Open File Envelope No. 3722

EL 538, EL 807 AND EL 1138

MOUNT FROME

PROGRESS AND FINAL REPORTS TO LICENCE SURRENDER FOR THE PERIOD 25/10/1979 TO 25/2/1988

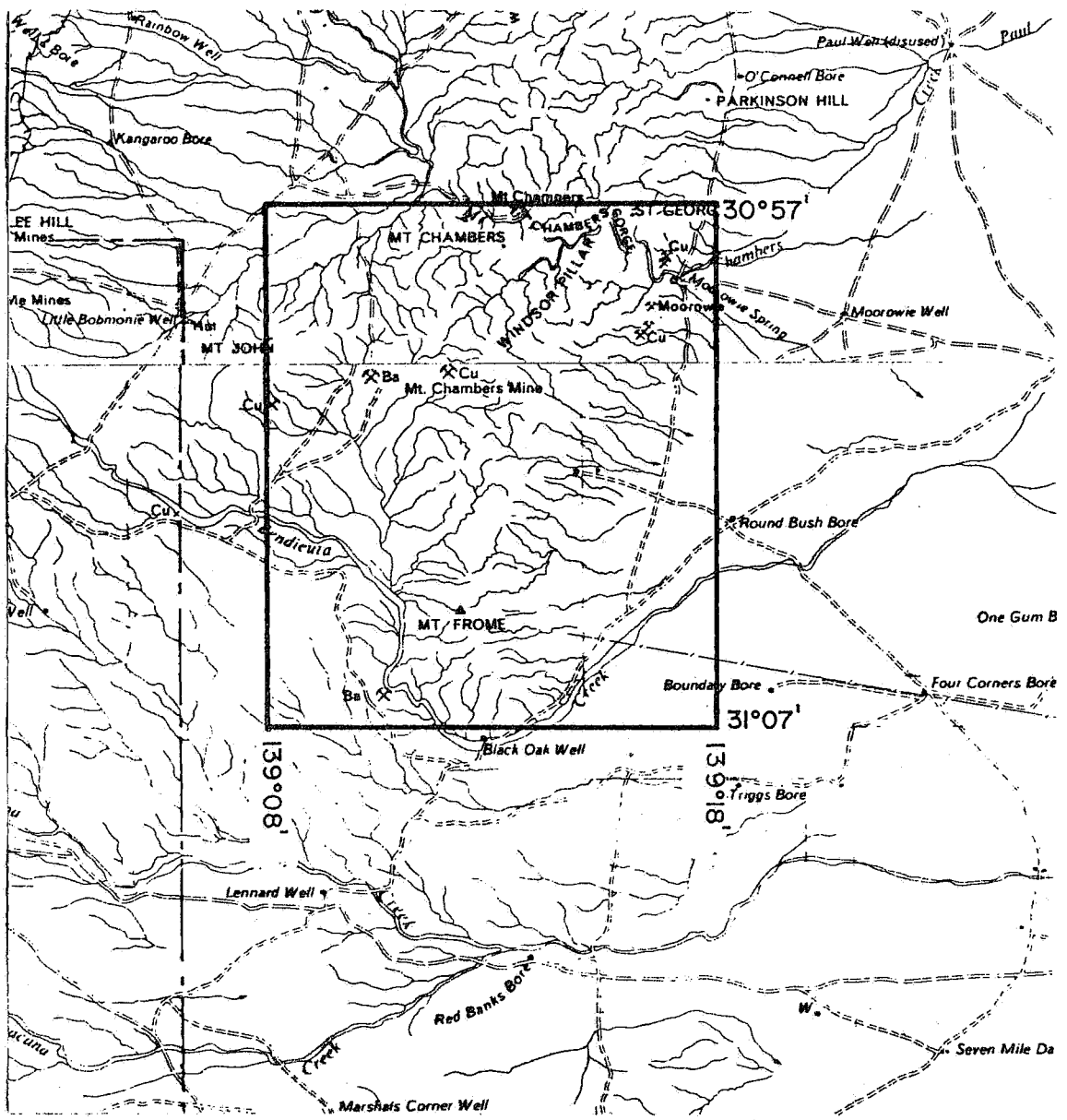
Submitted by
Dampier Mining Co. Ltd, Esso Australia Ltd and BHP Minerals Ltd
1988

Enquiries: Customer Services Branch
Minerals and Energy Resources
7th Floor
101 Grenfell Street, Adelaide 5000

Telephone: (08) 8463 3000
Facsimile: (08) 8204 1880

Government of South Australia
Primary Industries and Resources SA

SCHEDULE A



SCALE 1:250,000

KILOMETRES 5 0 5 10 15 20 25 KILOMETRES

EXPIRED

APPLICANT: DAMPIER MINING COMPANY LIMITED

DM: 221/79 AREA: 294 square kilometres

1:250000 PLANS: COPLEY, PARACHILNA

LOCALITY: MT FROME AREA — 100km S.E. of LIEGH CREEK

DATE GRANTED: 25-10-79 DATE EXPIRED: 24-10-80

REAP N.

EL No: 538

CONTENTS ENVELOPE 3722 — Transparencies In Cylinder 3722/1

TENEMENT: E.L's. 538, 807 & 1138 Mt. Frome - S.E. Of Leigh Creek.

TENEMENT HOLDER: B.H.P. Minerals Ltd.

REPORT: E.L. 1138 Mt. Frome Surrender Report. Report CR 6407. Pgs. 171-174

EXPLORATION LICENCE 538

MOUNT FROME, SOUTH AUSTRALIA

Report for the Quarter Ended 25th January, 1980.

1. GENERAL

Exploration Licence 538, of 294 square kilometres, was granted to Dampier Mining Company Limited on 25th October, 1979 for one year. The main target is lead and zinc mineralisation of the Mississippi Valley type.

2. FIELD INVESTIGATIONS

Geological Mapping was delayed due to poor access, but is currently in progress utilising a helicopter.

Detailed mapping of any areas of interest will be carried out during the next quarter.

3. EXPENDITURE

Expenditure debited to E.L. 538 to 31st January, 1980, was:

Wages and Salaries	$ 5,024
Messing and Accommodation	1,045
Fares and Mobilisation	644
Transport	1,490
Surveying/Aerial Photographs	168
Sample Analysis	768
Tenement Fees, Licences etc.	151
Occupancy/Location Expenses	16
Capital Items	676
	$9, 980

This report is submitted to the Department of Mines and Energy as required by Condition 4 of Exploration Licence 538.

EXPLORATION LICENCE 538

MOUNT FROME, SOUTH AUSTRALIA

REPORT FOR THE QUARTER ENDED 25th APRIL, 1980.

1. GENERAL

Exploration Licence 538, of 294 square kilometres, was granted to Dampier Mining Company Limited on 25th October, 1979, for one year. The main target is lead and zinc mineralization of the Mississippi Valley type.

2. FIELD INVESTIGATIONS

2.1 Geological Mapping

Traversing at 2 kilometre intervals was carried out utilising a helicopter. Copper, lead and zinc mineralization was examined near the Moorowie Mine and detailed mapping of this area commenced at the end of the quarter.

1:20000 aerial photography of this area was obtained to assist with this mapping.

3. EXPENDITURE

Expenditure debited to E.L. 538 during February, 1980, was :

Wages and Salaries	$ 59
Messing and Accommodation	197
Transport	697
Aircraft Charter	9 551
	$10 504

Total expenditure to 29th February, 1980, is $20 484.

Expenditure for March and April, 1980, has not yet been consolidated.

This report is submitted to the Department of Mines & Energy as required by Condition 4 of Exploration Licence 538.

EXPLORATION LICENCE 538
MOUNT FROME, SOUTH AUSTRALIA
REPORT FOR THE QUARTER ENDED 25TH JULY, 1980

1. General

Exploration Licence 538 of 294 square kilometres, was granted to Dampier Mining Company Limited on 25th October, 1979, for one year. The main target is lead and zinc mineralization of the Mississippi Valley type.

2. Field Investigations

Completion of detailed mapping was delayed because of drilling on our other areas. The mapping will be completed in the next quarter together with recommendations for testing the Moorowie Mine area mineralization with diamond drilling. An assessment of the Mt. John and Mt. Chambers Barite prospects will also be carried out.

3. Expenditure

Expenditure debited to E.L. 538 during the months March to June, 1980 was:

Wages and Salaries	$ 8 525
Messing and Accommodation	1 463
Fares and Mobilisation	104
Transport	1 596
Occupancy/Location Expenses	340
Vehicles	2 571
	$14 599

Total expenditure to 30th June, 1980, is $35 083.
Expenditure for July has not yet been consolidated.

This report is submitted to the Department of Mines and Energy as required by Condition 4 of Exploration Licence 538

EXPLORATION LICENCE 538

MOUNT FROME, SOUTH AUSTRALIA

REPORT FOR THE QUARTER ENDED 25th OCTOBER, 1980

1. GENERAL

Exploration Licence 538 of 294 square kilometres, was granted to Dampier Mining Company Limited on 25th October, 1979, for one year. The main target is lead and zinc mineralization of the Mississippi Valley type.

2. FIELD INVESTIGATIONS

Geological mapping at 1:20,000 scale was commenced during the quarter. To date, the northern half of the area has been completed. Several areas of fault controlled copper, lead and zinc mineralization were located; these areas will be mapped in more detail at 1:10,000 scale.

3. PROPOSED WORK

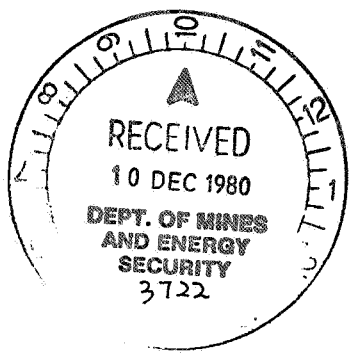
The following exploration work is planned:
(1) Completion of 1:20,000 geological mapping.
(2) Detailed mapping at 1:10,000 in selected areas.
(3) Drilling of the best surface indications as defined by prospecting and mapping.

4. EXPENDITURE

Expenditure debited to EL 538 during July, August, September and October, 1980, was:

Wages and Salaries	$ 2,889
Messing and Accommodation	604
Fares and Mobilisation	392
Transport	2,102
Surveying/Aerial Photographs	3,929
Sample Analysis	43
Occupancy/Location Expenses	5
	$ 9,964

Total expenditure to 31st October, 1980, is $45,047.

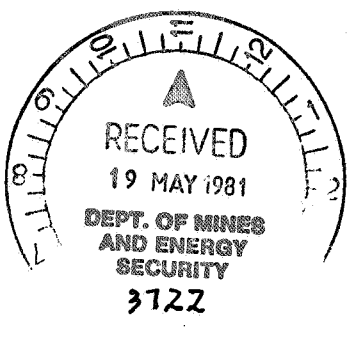


This report is submitted to the Department of Mines and Energy as required by Condition 4 of Exploration Licence 538.

EXPLORATION LICENCE 807

MOUNT FROME, SOUTH AUSTRALIA

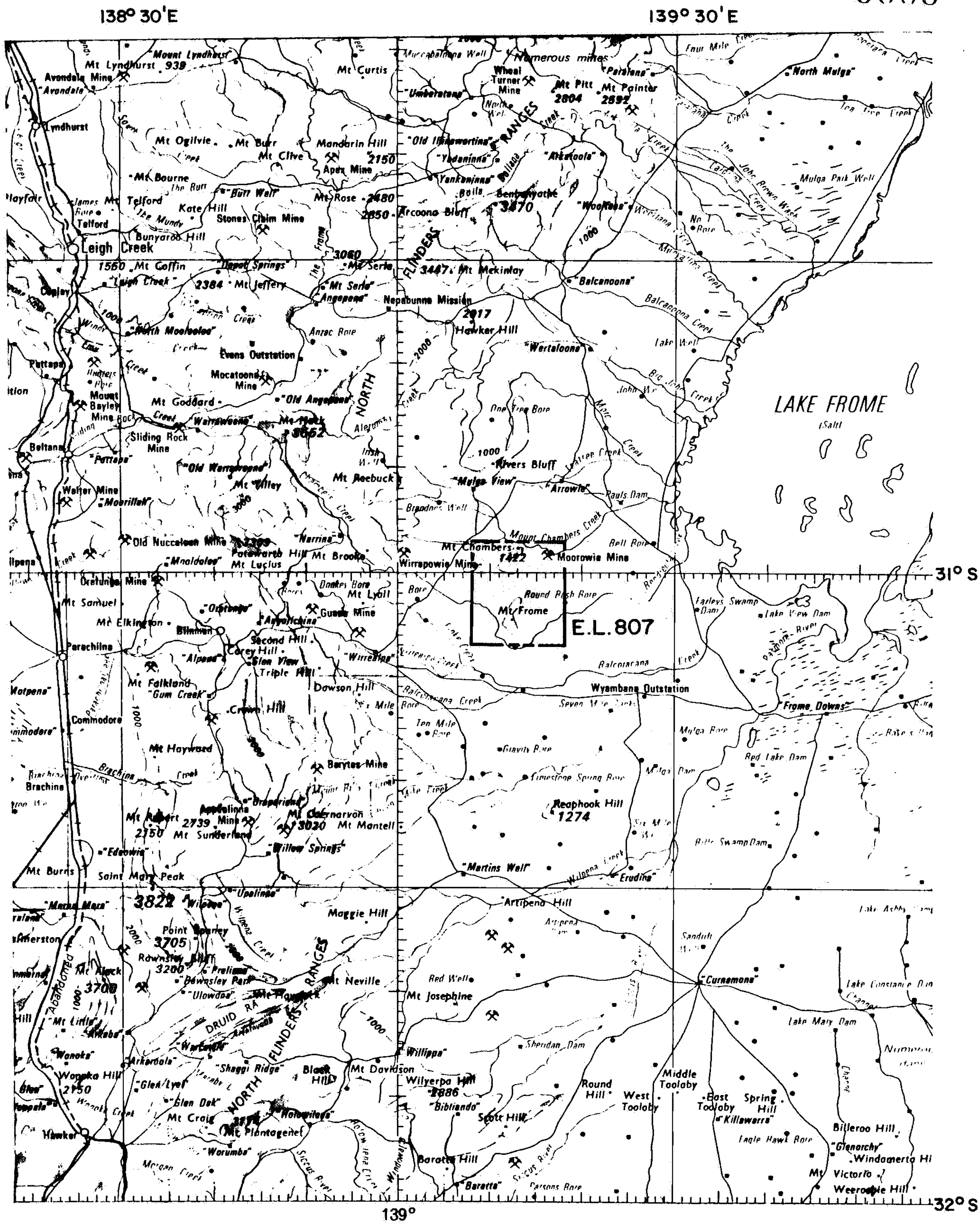
REPORT FOR THE QUARTER ENDED 12th MAY, 1981



CONTENTS

0008

0009



Scale 1:1 000,000

0 10 20 30 40 50 Km.

Centre Melbourne	THE BROKEN HILL PROPRIETARY CO. LTD.	Project No.
Date 7-5-81	E.L. 807, MT. FROME, S.A. LOCATION MAP	Drawing No. A4-2226

EXPLORATION LICENCE 807

MOUNT FROME, SOUTH AUSTRALIA

REPORT FOR THE QUARTER ENDED 12th MAY, 1981

1. GENERAL

Exploration Licence 807, of 294 square kilometres, was granted to Dampier Mining Company Limited on 12th February, 1981, for one year. This licence replaces EL 538, held by Dampier Mining Company Limited, covering the same area, which expired on 25th October, 1980.

The main target within the Exploration Licence area is lead and zinc mineralization of the Mississippi Valley type.

2. FIELD INVESTIGATIONS

Recent detailed geological mapping at 1:10,000 scale revealed three major unconformities within the Lower Cambrian Wilkawillina Limestone unit.

Lead (galena, cerrussite), zinc (hydrozincite, smithsonite, sphalerite), copper (malachite, azurite) and fluorite mineralization was discovered, associated with these unconformities.

They are the source of the historically enigmatic stream sediment anomalies detected by other companies who have previously carried out exploration in this area.

Grab samples from the unconformities assayed up to 5.8% Zn and 2.3% Pb. The geological map, sample site locations and assays are presently being drafted, and will be included in the next quarterly report.

3. PROPOSED WORK

A diamond drilling programme comprising two fences each of three drill holes is planned to test the recently discovered mineralization.

This drilling will be undertaken on the completion of the Wirrealpa drilling programme (possibly late July or early August). Drill sites and access tracks are being constructed. Approval has been given by the S.A. Dept. of Mines and Energy to carry out this proposed exploration programme.

...2/

4. EXPENDITURE

Expenditure debited to EL 538/807 during the five months November, 1980 to March, 1981, was :

Wages and Salaries	$4,155
Messing and Accommodation	1,039
Fares and Mobilisation	166
Transport	1,043
Radio Communications	10
Surveying/Aerial Photographs	386
Plant Services	311
Sample Analysis	168
Tenement Fees, Licences, etc.	291
Vehicles	750
Other Items	45
	$8,364

Total expenditure to 31st March, 1981, is $53,411.

This report is submitted to the Department of Mines and Energy as required by Condition 4 of Exploration Licence 807.

EXPLORATION LICENCE 807
MOUNT FROME, SOUTH AUSTRALIA
REPORT FOR THE QUARTER ENDED
12TH AUGUST, 1981

CONTENTS

0013

FIGURES

EXPLORATION LICENCE 807
MOUNT FROME, SOUTH AUSTRALIA
REPORT FOR THE QUARTER ENDED
12TH AUGUST, 1981

1. GENERAL

Exploration Licence 807 of 294 square kilometres was granted to Dampier Mining Company Limited on 12th February, 1981 for one year. This licence replaces EL 538 held by Dampier Mining Company Limited, covering the same area, which expired on 25th October, 1980.

2. FIELD INVESTIGATIONS

2 Stream Sediment Sampling

Sixty-five (65) stream sediment samples were collected from two drainage systems within the Wilnuroona Prospect (new name for the mineralised area in the north-west portion of EL 807). Although there had been recent heavy rains in the area, all streams were dry at the time of sampling. All samples were sieved in the field, utilising a 6 mesh sieve. The samples were then sent to ANALABS (Perth) where they were dried and sieved to three size fractions:-

(1) +20 mesh fraction
(2) -20 +80 mesh fraction
(3) -80 mesh fraction

All samples were prepared for analysis by perchloric/ hydrochloric acid digestion, and analysed by Atomic Absorption Spectroscopy.

All samples (in each of the three size intervals) were assayed for copper, lead, zinc, silver, manganese and iron. The results from the assays, and locations of sample collection sites are on Figure 2, Sheets 1 to 10.

Statistical analysis of the results is presently being undertaken, and this data will be included in the next report.

To assist in the appraisal of the previous geochemistry carried out in this area, the previous stream sediment survey results from the Wilnuroona area have been produced at 1:10,000 scale, and these reproductions are included in this report.

2.2 Diamond Drilling

The proposed drilling programme for this area is due to commence early in the next quarter.

The drilling programme of six (6) holes totalling approximately 2,000 metres is expected to take three (3) months to complete.

3. EXPENDITURE

Expenditure debited to EL 807 during the four months April to July, 1981, was:-

Wages and Salaries	$1,880
Messing and Accommodation	692
Fares and Mobilisation	38
Transport	1,098
Surveying/Aerial Photographs	33
Radio Communications	151
Aircraft Charter	879
Sample Analysis	443
Occupancy/Location Expenses	29
Administrative Costs/Overheads	262
	$5,505

Total expenditure on EL 538/807 to 31st July, 1981 is $58,916.

This report is submitted to the Department of Mines and Energy as required by Condition 4 of Exploration Licence 807.

FIG. 2 - 1

139° 12'

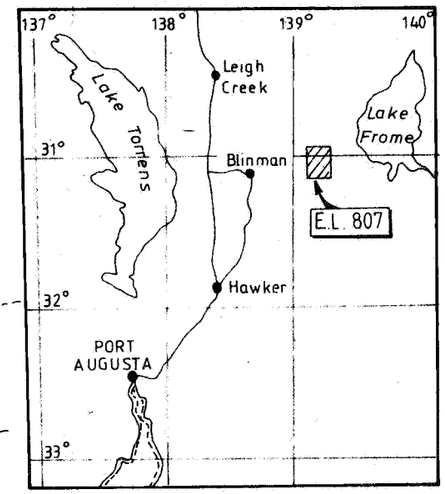
139° 13'

31°00

31°01

WILNUROONA

28 5127 29 30 31 33 34 35 36 37 39 38 42 5140 43 41 45 44 46 47 48 49 62 61 63 64 5160 58 56 55 153 52 51 5150 59 57 54 66 65 67 68 5170 69 72 71 73 75 74 5176 77 5178 81 79 5180 83 82 85 84 86 87 5190 89 91 88



LOCALITY MAP

0 100 200 300 400 500 metres

SCALE 1:10 000

STREAMS TRACED FROM AN ENLARGEMENT OF 1:50 000 WERTALOONA AND BENDIEUTA TOPO MAPS

THE BROKEN HILL PROPRIETARY CO. LTD.

E.L. 807 MT. FROME
WILNUROONA PROSPECT

STREAM SEDIMENTARY GEOCHEMISTRY
SAMPLE SITE LOCATIONS

Drawn: R K	Date: AUG 81	Centre: WHYALLA
Prepared: M. ROCHE	Project No:	Drawing No: A3-1787-1
Checked:		

Revisions:

0016

FIG. 2-2

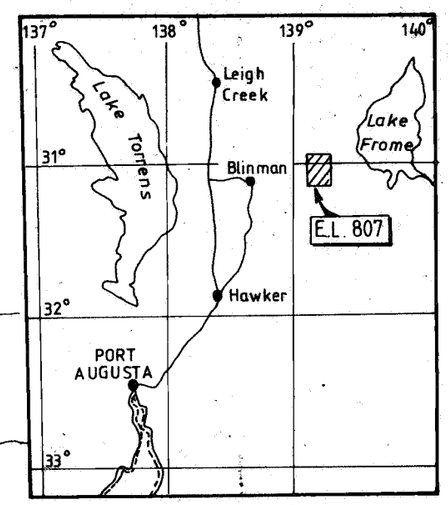
WILNUROONA

139° 12′

139° 13′

31°00

31°01′



LOCALITY MAP

ANALYSIS PREPARATION : PERCHLORIC / HYDROCHLORIC DIGESTION.

ANALYSIS METHOD: A.A.S.

STREAMS TRACED FROM AN ENLARGEMENT OF 1 : 50 000 WERTALOONA AND BENDIEUTA TOPO MAPS.

0 100 200 300 400 500 metres

SCALE 1 : 10 000

THE BROKEN HILL PROPRIETARY CO. LTD.

E.L. 807 MT. FROME WILNUROONA PROSPECT

STREAM SEDIMENT GEOCHEMISTRY

Cu Values (ppm) – 80 mesh fraction

Drawn: R K	Date: AUG 81	Centre: WHYALLA	
Prepared: M. ROCHE	Project No:	Drawing No: A3-1787-2	
Checked:			

Revisions:

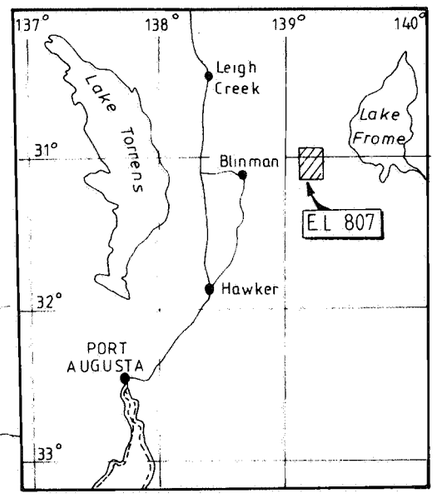
0317

FIG. 2-3

WILNUROONA

31°00

31°01



LOCALITY MAP

0 100 200 300 400 500 metres

SCALE 1:10 000

ANALYSIS PREPARATION : PERCHLORIC / HYDROCHLORIC DIGESTION

ANALYSIS METHOD. A A S.

STREAMS TRACED FROM AN ENLARGEMENT OF 1:50 000 WERTALOONA AND BENDIEUTA TOPO MAPS

THE BROKEN HILL PROPRIETARY CO. LTD.

E.L. 807 MT. FROME
WILNUROONA PROSPECT
STREAM SEDIMENT GEOCHEMISTRY
Cu Values (ppm) + 20 mesh fraction

Drawn: R K	Date: AUG 81	Centre: WHYALLA
Prepared: M. ROCHE	Project No:	Drawing No: A3-1787-3
Checked:		

Revisions:

0018

FIG. 2-4

139° 12′

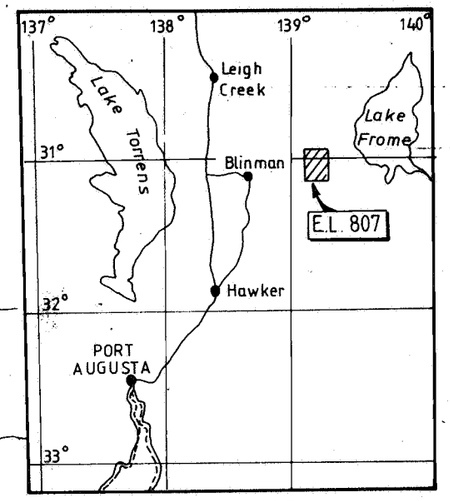
139° 13′

31°00

31°01′

WILNUROONA

28 24 23 20 21 23 23 19 21 20 20 23 22 18 23 34 20 25 29 33 63 30 53 47 40 40 31 56 59 64 55 38 43 39 47 35 39 46 47 69 43 26 63 39 45 45 47 48 28 24 27 31 29 39 27 36 25 30 61 55 53 35 29



LOCALITY MAP

ANALYSIS PREPARATION : PERCHLORIC / HYDROCHLORIC DIGESTION

ANALYSIS METHOD: A.A.S.

STREAMS TRACED FROM AN ENLARGEMENT OF 1 : 50 000 WERTALOONA AND BENDIEUTA TOPO MAPS.

0 100 200 300 400 500 metres

SCALE 1 : 10 000

THE BROKEN HILL PROPRIETARY CO. LTD.

E.L. 807 MT. FROME
WILNUROONA PROSPECT
STREAM SEDIMENT GEOCHEMISTRY
Cu Values (ppm) +80 -20 mesh fraction

Drawn: R K	Date: AUG 81	Centre: WHYALLA
Prepared: M. ROCHE	Project No:	Drawing No: A3-1787-4
Checked:		

Revisions:

0019

FIG. 2-5

WILNUROONA

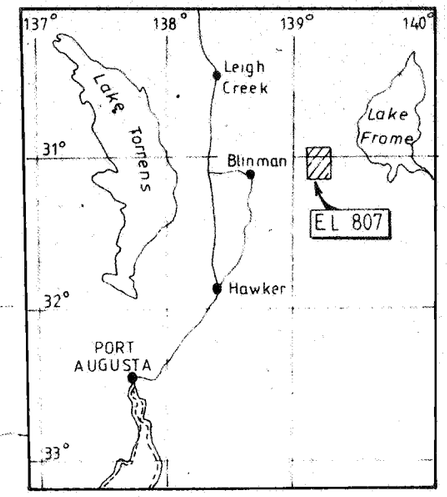
31°00

130 265 335 120 250 290 165 200 260 100 50 235

280 390 240 280 290 310 340 310 210 190 320 340 390 450 280 320 290

190 160 220 540 250 540 460 370 230 490 180 720 520 210 320 310 350 290 300 210 480

250 300 260 150 280 225 275 160 215 220 300 180 220 215 180



LOCALITY MAP

0 100 200 300 400 500 metres

SCALE 1:10 000

ANALYSIS PREPARATION PERCHLORIC / HYDROCHLORIC DIGESTION

ANALYSIS METHOD A A S

STREAMS TRACED FROM AN ENLARGEMENT OF 1 50 000 WERTALOONA AND BENDIEUTA TOPO MAPS

THE BROKEN HILL PROPRIETARY CO. LTD.

E.L. 807 MT. FROME
WILNUROONA PROSPECT

STREAM SEDIMENT GEOCHEMISTRY

Zn values (ppm) +20 mesh fraction

Drawn: R K	Date: AUG 81	Centre: WHYALLA
Prepared: M ROCHE	Project No:	Drawing No: A3-1787-5
Checked:		

Revisions

0020

FIG. 2-6

139° 12'

139° 13'

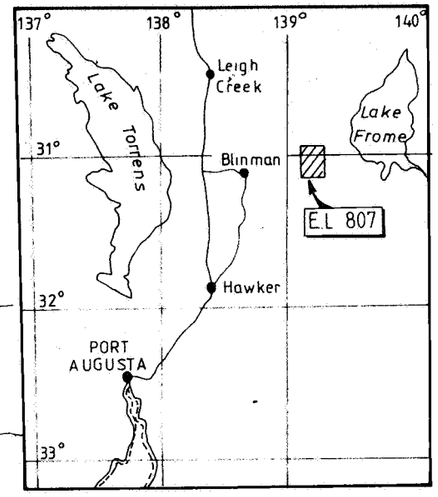
31°00

WILNUROONA

240 210 230 390 280 300 720 550 320 290 560 380 240 460 390 230 340 420 390 370 300 610 390 340 350 370 300 370 360 380 360 355 225 220 360 380 380 490 360 190 320 340 80 255 310 170 230 290 100 85 255 295 290 300 305 260 345 300 270 260 290 190 255 350 250 260

31°01'

LOCALITY MAP



0 100 200 300 400 500 metres

SCALE 1 : 10 000

ANALYSIS PREPARATION PERCHLORIC / HYDROCHLORIC DIGESTION

ANALYSIS METHOD. A.A.S

STREAMS TRACED FROM AN ENLARGEMENT OF 1 50 000 WERTALOONA AND BENDIEUTA TOPO MAPS

THE BROKEN HILL PROPRIETARY CO. LTD.

E.L. 807 MT. FROME
WILNUROONA PROSPECT

STREAM SEDIMENT GEOCHEMISTRY

Zn Values (ppm) + 80 - 20 mesh fraction

Drawn: R K	Date: AUG 81	Centre: WHYALLA
Prepared: M ROCHE	Project No:	Drawing No: A3-1787-6
Checked:		

Revisions:

0021

FIG. 2-7

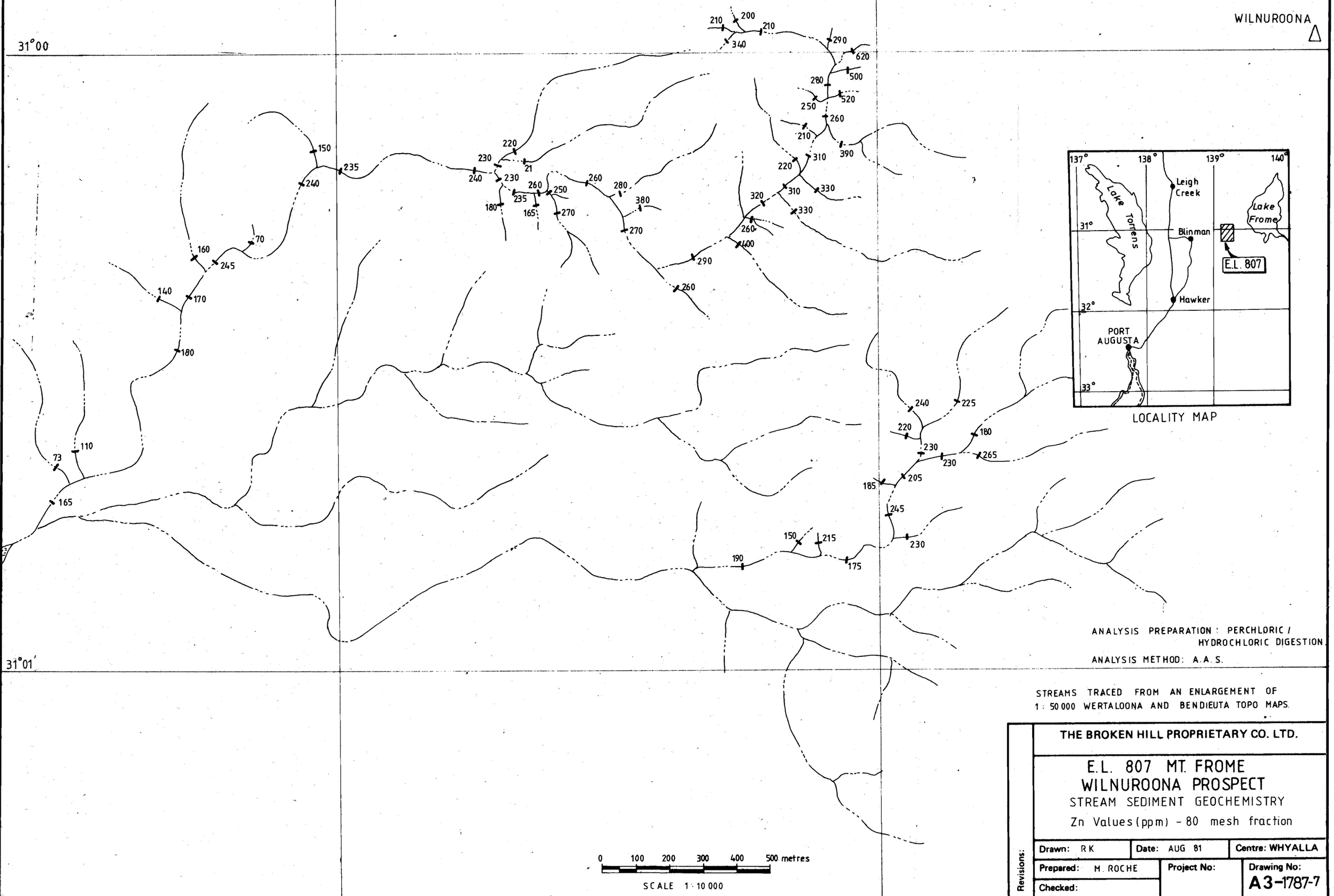
139° 12′

139° 13′

WILNUROONA △

31°00

31°01′



LOCALITY MAP

ANALYSIS PREPARATION : PERCHLORIC / HYDROCHLORIC DIGESTION

ANALYSIS METHOD: A.A.S.

STREAMS TRACED FROM AN ENLARGEMENT OF 1 : 50 000 WERTALOONA AND BENDIEUTA TOPO MAPS.

0 100 200 300 400 500 metres

SCALE 1 : 10 000

THE BROKEN HILL PROPRIETARY CO. LTD.

E.L. 807 MT. FROME
WILNUROONA PROSPECT
STREAM SEDIMENT GEOCHEMISTRY
Zn Values (ppm) - 80 mesh fraction

Drawn: R K	Date: AUG 81	Centre: WHYALLA	
Prepared: M. ROCHE	Project No:	Drawing No: A3-1787-7	
Checked:			

Revisions:

0022

FIG. 2-8

139° 12′

139° 13′

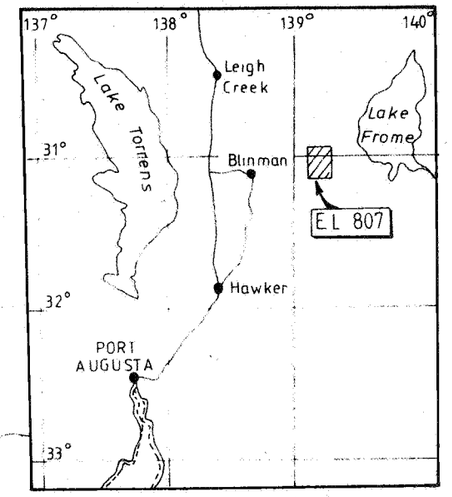
WILNUROONA

31°00

31°01′

88 74 290 210 88 2300 380 400 75 200 80 230 210 240 98 141 84 155 78 61 133 122 99 680 115 130 128 200 88 126 160 122 230 130 92 310 114 148 320 110 310 72 220 114 450 180 48 41 109 56 93 46 76 76 74 51 64 46 74 34 41 66 56 58

0 100 200 300 400 500 metres



LOCALITY MAP

ANALYSIS PREPARATION PERCHLORIC / HYDROCHLORIC DIGESTION

ANALYSIS METHOD A A S

STREAMS TRACED FROM AN ENLARGEMENT OF 1 50 000 WERTALOONA AND BENDIEUTA TOPO MAPS

THE BROKEN HILL PROPRIETARY CO. LTD.

E.L. 807 MT. FROME
WILNUROONA PROSPECT
STREAM SEDIMENT GEOCHEMISTRY
Pb values (ppm) + 20 mesh fraction

Drawn: [illegible]	Date: AUG 8	Centre: WHYALLA
Prepared: M. ROCHE	Project No:	Drawing No: A3-1787-8
Checked:		

Revisions

0023

FIG. 2-9

139° 12'

139° 13'

WILNUROONA

31°00

31°01'

108 98 134 102 230 1440 380 1410 106 278 115 360 200 410 114 260 120 290 102 94 260 220 136 170 120 210 230 210 220 330 190 114 128 310 260 220 410 170 210 190 220 410 108 230 136 610 230 56 72 220 78 116 68 130 98 98 91 57 92 98 118 44 61 90 89

LOCALITY MAP

137° 138° 139° 140°

31° 32° 33°

Lake Torrens

Leigh Creek

Lake Frome

Blinman

E.L 807

Hawker

PORT AUGUSTA

0 100 200 300 400 500 metres

SCALE 1:10 000

ANALYSIS PREPARATION : PERCHLORIC / HYDROCHLORIC DIGESTION

ANALYSIS METHOD: A.A.S.

STREAMS TRACED FROM AN ENLARGEMENT OF 1:50 000 WERTALOONA AND BENDIEUTA TOPO MAPS.

THE BROKEN HILL PROPRIETARY CO. LTD.

E.L. 807 MT. FROME
WILNUROONA PROSPECT
STREAM SEDIMENT GEOCHEMISTRY
Pb values (ppm) + 80 - 20 mesh fraction

Drawn: R.K	Date: AUG 81	Centre: WHYALLA
Prepared: M. ROCHE	Project No:	Drawing No: A3-1787-9
Checked:		

Revisions:

0024

FIG. 2-10

139° 12′

139° 13′

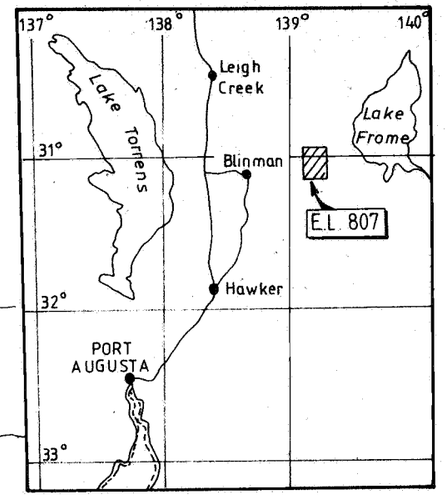
31°00

31°01′

WILNUROONA

64 65 70 120 80 590 260 116 65 210 129 76 109 66 123 142 81 120 76 62 108 118 79 82 220 110 92 103 124 66 89 95 76 96 73 82 64 76 97 113 88 95 230 126 340 94 123 45 49 95 50 72 44 60 61 46 52 60 67 33 48 58 48

LOCALITY MAP



ANALYSIS PREPARATION : PERCHLORIC / HYDROCHLORIC DIGESTION

ANALYSIS METHOD: A.A.S.

STREAMS TRACED FROM AN ENLARGEMENT OF 1 : 50 000 WERTALOONA AND BENDIEUTA TOPO MAPS.

0 100 200 300 400 500 metres

SCALE 1 : 10 000

THE BROKEN HILL PROPRIETARY CO. LTD.

E.L. 807 MT. FROME WILNUROONA PROSPECT

STREAM SEDIMENT GEOCHEMISTRY

Pb values (ppm) – 80 mesh fraction

Drawn: R K	Date: AUG 81	Centre: WHYALLA	
Prepared: M. ROCHE	Project No:	Drawing No: A 3-1787-10	
Checked:			

Revisions:

0025

139°11'

139°12'

139°13'

139°14'

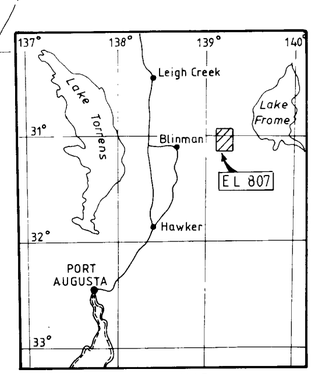
31°00'

31°01'

MOUNT CHAMBERS MINE

WILNUROONA

280 400 190 1300 500 230 260 240 300 200 300 320 1100 300 140 300 160 1200 6000 400 210 300 660 500 850 140 720 1100 950 2600 750 450 280 200 170 120 80 1100 510 750 480 60 420 690 140 75 280 500 100 170 110 80 430 150 340 820 550 2800 570 1000 1400 1100 1000 1000 120 750 950 1100 200 1100 120 200 240 100 120 110 130 80 110 110 100 100 110 100 570 120 40 100



LOCALITY MAP

STREAMS TRACED FROM AN ENLARGEMENT OF 1 50 000 WERTALOONA AND BENDIEUTA TOPO MAPS

0 100 200 300 400 500 metres

SCALE : 1: 10 000

THE BROKEN HILL PROPRIETARY CO. LTD.

E.L. 807, MT. FROME WILNUROONA PROSPECT

Pb VALUES (ppm) STREAM SEDIMENT SURVEY

Reproduced from plans accompanying S.A.D.M.E. env. 1104

Drawn : R.K	Date : JUNE '81	Centre : WHYALLA	
Prepared : M.ROCHE	Project No:	Drawing No: A2-1777	
Checked :			

Revisions:

3722-1

Fig.3

139°11'

139°12'

139°13'

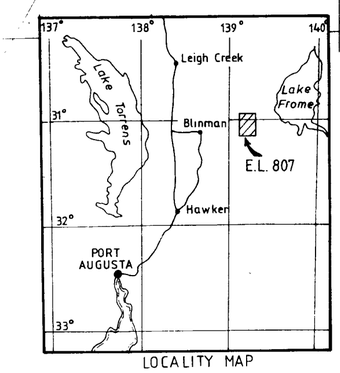
139°14'

MOUNT CHAMBERS MINE

WILNUROONA

110 320 240 110 230 90 290 350 360 300 250 230 280 520 310 270 240 340 260 170 500 260 400 360 160 420 180 540 340 330 400 160 220 320 150 200 110 190 50 130 40 55 45 70 100 190 200 100 200 170 200 170 250 200 240 240 140 260 220 150 240 190 270 230 180 300 140 160 240 190 150 110 180 200 120 520 300 200 150 100 220 240 80 240 150 150 180 160 110 200 120 120 140 200 140 150 130 160 120 160 110

21°01'



LOCALITY MAP

STREAMS TRACED FROM AN ENLARGEMENT OF 1:50 000 WERTALOONA AND BENDIEUTA TOPO MAPS.

0 100 200 300 400 500 metres

SCALE: 1:10 000

THE BROKEN HILL PROPRIETARY CO LTD

E.L. 807, MT. FROME
WILNUROONA PROSPECT

Zn VALUES (ppm) STREAM SEDIMENT SURVEY

Reproduced from plans accompanying S.A.D.M. 5 env. 1104

R K	JUNE '81	WHYALLA
M ROCHE		A2 1776

3722-2

Fig 4

EXPLORATION LICENCE 807

MOUNT FROME, SOUTH AUSTRALIA

REPORT FOR THE QUARTER ENDED 12th NOVEMBER, 1981

CONTENTS

0027

TABLES

APPENDICES

FIGURES

EXPLORATION LICENCE 807

MOUNT FROME, SOUTH AUSTRALIA

0028

REPORT FOR THE QUARTER ENDED 12th NOVEMBER, 1981

1. GENERAL

Exploration Licence 807 of 294 square kilometres was granted to BHP Minerals Limited (formerly Dampier Mining Company Limited) on 12th February, 1981 for one year (Figure 1).

This licence replaces EL 538 held by DAMCO covering the same area, which expired on 25th October, 1980.

2. FIELD INVESTIGATIONS

2.1 Drilling

A diamond drilling programme comprising 5 holes totalling 1524.5 metres was completed on 28.11.81. Drilling details are outlined in Table 2. All holes were drilled using a BHP owned Longyear 38 drill rig, operated under contract by CASEY DRILLING LTD.

Geological drill logs for the five holes (DDF1-5) are in Appendix 1. Geological drill sections are being prepared and will be included in the next quarterly report.

No significant mineralization was detected during this drilling programme.

Drilling was hampered by difficult drilling conditions (broken ground, cavities, dry holes) and, at times, adverse weather conditions. Two holes (DDF1 and DDF2) were abandoned due to bogging of bit in clay filled cavity (DDF1) and loss of core barrel in 20 metre cavity (DDF2).

The drill core from this programme is presently being transported to Whyalla where it will be stored in the core shed at the BHP Steelworks, Whyalla.

2.2 Mineralization

Sporadic mineralization was detected in several fracture zones within the Wilkawillina Limestone units. Where significant amounts of mineralisation were expected, in cavities beneath the Faunal Assemblage 2 unconformity, the prepared ground had been subjected to later dolomitization and recent weathering and leaching. Residual lead and zinc were detected (in apparent minor amounts) within these zones; these sections of core will be split and assayed.

cont./..

A full appraisal of this programme is presently being prepared and will be submitted in the next quarterly report.

2.3 Channel Sampling

Two traverses of channel samples were collected over a mineralized fault breccia within the Wilkawillina Limestone. The zone was sampled continuously with samples being bagged at 5 metre intervals.

The samples were sent to COMLABS (Adelaide) where they were crushed, pulverized and prepared for analysis by digestion in hydrochloric/perchloric acid and assayed by atomic absorption spectrophotometry. Assay results are in Table 1.

2.4 Geological Mapping

Detailed geological mapping in the vicinity of Wilnuroona prospect is presently being undertaken. 1:5,000 scale enlargements of the 1:20,000 scale colour aerial photography are being used for this mapping.

2.5 Geophysical Logging

Where conditions permitted, an attempt was made to log each diamond drill hole on its completion. Due to large cavities it was possible to obtain gamma profiles only from DDF 3, DDF 4 and DDF 5. The instrument used was a portable SIE T450 E. The resultant profiles are shown in Figures 3 (a),(b) and (c).

3. EXPENDITURE

Expenditure debited to EL 807 during the four months August to November, 1981, was:

Wages and Salaries	$15,166
Messing and Accommodation	2,815
Fares and Mobilisation	237
Drilling	58,599
Transport	3,761
Surveying/Aerial Photographs	917
Plant Services	2,002
Mobilisation of Equipment	286
Sample Analysis	860
Geophysics/Geochemistry	42
Administration/Overheads	4,238
Other Items	67
	$88,990

Total expenditure on EL's 538/807 to 30th November, 1981, is $147,906

This report is submitted to the Department of Mines and Energy as required by Condition 4 of Exploration Licence 807.

TABLE 1 CHANNEL SAMPLE ASSAY RESULTS

Sample No.	Interval(m)	Pb	Zn	Ag(ppm)
Line I				
CS3001	0 - 5	3.7%	9.2%	17
CS3002	5 - 10	4.5%	11.0%	24
CS3003	10 - 15	6.1%	29.0%	28
CS3004	15 - 20	1.5%	11.5%	9
CS3005	20 - 25	470ppm	3500ppm	1
Line II				
CS3006	0 - 5	500ppm	1600ppm	1
CS3007	5 - 10	1.1%	9.8%	6
CS3008	10 - 15	4.4%	20.0%	40
CS3009	15 - 20	11.4%	32.5%	43
CS3010	20 - 25	7.2%	17.4%	23
CS3011	25 - 30	3.9%	16.4%	19
CS3012	30 - 35	580ppm	2600ppm	1

COMLABS Pty. Ltd.
COMPUTERISED ANALYTICAL LABORATORIES

ANALYTICAL REPORT

JOB COM 811919

0031

Results in ppm

SAMPLE	Pb	Zn	Ag
CS 3001	3.70%	9.20%	17
2	4.50%	11.0%	24
3	6.10%	29.0%	27
4	1.50%	11.5%	9
5	470	3500	<1
6	500	1600	<1
7	1.10%	9.80%	6
8	4.40%	20.0%	40
9	11.4%	32.5%	43
10	7.20%	17.4%	23
1	3.90%	16.4%	19
CS 3012	580	2600	<1

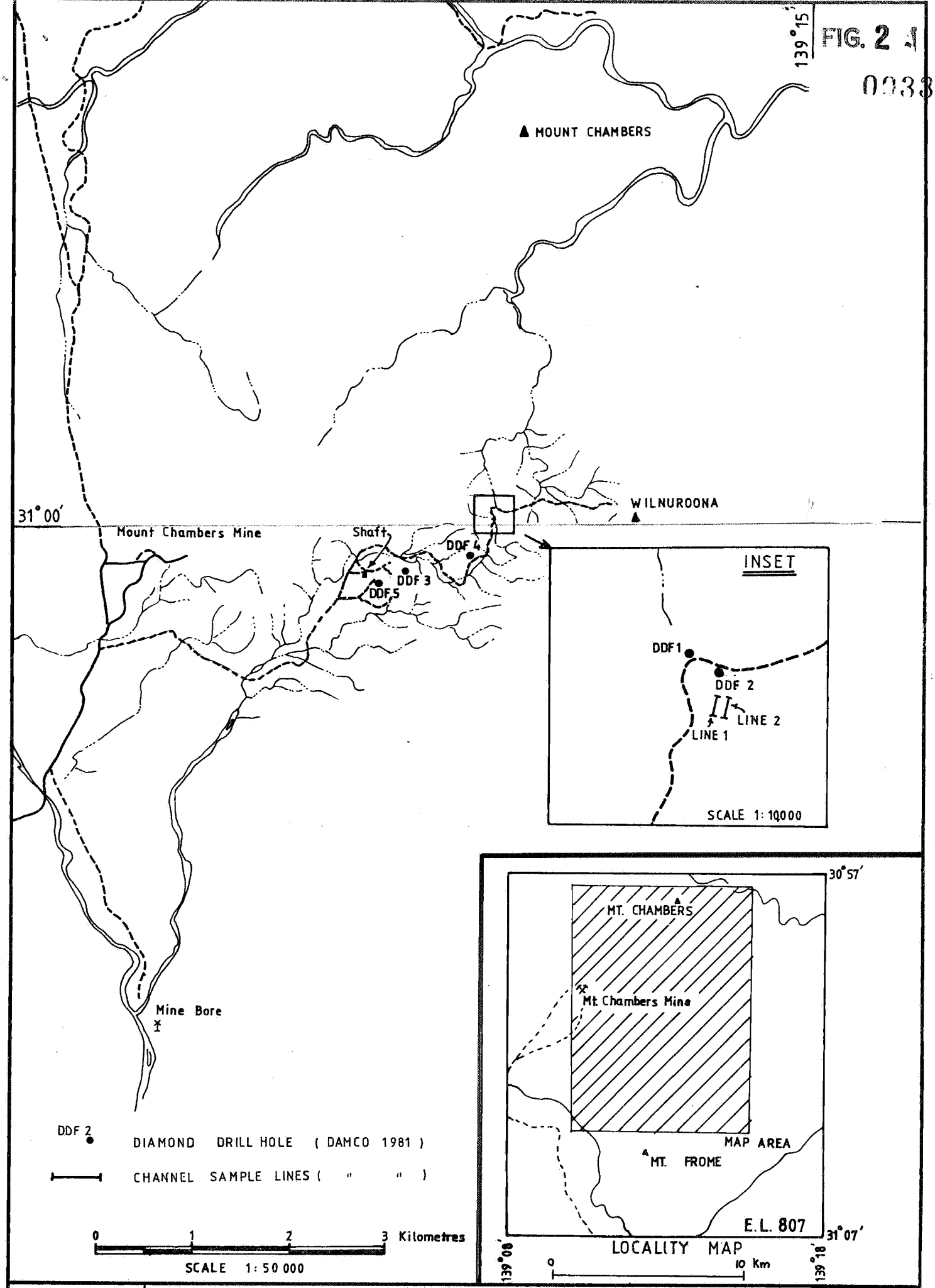
Method of Analysis - Pb, Zn : AAS 1/4
Ag : AAS 3

HOLE NO.	DATE COMPLETED	CO-ORDINATES (A.M.G.) NORTH (m)	CO-ORDINATES (A.M.G.) EAST (m)	TOTAL DEPTH	R.L. COLLAR	BEARING COLLAR	DECLINATION COLLAR	OTHER
DDF1	ABANDONED 11.9.81	6569075	32969	199.85	330m	-	VERTICAL	
DDF2	ABANDONED 25.9.81	6568550	32853	233.36	292m	-	VERTICAL	
DDF3	21.10.81	6569085	32970	370.80	332.5m	205	70°	
DDF4	10.11.81	6568560	32929	461.0	300m	180	70°	
DDF5	28.11.81	6568330	32826	300m	270m	260	70°	
			Total	1524.5m				

TABLE 2 DRILLING DETAILS

FIG. 2

0233



Centre: Whyalla	THE BROKEN HILL PROPRIETARY CO. LTD.	Project No.
Date	E.L. 807 MT FROME WILNUROONA PROSPECT DRILL HOLE LOCATIONS	Drawing No. A4- 362

DRILL HOLE: DDF 3	DEPTH OF HOLE: 370·8m
LOCATION.	DEPTH LOGGED 362·6m
	LOGGING UNIT SIE T450E
TYPE OF LOG: Gamma	CASING TYPE: Steel to 225·4m
DATE: 21-10-81	INCLINATION 70°S

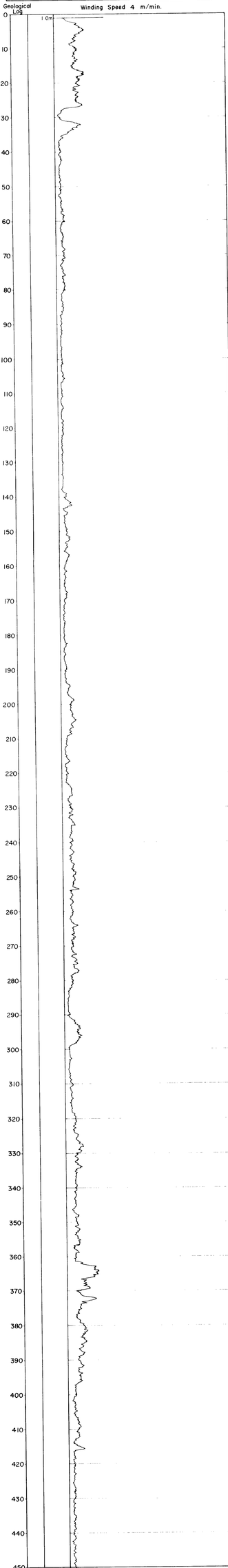
Centre. Adelaide	THE BROKEN HILL PROPRIETARY COMPANY LIMITED E L 807 MOUNT FROME, S.A. GAMMA LOG DDF 3	Project No 6-L160-1
Date 7-12-81		Drawing No G-20

3722-3

DRILL HOLE DDF 4	DEPTH OF HOLE 461·0m
LOCATION.	DEPTH LOGGED 451·3m
	LOGGING UNIT SIE T450E
TYPE OF LOG Gamma	CASING TYPE Steel to 210·0m
DATE 10-11-81	INCLINATION Vertical

Geological Log

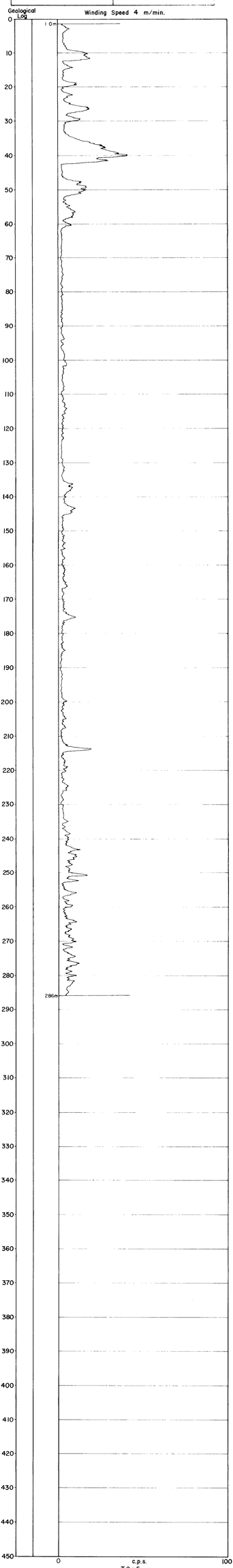
Winding Speed 4 m/min.



Centre Adelaide	THE BROKEN HILL PROPRIETARY COMPANY LIMITED E.L.807 MOUNT FROME, S.A. GAMMA LOG DDF 4	Project No 6-L160-2
Date 7-12-81		Drawing No G-21

3722-4

DRILL HOLE DDF 5	DEPTH OF HOLE 300.01m
LOCATION.	DEPTH LOGGED 286m
	LOGGING UNIT SIE T450E
TYPE OF LOG Gamma	CASING TYPE Steel to 210m
DATE 28-11-81	INCLINATION Vertical



Centre Adelaide	THE BROKEN HILL PROPRIETARY COMPANY LIMITED E.L.807 MOUNT FROME, S.A. GAMMA LOG DDF 5	Project No. 6-L160-3
Date 9-12-81		Drawing No. G-22

3722-5

APPENDIX 1

Geological Drill Logs DDF1-5

No. DDF1	EASTING 329690	DETAILS	PRECOLLAR	MAIN HOLE	DEPTH	DECL'N	BEARING	HOLE DIAM.	FROM	TO	PROJECT MISS. V.	AREA WILNUROONA
199.85m	NORTHING 6569075	Contractor	CASEY		0.0	VERTICAL		NW	0.0	39.0	JOB No. L160	SCALE 1:400.
AMG	LOGGED BY M.R.	Machine	LONGYEAR 38		EOH	VERTICAL		NQ	39.0	183.8	MINERAL TENEMENT OL 807 MT. FROME	
330m	DATUM MSL	Commenced	25-8-81					BQ	183.8	199.85	SHEET 1 OF 3	
		Completed (Abandoned)	11-9-81									
		Method	CORE									

MINERALIZATION CONTENT Pb	Fe	Mn	TYPE	SAMPLE Int	NUMBER	ASSAY RESULTS Zn%	Pb%	Ag ppm	STRAT AGE	COLOUR	LITHOS	L.C.A	TEXTURE	OPEN SPACE FRACTURING I F F I F F I F F	Vugh	Cyst	STYL Con	Dis	Rare	FOSSILS Abun	Comm	Rare	REMARKS
		.1																					Precollar; unconsolidated sands, brown clay, Manganese chips & top 8 metres.
		.1																					
		.1							Tertiary														↓
									€	B/P			A										39.0: Brown/pink weathered mottled (21cm cavity at 43.30m) limestone, Mn staining throughout, minor clay + calcite filled fractures weakly dolomitized in parts; occasional bands of illitic clays. Grading into pink (dolomitic)/grey (limestone) mottled texture, rare calcite.
													A										
										B/P													
										B/P			A										
									€	P			A										
												90°	C										72.35 Grey/black stylolitic flaggy limestone; large calcite filled fractures. Thin mottled band 77.51-79.76
													C										
												90°	C										

MINERALIZATION TYPE		COLOUR	
B	Blebs	W	White
C	Cavities	G	Grey
D	Disseminated	R	Red
E	Euhedra	B	Brown
L	Layered	Y	Yellow
M	Massive	Gn	Green
S	Stylolites	Bk	Black
V	Veins	P	Pink
X	Breccia	Bf	Buff

STYLOLITES

A	Abundant	> 5/m
C	Common	2 - 5/m
R	Rare	≤ 2/m

FOSSILS

- Algae
- Stromatolites
- Renalcis
- Brachiopods
- Oncolites
- Coral
- Archaeocyathid
- Gastropods
- Unidentified algal & skeletal fragments
- Bivalves

LITHOLOGIAS

Limestone (m)	Clay
Calcirudite	Oolite
Calcarenite	Evaporite
Calcilutite	Chert (bedded)
Biohermal limestone	Chert (massive)
Tuff	Breccia
Travertine	Mudstone
Dolomite (can be superimposed on any limestone)	Siltstone
Greywacke	Shale
Arkose	Sandstone

FRACTURES

Intensity (I)
1. V. Weak
2. Weak
3. Strong
4. V. Strong

Lithology of Fill (F)
- C_1 laminars calcrete
- C_2 pink calcite
- C_3 white calcite
- lead
- 3_1 red zinc
- 3_2 yellow/white zinc
- b barsite
- d_1 pink dolomite
- d_2 grey other dolomites
- m micrite
- q quartz
- o open

TEXTURES

- A
- Anm — 1. Clasts, 2. Matrix
- B
- C
- O
- Fenestrae
- Bedding/layering
- Veins
- Conformable contact
- Unconformable contact

E No. DDF 2	EASTING 32969	DETAILS	PRECOLLAR	MAIN HOLE	DEPTH	DECL'N	BEARING	HOLE DIAM. "	FROM	TO	PROJECT	AREA
'H	NORTHING 6569015	Contractor									JOB No.	SCALE
	LOGGED BY	Machine									MINERAL TENEMENT	
2 'O		Commenced									SHEET 2 OF	
	DATUM	Completed										
		Method										

MINERALIZATION CONTENT n Pb Fe	MINERALIZATION TYPE	SAMPLE Int	SAMPLE NUMBER	ASSAY RESULTS Zn%	Pb%	Ag ppm		STRAT AGE	COLOUR	LITHOS	L.C.A.	TEXTURE	OPEN SPACE FRACTURING I F F	I F F	I F F	Vugh.	Cryst.	Coat.	STYL. Con	Dis	Res	FOSSILS Abun	Comm	Rare	REMARKS
								€	G		90°	C→B													Occasional "chaos-like" stylolites; thin (<1m) mottled bands (A-type)
									G		90°	C→B													
									G																
									G			A Anm				R			A						113.3 Grey mottled stylolitic limestone, trace brown clay, fills vugs + fractures
								€	G							R			A						
									G			Anm							A						
									B			Anm							A						141.18-142.7 - Brown strongly weathered bed fill generally clays (paleokarst)
								€																	
												Anm				C									Slight veining + calcite filled vugs + fractures (V. Small)
									G/B							C									
												A													162.8 - Bcm
								€	G/B																
									G/B																175.1 Rubbly broken core 80cm cavity at 177.20m. 4.5m " " 179.0m.

MINERALIZATION TYPE

B	Blebs
C	Cavities
O	Disseminated
E	Euhedra
L	Layered
M	Massive
S	Stylolites
V	Veins
X	Breccia

COLOUR

W	White
G	Grey
R	Red
B	Brown
Y	Yellow
Gn	Green
Bk	Black
P	Pink
Bf	Buff

STYLOLITES

A	Abundant	> 5/m
C	Common	2 - 5/m
R	Rare	≤ 2/m

FOSSILS

- Algae
- Stromatolites
- Renalcis
- Brachiopods
- Oncolites
- Coral
- Archaeocyathid
- Gastropods
- Unidentified algal & skeletal fragments
- Bivalves

LITHOLOGIAS

- Limestone (mottled)
- Calcirudite
- Calcarenite
- Calcilutite
- Biohermal limestone
- Tuff
- Travertine
- Dolomite (can be superimposed on any limestone)
- Greywacke
- Arkose
- Clay
- Oolite
- Evaporite
- Chert (bedded)
- Chert (massive)
- Breccia
- Mudstone
- Siltstone
- Shale
- Sandstone

FRACTURES

Intensity (I)

1. V. Weak
2. Weak
3. Strong
4. V. Strong

Lithology of Fill (F)

- C_1 laminars calcrete
- C_2 pink calcite
- C_3 white calcite
- lead
- 3_1 red zinc
- 3_2 yellow/white zinc
- b barsite
- d_1 pink dolomite
- d_2 grey other dolomited
- m micrite
- q quartz
- o open

TEXTURES

- A
- Anm — 1. Clasts
- B — 2. Matrix
- C
- D
- Fenestrae
- Bedding/layering
- Veins
- Conformable contact
- Unconformable contact

0337

E No. DDF 2	EASTING 32969	DETAILS	PRECDLLAR	MAIN HOLE	DEPTH	DECL'N	BEARING	HOLE DIAM.	FROM	TO	PROJECT	AREA
H	NORTHING 6569075	Contractor									JOB No.	SCALE
	LOGGED BY	Machine						BQ	1838	EOH.	MINERAL TENEMENT	
		Commenced										
220 m	DATUM	Completed									SHEET 3 OF 3	
		Method										

MINERALIZATION CONTENT Pb	Fe	TYPE	SAMPLE Int	NUMBER	ASSAY RESULTS Zn%	Pb%	Ag ppm		STRAT AGE	COLOUR	LITHOS	L.C.A.	TEXTURE	OPEN SPACE FRACTURING I	F	F	I	F	F	I	F	F	Vugh.	Cryst.	Calc.	STYL Con	Dis	Res	FOSSILS Abun	Comm	Rare	REMARKS
				199.85m									EOH.																			Cavity to 183.0m. Vuggy, weathered, altered calcarenite → dolowacke Core 16m cavity at 183.8 Strongly weathered limestone, large calcite fillings Vuggy (moss sickenite) 1.9% Cavity at 191.70m. .90m " " 191.90m 3.5m " " 196.35m. EOH. (Hole abandoned - unable to fill cavity - no water gelation to hold).

MINERALIZATION TYPE		COLOUR	
B	Blebs	W	White
C	Cavities	G	Grey
D	Disseminated	R	Red
E	Euhedra	B	Brown
L	Layered	Y	Yellow
M	Massive	Gn	Green
S	Stylolites	Bk	Black
V	Veins	P	Pink
X	Breccia	Bf	Buff

STYLOLITES		
A	Abundant	≥ 5/m
C	Common	2 - 5/m
R	Rare	≤ 2/m

FOSSILS

- Algae
- Stromatolites
- Renalcis
- Brachiopods
- Oncolites
- Coral
- Archaeocyathid
- Gastropods
- Unidentified algal & skeletal fragments
- Bivalves

LITHOLOGIAS

- Limestone
- Calcirudite
- Calcarenite
- Calcilutite
- Biohermal limestone
- Tuff
- Travertine
- Dolomite (can be superimposed on any limestone)
- Greywacke
- Arkose
- Clay
- Oolite
- Evaporite
- Chert (bedded)
- Chert (massive)
- Breccia
- Mudstone
- Siltstone
- Shale
- Sandstone

FRACTURES

Intensity (I)

1. V. Weak
2. Weak
3. Strong
4. V. Strong

Lithology of Fill (F)

- C_1 laminars calcrete
- C_2 pink calcite
- C_3 white calcite
- lead
- 3_1 red zinc
- 3_2 yellow/white zinc
- b barsite
- d_1 pink dolomite
- d_2 grey other dolomited
- m micrite
- q quartz
- o open

TEXTURES

- A
- Anm — 1. Clasts 2. Matrix
- B
- C
- D
- Fenestrae
- Bedding/layering
- Veins
- Conformable contact
- Unconformable contact

HOLE No. DDF2	EASTING 828530	DETAILS	PRECOLLAR	MAIN HOLE	DEPTH	DECL'N	BEARING	HOLE DIAM.	FROM	TO	PROJECT Miss. V.	AREA WILUNA
DEPTH 233.36	NORTHING 6568550	Contractor	CASEY	DRILLING	0	VERTICAL		NW	0.0	0.5	JOB No. L160	SCALE 1:400
GRID AMG	LOGGED BY M.R.	Mechine	LONGYEAR 38		EOH			NQ	0.5	110.5	MINERAL TENEMENT EL. 807	MT. FROME
RL 292m.	DATUM MSL.	Commenced	12.9.81					BQ	110.5	233.36	SHEET 1 OF 3	
		Completed (Abandoned)	25.7.81									
		Method	CORE									

MINERALIZATION % CONTENT Zn	Pb	Fe	Mn	TYPE	SAMPLE Int	NUMBER	ASSAY RESULTS Zn%	Pb%	Ag ppm	STRAT AGE	COLOUR	LITHOS	L.C.A.	TEXTURE	OPEN SPACE FRACTURING I	F	F	I	F	F	I	F	F	Vugh	Cryst	Calcite	STYL Con	Dis	Reg	FOSSILS Abun	Comm	Rare	REMARKS
	<.1										G/B		80°	A/C																		Grey/brown mottled limestone; dolomitizes in places Mn dendrites clay bands at 2.06 (.20m) 3.26 (.45m) 4.66m (.25m) Grading to generally flaggy pink/brown/grey lst.
	<.1									€																					
	<.1																															
	<.1													C																	
	<.1										K/P			C																	
	<.1																															
														Anm.																		+ 20.6 Grey/brown mottled lst; brown clay 23.95 (.5m) 25.88 (.15m) 26.69 (.2m) grading to strongly weathered & dolomitized - increase Mn. minor spar calcite - filled vughs.
	<1.0																															
	<1.0																															
											P/G			A																	+ 32.2 Pink/grey mottled lst, slightly dolomitized Mn dendrites. Strong dolomite & clays 36.0 - 37.2.
														Anm																	+ 41.6 Grey/brown weathered calcarenite; calcite-filled vughs; clay bands at 47.10m
																																+ 48.96 Generally broken core grey clay filled fractures; strongly weathered.
											G		45°																			
										€																					As above - very vughy thick (up to 1m) clay bands.
											G																				As above - generally grey stylolitic calcarenite decrease in clay-filled fractures.

MINERALIZATION TYPE

B	Blebs
C	Cavities
D	Disseminated
E	Euhedra
L	Layered
M	Massive
S	Stylolites
V	Veins
X	Breccia

COLOUR

W	White
G	Grey
R	Red
B	Brown
Y	Yellow
Gn	Green
Bk	Black
P	Pink
Bf	Buff

Laminar Stromotoporoid
Stromatactoid
Geopetal

STYLOLITES

A	Abundant	> 5/
C	Common	2 - 5/
R	Rare	≤ 2/

FOSSILS

Algae
Stromatolites
Renalcis
Brachiopods
Oncolites
Coral
Archaeocyathid
Gastropods
Unidentified alg skeletal fragmen
Bivalves

LITHOLOGY

Limestone mx mottled
Calcirudite
Calcarenite
Calcilutite
Biohermal limestone
Tuff
Travertine
Oolomite (can be superimposed on any limestone)
Greywacke
Arkose
Clay
Oolite
Evaporite
Chert (bedded)
Chert (massive)
Breccia
Mudstone
Siltstone
Shale
Sandstone

FRACTURES

Intensity (I)
1. V. Weak
2. Weak
3. Moderate
4. Strong
5. V. Strong

Lithology of Fill (F)
C_1 laminar calcrete
C_2 pink calcite
C_3 white calcite
λ lead
3_1 red zinc
3_2 yellow/white zinc
b barite
d_1 pink dolomite
d_2 grey other dolomite
m micrite
q quartz
o open

TEXTURES

A
Anm 1. Clasts
B 2. Matrix
C
D
Fenestrae
Bedding/layering
Veins
Conformable contact
Unconformable contact

HOLE No. DDF2	EASTING 32853	DETAILS	PRECOLLAR	MAIN HOLE	DEPTH	DECL'N	BEARING	HOLE DIAM.	FROM	TO
DEPTH	NORTHING 6568550	Contractor								
ID	LOGGED BY	Machine						NQ	0.5	110.5
292 m	DATUM	Commenced						BQ	110.5	233.36
		Completed								
		Method								

PROJECT	AREA
JOB No.	SCALE
MINERAL TENEMENT	
SHEET 2 OF 3	

MINERALIZATION % CONTENT (Zn, Pb, Fe)	TYPE	SAMPLE (Int, NUMBER)	ASSAY RESULTS (Zn%, Pb%, Ag ppm)	STRAT AGE	COLOUR	LITHOS	L.C.A.	TEXTURE	OPEN SPACE FRACTURING (I F F I F F I F F)	Vugh, Cryst, Colig	STYL (Con, Dis, Rxt)	FOSSILS (Abun, Comm, Rare)	REMARKS
													Grey stylolitic calcarenite - oxidised in places; Mn dendrites & blebs in some fractures - trace clay; iron staining away from "recent" fractures (107.25 m) tending to be quite vughy (porous); degree of oxidation is variable from low to high; trace calcite filled vughs.
					G/W						A A A A		Generally oxidized (bleached) 'porous' calcarenite - common stylolites - fractures generally all strongly oxidized
					G/W								
													Rare stromatactoid
					G/W							Ⓐ Ⓐ	
					R		0 30°			C C C C C C C C C C C C	A A A A A A A A A A A A A	Ⓐ Ⓐ Ⓐ Ⓐ Ⓐ Ⓐ Ⓐ Ⓐ Ⓐ Ⓐ Ⓐ Ⓐ	156.2 Red archaeocyathid 'reef' oxidised & leached above; - several geopetal Occasional stp & stromatactoid.

MINERALIZATION TYPE

Code	Type
B	Blebs
C	Cavities
D	Disseminated
E	Euhedra
L	Layered
M	Massive
S	Stylolites
V	Veins
X	Breccia

COLOUR

Code	Colour
W	White
G	Grey
R	Red
B	Brown
Y	Yellow
Gn	Green
Bk	Black
P	Pink
Bf	Buff

STYLOLITES

Code		
A	Abundant	> 5/m
C	Common	2 - 5/m
R	Rare	≤ 2/m

FOSSILS: Algae; Stromatolites; Renalcis; Brachiopods; Oncolites; Coral; Archaeocyathid; Gastropods; Unidentified algal & skeletal fragments; Bivalves

Laminar Stromatoporoid; Stromatactoid; Geopetal

LITHOLOGY: Limestone; Calcirudite; Calcarenite; Calcilutite; Biohermal limestone; Tuff; Travertine; Dolomite (can be superimposed on any limestone); Greywacke; Arkose; Clay; Oolite; Evaporite; Chert (bedded); Chert (massive); Breccia; Mudstone; Siltstone; Shale; Sandstone

FRACTURES

Intensity (I)

1. V. Weak
2. Weak
3. Moderate
4. Strong
5. V. Strong

Lithology of Fill (F)

- C_1 laminar calcrete
- C_2 pink calcite
- C_3 white calcite
- ℓ lead
- 3_1 red zinc
- 3_2 yellow/white zinc
- h barite
- d_1 pink dolomite
- d_2 grey other dolomite
- m micrite
- q quartz
- o open

TEXTURES: A; Anm; B; C; D (1. Clasts (White), 2. Matrix (Black)); Fenestrae; Bedding/layering; Veins; Conformable contact; Unconformable contact

No. DDF2	EASTING 32953	DETAILS	PRECOLLAR	MAIN HOLE	DEPTH	DECL'N	BEARING	HOLE DIAM.	FROM	TO	PROJECT	AREA
	NORTHING 6569550	Contractor									JOB No.	SCALE
	LOGGED BY	Machine									MINERAL TENEMENT	
292 m.	DATUM	Commenced									SHEET 3 OF 3	
		Completed										
		Method										

MINERALIZATION CONTENT Pb	Fe	TYPE	SAMPLE Int	NUMBER	ASSAY RESULTS Zn%	Pb%	Ag ppm	STRAT AGE	COLOUR	LITHOS	L.C.A.	TEXTURE	OPEN SPACE FRACTURING I	F	F	I	F	F	I	F	F	Vugs	Cryst	Calcite	STYL Con	Dis	Res	FOSSILS Abun	Comm	Rare	REMARKS
																										A			A			Red/grey archaeocyathid limestone; abundant stylolites; algal features.
																					C			A			A			
																					C			A			A			
																					C			A			A			
																					C			A			A			
																					C			A			A			
																					C			A			A			
																								A			A			109.0 4m clay washed away.
																								A						203-215: sand filled cavity.
										CAVITY																				
																														215-217: red brown clays
																					C			A						217.66: Grey/red calcarenite
																					C			A						
																					C			A						
																					C			A						222.17: 2.5m cavity clay bands 225.15 (.1m), 225.50 (1.0m) cavity (1.9m) at 227.50 - thin A bands.
																								A			A		A	
1%	V																							A			A	A		1 cm band pyrite at 232 m.
		EOH										3336																		
																														Hole abandoned - core barrel broke in cavities - unable to retrieve.

MINERALIZATION TYPE		COLOUR	
B	Blebs	W	White
C	Cavities	G	Grey
D	Disseminated	R	Red
E	Euhedra	B	Brown
L	Layered	Y	Yellow
M	Massive	Gn	Green
S	Stylolites	Bk	Black
V	Veins	P	Pink
X	Breccia	Bf	Buff

STYLOLITES	
A	Abundant ≥ 5/m
C	Common 2-5/m
R	Rare ≤ 2/m

FOSSILS

- Algae
- Stromatolites
- Renalcis
- Brachiopods
- Oncolites
- Coral
- Archaeocyathid
- Gastropods
- Unidentified algal & skeletal fragments
- Bivalves
- Laminar Stromotoporoid
- Stromatactoid
- Geopetal

LITHOLOGY

- Limestone
- Calcirudite
- Calcarenite
- Calcilutite
- Biohermal limestone
- Tuff
- Travertine
- Oolomite (can be superimposed on any limestone)
- Greywacke
- Arkose
- Clay
- Oolite
- Evaporite
- Chert (bedded)
- Chert (massive)
- Breccia
- Mudstone
- Siltstone
- Shale
- Sandstone

FRACTURES

Intensity (I)

1. V. Weak
2. Weak
3. Moderate
4. Strong
5. V. Strong

Lithology of Fill (F)

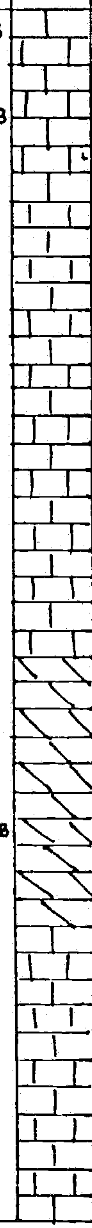
- C_1 laminar calcrete
- C_2 pink calcite
- C_3 white calcite
- λ lead
- 3_1 red zinc
- 3_2 yellow/white zinc
- b barite
- d_1 pink dolomite
- d_2 grey other dolomite
- m micrite
- q quartz
- o open

TEXTURES

- A
- Anm
- B
- C
- D
- 1. Clasts (White)
- 2. Matrix (Black)
- Fenestrae
- Bedding/layering
- Veins
- Conformable contact
- Unconformable contact

HOLE No. DDF 3	EASTING 329700	DETAILS	PRECOLLAR / MAIN HOLE	DEPTH	DECL'N	BEARING	HOLE DIAM.	FROM	TO	PROJECT MISS. V. · AREA WILNUROONA
DEPTH 370.80m	NORTHING 6569085	Contractor	CASEY	0.0	70°	205	NW	0.0	1.5	JOB No. L160. · SCALE 1:400
GRID AMG	LOGGED BY M.R.	Machine	LONGYEAR 38				NQ	1.5	225.36	MINERAL TENEMENT EL 807 MT FROME
RL 332.5m.	DATUM MSL	Commenced	28-9-81				BQ	225.36	370.80	SHEET 1 OF 5
		Completed	21.10.81							
		Method	CORE							

STRAT AGE	COLOUR	TEXTURE	OPEN SPACE / FRACTURING (I, F)	Vugh/Cryst	STYL	REMARKS
€	G/B		1 C3		C	Precollar - clays + sands/calcretes.
			1 C3		C	1.5 Grey/brown, oxidized rubbly limestone; calcite filled vughs (STM) - dolomitization in places. Clay band (.10m) at 11.70m. Mn veins & dendrites several clay bands throughout (or washed away)
	G/B		1 C3, 1 C3, 1 C3		C, C, C	
€				A		Pink/Brown/Grey massive to mottled (Anm) limestone generally oxidized; dolomitized in parts; calcite filled vughs (white/pink). Mn staining throughout; clay bands throughout
				A		48.2 as above; more intensely oxidised/dolomitized; larger calcite-filled vughs; Mn-enriched laminations. ("Fill")
€	G/P/B			A		60.25 Grey-pink dolomitic limestone (generally mottled-A).
		Anm				68.6 Grey mottled stylolitic limestone grading into generally flaggy grey lst (8cm)
		C				flaggy limestone as above



Column headings: MINERALIZATION (% CONTENT Zn, Pb, Fe; TYPE) · SAMPLE (NUMBER) · ASSAY RESULTS (Zn%, Pb%, Ag ppm) · STRAT AGE · COLOUR · LITHOS · L.C.A. · TEXTURE · OPEN SPACE FRACTURING (I F F I F F I F F; Vugh, Cryst) · STYL (Con, Dis, Res) · FOSSILS (Abun, Comm, Rare) · REMARKS

MINERALIZATION TYPE

- B Blebs
- C Cavities
- D Disseminated
- E Euhedra
- L Layered
- M Massive
- S Stylolites
- V Veins
- X Breccia

COLOUR

- W White
- G Grey
- R Red
- B Brown
- Y Yellow
- Gn Green
- Bk Black
- P Pink
- Bf Buff

STYLOLITES

- A Abundant > 5/m
- C Common 2 - 5/m
- R Rare ≤ 2/m

FOSSILS

Algae, Stromatolites, Renalcis, Brachiopods, Oncolites, Coral, Archaeocyathid, Gastropods, Unidentified algal & skeletal fragments, Bivalves

Laminar Stromotoporoid, Stromatactoid, Geopetal

LITHOLOGY

Limestone, Calcirudite, Calcarenite, Calcilutite, Biohermal limestone, Tuff, Travertine, Dolomite (can be superimposed on any limestone), Greywacke, Arkose, Clay, Oolite, Evaporite, Chert (bedded), Chert (massive), Breccia, Mudstone, Siltstone, Shale, Sandstone

FRACTURES

Intensity (I)

1. V. Weak
2. Weak
3. Moderate
4. Strong
5. V. Strong

Lithology of Fill (F)

- C_1 laminar calcrete
- C_2 pink calcite
- C_3 white calcite
- λ lead
- 3_1 red zinc
- 3_2 yellow/white zinc
- b barite
- d_1 pink dolomite
- d_2 grey other dolomite
- m micrite
- q quartz
- o open

TEXTURES

- A
- Anm — 1. Clasts (White) 2. Matrix (Black)
- B
- C
- D
- Fenestrae
- Bedding/layering
- Veins
- Conformable contact
- Unconformable contact

E No. DDF 3	EASTING 32970	DETAILS	PRECOLLAR	MAIN HOLE	DEPTH	OECL'N	BEARING	HOLE DIAM.	FROM	TO
'H	NORTHING 6569085	Contractor						NW		
)	LOGGEO BY	Machine						NQ		
332·5	OATUM	Commenced						BQ	225.36	
		Completed								
		Method								

PROJECT MISS. V.	AREA
JOB No. L160	SCALE
MINERAL TENEMENT	
SHEET 2 OF 5	

MINERALIZATION % CONTENT (n, Pb, Fe)	TYPE	SAMPLE (Int, NUMBER)	ASSAY RESULTS (Zn%, Pb%, Ag ppm)	STRAT AGE	COLOUR	LITHOS	L.C.A.	TEXTURE	OPEN SPACE FRACTURING (I F F I F F I F F)	Vugh-Cryst.	Con	STYL (Con, Dis, Res)	FOSSILS (Abun, Comm, Rare)	REMARKS
				€	B/G	Limestone	90°	C, C, C, C		R (repeated)		R (repeated); C (repeated, lower)		Dark/light grey flaggy limestone; occasional thin mottled band (c/m) of type A; rare calcite filled thin fractures and small vughs.
							90°							118·5 Grey mottled limestone; (crystalline) calcite filled vughs; chlorite staining; blebs of Fe & Mn.
														Grey (BCM) mottled limestone; occasional flaggy (type c) beds (c/m) - generally stylolitic.

MINERALIZATION TYPE		COLOUR	
B	Blebs	W	White
C	Cavities	G	Grey
D	Disseminated	R	Red
E	Euhedra	B	Brown
L	Layered	Y	Yellow
M	Massive	Gn	Green
S	Stylolites	Bk	Black
V	Veins	P	Pink
X	Breccia	Bf	Buff

Laminar Stromotoporoid
Stromatactoid
Geopetal

STYLOLITES		
A	Abundant	≥ 5/m
C	Common	2 - 5/m
R	Rare	≤ 2/m

FOSSILS
Algae
Stromatolites
Renalcis
Brachiopods
Oncolites
Coral
Archaeocyathid
Gastropods
Unidentified algal & skeletal fragments
Bivalves

LITHOLOGY

Limestone	Clay
Calcirudite	Oolite
Calcarenite	Evaporite
Calcilutite	Chert (bedded)
Biohermal limestone	Chert (massive)
Tuff	Breccia
Travertine	Mudstone
Dolomite (can be superimposed on any limestone)	Siltstone
Greywacke	Shale
Arkose	Sandstone

FRACTURES

Intensity (I)
1. V. Weak
2. Weak
3. Moderate
4. Strong
5. V. Strong

Lithology of Fill (F)
- C_1 laminar calcrete
- C_2 pink calcite
- C_3 white calcite
- ℓ lead
- 3_1 red zinc
- 3_2 yellow/white zinc
- b barite
- d_1 pink dolomite
- d_2 grey other dolomite
- m micrite
- q quartz
- o open

TEXTURES

A
Anm — 1. Clasts (White)
B — 2. Matrix (Black)
C
D
Fenestrae
Bedding/layering
Veins
Conformable contact
Unconformable contact

0345

LE No. DDF3	EASTING 32970	DETAILS	PRECOLLAR	MAIN HOLE	DEPTH	DECL'N	BEARING	HOLE DIAM.	FROM	TO	PROJECT / AREA
PTH	NORTHING 6569085	Contractor									JOB No. / SCALE
ID	LOGGED BY	Machine									MINERAL TENEMENT
332·5	DATUM	Commenced									SHEET 3 OF 5
		Completed									
		Method									

MINERALIZATION — % CONTENT (Zn, Pb, Fe, Cu) / TYPE

SAMPLE — Int / NUMBER

ASSAY RESULTS — Zn% / Pb% / Ag ppm

STRAT AGE

COLOUR

LITHOS

L.C.A.

TEXTURE

OPEN SPACE FRACTURING — I / F / F / I / F / F / I / F / F

Vugh. / Cryst. / Colln

STYL — Con / Dis / Res

FOSSILS — Abun / Comm / Rare

REMARKS

Zn	Pb	Fe	Cu	Int	NUMBER	Zn%	Pb%	Ag ppm	AGE	COLOUR	LITHOS	L.C.A.	TEXTURE	I	F	F	I	F	F	I	F	F	Vugh.	Cryst.	Colln	Con	Dis	Res	Abun	Comm	Rare	REMARKS
			tr																													
			tr																													
			tr																													
			tr																													
																																186·6 G/W calcarenite, fine xs calcite infilling cavities; translucent Fe staining + Mn dendrites; v. vughy. Dolomitic in parts.
																																197·0 Generally grey calcarenite styl's in places; generally calcite filled styl./fractures. Occ. clay fill. -altern. bands mottled CA & BCM. Trace pyrite in more C-type mottles.
																																209·0 Generally grey stylolitic CA, occasional pyrite-rich BCM partings. Broken core ~220m. WIT ~223·6m. -thin shaley (mott. c) bands throughout. Thin IFB.
																																229·8 Generally grey vughy honeycombed (fine) calcarenite, with pervasive overprinting of Fe/Mn staining, trace siderite dolomitic in parts; oxidized clays infilling some cavities. Some mottled textures. Dolomitic in parts; minor calcite-filled vughs. Some coarse crystalline calcite in vughs ~225·2m.
																																258·67 Grey stylolitic CA tends to be mottled in places; thin chert bands with Pb/Zn assoc. eg. 264·0.
<1	<1	<1																														

MINERALIZATION TYPE

B	Blebs	L	Layered
C	Cavities	M	Massive
D	Disseminated	S	Stylolites
E	Euhedra	V	Veins
		X	Breccia

COLOUR

W	White	Y	Yellow
G	Grey	Gn	Green
R	Red	Bk	Black
B	Brown	P	Pink
		Bf	Buff

STYLOLITES

A	Abundant	⩾ 5/m
C	Common	2 – 5/m
R	Rare	⩽ 2/m

FOSSILS

- Algae
- Stromatolites
- Renalcis
- Brachiopods
- Oncolites
- Coral
- Archaeocyathid
- Gastropods
- Unidentified algal & skeletal fragments
- Bivalves

- Laminar Stromotoporoid
- Stromatactoid
- Geopetal

LITHOLOGY

- Limestone
- Calcirudite
- Calcarenite
- Calcilutite
- Biohermal limestone
- Tuff
- Travertine
- Dolomite (can be superimposed on any limestone)
- Greywacke
- Arkose
- Clay
- Oolite
- Evaporite
- Chert (bedded)
- Chert (massive)
- Breccia
- Mudstone
- Siltstone
- Shale
- Sandstone

FRACTURES

Intensity (I)

1. V. Weak
2. Weak
3. Moderate
4. Strong
5. V. Strong

Lithology of Fill (F)

- C_1 laminar calcrete
- C_2 pink calcite
- C_3 white calcite
- λ lead
- 3_1 red zinc
- 3_2 yellow/white zinc
- b barite
- d_1 pink dolomite
- d_2 grey other dolomite
- m micrite
- q quartz
- o open

TEXTURES

- A
- Anm — 1. Clasts (White)
- B — 2. Matrix (Black)
- C
- D
- Fenestrae
- Bedding/layering
- Veins
- Conformable contact
- Unconformable contact

HOLE No. DDF3	EASTING 32970	DETAILS	PRECOLLAR	MAIN HOLE	DEPTH	DECL'N	BEARING	HOLE DIAM.	FROM	TO	PROJECT	AREA
DEPTH	NORTHING 6569085	Contractor									JOB No.	SCALE
GRID	LOGGED BY	Machine									MINERAL TENEMENT	
RL 332.5	DATUM	Commenced									SHEET 4 OF 5	
		Completed										
		Method										

MINERALIZATION % CONTENT Zn	Pb	Fe	TYPE	SAMPLE Int	NUMBER	ASSAY RESULTS Zn%	Pb%	Ag ppm	STRAT AGE	COLOUR	LITHOS	L.C.A.	TEXTURE	OPEN SPACE FRACTURING I	F	F	I	F	F	I	F	F	Vugh	Cavity	Calcite Con	Dis	Res	STYL	FOSSILS Abun	Comm	Rare	REMARKS
																																Grey stylolitic C.A.; occasional chert bands generally barren below 275 m.
																																Trace pyrite; occasional small bleb sphalerite disseminated or along stylolite.
																														A		
																														A		
																														A		293.8: Pale grey f-gr A mud; gen. stylt's & Zn in partings (tr.)
tr																														A		
tr																																296.55: Grey stylt's CA as above & occasional bands of (c/m) A mud
tr																																
tr	tr																															
tr	tr																															
tr																																
																																as above tending to be mottled (1cm).
tr																																
tr																																
																														A		
																														A		
													B/c													A							328 Grey mottled limestone
																										A						331 Grey pale A mud slumped brx. in places.
tr	tr																									A				A		
tr	tr																									c						
tr	tr																									c				A		
																										c						337 Grey CA.
																										c						
tr													B/c																			342.0 Grey mottled lst. & occasional thin (c/m) CA bands; occasional chert bands and nodules.
tr																																
tr													B/c																			C.g. sphalerite at 357.32 (~1cm. thick). Fine-grained honey-colored sphalerite disseminated sporadically throughout.
tr																																
													B/c																			

MINERALIZATION TYPE		COLOUR	
B	Blebs	W	White
C	Cavities	G	Grey
D	Disseminated	R	Red
E	Euhedra	B	Brown
L	Layered	Y	Yellow
M	Massive	Gn	Green
S	Stylolites	Bk	Black
V	Veins	P	Pink
X	Breccia	Bf	Buff

STYLOLITES		
A	Abundant	> 5/m
C	Common	2 - 5/m
R	Rare	< 2/m

FOSSILS

- Algae
- Stromatolites
- Renalcis
- Brachiopods
- Oncolites
- Coral
- Archaeocyathid
- Gastropods
- Unidentified algal & skeletal fragments
- Bivalves

- Laminar Stromotoporoid
- Stromatactoid
- Geopetal

LITHOLOGY

- Limestone
- Calcirudite
- Calcarenite
- Calcilutite
- Biohermal limestone
- Tuff
- Travertine
- Dolomite (can be superimposed) on any limestone)
- Greywacke
- Arkose
- Clay
- Oolite
- Evaporite
- Chert (bedded)
- Chert (massive)
- Breccia
- Mudstone
- Siltstone
- Shale
- Sandstone

FRACTURES

Intensity (I)

1. V. Weak
2. Weak
3. Moderate
4. Strong
5. V. Strong

Lithology of Fill (F)

- C_1 laminar calcrete
- C_2 pink calcite
- C_3 white calcite
- λ lead
- 3_1 red zinc
- 3_2 yellow/white zinc
- b barite
- d_1 pink dolomite
- d_2 grey other dolomite
- m micrite
- q quartz
- o open

TEXTURES

- A
- Anm — 1. Clasts (Wh
- B — 2. Matrix (Bla
- C
- D
- Fenestrae
- Bedding/layering
- Veins
- Conformable contact
- Unconformable contact

HOLE No. DDF3	EASTING 32970	DETAILS	PRECOLLAR	MAIN HOLE	DEPTH	DECL'N	BEARING	HOLE DIAM.	FROM	TO	PROJECT	AREA 1
DEPTH	NORTHING 65690E5	Contractor									JOB No.	SCALE
GRID	LOGGED BY	Machine									MINERAL TENEMENT	
RL 332.5	DATUM	Commenced									SHEET 5 OF 5	
		Completed										
		Method										

METRES	MINERALIZATION % CONTENT Zn	Pb	Fe	TYPE	SAMPLE Int	NUMBER	ASSAY RESULTS Zn%	Pb%	Ag ppm	STRAT AGE	COLOUR	LITHOS	LCA	TEXTURE	OPEN SPACE FRACTURING I	F	F	I	F	F	I	F	F	Vugh	Cryst	STYL Con	Dis	Ang	FOSSILS Abun	Comm	Rare	REMARKS
370						EOH						m																				Grey mottled limestone as above. 370.80
380																																
390																																

MINERALIZATION TYPE

B	Blebs
C	Cavities
D	Disseminated
E	Euhedra
L	Layered
M	Massive
S	Stylolites
V	Veins
X	Breccia

COLOUR

W	White
G	Grey
R	Red
B	Brown
Y	Yellow
Gn	Green
Bk	Black
P	Pink
Bf	Buff

STYLOLITES

A	Abundant	⩾ 5/m
C	Common	2 - 5/m
R	Rare	⩽ 2/m

FOSSILS

- Algae
- Stromatolites
- Renalcis
- Brachiopods
- Oncolites
- Coral
- Archaeocyathid
- Gastropods
- Unidentified algal & skeletal fragments
- Bivalves

- Laminar Stromotoporoid
- Stromatactoid
- Geopetal

LITHOLOGY

- Limestone
- Calcirudite
- Calcarenite
- Calcilutite
- Biohermal limestone
- Tuff
- Travertine
- Dolomite (can be superimposed) on any limestone)
- Greywacke
- Arkose
- Clay
- Oolite
- Evaporite
- Chert (bedded)
- Chert (massive)
- Breccia
- Mudstone
- Siltstone
- Shale
- Sandstone

FRACTURES

Intensity (I)

1. V. Weak
2. Weak
3. Moderate
4. Strong
5. V. Strong

Lithology of Fill (F)

- C_1 laminar calcrete
- C_2 pink calcite
- C_3 white calcite
- x lead
- 3_1 red zinc
- 3_2 yellow/white zinc
- b barite
- d_1 pink dolomite
- d_2 grey other dolomite
- m micrite
- q quartz
- o open

TEXTURES

- A
- Anm (1. Clasts (White) 2. Matrix (Black))
- B
- C
- D
- Fenestrae
- Bedding/layering
- Veins
- Conformable contact
- Unconformable contact

No. DDF 4	EASTING 32929	DETAILS	PRECOLLAR	MAIN HOLE	DEPTH	DECL'N	BEARING	HOLE DIAM.	FROM	TO	PROJECT MISS. V.	AREA WILNUROONA
H 461.0m	NORTHING 6568560	Contractor	CASEY	DRILLING	0.0	70°	180	NW	0.0	27.0	JOB No. L160	SCALE 1:400
A.M.G.	LOGGED BY M.R.	Machine	LONGYEAR 38		452.0m	69° (AC'D DTCH)		NQ	27.0	210.0	MINERAL TENEMENT E.L. 807 MT. FROME	
300m	DATUM M.S.L.	Commenced	21.10.81					BQ	210.0	461.0	SHEET 1 OF 6	
		Completed	10.11.81									
		Method	TRI-CONE	CORE								

MINERALIZATION CONTENT Pb	Fe	TYPE	SAMPLE Int	NUMBER	ASSAY RESULTS Zn%	Pb%	Ag ppm	STRAT AGE	COLOUR	LITHOS	L.C.A.	TEXTURE	OPEN SPACE FRACTURING I	F	F	I	F	F	I	F	F	Vugs	Cavity	STYL Con	Dis	Res	FOSSILS Abun	Comm	Rare	REMARKS
								Q+T																						Pre-collar - Brown clays, alluvium of calcite, limestone and manganese grains.
								€	G																					27.0 Grey massive limestone, partially dolomitized in places - Mn dendrites 31.5 → 34.6 - Cavity filled with brown goethite clays. 34.6-58.5: Grey/brown massive generally dolomitized limestone Mn veins in fine fractures; calcite filled vughs; trace siderite occasional glauconitic clay filled fractures; generally fenestral (open) to vughy texture
									G																					
																														58.5 Grey massive limestone; trace dolomitized (?) archaeocyathid occasional stylolites; some (coarse) calcite filled vughs; trace of mottled texture. partial dolomitization and oxidation throughout.
									G																					
								€																						

THE BROKEN HILL PROPRIETARY COMPANY LIMITED — EXPLORATION DEPARTMENT — HOLE No. DDF 4

MINERALIZATION TYPE		COLOUR	
B	Blebs	W	White
C	Cavities	G	Grey
D	Disseminated	R	Red
E	Euhedra	B	Brown
L	Layered	Y	Yellow
M	Massive	Gn	Green
S	Stylolites	Bk	Black
V	Veins	P	Pink
X	Breccia	Bf	Buff

STYLOLITES	
A	Abundant ≥ 5/m
C	Common 2 - 5/m
R	Rare ≤ 2/m

FOSSILS

- Algae
- Stromatolites
- Renalcis
- Brachiopods
- Oncolites
- Coral
- Archaeocyathid
- Gastropods
- Unidentified algal & skeletal fragments
- Bivalves

- Laminar Stromotoporoid
- Stromatactoid
- Geopetal

LITHOLOGY

- Limestone
- Calcirudite
- Calcarenite
- Calcilutite
- Biohermal limestone
- Tuff
- Travertine
- Dolomite (can be superimposed on any limestone)
- Greywacke
- Arkose
- Clay
- Oolite
- Evaporite
- Chert (bedded)
- Chert (massive)
- Breccia
- Mudstone
- Siltstone
- Shale
- Sandstone

FRACTURES

Intensity (I)

1. V. Weak
2. Weak
3. Moderate
4. Strong
5. V. Strong

Lithology of Fill (F)

- C_1 laminar calcrete
- C_2 pink calcite
- C_3 white calcite
- λ lead
- 3_1 red zinc
- 3_2 yellow/white zinc
- b barite
- d_1 pink dolomite
- d_2 grey other dolomite
- m micrite
- q quartz
- o open

TEXTURES

- A
- Anm — 1. Clasts (White) 2. Matrix (Black)
- B
- C
- D
- Fenestrae
- Bedding/layering
- Veins
- Conformable contact
- Unconformable contact

E No. DDF 4	EASTING 32929	DETAILS	PRECOLLAR	MAIN HOLE	DEPTH	DECL'N	BEARING	HOLE DIAM. "	FROM	TO	PROJECT	AREA
TH	NORTHING 656856	Contractor									JOB No.	SCALE
D	LOGGED BY	Machine									MINERAL TENEMENT	
	DATUM	Commenced									SHEET 2 OF 6	
		Completed										
		Method										

MINERALIZATION % CONTENT Zn Pb Fe | TYPE | SAMPLE Int | NUMBER | ASSAY RESULTS Zn% | Pb% | Ag ppm | STRAT AGE | COLOUR | LITHOS | L.C.A. | TEXTURE | OPEN SPACE FRACTURING I F F I F F I F F | Vugh Cryst Calcite | STYL Con Dis Res | FOSSILS Abun Comm Rare | REMARKS

Broken core 91.0 - 91.7m

95.0 Grey-brown vughy stratiform (Tension?), dolomitic limestone; Fe/Mn associated (similar to 39.6m above).

Broken core 107.0 - 108.0m

114m.. Grey massive archaeocyathid limestone large calcite (coarse) filled vughs.

130.7 Grey massive limestone occasional stylolites some filled with glauconite clays vughy in parts (111' to 95.0m above) variably fossil content; partially dolomitized

159.6 Vughy limestone as above - generally dolomitized; interbedded bands (~1m) of grey Ⓐ rich skeletal boundstone. Mn+Fe staining throughout; red hematitic filling vughs at 178m.

MINERALIZATION TYPE		COLOUR	
B	Blebs	W	White
C	Cavities	G	Grey
D	Disseminated	R	Red
E	Euhedra	B	Brown
L	Layered	Y	Yellow
M	Massive	Gn	Green
S	Stylolites	Bk	Black
V	Veins	P	Pink
X	Breccia	Bf	Buff

Laminar Stromotoporoid
Stromatactoid
Geopetal

STYLOLITES

A	Abundant	⩾ 5/m
C	Common	2 - 5/m
R	Rare	⩽ 2/m

FOSSILS

Algae
Stromatolites
Renalcis
Brachiopods
Oncolites
Coral
Archaeocyathid
Gastropods
Unidentified algal & skeletal fragments
Bivalves

LITHOLOGY

Limestone
Calcirudite
Calcarenite
Calcilutite
Biohermal limestone
Tuff
Travertine
Dolomite (can be superimposed on any limestone)
Greywacke
Arkose
Clay
Oolite
Evaporite
Chert (bedded)
Chert (massive)
Breccia
Mudstone
Siltstone
Shale
Sandstone

FRACTURES

Intensity (I)
1. V. Weak
2. Weak
3. Moderate
4. Strong
5. V. Strong

Lithology of Fill (F)
C_1 laminar calcrete
C_2 pink calcite
C_3 white calcite
λ lead
3_1 red zinc
3_2 yellow/white zinc
b barite
d_1 pink dolomite
d_2 grey other dolomite
m micrite
q quartz
o open

TEXTURES

A
Anm
B
C
D
Fenestrae
Bedding/layering
Veins
Conformable contact
Unconformable contact

1. Clasts (White)
2. Matrix (Black)

HOLE No. DDF4	EASTING 3[illegible]29	DETAILS	PRECOLLAR	MAIN HOLE	DEPTH	DECL'N	BEARING	HOLE DIAM.	FROM	TO	PROJECT	AREA 0548
DEPTH	NORTHING 656856	Contractor									JOB No.	SCALE
GRID	LOGGED BY	Machine									MINERAL TENEMENT	
RL 200m	DATUM	Commenced									SHEET 3 OF 6	
		Completed										
		Method										

METRES	MINERALIZATION % CONTENT Zn	Pb	Fe	Cu	TYPE	SAMPLE Int	NUMBER	ASSAY RESULTS Zn%	Pb%	Ag ppm	STRAT AGE	COLOUR	LITHOS	L.C.A.	TEXTURE	OPEN SPACE FRACTURING I	F	F	I	F	F	I	F	F	Vugh	Cryst	Calcite	STYL Com	Dis	Res	FOSSILS Abun	Com	Rare	REMARKS
190																																		
	tr	tr	tr		BSV																							A						mso Grey massive stylolitic limestone ; trace galena and sphalerite (+ pressopy) in thin fractures, Stylolites and dissemination as blebs.
200	"	"	"		"																							A						
	"	"	"		"																							A						
	"	"	"		"																							A						
	"	"	"		"																							A						
	"	"	"		"																							A			A			
210	"	"	"		"																							A			A			209.35 Clean grey massive calcarenite dolomitized in parts Broken core 212.85 → 213.5
																															A		
220																												R						
230																												R						
																												R						
240																										A								Several calcite filled Vughs.
																										A							
250																																		
																												A						253.9 Red hematitic paleosoil horizon (~10cm) Vughy sandy mottled limestone grading into generally clean grey mottled Stylolitic limestone
															A → Anm													A						
260		tr			B										↓													A						
		"			B																							A						
		"			"																							A						
		"			"																							A						
		"			"																							A						
270		"			"										A → Anm													A						

THE BROKEN HILL PROPRIETARY COMPANY LIMITED EXPLORATION DEPARTMENT HOLE No. DDF4

MINERALIZATION TYPE

B	Blebs
C	Cavities
D	Disseminated
E	Euhedra
L	Layered
M	Massive
S	Stylolites
V	Veins
X	Breccia

COLOUR

W	White
G	Grey
R	Red
B	Brown
Y	Yellow
Gn	Green
Bk	Black
P	Pink
Bf	Buff

STYLOLITES

A	Abundant	> 5/m
C	Common	2 - 5/m
R	Rare	< 2/m

FOSSILS

- Algae
- Stromatolites
- Renalcis
- Brachiopods
- Oncolites
- Coral
- Archaeocyathid
- Gastropods
- Unidentified algal & skeletal fragments
- Bivalves

- Laminar Stromotoporoid
- Stromatactoid
- Geopetal

LITHOLOGY

- Limestone
- Calcirudite
- Calcarenite
- Calcilutite
- Biohermal limestone
- Tuff
- Travertine
- Dolomite (can be superimposed on any limestone)
- Greywacke
- Arkose
- Clay
- Oolite
- Evaporite
- Chert (bedded)
- Chert (massive)
- Breccia
- Mudstone
- Siltstone
- Shale
- Sandstone

FRACTURES

Intensity (I)

1. V. Weak
2. Weak
3. Moderate
4. Strong
5. V. Strong

Lithology of Fill (F)

- C_1 laminar calcrete
- C_2 pink calcite
- C_3 white calcite
- λ lead
- 3_1 red zinc
- 3_2 yellow/white zinc
- b barite
- d_1 pink dolomite
- d_2 grey other dolomite
- m micrite
- q quartz
- o open

TEXTURES

- A
- Anm — 1. Clasts (White)
- B — 2. Matrix (Black)
- C
- D
- Fenestrae
- Bedding/layering
- Veins
- Conformable contact
- Unconformable contact

LE No. DDF4	EASTING	DETAILS	PRECOLLAR	MAIN HOLE	DEPTH	DECL'N	BEARING	HOLE DIAM.	FROM	TO	PROJECT	AREA
PTH	NORTHING	Contractor									JOB No.	SCALE
ID	LOGGED BY	Machine									MINERAL TENEMENT	
20.2m	DATUM	Commenced									SHEET 4 OF 6	
		Completed										
		Method										

0943

MINERALIZATION CONTENT Cu Pb F S	TYPE	SAMPLE Int	NUMBER	ASSAY RESULTS Zn%	Pb%	Ag ppm	STRAT AGE	COLOUR	LITHOS	L.C.A.	TEXTURE	OPEN SPACE FRACTURING 1 F	F	I	F	F	I	F	F	Vugh.	Cryst.	Colla.	STYL Con.	Dis.	Res.	FOSSILS Abun.	Comm.	Rare	REMARKS
tr		SBV					€	G			A→Anm	/	C1	32									A						Grey rolled limestone (BCM) minor intraformational cmable breccia (<10cm) minor fracturing (calcite filled), trace Sphalerite in fractures Veins and as blebs disseminations in matrix pyrite disseminated throughout
												/	C1										A						
												/	C1	32									A						
												/	C1										A						
tr												/	C1	32									A						
											A/Anm	/	C1										A						
												/											A						
												/											A						
												/											A						
								G				/											A						
											A/Anm	/									R		A						
												/											A						
												/											A						
											A/Anm	/									R		A						
												/											A						
												/											A						
										90°	C	/									R		C						
								G				/											C						
											C	/											R						
												/											R						
										90°		/											R						
											C	/											R						
								G				/											R						
											C	/											R						Occasional blebs of sphalerite and chalcopyrite (cpy) in fine fractures.
tr										90°		/											R						
											C	/											R						
												/											R						
												/											R						
								C			C	/											R						
										90°		/											R						
							€					/											q						

MINERALIZATION TYPE		COLOUR	
B	Blebs	W	White
C	Cavities	G	Grey
D	Disseminated	R	Red
E	Euhedra	B	Brown
L	Layered	Y	Yellow
M	Massive	Gn	Green
S	Stylolites	Bk	Black
V	Veins	P	Pink
X	Breccia	Bf	Buff

STYLOLITES		
A	Abundant	> 5/m
C	Common	2 - 5/m
R	Rare	≤ 2/m

FOSSILS

- Algae
- Stromatolites
- Renalcis
- Brachiopods
- Oncolites
- Coral
- Archaeocyathid
- Gastropods
- Unidentified algal & skeletal fragments
- Bivalves

- Laminar Stromotoporoid
- Stromatectoid
- Geopetal

LITHOLOGY

- Limestone
- Calcirudite
- Calcarenite
- Calcilutite
- Biohermal limestone
- Tuff
- Trevertine
- Dolomite (can be superimposed) on any limestone)
- Greywacke
- Arkose
- Clay
- Oolite
- Evaporite
- Chert (bedded)
- Chert (massive)
- Breccia
- Mudstone
- Siltstone
- Shale
- Sandstone

FRACTURES

Intensity (I)

1. V. Weak
2. Weak
3. Moderate
4. Strong
5. V. Strong

Lithology of Fill (F)

- C_1 laminar calcrete
- C_2 pink calcite
- C_3 white calcite
- λ lead
- 3_1 red zinc
- 3_2 yellow/white zinc
- b barite
- d_1 pink dolomite
- d_2 grey other dolomite
- m micrite
- q quartz
- o open

TEXTURES

- A
- Anm — 1. Clasts (White) 2. Matrix (Black)
- B
- C
- D
- Fenestrae
- Bedding/layering
- Veins
- Conformable contact
- Unconformable contact

HOLE No. DDF4	EASTING 33929	DETAILS	PRECOLLAR	MAIN HOLE	DEPTH	DECL'N	BEARING	HOLE DIAM.	FROM	TO	PROJECT	AREA
DEPTH	NORTHING 56851	Contractor									JOB No.	SCALE
GRID	LOGGED BY	Machine									MINERAL TENEMENT	
RL 3005	DATUM	Commenced									SHEET 5 OF 6	
		Completed										
		Method										

MINERALIZATION % CONTENT Zn Pb Fe S Cu	MINERALIZATION TYPE	SAMPLE INT	SAMPLE NUMBER	ASSAY RESULTS Zn%	Pb%	Ag ppm	STRAT AGE	COLOUR	LITHOS	L.C.A.	TEXTURE	OPEN SPACE FRACTURING I F F	I F F	I F F	VUGH CAVITY COLLA	STYL Dis Rim	FOSSILS Abun Comm Rare	REMARKS
tr tr	V						€	G		90	C							Grey weather limestone as above.
370 tr tr tr tr	SCV										A							
tr tr tr tr	SCV									90	A							
" " " "	"							G			C							
" " " "	"										C							
" " " "	"										A						7 7	
390 " " " "	"																	
											A							
											A							
								G			A							
											A						A	396.3 Grey calcarenite trace archaeocyathid fg Sphaerulites in fractures & Stylolites; interbedded red/green shales (≤10cm) at 413.9 and 417.0 m.
tr	S										A						A	
410 tr	S										A							
tr	S										A							
											A							
											A							
								G			A							
											A							
											A							
											A							
											A							
420 tr	S										A							421-423 Dark grey CA to CR (~5% clasts) Stylolitic fenestral
											A							423 Grey Stylolitic CA as above; pale weathering staining of limestone (428.2)
tr	S										A							Cpy/pyr/trace F infills fractures ± calcite
tr	S										A							436 Grey to dark grey CA to CR; thin oolitic bands and fenestral fabric;
430	+ CaF2										A							spar calcite infills fractures, trace
											A							sph/cpy/pyr (≤3 10cm at 449m)
440 tr	SCV							G			A							
tr	"									90	A							
tr	"										A							
tr	"										A							
tr	"										A							
450 tr	"						€				A							

MINERALIZATION TYPE

B	Blebs
C	Cavities
O	Disseminated
E	Euhedra
L	Layered
M	Massive
S	Stylolites
V	Veins
X	Breccia

COLOUR

W	White
G	Grey
R	Red
B	Brown
Y	Yellow
Gn	Green
Bk	Black
P	Pink
Bf	Buff

STYLOLITES

A	Abundant	≥ 5/m
C	Common	2 – 5/m
R	Rare	≤ 2/m

FOSSILS

- Algae
- Stromatolites
- Renalcis
- Brachiopods
- Oncolites
- Coral
- Archaeocyathid
- Gastropods
- Unidentified algal & skeletal fragments
- Bivalves
- Laminar Stromotoporoid
- Stromatactoid
- Geopetal

LITHOLOGY

- Limestone
- Calcirudite
- Calcarenite
- Calcilutite
- Biohermal limestone
- Tuff
- Travertine
- Dolomite (can be superimposed) on any limestone)
- Greywacke
- Arkose
- Clay
- Oolite
- Evaporite
- Chert (bedded)
- Chert (massive)
- Breccia
- Mudstone
- Siltstone
- Shale
- Sandstone

FRACTURES

Intensity (I)

1. V. Weak
2. Weak
3. Moderate
4. Strong
5. V. Strong

Lithology of Fill (F)

- C_1 laminar calcrete
- C_2 pink calcite
- C_3 white calcite
- λ lead
- 3_1 red zinc
- 3_2 yellow/white zinc
- b barite
- d_1 pink dolomite
- d_2 grey other dolomite
- m micrite
- q quartz
- o open

TEXTURES

- A
- Anm — 1. Clasts (Wh
- B — 2. Matrix (Bla
- C
- D
- Fenestrae
- Bedding/layering
- Veins
- Conformable contact
- Unconformable contact

HOLE No. DDF4	EASTING 32920	DETAILS	PRECOLLAR	MAIN HOLE	DEPTH	DECL'N	BEARING	HOLE DIAM.	FROM	TO	PROJECT	AREA
DEPTH	NORTHING 65685	Contractor									JOB No.	SCALE
GRID	LOGGED BY	Machine									MINERAL TENEMENT	
RL 350 m	DATUM	Commenced									SHEET 6 OF 6	
		Completed										
		Method										

METRES	MINERALIZATION % CONTENT Zn Pb FeS	MINERALIZATION TYPE	SAMPLE int	SAMPLE NUMBER	ASSAY RESULTS Zn%	Pb%	Ag ppm		STRAT AGE	COLOUR	LITHOS	L.C.A.	TEXTURE	OPEN SPACE FRACTURING I	F	F	I	F	F	I	F	F	Vugs	Cryst	Con	STYL Dis	Res	FOSSILS Abun	Comm	Rare	REMARKS
	tr tr	SB								G				1	S															CA-CR as above
	N tr	"												1	S															
	" "	"							E					1	S															455-5 Grey stylolitic limestone fine fracture calcite & sphalerite and pyrite
	" "	"												1	S															
	" "	"								G				1	S															
460	461.0m	EOH																												
470																														HOLE logged 0-452m R.S.P. " 210.0-452m. 10.11.81.

MINERALIZATION TYPE		COLOUR	
B	Blebs	W	White
C	Cavities	G	Grey
O	Oisseminated	R	Red
E	Euhedra	B	Brown
L	Layered	Y	Yellow
M	Massive	Gn	Green
S	Stylolites	Bk	Black
V	Veins	P	Pink
X	Breccia	Bf	Buff

STYLOLITES	
A	Abundant > 5/m
C	Common 2-5/m
R	Rare ≤ 2/m

FOSSILS

- Algae
- Stromatolites
- Renalcis
- Brachiopods
- Oncolites
- Coral
- Archaeocyathid
- Gastropods
- Unidentified algal & skeletal fragments
- Bivalves

- Laminar Stromotoporoid
- Stromatactoid
- Geopetal

LITHOLOGY

- Limestone
- Calcirudite
- Calcarenite
- Calcilutite
- Biohermal limestone
- Tuff
- Travertine
- Dolomite (can be superimposed on any limestone)
- Greywacke
- Arkose
- Clay
- Oolite
- Evaporite
- Chert (bedded)
- Chert (massive)
- Breccia
- Mudstone
- Siltstone
- Shale
- Sandstone

FRACTURES

Intensity (I)

1. V. Weak
2. Weak
3. Moderate
4. Strong
5. V. Strong

Lithology of Fill (F)

- C_1 laminar calcrete
- C_2 pink calcite
- C_3 white calcite
- λ lead
- 3_1 red zinc
- 3_2 yellow/white zinc
- b barite
- d_1 pink dolomite
- d_2 grey other dolomite
- m micrite
- q quartz
- o open

TEXTURES

- A
- Anm — 1. Clasts (Whi
- B — 2. Matrix (Bla
- C
- D
- Fenestrae
- Bedding/layering
- Veins
- Conformable contact
- Unconformable contact

HOLE No. DDF5	EASTING 32826	DETAILS	PRECOLLAR	MAIN HOLE	DEPTH	DECL'N	BEARING	HOLE DIAM.	FROM	TO	PROJECT MISS. V.	AREA WILLUREENA
DEPTH 300.10m.	NORTHING 6568330	Contractor	CASEY DRILLING		0.0	-70°		NQ	0.0	210	JOB No. L160	SCALE 1:200
GRID AMG	LOGGED BY M.R.	Machine	LONGYEAR 38		300m	64° (ACID ETCH)		BQ	210	300.1	MINERAL TENEMENT GL 807 MT. FROME	
R.L. 270m	DATUM MSL.	Commenced	11-11-81								SHEET 1 OF 7	
		Completed	28-11-81									
		Method	CORE									

MINERALIZATION % CONTENT Zn Pb Fe	TYPE	SAMPLE Int	NUMBER	ASSAY RESULTS Zn%	Pb%	Ag ppm	STRAT AGE	COLOUR	LITHOS	L.C.A.	TEXTURE	OPEN SPACE FRACTURING I F F	I F F	I F F	Vugs Cavity Fossil	STYL Com Occ Rare	FOSSILS Abun Comm Rare	REMARKS
								G/B	CAVITY		B B A	1 d1 m1	1 0		F	C C C R R R R R R		Grey vughy massive calcarenite, coarse crystalline calcite in vughs; fine grained dolomite mud infilling fractures. Cavities at 2.5m (0.38m) and 2.8m (0.3m). Dolomitized and oxidized trace Mn staining (7.3-8.6) Cavity at 8.6 (1.7m) - brown clay, Mn staining and blebs.
												1 d1 m1	1 0		A	R		
												1 d1 m1	2 0		c	R		Grey massive calcarenite as above with fewer and smaller vughs. Increase in dolomite and Mn rich clay infilling vughs, cavities and fractures.
												1 d1 m1	2 0		c	R		
								G/D	CAVITY			1 d1 m1	1 m1	1 0	c c c R V	R A		
															R	A		Clasts at 27.0m (1.75m)
								G/P				1 m1	2 0					Grey massive calcarenite with abundant dolomitic silt-clay filled stylolites grading into dolomitic siltstone - generally green and pink staining; Mn along fractures; strongly bleached. Thin coarse grainstone beds (< 10 cm).
								G/P					2 0					
												1 m1 d1			c	A		Grey dolarenite - calcite filled vughs.

MINERALIZATION TYPE		COLOUR	
B	Blebs	W	White
C	Cavities	G	Grey
D	Disseminated	R	Red
E	Euhedra	B	Brown
L	Layered	Y	Yellow
M	Massive	Gn	Green
S	Stylolites	Bk	Black
V	Veins	P	Pink
X	Breccia	Bf	Buff

STYLOLITES	
A	Abundant > 5/m
C	Common 2-5/m
R	Rare ≤ 2/m

FOSSILS

- Algae
- Stromatolites
- Renalcis
- Brachiopods
- Oncolites
- Coral
- Archaeocyathid
- Gastropods
- Unidentified algal & skeletal fragments
- Bivalves

- Laminar Stromotoporoid
- Stromatactoid
- Geopetal

LITHOLOGY

- Limestone
- Calcirudite
- Calcarenite
- Calcilutite
- Biohermal limestone
- Tuff
- Travertine
- Dolomite (can be superimposed on any limestone)
- Greywacke
- Arkose
- Clay
- Oolite
- Evaporite
- Chert (bedded)
- Chert (massive)
- Breccia
- Mudstone
- Siltstone
- Shale
- Sandstone

FRACTURES

Intensity (I)

1. V. Weak
2. Weak
3. Moderate
4. Strong
5. V. Strong

Lithology of Fill (F)

- C_1 laminar calcrete
- C_2 pink calcite
- C_3 white calcite
- λ lead
- 3_1 red zinc
- 3_2 yellow/white zinc
- b barite
- d_1 pink dolomite
- d_2 grey other dolomite
- m micrite
- q quartz
- o open

TEXTURES

- A
- Anm — 1. Clasts (White)
- B — 2. Matrix (Black)
- C
- D
- Fenestrae
- Bedding/layering
- Veins
- Conformable contact
- Unconformable contact

0953

HOLE No. DDP5	EASTING	DETAILS	PRECOLLAR	MAIN HOLE	DEPTH	DECL'N	BEARING	HOLE DIAM.	FROM	TO	PROJECT	AREA
DEPTH	NORTHING	Contractor									JOB No.	SCALE
GRID	LOGGED BY	Machine									MINERAL TENEMENT	
RL	DATUM	Commenced									SHEET 2 OF 7	
		Completed										
		Method										

METRES	MINERALIZATION % CONTENT Zn	Pb	Fe	TYPE	SAMPLE Int	NUMBER	ASSAY RESULTS Zn%	Pb%	Ag ppm	STRAT AGE	COLOUR	LITHOS	L.C.A.	TEXTURE	OPEN SPACE FRACTURING I	F	F	I	F	F	I	F	F	Vugh	Cavity	Calcite	STYL Con	Dis	Rep	FOSSILS Abun	Comm	Rare	REMARKS
50											G/B				I	d1	M							C		A						Cavity at 46.5 (0.4m) 47.15: light brown to white clays. 51.2: Grey/brown massive dolarenite; extensive Mn dendrites; generally broken core; strongly leached; several small, clay filled cavities.
60											G/B																					Grey/brown dolarenite as above - occasional mica fault breccia; occasional calcite (trace siderite) filled vugs. Mn staining throughout. Occasional dolomite clay filled stylolites.
70											G/B																					Grey-brown dolarenite as above; generally strongly leached; Mn staining throughout.
80											G/B																					Varying degrees of dolomitization and leaching; grading from grey, clean calcarenite to oxidized Mn rich dolarenite/ pink dolomite clays associated with stylolites.
90																																

MINERALIZATION TYPE		COLOUR	
B	Blebs	W	White
C	Cavities	G	Grey
O	Disseminated	R	Red
E	Euhedra	B	Brown
L	Layered	Y	Yellow
M	Massive	Gn	Green
S	Stylolites	Bk	Black
V	Veins	P	Pink
X	Breccia	Bf	Buff

STYLOLITES		
A	Abundant	⩾ 5/m
C	Common	2 - 5/m
R	Rare	⩽ 2/m

FOSSILS

- Algae
- Stromatolites
- Renalcis
- Brachiopods
- Oncolites
- Coral
- Archaeocyathid
- Gastropods
- Unidentified algal & skeletal fragments
- Bivalves

- Laminar Stromotoporoid
- Stromatectoid
- Geopetal

LITHOLOGY

- Limestone
- Calcirudite
- Calcarenite
- Calcilutite
- Biohermal limestone
- Tuff
- Travertine
- Oolomite (can be superimposed on any limestone)
- Greywacke
- Arkose
- Clay
- Oolite
- Evaporite
- Chert (bedded)
- Chert (massive)
- Breccia
- Mudstone
- Siltstone
- Shale
- Sandstone

FRACTURES

Intensity (I)

1. V. Weak
2. Weak
3. Moderate
4. Strong
5. V. Strong

Lithology of Fill (F)

- C_1 laminar calcrete
- C_2 pink calcite
- C_3 white calcite
- λ lead
- 3_1 red zinc
- 3_2 yellow/white zinc
- b barite
- d_1 pink dolomite
- d_2 grey other dolomite
- m micrite
- q quartz
- o open

TEXTURES

- A
- Anm — 1. Clasts (White)
- B — 2. Matrix (Black)
- C
- D
- Fenestrae
- Bedding/layering
- Veins
- Conformable contact
- Unconformable contact

HOLE No. DDF5	EASTING	DETAILS	PRECOLLAR	MAIN HOLE	DEPTH	DECL'N	BEARING	HOLE DIAM.	FROM	TO	PROJECT	AREA
DEPTH	NORTHING	Contractor									JOB No.	SCALE
RIG	LOGGED BY	Machine									MINERAL TENEMENT	
	DATUM	Commenced									SHEET 3 OF 7	
		Completed										
		Method										

MINERALIZATION % CONTENT Zn Pb Fe	TYPE	SAMPLE Int	NUMBER	ASSAY RESULTS Zn%	Pb%	Ag ppm		STRAT AGE	COLOUR	LITHOS	L.C.A.	TEXTURE	OPEN SPACE FRACTURING I F F I F F I F F	Vugh. Cryst. Cavity	STYL Con Dis Res	FOSSILS Abun Comm Rare	REMARKS
									G/B				I d1 Mn I O	C	A		Variable dolomite / calcarenite as above Lisergang banding 90.9 - 91.8. Several white calcite filled vughs; trace siderite. Abundant Mn staining.
									G/B								Cavity at 112.5 (0.5m)
										CAVITY							112.7 - 114.7 Brown clay and limestone rubble.
									G/B								Strongly weathered dolomite lisergang banding
									G/B								Red (Fe) clay infilling fractures

MINERALIZATION TYPE		COLOUR	
B	Blebs	W	White
C	Cavities	G	Grey
D	Disseminated	R	Red
E	Euhedra	B	Brown
L	Layered	Y	Yellow
M	Massive	Gn	Green
S	Stylolites	Bk	Black
V	Veins	P	Pink
X	Breccia	Bf	Buff

STYLOLITES		
A	Abundant	≥ 5/m
C	Common	2 - 5/m
R	Rare	≤ 2/m

FOSSILS

- Algae
- Stromatolites
- Renalcis
- Brachiopods
- Oncolites
- Coral
- Archaeocyathid
- Gastropods
- Unidentified algal & skeletal fragments
- Bivalves

- Laminar Stromotoporoid
- Stromatactoid
- Geopetal

LITHOLOGY

- Limestone
- Calcirudite
- Calcarenite
- Calcilutite
- Biohermal limestone
- Tuff
- Travertine
- Dolomite (can be superimposed on any limestone)
- Greywacke
- Arkose
- Clay
- Oolite
- Evaporite
- Chert (bedded)
- Chert (massive)
- Breccia
- Mudstone
- Siltstone
- Shale
- Sandstone

FRACTURES

Intensity (I)

1. V. Weak
2. Weak
3. Moderate
4. Strong
5. V. Strong

Lithology of Fill (F)

- C_1 laminar calcrete
- C_2 pink calcite
- C_3 white calcite
- λ lead
- 3_1 red zinc
- 3_2 yellow/white zinc
- b barite
- d_1 pink dolomite
- d_2 grey other dolomite
- m micrite
- q quartz
- o open

TEXTURES

- A
- Anm — 1. Clasts (White) 2. Matrix (Black)
- B
- C
- D
- Fenestrae
- Bedding/layering
- Veins
- Conformable contact
- Unconformable contact

HOLE No. DDF 5	EASTING	DETAILS	PRECOLLAR	MAIN HOLE	DEPTH	DECL'N	BEARING	HOLE DIAM.	FROM	TO	PROJECT	AREA
DEPTH	NORTHING	Contractor									JOB No.	SCALE
GRID	LOGGED BY	Machine									MINERAL TENEMENT	
RL	DATUM	Commenced									SHEET 4 OF 7	
		Completed										
		Method										

METRES	MINERALIZATION % CONTENT Zn	Pb	Fe	TYPE	SAMPLE Int	NUMBER	ASSAY RESULTS Zn%	Pb%	Ag ppm		STRAT AGE	COLOUR	LITHOS	L.C.A.	TEXTURE	OPEN SPACE FRACTURING I	F	F	I	F	F	I	F	F	Vugh	Calcite	STYL Con	Dis	Pns	FOSSILS Abun	Comm	Rare	REMARKS
													CAVITY			2	d2	Hm	2	0					R		C						Cavity at 135.65 (0.2m) Brown clays and rubble
													CAVITY																			
												G/B																					Cavity at 137.60 (0.5m) Generally broken core; strongly oxidised; brown unconsolidated clays & fractures and cavities; poor core recovery; Mn rich. Brown, yellow and red clays
140																																	
																																	Pink brown dolomite, limonite staining throughout trace calcite filled vughs. Mn staining in fractures; thin clay filled cavities; high angle (LCA) mineralised fracturing and tension gashes; 'older' vughs infilled with f.g. dolomitic clays and silts; Mn dendrites; lieseganging banding.
150												P/B																					
160																																	
																																	Grey pink calcarenite - dolomite in parts. Fe replacing sulphides at 165m. Thin vuggy fractures; Mn dendrites throughout. Large fractures infilled with oxidized clay and breccia.
												G/P																					
170																																	
													CAVITY																					
180																																	

MINERALIZATION TYPE		COLOUR	
B	Blebs	W	White
C	Cavities	G	Grey
D	Disseminated	R	Red
E	Euhedra	B	Brown
L	Layered	Y	Yellow
M	Massive	Gn	Green
S	Stylolites	Bk	Black
V	Veins	P	Pink
X	Breccia	Bf	Buff

TTTT	Laminar Stromotoporoid
	Stromatactoid
	Geopetal

STYLOLITES		
A	Abundant	≥ 5/
C	Common	2 - 5/
R	Rare	≤ 2/

FOSSILS	
	Algae
	Stromatolite
	Renalcis
	Brachiopods
	Oncolites
	Coral
	Archaeocyathid
	Gastropods
	Unidentified alg skeletal fragmer
	Bivalves

LITHOLOGY

Limestone	Clay
Calcirudite	Oolite
Calcarenite	Evaporite
Calcilutite	Chert (bedded)
Biohermal limestone	Chert (massive)
Tuff	Breccia
Travertine	Mudstone
Dolomite (can be superimposed) on any limestone)	Siltstone
Greywacke	Shale
Arkose	Sandstone

FRACTURES

Intensity (I)

1. V. Weak
2. Weak
3. Moderate
4. Strong
5. V. Strong

Lithology of Fill (F)

- C_1 laminar calcrete
- C_2 pink calcite
- C_3 white calcite
- λ lead
- 3_1 red zinc
- 3_2 yellow/white zinc
- b barite
- d_1 pink dolomite
- d_2 grey other dolomite
- m micrite
- q quartz
- o open

TEXTURES

A, Anm, B, C, D

1. Clasts
2. Matrix

Fenestrae

Bedding/layering

Veins

Conformable contact

Unconformable contact

HOLE No. DDF5	EASTING	DETAILS	PRECOLLAR	MAIN HOLE	DEPTH	DECL'N	BEARING	HOLE DIAM	FROM	TO	PROJECT	AREA
DEPTH	NORTHING	Contractor									JOB No.	SCALE
GRID	LOGGED BY	Machine									MINERAL TENEMENT	
RL	DATUM	Commenced									SHEET 5 OF 7	
		Completed										
		Method										

METRES

MINERALIZATION: % CONTENT Zn Pb Fe; TYPE

SAMPLE: Int; NUMBER

ASSAY RESULTS: Zn%; Pb%; Ag ppm

STRAT: AGE

COLOUR

LITHOS

LCA

TEXTURE

OPEN SPACE FRACTURING: I F F I F F I F F; Vugh; Cryst

STYL: Con; Dis

FOSSILS: Abun; Comm; Rare

REMARKS

	COLOUR	LITHOS	LCA	TEXTURE	OPEN SPACE FRACTURING	Vugh	Cryst	STYL Con	STYL Dis	FOSSILS Abun	FOSSILS Comm	FOSSILS Rare	REMARKS
190	G/B			B, A	2 d2 d1 2 o	C		A				(A)	Grey-brown calcarenite dolomitized in places, generally oxidized limonite staining common. Thin breccia filled cavities occasional clay bands.
200	G/B											(A)	Inclusions banding common.
210	G/B	CAVITY											Cavity at 210.10m (0.75m)
220										(A)		(A)	

THE BROKEN HILL PROPRIETARY COMPANY LIMITED — EXPLORATION DEPARTMENT — HOLE No. DDF5

MINERALIZATION TYPE

B	Blebs
C	Cavities
D	Disseminated
E	Euhedra
L	Layered
M	Massive
S	Stylolites
V	Veins
X	Breccia

COLOUR

W	White
G	Grey
R	Red
B	Brown
Y	Yellow
Gn	Green
Bk	Black
P	Pink
Bf	Buff

STYLOLITES

A	Abundant	≥ 5/m
C	Common	2 – 5/m
R	Rare	≤ 2/m

FOSSILS

- Algae
- Stromatolites
- Renalcis
- Brachiopods
- Oncolites
- Coral
- Archaeocyathid
- Gastropods
- Unidentified algal & skeletal fragments
- Bivalves

- Laminar Stromotoporoid
- Stromatactoid
- Geopetal

LITHOLOGY

- Limestone
- Calcirudite
- Calcarenite
- Calcilutite
- Biohermal limestone
- Tuff
- Travertine
- Oolomite (can be superimposed on any limestone)
- Greywacke
- Arkose
- Clay
- Oolite
- Evaporite
- Chert (bedded)
- Chert (massive)
- Breccia
- Mudstone
- Siltstone
- Shale
- Sandstone

FRACTURES

Intensity (I)

1. V. Weak
2. Weak
3. Moderate
4. Strong
5. V. Strong

Lithology of Fill (F)

- C_1 laminar calcrete
- C_2 pink calcite
- C_3 white calcite
- λ lead
- 3_1 red zinc
- 3_2 yellow/white zinc
- b barite
- d_1 pink dolomite
- d_2 grey other dolomite
- m micrite
- q quartz
- o open

TEXTURES

- A
- Anm — 1. Clasts (White) 2. Matrix (Black)
- B
- C
- O
- Fenestrae
- Bedding/layering
- Veins
- Conformable contact
- Unconformable contact

FILE No. DDF5	EASTING	DETAILS	PRECOLLAR	MAIN HOLE	DEPTH	DECL'N	BEARING	HOLE DIAM.	FROM	TO
DEPTH	NORTHING	Contractor								
		Machine								
GRID	LOGGED BY	Commenced								
		Completed								
	DATUM	Method								

PROJECT	AREA
JOB No.	SCALE
MINERAL TENEMENT	
SHEET 6 OF 7	

MINERALIZATION % CONTENT (Zn, Pb, FeS)	TYPE	SAMPLE (Int, NUMBER)	ASSAY RESULTS (Zn%, Pb%, Ag ppm)	STRAT AGE	COLOUR	LITHOS	L.C.A.	TEXTURE	OPEN SPACE / FRACTURING (I, F, F, I, F, F, I, F, F, Vugh, Cryst, Colla)	STYL (Con, Dis, Res)	FOSSILS (Abun, Comm, Rare)	REMARKS
					B/G	Limestone			I: 1, F: d_1, I: 2, F: D; C	C	Ⓐ Ⓐ	Brown-grey strongly oxidized and leached archaeocyathid limestone. Generally fractured. Minor calcite filled cavities and vughs. Abundant clay filled fractures
					B/G	Limestone					Ⓐ	Strongly leached limestone as above. Individual Ⓐ prominent where surrounding matrix has been leached. trace pyrite in fractures.
Nil	V											
											Ⓐ	
					B/G	CAVITY						Cavity at 257m (1.2m)
						CAVITY						Cavity at 267 (0.4m).

MINERALIZATION TYPE
- B Blebs
- C Cavities
- D Disseminated
- E Euhedra
- L Layered
- M Massive
- S Stylolites
- V Veins
- X Breccia

COLOUR
- W White
- G Grey
- R Red
- B Brown
- Y Yellow
- Gn Green
- Bk Black
- P Pink
- Bf Buff

STYLOLITES
- A Abundant ≥ 5/m
- C Common 2 - 5/m
- R Rare ≤ 2/m

FOSSILS
- Algae
- Stromatolites
- Renalcis
- Brachiopods
- Oncolites
- Coral
- Archaeocyathid
- Gastropods
- Unidentified algal & skeletal fragments
- Bivalves

- Laminar Stromotoporoid
- Stromatactoid
- Geopetal

LITHOLOGY
- Limestone
- Calcirudite
- Calcarenite
- Calcilutite
- Biohermal limestone
- Tuff
- Travertine
- Dolomite (can be superimposed on any limestone)
- Greywacke
- Arkose
- Clay
- Oolite
- Evaporite
- Chert (bedded)
- Chert (massive)
- Breccia
- Mudstone
- Siltstone
- Shale
- Sandstone

FRACTURES

Intensity (I)
1. V. Weak
2. Weak
3. Moderate
4. Strong
5. V. Strong

Lithology of Fill (F)
- C_1 laminar calcrete
- C_2 pink calcite
- C_3 white calcite
- λ lead
- 3_1 red zinc
- 3_2 yellow/white zinc
- b barite
- d_1 pink dolomite
- d_2 grey other dolomite
- m micrite
- q quartz
- o open

TEXTURES
- A
- Anm — 1. Clasts (White) 2. Matrix (Black)
- B
- C
- D
- Fenestrae
- Bedding/layering
- Veins
- Conformable contact
- Unconformable contact

HOLE No. DDF 5	EASTING	DETAILS	PRECOLLAR	MAIN HOLE	DEPTH	DECL'N	BEARING	HOLE DIAM.	FROM	TO	PROJECT	AREA
DEPTH	NORTHING	Contractor									JOB No.	SCALE
AZIMUTH	LOGGED BY	Machine									MINERAL TENEMENT	
RL	DATUM	Commenced									SHEET 7 OF 7	
		Completed										
		Method										

METRES	MINERALIZATION % CONTENT Zn Pb Fe	TYPE	SAMPLE Int	NUMBER	ASSAY RESULTS Zn%	Pb%	Ag ppm	STRAT AGE	COLOUR	LITHOS	L.C.A.	TEXTURE	OPEN SPACE FRACTURING I F F I F F I F F	Vugh- Cryst	Calla	STYL Con	Dis	Res	FOSSILS Abun	Comm	Rare	REMARKS
90																						
100					EOH	300.10																

Casing at 270.4 (0.3m)

(A) Grey/brown leached and oxidised calcarenite dolomitized in places; trace Mn throughout.

(A) Generally broken core;

Brown clays prominent throughout

(A)

MINERALIZATION TYPE		COLOUR	
B	Blebs	W	White
C	Cavities	G	Grey
D	Disseminated	R	Red
E	Euhedra	B	Brown
L	Layered	Y	Yellow
M	Massive	Gn	Green
S	Stylolites	Bk	Black
V	Veins	P	Pink
X	Breccia	Bf	Buff

STYLOLITES		
A	Abundant	⩾ 5/m
C	Common	2 – 5/m
R	Rare	⩽ 2/m

FOSSILS

- Algae
- Stromatolites
- Renalcis
- Brachiopods
- Oncolites
- Coral
- Archaeocyathid
- Gastropods
- Unidentified algal & skeletal fragments
- Bivalves

- Laminar Stromotoporoid
- Stromatactoid
- Geopetal

LITHOLOGY

- Limestone
- Calcirudite
- Calcarenite
- Calcilutite
- Biohermal limestone
- Tuff
- Travertine
- Dolomite (can be superimposed on any limestone)
- Greywacke
- Arkose
- Clay
- Oolite
- Evaporite
- Chert (bedded)
- Chert (massive)
- Breccia
- Mudstone
- Siltstone
- Shale
- Sandstone

FRACTURES

Intensity (I)

1. V. Weak
2. Weak
3. Moderate
4. Strong
5. V. Strong

Lithology of Fill (F)

- C_1 laminar calcrete
- C_2 pink calcite
- C_3 white calcite
- λ lead
- 3_1 red zinc
- 3_2 yellow/white zinc
- b barite
- d_1 pink dolomite
- d_2 grey other dolomite
- m micrite
- q quartz
- o open

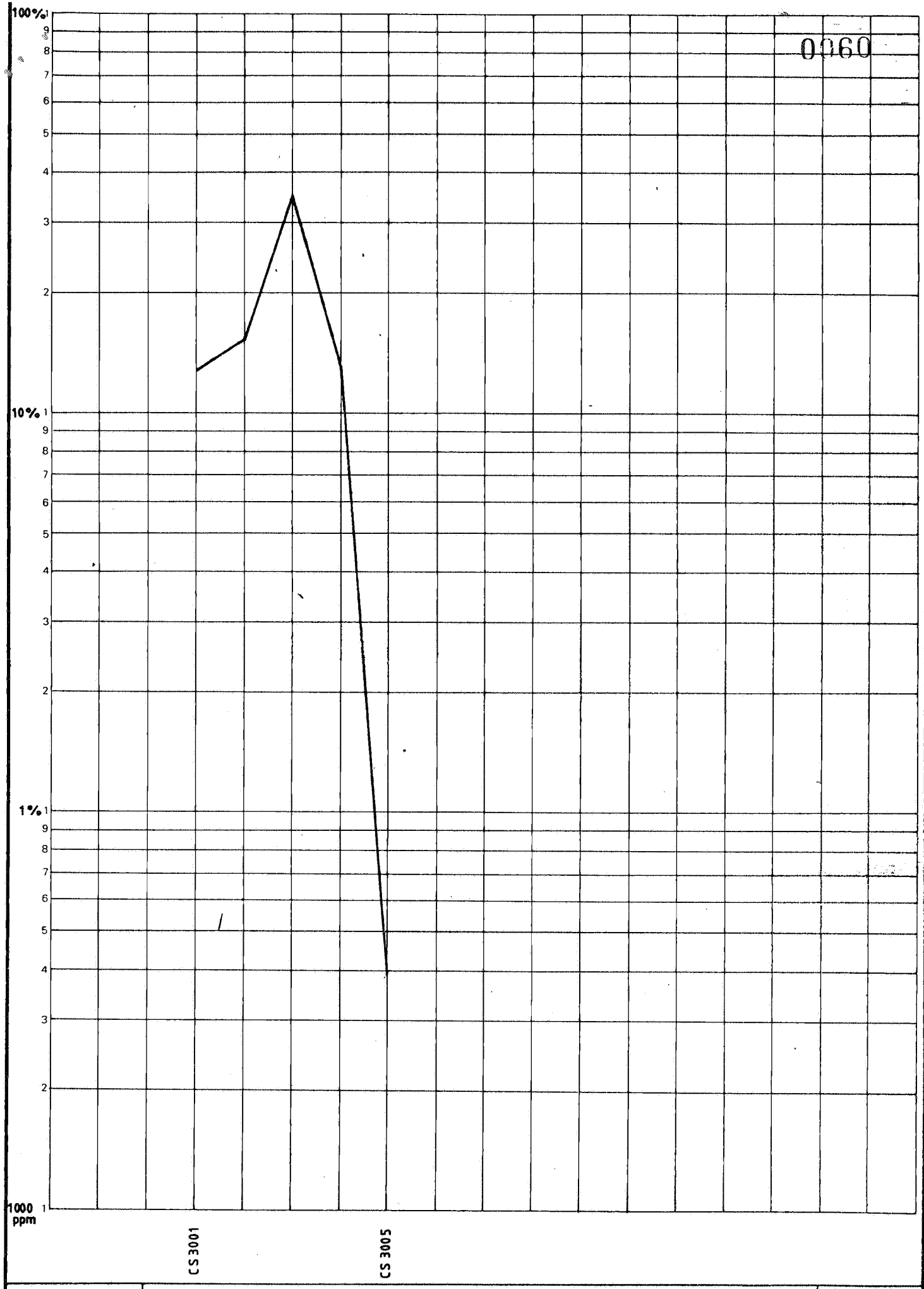
TEXTURES

- A
- Anm — 1. Clasts (White)
- B — 2. Matrix (Black)
- C
- D
- Fenestrae
- Bedding/layering
- Veins
- Conformable contact
- Unconformable contact

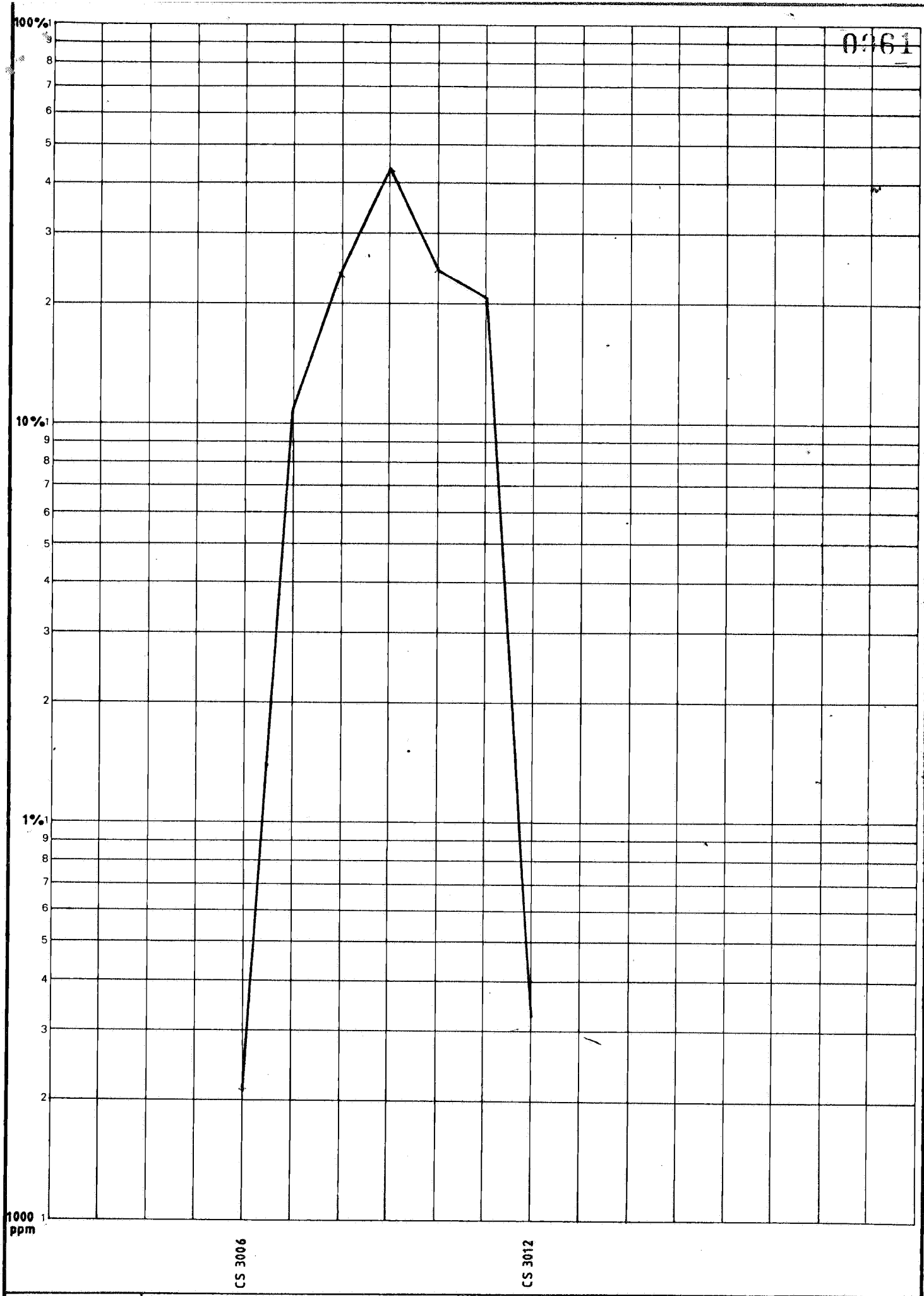
APPENDIX 2

Channel Sample Traverses

Total Metal Content Graphs



Centre: Whyalla	THE BROKEN HILL PROPRIETARY CO. LTD.	Project No.
Date: Dec '81	E.L. 807 WILNUROONA PROSPECT CHANNEL SAMPLE TRAVERSES Traverse No. 1 Sample Nos. CS 3001 – CS 3005 Total Metal Content (Pb + Zn)	Drawing No. A4-363



Centre: Whyalla	THE BROKEN HILL PROPRIETARY CO. LTD.	Project No.
Date: Dec. '81	E.L. 807 WILNUROONA PROSPECT, CHANNEL SAMPLE TRAVERSES Traverse No. 2 Sample Nos. C S 3006 – CS 3012 Total Metal Content (Pb + Zn)	Drawing No. A4-364

EXPLORATION LICENCE 807

MOUNT FROME, SOUTH AUSTRALIA

REPORT FOR THE QUARTER ENDED 12th FEBRUARY, 1982

CONTENTS

EXPLORATION LICENCE 807

MT. FROME, SOUTH AUSTRALIA

REPORT FOR THE QUARTER ENDED 12th FEBRUARY, 1982

1. GENERAL

Exploration Licence 807 of 294 square kilometres was granted to BHP Minerals Limited on 12th February, 1981, for one year. This licence replaces E.L. 538 held by BHP Minerals Limited (formerly Dampier Mining Company Limited) covering the same area, which expired on 25th October, 1980.

An application for the renewal of the Exploration Licence for a further twelve months has been submitted.

2. FIELD INVESTIGATIONS

The 1:5,000 scale geological mapping in the vicinity of Wilnuroona Prospect has been delayed due to commitments in other tenements.

3. MINERALISATION

Selected sections of core from the recently completed drilling program were split and half-core samples sent to COMLABS, Adelaide for analysis.

The analysis results from this work are in the Appendix.

The first batch of samples (Nos. AC5191-AC5349) were analysed for copper, lead, zinc (method AAS1/1A) and calcium, magnesium (method AAS 6). The remaining samples (Nos. AC5350-5456) were analysed for lead, zinc (method AAS 1) and if the total metal content (lead + zinc) for these samples was greater than 0.5%, the samples were analysed for copper, cadmium, cobalt (method AAS 1), silver (AAS 3), gold (AAS 5A) and arsenic (XRF 1).

As can be seen from the results, no significant mineralisation was intersected in these drill holes. The highest value is in drill hole DDF4, where a one metre interval (440 to 441m) returned 0.9% zinc.

Further work is currently being undertaken in correlating these analysis results with the drill core and surface geology in the area.

4. EXPENDITURE

Expenditure debited to EL 807 during December, 1981 and January, 1982, was:

cont./..

Wages and Salaries	$ 7,024
Messing and Accommodation	1,953
Fares and Mobilisation	94
Occupancy/Location Expenses	32
Transport	902
Surveying/Aerial Photographs	17
Sample Analysis	286
Mobilisation of Equipment	56
Vehicles	253
Administration/Overheads	531
	$11,148

Revised total expenditure on EL's 538/807 to 31st January, 1982, is $145,603

This report is submitted to the Department of Mines and Energy as required by Condition 4 of Exploration Licence 807.

APPENDIX

Analysis Results

ANALYTICAL REPORT

JOP COM820021 O/N : L 160 Sheet 001845 0067

Results in ppm

SAMPLE	Cu	Pb	Zn	%Mg	%Ca	
DDF 2. AC 5191	18	75	160	4.2	29.7	23.1 - 24.1 m
AC 5192	120	110	610	3.6	19.9	24.1 - 25.1
AC 5193	130	85	630	2.4	25.3	25.1 - 26.1
AC 5194	32	48	230	3.2	25.8	26.1 - 27.1
AC 5195	32	38	310	6.2	27.0	27.1 - 28.1
AC 5196	250	320	1350	0.31	13.4	28.1 - 29.1
AC 5197	100	90	290	0.52	33.2	29.1 - 30.1
AC 5198	28	20	110	0.28	38.3	30.1 - 31.1
AC 5199	12	6	105	2.4	35.8	31.1 - 32.1
AC 5200	16	14	60	11.8	22.8	32.1 - 33.1
AC 5201	16	14	60	11.8	22.5	33.1 - 34.1
AC 5202	18	12	60	11.8	22.6	34.1 - 35.1
AC 5203	18	12	65	11.2	21.8	35.1 - 36.1
AC 5204	160	155	410	2.6	27.7	36.1 - 37.1

.../ 12

ANALYTICAL REPORT

67A

JOP COM820021 O/N : L 160 Sheet 001845

Results in ppm

	SAMPLE	Cu	Pb	Zn	%Mg	%Ca	
DDF2	AC 5205	80	90	310	9.6	22.1	37.1 - 38.1
	AC 5206	70	28	220	8.0	26.8	41.6 - 42.6
	AC 5207	100	44	320	1.18	37.1	42.6 - 43.6
	AC 5208	16	8	80	2.6	37.8	43.6 - 44.6
	AC 5209	12	6	46	1.4	38.9	44.6 - 45.6
	AC 5210	14	36	70	1.6	39.3	45.6 - 46.6
	AC 5211	22	34	80	2.2	36.1	46.6 - 47.6
	AC 5212	20	44	80	0.20	41.8	47.6 - 48.6
	AC 5213	36	75	115	0.19	41.9	48.6 - 49.6
	AC 5214	36	80	100	0.17	41.2	49.6 - 50.6
	AC 5215	38	75	105	0.23	40.8	50.6 - 51.6
	AC 5216	40	65	115	0.14	41.1	57.6 - 52.6
	AC 5217	6	65	90	8.2	29.9	155.0 - 156.0
	AC 5218	4	28	48	3.4	37.2	156.0 - 157.0
	AC 5219	2	32	100	9.2	28.4	157.0 - 158.0
	AC 5220	28	170	570	0.81	41.2	230.36 - 231.36
	AC 5221	50	220	1350	3.8	34.7	231.36 - 232.36
	AC 5222	28	170	1550	5.8	33.3	232.36 - 233.36
DDF3	AC 5223	4	115	210	0.20	39.7	1.5 - 2.3
	AC 5224	4	38	115	0.18	41.3	2.5 - 3.5
	AC 5225	2	90	135	0.19	40.6	3.5 - 4.5
	AC 5226	8	200	310	0.17	38.9	4.5 - 5.5
	AC 5227	2	110	130	0.18	36.2	5.5 - 6.5
	AC 5228	8	195	260	0.38	25.3	6.5 - 7.5
	AC 5229	6	330	680	0.20	34.4	7.5 - 8.5

.../ 13

ANALYTICAL REPORT

JOB COM820021 O/N : L 160 Sheet 001845 0068

Results in ppm

	SAMPLE	Cu	Pb	Zn	%Mg	%Ca	
DDF 3	AC 5230	8	85	500	0.31	35.4	8·5 - 9·5
	AC 5231	10	145	380	0.20	35.1	9·5 - 10·5
	AC 5232	6	55	360	0.19	34.2	10·5 - 11·5
	AC 5233	2	36	260	0.16	35.9	11·5 - 12·5
	AC 5234	6	36	350	0.21	30.0	12·5 - 13·5
	AC 5235	4	230	360	0.21	35.0	13·5 - 14·5
	AC 5236	4	420	270	0.18	36.1	14·5 - 15·5
	AC 5237	4	380	440	0.18	34.5	15·5 - 16·5
	AC 5238	12	1850	750	0.18	35.4	16·5 - 17·5
	AC 5239	8	1000	1200	0.25	37.5	17·5 - 18·5
	AC 5240	6	590	840	0.21	39.8	18·5 - 19·5
	AC 5241	4	630	690	0.24	39.5	19·5 - 20·5
	AC 5242	10	520	950	0.16	38.1	20·5 - 21·5
	AC 5243	2	530	790	0.20	38.8	21·5 - 22·5
	AC 5244	2	260	650	0.26	38.2	22·5 - 23·5
	AC 5245	8	260	710	1.25	36.9	23·5 - 24·5
	AC 5246	4	170	400	0.42	39.7	24·5 - 25·5
	AC 5247	4	105	330	6.6	30.3	25·5 - 26·5
	AC 5248	2	95	140	10.8	23.3	26·5 - 27·5
	AC 5249	12	185	840	6.8	24.2	27·5 - 28·5
	AC 5250	6	105	500	9.0	23.8	28·5 - 29·5
	AC 5251	2	115	280	10.8	21.5	29·5 - 30·5
	AC 5252	2	145	500	6.6	28.2	30·5 - 31·5
	AC 5253	2	360	870	0.60	36.9	31·5 - 32·5
	AC 5254	4	300	900	0.45	36.5	32·5 - 33·5

.../ 14

ANALYTICAL REPORT

0069

JOB COM820021 O/N : L 160 Sheet 001845

Results in ppm

	SAMPLE	Cu	Pb	Zn	%Mg	%Ca	
DDF 3	AC 5255	2	75	640	0.40	36.5	33.5 - 34.5
	AC 5256	2	115	450	8.2	28.2	34.5 - 35.5
	AC 5257	4	130	330	7.4	29.9	35.5 - 36.5
	AC 5258	10	120	440	8.4	27.3	36.5 - 37.5
	AC 5259	10	200	640	1.0	33.9	37.5 - 38.5
	AC 5260	12	140	490	5.2	33.0	38.5 - 39.5
	AC 5261	6	180	370	2.8	35.0	39.5 - 40.5
	AC 5262	8	180	290	0.61	41.4	40.5 - 41.5
	AC 5263	12	270	690	0.26	34.8	41.5 - 42.5
	AC 5264	6	170	510	0.79	40.0	42.5 - 43.5
	AC 5265	8	260	340	0.25	39.9	43.5 - 44.5
	AC 5266	6	200	320	0.33	39.1	44.5 - 45.5
	AC 5267	4	160	330	4.4	32.2	45.5 - 46.5
	AC 5268	4	120	470	8.2	27.0	46.5 - 47.5
	AC 5269	8	160	580	4.8	32.7	47.5 - 48.5
	AC 5270	12	350	740	0.36	36.0	48.5 - 49.5
	AC 5271	8	180	500	3.8	34.6	49.5 - 50.5
	AC 5272	10	430	730	0.23	35.7	50.5 - 51.5
	AC 5273	12	570	840	0.18	36.2	51.5 - 52.5
	AC 5274	12	610	870	0.23	27.1	52.5 - 53.5
	AC 5275	8	200	360	2.6	34.5	53.5 - 54.5
	AC 5276	10	310	490	0.63	37.1	54.5 - 55.5
	AC 5277	10	490	800	0.41	37.7	55.5 - 56.5
	AC 5278	6	230	610	5.2	30.7	56.5 - 57.5
	AC 5279	8	260	720	7.6	25.0	57.5 - 58.5

.../ 15

COMLABS Pty. Ltd.
COMPUTERISED ANALYTICAL LABORATORIES

ANALYTICAL REPORT

JOB COM820021 O/N : L 160 Sheet 001845 0170

Results in ppm

	SAMPLE	Cu	Pb	Zn	%Mg	%Ca	
DDF 3	AC 5280	8	460	710	0.48	32.6	58.5 - 59.5
	AC 5281	8	380	620	0.49	38.1	59.5 - 60.5
DDF 3	AC 5288	4	280	570	2.8	37.2	180.0 - 181.0
	AC 5289	4	65	220	1.8	37.9	181.0 - 182.0
	AC 5290	8	55	140	1.6	34.9	182.0 - 183.0
	AC 5291	6	46	135	1.8	33.6	183.0 - 184.0
	AC 5292	8	44	145	1.2	35.8	184.0 - 185.0
	AC 5293	8	46	150	1.0	36.8	185.0 - 186.0
	AC 5294	12	55	140	6.0	31.4	186.0 - 187.0
	AC 5295	12	55	220	11.6	24.3	187.0 - 188.0
	AC 5296	12	60	700	12.2	25.1	188.0 - 189.0
	AC 5297	10	75	770	12.2	24.4	189.0 - 190.0
	AC 5298	10	48	190	12.8	23.9	190.0 - 191.0
	AC 5299	8	36	145	12.6	24.2	191.0 - 192.0
	AC 5300	10	22	110	9.8	28.3	192.0 - 193.0
	AC 5301	12	60	240	12.0	24.8	193.0 - 194.0
	AC 5302	10	34	150	11.6	24.2	194.0 - 195.0
	AC 5303	10	34	90	11.8	24.8	195.0 - 196.0
	AC 5304	8	26	100	10.6	27.0	196.0 - 197.0

.../ 16

ANALYTICAL REPORT

JOB COM820021 O/N : L 160 Sheet 001845 0071

Results in ppm

	SAMPLE	Cu	Pb	Zn	%Mg	%Ca	
DDF 3	AC 5305	6	18	140	6.2	32.6	229·8 - 230·8
	AC 5306	6	16	115	10.0	25.9	230·8 - 231·8
	AC 5307	4	18	80	11.8	22.9	231·8 - 232·8
	AC 5308	8	20	70	11.6	23.2	232·8 - 233·8
	AC 5309	4	16	130	11.0	25.1	233·8 - 234·8
	AC 5310	<4	14	70	7.2	30.6	234·8 - 235·8
	AC 5311	2	46	95	7.2	30.1	235·8 - 236·8
	AC 5312	4	65	95	12.0	22.7	236·8 - 237·8
	AC 5313	2	60	90	12.0	22.7	237·8 - 238·8
	AC 5314	2	32	240	11.4	22.8	338·8 - 239·8
	AC 5315	4	40	250	12.0	24.2	239·8 - 240·8
	[illegible]						

DDF 3	AC 5330	4	70	130	7.6	31.2	258·6 - 259·6

.../ 17

ANALYTICAL REPORT

JOB COM820021 O/N : L 160 Sheet 001845 0072

Results in ppm

	SAMPLE	Cu	Pb	Zn	%Mg	%Ca	
DDF3	AC 5331	12	175	960	2.0	39.9	259.6 - 260.6
	AC 5332	<2	44	55	2.2	40.1	260.6 - 261.6
	AC 5333	2	90	105	2.0	40.0	261.6 - 262.6
	AC 5334	2	90	190	2.0	37.0	262.6 - 263.6
	AC 5335	4	460	1700	3.2	35.9	263.6 - 264.6
	AC 5336	2	170	500	3.8	35.8	264.6 - 265.6
	AC 5337	2	610	2100	3.4	36.1	265.6 - 266.6
	AC 5338	6	1150	180	2.4	37.5	266.6 - 267.6
	AC 5339	2	135	210	2.6	37.0	267.6 - 268.6
	AC 5340	2	95	165	3.2	37.3	268.6 - 269.6
	AC 5341	2	75	155	5.0	33.3	269.6 - 270.6
	AC 5342	4	55	145	4.8	32.7	270.6 - 271.6
	AC 5343	8	60	130	5.0	33.6	271.6 - 272.6
	AC 5344	4	55	105	4.4	32.6	272.6 - 273.6
	AC 5345	6	50	115	2.8	35.4	273.6 - 274.6
	AC 5346	6	30	90	1.8	36.4	274.6 - 275.6
	AC 5347	6	34	160	1.4	39.7	275.6 - 276.6
	AC 5348	4	20	65	4.0	36.1	276.6 - 277.6
	AC 5349	8	30	90	1.2	36.4	277.6 - 278.6

Method of Analysis : Cu Pb Zn : AAS1/1A
Ca Mg : AAS6

.../ 18

COMLABS Pty. Ltd.
COMPUTERISED ANALYTICAL LABORATORIES

ANALYTICAL REPORT

0073

JOB COM820079 O/N : L 160 Sheet 001846

Results in ppm

	SAMPLE	Pb	Zn	
DDF 3	AC 5350	85	700	294.5 - 295.5
	AC 5351	95	14	295.6 - 296.6
	AC 5352	44	170	327.51 - 328.51
	AC 5353	40	250	328.51 - 329.51
	AC 5354	100	450	329.51 - 330.51
	AC 5355	34	900	330.51 - 331.51
	AC 5356	48	3000	331.51 - 332.51
DDF 4	AC 5357	12	120	189.80 - 190.80
	AC 5358	16	200	190.80 - 191.80
	AC 5359	10	46	191.80 - 192.80
	AC 5360	12	70	192.80 - 193.80
	AC 5361	18	100	193.80 - 194.80
	AC 5362	22	10	335.27 - 336.27
	AC 5363	20	6	336.27 - 337.27
	AC 5364	26	6	337.27 - 338.27
	AC 5365	28	16	366.15 - 367.15
	AC 5366	24	12	367.15 - 368.15
	AC 5367	20	10	368.15 - 369.15
	AC 5368	22	10	369.15 - 370.15
	AC 5369	30	90	370.15 - 371.15
	AC 5370	110	650	371.15 - 372.15
	AC 5371	160	400	398.0 - 399.0
	AC 5372	260	160	399.0 - 400.0
	AC 5373	22	8	400.0 - 401.0
	AC 5374	16	6	401.0 - 402.0

.../ 2

ANALYTICAL REPORT

JOB COM820079 O/N : L 160 Sheet 001846 0074

Results in ppm

	SAMPLE	Pb	Zn	
DDF 4	AC 5375	8	8	402.0 - 403.0
	AC 5376	14	8	403.0 - 404.0
	AC 5377	16	22	430.0 - 431.0
	AC 5378	38	22	431.0 - 432.0
	AC 5379	24	28	432.0 - 433.0
	AC 5380	26	40	433.0 - 434.0
	AC 5381	28	24	434.0 - 435.0
	AC 5382	22	16	435.0 - 436.0
	AC 5383	55	18	436.0 - 437.0
	AC 5384	55	24	437.0 - 438.0
	AC 5385	42	22	438.0 - 439.0
	AC 5386	48	400	439.0 - 440.0
	AC 5387	44	9000	440.0 - 441.0
	AC 5388	40	300	441.0 - 442.0
	AC 5389	20	1200	442.0 - 443.0
	AC 5390	26	180	443.0 - 444.0
	AC 5391	18	28	444.0 - 445.0
	AC 5392	22	28	445.0 - 446.0
	AC 5393	22	14	446.0 - 447.0
	AC 5394	16	18	447.0 - 448.0
	AC 5395	24	12	448.0 - 449.0
	AC 5396	28	12	449.0 - 450.0
	AC 5397	20	30	450.0 - 451.0
	AC 5398	28	170	451.0 - 452.0
	AC 5399	30	110	452.0 - 453.0

.../ 3

ANALYTICAL REPORT

JOB COM820079 O/N : L 160 Sheet 001846

Results in ppm

0975

	SAMPLE	Pb	Zn	
DDF 4	AC 5400	16	40	453.0 - 454.0
	AC 5401	14	32	454.0 - 455.0
	AC 5402	22	32	455.0 - 456.0
	AC 5403	26	18	456.0 - 457.0
	AC 5404	26	12	457.0 - 458.0
	AC 5405	22	500	458.0 - 459.0
	AC 5406	24	18	459.0 - 460.0
DDF 5	AC 5407	410	500	40.0 - 41.0
	AC 5408	280	350	41.0 - 42.0
	AC 5409	34	60	42.0 - 43.0
	AC 5410	32	80	43.0 - 44.0
	AC 5411	55	150	44.0 - 45.0
	AC 5412	50	120	45.0 - 46.0
	AC 5413	75	250	46.0 - 47.0
	AC 5414	360	250	47.0 - 48.0
	AC 5415	680	350	48.0 - 49.0
	AC 5416	910	700	49.0 - 50.0
	AC 5417	44	250	150.0 - 151.0
	AC 5418	42	120	151.0 - 152.0
	AC 5419	44	130	152.0 - 153.0
	AC 5420	34	110	153.0 - 154.0
	AC 5421	24	120	154.0 - 155.0
	AC 5422	44	150	155.0 - 156.0
	AC 5423	34	130	156.0 - 157.0
	AC 5424	48	110	157.0 - 158.0

.../ 4

ANALYTICAL REPORT

JOB COM820079 O/N : L 160 Sheet 001846 0076

Results in ppm

	SAMPLE	Pb	Zn	
DDH 5	AC 5425	36	90	158.0 - 159.0
	AC 5426	20	90	159.0 - 160.0
	AC 5427	26	130	160.0 - 161.0
	AC 5428	100	250	161.0 - 162.0
	AC 5429	46	250	162.0 - 163.0
	AC 5430	46	170	163.0 - 164.0
	AC 5431	14	50	164.0 - 165.0
	AC 5432	12	38	165.0 - 166.0
	AC 5433	34	80	166.0 - 167.0
	AC 5434	26	60	167.0 - 168.0
	AC 5435	42	100	168.0 - 169.0
	AC 5436	34	110	169.0 - 170.0
	AC 5437	65	110	170.0 - 171.0
	AC 5438	135	60	171.0 - 172.0
	AC 5439	310	190	172.0 - 173.0
	AC 5440	50	150	173.0 - 174.0
	AC 5441	300	160	174.0 - 175.0
	AC 5442	500	1300	175.0 - 176.0
	AC 5443	100	130	176.0 - 177.0
	AC 5444	70	90	177.0 - 178.0
	AC 5445	110	140	178.0 - 179.0
	AC 5446	46	70	179.0 - 180.0
	AC 5447	250	300	240.0 - 241.0
	AC 5448	400	150	241.0 - 242.0
	AC 5449	200	120	242.0 - 243.0

.../ 5

ANALYTICAL REPORT

JOB COM820079 O/N : L 160 Sheet 001846 0077

Results in ppm

	SAMPLE	Pb	Zn	
DDH 5	AC 5450	450	1000	243.0 - 244.0
	AC 5451	190	200	244.0 - 245.0
	AC 5452	170	300	245.0 - 246.0
	AC 5453	350	450	246.0 - 247.0
	AC 5454	100	500	247.0 - 248.0
	AC 5455	120	750	248.0 - 249.0
	AC 5456	200	250	249.0 - 250.0

Method of Analysis : Pb Zn : AAS1

.../ 6

ANALYTICAL REPORT

0078

JOB COM820079 O/N : L 160 Sheet 001846

Results in ppm

SAMPLE	Cu	Ag	Cd	Co	Au	As
AC 5356	8	<1	5	<4	<0.05	6
AC 5387	6	<1	23	<4	<0.05	9

Method of Analysis : Cu Cd Co : AAS1
Ag : AAS3
Au : AAS5A
As : XRF1

EXPLORATION LICENCE 807

MT. FROME, SOUTH AUSTRALIA

REPORT FOR THE QUARTER ENDED 12TH MAY, 1982

1. GENERAL

Exploration Licence 807 of 294 square kilometres was granted to BHP Minerals Ltd on 12th February, 1981 for one year, and was renewed for a further year on 12th February, 1982.

The licence replaces E.L. 538 held by BHP Minerals Limited covering the same area, which expired on 25th October, 1980.

2. FIELD INVESTIGATIONS

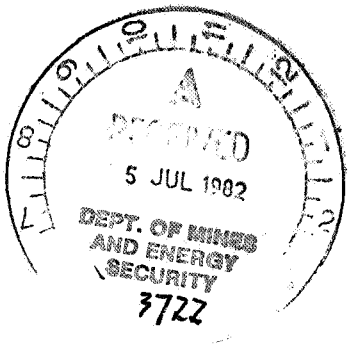
Due to commitments in adjacent tenements, no field work was carried out on E.L.807 during this quarter.

3. EXPENDITURE

Expenditure debited to EL 807 during the four months February to May, 1982, was:

Wages and Salaries	$ 3,257
Fares and Mobilisation	203
Occupancy/Location Expenses	4
Transport	202
Surveying/Aerial Photographs	383
Sample Analysis	5,057
Drilling	943
Tenement Fees, Licences, etc.	223
Administration/Overheads	514
	$10,786

Revised total expenditure on EL's 538/807 to 31st May, 1982, is $156,389.



This report is submitted to the Department of Mines and Energy as required by Condition 4 of Exploration Licence 807.

EXPLORATION LICENCE 807

MT. FROME, SOUTH AUSTRALIA

REPORT FOR THE QUARTER ENDED 12th AUGUST, 1982

1. GENERAL

Exploration Licence 807 of 294 square kilometres was granted to BHP Minerals Limited on 12th February, 1981 for one year and was renewed for a further year on 12th February, 1982.

The licence replaces E.L. 538 held by BHP Minerals Limited covering the same area, which expired on 25th October, 1980.

2. FIELD INVESTIGATIONS

Detailed geological mapping at 1:5,000 scale of the Wilnuroona Prospect and Moorowie Mine area is presently being undertaken.

It is anticipated that this mapping will be completed by the end of August following which a complete appraisal of this exploration licence area will be made.

3. EXPENDITURE

Expenditure debited to E.L. 807 during June and July, 1982, was:

Wages and Salaries	$3,554
Transport	26
Administration/Overheads	179
	$3,759

Total expenditure on E.L's 538/807 to 31st July, 1982, is: $160,148

This report is submitted to the Department of Mines and Energy as required by Condition 4 of Exploration Licence 807.

EXPLORATION LICENCE 807

MT. FROME, SOUTH AUSTRALIA

REPORT FOR THE QUARTER ENDED 12th NOVEMBER, 1982

1. GENERAL

Exploration Licence 807 of 294 square kilometres was granted to BHP Minerals Limited on 12th February, 1981 for one year and was renewed for a further year on 12th February, 1982.

The licence replaces E.L. 538 held by BHP Minerals Limited covering the same area, which expired on 25th October, 1980.

2. FIELD INVESTIGATIONS

2.1 Geological Mapping and Prospecting

Detailed geological mapping at 1:5,000 scale was carried out on the western side of the Mt. Frome area (Wilnuroona Prospect).

A report on this mapping is being prepared and will be included in the next quarterly report.

The proposed mapping in the Moorowie area has been delayed due to other commitments in the Flinders Ranges.

2.2 Geochemical Sampling

A two metre grid was surveyed over a zone of mineralisation (lead + zinc) in the Wilnuroona area. (Grid = 32 x 28 m).

Rock powder samples to a depth of 1.5 - 2.0 metres were collected utilizing a jackhammer at each site on the grid.

A total of 224 samples were collected, bagged and sent to Comlabs (Adelaide) for analysis (copper, lead, zinc, silver). Analysis results have not yet been received.

3. EXPENDITURE

Expenditure debited to E.L. 807 during August, September and October, 1982, was:

cont./..

Wages and Salaries	$ 8,416
Messing and Accommodation	763
Fares and Mobilisation	328
Radio Communications	73
Transport	1,239
Surveying and Aerial Photographs	105
Sample Analysis	241
Administration and Overheads	558
	$11,723

Total expenditure on E.L. 538/807 to 31st October, 1982, is $117,871

4. PROPOSED PROGRAMME

(1) Geological mapping at 1:5,000 scale in the Moorowie area.

(2) Appraisal of all geological and geochemical data.

(3) Further drilling (if warranted).

This report is submitted to the Department of Mines and Energy as required by Condition 4 of Exploration Licence 807.

EXPLORATION LICENCE 807

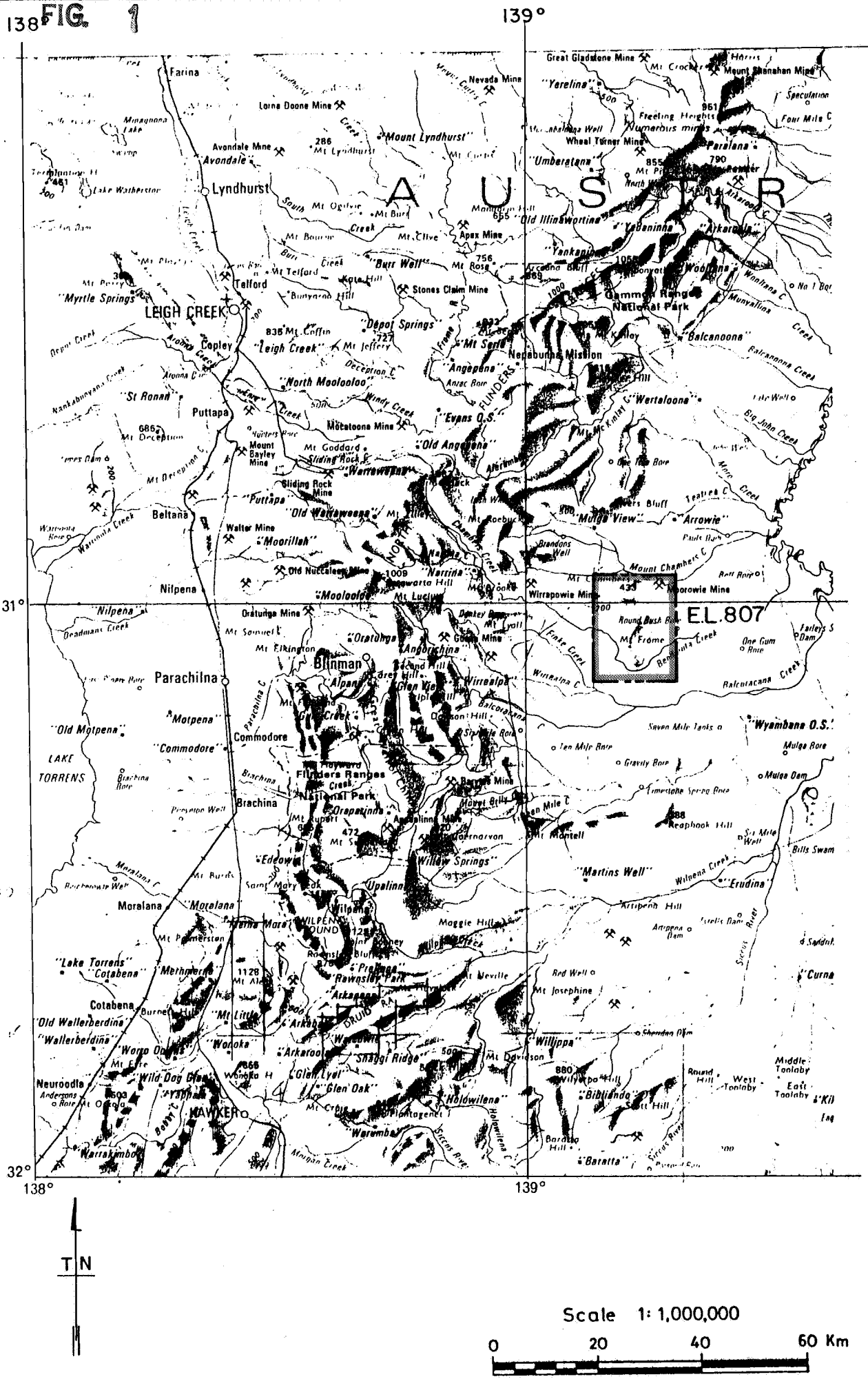
MT. FROME, SOUTH AUSTRALIA

REPORT FOR THE QUARTER ENDED 12th FEBRUARY, 1983

CONTENTS

FIGURES

FIG. 1



Centre: Melbourne	THE BROKEN HILL PROPRIETARY CO LTD. EL 807, MT. FROME, S.A. LOCATION MAP	Project No.
Date: 29-3-83		Drawing No. A4-2386

EXPLORATION LICENCE 807

0086

MT. FROME, SOUTH AUSTRALIA

REPORT FOR THE QUARTER ENDED 12th FEBRUARY, 1983

1. GENERAL

Exploration Licence 807 of 294 square kilometres was granted to BHP Minerals Limited on 12th February, 1981 for one year and was renewed for a further year on 12th February, 1982.

The licence replaced E.L. 538 held by BHP Minerals Limited covering the same area, which expired on 25th October, 1980.

2. FIELD INVESTIGATIONS

2.1 Geochemical Sampling

A total of four hundred and eighty (480) samples were collected on two separate 2 metre grids within the Wilnuroona Prospect, Mt. Frome, S.A.

Sampling Technique

Samples were collected utilizing a jackhammer and a 85 c.f.m. compressor.

Initially two metre steel rods were tried, but due to the rods getting bogged in the fractured limestone and the difficulty of lifting an 80 lb jackhammer 2 metres off the ground, it was decided to reduce the rod lengths to 1.3 metres.

The top 1-2 cm of sample was not collected, due to sampling difficulties when attempting to "bed" the rod on the massive limestone outcrop.

Once the rod had been "bedded", plastic sheeting was placed over the sample site, a plastic bottle placed over the hole, with the jackhammer rod passing through the plastic bottle. Rags were wrapped around the neck of the plastic bottle to prevent sample loss. Each hole required two stages of "drilling". An initial 60 cm rod was used followed by a 1.3 metre rod. Samples were bagged at each rod change, with the sample recovery implements being thoroughly cleaned after each sample site.

Sample loss for the programme was negligible.

Samples were analysed by Comlabs Pty Ltd of Adelaide. Copper, lead and zinc were analysed by method AAS1 and silver by method AAS3.

cont./..

0087

Grid A

The first grid (28 x 32 metres) was centred on a mineralised pod which was previously sampled by continuous channel sampling. Two lines of channel sampling were collected 10 metres apart. Samples were bagged at 5 metre intervals. The results are shown below:

Line 1	Pb (%)	Zn (%)	Ag (ppm)
CS 3001	3.7	9.2	17
3002	4.5	11.0	24
3003	6.1	29.0	27
3004	1.5	11.5	9
3005	0.05	0.35	1

Line 2	Pb (%)	Zn (%)	Ag (ppm)
CS 3006	0.05	0.16	1
3007	1.10	9.8	6
3008	4.4	26.0	40
3009	11.4	32.5	43
3010	7.2	17.4	23
3011	3.9	16.4	19
3012	0.06	0.26	1

A total of two hundred and twenty four (224) samples were collected on the jack hammer sample grid. Analysis results and plots from this programme are on Figures 2 a & b.

Statistical information on these results are:

	Average	S.D.
Cu	23.7 ppm	19.1
Pb	1.71 %	3.23
Zn	1.51 %	3.82
Ag	6.1 ppm	13.94

This sampling programme delineated two high grade pods within the generally highly anomalous grid area.

Grid B

A total of two hundred and fifty six (256) samples were collected on a mineralised zone approximately 400 metres north-west (along strike) of Grid A.

The grid was also centred on lead and zinc mineralisation detected during our mapping/prospecting programme. This mineralisation is indicative of the general stratabound mineralisation detected beneath the "Flinders Unconformity" (local name), which is enhanced in some areas (e.g. Grid A) by faulting. The results from this grid are much lower than those from the mineralised pod over which Grid A was emplaced. A maximum value of 0.46% combined Pb + Zn was recorded.

cont./..

All analysis results and plots are on Figure 3.

Conclusion

This method of geochemical sampling was initiated to gain statistical information of the "grades" of mineralised zones/pods within the Lower Cambrian carbonate units of the Flinders Ranges.

In this respect the method has proved to be quite successful, and further sampling programmes of a similar nature are proposed for other mineralised areas in the Flinders Ranges.

3. WORK PROPOSED

3.1 Geophysics

An I.P./resistivity survey (approximately 4.2 line kilometres) covering the mineralised fault zone on the eastern flank of the Mt. Frome area (Moorowie Prospect) is proposed to commence in late February.

4. EXPENDITURE

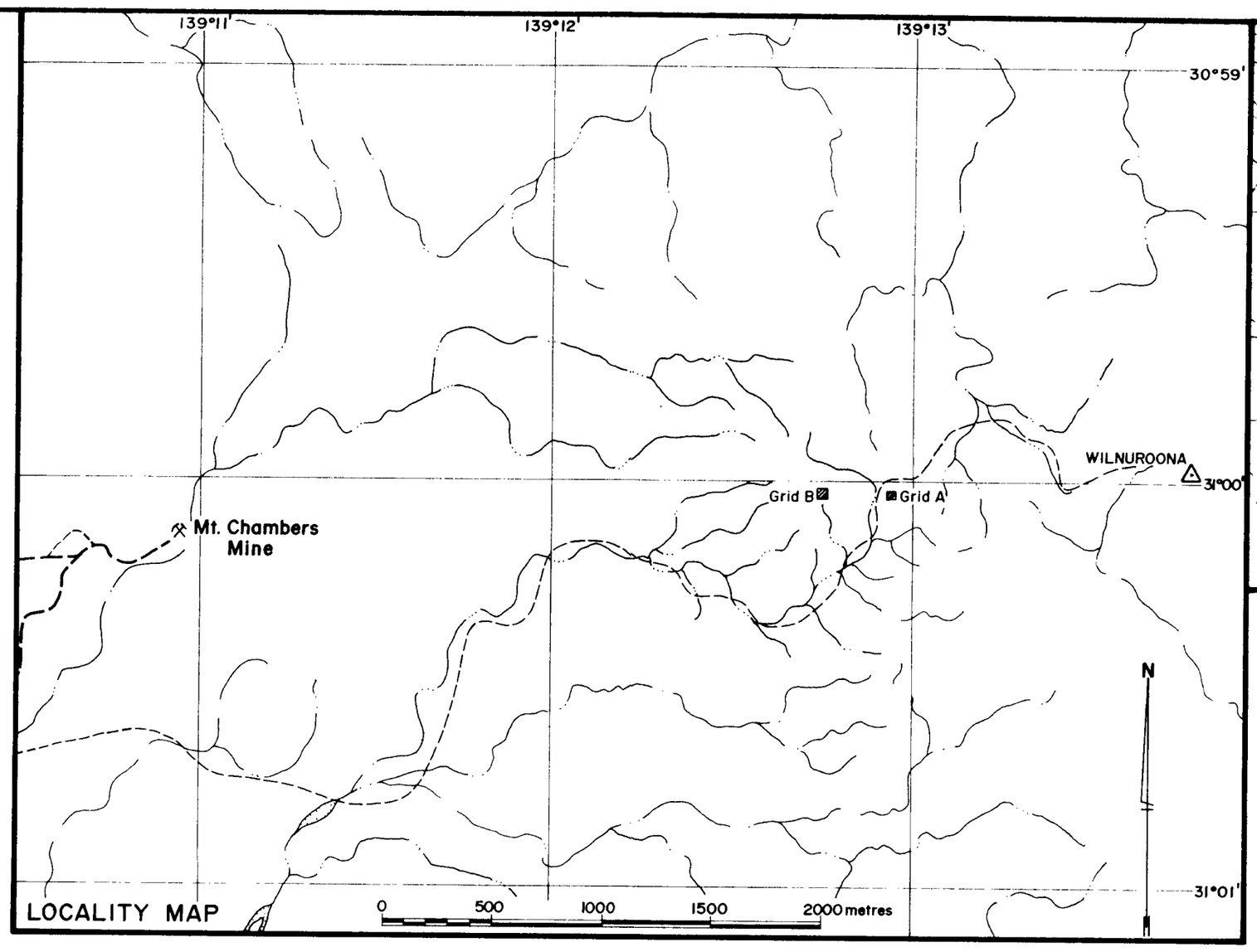
Expenditure debited to E.L. 807 during November, December, 1982 and January, 1983, was:

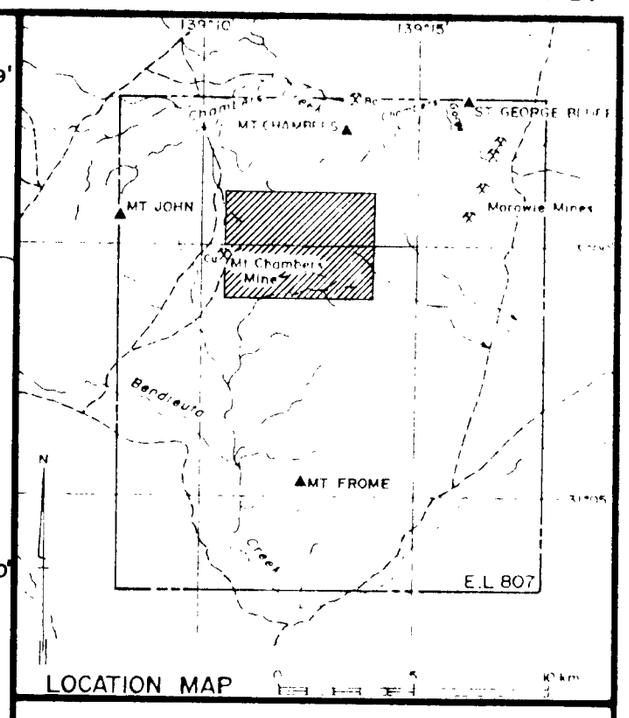
Wages and Salaries	$ 5,031
Fares and Mobilisation	166
Messing and Accommodation	766
Transport	1,452
Sample Analysis	3,858
Occupancy and Location Expenses	11
Tenement Fees, Licences etc.	75
Plant Hire	914
Administration and Overheads	614
	$12,887

Total expenditure on E.L. 538/807 to 31st January, 1983, is: $130,758

This report is submitted to the Department of Mines and Energy as required by Condition 4 of Exploration Licence 807.

FIG. 2a





0·28 o 1	0·21 o 1	0·58 o 1	1·38 o 3	2·95 o 9	1·29 o 2	0·74 o 1	0·65 o 1	0·46 o 1	0·35 o 1	0·14 o 1	0·42 o 1	0·09 o 1	0·04 o 1	0·17 o 1	0·16 o 1	N
0·42 o 1	0·85 o 1	0·97 o 2	1·60 o 3	1·45 o 2	0·31 o 1	1·34 o 2	1·53 o 2	0·63 o 1	0·81 o 1	0·61 o 2	0·09 o 1	0·23 o 1	0·15 o 1	0·15 o 1	0·11 o 1	M
0·96 o 2	1·05 o 1	1·06 o 2	0·45 o 1	1·61 o 3	2·08 o 3	4·15 o 4	12·87 o 15	15·13 o 15	1·27 o 1	1·26 o 1	0·74 o 1	0·31 o 1	0·40 o 1	0·29 o 1	0·16 o 1	L
1·40 o 2	2·78 o 6	2·44 o 4	1·72 o 2	2·75 o 4	4·35 o 21	4·10 o 7	9·75 o 9	3·49 o 2	1·09 o 2	1·42 o 1	0·74 o 1	0·50 o 1	0·31 o 1	0·26 o 1	0·24 o 1	K
0·53 o 1	2·02 o 3	2·36 o 4	1·52 o 2	0·62 o 1	5·70 o 8	3·67 o 8	7·10 o 10	5·50 o 16	2·92 o 4	2·56 o 3	0·61 o 1	0·53 o 1	0·39 o 1	0·29 o 1	0·16 o 1	J
0·13 o 1	1·28 o 2	2·88 o 3	3·80 o 4	10·40 o 14	7·95 o 14	2·35 o 4	20·00 o 55	26·15 o 30	3·80 o 4	4·26 o 16	0·24 o 1	0·50 o 1	0·42 o 1	0·34 o 1	0·17 o 1	I
0·29 o 1	1·44 o 2	2·05 o 2	5·75 o 5	9·90 o 14	10·00 o 16	11·70 o 21	29·75 o 28	23·30 o 41	2·89 o 5	2·70 o 5	2·56 o 29	0·40 o 1	0·69 o 1	0·29 o 1	0·20 o 1	H
0·92 o 1	0·77 o 1	1·83 o 3	8·07 o 11	9·65 o 12	2·47 o 5	13·55 o 20	16·00 o 22	36·00 o 158	3·12 o 22	4·42 o 23	11·40 o 32	11·10 o 14	1·08 o 2	0·43 o 1	0·20 o 1	G
0·76 o 1	0·89 o 1	1·58 o 2	2·52 o 3	2·39 o 2	2·19 o 10	2·40 o 5	2·12 o 25	15·30 o 50	13·10 o 19	26·60 o 44	31·20 o 69	8·80 o 14	2·54 o 3	0·43 o 1	0·11 o 1	F
0·40 o 1	0·40 o 1	1·16 o 1	35·80 o 1	3·14 o 17	1·24 o 3	0·61 o 1	0·51 o 1	4·55 o 7	1·25 o 3	3·61 o 10	3·70 o 12	2·57 o 1	3·09 o 2	0·43 o 1	1·66 o 1	E
0·27 o 1	0·60 o 1	1·19 o 1	9·60 o 2	5·00 o 10	4·95 o 15	1·74 o 6	0·43 o 1	6·70 o 9	1·07 o 1	1·55 o 2	2·66 o 9	2·20 o 9	4·87 o 11	1·79 o 1	0·20 o 1	D
0·20 o 1	0·36 o 1	0·49 o 1	0·88 o 1	0·67 o 1	4·22 o 9	2·03 o 9	0·63 o 1	0·52 o 1	1·53 o 1	1·49 o 1	2·54 o 1	4·64 o 2	1·34 o 1	0·65 o 1	1·52 o 1	C
0·09 o 1	0·11 o 1	0·17 o 1	0·35 o 1	0·67 o 1	0·39 o 1	0·40 o 1	0·64 o 1	0·36 o 1	o	2·14 o 9	2·13 o 1	1·66 o 1	2·22 o 1	0·40 o 1	0·50 o 1	B
0·09 o 1	0·20 o 1	0·18 o 1	0·26 o 1	0·45 o 1	0·30 o 1	0·32 o 1	0·39 o 1	0·56 o 1	0·33 o 1	0·94 o 1	5·88 o 6	0·91 o 1	0·81 o 1	1·76 o 1	3·40 o 2	A
16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	

N

NOTES:
- Samples taken at 2 metre intervals on a 32 metre x 28 metre grid
- Samples collected over approx. one metre depth, utilising a jackhammer
- Analysis method: AAS

LEGEND

Lead + Zinc (%)
o
Silver (ppm)

Geochemical sample

SCALE 1:100

0 2 4 6 8 10 metres

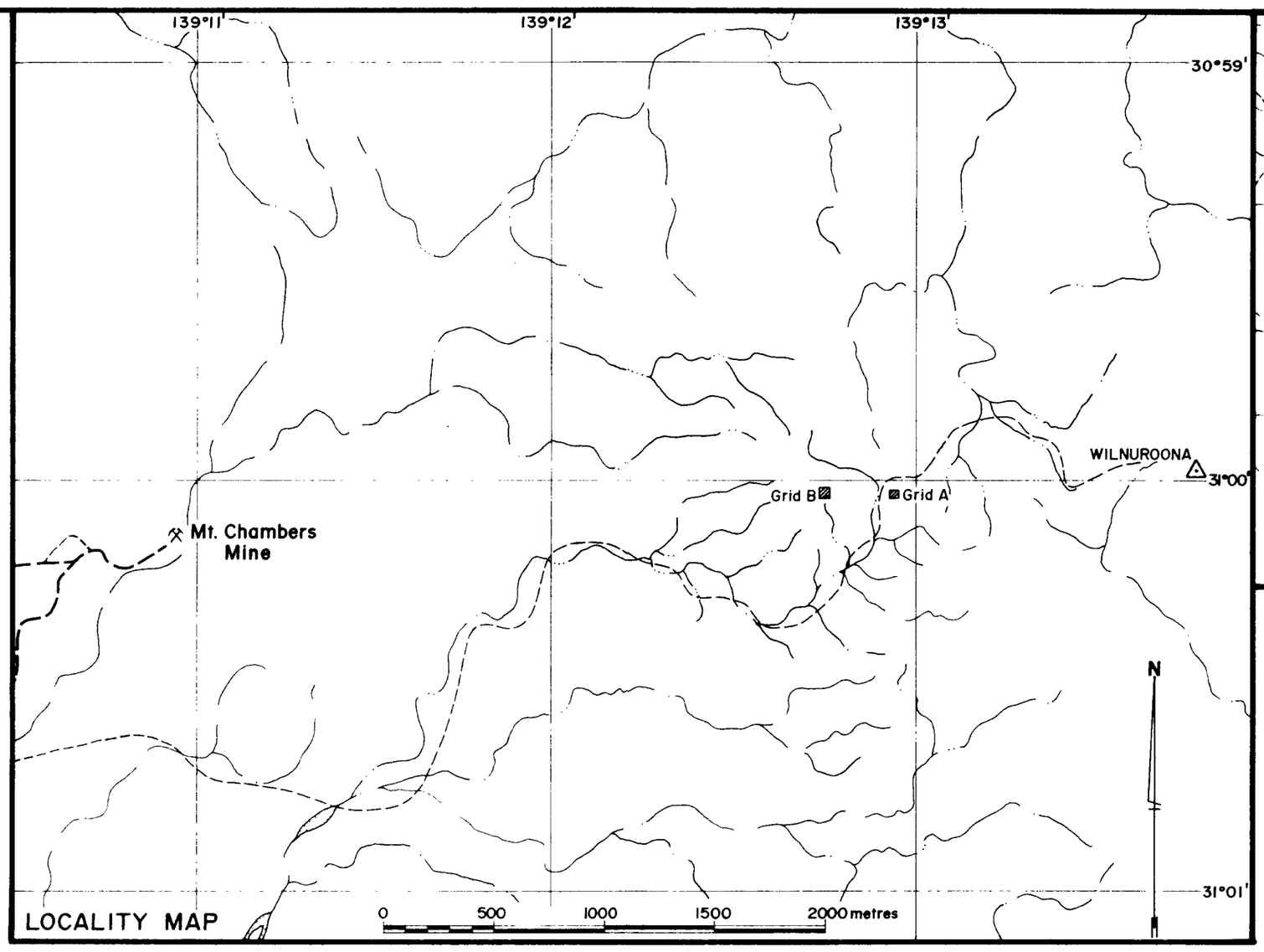
3722-6

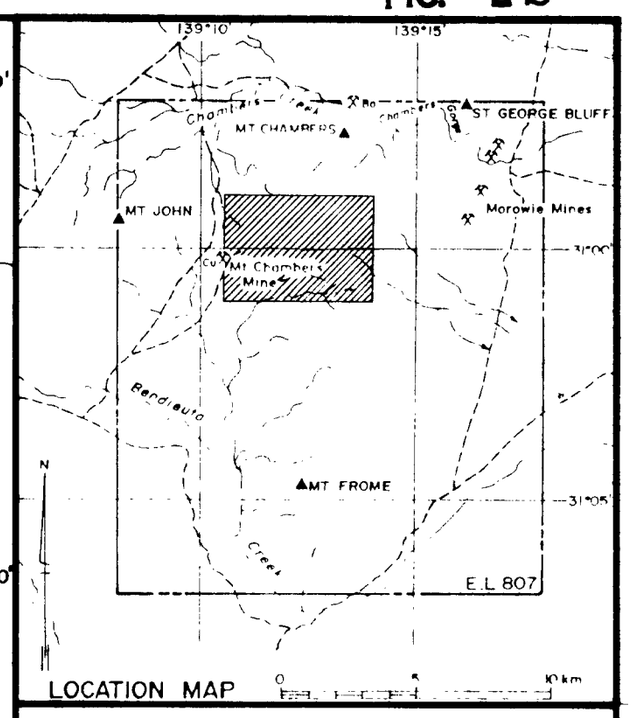
THE BROKEN HILL PROPRIETARY CO. LTD.
EXPLORATION DEPARTMENT

E.L.807 MT. FROME, S.A.
WILNUROONA AREA
GRID A
LEAD + ZINC (%), SILVER (ppm) ASSAYS

Revisions			
	Drawn M.T.R.	Date: 7-2-83	Centre Adelaide
	Traced: A.R.V.	Project No 6-L160-6	Drawing No A2-347
	Checked		

FIG. 2b





16 0.13/0.15	12 0.14/0.07	16 0.32/0.26	16 0.81/0.57	20 2.20/0.75	12 0.93/0.36	14 0.55/0.19	12 0.34/0.31	22 0.27/0.19	16 0.22/0.13	10 0.07/0.07	24 0.30/0.12	10 0.05/0.04	6 0.02/0.02	12 0.08/0.09	12 0.07/0.09	N
14 0.29/0.13	14 0.57/0.28	16 0.61/0.36	18 0.87/0.73	20 0.83/0.62	8 0.12/0.19	16 1.02/0.32	22 1.20/0.33	16 0.40/0.23	26 0.46/0.35	26 0.36/0.25	6 0.04/0.05	18 0.14/0.09	14 0.09/0.06	12 0.07/0.08	14 0.06/0.05	M
16 0.65/0.31	14 0.67/0.38	16 0.57/0.49	10 0.10/0.35	18 0.91/0.70	18 1.28/0.80	22 3.05/1.10	32 11.90/0.97	36 14.60/0.53	18 0.69/0.58	16 0.50/0.76	20 0.41/0.33	10 0.14/0.17	20 0.27/0.13	16 0.16/0.13	16 0.10/0.06	L
16 0.92/0.48	20 2.10/0.68	22 1.65/0.79	18 1.04/0.68	16 1.55/1.20	18 3.40/0.95	24 2.30/1.80	18 8.45/1.30	20 1.39/2.10	14 0.53/0.56	22 0.72/0.70	20 0.45/0.29	24 0.34/0.16	20 0.20/0.11	20 0.15/0.11	20 0.16/0.08	K
14 0.28/0.25	22 1.32/0.70	18 1.70/0.66	18 1.01/0.51	8 0.32/0.30	18 4.50/1.20	26 1.67/2.00	24 3.10/4.00	20 2.30/3.20	18 1.72/1.20	26 1.87/0.69	16 0.39/0.22	20 0.34/0.19	20 0.22/0.17	14 0.14/0.15	16 0.10/0.06	J
8 0.04/0.09	16 0.71/0.57	22 1.68/1.20	26 2.80/1.00	38 9.10/1.30	38 6.85/1.10	24 1.15/1.20	50 6.00/14.00	32 4.15/22.00	24 2.40/1.40	18 1.56/2.70	10 0.09/0.15	16 0.28/0.22	20 0.25/0.17	20 0.21/0.13	20 0.10/0.07	I
8 0.09/0.20	14 0.54/0.90	24 1.00/1.05	38 2.95/2.80	42 5.60/4.30	85 8.60/1.40	48 9.80/1.90	80 7.75/22.00	46 8.30/15.00	20 1.39/1.50	20 1.20/1.50	20 1.92/0.64	20 0.21/0.19	28 0.53/0.16	30 0.17/0.12	18 0.11/0.09	H
14 0.41/0.51	12 0.17/0.60	20 1.15/0.68	36 1.67/6.40	36 3.35/6.30	18 0.97/1.50	42 2.55/11.00	42 4.00/12.00	70 19.00/17.00	14 1.42/1.70	18 1.82/2.60	20 5.10/6.30	34 8.30/2.80	28 0.83/0.25	32 0.29/0.14	26 0.12/0.08	G
16 0.39/0.37	18 0.39/0.50	22 0.75/0.83	24 1.70/0.82	26 1.45/0.94	16 0.59/1.60	14 0.50/1.90	16 0.92/1.20	75 10.80/4.50	85 10.80/2.30	75 9.60/17.00	70 29.60/1.60	26 2.50/6.30	34 2.15/0.39	34 0.31/0.12	20 0.11/0.18	F
12 0.14/0.26	16 0.18/0.22	20 0.36/0.80	100 2.80/33.00	50 2.15/0.99	10 0.24/1.00	10 0.32/0.29	10 0.18/0.33	78 3.35/1.20	12 0.55/0.70	26 1.41/2.20	14 2.40/1.30	34 1.47/1.10	44 2.70/0.39	34 0.32/0.11	40 1.44/0.22	E
12 0.11/0.16	18 0.27/0.33	16 0.38/0.81	48 1.10/8.50	38 2.90/2.10	26 2.45/2.50	12 0.79/0.95	12 0.26/0.17	165 5.20/1.50	12 0.71/0.36	16 0.87/0.68	20 1.70/0.96	14 1.15/1.05	20 1.87/3.00	26 1.06/0.73	10 0.08/0.12	D
14 0.06/0.14	14 0.11/0.25	16 0.15/0.34	18 0.24/0.64	14 0.17/0.50	30 1.92/2.30	16 1.07/0.96	14 0.30/0.33	14 0.34/0.18	20 1.26/0.27	18 1.00/0.49	16 1.44/1.10	100 4.15/0.49	60 1.15/0.19	40 0.51/0.14	50 1.36/0.16	C
8 0.03/0.06	16 0.03/0.08	8 0.03/0.14	14 0.09/0.26	26 0.10/0.57	14 0.11/0.28	12 0.15/0.25	16 0.29/0.35	18 0.15/0.21	0	16 1.36/0.78	30 1.50/0.63	32 1.10/0.56	80 1.97/0.25	8 0.13/0.27	38 0.41/0.09	B
10 0.03/0.06	14 0.05/0.15	10 0.06/0.12	10 0.10/0.16	14 0.12/0.33	12 0.07/0.23	14 0.11/0.21	14 0.08/0.31	18 0.29/0.27	20 0.19/0.14	20 0.45/0.49	48 5.05/0.83	44 0.72/0.19	50 0.52/0.29	44 1.40/0.36	48 2.80/0.60	A
16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	

N

NOTES:
- Samples taken at 2 metre intervals on a 32 metre x 28 metre grid
- Samples collected over approx. one metre depth, utilising a jackhammer
- Analysis method: AAS

LEGEND

Copper (ppm) o Lead (%) / Zinc (%) Geochemical sample

SCALE 1:100

0 2 4 6 8 10 metres

3722-7

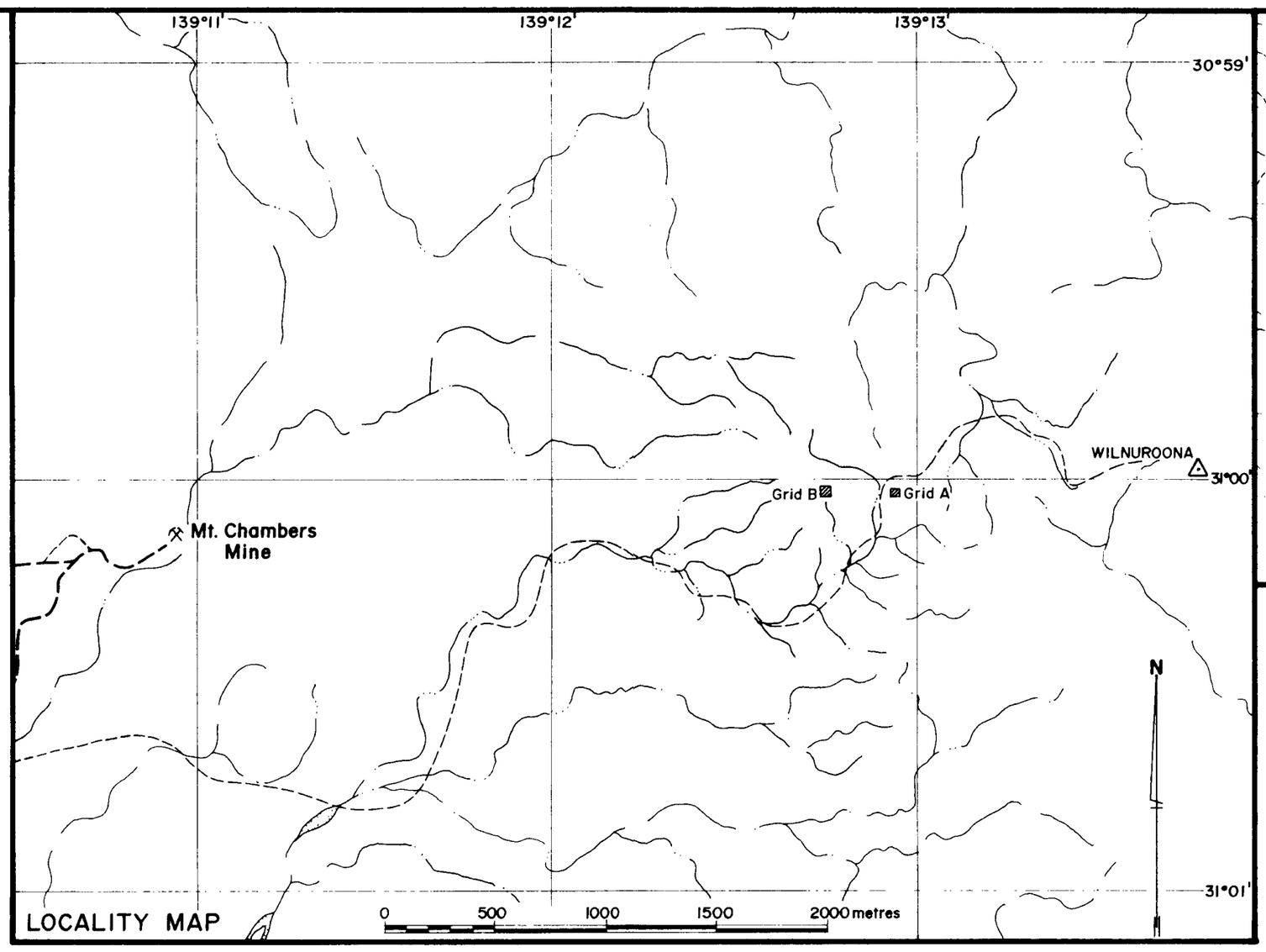
THE BROKEN HILL PROPRIETARY CO LTD.
EXPLORATION DEPARTMENT

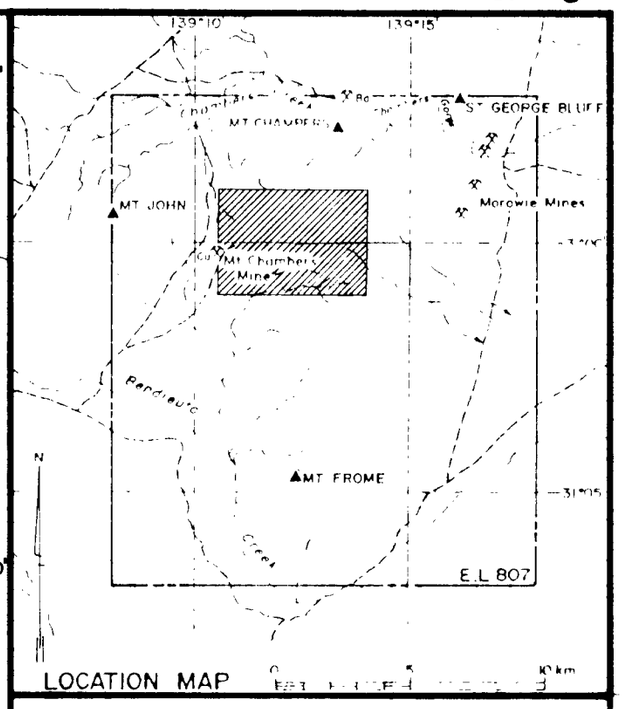
E.L.807 MT. FROME, S.A.
WILNUROONA AREA
GRID A
COPPER (ppm), LEAD (%), ZINC (%) ASSAYS

Drawn M.T.R.	Date 4-2-83	Centre Adelaide
Traced A.R.V.	Project No 6-L160-5	Drawing No A2-346
Checked		

Revisions

FIG. 3





<2 o 340/620	2 o 170/300	26 o 110/280	4 o 60/240	4 o 90/140	<2 o 140/140	2 o 70/180	<2 o 12/85	<2 o 80/110	2 o 75/310	12 o 110/170	6 o 55/110	4 o 28/80	6 o 50/200	4 o 80/180	4 o 100/450	P
4 o 960/2700	4 o 520/1250	6 o 140/180	12 o 70/170	4 o 80/130	2 o 80/160	<2 o 50/125	<2 o 20/60	2 o 100/280	6 o 75/65	6 o 90/165	<2 o 32/65	<2 o 40/80	4 o 55/110	<2 o 48/110	2 o 50/340	O
4 o 360/790	2 o 250/210	2 o 300/240	4 o 120/140	4 o 120/200	<2 o 44/80	<2 o 24/130	4 o 180/390	2 o 150/290	4 o 170/780	<2 o 38/110	4 o 60/170	4 o 70/140	2 o 30/135	<2 o 55/190	4 o 70/250	N
4 o 510/780	<2 o 360/260	2 o 130/110	2 o 70/100	2 o 90/125	2 o 70/110	2 o 60/120	<2 o 95/190	4 o 290/520	4 o 110/390	<2 o 105/380	<2 o 100/150	<2 o 55/90	<2 o 30/170	<2 o 30/150	4 o 120/200	M
6 o 500/1500	2 o 340/320	<2 o 160/250	2 o 60/125	4 o 90/140	4 o 110/150	6 o 140/300	4 o 150/410	4 o 250/670	4 o 250/390	2 o 160/750	4 o 110/210	<2 o 60/270	2 o 12/270	12 o 85/190	4 o 22/160	L
6 o 480/370	4 o 210/350	6 o 290/340	6 o 28/510	6 o 630/410	8 o 1250/580	6 o 440/860	4 o 460/1100	2 o 110/420	6 o 120/250	<2 o 70/370	2 o 70/310	4 o 60/2300	2 o 8/70	<2 o 4/44	2 o 20/100	K
6 o 2700/960	6 o 490/1050	4 o 180/400	6 o 750/1450	4 o 460/650	8 o 450/500	2 o 300/480	4 o 160/470	2 o 60/380	18 o 50/400	2 o 42/250	6 o 85/280	2 o 6/65	<2 o 20/60	2 o 28/80	<2 o 32/65	J
<2 o 260/560	2 o 210/650	4 o 320/910	6 o 270/770	4 o 60/820	4 o 130/1100	4 o 120/490	<2 o 50/360	2 o 46/240	2 o 50/210	<2 o 50/230	2 o 38/130	2 o 70/210	4 o 80/160	<2 o 100/250	<2 o 50/160	I
6 o 330/580	4 o 520/740	4 o 420/1100	8 o 340/1200	2 o 48/470	2 o 90/460	4 o 90/150	6 o 95/350	6 o 90/350	2 o 60/190	<2 o 46/200	<2 o 80/130	10 o 110/210	4 o 55/840	12 o 110/230	2 o 100/320	H
2 o 210/900	2 o 140/1100	2 o 160/840	2 o 140/640	<2 o 60/550	4 o 100/430	<2 o 80/310	2 o 30/140	<2 o 36/170	<2 o 28/120	2 o 50/170	2 o 90/340	<2 o 90/260	6 o 185/430	4 o 130/450	6 o 170/130	G
2 o 120/560	4 o 75/320	2 o 160/760	4 o 140/770	4 o 100/790	2 o 60/290	10 o 200/380	10 o 170/260	<2 o 70/260	<2 o 50/160	4 o 70/300	6 o 100/290	6 o 90/240	4 o 110/310	10 o 80/190	8 o 120/200	F
6 o 100/450	<2 o 80/380	4 o 90/400	4 o 65/310	2 o 90/500	2 o 100/580	4 o 115/310	4 o 85/250	4 o 115/270	6 o 160/240	4 o 85/300	4 o 130/350	4 o 100/490	2 o 140/690	2 o 80/200	2 o 50/90	E
6 o 100/40	8 o 80/190	6 o 120/360	4 o 100/360	4 o 70/250	8 o 140/460	6 o 100/460	6 o 130/210	10 o 180/280	8 o 130/210	4 o 120/230	4 o 95/190	4 o 70/200	6 o 140/190	6 o 80/180	6 o 175/340	D
12 o 145/290	12 o 120/280	18 o 80/210	10 o 140/270	18 o 70/200	6 o 100/190	6 o 170/430	4 o 130/230	4 o 120/200	4 o 130/250	4 o 70/220	4 o 80/310	4 o 140/570	4 o 230/460	4 o 120/380	4 o 140/600	C
6 o 80/250	8 o 110/190	10 o 130/220	10 o 130/270	6 o 110/220	4 o 100/260	6 o 150/450	8 o 140/330	4 o 90/230	6 o 100/250	4 o 115/360	4 o 155/540	6 o 720/3900	4 o 340/1400	6 o 100/440	6 o 90/430	B
16 o 95/160	10 o 125/200	4 o 150/210	4 o 90/220	10 o 110/250	6 o 85/260	6 o 100/320	6 o 95/300	4 o 70/250	4 o 70/320	10 o 100/310	4 o 130/530	2 o 110/500	2 o 95/160	<2 o 110/200	2 o 240/340	A
16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	

N

NOTES:
- Samples taken at 2 metre intervals on a 32 metre x 28 metre grid
- Samples collected over approx. one metre depth, utilising a jackhammer
- Analysis method: AAS

LEGEND

Copper (ppm) o Lead (ppm) / Zinc (ppm) Geochemical sample

SCALE 1:100

0 2 4 6 8 10 metres

3722-8

THE BROKEN HILL PROPRIETARY CO. LTD
EXPLORATION DEPARTMENT

E.L.807 MT. FROME, S.A.
WILNUROONA AREA
GRID B
COPPER(ppm), LEAD(ppm), ZINC(ppm) ASSAYS

Revisions			
	Drawn M.T.R.	Date 9-2-83	Centre Adelaide
	Traced A.R.V.	Project No 6-L160-7	Drawing No A2-348
	Checked		

EXPLORATION LICENCE 1138

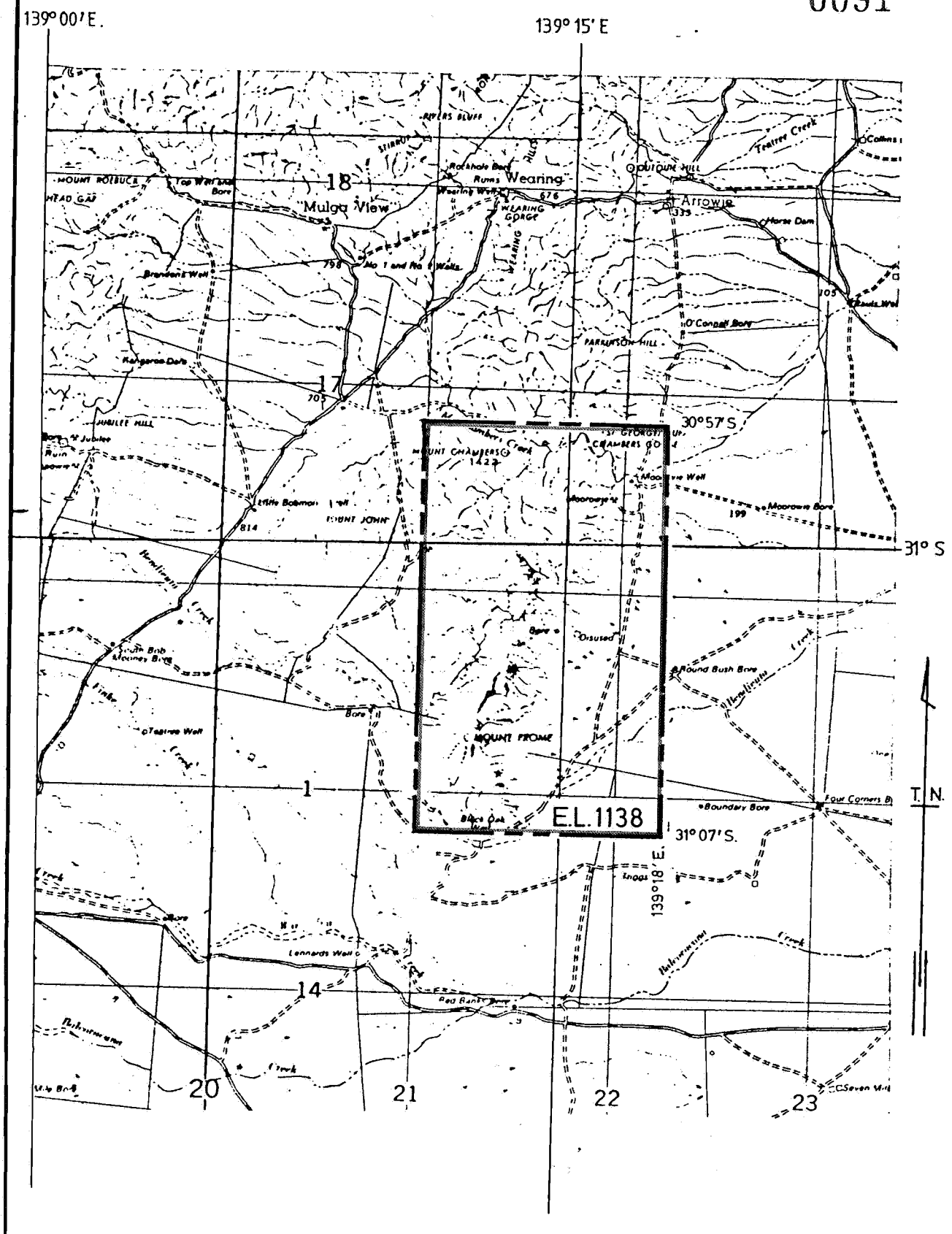
MT. FROME, SOUTH AUSTRALIA

REPORT FOR THE QUARTER ENDED 28TH JULY, 1983

CONTENTS

APPENDICES

FIGURES



Scale 1: 250,000

0 5 10 15 20 Kms.

This map photo copied from .....
1: 250,000 sheet : COPLEY, PARACHILNA

Centre Melbourne	E.L.1138 - MT. FROME, S.A. LOCATION MAP	Project No. L160
Date 26 . 8 . 83		Drawing No. A4-2423

EXPLORATION LICENCE 1138
MT. FROME, SOUTH AUSTRALIA
REPORT FOR THE QUARTER ENDED 28TH JULY, 1983

1. GENERAL

Exploration Licence 1138 of 203 square kilometres was granted to BHP Minerals Limited on 28th April, 1983, for one year. This is part of the area originally held as E.L. 538 and then as E.L. 807.

2. FIELD INVESTIGATIONS

2.1 Geophysics

Four I.P. traverses totalling 3.2 kilometres were surveyed in the Moorowie Prospect (see Figure 2).

Pseudo sections showing apparent chargeabilities and apparent resistivities are in Appendix 1, the operations report is in Appendix 2 and interpretation of the data is in Appendix 3.

No I.P. anomalies were detected at the Moorowie Prospect on the lines surveyed.

2.2 Drilling

One diamond drill hole (DDM 1, total depth 345 metres) was completed in the vicinity of the Old Moorowie copper mine. The drilling was undertaken using a Longyear 38 drill rig owned by BHP Minerals Limited and operated by Dallas Drilling.

Water supplies for drilling purposes were pumped from the Moorowie Spring in Chambers Gorge to the drillsite via black polythene pipe. This reduced excessive deterioration of the dirt tracks if water had been trucked to the site.

The target for this drillhole was zinc and copper mineralization which at the surface appears to be related to north-south shear zones within massive limestone units (Moorowie Limestone).

Previous rock chip grid geochemistry carried out by E.Z. revealed copper values up to 16% and zinc values up to 30%.

The drillhole was angled to intersect several of the north-south mineralized shear zones.

The drillhole did not intersect any major mineralized zones. The degree of shearing, silicification and dolomitization (Presqu'ile type) was not evident in the drill core.

A summary geological log is in Appendix 4 and analysis results from selected sections of the drill core are in Appendix 5.

No further work is proposed at this stage.

3. EXPENDITURE

Expenditure debited to E.L. 1138 during the five months February to June, 1983 was:

Wages and Salaries	$12,199
Fares and Mobilisation	231
Messing and Accommodation	584
Drilling	11,135
Transport	2,693
Radio Communications	430
Mobilisation of Equipment	47
Surveying and Aerial Photographs	4
Plant Hire	1,101
Sample Analysis	611
Geophysics	4,534
Tenement Fees, Licences, etc.	313
Administration and Overheads	1,694
	$35,576

Total expenditure to 30th June, 1983 is $166,334

This report is submitted to the Department of Mines and Energy as required by Condition 4 of Exploration Licence 1138.

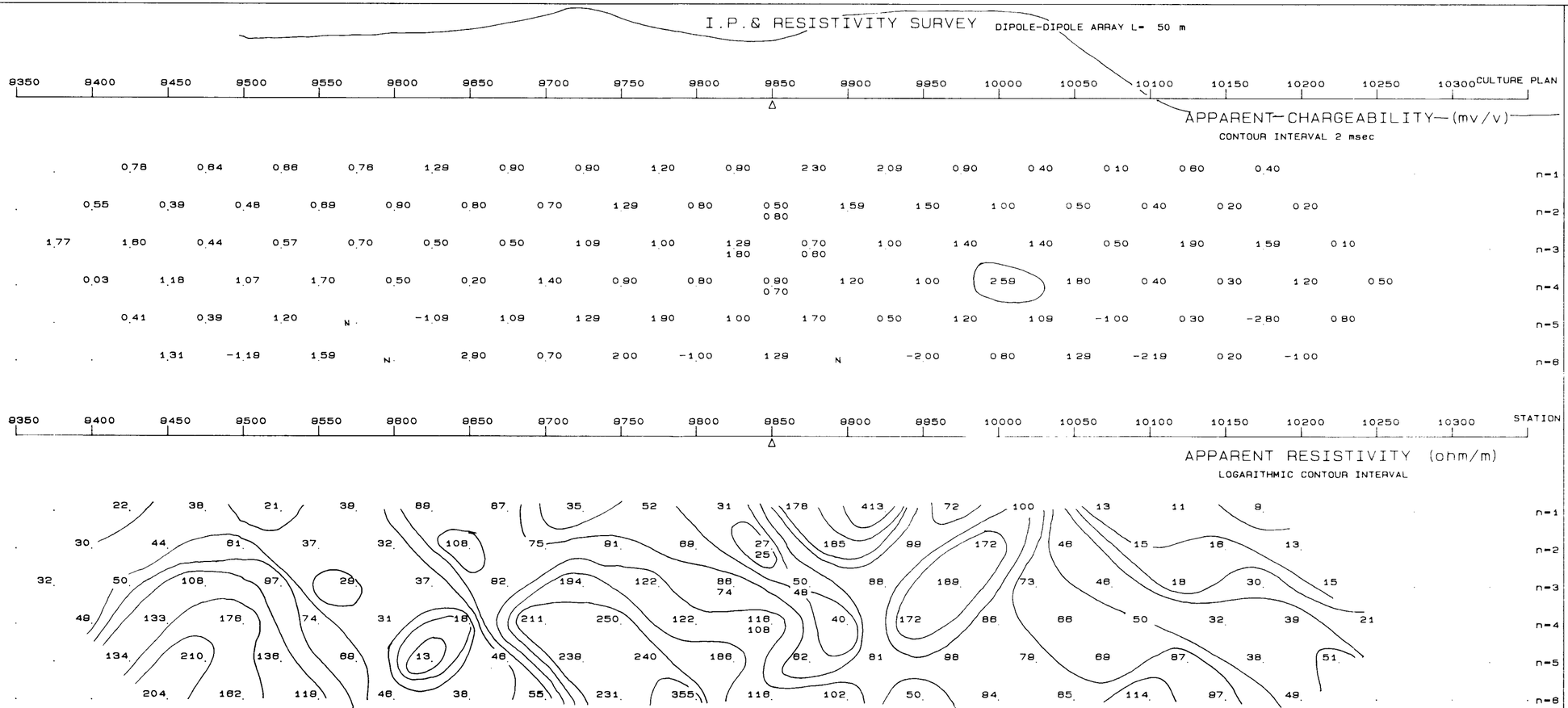
NC:hk
0146r

A P P E N D I X 1.

Pseudo Sections Showing Apparent Chargeability and Apparent Resistivity

I.P.& RESISTIVITY SURVEY

DIPOLE-DIPOLE ARRAY L= 50 m



THE B.H.P. CO. LTD.

Area : FLINDERS RANGES S.A.

Grid : MOROWIE

Line No: 9450N

Setup points : 9850E ;

Scale : 1: 2500

Date : 180283

Job No. 428

INSTRUMENTATION USED

Rx Type : Huntec Mk Iv s/n

Tx Type : Huntec Mk IV 7.5 kW

METHOD : Dipole.Dipole Array L= 50m

TIME DOMAIN

Time sequence : 2 sec on, 2 sec off

Integration time recorded: Channels 0-9

Integration time plotted : Channels -9

Delay time, TD : 500 msec. after cut off

Linear channel width : 100 msec.

SECTION A : Apparent Chargeability (ohm/m)

contour interval 2 msec

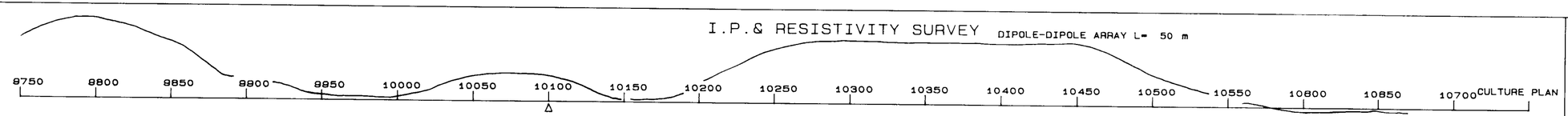
SECTION B : Apparent Resistivity (mv/v)

logarithmic contour interval

Surveyed by SOLO GEOPHYSICS & Co

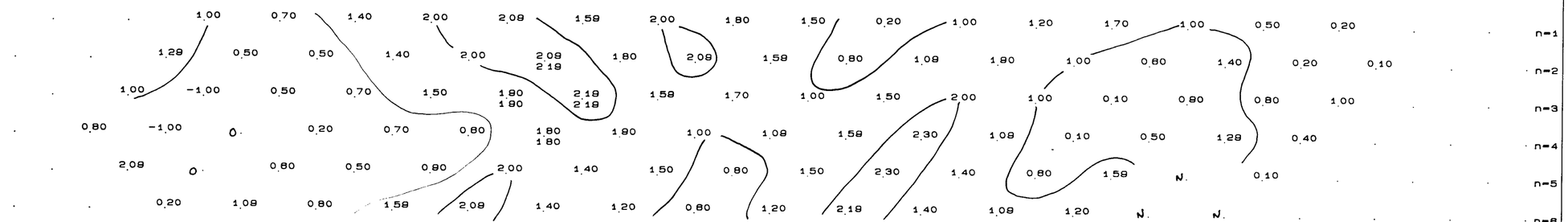
I.P.& RESISTIVITY SURVEY

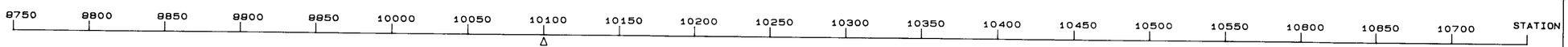
DIPOLE-DIPOLE ARRAY L= 50 m



APPARENT CHARGEABILITY (mv/v)

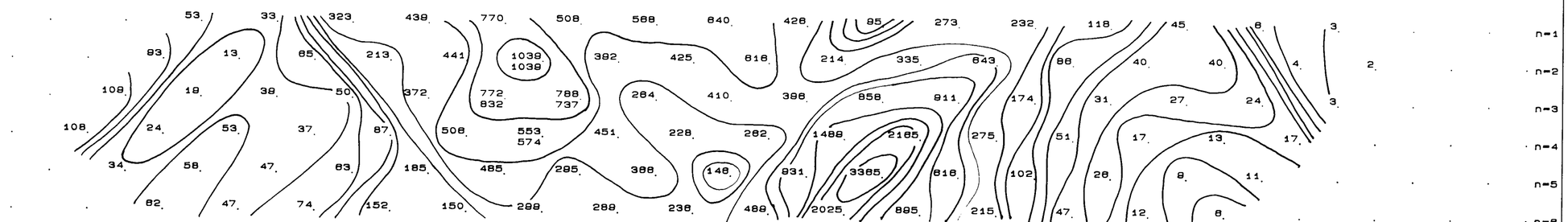
CONTOUR INTERVAL 2 msec





APPARENT RESISTIVITY (ohm/m)

LOGARITHMIC CONTOUR INTERVAL



THE B.H.P. CO. LTD.

Area : FLINDERS RANGES S.A.

Grid : MOROWIE

Line No: 10000N

Setup points : 10100E ;

Scale : 1: 2500

Date : 190283

Job No. 428

INSTRUMENTATION USED

Rx Type : Huntec Mk Iv s/n

Tx Type : Huntec Mk IV 7.5 kW

METHOD : Dipole.Dipole Array L= 50m

TIME DOMAIN

Time sequence : 2 sec on, 2 sec off

Integration time recorded: Channels 0-9

Integration time plotted : Channels -9

Delay time,TD : 500 msec. after cut off

Linear channel width : 100 msec.

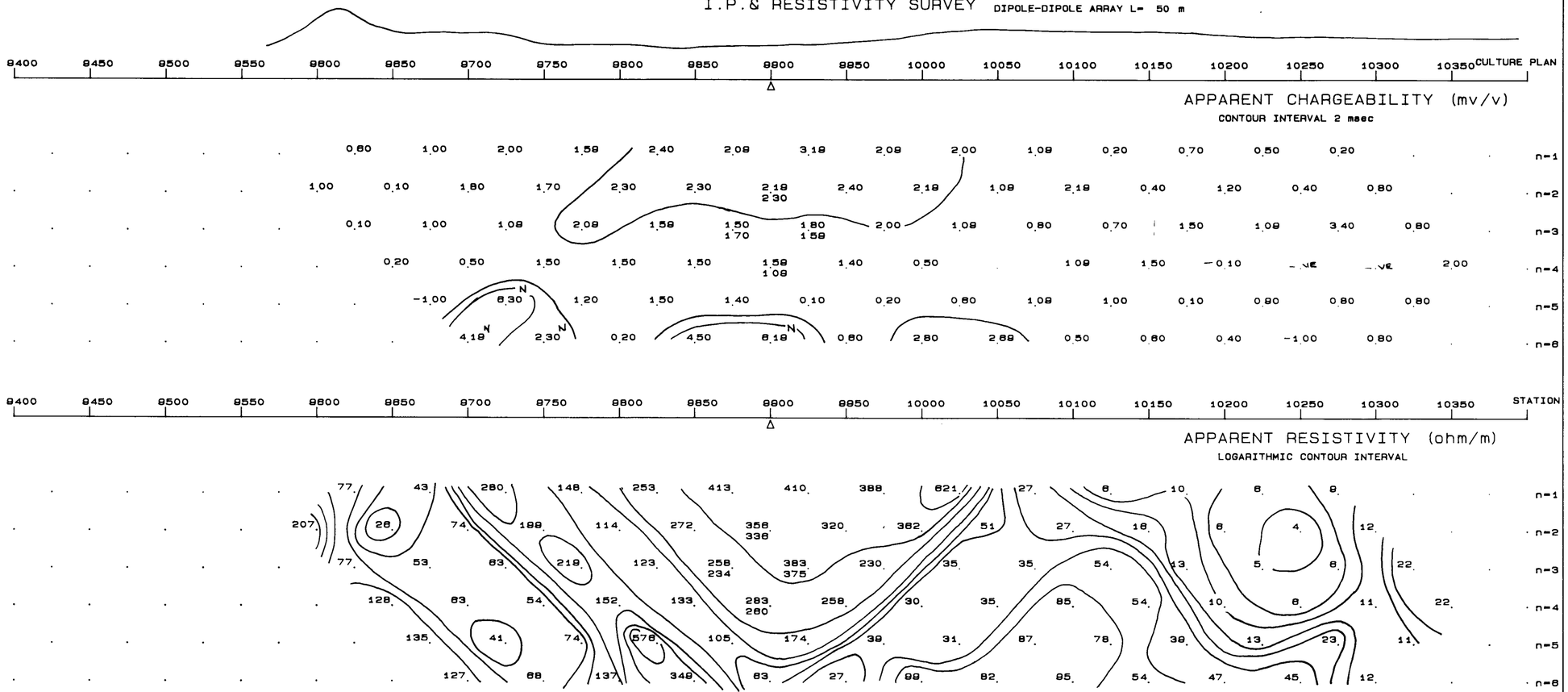
SECTION A : Apparent Chargeability (ohm/m)
contour interval 2 msec

SECTION B : Apparent Resistivity (mv/v)
logarithmic contour interval

Surveyed by SOLO GEOPHYSICS & Co

I.P.& RESISTIVITY SURVEY

DIPOLE-DIPOLE ARRAY L= 50 m



THE B.H.P. CO. LTD.

Area : FLINDERS RANGES S.A.

Grid : MOROWIE

Line No: 9200N

Setup points : 9900E ;

Scale : 1: 2500

Date : 170283

Job No. 428

INSTRUMENTATION USED

Rx Type : Huntec Mk Iv s/n

Tx Type : Huntec Mk IV 7.5 kW

METHOD : Dipole, Dipole Array L= 50m

TIME DOMAIN

Time sequence : 2 sec on, 2 sec off

Integration time recorded: Channels 0-9

Integration time plotted : Channels -9

Delay time, TD : 500 msec. after cut off

Linear channel width : 100 msec.

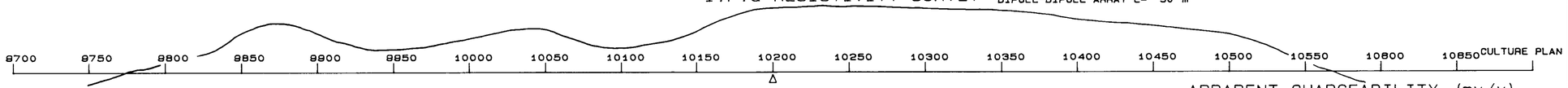
SECTION A : Apparent Chargeability (ohm/m)
contour interval 2 msec

SECTION B : Apparent Resistivity (mv/v)
logarithmic contour interval

Surveyed by SOLO GEOPHYSICS & Co

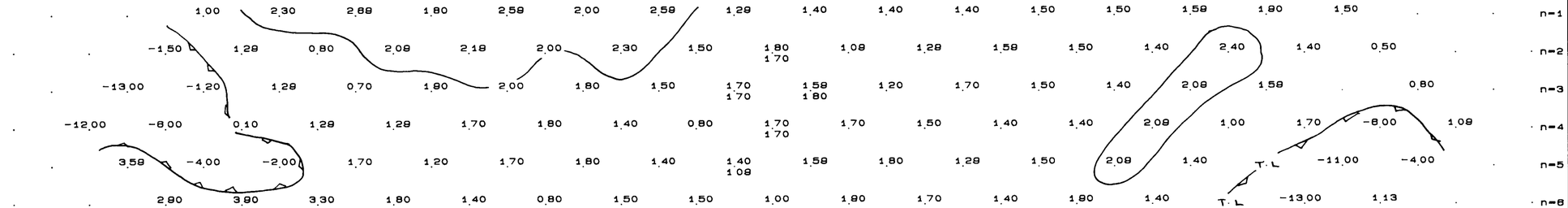
I.P.& RESISTIVITY SURVEY

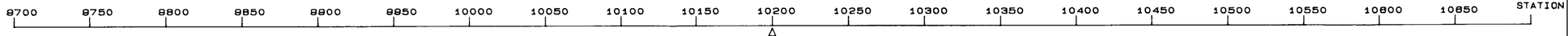
DIPOLE-DIPOLE ARRAY L= 50 m



APPARENT CHARGEABILITY (mv/v)

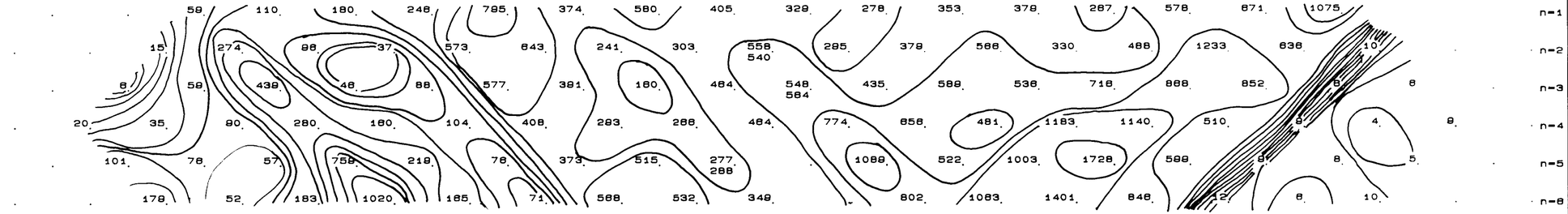
CONTOUR INTERVAL 2 msec





APPARENT RESISTIVITY (ohm/m)

LOGARITHMIC CONTOUR INTERVAL



THE B.H.P. CO. LTD.

Area : FLINDERS RANGES S.A.

Grid : MOROWIE

Line No: 10250N

Setup points : 10200E ;

Scale : 1: 2500

Date : 210283

Job No. 428

INSTRUMENTATION USED

Rx Type : Huntec Mk Iv s/n

Tx Type : Huntec Mk IV 7.5 kW

METHOD : Dipole, Dipole Array L= 50m

TIME DOMAIN

Time sequence : 2 sec on, 2 sec off

Integration time recorded: Channels 0-9

Integration time plotted : Channels -9

Delay time, TD : 500 msec. after cut off

Linear channel width : 100 msec.

SECTION A : Apparent Chargeability (ohm/m)
contour interval 2 msec

SECTION B : Apparent Resistivity (mv/v)
logarithmic contour interval

Surveyed by SOLO GEOPHYSICS & Co

APPENDIX II

Operations Report on I.P. Survey
(by Solo Geophysics)

MOROWIE & MORRO GORGE INDUCED POLARIZATION SURVEYS

For: THE BROKEN HILL PROPRIETARY CO. LTD.,
41 - 47 CURRIE STREET,
ADELAIDE S.A. 5000.

Date: February, March 1983

The above survey was carried out on two areas of the N.E. Flinders Ranges 500 kilometres north of Adelaide and approximately 40 and 70 kilometres N.E. of Blinman. A two man crew comprising Brian Rau and M. Burdorf were mobilized from Adelaide by vehicle with camping equipment for the survey duration. A client geophysicist and field assistant made up the balance of the field party.

SURVEY EQUIPMENT

A high powered Huntec MK IV 7.5kwatt time/frequency domain transmitter- generator unit and MK IV induced polarization receiver were used for the survey. The generator was not manually portable and was mounted in a separate trailer.The transmitter and cables were of a lesser weight and could be carried to a convenient station near the generator.

The following instrument settings were used for both surveys

Transmitter timing 2 seconds on / 2 off
Receiver: delay time 500m sec
integration time channels 0 - 9 100msecs each
total chargeability plotted 500 - 1500 msecs.

A second Huntec MK IV receiver was supplied by the client for combined field use.

THE SURVEYS

A. Morowie Grid

This area was associated with old mine workings showing shallow surface colourations of malachite. The grid extended from the sediments on the eastern flank of the hills into the first line of hills consisting of limestones.
A dipole distance of 50 metres was selected for all lines and electrode preparation commenced on line 9200N. The ground was extremely dry and non conductive and later further preparation was made to complete the survey line. Transmitter voltages up to 3200volts were used to obtain currents approximating 2 amps.

Voltages became noisy on separations 4,5,6 until prepared pot holes were watered in advance to stabilize self potential gradients. The first line was stopped when temperatures exceeded 45C and completed the next day. The pseudosection of line 9200N showed no chargeability anomaly or well defined conductor and the next line north was completed.

The results of this line again showed no distinct chargeable zone, generally indicating a non responsive background unit. The greater topographical relief distinguished the high resistivity limestones from the highly conductive sediments on the eastern flank. The sediments also responded with higher current circuits of the transmitter unit.

Lines 10000N and 10250N were completed after significant preparation to increase electrode contact and enhance any subtle chargeable zones. Again no significant chargeable zones were isolated butgreater topographical relief did modify resistivity sections relative to the flatter line 9200N. The negative areas of chargeability were associated with topographical relief and a more conductive surface feature where signal strength diminished rapidly. As a result of the very weak response from the area the remaining lines were discontinued.

Careful driving allowed equipment access to all lines and adequate preparation of current electrodes. Water was supplied from client water truck.

LINES SURVEYED as follows:

Line 9200N 9600E to 10300E

Line 9450N 9450E to 10200E

Line 10000N 9850E to 10700E

Line 10250N 9750E to 10700E all at 50m dipoles

SUMMARY

Two receivers were used and four potential circuits to increase the efficiency of the survey. As each station was completed with the minimum of transmitter switching the operating time was greatly reduced. However due to signal noise in the conductive area some delays were encountered and twelve hour field days were necessary to avoid rewatering to allow completion the next day. The equipment operated reliably to air temperatures reaching mid forties. A short period of rain on the last line to be completed produced extreme noise due to rapidly changing S.P. levels. The data was repeated the next morning with normal results.

Data sets between the two receivers were compatable when operated in series with the potential circuits. Special pots with high seepage level were used to maintain a stable contact with the dry ground, preferrably in an augered hole not diectly exposed to the sun.

Field data was collected as data sets for Vp,primary voltage I, the current Sp, circuit self potentials and Ch, the total chargeability and the channels Ch_0 to Ch_9 the individual windows as selected For details see enclosed sheets.

Data was finally presented as pseudosections of plotted resistivities and total chargeability.

for SOLO GEOPHYSICS & Co.

BRIAN A. RAU

APPENDIX III

Interpretation of I.P. Survey data

INTRODUCTION

A dipole-dipole I.P. survey was conducted over prospects in E.L. 1138 (Moorowie) in the Flinders Range area of S.A.

The survey was planned as a test survey to evaluate the applicability of the technique in that area. The specific aim was to detect the presence of any large mass of ore associated with mineralization located on the surface during earlier mapping.

It was accepted that should the orebody be composed of sphalerite with no other sulphides then the technique would miss the mineralization.

SURVEY PARAMETERS

A high powered Huntec Mk IV 7.5kw transmitter and two Hunter Mk IV receivers were used for the survey. The transmitter was used on a 2 second on - 2 second off cycle, and the receivers measured the total apparent chargeability from 500 msec to 1500 msec. Field work was carried out by 2 Solo Geophysics Technicians and 3 BHP persons.

Access proved to be difficult with traverse lines passing over steep hills. The problem was compounded by air temperatures in excess of 45^{o}C. Water had to be carried by hand to most electrode sites.

RESULTS

Apparent chargeability and apparent resistivity pseudo-sections are attached.

1. Moorowie

   Four I.P. traverses totalling 3.2km were surveyed around old mine workings located on scattered malachite and sphalerite occurences within the Moorowie Formation Limestones, (see fig. 44). All lines were read with an electrode separation of 50 metres.

Cont./..

Line 9200N No recognisable I.P. anomaly was detected. Slightly higher chargeability readings between 9850E and 10150E appear to be a normal consequence from the associated higher resistivities. However resistivities coincide with the beginning of a topographically flat area and perhaps are due to the beginning of the Tertiary sediments of the Frome embayment.

Line 9450N Again, no recognisable chargeability anomalies are present. As with Line 9200N, the eastern end of the line detected lower resistivities.

Line 10000N Slightly higher chargeabilities at 10100E and 10350E are due to higher resistivities and are not considered significant.

Line 10250N No chargeability anomalies of significance were detected.

CONCLUSIONS AND RECOMMENDATIONS

Trial induced polarization surveys at Moorowie prospects has shown:

The Moorowie Limestone (as traversed at Moorowie prospect) exhibit high apparent resistivities and low chargeabilities. Recognition of metallic ore zones within this unit should be practical using I.P.

No I.P. anomalies were detected at this prospect on the lines surveyed.

APPENDIX IV

Summary Log DDM1

SUMMARY LOG DDM1

Location: East side of Mnt. Frome Block, adjacent to the disused Moorowie Cu Mine.

Orientation: Inclined drill hole, 70° to East. 73.5° at 345m.

Target: Zn-Cu mineralization in N-S shear zones hosted by massive carbonates.

Contractor: M. Dallas, company Longyear 38 rig.

Geological Log:

0-53m Massive bedded calcarenites with abundant Archeocyathids. Graded units with siliclastic, coarse, calcarenites are common. Irregular areas of low grade iron impregnation, dolomitization and silicification occur throughout the unit. Minor irregular calcite veining and vugs are widespread with traces of secondary and primary Cu and Zn phases with Mn oxides. Thin, <5mm, sphalerite veinlets are present in the interval 10-14m, traces of chalcocite were noted around 42-47m.

53-60m Transitional sequence, darker coloured fine grained calcarenites with Archeocyathids and subordinate interbeds of laminated black micrites with traces of pyrite and malachite.

60-71.3m Graded units of dark coloured micrites and calcarenites, with thin shaly and graphitic units. Minor calcite veining in calcarenites. Calcarenite units are disrupted by syn-sedimentary slumping, compaction, etc...

71.3-292m Abrupt change to pure, massive calcarenites lacking the rich Archeocyathid fauna of the upper unit. Low grade iron impregnation and dolomitization widespread. Minor Ca veinlets and vugs are common in places resulting in broken ground with small cavities at 243.6 and 247.57m. Veining less common below 270m. Traces of chalcocite and sphalerite are present, mainly in the top half of the unit.

292-350m Graded units of dark coloured, laminated micrites and paler calcarenite units. "Ribbon limestone" type facies with synsedimentary disruption of thinner (<20cm) calcarenite units. No traces of mineralization.

END OF HOLE.

S. G. Walters

SGW:cs
27th April 1983

APPENDIX V

Assay results from selected core of DDM1

0110

COMLABS Pty. Ltd.

COMPUTERISED ANALYTICAL LABORATORIES

Head Office and
Central Laboratory
305 SOUTH ROAD,
MILE END SOUTH
STH. AUST. 5031
TEL.: (08) 43 5722
TELEX: AA89323

NATA REGISTERED No. 1526

OUR REF.: COM 831167

YOUR REF.: L160 001877

Mr. M. Roche,
BHP Exploration,
GPO Box 1818,
ADELAIDE. S.A. 5000,

8.6.83

Dear Mick,

RE: JOB COM 831167

Enclosed are the assays for the samples delivered to our laboratory on the 2nd June, 1983.

Yours sincerely,
COMLABS PTY LTD

per :

COMLABS Pty. Ltd.
COMPUTERISED ANALYTICAL LABORATORIES

ANALYTICAL REPORT

JOB COM831167 O/N : L160 001877

Results in ppm

Hole DDM 1

SAMPLE	Cu	Pb	Zn	Ag	
AC 5608	26	36	105	<1	3-4m
AC 5609	36	34	155	<1	4-5m
AC 5610	36	24	60	<1	5-6m
AC 5611	46	20	75	<1	6-7
AC 5612	48	20	55	<1	7-8
AC 5613	75	24	60	<1	8-9
AC 5614	70	38	170	<1	9-10
AC 5615	95	24	175	<1	10-11
AC 5616	55	20	60	<1	11-12
AC 5617	610	24	50	<1	12-13
AC 5618	170	22	44	<1	13-14
AC 5619	48	24	38	<1	14-15
AC 5620	26	28	24	<1	15-16
AC 5621	55	26	65	<1	16-17
AC 5622	80	28	90	<1	17-18
AC 5623	70	24	95	<1	18-19
AC 5624	370	44	145	<1	19-20
AC 5625	160	28	115	<1	20-21
AC 5626	230	44	95	<1	21-22
AC 5627	85	32	100	<1	22-23
AC 5628	130	24	85	<1	23-24
AC 5629	190	55	150	<1	24-25
AC 5630	170	34	65	<1	25-26
AC 5631	140	24	36	1	26-27
AC 5632	190	34	135	1	27-28

.../ 2

ANALYTICAL REPORT

0112

JOB COM831167 O/N : L160 001877

Results in ppm

SAMPLE	Cu	Pb	Zn	Ag	
AC 5633	460	50	135	<1	28-29
AC 5634	350	34	190	<1	29-30
AC 5635	190	30	100	<1	30-31
AC 5636	200	24	85	1	31-32
AC 5637	550	24	65	<1	32-33
AC 5638	250	60	155	<1	33-34
AC 5639	240	38	300	<1	34-35
AC 5640	280	36	300	<1	35-36
AC 5641	360	46	210	<1	36-37
AC 5642	210	36	220	<1	37-38
AC 5643	280	32	110	<1	38-39
AC 5644	270	38	195	<1	39-40
AC 5645	90	30	190	<1	40-41
AC 5646	16	20	90	<1	41-42
AC 5647	14	26	60	<1	42-43
AC 5648	65	28	85	<1	43-44
AC 5649	130	38	55	2	44-45
AC 5650	60	42	75	1	45-46
AC 5651	75	34	44	<1	46-47
AC 5652	42	80	70	<1	47-48
AC 5653	44	30	38	<1	48-49
AC 5654	50	26	120	<1	49-50
AC 5655	10	24	165	<1	95-96
AC 5656	8	24	175	<1	96-97
AC 5657	14	100	750	<1	97-98

.../ 3

ANALYTICAL REPORT

C113

JOB COM831167 O/N : L160 001877

Results in ppm

SAMPLE	Cu	Pb	Zn	Ag	
AC 5658	16	160	1200	<1	98-99
AC 5659	12	36	1050	<1	99-100
AC 5660	12	30	920	<1	100-101
AC 5661	10	26	710	<1	101-102
AC 5662	12	22	610	<1	102-103
AC 5663	10	30	210	<1	103-104
AC 5664	12	46	530	<1	104-105
AC 5665	6	24	105	<1	135-136
AC 5666	10	34	210	<1	136-137
AC 5667	14	75	290	<1	137-138
AC 5668	16	36	230	<1	138-139
AC 5669	8	24	115	<1	139-140
AC 5670	10	28	200	<1	150-151
AC 5671	8	24	180	<1	151-152
AC 5672	8	24	185	<1	152-153
AC 5673	8	26	200	<1	153-154
AC 5674	6	30	150	<1	154-155
AC 5675	8	26	135	<1	155-156
AC 5676	6	30	105	<1	156-157
AC 5677	6	26	80	<1	157-158
AC 5678	14	26	42	<1	158-159
AC 5679	8	38	140	<1	159-160
AC 5680	6	32	65	<1	160-161
AC 5681	6	28	50	<1	161-162
AC 5682	6	32	70	1	162-163

.../ 4

ANALYTICAL REPORT

0114

JOB COM831167 O/N : L160 001877

Results in ppm

SAMPLE	Cu	Pb	Zn	Ag	
AC 5683	4	28	46	<1	163-164
AC 5684	4	26	40	<1	164-165
AC 5685	6	26	48	<1	165-166
AC 5686	4	24	40	<1	166-167
AC 5687	4	28	34	<1	167-168
AC 5688	8	26	60	<1	168-169
AC 5689	4	28	44	<1	169-170
AC 5690	6	34	210	<1	200-201
AC 5691	6	48	230	<1	201-202
AC 5692	8	55	470	<1	202-203
AC 5693	6	28	610	<1	203-204
AC 5694	4	20	350	<1	204-205
AC 5695	4	20	170	<1	205-206
AC 5696	4	20	110	<1	206-207
AC 5697	4	24	85	<1	207-208
AC 5698	6	24	70	<1	208-209
AC 5699	4	24	90	<1	209-210
AC 5700	12	26	110	<1	260-261
AC 5701	16	30	145	<1	261-262
AC 5702	16	24	110	<1	262-263
AC 5703	8	22	65	<1	263-264
AC 5704	14	38	120	<1	264-265
AC 5705	12	24	70	<1	265-266
AC 5706	12	26	130	<1	266-267
AC 5707	18	26	160	<1	267-268

.../ 5

ANALYTICAL REPORT

0115

JOB COM831167 O/N : L160 001877

Results in ppm

SAMPLE	Cu	Pb	Zn	Ag	
AC 5708	12	44	105	<1	268 - 269
AC 5709	20	28	135	<1	269 - 270
AC 5710	20	24	55	<1	290 - 291
AC 5711	20	90	65	<1	291 - 292
AC 5712	44	110	310	<1	292 - 293
AC 5713	16	120	195	<1	293 - 294
AC 5714	10	65	140	<1	294 - 295
AC 5715	6	50	300	<1	295 - 296
AC 5716	6	38	145	<1	296 - 297
AC 5717	8	36	100	<1	297 - 298
AC 5718	12	38	115	<1	298 - 299
AC 5719	18	36	90	<1	299 - 300
AC 5720	10	38	860	<1	300 - 301
AC 5721	10	44	175	<1	301 - 302
AC 5722	8	50	195	<1	302 - 303
AC 5723	12	90	240	<1	303 - 304
AC 5724	8	75	162	<1	304 - 305
AC 5725	8	50	300	<1	305 - 306
AC 5726	8	46	220	<1	306 - 307
AC 5727	8	50	670	<1	307 - 308
AC 5728	16	46	110	<1	308 - 309
AC 5729	14	50	165	<1	309 - 310

Method of Analysis : Cu Pb Zn : AAS 1
Ag : AAS 3

139°15'

31°00'

31°05'

Mount Chambers Creek

CHAMBERS GORGE

MT. CHAMBERS

MOUNT CHAMBERS MINE

Mine Bore

MT FROME

Mount Frome Mine

Moorowie Well

Moorowie Prospect

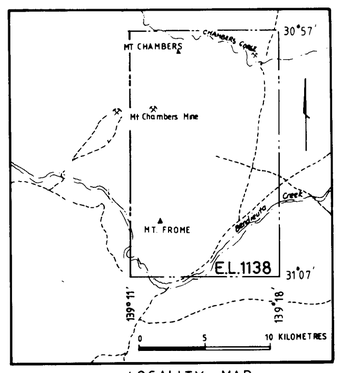
DDMI

Moorowie Mine

095 097 012 052 070 068 054 010 056 008

Pb Pu Pc Pc? Pwp Ehw Ehp Ehr Ehr1 Ehr2 Ehm Elb Em D E Emb Emw d Cu Ba

LOCALITY MAP



LEGEND

- Em — Middle Cambrian (Undifferentiated
- Emw — Wirrealpa Limestone
- Emb — Billy Creek Formation
- Ehm — Moorowie Limestone.
- Ehr2 — Upper Parara Limestone
- Ehr1 — Shaley Parara
- E — Birdseye Limestone
- Ehr — Lower Parara
- Elb — Bendleuta Formation
- D — Mottled Limestone.
- Ehw — Wilkawillina Limestone
- Ehp — Parachilna Formation
- Pwp — Pound Quartzite
- Pc — "Diapiric" material
- Pu — Proterozoic (Undifferentiated)
- d — Dolerite intrusive
- Mine, diggings
- Photo centre.
- Fault
- Trend lines
- Geological boundaries
- Drainage system
- Road
- Dip of bedding 10°-25°, 25°-30°, 25°-50°, >50°, horizontal
- Anticline, syncline
- IP survey line
- DDMI — Diamond drillhole - B.H.P. 1983

SCALE 1. 25,000

0 1 2 Kilometres

THE BROKEN HILL PROPRIETARY CO. LTD.
EXPLORATION DEPARTMENT

E.L. 1138 - MT. FROME, SA.

PHOTO INTERPRETATION

Drawn R.K	Date April '82	Centre WHYALLA
Prepared M.R	Project No 6-L16-14	Drawing No. A0 - 41
Checked		

Revisions:

3722-9

THE FLINDERS PROJECT

EXPLORATION FOR CARBONATE - HOSTED BASE METALS

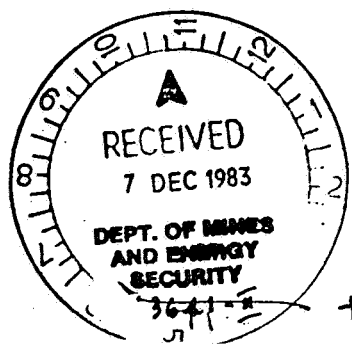
IN THE

FLINDERS RANGES, SOUTH AUSTRALIA.

Compiled by

M.T. Roche
P.J. Parrington
C.F. Blain

September 1983



Env. 3722

~~Env. 3908~~

CONTENTS

1.0 SUMMARY

Since 1978, BHP Minerals Ltd. has adopted a conceptual approach to exploration for Mississippi Valley - type (MVT) mineralisation in the Flinders Ranges of South Australia. The prospective host rocks for this style of mineralisation are the widespread lower Cambrian shallow-water carbonates.

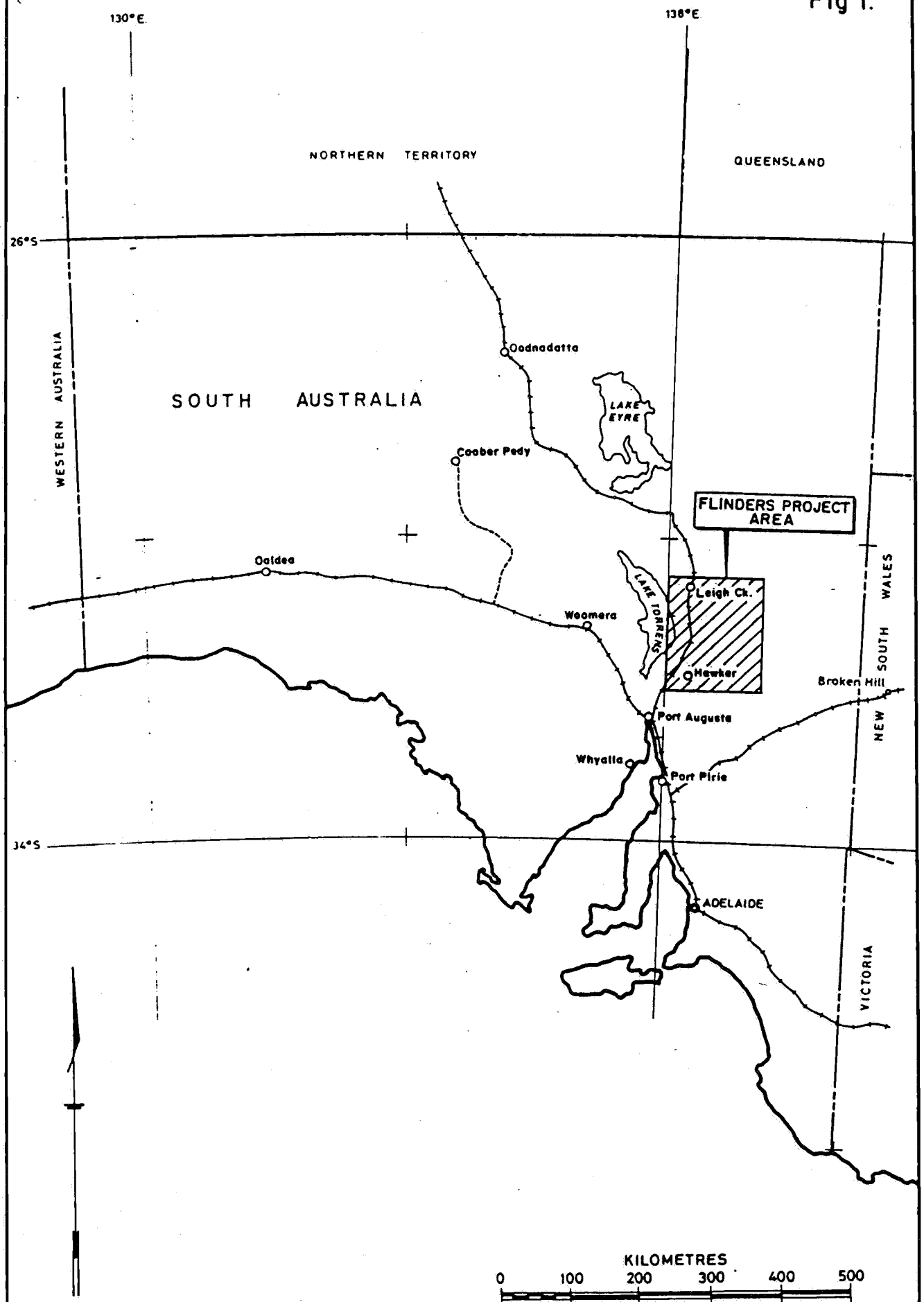
Exploration to date has concentrated on recognizing and evaluating the significance of features characteristic of MVT deposits, the most important of which are the occurrences of lead-zinc mineralization as open-space filling, the development of reefs and unconformities, and dolomitization. The evidence of all of these features in the Flinders region is indicative of the significant potential for MVT mineralisation. BHP has consolidated its exploration interests into 7 Exploration Licence holdings, aggregating 2403 square kilometres.

In the course of exploration, a number of new prospects have been recognized.

Extensive Cambrian karsting of limestone along the western margin of the Wirrealpa Diapir offers adequate ground preparation over a six kilometre strike length at Donkey Bore. Application of the MVT model at Wirrealpa Mine suggests that previously recognised mineralization may be more extensive. A significant geochemical anomaly in a favourable lithological and structural setting at Wilnuroona requires drill testing.

Considering the favourable location of the Flinders Project Area and the demonstrated potential for carbonate-hosted base metal deposits, BHP Minerals wishes to continue an integrated exploration approach under a joint venture agreement. This will allow for exploration to proceed at a relatively fast rate and the sharing of exploration and development risks. BHP prefers to retain management of the project but will consider relinquishment of this function while the incoming partner is major contributor.

Fig 1.



Centre: Melbourne	THE BROKEN HILL PROPRIETARY CO LTD FLINDERS PROJECT, S. A. LOCATION MAP	Project No
Date: 30-9-83		Drawing No: A4-

2.0 INTRODUCTION

2.1 Location and Access

The project area is located in the Flinders Ranges, 450 km north of Adelaide, South Australia, covering parts of the Copley and Parachilna 1:250,000 sheet areas.

Principal access is by sealed road from Adelaide via Port Augusta to Hawker with a network of unsealed roads servicing small towns and station properties. Commuter airline services link Leigh Creek, Hawker and Port Augusta with Adelaide. There is also a rail link between Port Augusta and Leigh Creek for the transportation of coal for power production.

Climate is temperate with low rainfall (annual average approximately 250 mm) supporting a vegetation of dry Sclerophyll, Savannah, Mallee and arid and salt marsh plant communities.

Wool growing is the principal economic activity with beef cattle raising, mining and tourism providing other employment opportunities.

Spectacular scenery has led to the proclamation of a National Park in the central part of the project area.

2.2 Cambrian Stratigraphy of the Flinders Ranges

Following a major regressive period in the late Precambrian, the last depositional event in the Adelaide Geosyncline prior to deformation was the deposition of up to 2000 metres of Cambrian sediments.

Early Cambrian deposition was characterised by shallow shelf carbonates (Wilkawillina Limestone) but with continuous depression of the mobile trough, "deeper water" shaley limestone (Parara Limestone) was laid down. Stabilization of the negative movements towards middle Cambrian time led to a shallowing of the Cambrian basin and to an evaporitic red bed environment (Billy Creek Formation). This was followed by further shallow carbonate deposition (Wirrealpa Limestone) and then a major influx of clastic material (Lake Frome Group sediments).

<table>
<tr><th>AGE</th><th>MT. SCOTT AREA
(Daily, 1956)</th><th>LAKE FROME AREA
(Coates, 1972)</th><th>BHP MINERALS LTD. (1983)</th></tr>
<tr><td>MIDDLE CAMBRIAN</td><td>Aroona Limestone</td><td>Wirrealpa Limestone
Billy Creek Formation</td><td>Wirrealpa Limestone
Billy Creek Formation</td></tr>
<tr><td rowspan="3">LOWER CAMBRIAN</td><td>Unnamed
Clastics</td><td>Narina Greywacke
Oraparinna Shale
Bunkers Sandstone</td><td>Narina Greywacke
Nepabunna Siltstone
Oraparinna Shale
Bunker Sandstone</td></tr>
<tr><td rowspan="2">Ajax
Limestone</td><td>Parara Limestone</td><td>Upper Parara Limestone
Midwerta Shale
Lower Parara Limestone
(bioherms , biostromes,
skeletal grainstones,
mottled facies)
FLINDERS UNCONFORMITY
Wilkawillina Limestone
(bioherms, biostromes,
flaggy limestone units)
Wirrapowie Limestone
Woodendinna Dolomite</td></tr>
<tr><td>Wilkawillina
Limestone</td></tr>
<tr><td colspan="3">PARACHILNA FORMATION</td></tr>
<tr><td>ADELAIDEAN</td><td colspan="3">Pound Quartzite
Wonoka Formation
Bunyeroo Formation</td></tr>
</table>

Cu Pb Zn — OBSERVED MINERALISATION

Fig 2. FLINDERS STRATIGRAPHY

Major tectonic events occurred towards the end of the late Cambrian, culminating in a major crustal upheaval (Delmarian Orogeny) which, by the late Ordovician, had transformed the Adelaide geosyncline into a complex fold and fault belt. Today this is expressed as the prominent basin and ridge topography of the Flinders Ranges.

The stratigraphic succession in the project area together with an indication of mineralized intervals is shown in Figure 2.

2.3 Target and Exploration Concept

Since 1979, BHP's exploration activities have been oriented towards location of base metal deposits of the Mississippi Valley type (MVT). Deposits of this type in other parts of the world occur in shallow-water carbonate sequences on the margins of large sedimentary basins at locations where suitable ground preparation has allowed for accumulation of sulphides. Faults, facies changes, uncomformities and dolomitization contribute to such ground preparation during or after lithification of the host while active sedimentation continued in the basin. The open spaces created might be expected to be enhanced by mineralizing solutions.

In MVT producing areas of North America, individual ore bodies range from several hundred thousand to 20 million tonnes and commonly occur in clusters over several hundred square kilometres with aggregate tonnages in a district being 50 to 100 million tonnes or greater.

Ore minerals are principally sphalerite and galena with copper, silver and cadmium often providing credits. Average grades might be expected to range from less than 5% lead plus zinc to greater than 20%.

General characteristics of MVT deposits suggest that a somewhat different exploration approach from that for other base metal types is necessary. Successful programmes rely heavily on systematic drilling in the vicinity of observed positive indications (principally the recognition of mineralization as open space filling) with a complete geological evaluation of each core guiding the location of subsequent holes. The nature and distribution of mineralization favour a statistical evaluation of drill results. Experience suggests that geophysical techniques may not be suitable as direct ore finders during the early exploration stage.

Work to date on the lower Cambrian carbonate sequence shows that most, if not all, of the required criteria are demonstrably fulfilled, and that a detailed evaluation of prospects is warranted.

3.0 TENEMENTS

The particulars of previously held and current Exploration Licences are listed in Table 1 and their localities are shown on Figure 3.

In view of our integrated approach to exploring these tenements, the South Australian Department of Mines and Energy (SADME) has indicated that all current tenement blocks can be renewed providing that the collective commitment is realized, even though expenditures may not be in accordance with individual tenement commitments. We intend to seek renewawl of all current tenements. The total commitment for the twelve months commencing 1/12/83 is expected to be $160,000.

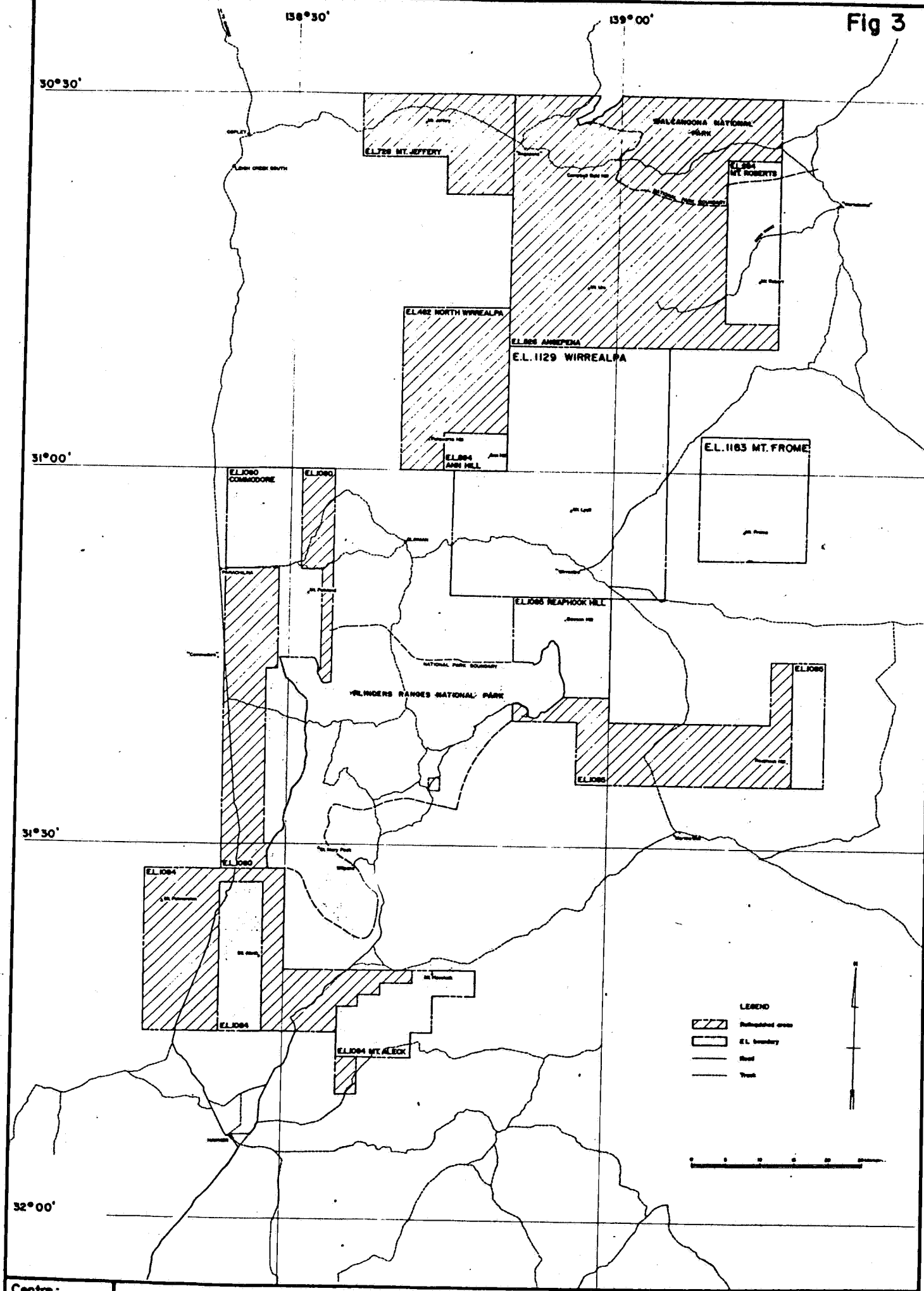
As the Flinders Ranges is a region of general environmental interest, we are required to observe special work conditions on some tenements. These are not restrictive.

TABLE 1 - TENEMENTS

TENEMENT (*CURRENT)		GRANTED	RENEWAL	EXPIRY	AREA (Sq. Km.)	COMMITMENT	EXPENDITURE (TO 31.7.83) #
MT. JEFFREY	E.L. 728	22.9.80	-	21.9.81	260	25,000	17,028
ANGEPENA	E.L. 526	12.9.79	12.9.80	12.9.81	1146	140,000	196,956
MT. ROBERTS	*E.L. 934	16.11.81	16.11.82	16.11.83	192	20,000	66,225
WIRREALPA NORTH	E.L. 482	7.6.79	7.6.80	7.6.81	380	50,000	48,864
ANN HILL	*E.L. 894	28.9.81	28.9.82	28.9.83	53	20,000	8,438
WIRREALPA	E.L. 436	30.11.78	30.11.79	30.11.80	1030	100,000	
WIRREALPA	E.L. 809	2.3.81	2.3.82	2.3.83	1030	100,000	
WIRREALPA	*E.L.1129	28.3.83	-	28.3.84	1030	50,000	456,221
MT. FROME	E.L. 538	25.10.79	-	25.10.80	294	15,000	
MT. FROME	E.L. 807	12.2.81	12.2.82	12.2.83	294	50,000	
MT. FROME	*E.L.1138	28.4.83	-	28.4.84	206	25,000	212,731
COMMODORE	E.L. 726	22.9.80	22.9.81	22.9.82	787	40,000	
COMMODORE	*E.L.1080	15.11.82	-	15.11.83	368	17,500	31,386
REAPHOOK HILL	E.L. 725	22.9.80	-	22.9.81	617	30,000	
REAPHOOK HILL	E.L. 725	-	22.9.81	22.9.82	256	15,000	
REAPHOOK HILL	*E.L.1085	19.11.82	-	19.11.83	256	15,000	49,961
MT. ALECK	E.L. 727	22.9.80	-	22.9.81	780	35,000	
MT. ALECK	E.L. 727	-	22.9.81	22.9.82	474	16,000	
MT. ALECK	*E.L.1084	19.11.82	-	19.11.83	298	16,000	40,020
					2403 (current)	$ 779,500	$ 1,127,830

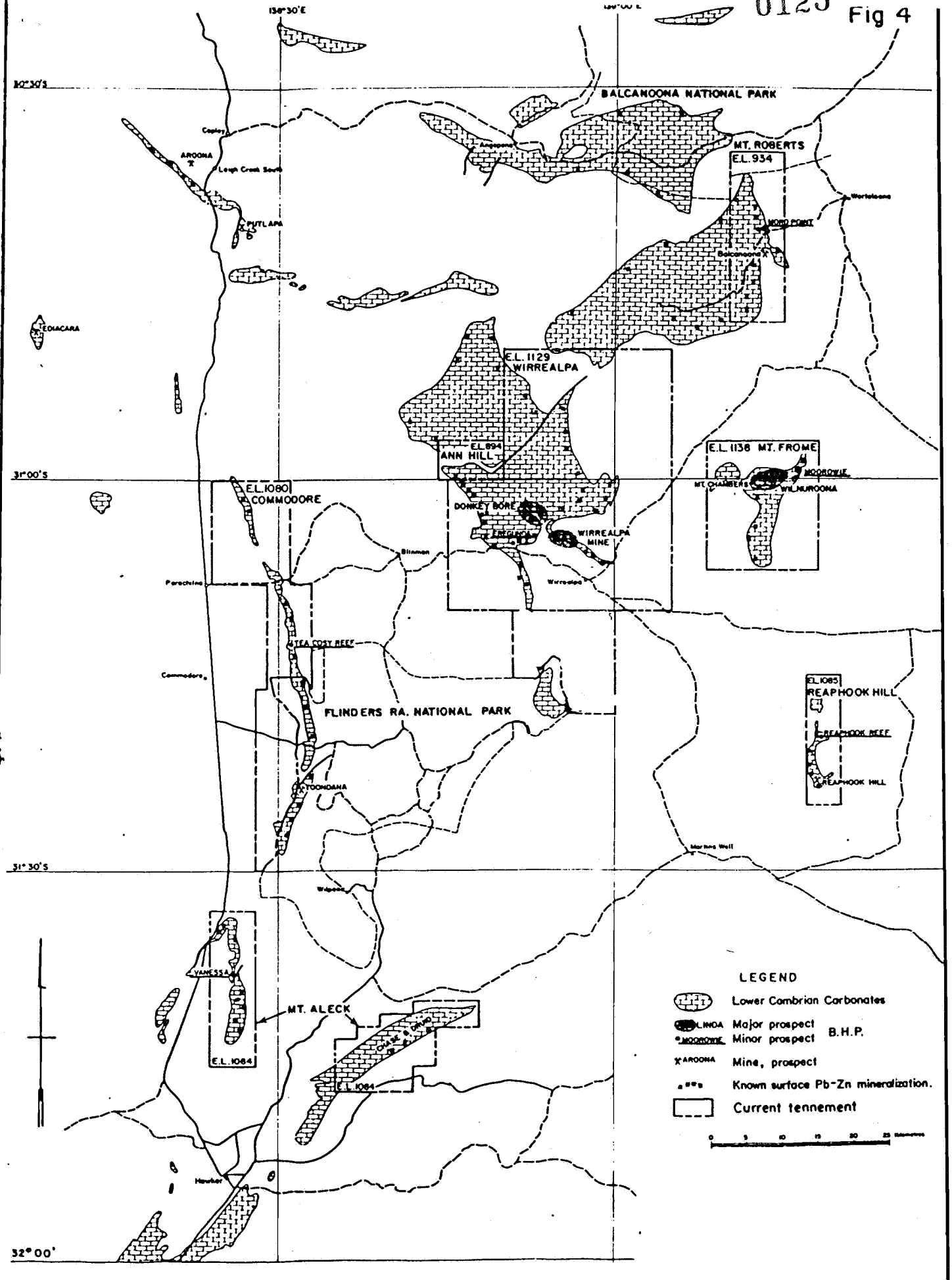
Cumulative where appropriate.

Fig 3



Centre: Melbourne	THE BROKEN HILL PROPRIETARY CO. LTD. FLINDERS RANGES PROJECT, S.A. EXPLORATION LICENCES	Project N°:
Date: 11-10-83		Drawing N°:

0125 Fig 4



Centre: Melbourne	THE BROKEN HILL PROPRIETARY CO. LTD. FLINDERS RANGES PROJECT, S.A. LOCATION OF PROSPECTS	Project N°:
Date: 11-10-83		Drawing N°:

4.0 WORK TO DATE

4.1 Previous Investigations

Numerous, small, high-grade copper and silver-lead deposits in the lower Cambrian sequences of the Flinders Ranges have been worked intermittently between 1860 and the present. Interest in carbonate-hosted base metals was renewed in the 1960's, following recognition of the style of mineralization at Ediacara and other localities by SADME, and this led to a surge in exploration activity in the period 1965 to 1975. During this phase a number of companies carried out reconnaissance programmes, relying heavily on stream sediment surveys. Follow-up of the best anomalies resulted in the discovery of Puttapa, Aroona, Third Plain and Reaphook Hill. Lower-order anomalies were either not followed up or were rejected after inspection.

Details of previous investigations are included in a supplementary report. Major prospects are listed in Table 2 and locations are shown on Figure 4.

TABLE 2 - PREVIOUS MINING ACTIVITIES

DEPOSIT/ PROSPECT	GEOLOGICAL SETTING	ACTIVITY	PUBLISHED "RESERVES"
Ediacara	Stratabound galena in sandy and laminated algal dolomites of Ajax Limestone.	Mined 1888-1913 Drilled 1946/47 by Dept. of Mines Drilled 1965/66 by CRA	Production 24,000 t@ 30% Pb, 8.5% oz/t Ag. Drilling Indicated 12 mt@ 0.8% Pb in algal dolomite 17 mt@ 1.2% Pb in sandy dolomite (including 1.2 mt @2.2% Pb)
Wirrealpa	Galena with minor sphalerite, chalcopyrite in limestone adjacent to faulted contact between Wirrealpa Diapair and lower Cambrian limestone.	Mined periodically 1880-1945 Shaft to 60 m	1888 Production 60 tons @ 70% Pb, 5-8 oz/t Ag Total production unknown.
Puttapa	Willemite associated with thrust fault in Ajax Lst.	1974/76 mined by E.Z. currently care & maintenance	900,000 t@ 35% Zn, 2.2% Pb
Aroona	Willemite in Ajax Limestone	E.Z. currently care & maintainance	100,000 t@ 35% Zn, 2.0% Pb
Third Plain	Willemite in basal Cambrian (principally limestone/dolomite)	1966/67 Kennecott 1969/70 North Flinders trenching, drilling	80,000 t@ 20% Zn

4.2 Exploration by BHP

Based on the knowledge gained by BHP geologists in Australia, visits to North American and European carbonate-hosted base metal mines, and the advice of experienced consultants, the lower Cambrian carbonate sequences in the Flinders Ranges were identified as having enhanced potential as a region that could host significant mineralization of Mississippi Valley Type at economic grade and tonnage.

Procedure

Reconnaissance in 1978 located widespread surface mineralization (principally hydrozincite/smithsonite) which had not previously been recorded. A re-examination of earlier stream sediment results suggested that a number of high to moderate anomalies were in fact, related to surface mineralization. Following acquisition of title, a reconnaissance mapping/prospecting programme was instigated with infill stream sediment sampling where appropriate. Mineralization was found to range from the Wonoka formation (pre Cambrian) to middle Cambrian Wirrealpa Limestone and to be concentrated in particular facies of lower Cambrian Wilkawillina Limestone. A number of core holes were drilled to test a mineralized mottled limestone at Wirrealpa and to determine down dip facies variations.

After systematic testing, it was recognized that most potential for economic base metal mineralization was in areas where structural and stratigraphic evidence of suitable ground preparation could be observed in close proximity to known lead/zinc occurrences. Recently our exploration has concentrated on areas of Cambrian reef development, major unconformities with related karsting and fault-related breccias. Detailed geological mapping, rock chip sampling, drilling and geophysics have been used to locate targets which warrant further work.

Results

Individual prospects are dealt with in more detail in Sections 5 and 6. Surveys undertaken in each EL are summarized in Table 3 and prospect localities are shown on Figure 4.

Although it is difficult to rank prospects that are at different stages of exploration, we have selected five which, on the basis of observed features and potential for bodies of the dimensions sought, warrant early follow-up. Other prospects by comparison are at a more "grass-roots" stage although minimal work on any may require revision of priorities.

5.2 DONKEY BORE

Lead and zinc mineralization is associated with a major Cambrian karst topography which has developed beneath the Flinders Unconformity

Geological Setting

The Donkey Bore prospect is on the north eastern limb of an assymetrical syncline of lower Cambrian carbonates. At this locality which abuts the north-western extension of the Wirrealpa Diapir approximately 600 metres of section known from the western limb of the syncline is missing. A major unconformity is apparent between massive biohermal limestone and the overlying, thin-bedded Parara limestone.

Prepared Ground/Mineralization

Development of breccias below the Flinders Unconformity (characterized by red palaeosol) provides adequate ground preparation for mineralizing solutions. This prepared ground has been shown by limited drilling to be further enhanced at depth. Surface mineralization (principally galena (with subordinate hydrozincite/smithsonite) occurs as open space fill and disseminations in biohermal limestone which outcrops discontinuously for 6 kilometres. There is potential for this karsted/mineralized system to extend a further 6 kilometres to the north-west. The best drill intercept to date has been in WD 18 (10 metres of 1.2% Pb & Zn) within 40 metres of coarse breccia.

Recommended Next Stage

Pattern drilling of the zone of interest with fences of cored holes precollared through Parara limetstone is recommended to test continuity of prepared ground and to locate ore grade mineralization.

295,000 m E

6 565 000 m N

6,560,000 m N (AMG)

WD14

WD13

WD15

WD7

WD8

SECTION A

DONKEY BORE

Wilkawillina Limestone

Parara Limestone

Bunkers Sandstone

Narina Greywacke

Oraparinna Shale

Wirrealpa Diapir

Wirrealpa Ck

WD17

16

See detailed plan

WD18

WD19

WIRREALPA SPRING

Wilk Lst

sandy facies

Parara Limestone

0 1000 2000 metres

REGIONAL GEOLOGY

Mineral occurences

S.W. N.E.

WD8 WD15

400m

200m

0m

Parara Lst.

Diapir

Parara Lst

Mottled Lst

SECTION A

Parara Limestone

Unconform

Wilkawillina Limestone

SECTION B

Wirrealpa Diapir

WD18

33

40

Bunkers Sandstone

29

sandy facies

39

Parara Limestone

37

41

50

60

WIRREALPA SPRING

WD19

Wilkawillina Lst

Shaft Pb, Ba

65

18

20

32

Scale 1:10000

0 500 metres

Mineral occurences

W E

WD 18

400

300

200

100

Parara Limestone

Wilkawillina Limestone

Diapir

ELEVATION (m)

SECTION B

SUMMARY OF ASSAYS

WD 8 - 9m at 0·6% Pb+Zn (1m at 1·5% Pb+Zn)

WD 15 - 11m at 0·55% Pb+Zn (1m at 1·6% Pb+Zn)

WD 18 - 10m at 1·2 % Pb+Zn (1m at 2·35% Pb+Zn)

WD 19 - 8m at 1·44% Pb+Zn (1m at 5·75% Pb+Zn)

Fig 6

THE BROKEN HILL PROPRIETARY CO. LTD.
EXPLORATION DEPARTMENT

EL 1129, WIRREALPA, S.A.

DONKEY BORE PROSPECT

Revisions:			
Prepared by: P Parrington		Centre: Melbourne	
Date: 20-10-83		Project No	Drawing No A3-
Drawn M Rosker			

0169

5.4 WIRREALPA MINE

Approximately 1000 tonnes of high-grade silver-lead ore has been produced from underground and surface workings at the Wirrealpa Mine since discovery in 1883. Ore was apparently hand picked and run-of-mine grades are not available.

Geological Setting

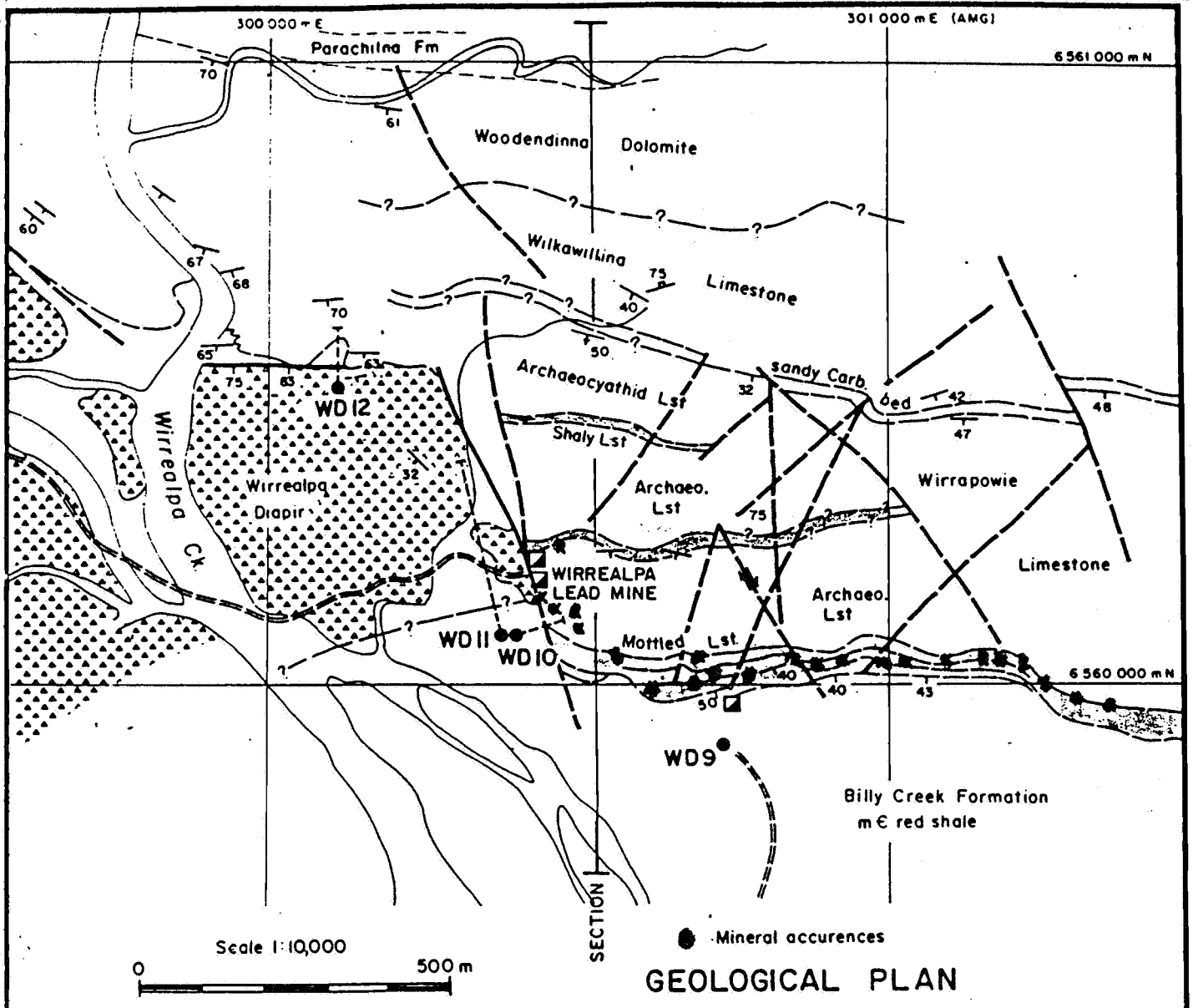
The prospect lies within lower Cambrian archaeocyathid-rich limestones below an unconformity and adjacent to the faulted contact between the lower Cambrian and the Wirrealpa Diapir. Sandstones and shales of middle Cambrian Billy Creek Formation overlie the unconformity. Recent drilling by BHP suggests the lithology of the adjacent "diapir" is highly variable and at least parts of it may represent trough-fill of post lower Cambrian age.

Prepared Ground/Mineralization

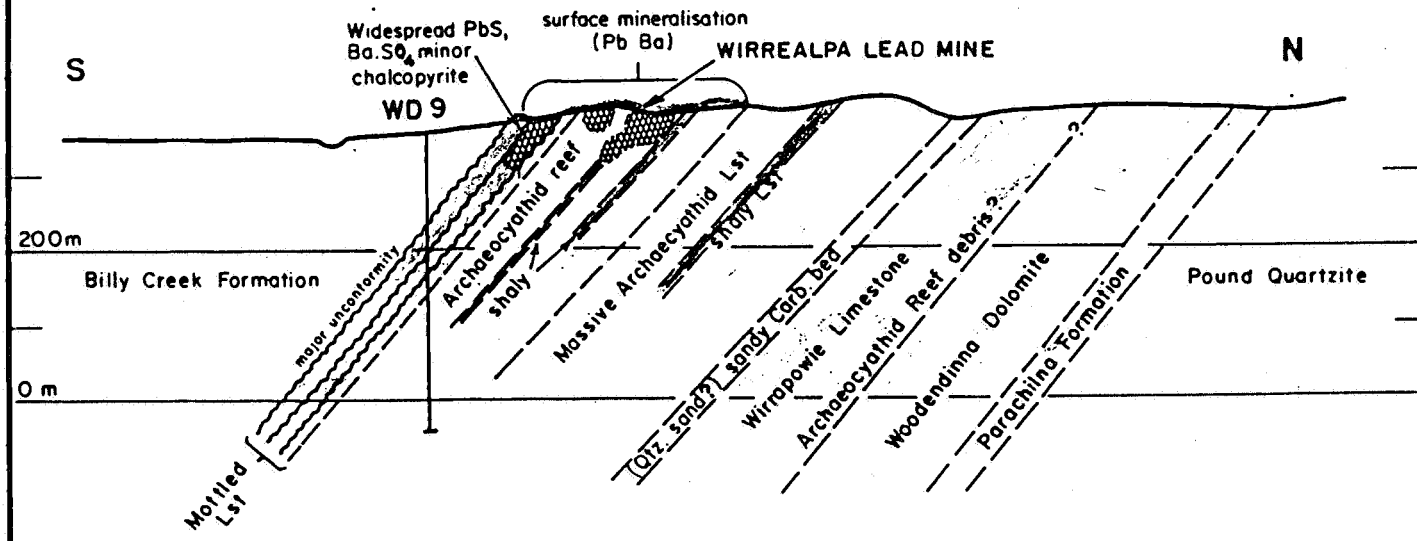
Observed mineralization which includes galena, cerussite, azurite, malachite, barite, hydrozincite and spalerite with elevated values of silver and gold, occurs as open space fill associated with the diapir contact fault and in pods below the unconformity. Surface exposure of prepared ground and associated mineralization extends for approximately 5 km south-east from the main Wirrealpa Mine shaft.

Recommended next stage

Pattern drilling to test extent of mineralization adjacent to the "diapir" and along the unconformity surface is required. Underground mapping of old workings may be warranted.



GEOLOGICAL PLAN



GEOLOGICAL SECTION

Fig 8

Centre Melbourne	THE BROKEN HILL PROPRIETARY CO. LTD.	Project N°
Date Oct '83	E.L. 1129, WIRREALPA, S.A.	Drawing N°
	WIRREALPA MINE PROSPECT	

5.5 WILNUROONA

Highly anomalous stream sediment geochemical values (up to 0.6% Pb, 0.4% Zn) were previously detected draining a possible major collapse zone of lower Cambrian carbonates. A high-grade pod of surface mineralization has been located close to the Flinders Unconformity.

Geological Setting

Shallow-dipping facies of the lower Cambrian Wilkawillina limestone have been severely disrupted by major fault structures (generally trending NNE) during deposition, resulting in at least three unconformities and a probable collapse zone in the vicinity of the Mt. Chamber Cu shaft where outcrop is very poor.

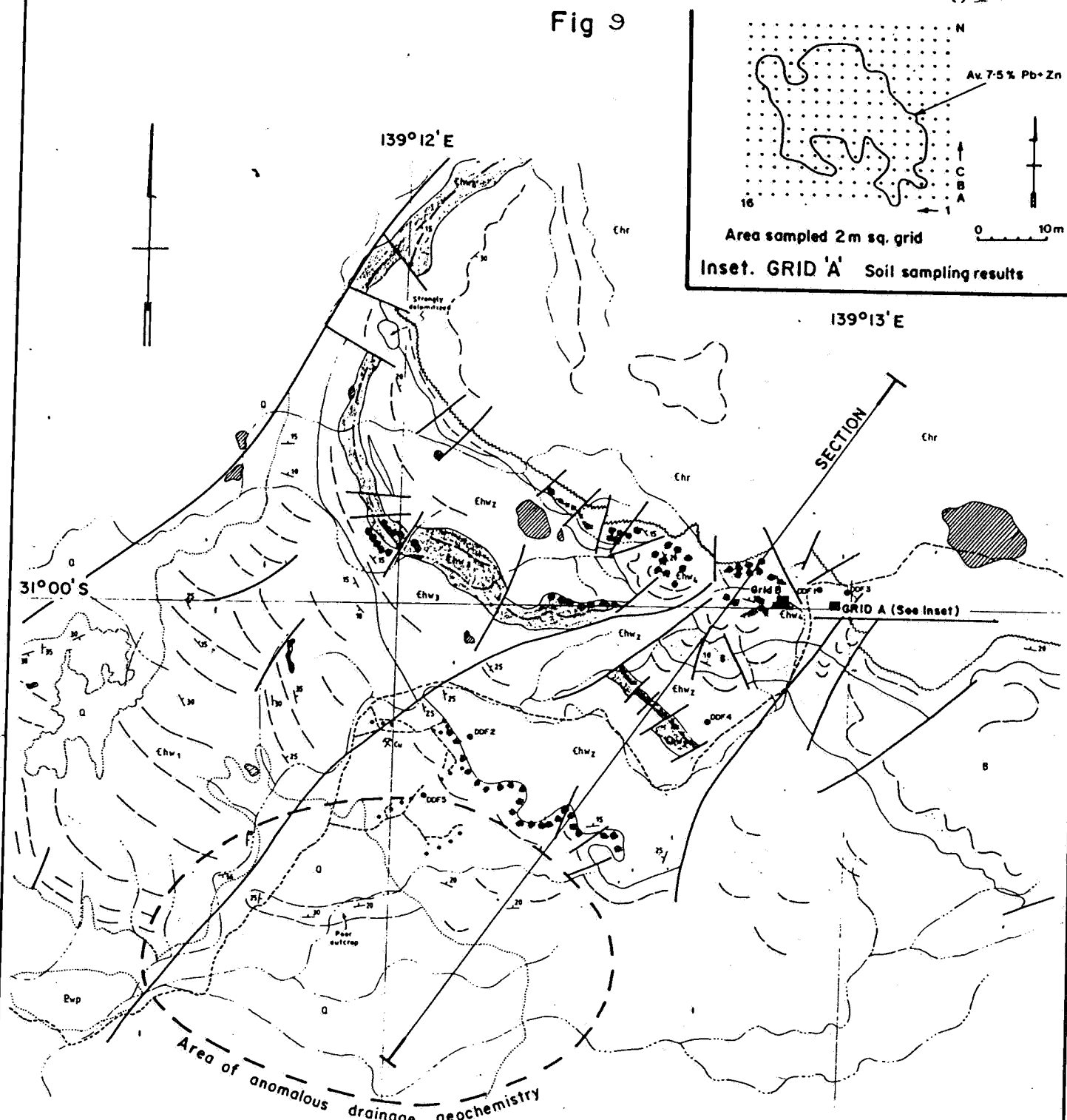
Prepared Ground/Mineralization

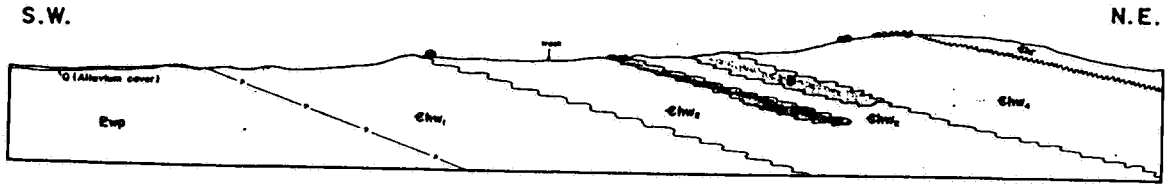
Because of the extensive faulting, large areas of suitable prepared ground have been defined or inferred. One pod of previously undetected surface mineralization has been sampled in detail using a jackhammer to a depth of one metre resulting in an average of 7.5% Pb+Zn over approximately 300 sq metres with maximum values of 19% Pb, 33% Zn and 158 g/t Ag. Mineralization in the area occurs with dolomitization principally as fracture fill. The area of major stream sediment anomalism has not been tested.

Recommended Next Stage

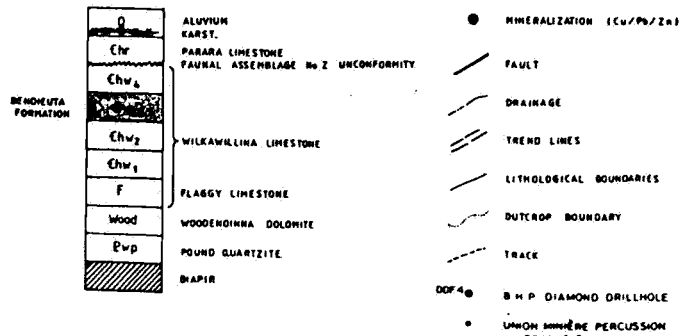
Shallow bedrock drilling to define the source of the geochemistry anomaly.

Fig 9





SECTION



0 200 400 600 800 1000 metres

THE BROKEN HILL PROPRIETARY CO. LTD.
EXPLORATION DEPARTMENT

E.L.1138 MT. FROME, S.A.

WILNUROONA PROSPECT

Drawn: M.T.R. Date: 6-81, 9-83 Centre Way, Adel

6.0 OTHER PROSPECTS

A number of prospects have been defined which have either been partially tested and downgraded with respect to major prospects or have had insufficient work done to rate higher priority. Locations are shown on Figure 4 and relevant exploration data is listed in the appendix.

6.1 Moro Point

Surface mineralization is associated with a faulted biohermal reef complex. The best drill intercept to date is 1 metre of 2.75% Pb+Zn as fracture fill within a bioherm. Drilling of several I.P. anomalies defined in a test survey revealed pyritic/graphitic shale as the source.

6.2 Eregunda Fault Zone

Anomalous stream sediment geochemistry, surface mineralization and suitable ground preparation have been detected along the faulted contact between the southern end of the Donkey Bore Syncline and the Wirrealpa Diapir. This area is prospective as the southern extension of the Donkey Bore prospect (5.2).

6.3 Moorowie

Prospecting has located areas of copper, lead and zinc mineralization associated with diapiric breccia, sparry dolomite, fracture and fault breccias in lower Cambrian carbonates. Rockchip sampling (by E.Z.) defined areas of copper (up to 16%) and zinc (up to 30%) mineralization associated with north-south trending linear features and silicified zones. A recent I.P. survey and one drill hole were not encouraging.

6.4 Tea Cosy Creek

A biohermal reef complex outcrops south of Parachilna Gorge immediately below the Flinders Unconformity. Follow-up to date has been minimal.

6.5 Commodore

Surface mineralization is associated with the Flinders Unconformity which is well exposed within the National Park. The horizon of interest is masked by scree outside the Park.

6.6 Bunker Range

Several anomalous stream sediment geochemical anomalies occur along a 15 km strike length of lower Cambrian carbonates, north and south of the Third Plain prospect (5.3). Surface mineralization has also been located in the Wonoka Formation (pre Cambrian) in this area.

6.7. Reaphook Hill

Three areas of anomalous stream sediment geochemistry have been outlined, one of which is associated with a faulted reef complex. Surface gossans contain anomalous Pb, Zn and Ni. The Reaphook Hill scholzite deposit occurs within the area of interest.

6.8 Vanessa

Barite and copper mineralization area associated with a faulted block of lower Cambrian carbonates is the Mern Merna Syncline. Follow-up rock chip and soil sampling results were not encouraging.

6.9 Chace and Druid

Anomalous stream sediment results from the southern limb of the Chace and Druid Syncline have not been followed up. Systematic sampling of the trench for the Moomba-Stony Point gas pipeline (largely along strike) did not reveal any major anomalous zones.

All areas warrant further surface work to define drill targets.

APPENDIX

FLINDERS PROJECT - AVAILABLE DATA

1. All data available BHP Camberwell and Adelaide
   except Aerial Photography-Adelaide
   Drill core - Adelaide and Whyalla

2 CR - refers to BHP Company Report
FR - refers to Flinders Ranges plan number

3. * indicates plan available as overlay to geology

4. Most quarterly reports to SADME were not bound as Company Reports

MATERIAL	SCALE/PERIOD	COVERAGE	REFERENCE
Aerial Photography (colour)	1:20,000	Mt. Roberts	
	1:10,000	Ann Hill	
	1:10,000	Wirrealpa	
	1:20,000	Mt. Frome	
	1:20,000	Commodore	
	1:20,000	Reaphook Hill	
	1:20,000	Mt. Aleck	
Quarterly, partial relinquishment and final reports to SADME	Dec. 1980 - Sept. 1981	Mt. Jeffrey	CR 3048 CR 3313
	Dec. 1979 - Sept. 1981	Angepena	CR 2609 CR 2652 CR 2718 CR 3191 CR 3007
	Feb. 1982 - Aug. 1983	Mt. Roberts	CR 3474 CR 3683 CR 3818
	July 1979 - June 1981	Wirrealpa Nth.	CR 2610 CR 3071
	Dec. 1981 - Sept. 1983	Ann Hill	CR 3155
	Feb. 1979 - Aug. 1983	Wirrealpa	CR 2608 CR 2653 CR 2719 CR 2868 CR 3175 CR 3310 CR 3328 CR 3477
	Jan. 1980 - July 1983	Mt. Frome	CR 3043 CR 3154 CR 3320 CR 3818 CR 3862 CR 3958
	Dec. 1980 - Aug. 1983	Commodore	CR 3047 CR 3321 CR 3476 CR 3902
	Dec. 1980 - Aug. 1983	Reaphook Hill	CR 3046 CR 3308 CR 3302 CR 3817 CR 3490
	Dec. 1980 - Aug. 1983	Mt. Aleck	CR 3045 CR 3626 CR 3296 CR 3820 CR 3527
Tenement Documents	Current	Mt. Roberts	CR Vol I
		Ann Hill	" "
		Wirrealpa	" "
		Mt. Frome	" "
		Commodore	" "
		Reaphook Hill	" "
		Mt. Aleck	" "
Published Reports		Mines and Prospects	CR 3984 Vol II
Drill Logs/ Assay Results		Wirrealpa Mt. Frome Mt. Roberts	CR 3984 Vol III
Core, Rock Chip Assay Results		Various	CR 3984 Vol IV
Rock Chip Assay Results		Various Prospects	CR 3984 Vol V
Rock, gossan Assay Results		Various Prospects	CR 3984 Vol VI
Stream Sediment Assay Results		Various Prospects	CR 3984 Vol VII
Petrological Reports		Various core gossans	CR 3984 Vol VIII
Drill Core		Wirrealpa	WD 1-17
		"	WD 18-19
		Mt. Roberts	MD 1-7
		"	MPD 1-4
		Mt. Frome	DDF 1-5
		"	DDM 1

MATERIAL	SCALE	COVERAGE	REFERENCE
Regional			
Geology	1:250,000	Flinders	FR 001
Tenement *	"	"	FR 002
Aeromagnetics *	"	"	FR 003
Gravity *	"	"	FR 004
Mt. Roberts			
Geology	1:20,000	Mt. Roberts	FR 005
S. Sed. Geoch. *	"	"	FR 006
Geology	1:5,000	Moro Point	FR 007
Geochem. *	"	"	FR 008
Geophysics *	"	"	FR 009
I.P.	Pseudo sections	"	FR 010-19
Wirrealpa			
Geology	1:50,000	Wirrealpa	FR 020
"	1:10,000	Wirrealpa Spring	FR 021
"	1:10,000	Ti Tree Gorge	FR 022
Geochem. *	1:10,000	Wirrealpa Spring	FR 023
Gamma Logs	Down hole	Wirrealpa	FR 024-37
Mt. Frome			
Geology	1:20,000	Mt. Frome	FR 038
"	1:10,000	Wilnuroona	FR 039
Geochem. Pb *	"	"	FR 040
Geochem. Zn *	"	"	FR 041
Rock chip	1:100	Grid A	FR 042-43
"	"	Grid B	FR 044
Geology	1:1,200	Moorowie	FR 045
I.P.	Pseudo sections	"	FR 046-49
Gamma Log	Down hole	DDMI	FR 050
Commodore			
Geology Pb/Zn *	1:20,000	Commodore	FR 051-54
"	1:5,000	Tea Cosy Reef	FR 055
Geochem. Pb/Zn *	1:20,000	Commodore	FR 056-63
Reaphook Hill			
Geology	1:20,000	Reaphook Hill	FR 064
Geochem. *	"	"	FR 065-67
Geology	1:5,000	Reaphook Reef	FR 068
Geology	1:20,000	Third Plain/Linda	FR 069
Geochem.	"	"	FR 070-72
Geology	1:5,000	Linda	FR 073
Rockchip *	"	"	FR 074
Geology	"	Third Plain	FR 075

MATERIAL	SCALE	COVERAGE	REFERENCE
Mt. Aleck			
Geology	1:20,000	Mern Merna	FR 076
Geochem. *	"	" "	FR 077-85
Rockchip		Vanessa	FR 086
Geology	1:20,000	Chace & Druid	FR 087
Geochem *	"	"	FR 088-90

BHP Minerals Limited
[Incorporated in WA]
"Wolfstep Building" 695 Burke Road
Camberwell Victoria 3124
Australia

The Director-General,
Department of Mines and Energy,
P.O. Box 151,
EASTWOOD, S.A., 5063.

17 FEB 1984

Dear Sir,

QUARTERLY REPORT EXPLORATION LICENCE 1138
MT. FROME - S.A. - 28/1/84

No field work was carried out during the period. The entire Flinders Ranges Project is presently being offered to other companies as a Joint Venture.

A summary report of the Flinders Ranges Project has previously been submitted.

Yours faithfully,
for BHP Minerals Limited

B. J. VIVIAN

Telephone (03) 82 8251
Telegrams
'Hematite' Melbourne
Telex 30 408

Postal Address
P.O. Box 559
Camberwell
Victoria 3124
Australia

Your Ref:
Our Ref: JB:sh:ls
E6/20/2/T

BHP Minerals Limited
[Incorporated in WA]
"Wolfstep Building" 695 Burke Road
Camberwell Victoria 3124
Australia

140

The Director-General,
Department of Mines and Energy,
P.O. Box 151,
EASTWOOD, S.A., 5063.

18 MAY 1984

Dear Sir,

QUARTERLY REPORT EXPLORATION LICENCE 1138
MT. FROME - S.A. - 25TH APRIL, 1984

No field work was carried out during the last quarter. Joint Venture arrangements with ESSO Minerals on the Flinders Ranges Project are presently being negotiated and we should be in a position to report on a detailed exploration program for the entire project by mid-June, 1984.

Yours faithfully,
for BHP Minerals Limited

B. J. VIVIAN

Telephone (03) 82 8251
Telegrams
'Hematite' Melbourne
Telex 30 408

Postal Address
P.O. Box 559
Camberwell
Victoria 3124
Australia

Your Ref:
Our Ref: SH:ls 3722
E6/20/3-T

141

BHP Minerals Limited
[Incorporated in WA]
"Wolfstep Building" 695 Burke Road
Camberwell Victoria 3124
Australia

1 AUG 1984

The Director-General,
Department of Mines and Energy,
P.O.BOX. 151,
EASTWOOD, S.A. , 5063.

Dear Sir,

QUARTERLY REPORT EXPLORATION LICENCE 1138
MT FROME -S.A.- 28th JULY, 1984.

No field work was carried out during the last quarter.

The Joint Venture Agreement with ESSO Minerals on the Flinders Rangers Project is currently being executed.

Yours faithfully,

B.J.VIVIAN.

RECEIVED
6 AUG 1984
DEPT. OF MINES AND ENERGY SECURITY
7722

813 3666
Telephone (03) ~~82 8251~~
Telegrams
'Hematite' Melbourne
Telex 30 408

Postal Address
P.O. Box 559
Camberwell
Victoria 3124
Australia

Your Ref:
Our Ref: E6/20/3-T
SH:PD.

142

ESSO AUSTRALIA LTD.

INCORPORATED IN NEW SOUTH WALES
G.P.O. BOX 4047 SYDNEY 2001 ★ TELEPHONE 236 2911 (AREA CODE 02)
ESSO HOUSE, 127 KENT STREET, SYDNEY, NEW SOUTH WALES
TELEGRAMS "ESSO" ★ CABLES "ESSOEAST"

SYDNEY 17 December, 1984

YOUR REF:

OUR REF: 6180/RH/593, 594-599 incl., 500

SUBJECT Flinder Range Joint Venture

Director-General,
Department of Mines & Energy,
191 Greenhill Road,
PARKSIDE SA 5063

Dear Sir,

I refer to the Flinders Range Joint Venture Agreement between Esso Exploration and Production Australia Inc. and BHP Minerals Limited, that was lodged with your Department under cover of my letter of 11 October, 1984, and Exploration Licences 934, 1080, 1084, 1085, 1129, 1138 and 1188.

In accordance with Clause 3.1 of the Agreement Esso, as operator in respect to these licences, submits Quarterly Reports for those titles listed hereunder :-

Exploration Licence 1138 (Mt Frome) - Quarterly Report for the period ending 28 October, 1984

A total of 370 metres reverse circulation and 1097 metres Rotary-Air blast drilling was completed at the Wilnaroona and Eric (formerly Camp Area) Prospects during this quarter.

Assay results have not been received to date and a full report of this drilling program including these results will be submitted in the next Quarterly Report.

We advise expenditures on the above project for the quarter 28.7.1984 to 28.10.1984 and cumulative to 28.10.1984 are as follows :

	Cumulative Previous Periods	This Period	Cumulative to date
Geological	493	6750	7243
Geophysical	-	-	-
Geochemical	-	3000	3000
Drilling	-	15000	15000
Technical Service	-	-	-
Other	-	3287	3287
Overheads (5%)	25	1402	1427
TOTAL	518	29439	29957

3722

ESSO AUSTRALIA LTD. 0143

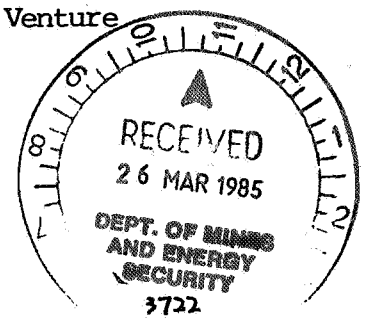
INCORPORATED IN NEW SOUTH WALES
G.P.O. BOX 4047 SYDNEY 2001 ★ TELEPHONE 236 2911 (AREA CODE 02)
ESSO HOUSE, 127 KENT STREET, SYDNEY, NEW SOUTH WALES
TELEGRAMS "ESSO" ★ CABLES "ESSOEAST"

SYDNEY 20 March, 1985

YOUR REF:

OUR REF: 6180/RH/593,594-599,500

SUBJECT Flinders Range Joint Venture



The Director-General
Department of Mines & Energy
191 Greenhill Road
PARKSIDE SA 5063

Dear Sir,

I refer to the Flinders Range Joint Venture Agreement between Esso Exploration and Production Australia Inc. and BHP Minerals Limited and Exploration Licences 934, 1080, 1084, 1085, 1129, 1138 and 1188.

In accordance with Clause 3.1 of the Agreement Esso, as operator in respect to these licences, submits hereunder the Quarterly Reports due in respect to the titles listed.

Exploration Licence 1138 (Mt. Frome) - Quarterly Report for the period ending 28 January 1985.

A full report on the results of drilling programme undertaken within the above Exploration Licence has been separately submitted.

Exploration proposals for the entire Flinders Ranges Joint Venture Project areas have been separately presented to your Department.

I advise expenditures on the abnove project for the quarter to 28.1.85 and cumulative to 28.1.85 are as follows:

	Cumulative Previous Periods	This Period	Cumulative to Date
Geological	7,243	13,346	20,589
Geophysical	-	-	-
Geochemical	3,000	(1,989)	1,011
Drilling	15,000	2,947	17,947
Technical Service	-	-	-
Computing	-	-	-
Other	3,287	-	3,287
Overheads (5%)	1,427	716	2,143
TOTAL	29,957	15,020	44,977

ESSO AUSTRALIA LTD.

INCORPORATED IN NEW SOUTH WALES
G.P.O. BOX 4047 SYDNEY 2001 ★ TELEPHONE 236 2911 (AREA CODE 02)
ESSO HOUSE, 127 KENT STREET, SYDNEY, NEW SOUTH WALES
TELEGRAMS "ESSO" ★ CABLES "ESSOEAST"

SYDNEY 7 June, 1985

YOUR REF:

OUR REF: 6180/RH/599, 500

SUBJECT Flinders Range Joint Venture

The Director-General
Department of Mines & Energy
191 Greenhill Road
PARKSIDE SA 5063

Dear Sir,

I refer to the Flinders Range Joint Venture Agreement between Esso Exploration and Production Australia Inc. and BHP Minerals Limited and Exploration Licences 1138 and 1188.

In accordance with Clause 3.1 of the Agreement Esso, as operator in respect to these licences, submits hereunder the Quarterly Reports due in respect to the titles listed.

Exploration Licence 1138 (Mt. Frome) - Quarterly Report for the period ending 28 April 1985.

A short drilling programme of four diamond drill holes within the ERIC Prospect (previously described) was commenced on 19 April 1985.

The proposed target depth of each of the drill holes is 100 metres (pre-collared to bedrock).

The drilling is being undertaken by Peter Nitschke Drilling Pty. Ltd. of Hahndorf, S.A. who are utilising a Bourne 1000TMD drill-rig.

Full details and results of this drilling will be included in the next quarterly report.

Expenditures on the above project for the quarter to 28.4.85 and cumulative to 28.4.85 are as follows:

	Cumulative Previous Periods	This Period	Cumulative to Date
Geological	20,589	5,729	26,318
Geophysical	-	-	-
Geochemical	1,011	-	1,011
Drilling	17,947	15,000	32,947
Technical Service	-	-	-
Computing	-	-	-
Other	3,287	160	3,447
Overheads (5%)	2,143	1,045	3,188
TOTAL	44,977	21,934	66,911

Yours faithfully,

Russell Hetherington

0145

BHP Minerals Limited
[Incorporated in WA]
"Wolfstep Building" 695 Burke Road
Camberwell Victoria 3124
Australia

15 OCT 1985

The Director General,
Department of Mines and Energy,
P.O. Box 151,
EASTWOOD, S.A. 5063.

Dear Sir,

QUARTERLY REPORT FOR EXPLORATION LICENCE 1138 -
MT. FROME, PERIOD ENDING 28TH JULY, 1985

* ~~No field work has been carried out during the last quarter for the abovementioned area.~~

A report of the 1985 drilling programme has been separately submitted. ~~Further~~ work will be dependant on the appraisal ~~of the~~ results of this drilling.

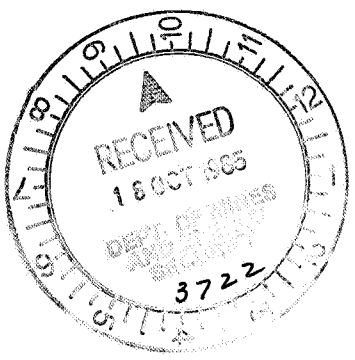
? where ?

We apologise for the delay in submitting this report, which has been due to confusion over responsibility for title maintenance following Esso's withdrawal from the Flinders Range Joint Venture.

* Drilling was completed at the ERIC prospect. Total ESSO expenditure during tenure of JV was $93,387 giving $26476 for this period.

Yours faithfully,
for BHP Minerals Limited

S.A. JOHNSON



Telephone 813 3666
Telegrams
'Hematite' Melbourne
Telex 30 408

Postal Address
P.O. Box 559
Camberwell
Victoria 3124

Your Ref:
Our Ref: JG:HR
E6/29/7-M

EXPLORATION LICENCE 1138

MT. FROME, SOUTH AUSTRALIA

REPORT FOR THE QUARTER ENDED 28th OCTOBER, 1985

by: S.T. Mann
Adelaide

CONTENTS

FIGURE

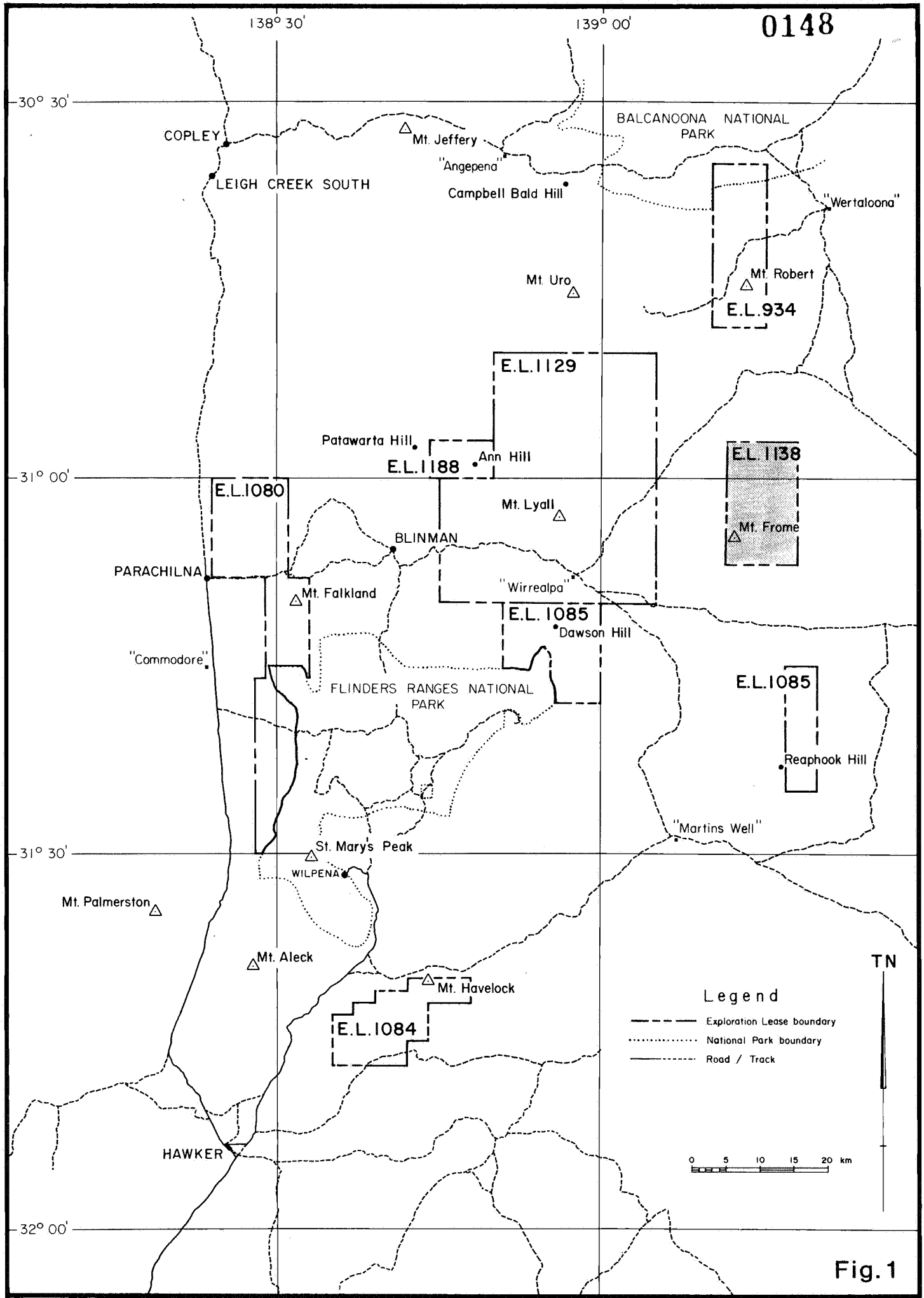


Fig. 1

Centre ADELAIDE	THE BROKEN HILL PROPRIETARY CO. LTD.	Project Nº 6-LI5-24
Date 12 · 11 · 85	FLINDERS RANGES, S.A. LOCATION MAP	Drawing Nº A4-443

EXPLORATION LICENCE 1138

MT. FROME, SOUTH AUSTRALIA

REPORT FOR THE QUARTER ENDED 28th OCTOBER, 1985

1. SUMMARY

Exploration Licence 1138, Mt. Frome of 206 square kilometres was granted to BHP Minerals Limited on the 28th April, 1983. On the 13th August, 1984 it became part of a Joint Venture Agreement with ESSO Exploration. The agreement was terminated on the 2nd September, 1985.

The location of E.L. 1138, Mt. Frome is shown on Figure 1.

Since the last quarterly report was submitted, no fieldwork has been undertaken within the Exploration Licence.

2. EXPENDITURE

No expenditure against this tenement has been made since the Heads of Agreement with ESSO Exploration and Production (Australia) Inc. was terminated on September 2nd, 1985.

(CR 4850)

EXPLORATION LICENCE 1138

MT. FROME - SOUTH AUSTRALIA

REPORT FOR THE QUARTER ENDED
28th JANUARY, 1986.

CONTENTS

FIGURES

APPENDIX

EXPLORATION LICENCE 1138

MT. FROME, SOUTH AUSTRALIA

REPORT FOR THE QUARTER ENDED 28th JANUARY, 1986

1. GENERAL

Exploration Licence 1138, Mt. Frome of 206 square kilometres was granted to BHP Minerals Limited on the 28th April, 1983. On the 13th August, 1984 it became part of a Joint Venture Agreement with ESSO Exploration. This agreement was terminated on the 2nd September, 1985.

The location of E.L. 1138, Mt. Frome is shown on Figure 1.

2. FIELD INVESTIGATIONS

2.1 *Rotary Air Blast Drilling Programme.*

A Rotary Air Blastdrilling programme was proposed at the Eric Prospect in the Mt. Frome Exploration Licence. Proposed holes were pegged around Pb and Zn anomalies identified from previous BHP drilling. In addition, the grid was extended to the south, with holes being pegged at 100 metre intervals in an effort to close off the anomaly.

Drilling was confined to areas underlain by Lower Cambrian carbonate units which contain lead and zinc mineralization of the Mississippi Valley type. The grid was extended to the south until Parachilna Formation or Pound Quartzite was recognised either in outcrop or from the drillholes.

All fill-in holes around previous Pb-Zn anomalies were completed. Fill-in holes included REP108 - REP126 and REP129 - REP130. Two holes were not drilled because of outcrop. Only one fill-in hole was abandoned. REP109 was stopped at 12 metres, before reaching

unweathered bedrock because the hole was collapsing around the drillrods and sample return became negligible.

A number of other holes from the grid extension to the south were also abandoned.

REP 134 was abandoned at 30 metres depth because free flowing fine white sands jammed the rods and prevented adequate sample return. REP135, 136 and 141 were stopped at 46 m, 22 m and 14 m respectively, since the holes could potentially have gone to quite a depth in the soft white sands. These sands were interpreted as being outside the prospective area. REP138 and 139 were drilled within an actual creek bed and could not penetrate the boulder gravels within that creek.

The lithologies intersected in the drillholes generally included red-brown soils towards the surface followed by weathered bedrock. Within or adjacent to the creeks the red brown soils often had boulder or cobble conglomerates associated with them. Holes REP134 - 137, 140, 141 and 143 all penetrated a fine, white, sometimes flowing sand which probably represented deeply weathered Parachilna Formation or less likely the Rawnsley Quartzite Member of the Pound Quartzite.

Samples were collected at 2 metre intervals and were dispatched to Comlabs Pty. Ltd. in Adelaide and assayed for Cu, Pb, Zn and Ag. (Appendix 1). Figure 2 shows the location of drillholes while Figures 3 and 4 are contour maps of the maximum lead and maximum zinc values per hole respectively.

Logistics of the drilling programme are as follows:

Number of holes drilled	:	38
Number of metres drilled	:	445.5 metres
Average hole depth	:	11.7 metres
Maximum hole depth	:	46 metres
Minimum hole depth	:	0.5 metres
No. of samples collected	:	229

Hole No.	Depth (m)	Coordinates		ADL Sample No.	No. of geochemistry Samples
REP 108	21	6568150N	328400E	10000 - 10010	11
109	12	6568050N	328400E	10011 - 10016	6
110	13	6568000N	328350E	10017 - 10023	7
111	6	6567950N	328400E	10024 - 10026	3
112	14	6567900N	328450E	10027 - 10033	7
113	0.5	6567850N	328450E	No sample	-
114	6	6567800N	328450E	10035 - 10037	3
115	3	6567750N	328500E	10038 - 10039	2
116	6	6567750N	328550E	10040 - 10041, 10034	3
117	18	6567750N	328600E	10042 - 10050	9
118	2	6567700N	328650E	10051	1
119	17	6567700N	328550E	10052 - 10060	9
120	2	6567650N	328550E	10061	1
121	22	6567600N	328550E	10062 - 10072	11
122	28	6567650N	328600E	10073 - 10086	14
123	8	6567550N	328550E	10087 - 10090	4
124	10	6567500N	328550E	10091 - 10095	5
125	1	6567450N	328550E	10096	1
126	2	6567450N	328500E	10097	1
127	1	6567400N	328450E	10098	1
128	1	6567400N	328500E	10099	1
129	15	6567550N	328600E	10100 - 10107	8
130	8	6567550N	328650E	10108 - 10111	4
131	15	6567400N	328200E	10112 - 10119	8
132	1	6567300N	328200E	10120	1
133	6	6567400N	328300E	10121 - 10123	3
134	30	6567400N	327700E	10124 - 10138	15
135	46	6567400N	327800E	10139 - 10161	23
136	22	6567400N	327900E	10162 - 10172	11
137	30	6567300N	328000E	10173 - 10187	15
138	2	6567400N	328000E	10188	1
139	1	6567400N	328100E	10189	1
140	30	6567300N	328100E	10190 - 10204	15
141	14	6567200N	328200E	10205 - 10211	7
142	3	6567200N	328100E	10212 - 10213	2
143	14	6567100N	328100E	10214 - 10220	7
144	9	6567200N	328000E	10221 - 10225	5
145	6	6567300N	327900E	10226 - 10228	3

3. EXPENDITURE

Exploration Expenditure for the quarter under review totalled $11,009. Details of the expenditure for the period 29th October, 1985 to 28th January, 1986 are as follows:

	$
Wages & Salaries	3,059
Field Support	498
Drafting	581
Drilling	3,708
Vehicles	413
Geochemistry	2,226
Administration Charges	524
	$11,009

APPENDIX 1

ROTARY AIR BLAST DRILLING GEOCHEMICAL RESULTS

COMLABS Pty. Ltd.
COMPUTERISED ANALYTICAL LABORATORIES

0156

Head Office and
Central Laboratory
305 South Road,
Mile End South,
Sth. Aust. 5031.
Tel: (08) 43 5722
Telex: AA89323

NATA REGISTERED No. 1526

OUR REF.: COM852173

YOUR REF.: B48/A77 Sheet 008739

Mr. S. Mann
BHP Exploration Co. Ltd.
125-129 Rundle Street
KENT TOWN

SA 5061

December 13, 1985

Dear Stephen

RE: JOB COM852173

Enclosed are the assays for the samples delivered to our laboratory on November 29, 1985

Yours Sincerely,
COMLABS PTY LTD

per :

c.c.: BHP ADELAIDE No. of copies : 1
c.c.: BHP VICTORIA No. of copies : 1

Report Length 15 pages

COMLABS Pty. Ltd.
COMPUTERISED ANALYTICAL LABORATORIES

ANALYTICAL REPORT

JOB COM852173
O/N : B48/A77 Sheet 008739

0157

HOLE NUMBER	SAMPLE INTERVAL (m)	SAMPLE	Cu	Pb	Zn	Ag
REP 108	0 - 2	ADL 10000	80	1300	155	<1
	4	ADL 10001	95	1300	170	<1
	6	ADL 10002	95	1500	140	<1
	8	ADL 10003	110	1650	165	1
	10	ADL 10004	110	2000	195	1
	12	ADL 10005	130	2150	220	1
	14	ADL 10006	165	3300	290	<1
	16	ADL 10007	310	3450	470	1
	18	ADL 10008	600	3450	690	1
	20	ADL 10009	530	3950	710	<1
	21	ADL 10010	400	3600	580	1
REP 109	0 - 2	ADL 10011	80	380	230	<1
	4	ADL 10012	105	6850	220	<1
	6	ADL 10013	350	3.10%	230	2
	8	ADL 10014	1650	4.35%	1400	6
	10	ADL 10015	1800	6.70%	800	14
	12	ADL 10016	1450	4.45%	580	10
REP 110	0 - 2	ADL 10017	38	1400	26	<1
	4	ADL 10018	38	1600	28	<1
	6	ADL 10019	38	3000	32	1
	8	ADL 10020	32	2900	42	1
	10	ADL 10021	70	2250	80	1
	12	ADL 10022	LNR	LNR	LNR	LNR
	13	ADL 10023	90	2350	145	1
REP 111	0 - 2	ADL 10024	430	4150	610	1
		UNITS	ppm	ppm	ppm	ppm
		SCHEME	AAS1	AAS1 AAS1A	AAS1	AAS3

ANALYTICAL REPORT

JOB COM852173
O/N : B48/A77 Sheet 008739

0158

HOLE NUMBER	SAMPLE INTERVAL (m)	SAMPLE	Cu	Pb	Zn	Ag
REP 111	2 - 4	ADL 10025	760	5150	400	3
	6	ADL 10026	970	5300	520	2
REP 112	0 - 2	ADL 10027	48	3900	50	<1
	4	ADL 10028	60	7600	26	<1
	6	ADL 10029	50	7050	26	<1
	8	ADL 10030	48	6550	42	<1
	10	ADL 10031	115	5100	65	<1
	12	ADL 10032	210	6100	110	<1
	14	ADL 10033	230	6000	185	1
Part of REP 116	0 - 2	ADL 10034	250	1.10%	65	1
REP 114	0 - 2	ADL 10035	40	1150	95	<1
	4	ADL 10036	44	1850	36	<1
	6	ADL 10037	165	2450	95	1
REP 115	0 - 2	ADL 10038	350	7950	105	1
	3	ADL 10039	760	8050	220	1
Part of REP 116	2 - 4	ADL 10040	230	6450	60	1
	6	ADL 10041	640	9050	175	<1
REP 117	0 - 2	ADL 10042	260	6650	145	<1
	4	ADL 10043	420	9350	200	1
	6	ADL 10044	1100	1.10%	650	<1
	8	ADL 10045	160	1.60%	90	1
	10	ADL 10046	160	1.23%	80	<1
	12	ADL 10047	540	9250	230	<1
	14	ADL 10048	710	6550	340	1
	16	ADL 10049	900	6750	520	1
		UNITS	ppm	ppm	ppm	ppm
		SCHEME	AAS1	AAS1 AAS1A	AAS1	AAS3

ANALYTICAL REPORT

JOB COM852173
O/N : B48/A77 Sheet 008739

0159

HOLE NUMBER	SAMPLE INTERVAL (m)	SAMPLE	Cu	Pb	Zn	Ag
REP 117	16 - 18	ADL 10050	230	5700	220	1
REP 118	0 - 2	ADL 10051	65	670	60	<1
REP 119	0 - 2	ADL 10052	120	1.47%	60	<1
	4	ADL 10053	155	2.30%	85	<1
	6	ADL 10054	125	1.66%	46	<1
	8	ADL 10055	150	1.41%	70	<1
	10	ADL 10056	130	1.09%	65	<1
	12	ADL 10057	160	1.05%	95	1
	14	ADL 10058	95	1.03%	60	1
	16	ADL 10059	130	6750	195	1
	17	ADL 10060	200	5350	340	1
REP 120	0 - 2	ADL 10061	100	3350	50	<1
REP 121	0 - 2	ADL 10062	46	4400	22	<1
	4	ADL 10063	90	9700	22	<1
	6	ADL 10064	185	2.45%	34	<1
	8	ADL 10065	100	2.10%	22	1
	10	ADL 10066	65	9900	22	<1
	12	ADL 10067	44	4900	18	<1
	14	ADL 10068	90	1.21%	30	<1
	16	ADL 10069	220	1.07%	90	1
	18	ADL 10070	140	8300	44	1
	20	ADL 10071	175	7500	70	1
	22	ADL 10072	155	6750	95	1
REP 122	0 - 2	ADL 10073	130	5950	80	1
	4	ADL 10074	115	8250	60	<1
		UNITS	ppm	ppm	ppm	ppm
		SCHEME	AAS1	AAS1 AAS1A	AAS1	AAS3

ANALYTICAL REPORT

JOB COM852173
O/N : B48/A77 Sheet 008739

0160

HOLE NUMBER	SAMPLE INTERVAL (m)	SAMPLE	Cu	Pb	Zn	Ag
REP 122	0 - 6	ADL 10075	135	2.80%	60	1
	8	ADL 10076	195	4.30%	48	<1
	10	ADL 10077	165	5.30%	32	<1
	12	ADL 10078	145	4.40%	26	1
	14	ADL 10079	105	2.80%	22	1
	16	ADL 10080	9	700	7	<1
	18	ADL 10081	12	310	6	1
	20	ADL 10082	18	480	8	1
	22	ADL 10083	14	240	7	<1
	24	ADL 10084	44	2900	28	<1
	26	ADL 10085	135	4800	120	1
	28	ADL 10086	120	3100	95	1
REP 123	0 - 2	ADL 10087	125	2550	55	1
	4	ADL 10088	135	3400	55	1
	6	ADL 10089	250	5550	150	1
	8	ADL 10090	670	3400	680	1
REP 124	0 - 2	ADL 10091	140	1100	60	<1
	4	ADL 10092	170	1800	55	1
	6	ADL 10093	270	6600	180	1
	8	ADL 10094	175	4400	190	1
	10	ADL 10095	195	4000	230	1
REP 125	0 - 1	ADL 10096	44	135	95	<1
REP 126	0 - 2	ADL 10097	34	125	105	<1
REP 127	0 - 1	ADL 10098	42	115	90	<1
REP 128	0 - 1	ADL 10099	38	145	110	<1
		UNITS	ppm	ppm	ppm	ppm
		SCHEME	AAS1	AAS1 AAS1A	AAS1	AAS3

ANALYTICAL REPORT

JOB COM852173
O/N : B48/A77 Sheet 008739

0161

HOLE NUMBER	SAMPLE INTERVAL (m)	SAMPLE	Cu	Pb	Zn	Ag
REP 129	0 - 2	ADL 10100	30	1700	22	<1
	4	ADL 10101	24	630	14	<1
	6	ADL 10102	80	7150	34	1
	8	ADL 10103	95	1.16%	50	1
	10	ADL 10104	70	4900	30	1
	12	ADL 10105	85	2850	44	1
	14	ADL 10106	75	2150	48	1
	15	ADL 10107	175	2400	155	3
REP 130	0 - 2	ADL 10108	48	3000	55	1
	4	ADL 10109	55	3350	60	1
	6	ADL 10110	60	2800	60	1
	8	ADL 10111	175	3300	140	2
REP 131	0 - 2	ADL 10112	40	115	95	<1
	4	ADL 10113	34	270	70	1
	6	ADL 10114	44	390	32	1
	8	ADL 10115	140	510	75	1
	10	ADL 10116	140	530	80	1
	12	ADL 10117	280	480	175	1
	14	ADL 10118	550	500	450	2
	15	ADL 10119	290	310	280	1
REP 132	0 - 1	ADL 10120	42	105	155	<1
REP 133	0 - 2	ADL 10121	42	85	65	<1
	4	ADL 10122	280	490	230	<1
	6	ADL 10123	190	400	190	<1
REP 134	0 - 2	ADL 10124	34	65	65	<1
		UNITS	ppm	ppm	ppm	ppm
		SCHEME	AAS1	AAS1 AAS1A	AAS1	AAS3

ANALYTICAL REPORT

JOB COM852173
O/N : B48/A77 Sheet 008739

0162

HOLE NUMBER	SAMPLE INTERVAL (m)	SAMPLE	Cu	Pb	Zn	Ag
REP 134	2 - 4	ADL 10125	38	100	80	<1
	6	ADL 10126	30	170	50	<1
	8	ADL 10127	7	30	22	<1
	10	ADL 10128	6	28	18	1
	12	ADL 10129	10	60	18	<1
	14	ADL 10130	10	50	20	<1
	16	ADL 10131	8	70	55	<1
	18	ADL 10132	6	55	16	<1
	20	ADL 10133	9	115	14	<1
	22	ADL 10134	6	48	20	<1
	24	ADL 10135	4	28	55	<1
	26	ADL 10136	8	28	50	<1
	28	ADL 10137	6	14	10	<1
	30	ADL 10138	5	10	7	<1
REP 135	0 - 2	ADL 10139	30	60	100	<1
	4	ADL 10140	24	65	55	<1
	6	ADL 10141	9	60	14	<1
	8	ADL 10142	8	55	40	<1
	10	ADL 10143	6	42	14	<1
	12	ADL 10144	4	8	7	<1
	14	ADL 10145	2	4	4	<1
	16	ADL 10146	4	10	155	<1
	18	ADL 10147	3	<4	5	<1
	20	ADL 10148	3	<4	16	<1
	22	ADL 10149	3	<4	3	<1
		UNITS	ppm	ppm	ppm	ppm
		SCHEME	AAS1	AAS1	AAS1	AAS3

ANALYTICAL REPORT

JOB COM852173
O/N : B48/A77 Sheet 008739

0163

HOLE NUMBER	SAMPLE INTERVAL (m)	SAMPLE	Cu	Pb	Zn	Ag
REP 135	22 - 24	ADL 10150	3	<4	8	<1
	26	ADL 10151	4	4	10	<1
	28	ADL 10152	4	<4	7	<1
	30	ADL 10153	3	<4	4	<1
	32	ADL 10154	4	4	14	<1
	34	ADL 10155	4	40	28	<1
	36	ADL 10156	4	14	8	<1
	38	ADL 10157	4	10	4	<1
	40	ADL 10158	9	50	18	<1
	42	ADL 10159	32	85	30	<1
	44	ADL 10160	60	130	24	1
	46	ADL 10161	85	135	28	1
REP 136	0 - 2	ADL 10162	32	55	90	1
	4	ADL 10163	30	46	60	<1
	6	ADL 10164	48	75	48	<1
	8	ADL 10165	50	120	55	<1
	10	ADL 10166	44	125	42	<1
	12	ADL 10167	38	115	48	<1
	14	ADL 10168	12	55	12	<1
	16	ADL 10169	12	60	30	<1
	18	ADL 10170	14	70	42	<1
	20	ADL 10171	8	46	12	<1
	22	ADL 10172	8	42	9	<1
REP 137	0 - 2	ADL 10173	20	80	42	<1
	4	ADL 10174	6	20	5	<1
		UNITS	ppm	ppm	ppm	ppm
		SCHEME	AAS1	AAS1	AAS1	AAS3

ANALYTICAL REPORT

JOB COM852173
O/N : B48/A77 Sheet 008739

0164

HOLE NUMBER	SAMPLE INTERVAL (m)	SAMPLE	Cu	Pb	Zn	Ag
REP 137	4 - 6	ADL 10175	5	42	5	<1
	8	ADL 10176	4	42	16	<1
	10	ADL 10177	5	46	10	<1
	12	ADL 10178	4	24	5	<1
	14	ADL 10179	12	16	5	<1
	16	ADL 10180	6	30	80	<1
	18	ADL 10181	10	75	4	<1
	20	ADL 10182	28	240	12	<1
	22	ADL 10183	26	210	14	<1
	24	ADL 10184	20	260	20	<1
	26	ADL 10185	26	50	12	<1
	28	ADL 10186	24	85	16	1
	30	ADL 10187	22	210	14	<1
REP 138	0 - 2	ADL 10188	32	50	125	<1
REP 139	0 - 1	ADL 10189	38	95	115	<1
REP 140	0 - 2	ADL 10190	32	42	75	<1
	4	ADL 10191	30	55	95	<1
	6	ADL 10192	6	28	10	<1
	8	ADL 10193	8	30	22	<1
	10	ADL 10194	6	12	9	1
	12	ADL 10195	3	8	6	<1
	14	ADL 10196	3	8	2	<1
	16	ADL 10197	2	8	20	<1
	18	ADL 10198	3	8	4	<1
	20	ADL 10199	4	42	4	<1
		UNITS	ppm	ppm	ppm	ppm
		SCHEME	AAS1	AAS1	AAS1	AAS3

ANALYTICAL REPORT

JOB COM852173
O/N : B48/A77 Sheet 008739

0165

HOLE NUMBER	SAMPLE INTERVAL (m)	SAMPLE	Cu	Pb	Zn	Ag
REP 140	20 - 22	ADL 10200	3	42	2	<1
	24	ADL 10201	9	270	9	<1
	26	ADL 10202	24	450	40	<1
	28	ADL 10203	32	420	48	<1
	30	ADL 10204	100	250	170	<1
REP 141	0 - 2	ADL 10205	28	34	42	24
	4	ADL 10206	22	32	44	<1
	6	ADL 10207	5	42	5	<1
	8	ADL 10208	4	24	7	<1
	10	ADL 10209	3	6	6	<1
	12	ADL 10210	2	<4	<2	<1
	14	ADL 10211	2	4	<2	<1
REP 142	0 - 2	ADL 10212	8	12	9	<1
	3	ADL 10213	38	65	170	<1
REP 143	0 - 2	ADL 10214	44	95	130	<1
	4	ADL 10215	6	44	6	<1
	6	ADL 10216	50	115	155	<1
	8	ADL 10217	8	38	7	<1
	10	ADL 10218	3	18	2	<1
	12	ADL 10219	4	20	2	<1
	14	ADL 10220	5	8	3	<1
REP 144	0 - 2	ADL 10221	40	24	55	1
	4	ADL 10222	5	12	5	<1
	6	ADL 10223	12	24	26	<1
	8	ADL 10224	6	12	40	<1
		UNITS	ppm	ppm	ppm	ppm
		SCHEME	AAS1	AAS1	AAS1	AAS3

ANALYTICAL REPORT

JOB COM852173
O/N : B48/A77 Sheet 008739

0166

HOLE NUMBER	SAMPLE INTERVAL (m)	SAMPLE	Cu	Pb	Zn	Ag
REP 144	8 - 9	ADL 10225	3	6	10	<1
REP 145	0 - 2	ADL 10226	24	50	85	<1
	4	ADL 10227	18	46	32	<1
	6	ADL 10228	22	50	38	<1
		UNITS	ppm	ppm	ppm	ppm
		SCHEME	AAS1	AAS1	AAS1	AAS3

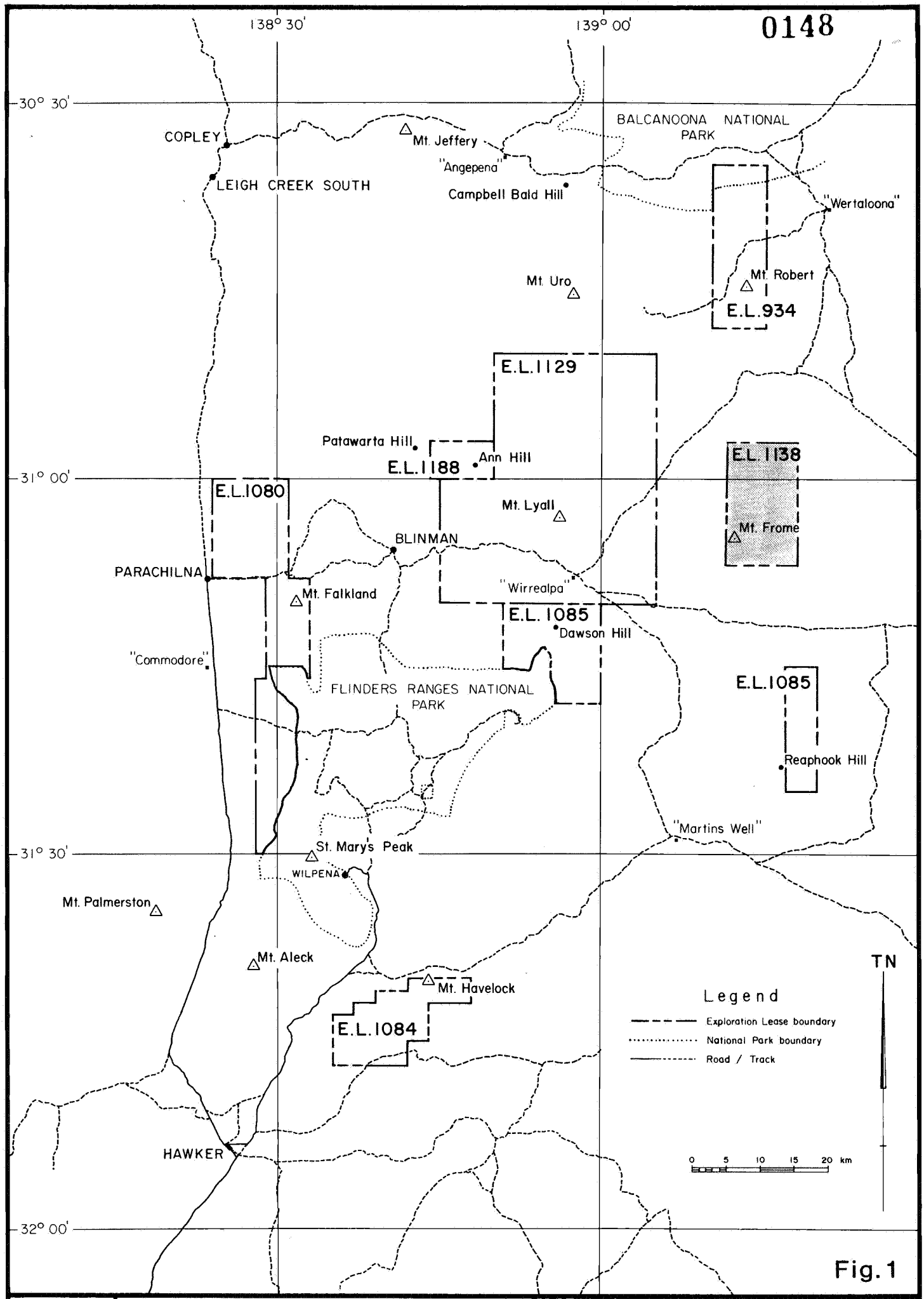


Fig. 1

Centre ADELAIDE	THE BROKEN HILL PROPRIETARY CO. LTD.	Project Nº 6-L15-24
Date 12 · 11 · 85	FLINDERS RANGES, S.A.	Drawing Nº A4-443
	LOCATION MAP	

328 000 m E

329 000 m E

6 569 000 m N

6 568 000 m N

1 250 — 500ppm

2 1700 — 1000ppm — 500 ppm

3 960

4 1700

5 1550

6 1500 — 1000 ppm

7 830

8 380 — 500ppm

9 830

10 46

11 130

12 820

13 280

14 420

15 280

16 135

17 280

18 400

19 650

20

21 2300

22 230

23 1500

24 220

25 840 — 1000ppm

26 140

27 3600

28 350

29 300

30 1050

31 290

32 580

33 1750

34 340

35 140

36 860

37 270 — 500ppm

38 14 400 — 1% — 0.5%

39 3000 — 500 ppm — 1000 ppm

40 8050

41 2150

42 490

43 50 500

44 3650

45 380

46 1350

47 2050 — 1000ppm

48 640

49 360

50 340

51 610

52 720

53 810

54 4300

55 850

110 3000

56 42 000

57 1700

108 3950

109 67 000

111 5300

112 7600

64 1700

65 240

66 220

113 — 0.5% — 1%

114 2450

69 16 700

68 1200

67 165 — 500ppm — 1000 ppm

70 3300

71 2650

72 340

73 175

74 550

75 80

76 36

77 530 — 1000ppm

115 8050

116 11 000

117 16 000

86 34 000

119 23 000

87 10 700

118 670

88 8500

120 3350

122 53 000

78 85

79 140

80 850

81 250

82 150

83 300

84 870

85 1050

98 85

97 75

96 400

95 340

94 230

93 85

92 520

91 100

90 3350

121 24 500

89 5 450 — 0.5% — 1%

123 5550

129 11 600

130 3350

107 120

106 430

105 440

104 440

103 400

102 410

101 115

100 2 050

124 6600

99 19 400

126 125

125 135

134 115

135 135

136 125

138 50

139 95

131 530 — 500 ppm

133 490

127 115

128 145

145 50

137 260

140 450

132 105

144 24

142 65

141 42

143 115

N

328 000 m E

329 000 m E

LEGEND

—— 500 ppm —— Maximum Pb value contours

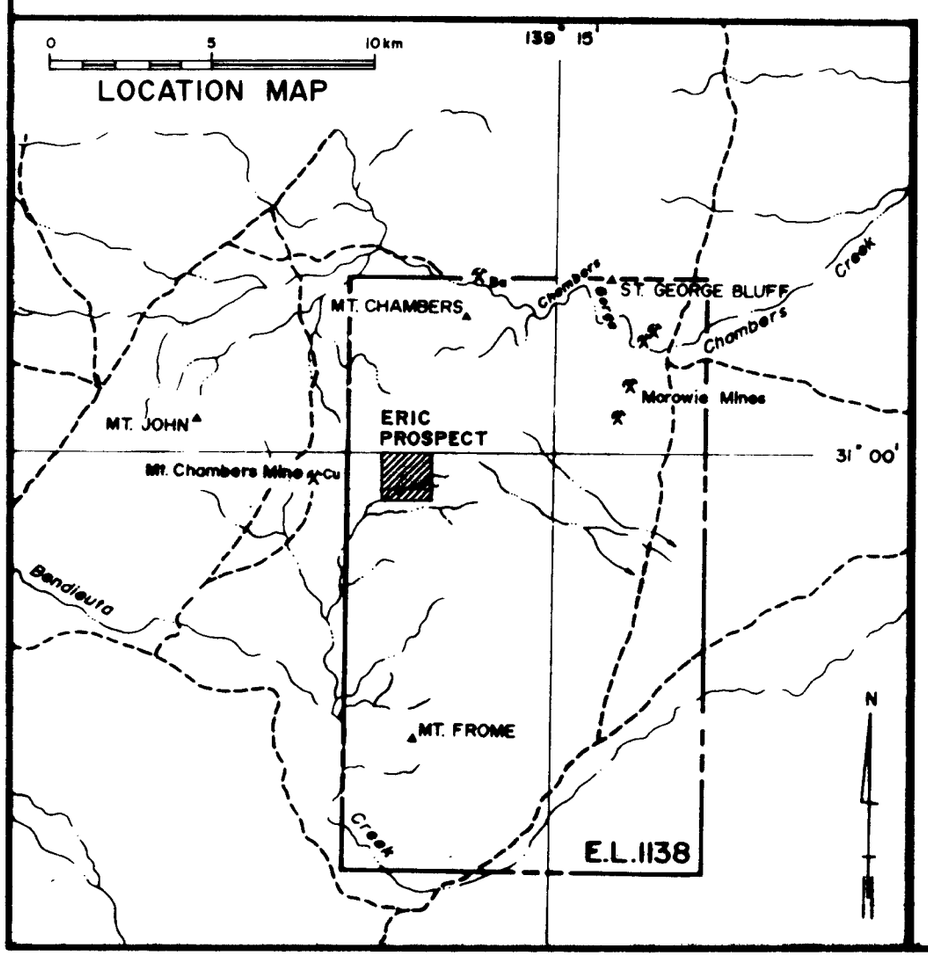
o 80 / 850 R.A.B. drillhole, prefixed REP *(maximum lead value)*

—— Creeks

Scale 1:5 000

0 100 200 300 400 metres

Fig. 2



3722-10

THE BROKEN HILL PROPRIETARY CO. LTD.
EXPLORATION DEPARTMENT

E.L.1138 MT. FROME, S.A.
ERIC PROSPECT
MAXIMUM LEAD VALUES

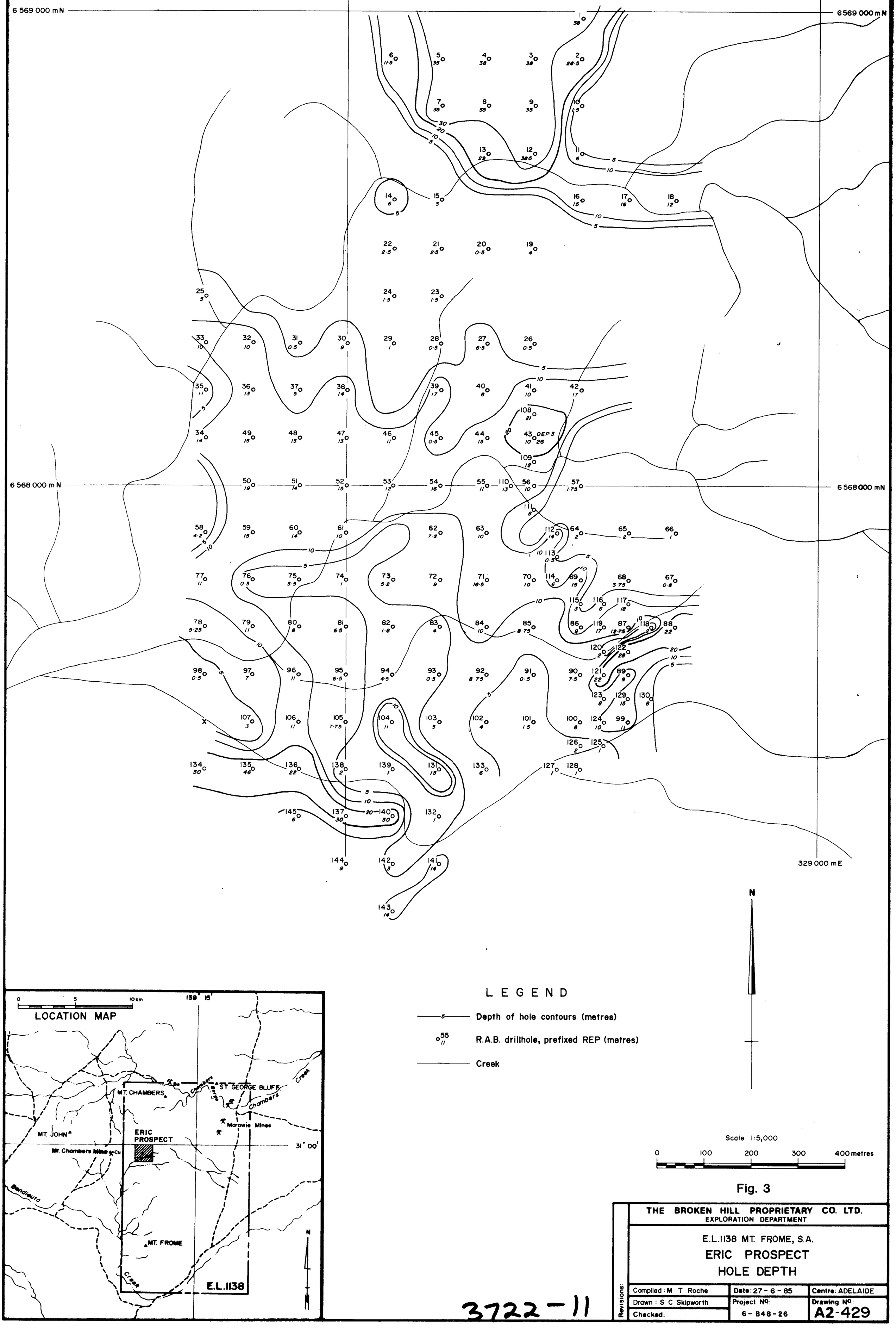
Revisions			
	Compiled: M T Roche	Date: 27 - 6 - 85	Centre: ADELAIDE
	Drawn: S C Skipworth	Project No: 6 - 848 - 25	Drawing No: A2-428
	Checked:		

328 000 mE

329 000 mE

6 569 000 mN

6 568 000 mN



329 000 mE

N

LEGEND

5 — Depth of hole contours (metres)

55/11 — R.A.B. drillhole, prefixed REP (metres)

Creek

Scale 1:5,000

0 100 200 300 400 metres

Fig. 3

3722-11

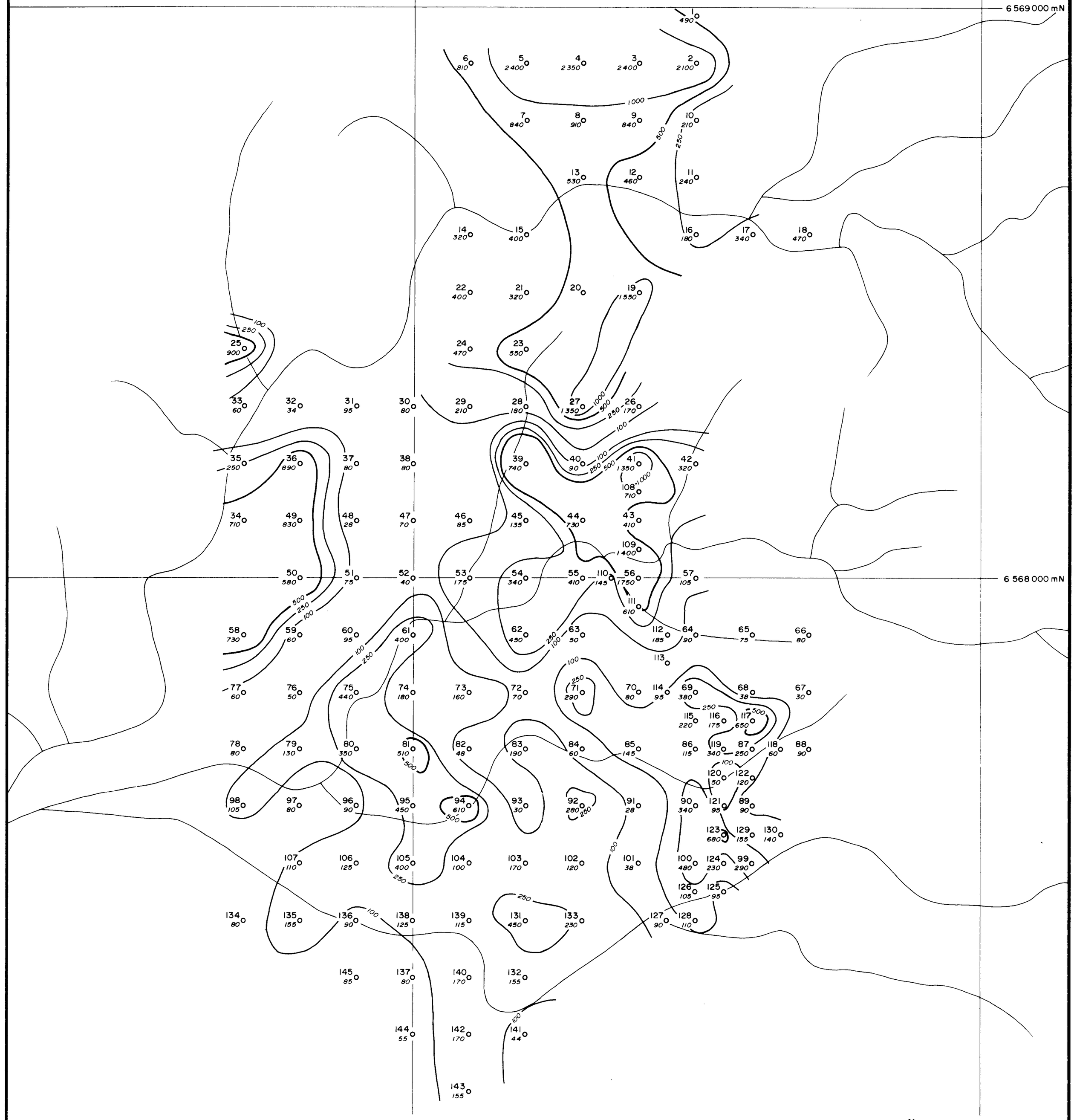
	THE BROKEN HILL PROPRIETARY CO. LTD. EXPLORATION DEPARTMENT		
Revisions:	E.L.1138 MT. FROME, S.A. ERIC PROSPECT HOLE DEPTH		
	Compiled: M T Roche	Date: 27 - 6 - 85	Centre: ADELAIDE
	Drawn: S C Skipworth	Project No: 6 - 848 - 26	Drawing No: A2-429
	Checked:		

328 000 m E

329 000 m E

6 569 000 mN

6 568 000 mN



N

Scale 1:5 000

0 100 200 300 400m

LEGEND

—500— Maximum Zn value contour (ppm)

o^{134}_{60} R.A.B. drillhole, prefixed REP *(maximum zinc value)*

——— Creeks

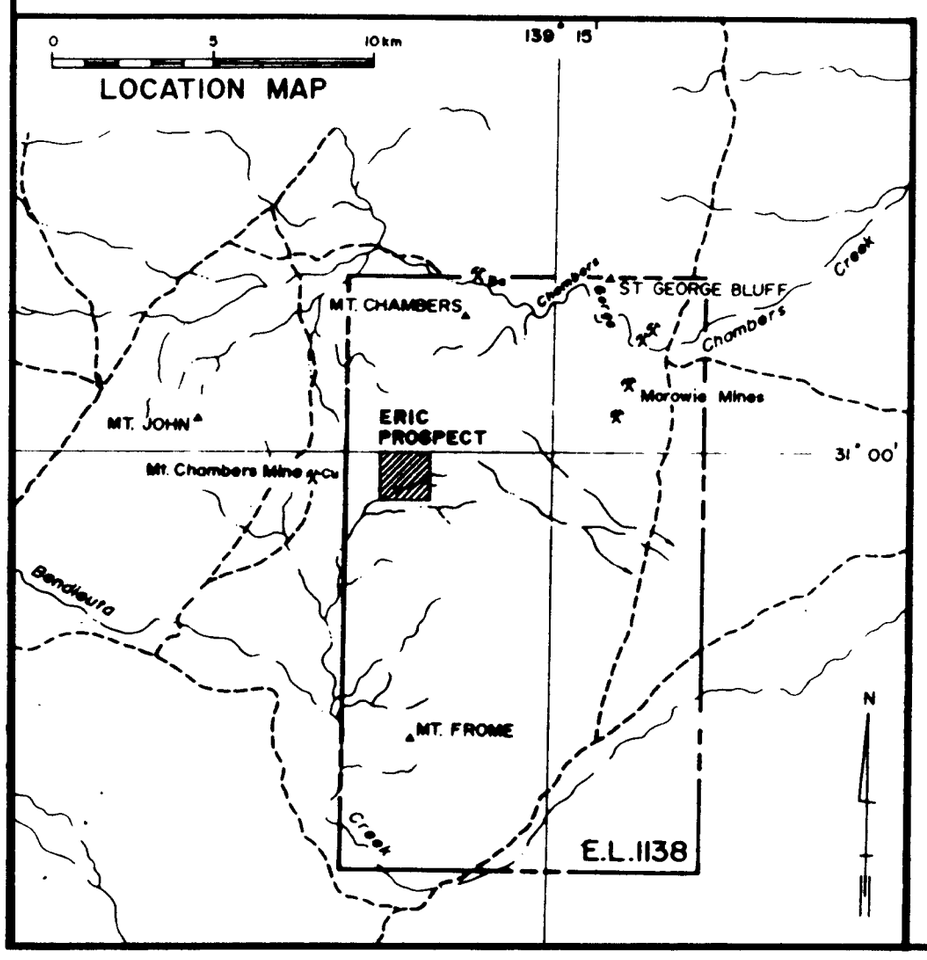


Fig. 4

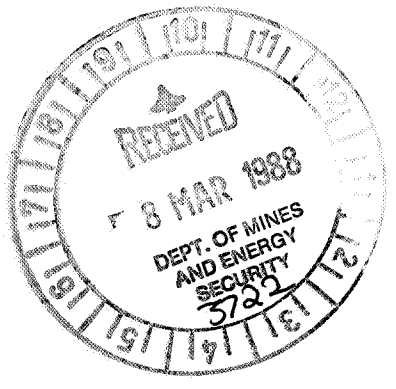
	THE BROKEN HILL PROPRIETARY CO. LTD. EXPLORATION DEPARTMENT		
Revisions:	E.L.1138 MT. FROME, S.A. ERIC PROSPECT MAXIMUM ZINC VALUES		
	Prepared : S T Mann	Date: 16 - 1 - 86	Centre: ADELAIDE
	Drawn : S C Skipworth	Project No: 6 – B48 – 19	Drawing No: A2-460
	Checked:		

3722-12

CR 5747

EXPLORATION LICENCE 1138
MOUNT FROME, SOUTH AUSTRALIA

REPORT FOR THE QUARTER ENDING
27th OCTOBER 1987.



CONTENTS

FIGURES

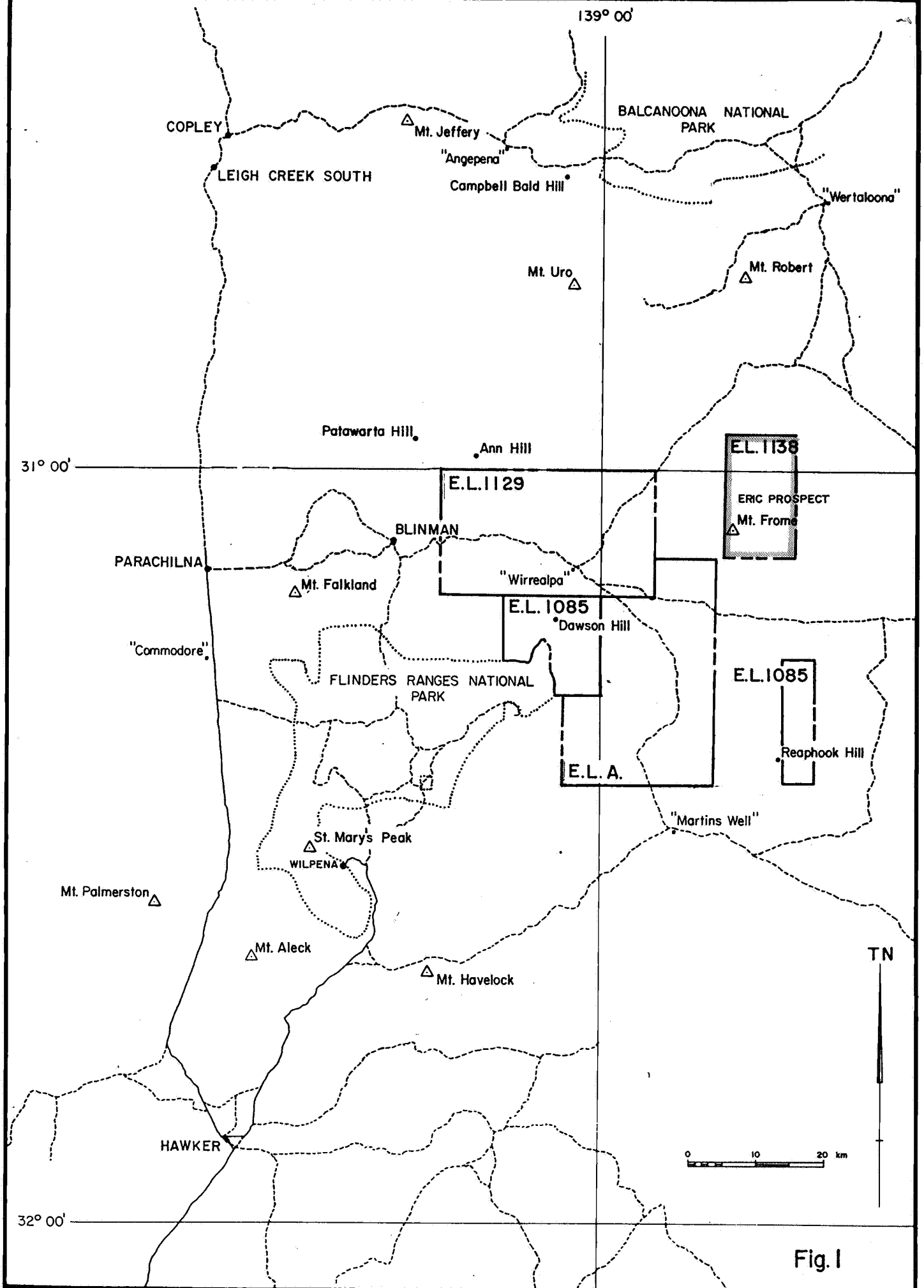


Fig. 1

Centre ADELAIDE	THE BROKEN HILL PROPRIETARY CO. LTD. FLINDERS RANGES , S.A. LOCATION MAP	Project No 6-L15-24
Date 12 · 11 · 85		Drawing No A4-443A

EXPLORATION LICENCE 1138

MOUNT FROME, SOUTH AUSTRALIA

REPORT FOR THE QUARTER ENDING 27TH OCTOBER 1987

1. GENERAL

Exploration Licence 1138, Mount Frome of 206 sq km was granted to BHP Minerals Limited on 28th April 1983. On the 13th August 1984 it became part of a joint venture agreement with Esso Exploration. This agreement was terminated on the 2nd September, 1985.

The location of EL.1138 Mount Frome is shown on Figure 1.

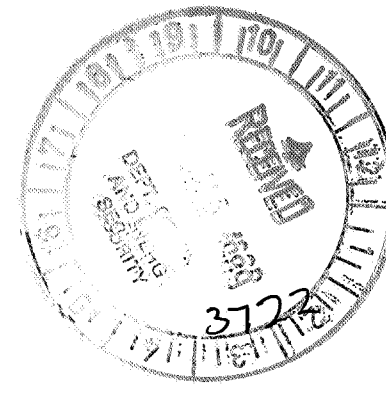
2. FIELD INVESTIGATIONS

Since the last quarterly report was submitted no field work has been undertaken within the Exploration Licence.

3. EXPENDITURE

Minor administrative expenditure has been incurred against this tenement amounting to $320.

CR 6407
EXPLORATION LICENCE 1138
MT. FROME, SOUTH AUSTRALIA
SURRENDER REPORT.



CONTENTS

FIGURES

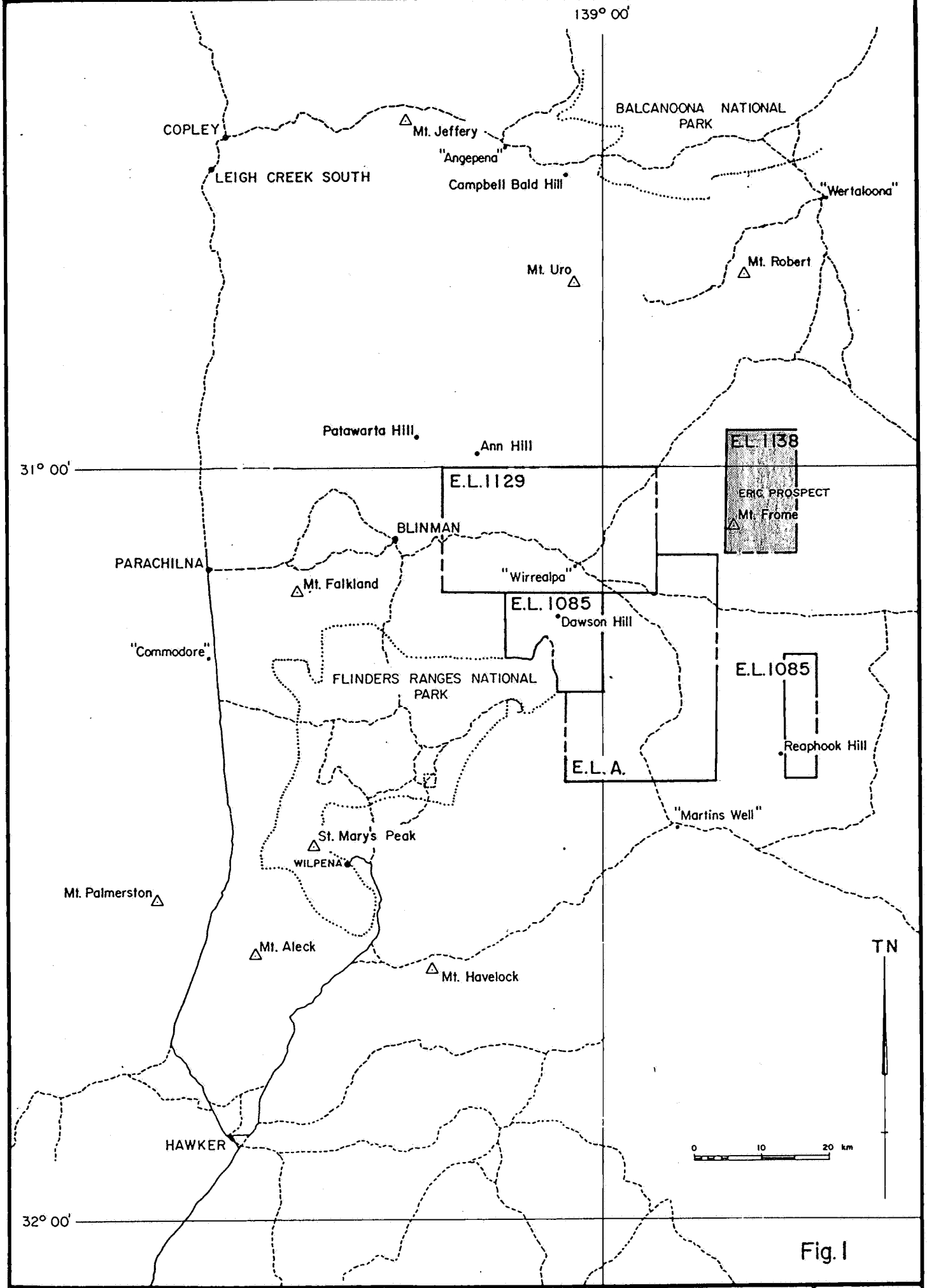


Fig. 1

Centre ADELAIDE	THE BROKEN HILL PROPRIETARY CO. LTD.	Project N° 6-L15-24
Date 12 · 11 · 85	FLINDERS RANGES , S.A. LOCATION MAP	Drawing N° A4-443A

EXPLORATION LICENCE 1138

MT. FROME, SOUTH AUSTRALIA

SURRENDER REPORT

1. GENERAL

Exploration Licence 1138 was originally granted to BHP Minerals Limited on 25th October 1979 as EL538. Together with eight other exploration licences in the northern Flinders Ranges it became part of a regional search for carbonate hosted Pb-Zn mineralization of the Mississippi Valley type. In August 1984 the area was joint ventured with Esso Exploration Limited. The joint venture agreement operated for about one year and was terminated on 2nd September, 1985.

Since that time a RAB drilling programme has been carried out at Eric Prospect. This work is fully documented in the quarterly report ending 28th January, 1986.

Following the RAB drilling, a programme of diamond drilling was recommended, intending to locate the primary source of lead & zinc in the Wilnuroona and Eric Prospect areas. However this recommendation was not followed through and no further work was done in this licence area.

EL1138 was surrendered on 25th February, 1988.

2. EXPENDITURE

Administrative expenditure has been incurred against this tenement since the previous report amounting to $1,044.

3. ERRATUM

The reader should note that on the contents page of the report for the quarter ended 28th January 1986, Figure 2 is entitled 'E.L. 1138, Mt. Frome, S.A. Eric Prospect - Overburden Thickness'. This should read 'E.L. 1138 Mt. Frome, S.A. Eric Prospect - Hole Depth'.