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EL 436, EL 809 AND EL 1129

WIRREALPA

PROGRESS, PARTIAL SURRENDER AND FINAL REPORTS TO LICENCE SURRENDER FOR THE PERIOD 13/11/1978 TO 26/2/1988

Submitted by
Dampier Mining Co. Ltd and BHP Minerals Ltd
1988

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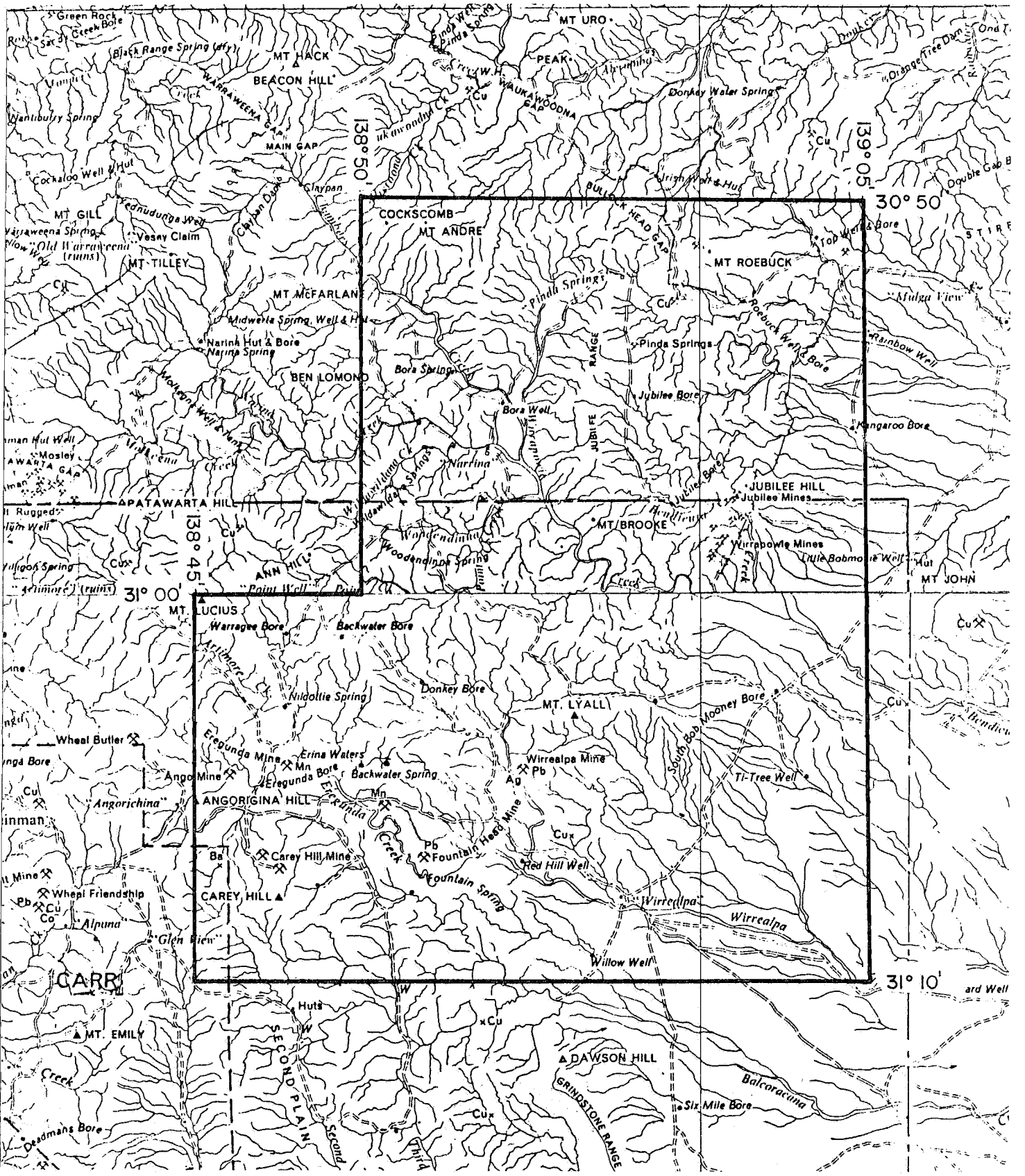
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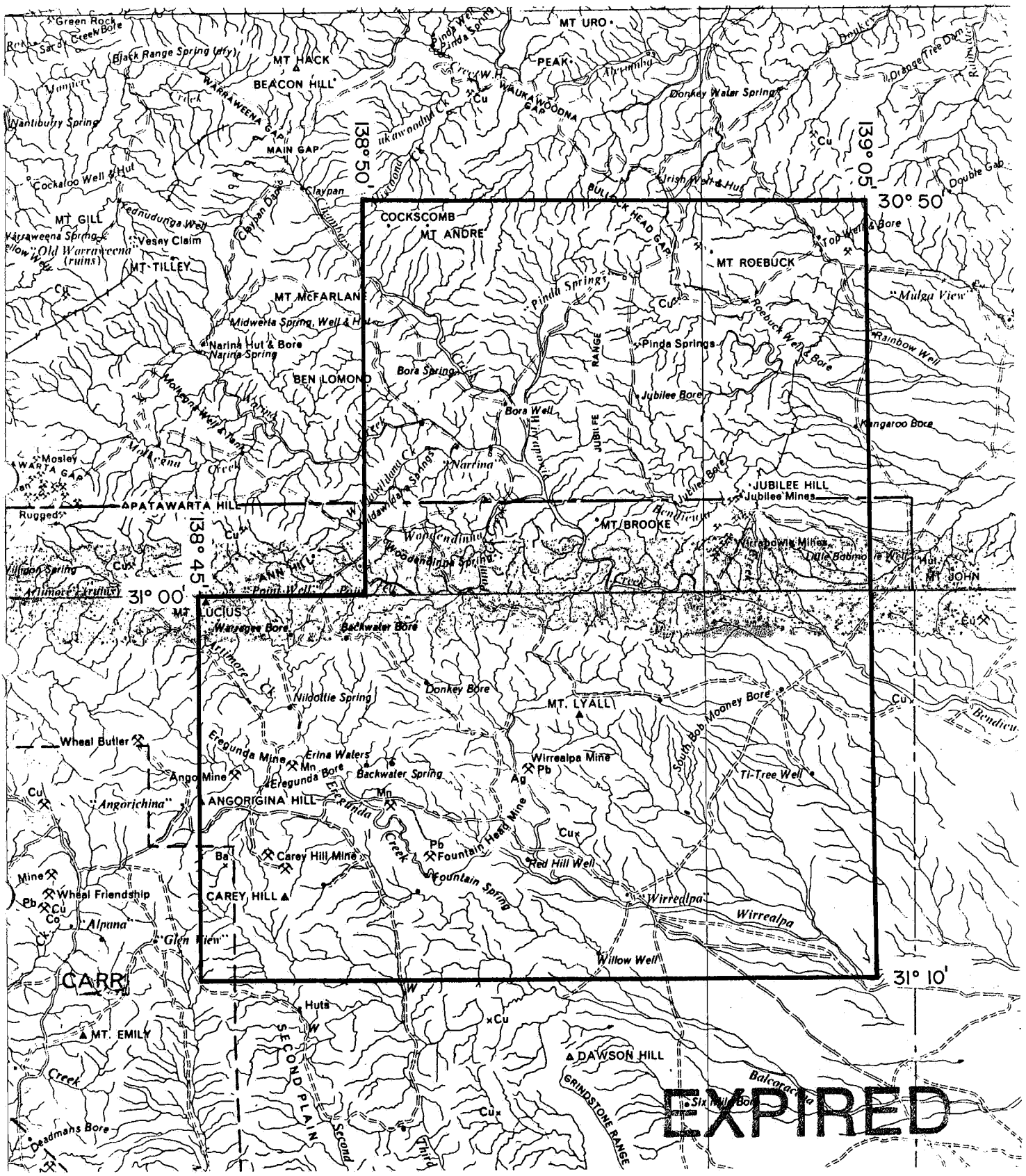
Telephone: (08) 8463 3000
Facsimile: (08) 8204 1880

Government of South Australia
Primary Industries and Resources SA

SCHEDULE A


COCKSCOMB
MT ANDRE
MT ROEBUCK
MT McFARLAN
MT TILLEY
MT GILL
BEN LOMOND
MT HACK
BEACON HILL
MT URO
PEAK
PATAWARTA HILL
ANN HILL
MT BROOKE
JUBILEE HILL
MT JOHN
MT LUCIUS
MT LYALL
ANGORIGINA HILL
CAREY HILL
MT EMILY
DAWSON HILL
CARR
Pinda Springs
Bora Springs
Bora Well
Jubilee Bore
Jubilee Mines
Nurrina
Narina Hut & Bore
Midwella Spring, Well & Hut
Woodendinna Spring
Warragee Bore
Backwater Bore
Donkey Bore
Nildoltie Spring
Eregunda Mine
Erina Waters
Eregunda Bore
Backwater Spring
Wirrealpa Mine
Carey Hill Mine
Fountain Head Mine
Fountain Spring
Red Hill Well
Wirrealpa
Willow Well
Six Mile Bore
Deadmans Bore
Huts
Cockaloo Well & Hut
Vesey Claim
Old Warraweena (ruins)
Mosley
Rugged
Claypan
Claypan Bore
Rednudunga Well
Warraweena Gap
Main Gap
Woodna Gap
Bull Head Gap
Jubilee Range
Grindstone Range
First Second Third
Second Plain
Warraweena Creek
Mokeyon Well & Dam
Woodendinna Creek
Paint Well
Donkey Water Spring
Rainbow Well
Kangaroo Bore
Ti-Tree Well
South Bob Mooney Bore
Balcoracanna
Wheal Butler
Wheal Friendship
Alpina
Glen Rien
Angorichina
Ango Mine
Green Rock Creek Bore
Black Range Spring (dry)
Wantibulyy Spring
Cockaloo Well & Hut
Narina Spring
Old Warraweena (ruins)
Top Well & Bore
Mulga View
Roebuck Well & Bore
Pinda Springs
Jubilee Bore
Jubilee Mines
Wirrapowie Mines
Mt John Well
Hut
Willow Well
Wirrealpa
Red Hill Well
Fountain Spring
Carey Hill Mine
Fountain Head Mine
Wirrealpa Mine
Backwater Spring
Eregunda Bore
Eregunda Mine
Erina Waters
Donkey Bore
Nildoltie Spring
Warragee Bore
Backwater Bore
Six Mile Bore
Balcoracanna
Grindstone Range
Dawson Hill
Mt Emily
Carey Hill
Angorichina
Angoorichina
Wheal Butler
Wheal Friendship
Alpina
Glen Rien

SCHEDULE A



SCALE 1:250,000

KILOMETRES 5 0 5 10 15 20 25 KILOMETRES

B.H.P. MINERALS LIMITED

APPLICANT: ~~DAMPIER MINING COMPANY LIMITED~~

Re-ACP 13/83

DM: 655/80 AREA: 1030 square kilometres

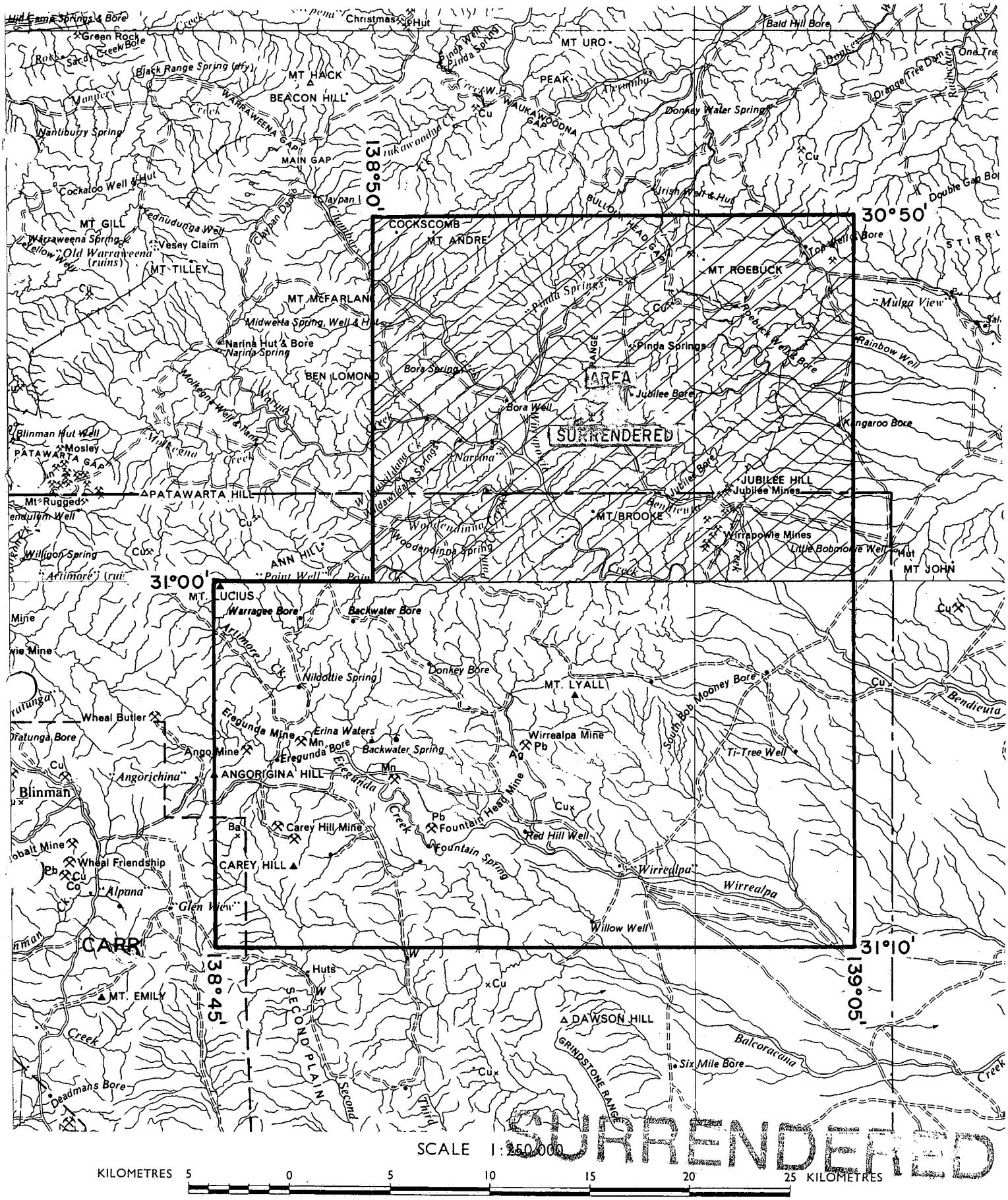
1:250000 PLANS: COPLEY - PARACHILNA

LOCALITY: WIRREALPA AREA - Approximately 20 kilometres East of Blinman

DATE GRANTED: 2·3·81 DATE EXPIRED: 1·3·82 83

EL No: 809

SCHEDULE A ✓



SURRENDERED

APPLICANT: BHP MINERALS LIMITED

DM: 13/83

AREA: ~~1030~~ 587 square kilometres (approx.)

1:250 000 PLANS: COPLEY, PARACHILNA

LOCALITY: WIRREALPA AREA - Approx. 20km east of Blinman

DATE GRANTED: 28·3·83

DATE EXPIRED: 27·3·~~84~~ ~~8687~~ 88

EL No: 1129

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TENEMENT HOLDER: B.H.P. Minerals.

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EXPLORATION LICENCE 436

WIRREALPA, SOUTH AUSTRALIA

REPORT FOR THE QUARTER ENDED 28th FEBRUARY 1979

1. General

Exploration Licence 436 of 1030 square kilometres in the Copley and Parachilna 1:250,000 sheet areas, was granted to Dampier Mining Company Limited on 30th November, 1978 for 1 year.

2. Work Done

Two field reconnaissances were carried out. It is planned to fly aerial photography and to begin geological mapping and geochemical sampling when weather permits. A literature survey was carried out and results of previous work was plotted.

3. Expenditure

Expenditure debited to Exploration Licence 436 to 28th February 1979, was:

Wages and Salaries	$ 4,545	
Messing and Accommodation	258	
Transport	117	
Surveying/Aerial Photography	2	
Sample Analysis	386	
Tenement Fees, Licences etc.	519	
Occupancy/Location Expenses	24	
Vehicles	11,366	5851
	$17,217	

This report is submitted to the Mines Department as required by Condition 4 of Exploration Licence 436.

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EXPLORATION LICENCE ~~463~~ 436
WIRREALPA, SOUTH AUSTRALIA
REPORT FOR THE QUARTER ENDED 30TH MAY, 1979

1. GENERAL

Exploration Licence 436, of 1,030 square kilometres in the Copley and Parachilna 1:25,000 sheet areas, was granted to Dampier Mining Company Limited on 30th November, 1978, for one year.

2. WORK DONE

2.1 Aerial Photography

Colour photography at 1:10,000 scale was flown by the South Australian Lands Department. Half of the photographs have been received.

2.2. Base Map

A base map at 1:10,000 scale was prepared by Photec by enlarging 1:50,000 Lands Department topographic maps. New information from the aerial photography was added.

2.3 Geological Mapping

The three main mineralized horizons were traced almost continuously along their outcrop (about 40 km). Two other horizons stratigraphically below these have not yet been completely traced. The top three and the bottom zinc-rich beds are "mottled" limestone; the fifth bed is calcarenite with calcite filled veins.

The mineralized "mottled" limestones appear to be Archaeocyathid-rich beds with a calcilutite matrix which has been pressure solved to produce the mottled effect. The zinc appears to replace the fossils, which are generally difficult to recognise.

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The thickest mineralized section to date averages 2 metres in thickness and extends for several kilometres.

~~2.4 Soil Sampling~~

~~98 soil samples were collected during the mapping. Analysis results have not yet been received.~~

3. EXPENDITURE

Expenditure debited to E.L. 436 during March, April and May, 1979 was :

Wages and Salaries	$8,554
Messing and Accommodation	531
Fares and Mobilisation	195
Transport	2,461
Surveying/Aerial Photography	16,553
Occupancy/Location Expenses	715
Other Items	49
	$29,058

Revised total expenditure to 31st May, 1979 is $42,775.

This report is submitted to the Mines Department as required by Condition 4 of Exploration Licence 436.

Exploration Licence 436

Wirrealpa, South Australia

Report for the Quarter Ended 30th August, 1979.

1. General

Exploration Licence 436 of 1,030 square kilometres in the Copley and Parachilna 1:250,000 sheet areas, was granted to Dampier Mining Company Limited on 30th November, 1978, for one year.

2. Field Investigations

2.1 Geological Mapping and Prospecting

Geological mapping and prospecting of the Cambrian carbonate sequences in E.L. 436 were virtually completed during the quarter. A geological map is in preparation.

The mineralized horizon in the limestone below the Parara Limestone was shown to extend essentially continuously throughout the area south of the east-west Narina Fault, giving a strike length of over 40 kilometres. North of the Narina Fault, the mineralization is present only as 10 centimetre thick bands.

2.2 Drilling

Seven drill sites were selected to test stratigraphy and mineralization at depth. The S.A.D.M.E. was shown the drill sites, and a field inspection is to be arranged to determine the best access to these sites to minimise any detrimental effects to the environment. The drilling is planned to begin in November.

3. Expenditure

Expenditure debited to E.L. 436 during June, July and August, 1979 was:

Wages and Salaries	$ 14 657
Messing and Accommodation	856
Fares and Mobilisation	599
Transport	453
Sample Analysis	1 094
Occupancy/Location Expenses	60
Other Items	32
	$ 17 751

Revised total expenditure to 31st August, 1979 is $ 60 445.

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3427.

This report is submitted to the Department of Mines and Energy as required by Condition 4 of Exploration Licence 436.

EXPLORATION LICENCE 436

WIRREALPA, SOUTH AUSTRALIA

Report for the Quarter Ended 30th November, 1979

1. GENERAL

Exploration Licence 436 of 1,030 square kilometres in the Copley and Parachilna 1:250,000 sheet areas, was granted to Dampier Mining Company Limited on 30th November, 1978 for one year, and renewed for a further year on 30th November, 1979.

2. FIELD INVESTIGATIONS

2.1 Geological Mapping and Prospecting

Mapping to date has shown that several local mappable unconformities exist in the carbonates within the syncline. Mineralisation has been located at these unconformities and at present more detailed mapping is being carried out to ascertain the areal extent of the unconformities. This work will be completed during the next period.

Lead and zinc mineralisation has also been located in the Wonoka Formation and prospecting and mapping of this formation are being carried out at present also.

2.2 Drilling

A field inspection by the South Australian Department of Mines and Energy was carried out in October and permission was granted to carry out the construction of drill sites and access tracks as per the "Guidelines". This work was completed late in the period. Drilling is due to commence in January, the delay being due to drillers late arrival from Queensland.

3. EXPENDITURE

Expenditure debited to E.L. 436 during August, September and November, 1979 was:

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Wages and Salaries	$8,234
Messing and Accommodation	508
Fares and Mobilisation	318
Transport	357
Sample Analysis	49
Occupancy/Location Expenses	48
Surveying/Aerial Photographs	23
Tenement Fees, Licences etc.	517
Other Items	17
	$10,071

Total expenditure to 30th November, 1979 is $70,516.

This report is submitted to the Department of Mines and Energy as required by Condition 4 of Exploration Licence 436.

EXPLORATION LICENCE 436

WIRREALPA, SOUTH AUSTRALIA

REPORT FOR THE QUARTER ENDED 1ST MARCH, 1980

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1. GENERAL

2. FIELD INVESTIGATIONS

3. EXPENDITURE

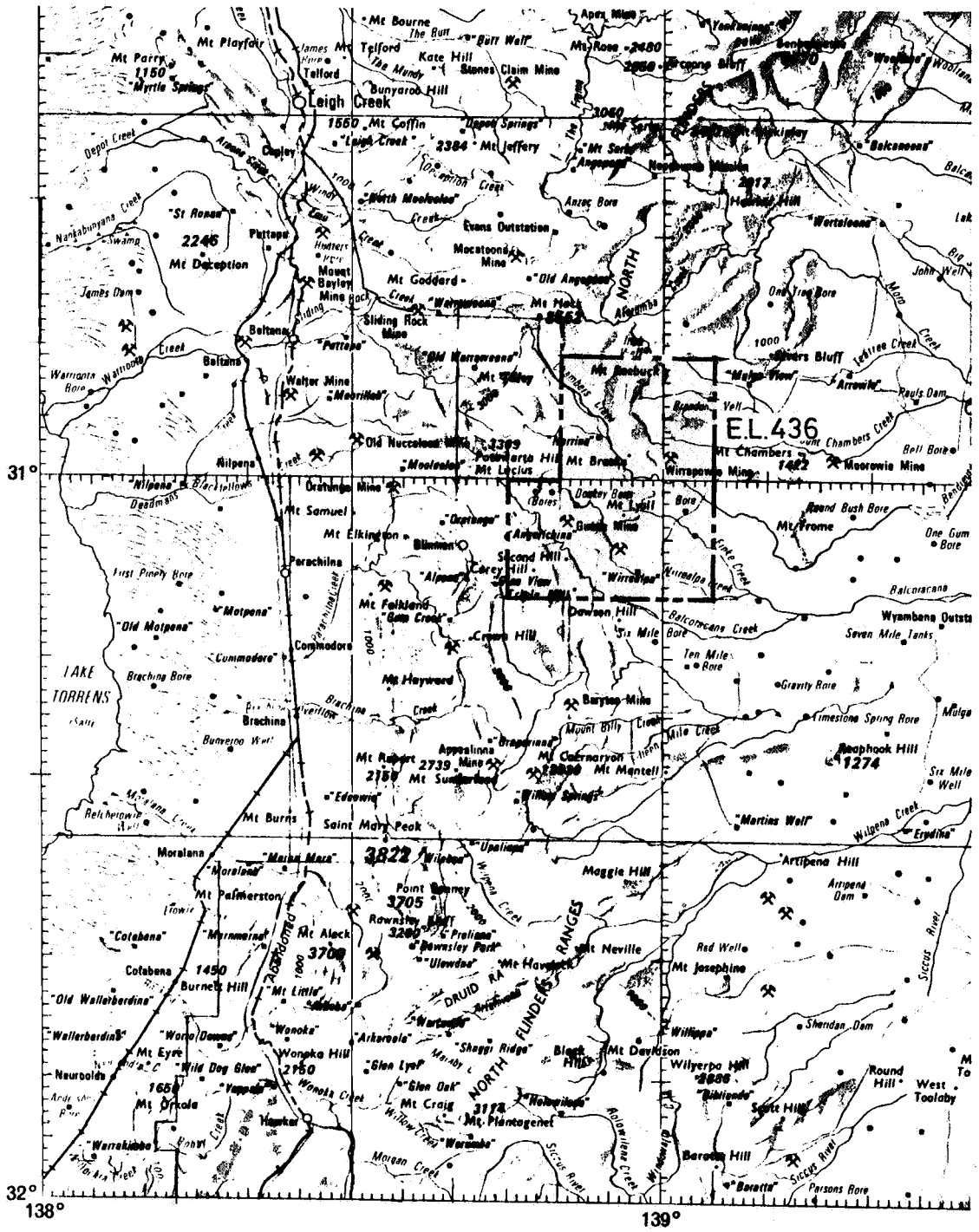
Figures

Figure 1 EL 436 Wirrealpa, S.A.
Location Map

Figure 2 North Flinders Ranges, S.A.
EL 436 Cambrian Geology

FIG. 1

011


E.L.436
31°
32°
138°
139°
T N
Leigh Creek
Mt Playfair
Mt Parry
1150
Myrtle Springs
Mt Bourne
The Butt
Buff Wolf
Telford
Kate Hill
Stones Claim Mine
Bunyaroo Hill
Mt Rose 2480
1550 Mt Coffin
Upper Springs
2384 Mt Jeffery
Depot Creek
Copley
Nankabunyana Creek
"St Ronan"
2246
Mt Deception
Pattapa
Mount Bayley Mine
James Dam
Mt Godderd
Mocatoondi Mine
Evans Outstation
Anzac Bore
NORTH
Mt Hack
Old Angepena
Sliding Rock Mine
Old Nuccaleena Mine
2309
Mt Lucius
Mt Brumby
Mt Chambers
1482
Moorowie Mine
Wimpawie Mine
Mt Frome
Round Bush Bore
Mt Samuel
Mt Elkington
Oratunga Mine
Blinman
Second Hill
Carey Hill
Dawson Hill
Six Mile Bore
Ten Mile Bore
Gravity Bore
Limestone Spring Bore
Seven Mile Tanks
Wyambena Outstn
Perachilna
Mt Falkland
Gum Creek
Crown Hill
Commodore
Old Motpena
Motpena
LAKE TORRENS
Brachina Bore
Brachina
Mt Hayward
Bunyeroo Well
Baryles Mine
Mount Billy
Mile Creek
Mt Robert
2739
2158
Mt Sumpter
Appealinna
Mt Carnarvon
2880
Mt Mantell
Beaphook Hill
1274
Six Mile Well
Mt Burns
Saint Mary Peak
Edowie
Martins Well
Wilpena Creek
Erudina
Moralana
Mt Palmerston
3822
Wilpena
Point Bonney
3705
Rawnsley Bluff
3260
Rawnsley Park
Maggie Hill
Artipena Hill
Artipena Dam
Mt Alack
3708
Mt Little
Cotabena
1450
Burnett Hill
Old Wallerberdina
Wallerberdina
Mt Eyre
Wild Dog Glen
Wonoka Hill
2150
Wonoka
Arkaroola
Shaggi Ridge
Glen Lyel
Glen Osk
Mt Craig
3172
Mt Plantagenet
Warramba
Mt Neville
Red Well
Mt Josephine
Sheridan Dam
Siccus River
Mt Davidson
Black Hill
Wilyerpa Hill
2886
Round Hill
West Toolaby
Scott Hill
Beraota Hill
Parsons Bore
Neuroodla
1650
Mt Oriole
Hawker
Warrioota Bore
Walter Mine
Mokrillen
Baltana
Nilpena
Deadmans
Blackfellows
Warrioota Creek
Depot Creek
Anzac Spring
Hutters Well
Mocatoondi Creek
Mt Godderd Creek
Old Mangarowena
Mt Hack Creek
Sliding Rock Creek
Pattapa Creek
Nankabunyana Creek
Swamp
James Dam
Mt Lucius Creek
Brumby Creek
Mt Chambers Creek
Joint Chambers Creek
Bell Bore
Brandon Well
Meloo View
Arrowie
Rauls Dam
Big John Well
Mara Creek
Leatree Creek
Rivers Bluff
One Tree Bore
Wertaloona
Hallsdale Hill
Balcanoona
Balcanoona Creek
Wyambena Creek
Mt Lyell
Bore
Dawley Bore
Oratunga
Anglachina
Alpena
Wirrealpa
Kirrealpa Creek
Perachilna Creek
First Pinery Bore
Commodore Creek
Brachina Creek
Brachina Gorge
Mt Haywood Creek
Mt Robert Creek
Edowie Creek
Wilpena Creek
Moralana Creek
Reichelowie Creek
Mt Burns Creek
Mt Palmerston Creek
Cotabena Creek
Burnett Creek
Mt Little Creek
Wonoka Creek
Arkaroola Creek
Willow Creek
Morgan Creek
Siccus River
Aldowlinna Creek
Warramba Creek
Mt Neville Creek
Sheridan Creek
Parsons Bore
Beraota
Scott Hill
Wilyerpa Hill
Mt Josephine
Red Well
Artipena Hill
Maggie Hill
Point Bonney
Rawnsley Bluff
Rawnsley Park
Ulewidna
Mt Hawkstock
Mt Alack
Mt Little
Wonoka Hill
Shaggi Ridge
Glen Lyel
Glen Osk
Mt Craig
Mt Plantagenet
Warramba
Arkaroola
Wertaloona
Mocatoondi Mine
Evans Outstation
Anzac Bore
Hallsdale Hill
Balcanoona
Mt Lyell
Dawley Bore
Oratunga
Anglachina
Alpena
Wirrealpa
Mt Chambers
Moorowie Mine
Wimpawie Mine
Mt Frome
Round Bush Bore
One Gum Bore
Wyambena Outstn
Seven Mile Tanks
Ten Mile Bore
Gravity Bore
Limestone Spring Bore
Beaphook Hill
1274
Six Mile Well
Martins Well
Wilpena Creek
Erudina
Artipena Hill
Artipena Dam
Sheridan Dam
Siccus River
Red Well
Mt Josephine
Mt Neville
Mt Davidson
Black Hill
Wilyerpa Hill
2886
Round Hill
West Toolaby
Scott Hill
Beraota Hill
Parsons Bore
Siccus River
Aldowlinna Creek
Willow Creek
Morgan Creek
Warramba Creek
Mt Craig
3172
Mt Plantagenet
Hawker
Neuroodla
1650
Mt Oriole

280 000 ME
285 000 ME
290 000 ME
295 000 ME
300 000 ME
305 000 ME
310 000 ME
315 000 ME

6 590 000 MN
6 585 000 MN
6 580 000 MN
6 575 000 MN
6 570 000 MN
6 565 000 MN
6 560 000 MN
6 555 000 MN
6 550 000 MN

Saplings Well
Warrawoona Gap
Main Gap
Cockatoo Well
Yednudunga Well
MOUNT OILL
Old Warrawoona
Warrawoona Spring
MOUNT TILLEY
MOUNT MEARLANE
Magpie Water
Hut Bore
Narrina Spring
Narrina Creek
Patawarta Bore
Patawarta Gap
PATAWARTA HILL
Bold Hill Spring
Antimore
Bore Spring
Bore Well
NARRINA
Miswerri Bore
Miswerri Spring
Burnside West Bore
Burnside West Mine
Burnside Mine
Bride Springs
Kangaroo Bore
WD 5
Jubilee Bore
Jubilee Mines
JUBILEE HILL
Wirrapowie Mines
MOUNT BROOKE
Wirrapowie Creek
WD 2
WD 4
WD 3
Mt Wyatt Bore
MOUNT LYALL
WB-7
Back Alley Bore
Donkey Bore
WD 1
Old Wirrealpa Mine
WIRREALPA HILL
Back Alley Spring
Wirrealpa Mine
Wirrealpa Creek
Red Hill Well
Wirrealpa
WD 6
Willow Well
WIRREALPA
THE BUNKERS

LEGEND

- mC — MIDDLE CAMBRIAN SEQUENCE.
- Ehn — NARRINA GREYWACKE.
- Eho — ORAPARINNA SHALE.
- Ehs — BUNKERS SANDSTONE.
- Ehd — MIDWERTA SHALE.
- Ehw — WILKAWILLINA LIMESTONE.
- Ehr — PARARA LIMESTONE.
- B — WIRRAPOWIE LIMESTONE.
- A — WOODENDINNA DOLOMITE.
- Ehp — PARACHILNA FORMATION.
- Pwp — POUND QUARTZITE.
- P — MISC. PROTEROZOIC.
- FAULT
- UNCONFORMITY.
- SYNCLINE
- ANTICLINE
- LEASE BOUNDARY
- WD6 Drill hole

S.A.
LOCALITY MAP

3427-1

0 1000 2000 3000 4000 5000 metres
SCALE 1:50 000

3427-1

THE BROKEN HILL PROPRIETARY CO. LTD.

NTH FLINDERS RANGES S.A.
E.L. 436
CAMBRIAN GEOLOGY

Revisions			
	Drawn R.M.K.	Date Feb '80	Centre WHYALLA
	Traced	Drawing No.	1711
	Checked		

EXPLORATION LICENCE 436

WIRREALPA, SOUTH AUSTRALIA

REPORT FOR THE QUARTER ENDED 1ST MARCH, 1980

1. GENERAL

Exploration Licence 436 of 1,030 square kilometres in the Copley and Parachilna 1:250,000 sheet areas, was granted to Dampier Mining Company Limited on 30th November, 1978, and renewed for a further year on 30th November, 1979 (see Figure 1).

2. FIELD INVESTIGATIONS

2.1 Geological Mapping and Prospecting

Mapping of the Cambrian was completed. Figure 2 is a 1:50,000 geological map. Mapping and prospecting of the Upper Proterozoic units are continuing. Currently we are compiling cross sections of the area and structure contour maps to show the depths to the various unconformities we have located within the Cambrian.

2.2 Drilling

During the quarter 6 holes (WD1-6), were completed and hole WD7 is in progress. Drill holes WD1-6 encountered minor lead/zinc mineralisation, none of which is of economic significance. Figure 2 shows the location of the drill holes. Drill logs and details of holes WD1-6 will be forwarded later.

3. EXPENDITURE

Expenditure debited to EL 436 during December, 1979, and January and February, 1980 was :

Wages and Salaries	$15,722
Messing and Accommodation	3,147
Fares and Mobilisation	300
Drilling	93,712
Transport	548
Radio Communications	31
Surveying/Aerial Photographs	26
Sample Analysis	374
Occupancy/Location Expenses	6
	$113,866

Total expenditure to 29th February, 1980, is $184,382.

This report is submitted to the Department of Mines and Energy as required by Condition 4 of Exploration Licence 436.

EXPLORATION LICENCE 436

WIRREALPA, SOUTH AUSTRALIA

Report for the Quarter Ended 1st June, 1980

CONTENTS

1. GENERAL

2. FIELD INVESTIGATIONS

2.1 Geological Mapping and Prospecting

2.2 Drilling

3. EXPENDITURE

APPENDICES

1. Drill Hole Details

2. Drill Logs Holes WD1-12

FIGURES

1. E.L. 436 Wirrealpa, S.A. Location

2. Drillhole Location Plan 1716

EXPLORATION LICENCE 436

WIRREALPA, SOUTH AUSTRALIA

Report for the Quarter Ended 1st June, 1980

1. GENERAL

Exploration Licence 436 of 1,030 square kilometres in the Copley and Parachilna 1:250,000 sheet areas, was granted to Dampier Mining Company Limited for one year on 30th November, 1978, and renewed for a further year on 30th November, 1979 (see Figure 1).

2. FIELD INVESTIGATIONS

2.1 Geological Mapping and Prospecting

Compilation of cross-sections and structure contour maps is continuing. Further mapping to establish the relationships of some of the faults in the area is being carried out to assist with the map production, and also to define accurately the areal extent of the Cambrian unconformities.

2.2 Drilling

During the quarter a further 6 holes were completed. Holes WD 7-10 encountered minor lead/zinc mineralisation. Holes WD 11 and 12 did not intersect any mineralization; they are however, strongly oxidised throughout. Drill logs for all holes (WD1-12) are in Appendix 2. Figure 2 is a drill hole location plan. Assay results are expected during the next quarter. An explanatory note for abbreviations in the geological logs will be forwarded later.

3. EXPENDITURE

Expenditure debited to E.L. 436 duting March, April and May, 1980, was :

Wages and Salaries	$ 1,441
Messing and Accommodation	2,345
Fares and Mobilisation	264
Transport	1,112
Surveying/Aerial Photographs	541
Occupancy/Location Expenses	80
Plant Services	242
Capital Items	5,034
Vehicles	2,572
Tenement Fees, Licences etc	290
	$13,921

Total expenditure to 31st May, 1980, is $198,303.

This report is submitted to the Department of Mines and Energy as required by Condition 4 of Exploration Licence 436.

APPENDIX 1

DRILL HOLE DETAILS

WIRREALPA EL 436 - DRILL HOLE DETAILS

HOLE	NORTHING	EASTING	DEC'N.	DEPTH(m)	RL(m)
	31.0425	138.8078			
WD 1 (Backwater)	6563612N	290788E	65° 235 T	357.1	548.0
	31.0265	138.9211			
WD 2 (Wards Bore)	6565589N	301565E	90°	275.85	451.0
	31.0324	138.9239			
WD 3 (Wards Bore)	6564939N	301848E	90°	336.35	449.5
	31.0293	138.9218			
WD 4 (Wards Bore)	6565287N	301644E	90°	45.75	450.5
	30.9294	138.8950			
WD 5 (Narrina)	6576314N	298873E	90°	374.90	449.75
	31.1297	138.8640			
WD 6 (TiTree)	6554050N	296335E	90°	101.80	400.0
	31.0316	138.8628			
WD 7 (Diapir)	6564920N	296015E	90°	424.15	485.0
	31.0347	138.8557			
WD 8 (Donkey Bore)	6564565N	295344E	60°	320.90	485.0
	31.0801	138.9130			
WD 9 (Wirr. Mine)	6559632N	300905E	90°	400.00	358.0
	31.0783	138.9103			
WD 10 (Wirr. Mine)	6559835N	300642E	60° 90 T	217.95	362.0
	31.0783	138.9101			
WD 11 (Wirr. Mine)	6559830N	300628E	60° 360 T	372.65	362.0
	31.0714	138.9119			
WD 12 (Wirr. Mine)	6560600N	300780E	60° 360 T	89.70	385.0

APPENDIX 2

DRILL LOGS HOLES WD 1-12

0 - 3.00	Precollar
3.00- 3.43	B
3.43- 5.80	A. Matrix oxidised to red-brown occasionally. Some orange-brown dolomite. Some pyrite.
5.80- 5.90	Anm
5.90- 6.86	C
6.86- 8.20	A
8.20- 9.20	Anm
9.20- 9.80	A
9.80-10.30	Anm
10.30-10.50	A
10.50-10.77	Anm
10.77-11.17	C
11.17-11.30	Anm
11.30-11.40	A
11.40-11.76	B
11.76-12.95	A
12.95-13.70	Anm
13.70-13.80	Anm fine.
13.80-13.89	Anm
13.89-13.94	Anm fine.
13.94-15.90	A type. Pyrite in calcite blebs in the matrix.
15.90-19.05	Anm
19.05-19.33	Birdseye with stylolites.
19.33-19.68	Anm
19.68-21.85	Birdseye with stylolites.

...2/

WD1 contd.

21.85-22.10	Anm
22.10-22.48	Birdseye
22.48-25.96	Anm
25.96-26.27	A
26.27-28.00	Anm
28.00-30.63	A
30.63-31.27	Anm
31.27-31.43	Micrite
31.43-32.02	Anm
32.02-34.80	A
34.80-35.43	Anm fine.
35.43-36.25	A
36.25-37.21	Thin bedded fine calcarenite.
37.21-37.54	A fine.
37.54-39.51	A. Pyrite with rare A.
39.51-42.21	Anm with rare A.
42.21-42.88	A
42.88-43.14	A fine.
43.14-43.36	A
43.36-44.57	B with rare A type.
44.57-45.41	A
45.41-45.67	A fine.
45.67-45.89	A
45.89-46.58	B
46.58-47.06	A
47.06-47.36	A fine.

...3/

WD1 contd.

47.36-49.63	A
49.63-50.60	C
50.60-52.80	A
52.80-53.00	B
53.00-53.13	A fine.
53.13-53.60	B
53.60-54.06	A
54.06-55.22	A fine.
55.22-55.40	A with 30-40% matrix and subrounded fragments.
55.40-56.37	A
56.37-58.27	C with rare breccia fragments in the matrix.
58.27-59.40	A with up to 50% matrix.
59.40-62.69	C with rare breccia fragments in the matrix.
62.69-63.31	B
63.31-64.79	A with up to 30% matrix.
64.79-64.97	Anm
64.97-65.16	B
65.16-65.31	Anm
65.31-65.44	Thinly bedded B type.
65.44-66.46	C
66.46-67.08	A
67.08-68.00	C with some pyrite.
68.00-76.46	B with rare breccia fragments. Some sphalerite and galena in calcite veins and in the matrix.
76.46-78.47	A
78.47-79.26	B. Possibly slump folded.

...4/

WD1 contd.

79.26- 79.66	A
79.66- 83.07	B with galena and sphalerite in veins and in the matrix.
83.07- 84.70	A
84.70- 85.20	Anm
85.20- 85.72	Anm with A fine.
85.72- 86.68	Anm with minor sphalerite.
86.68- 87.38	A
87.38- 88.85	Anm with scarce A type.
88.85- 92.15	A
92.15- 92.25	Loose sand.
92.25- 92.47	A fine with minor galena.
92.47- 95.00	A
95.00- 97.86	C
97.86- 98.23	B
98.23-100.24	C
100.24-100.62	Anm
100.62-103.78	C
103.78-103.93	Anm
103.93-104.15	A with minor pyrite.
104.15-106.55	C with sporadic pyrite.
106.55-107.10	A, oxidised.
107.10-113.74	C with blebs of pyrite up to 1cm in size.
113.74-114.61	A fine.
114.61-114.94	B
114.94-115.18	Anm with pyrite along stylolites and within the limestone fragments.

...5/

WD1 contd.

115.18-118.86	B with pyrite.
118.86-121.94	C with pyrite.
121.94-122.45	C
122.45-124.31	Anm
124.31-124.51	A
124.51-124.99	B with rare C.
124.99-125.74	B with pyrite throughout.
125.74-126.86	A with pyrite throughout.
126.86-127.92	B with a calcite parallel to bedding and veins across the core.
127.92-128.08	A
128.08-128.18	Anm
128.18-128.28	Fractured Anm with calcite veins.
128.28-128.88	B
128.88-129.28	A with some C.
129.28-130.23	C with rare B.
130.23-134.92	C with scattered pyrite blebs.
134.92-135.03	Anm
135.03-137.67	C with minor Anm with calcite filled fractures.
137.67-137.85	A fine with fossil fragments with pyrite at the top of the band.
137.85-139.78	A with minor pyrite.
139.78-140.88	A with some fine bedding.
140.88-143.11	Anm with some bedding?
143.11-144.43	A or broken B with sphalerite and galena in cavity fill.
144.43-144.67	B
144.67-145.72	A with some Anm with some sphalerite in fractures.

...6/

WD1 contd.

145.72-150.18	B with sphalerite and galena in fractures with some pyrite.
150.18-151.80	B slumped with sphalerite in fractures with calcite.
151.80-154.23	B with calcite veins with some sphalerite.
154.23-154.32	Black shale with calcite veins.
154.32-157.36	B finely banded.
157.36-159.48	A fine with sphalerite blebs in the matrix and minor galena. Mineralization also along stylolites and in fractures.
159.48-160.71	C with some A. Sphalerite in blebs parallel to bedding.
160.71-161.45	B with sphalerite and galena parallel to bedding.
161.45-161.46	Calcite veins.
161.46-163.06	A
163.06-169.26	B with bands of Anm. Some galena and sphalerite in the matrix and in fractures. Some brecciation.
169.26-169.71	Black calcilutite, very fine grained and fine bedded, very fine pyrite along bedding or bedded?
169.71-178.60	B some slumping at the top of the interval. Many calcite filled fractures with minor sphalerite.
178.60-178.90	C with calcite filled fractures.
178.90-179.21	A
179.21-179.39	C
179.39-181.10	B. Calcite filled fractures with some sphalerite and pyrite, collapse breccias?
181.10-181.48	B with black limestone and with much pyrite. Many fossil fragments.
181.48-182.25	B
182.25-211.69	A some fracturing and rare C and Anm.
211.69-223.05	C with rare Anm, a few fractures and possible collapse type breccias.

...7/

WD1 contd.

223.05-224.16	A some calcite veins.
224.16-224.72	C some calcite veins.
224.72-225.22	A some calcite veins.
225.22-225.51	B
225.51-244.13	C with rare A zones and some B zones. Calcite filled fractures.
244.13-245.16	Anm.
245.16-248.02	C with some A and rare Anm. Many fossil fragments.
248.02-282.38	A rare Anm, some C many fossil fragments. Calcite filled fractures. Possible collapse? zones.
282.38-283.44	B
283.44-297.83	A with calcite veins, many fossil fragments.
297.83-303.97	C, some A.
303.97-310.01	A with minor C, calcite filled fractures CFL. Some strongly fractured calcite filled zones.
310.01-313.14	C
313.14-323.01	A with some C.
323.01-323.07	B
323.07-357.10	A with fossil fragment rich zones.

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WD2 WIRREALPA EL 436

0 - 3.00	Percussion precollar.
3.00-25.45	Grainstone breccia i.e. calcarenite fragments, some calcite veins.
25.45-25.60	Polymict breccia with fine pyrite. Fragments from 1mm to 5cm. Fragments subrounded.
25.60-26.50	C type with some A. (Polymict).
26.50-27.35	A type. (Polymict).
27.35-28.20	C type. (Polymict).
28.20-29.75	Anm rare with minor fine pyrite in the matrix.
29.75-31.60	C type. Calcite veins to 1cm thick at 80° to LCA.
31.60-32.55	A type.
32.55-34.80	A type with greater than 50% matrix. Random calcite veins.
34.80-38.45	A type with 30-50% matrix. (Calcite filled vacities at 34.80). Random calcite veins. Matrix lessens to 10% at the base.
38.45-38.80	Limestone, some chert, calcite filled cavities.
38.80-40.00	A with small fragments, 1-5cm tablets grading to 3 x 5cm approx. Calcite veins at 20° to LCA.
40.00-40.25	C with fine stylolites.
40.25-43.35	A calcite veins 20° - 80° to LCA.
43.35-44.60	Micrite, some chert.
44.60-45.95	A with calcite veins.
45.95-46.25	Anm 2-5% pyrite in fragments and along stylolites (probably all stylolites bounds).
46.25-48.90	A with calcite veins at 20° to LCA. 1% pyrite.
48.90-49.60	Anm
49.60-53.60	A with calcite veins at 20° to the LCA, some calcite along stylolites, minor pyrite in fragments.
53.60-54.35	Anm rare matrix. (Water zone, oxidised).

...2/

WD2 contd.

54.35-56.90	A
56.90-57.00	C
57.00-57.15	Anm. (Water zone, oxidised).
57.15-60.20	A with large fragments to 8cm. Silica rich bands in the limestone fragments.
60.20-64.35	C, rare A, stylolites, rounded fragments minor pyrite.
64.35-64.85	Fine grained limestone with chert.
64.85-65.90	A with pyrite to 5% locally in the matrix.
65.90-67.30	C with wavy bedding.
67.30-68.60	A pyrite locally to 5%, some B zones.
68.60-69.10	B poorly developed.
69.10-69.35	Fine grained limestone with chert.
69.35-70.40	B with calcite veins at the end of the interval.
70.40-74.30	A minor pyrite, some crude C, large fragments to 10cm, some local zones of greater than 50% matrix.
74.30-74.55	Fine grained limestone with chert.
74.55-81.40	A small bleb at 76.1, some poorly developed B increasing towards the base.
81.40-81.75	Fine grained limestone with chert.
81.75-82.65	A some oxidised BCM.
82.65-85.10	C
85.10-85.40	A some matrix to 50%.
85.40-92.30	C some near B many TCF. Oxidised zone at 89.75.
92.30-92.65	A
92.65-95.00	C, some oxidation.
95.00-96.30	Anm of calcarenite with random stylolites, chert at 96.35.

...3/

WD2 contd.

96.30- 97.70	A
97.70- 98.00	Calcarenite
98.00- 98.10	A
98.10- 98.15	Thinly bedded limestone with stylolites along bedding.
98.15-103.00	A, some matrix oxidised to yellow-brown.
103.00-103.35	Calcarenite
103.35-106.20	Anm
106.20-110.75	Calcarenite with chert at 109.05 and some TCF.
110.75-111.40	A
111.40-112.50	Calcarenite with calcite filled fractures.
112.50-115.75	A with chert at 113.35.
115.75-116.70	Finely laminated black and grey calcilutite, large calcite vein at 115.75.
116.70-117.85	C
117.85-118.32	A, calcarenite, oxidised, water zones? at 115.12 and 114.34. Chert at 111.64.
118.32-119.31	B very stylolitic, thin calcite filled breccia zone at 118.63.
119.31-120.58	A and Anm. Large calcite veins across the core at 119.93.
120.58-122.68	B with small C zone at the base.
122.68-124.10	A
124.10-124.50	B
124.50-124.93	A with Anm and some matrix to 30%.
124.93-125.03	B
125.03-128.14	C with A or possibly A with C.
128.14-128.24	B
128.24-129.78	C or possibly stylolitic B.

...4/

WD2 contd.

129.78-132.60	A
132.60-132.77	Calcarenite
132.77-133.40	A
133.40-134.61	C
134.61-137.34	A with possible C at the base.
137.34-139.59	C
139.59-140.49	A rare Anm.
140.49-140.93	B
140.93-142.49	C
142.49-142.80	B
142.80-144.29	C
144.29-144.76	B
144.76-159.99	A rare C and Anm. Matrix over 50% from 149.75-150.75. Some B wavy type near the top.
159.99-167.53	C rare A zones with 20-40% matrix.
167.53-169.64	A rare Anm.
169.64-177.21	B, calcite filled fractures.
177.21-179.07	C, calcite filled fractures.
179.07-182.89	B rare C.
182.89-189.13	C with some zones with matrix to 70% at 187.18, sphalerite at 184.56 in slumped cavity fill?
189.13-190.67	A some Anm at base, one 2.5cm calcite vein.
190.67-190.85	Anm, stylolites very weak.
190.85-193.07	Anm with TCF and CFLS.
193.07-193.26	B
193.26-195.78	Anm oxidised, water zone?

...5/

WD2 contd.

195.78-202.46	B, fractured near fault, minor sphalerite in vertical joint.
202.46-202.80	Fault/fracture zone, oxidised and calcite filled.
202.80-203.60	B, rare fine C.
203.60-206.78	B, wavy with some C.
206.78-212.75	C, fractured with calcite fill sphalerite in a joint at 212.67. Many fossils, more sphalerite at 207.10 in a 4mm calcite vein.
212.75-213.03	B
213.03-215.83	C fractured with calcite fill, fossils throughout fractured zone at 213.23 with sphalerite.
215.83-230.87	B, more stylolite than normal, pyrite along joints throughout, some disseminated. Rare sphalerite at 222.80.
230.87-232.34	C with minor Anm.
232.34-233.62	B
233.62-238.97	C
238.97-241.55	C, fault or joint has caused oxidation up to 3mm displacement on small faults.
241.55-259.79	C, some A and rare Anm. Calcite filled fractures. Sphalerite/pyrite at 246.92.
259.79-263.08	A, some C, fractures with calcite fill.
263.08-264.53	C
264.53-267.64	A with rare C.
267.64-269.85	C with some A.
269.85-275.85	B, fracture at base of interval with calcite fill.

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WD3 WIRREALPA EL 436

0 - 3.00	Percussion Precollar.
3.00- 11.60	B type oxidised, matrix now brown, fractures are calcite filled, rare Anm. C towards the base. Calcite filled fractures.
11.60- 12.10	A with some B, calcite filled fractures.
12.10- 12.83	Folded C.
12.83- 13.90	Oxidised B, calcite filled fractures.
13.90- 14.60	Oxidised C, calcite filled fractures.
14.60- 16.70	Oxidised B, calcite filled fractures.
16.70- 16.88	Oxidised B, with micromitra - calcite filled fractures.
16.88- 22.20	Oxidised B with some A, calcite veins (to 7mm) at 45° to LCA, calcite filled fractures.
22.20- 26.15	Oxidised A, calcite filled fractures.
26.15- 28.00	A, calcite filled fractures.
28.00- 28.10	Oxidised Anm, calcite filled fractures.
28.10- 33.15	A some Anm, calcite filled fractures.
33.15- 40.03	A some banded, some Anm, partly oxidised and grades into C type at the base. Calcite filled fractures.
40.03- 49.76	C some oxidised, calcite filled fractures, rare pyrite, sphalerite and galena.
49.76- 81.23	Mainly A with some Anm and C zones. Some oxidised. Calcite filled fractures.
81.23- 81.68	B with rare A. Calcite filled fractures.
81.68- 86.64	A with rare B. Rare calcite filled fractures.
86.64- 95.25	C with some B, some calcite filled fractures.
95.25- 98.66	A with some Anm, calcite filled fractures.
98.66-104.63	B with rare Anm, calcite filled fractures and wispy layers of pyrite in the matrix.

...2/

WD3 contd.

104.63-106.00	A with some Anm, calcite filled fractures.
106.00-106.80	B with calcite filled fractures.
106.80-108.95	C with some B, calcite filled fractures.
108.95-125.29	Mainly C with some B and rare Anm.
125.29-130.01	A
130.01-136.43	B (Fault at 131.40?).
136.43-156.70	C with some A TCF. Fossil fragments in limestone?
156.70-160.30	B with small C zone. Fossil fragments in limestone?
160.30-177.50	C with some A and B. Fossil fragments in limestone? Calcite filled fractures.
177.50-199.75	B with C zones. C with bands to 10cm of finely laminated black matrix with fossil fragments? and pyrite.
199.75-228.66	Anm (MB)
228.66-228.96	C
228.96-231.99	Stromatolites? with debris? some pyrite and sphalerite?
231.99-235.77	B with Anm and C at the base.
235.77-238.47	(ANB) Anm, skeletal grainstone, stromatolites? small blebs of pyrite and sphalerite.
238.47-246.45	B with some C. Fine stylolites within limestone fragments.
246.45-247.69	Stromatolites with Archaeocyathids and a basal 10cm calcarenite zone.
247.69-256.28	C with calcite filled fractures, some A zones.
256.28-258.62	Stromatolites with galena in calcite veins and some pyrite, rare C type.
258.62-260.15	Brecciated zone with rare C zones.
260.15-265.78	C zones of calcarenites. Stromatolites?

...3/

WD3 contd.

265.78-269.46	Archaeocyathids and stromatolites? with rare B and C zones. Brecciated zones with calcite and small displacement on faults. Some fine grained pale sphalerite.
269.46-305.70	Interbedded fine (2lmm) and coarse (2-3m) calcarenites with clay interbeds. Rare sphalerite blebs at the base.
305.70-308.15	Brecciated zone calcite fill with scattered sphalerite.
308.15-336.35	B some brecciated zones and some slumped and brecciated. Rare pyrite.

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0 -18.00	Percussion precollar.
18.00-22.35	C some calcite filled fractures (parallel to core and perpendicular to LCA). Matrix oxidised with possible sphalerite and pyrite.
22.35-27.90	B with up to 50% matrix.
27.90-28.95	A
28.95-30.62	Anm with unconformity? at the base.
30.62-33.66	Anm with pyrite and galena in the cavities.
33.66-34.39	C
34.39-34.99	Anm with pyrite up to 5%.
34.99-36.35	A with Anm.
36.35-37.15	A with some Anm minor pyrite and galena in cavities.
37.15-37.45	B strongly fractured, minor galena and sphalerite in calcite filled fractures.
37.45-45.75	C, fault/joint at 39.80? may be a slump fold sphalerite, pyrite and galena in calcite filled fractures.

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WD5 WIRREALPA EL 436 PARARA LIMESTONE

0 - 63.80	Green and grey calcilutite with interbedded limestone bands generally 2-5cm. Some soft sediment deformation. Some calcarenite bands (to 10cm) with carbonaceous particles.
63.80- 69.15	B with interbedded calcarenite bands.
69.15- 87.74	B but thicker limestone zones, some Anm zones and some thin bedded zones. Some thin banded B (1-3cm). Minor pyrite in calcite filled vugs.
87.74- 88.04	Calcarenite.
88.04- 88.10	Anm
88.10- 91.29	B with some C. B thicker than usual.
91.29-103.40	C some fine calcarenite, some B type.
103.40-103.80	Calcarenite possibly brecciated at the base.
103.80-104.18	B with some C. B thicker than usual, some sphalerite.
104.18-104.38	Breccia with calcite fill and orange sphalerite and pyrite.
104.38-107.73	B finely banded, some C.
107.73-107.85	Black calcilutite finely banded, pyrite.
107.85-108.02	Calcarenite brecciated at the base, some chert and pyrite.
108.02-108.20	B coarse.
108.20-111.79	B fine.
111.79-111.96	Breccia with disseminated orange-pale brown sphalerite with pyrite in calcite filled vugs.
111.96-112.23	Polymict breccia with black calcareous matrix.
112.23-112.37	Breccia, calcite fill with some sphalerite and pyrite.
112.37-113.10	Polymict breccia, some sphalerite?
113.10-113.34	Coarse B with some breccia and pyrite.
113.34-121.13	B with some C.

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WD5 contd.

121.13-123.09	Polymict breccia with some sphalerite and pyrite.
123.09-123.29	Coarse B with sphalerite and pyrite in CFLS.
123.29-141.13	C
141.13-141.80	Fine grained calcarenite.
141.80-141.98	Evaporites? with sphalerite.
141.98-142.10	B with sphalerite in calcite filled fractures.
142.10-142.38	Fine calcarenite.
142.38-143.60	B finely banded, some C some sphalerite.
143.60-144.05	Evaporites? with pyrite in blebs and disseminated.
144.05-152.88	C with some pyrite in the matrix. Some B and some fossil fragments.
152.88-153.68	B slumped with some pyrite.
153.68-157.12	C with some B and with some pyrite.
157.12-157.65	Slump breccia, cavities fill with calcite and some pyrite.
157.65-169.91	C with some B and occasional pyrite blebs.
169.91-172.02	A
172.02-172.41	Anm
172.41-188.41	A with bands of calcarenite to 4cm thick. Stylolites between bands. Sporadic sphalerite TCF to 1cm wide and .5m long. More regularly bedded towards the base.
188.41-189.35	C with fine bedding visible and some small blebs of sphalerite.
189.35-191.95	Black calcilutite with fine pyrite and some chert zones, some very fine sphalerite (Evap?).
191.95-195.65	D
195.65-195.80	A with calcite filled fractures.
195.80-196.52	B with calcite filled fractures.

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WD5 contd.

196.52-196.71	A
196.71-197.26	B with some calcite filled fractures.
197.26-210.96	C some B and rare calcite filled fractures. Fine veins of pyrite and minor sphalerite in calcite filled fractures. Very minor A.
210.96-211.11	Calcarenite with fossil fragments.
211.11-214.80	B with calcite filled fractures. Limestone is fine calcarenite with fossil fragments? Pyrite in the matrix.
214.80-230.94	A gradational from above. Some B and some pyrite in the matrix. Calcite filled fractures.
230.94-234.35	B with disseminated pyrite in the matrix. Some calcite filled fractures.
234.35-242.49	A with pyrite, some calcite filled fractures.
242.49-247.34	B some calcite filled fractures.
247.34-255.70	Slumped C pyrite in the matrix and in the limestone. Limestone is fine calcarenite with fossil fragments. Some Anm.
255.70-258.83	B with some calcite filled fractures.
258.83-265.66	A with pyrite and some calcite filled fractures.
265.66-271.24	B some sphalerite blebs in matrix, some calcite filled fractures.
271.24-271.35	Anm with fine sphalerite and pyrite in calcite or calcite filled fractures.
271.35-276.43	B some C, fine sphalerite throughout in the matrix.
276.43-295.31	A with 8cm of carbonaceous material at the start with sphalerite and pyrite. Some B zones and some CFLS.
295.31-308.09	Anm with some A fossil rich? Sphalerite in abundant calcite filled fractures.
308.09-313.12	B rare, calcite filled fractures.
313.12-314.92	A some calcite filled fractures.

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WD5 contd.

314.92-327.30	B with some C and rare A.
327.30-330.59	C some B.
330.59-339.92	A type with fossil fragments and pyrite in the limestone.
339.92-344.90	C with B, some calcite filled fractures.
344.90-346.86	A with strong calcite filled vertical fracture. Limestone is calcarenite? some pyrite in limestone.
346.86-349.82	A with pyrite in limestone and matrix.
349.82-351.76	B some sphalerite, limestones contain fossil fragments. Some calcite filled fractures.
351.76-354.74	A some sphalerite in calcite filled fractures.
354.74-374.90	C small A and B zones.

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WD6 WIRREALPA EL 436

Wonyka

0 - 65.20	Interbedded weathered calcareous siltstone and sandstone, yellow brown and purple. Some Limestone near the base, micrites, intraformational breccias and calcarenites.
65.20- 76.83	Grey interbedded ooid grainstones (many quartz rich bands), micrites and stromatolites, finely disseminated pyrite, sphalerite and galena in the matrix of the ooid grainstones. Large blebs associated with stylolites and fractures.
76.83-101.80	Fine grained laminar stromatolites ?(micrites) with pyrite along bedding planes and in breccia zones. These breccia zones are between stromatolite? bands and may be debris zones rather then intra-formational breccia. Some calcarenite bands with clastics included in a matrix of green calcilutite. Some cross bedding in the calcarenites.

Potsy

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WD7 WIRREALPA EL 436

0 - 6	Percussion Precollar.
6 - 56.47	B with limestone bands of calcarenite and skeletal grainstone (Archaeocyathids & Micromitra?). Some BCM with pyrite blebs.
56.47-77.91	B with limestone bands of fine calcarenite fractured and brecciated with some pyrite. Calcite filled fractures.
77.91-86.10	A with pyrite and calcite filled fractures, some Anm of calcarenite. Fault at 86.10?
86.10-103.18	Calcarenite with rare Anm of calcarenite. Pyrite along stylolites and carbonaceous material. Calcite filled fractures.
103.18-106.97	C, some calcite filled fractures and some pyrite.
106.97-111.05	A with some pyrite, small B & C intervals.
111.05-111.36	B
111.36-111.92	A with matrix to 20% and some Anm.
111.92-112.18	Calcarenite.
112.18-112.91	Anm
112.91-113.24	C wispy.
113.24-114.64	Anm, very rare BCM matrix, chert? at 113.42. Tends to B at the base.
114.64-114.85	Calcarenite.
114.85-149.85	B with small A and Anm zones. Minor sphalerite at 130.75.
149.85-151.30	Conglomerate, base of zone above?, some pyrite.
151.30-151.85	Anm 5-10% pyrite.
151.85-158.45	C, some A at the base, some calcite filled fractures, some pyrite.
158.45-158.65	Calcarenite with 5% pyrite, calcite filled fractures.
158.65-160.15	A strongly fractured and brecciated, calcite fill.

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WD7 contd.

160.15-161.20	Cavity filled with calcite.
161.20-162.05	A with calcite filled fractures and some pyrite.
162.05-166.95	Cavity with calcite and calcite filled fractures with some pyrite.
166.95-168.20	B with calcite filled fractures.
168.20-171.05	Cavity with dark fine calcarenite, BCM and many calcite filled fractures.
171.05-171.65	B with calcite filled fractures and some pyrite.
171.65-172.25	Cavity with calcarenite and BCM fill.
172.25-184.95	B with calcite filled fractures and some limestone fragments in the fractures. Some A type at the base.
184.95-185.25	Calcite vein.
185.25-187.90	A with calcite filled fractures.
187.90-188.50	A very strongly fractured.
188.50-190.80	A with calcite filled fractures.
190.80-193.0	A very strongly fractured with limestone fragments in the fractures.
193.0 -198.65	A, some calcite filled fractures.
198.65-199.10	BCM to 70%.
199.10-203.0	Cavity infilling.
203.0 -214.95	B, some calcite filled fractures.
214.95-215.95	A, some calcite filled fractures.
215.95-219.05	C
219.05-219.90	Calcarenite with pyrite in matrix of fragments. BCM increases towards the base also strong calcite filled fractures at the base.
219.90-233.65	A and some C and rare B with calcite filled fractures.

...3/

WD7 contd.

233.65-237.35	B with calcite filled fractures.
237.35-239.65	A, some C, calcite filled fractures.
239.65-243.75	B and some C, calcite filled fractures.
243.75-244.70	A and Anm near the base many calcite filled fractures.
244.70-247.50	Calcarenite as Anm with much fine pyrite.
247.50-247.67	Anm with 4% pyrite.
247.67-248.90	A with calcite filled fractures.
248.90-276.05	B with strong calcite filled fractures in some zones.
276.05-278.45	A, rare B near the base, rare calcite filled fractures.
278.45-280.35	B with some C near the top.
280.35-280.67	Calcarenite with some pyrite.
280.67-282.00	Mixed B and C grading to A at the base with some calcite filled fractures.
282.00-350.60	A, some Anm, calcite filled fractures, calcarenite bands with fine pyrite. Fluorite in calcite filled vugs in BCM. Minor sphalerite in fractures in the original rocks.
350.60-372.50	B, some C, calcite filled fractures. Sphalerite at 370.15. Matrix varies from BCM to fine calcarenite.
372.50-392.45	Calcarenite, some A and Anm, some skeletal grainstone. Matrix varies from BCM to coarse clastic (2-4mm) zones, calcite filled fractures.
392.45-424.15	B and C with variable matrix and some calcarenite zones. Rare A and Anm towards the base, calcite filled fractures.

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WD8 WIRREALPA EL 436

0 - 42.00	Percussion Precollar.
42.00-141.85	B mainly, some C and some thicker BCM bands to 30cm. Pyrite in BCM and limestone is fine to very fine calcarenites with occasionally up to 25% clastics. Rare skeletal grainstone and intraformational breccia bands.
141.85-162.60	B with calcite filled fractures.
162.60-224.90	B but generally has more BCM. Has pyrite in BCM.
224.90-226.98	A zone with fine disseminated sphalerite at 225.30.
226.98-229.80	B very wispy.
229.80-236.55	BCM mainly with FPC zones, calcite filled fractures, galena in calcite filled fractures at 230.80. Pyrite replaced Archaeocyathids around 231.30. Sphalerite in fragments at 231.55. Fine disseminated pyrite common. Stromatolites at 236.55?
236.55-264.07	Fine B with BCM zones. Minor unconformity at 232.35 has pryite and sphalerite. Calcite filled fractures at 20^{o} and 80^{o} to LCA. Pyrite blebs in the fractures. Calcite filled fractures.
264.07-300.49	Birdseye with calcarenite and some skeletal rich zones. Oxidised along stylolites, joints etc. Galena along stylolites e.g. 273.73 and 279.40-281.90. Rare sphalerite and further sporadic galena at 278.60-300.39.
300.49-314.82	Calcarenite with skeletal grainstone zones, calcite filled vugs. Gradually increasing clastic content downwards.
314.82-316.41	Stromatolites with Archaeocyathids and minor sphalerite at the base.
316.41-320.90	Calcarenite 1-5mm fragments with interbeds of clastic rich material.

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WD9 WIRREALPA EL 436

0 - 20.80	Percussion Precollar.
20.80-36.60	Middle Cambrian red and green shales and siltstone, oxidised.
36.60-44.10	Fine calcarenite, calcareous matrix and green shale interbeds.
44.10-46.25	Conglomerate with Proterozoic fragments to 25mm.
46.25-52.30	Red and green Middle Cambrian shales.
52.30-54.48	Brown and grey fine grained limestone, some birdseye textures.
54.48-56.85	Brecciated limestone infilling a cavity.
56.85-93.25	Limestone oxidised, mainly stromatolites with some infilled cavities. Galena with pyrite along stylolites at 90.15.
93.25-95.25	Cavity fill, palaeo soil with some calcarenite fragments.
95.25-115.25	Laminar, stromatolites and micrites. Clay rich zones. Pyrite along stylolites in unoxidised limestone. Birdseye and calcarenite at the base of the zone. Malachite and chalcopyrite at 96.70.
115.25-206.35	Reefal limestone? Renalcis and Archaeocyathids throughout. Numerous cavities with sediment and clear calcite fill. Occasional pyrobitumen blebs?
206.35-213.45	Fine calcarenite.
213.45-316.50	Reef Debris? Limestone varies from fine calcarenite to conglomerates with fragments to 1m? Oxidised throughout with rare pyrite remaining. Towards base have more consistent calcarenite bands.
316.50-375.15	Calcarenites with abundant clastic material. There appears to be a cyclicity to the sedimentation i.e. commencing calcarenite then stromatolites then Archaeocyathids then debris then calcarenite again. Glauconite is common in the calcarenite bands and the whole interval is oxidised.
375.15-400.00	Clean calcarenite with rare fossil fragments and minor disseminated pyrite. Some oxidation.

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WD10 WIRREALPA EL 436

0 - 24.00	Percussion Precollar.
24.00-52.70	Middle Cambrian green and red shale and siltstone. (Halite? rich zone producing collapse structures eg. 30.70). Strongly fractured.
52.70-78.40	Conglomerate zone with Proterozoic fragments up to 3.5m, generally .5-2cm in a clay matrix.
78.40-80.05	Middle Cambrian green and red shales.
80.05-94.35	Conglomerate of Middle and Lower? Cambrian fragments together with Proterozoic material near the base.
94.35-103.60	Lower Cambrian limestone breccia, strongly oxidised.
103.60-106.70	Weathered 'in situ' limestone.
106.70-134.60	Mainly stromatolites with malachite sporadically throughout the first 2m.
134.60-144.25	Limestone breccia with laminar calcite (Unconformity?). Minor chalco pyrite along stylolites at the base.
144.25-162.95	Birdseye limestone with limestone after evaporites. Some calcarenite and calcirudite with fragments to 20cm. Possible palaeo-soil horizons e.g. 162.85.
162.95-169.10	Reefal material with Renalcis and Archaeocyathids, may be debris above the reef.
169.10-217.95	Reefal limestone, may cycle from reef to reef debris to reef etc. Renalcis and Archaeocyathids throughout. Malachite, azurite and barite 170.20-171.10 in a fractured zone and malachite along a stylolite at 208.35.

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WD11 WIRREALPA EL 436

0 - 24.0	Percussion Precollar.
24.00-39.00	Middle Cambrian green and red shales, 1cm of sandstone at the base.
39.00-40.35	Brecciated and fractured Middle Cambrian shales. (May be reworked, ie. in conglomerate).
40.34-372.65	Conglomerate of Proterozoic material. Some blocks appear to be a reworked older conglomerate. Weathered granite at 298.5 - 300.1?

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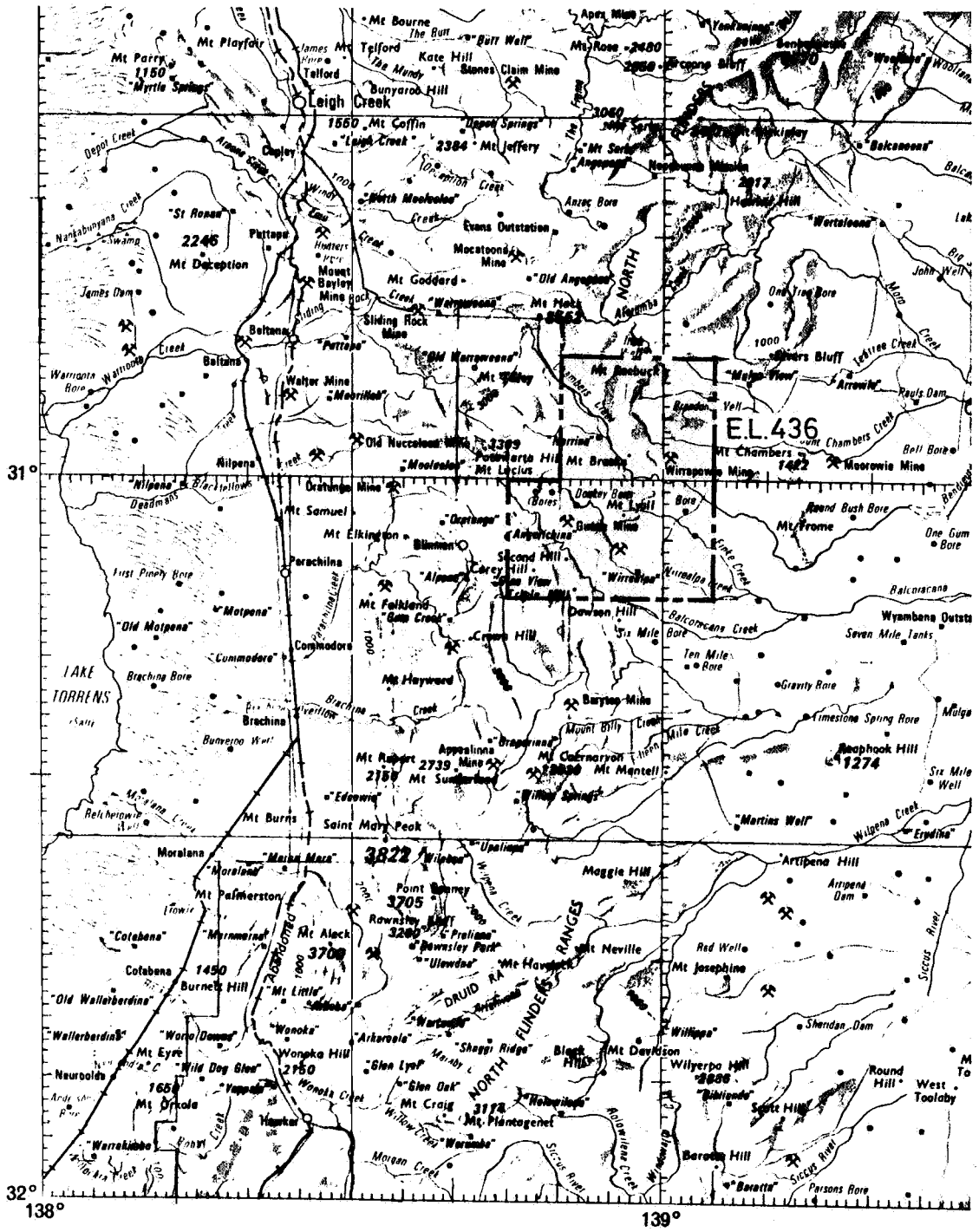
WD12 WIRREALPA EL 436

0 -26.90	Conglomerate of Proterozoic fragments, oxidised.
26.90-27.85	Palaeo-soils?
27.85-29.20	Stromatolites with debris zones and occasional Palaeo-soil horizons?
29.20-38.20	Limestone conglomerate with palaeo-soil horizons?
38.20-40.10	Dolomite recrystallized with manganese dendrites along fractures.
40.10-43.00	Stromatolites with Renalcis and some Archaeocyathids, all oxidised.
43.00-45.15	Calcarenite and skeletal grainstone may be cavity fill, oxidised, dolomite.
45.15-45.90	Reefal limestone, oxidised.
45.90-59.30	Calcarenite and skeletal grainstone, mainly dolomite, may be cavity fill, all oxidised.
59.30-60.05	Skeletal grainstone.
60.05-89.70	Calcarenite mainly with skeletal grainstone increasing towards the base of the interval. Pyrite along stylolites throughout in unoxidised core.

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FIG. 1

011


E.L.436
31°
32°
138°
139°
T N
Leigh Creek
Mt Playfair
Mt Parry
1150
Myrtle Springs
Mt Bourne
The Butt
Buff Wolf
Telford
Kate Hill
Stones Claim Mine
Bunyaroo Hill
Mt Rose 2480
1550 Mt Coffin
Upper Springs
2384 Mt Jeffery
Depot Creek
Copley
Nankabunyana Creek
"St Ronan"
2246
Mt Deception
Pattapa
Mount Bayley Mine
James Dam
Mt Godderd
Mocatoondi Mine
Evans Outstation
Anzac Bore
NORTH
Mt Hack
Old Angepena
Sliding Rock Mine
Old Nuccaleena Mine
2309
Mt Lucius
Mt Brumby
Mt Chambers
1482
Moorowie Mine
Wimpawie Mine
Mt Frome
Round Bush Bore
Mt Samuel
Mt Elkington
Oratunga Mine
Blinman
Second Hill
Carey Hill
Dawson Hill
Six Mile Bore
Ten Mile Bore
Gravity Bore
Limestone Spring Bore
Seven Mile Tanks
Wyambena Outstn
Perachilna
Mt Falkland
Gum Creek
Crown Hill
Commodore
Old Motpena
Motpena
LAKE TORRENS
Brachina Bore
Brachina
Mt Hayward
Bunyeroo Well
Baryles Mine
Mount Billy
Mile Creek
Mt Robert
2739
2158
Mt Sumpter
Appealinna
Mt Carnarvon
2880
Mt Mantell
Beaphook Hill
1274
Six Mile Well
Mt Burns
Saint Mary Peak
Edowie
Martins Well
Wilpena Creek
Erudina
Moralana
Mt Palmerston
3822
Wilpena
Point Bonney
3705
Rawnsley Bluff
3260
Rawnsley Park
Maggie Hill
Artipena Hill
Artipena Dam
Mt Alack
3708
Mt Little
Cotabena
1450
Burnett Hill
Old Wallerberdina
Wallerberdina
Mt Eyre
Wild Dog Glen
Wonoka Hill
2150
Wonoka
Arkaroola
Shaggi Ridge
Glen Lyel
Glen Osk
Mt Craig
3172
Mt Plantagenet
Warramba
Mt Neville
Red Well
Mt Josephine
Sheridan Dam
Siccus River
Mt Davidson
Black Hill
Wilyerpa Hill
2886
Round Hill
West Toolaby
Scott Hill
Beraota Hill
Parsons Bore
Neuroodla
1650
Mt Oriole
Hawker
Warrioota Bore
Walter Mine
Mokrillen
Baltana
Nilpena
Deadmans
Blackfellows
Warrioota Creek
Depot Creek
Anzac Spring
Hutters Well
Mocatoondi Creek
Mt Godderd Creek
Old Mangarowena
Mt Hack Creek
Sliding Rock Creek
Pattapa Creek
Nankabunyana Creek
Swamp
James Dam
Mt Lucius Creek
Brumby Creek
Mt Chambers Creek
Joint Chambers Creek
Bell Bore
Brandon Well
Meloo View
Arrowie
Rauls Dam
Big John Well
Mara Creek
Leatree Creek
Rivers Bluff
One Tree Bore
Wertaloona
Hallsdale Hill
Balcanoona
Balcanoona Creek
Wyambena Creek
Mt Lyell
Bore
Dawley Bore
Oratunga
Anglachina
Alpena
Wirrealpa
Kirrealpa Creek
Perachilna Creek
First Pinery Bore
Commodore Creek
Brachina Creek
Brachina Gorge
Mt Haywood Creek
Mt Robert Creek
Edowie Creek
Wilpena Creek
Moralana Creek
Reichelowie Creek
Mt Burns Creek
Mt Palmerston Creek
Cotabena Creek
Burnett Creek
Mt Little Creek
Wonoka Creek
Arkaroola Creek
Willow Creek
Morgan Creek
Siccus River
Aldowlinna Creek
Warramba Creek
Mt Neville Creek
Sheridan Creek
Parsons Bore
Beraota
Scott Hill
Wilyerpa Hill
Mt Josephine
Red Well
Artipena Hill
Maggie Hill
Point Bonney
Rawnsley Bluff
Rawnsley Park
Ulewidna
Mt Hawkstock
Mt Alack
Mt Little
Wonoka Hill
Shaggi Ridge
Glen Lyel
Glen Osk
Mt Craig
Mt Plantagenet
Warramba
Arkaroola
Wertaloona
Mocatoondi Mine
Evans Outstation
Anzac Bore
Hallsdale Hill
Balcanoona
Mt Lyell
Dawley Bore
Oratunga
Anglachina
Alpena
Wirrealpa
Mt Chambers
Moorowie Mine
Wimpawie Mine
Mt Frome
Round Bush Bore
One Gum Bore
Wyambena Outstn
Seven Mile Tanks
Ten Mile Bore
Gravity Bore
Limestone Spring Bore
Beaphook Hill
1274
Six Mile Well
Martins Well
Wilpena Creek
Erudina
Artipena Hill
Artipena Dam
Sheridan Dam
Siccus River
Red Well
Mt Josephine
Mt Neville
Mt Davidson
Black Hill
Wilyerpa Hill
2886
Round Hill
West Toolaby
Scott Hill
Beraota Hill
Parsons Bore
Siccus River
Aldowlinna Creek
Willow Creek
Morgan Creek
Warramba Creek
Mt Craig
3172
Mt Plantagenet
Hawker
Neuroodla
1650
Mt Oriole

290 000 ME

300 000 ME

310 000 ME

6 580 000 MN

6 570 000 MN

6 560 000 MN

6 550 000 MN

WD 5

WD 2

WD 4

WD 3

WD 7

WD 8

WD 1

WD 12

WD 10

WD 11

WD 9

WD 6

WD 2 – Drillhole

0 1000 2000 3000 4000 5000 metres

SCALE 1 50 000

FIG. 2

3427-2

THE BROKEN HILL PROPRIETARY CO. LTD.
EXPLORATION DEPARTMENT

NTH FLINDERS RANGES S.A.
E.L. 436

DRILLHOLE LOCATION PLAN

Drawn R.K.	Date March 80	Centre WHYALLA
Traced	Project N°	Drawing No 1716
Checked		
O.I.C.		

Revisions

Exploration Licence 436

Wirrealpa, South Australia

Report for the Quarter ended
31st August, 1980

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1. General

2. Field Investigations

    2.1. Geological Mapping and Prospecting
    2.2. Drilling

3. Expenditure

APPENDICES

1. Notes on Symbols Used in Core Logging
   Textural Styles in Lower Cambrian Limestone Core

2. Analysis Results

FIGURES

1. E.L. 436 Wirrealpa, S.A. Location

2. Drilling - Summary Logs A3-1662

EXPLORATION LICENCE 436

WIRREALPA, SOUTH AUSTRALIA

REPORT FOR THE QUARTER ENDED 31st AUGUST, 1980

1. GENERAL

Exploration Licence 436 of 1,030 square kilometres in the Copley and Parachilna 1:250,000 sheet areas, was granted to Dampier Mining Company Limited for one year on 30th November, 1979. (See Figure 1).

2. FIELD INVESTIGATIONS

2.1 Geological Mapping and Prospecting

The 1:10,000 mapping of the area has not yet been completed. It will continue during the next quarter.

2.2 Drilling

Graphic logs of drill holes WD1-12 drilled during previous quarters, are shown on Figure 2. Explanatory notes for the drill logs are in Appendix 1, together with a plan showing textural styles in Lower Cambrian limestone core and pictures of core.

Assay results from drilling samples are in Appendix 2.

3. EXPENDITURE

Expenditure debited to E.L. 436 during June, July and August, 1980 was:

Wages and Salaries	$5,272
Messing and Accommodation	779
Fares and Mobilisation	80
Transport	1,378
Surveying/Aerial Photographs	139
Plant Services	864
Mobilisation of Equipment	286
Sample Analysis	1,562
Other Items	71
	$10,431

Total expenditure to 31st August, 1980 is $208,734.

This report is submitted to the Department of Mines and Energy as required by Condition 4 of Exploration Licence 436.

APPENDIX 1

Notes on Symbols Used in Core Logging
Textural Styles in Lower Cambrian Limestone Core.

NOTES ON SYMBOLS USED IN CORE LOGGING

E.L. 436 - WIRREALPA

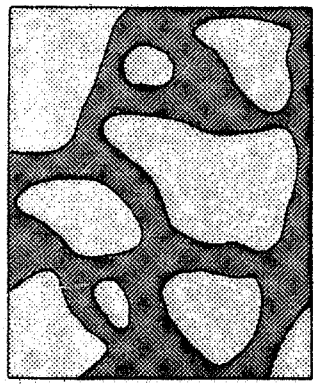
The following symbols were used during core logging to denote the more common rock types observed.

A, B, C, D, Anm, BCM, TCF & CFLS.

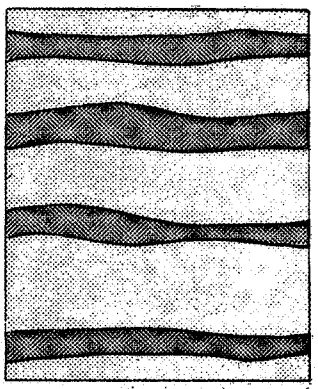
These are described on the following pages.

The symbols MB (WD3 199.75-228.66) and ANB (WD3 235.77-238.47) are incorrect and FPC is an abbreviation for a flat pebble conglomerate.

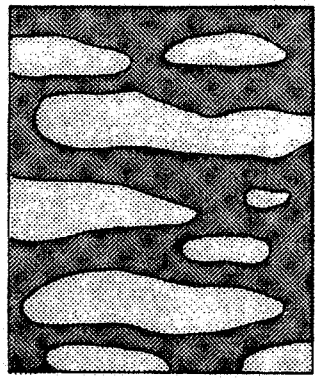
A	Breccia - generally monomict and rarely polymict (polymict types are denoted in the logs). The fragments are generally micritic and rarely comprise calcarenite or skeletal rich bands, dissolution (stylolytic) contacts between fragments are common. The matrix is between 10-30% and comprise black calcareous siltstone/mudstone (BCM). (Photo 436/04).
Anm	(no matrix). As for A however the matrix is less than 10%. (Photo 436/06, 436/08).
B	Interbedded general parallel beds of grey micrites (4-10cm) with black calcareous siltstone/mudstone (1-5cm). (Photo 436/20).
C	Similar to B however the limestone bands are not as persistent laterally. The limestone fragments usually have rounded ends and with the smaller fragments they have a typically ellipsoidal appearance. (Photo 436/20).
D	Any of A, B or C where the matrix material is greater than 50%. Limestone fragments suspended in the matrix invariably are subrounded or ellipsoidal depending on size.
BCM	Black calcareous matrix. Generally a finely laminated black calcareous siltstone or mudstone.
TCF/CFLS	These refer to calcite filled fractures. TCF are fine calcite filled fractures cutting across the limestone and matrix alike. CFLS refers to fractures which are only calcite filled where they cross limestone fragments, the fracture itself can be seen to penetrate the matrix as a thin line only. (Photo 436/18).



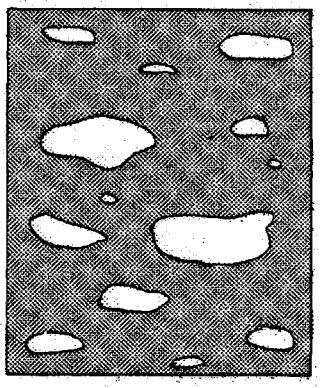
UNIT A



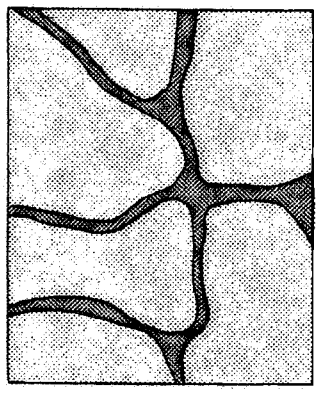
UNIT B



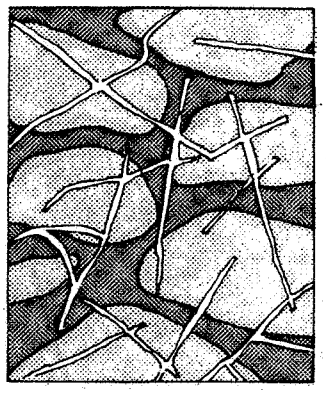
UNIT C



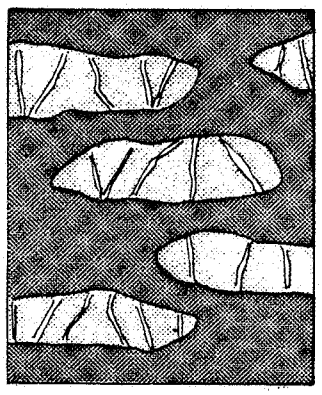
UNIT D



UNIT Anm



A with TCF



C with CFLS



Generally black calcareous matrix



Generally grey micrite/limestone.



Calcite.

TEXTURAL STYLES IN LOWER CAMBRIAN LIMESTONE CORE
E.L. 436 WIRREALPA, E.L.526 ANGEPENA S.A.

10
20
30
40
4361108

10
20
30
40
4361104

10
20
30
40
4361110

10
20
30
40
4361106

10
20
30
40

10
20
30
40

APPENDIX 2

Analysis Results

ANALABS (AUST.) PTY. LTD.

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Rack No. 224
Page No. 1
Order No.

GEOCHEMICAL RESULT SHEET

TUBE No.	SAMPLE No.		Cu	Zn	Pb	Hole No				
1	AQ	640	10	85	95	WD 4	18·00	19·00		
2		41	10	195	235	"	19·00	20·00		
3		42	10	130	155	"	20·00	21·00		
4		43	10	80	65	"	21·00	22·00		
5		44	10	40	25	"	22·00	23·00		
6		45	15	60	45	"	23·00	24·00		
7		46	10	40	45	"	24·00	25·00		
8		47	15	95	85	"	25·00	26·00		
9		48	10	45	85	"	26·00	27·00		
10		49	10	125	145	"	27·00	28·00		
11	AQ	650	10	170	145	"	28·00	29·00		
12		51	10	240	330	"	29·00	30·00		
13		52	5	215	325	"	30·00	31·00		
14		53	30	590	1200	"	31·00	32·00		
15		54	25	230	375	"	32·00	33·00		
16		55	150	235	1400	"	33·00	34·00		
17		56	70	250	1750	"	34·00	35·00		
18		57	100	570	80	"	35·00	36·00		
19		58	105	325	305	"	36·00	37·00		
20		59	60	250	800	"	37·00	38·00		
21	AQ	660	20	350	775	"	38·00	39·00		
22		61	15	335	205	"	39·00	40·00		
23		62	40	345	60	"	40·00	41·00		
24		63	90	1250	70	"	141·00	42·00		
25		64	60	1650	1250	"	119·00	43·00		
Detection			5	5	5					
Standard										
Digestion			A1							
Method			A11							

RESPONSIBLE OFFICER 13/7/90

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

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Code No. 149 01 3496
Rack No. L24
Page No. 2
Order No.

GEOCHEMICAL RESULT SHEET

TUBE No.	SAMPLE No.		Cu	Zn	Pb	Hole No.				
1	AQ	665	65	510	100	WD 4	43.00	44.00		
2		66	65	265	85	"	44.00	45.00		
3		67	590	1300	405	"	45.00	45.75		
4		68	15	185	300	WD 8	266.83	276.33		
5		69	15	1800	3100	"	270.82	271.82		
6	AQ	670	10	90	355	"	272.85	273.85		
7		71	5	70	315	"	273.85	274.85		
8	→	72	15	2050	1.0%	"	274.85	275.85		
9		73	10	140	350	"	275.85	276.85		
10		74	10	420	6000	"	276.85	277.85		
11		75	10	50	145	"	277.85	278.85		
12		76	5	395	1350	"	278.85	279.85		
13	→	77	10	4200	1.1%	"	279.85	280.85		
14		78	10	1500	5800	"	280.85	281.85		
15		79	10	115	2600	"	281.85	282.85		
16	AQ	680	10	1000	800	"	282.85	283.85		
17		81	10	2300	220	"	283.85	284.85		
18		82	15	1400	2850	"	284.85	285.85		
19		83	15	720	1500	"	285.85	286.85		
20	→	84	15	315	1.25%	"	286.85	287.85		
21		85	20	150	3700	"	287.85	288.85		
22										
23										
Repeat 24	AQ	640	10	80	85	WD 4	18.00	19.00		
Repeat 25	AQ	645	65	500	95	"	143.00	144.00		
Detection			5	5	5					
Standard	FS	5	150	110	20					
Digestion			Aq							
Method			Aq							

RESPONSIBLE OFFICER 19/7/90

Results in ppm unless otherwise specified
. = element present, but concentration too low to measure
X = element concentration is below detection limit
– = element not determined

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061

Code No. 14·9 01 3498
Rack No. L96
Page No. 3
Order No.

GEOCHEMICAL RESULT SHEET

TUBE No.	SAMPLE No.		Cu	Zn	Pb	Hole No.				
1	AQ	686	10	30	145	WD 8	288·85	289·85		
2		87	10	30	105	"	289·85	290·85		
3		88	35	160	305	"	290·85	291·85		
4		89	15	85	110	"	291·85	292·85		
5	AQ	690	30	125	155	"	292·85	293·85		
6		91	15	145	75	"	293·85	294·85		
7		92	15	85	80	"	294·85	295·85		
8		93	10	80	45	"	295·85	296·85		
9		94	20	80	90	"	296·85	297·85		
10		95	10	95	135	"	297·85	298·85		
11		96	5	85	25	"	298·85	299·85		
12		97	10	450	90	"	299·85	300·85		
13		98	10	500	85	"	300·85	301·85		
14		99	15	225	90	"	301·85	303·85		
15	AQ	700	10	590	90	"	303·85	305·85		
16		01	5	50	35	"	305·85	307·85		
17		02	10	125	100	"	307·85	309·85		
18		03	10	100	50	"	309·85	311·85		
19		04	5	20	25	"	311·85	313·85		
20		05	5	30	30	"	313·85	315·85		
21		06	5	425	730	WD 1	70·68	71·68		
22		07	5	105	495	"	80·50	81·50		
23		08	5	700	60	"	86·11	87·11		
24		09	5	1000	55	"	91·80	92·30		
25	AQ	710	10	3150	1250	"	115·60	116·60		
Detection			5	5	5					
Standard										
Digestion			Aq							
Method			Aq							

RESPONSIBLE OFFICER 14/7/80

Results in parts per million unless otherwise specified
T = element present; but concentration too low to measure
X = element concentration is below detection limit
– = element not determined

ANALABS (AUST.) PTY. LTD.

062

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Code No. 14-9 01 3491
Rack No. 196
Page No. 4
Order No.

GEOCHEMICAL RESULT SHEET

TUBE No.	SAMPLE No.		Cu	Zn	Pb					
1	AQ	711	5	1350	145	WD 1	147.10	148.10		
2		12	5	490	270	"	148.10	149.10		
3		13	10	1200	165	"	149.10	150.10		
4		14	10	480	80	"	150.10	151.10		
5		15	5	110	30	"	151.10	152.10		
6		16	10	340	55	"	152.10	153.10		
7		17	10	850	55	"	153.10	154.10		
8		18	10	415	30	"	154.10	155.10		
9		19	10	245	25	"	155.10	156.10		
10	AQ	720	20	40	25	"	156.10	157.10		
11		21	5	350	1000	"	159.68	160.68		
12		22	5	950	1100	"	162.54	163.54		
13		23	5	355	40	"	164.10	165.10		
14		24	5	725	60	"	166.60	167.60		
15		25	5	950	130	"	167.60	168.60		
16		26	5	900	1050	"	168.60	169.60		
17		27	5	240	1400	"	169.60	170.60		
18		28	15	30	45	WD 3	210.34	211.34		
19		29	10	15	65	"	256.00	257.00		
20	AQ	730	5	20	190	"	257.00	258.00		
21		31	15	455	15	WD 5	104.02	105.02		
22										
23										
24 Repeat	AQ	686	10	25	145	WD 8	288.85	289.85		
25 Repeat	AQ	711	5	1350	130	WD 1	147.10	148.10		
Detection			5	5	5					
Standard	FS	5	150	110	10					
Digestion			A1							
Method			A1/1							

RESPONSIBLE OFFICER 18/7/90

R = element present; but concentration too low to measure
T = element concentration is below detection limit
X = element not determined

ANALABS (AUST.) PTY. LTD.

063

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Code No. 14-9 01 3496
Rack No. L72
Page No. 5
Order No.

GEOCHEMICAL RESULT SHEET

TUBE No.	SAMPLE No.		Cu	Zn	Pb					
1	AQ	732	10	1100	35	WD 5	111.51	112.51		
2		33	15	40	35	"	142.90	143.90		
3		34	10	30	60	WD 6	65.45	66.45		
4		35	10	45	65	"	66.80	67.80		
5		36	10	70	125	"	67.80	68.80		
6	12	37	15	135	695	"	68.80	69.80		
7		38	10	590	125	"	69.80	70.80		
8		39	5	115	130	"	70.80	71.80		
9	AQ	740	10	40	1000	"	71.80	72.80		
10		41	10	415	390	"	72.80	73.80		
11		42	10	115	115	"	73.80	74.80		
12		43	5	185	105	"	74.80	75.80		
13		44	10	200	195	"	75.80	76.80		
14		45	10	50	40	"	76.80	77.80		
15		46	10	245	35	WD 7	130.42	131.42		
16		47	10	110	55	"	131.42	132.42		
17		48	10	50	50	"	148.49	149.49		
18		49	10	75	60	"	151.40	152.40		
19	AQ	750	15	155	125	"	152.40	153.40		
20		51	10	60	50	"	218.50	219.50		
21		52	5	50	65	"	213.75	214.75		
22		53	15	345	55	"	216.75	217.75		
23		54	10	65	35	"	217.75	218.75		
24		55	10	135	30	"	218.75	219.75		
25		56	10	20	35	"	279.50	280.50		
Detection			5	5	5					
Standard										
Digestion			A1							
Method			A1							

RESPONSIBLE OFFICER 14/7/93

F = ; in p nless wise ified
T = element present; but concentration too low to measure
X = element concentration is below detection limit
– = element not determined

ANALABS (AUST.) PTY. LTD.

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064

Code No. 14.9 01 3496
Rack No. L72
Page No. 6
Order No.

GEOCHEMICAL RESULT SHEET

TUBE No.	SAMPLE No.		Cu	Zn	Pb					
1	AQ	757	5	25	35	WD 7	300.00	301.00		
2		58	5	35	35	"	301.00	302.00		
3		59	5	35	30	"	302.00	303.00		
4	AQ	760	5	40	35	"	303.00	304.00		
5		61	5	30	30	"	304.00	305.00		
6		62	5	110	35	"	305.00	306.00		
7		63	5	45	35	"	306.00	307.00		
8		64	5	65	30	"	307.00	308.00		
9		65	5	430	30	"	308.00	309.00		
10		66	5	80	30	"	309.00	310.00		
11		67	5	55	35	"	310.00	311.00		
12		68	5	310	35	"	311.00	312.00		
13		69	5	40	30	"	312.00	313.00		
14	AQ	770	5	110	30	"	313.00	314.00		
15		71	5	185	35	"	314.00	315.00		
16		72	5	125	35	"	315.00	316.00		
17		73	5	175	35	"	316.00	317.00		
18		74	5	150	35	"	317.00	318.00		
19		75	5	225	30	"	318.00	319.00		
20		76	5	190	35	"	319.00	320.00		
21		77	5	270	25	"	320.00	321.00		
22										
23										
Repeat 34	AQ	732	10	1150	25	WD 5	111.51	112.51		
Repeat 25	AQ	757	5	30	25	WD 7	300.00	301.00		
Detection			5	5	5					
Standard	FS	S	165	120	20					
Digestion			A1							
Method			A1							

RESPONSIBLE OFFICER 19/7/90

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

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065

Code No. 14·9 01 3496
Rack No. 277
Page No. 7
Order No.

GEOCHEMICAL RESULT SHEET

TUBE No.	SAMPLE No.		Cu	Zn	Pb					
1	AQ	778	10	15	35	WD7	321·00	322·00		
2		79	10	5	35	"	322·00	323·00		
3	AQ	780	5	40	35	"	323·00	324·00		
4		81	10	5	40	"	324·00	325·00		
5		82	10	5	40	"	325·00	326·00		
6		83	10	X	30	"	326·00	327·00		
7		84	10	5	35	"	327·00	328·00		
8		85	10	5	30	"	328·00	329·00		
9		86	10	35	35	"	329·00	330·00		
10		87	5	30	45	"	330·00	331·00		
11		88	5	1800	35	"	331·00	332·00		
12		89	5	2450	40	"	332·00	333·00		
13	AQ	790	5	115	45	"	333·00	334·00		
14		91	5	120	50	"	334·00	335·00		
15		92	5	2550	45	"	335·00	336·00		
16		93	5	235	25	"	336·00	337·00		
17		94	10	215	30	"	337·00	338·00		
18		95	5	130	30	"	338·00	339·00		
19		96	5	665	30	"	339·00	340·00		
20		97	5	10	30	"	340·00	341·00		
21		98	5	5	25	"	341·00	342·00		
22		99	5	65	25	"	342·00	343·00		
23	AQ	800	5	105	25	"	343·00	344·00		
24		01	5	105	30	"	344·00	345·00		
25		02	5	10	25	"	345·00	346·00		
Detection			5	5	5					
Standard										
Digestion			A1							
Method			A1/1							

RESPONSIBLE OFFICER 19/7/80

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

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066

Code No. 14·9 01 3496
Rack No. 477
Page No. 8
Order No.

GEOCHEMICAL RESULT SHEET

TUBE No.	SAMPLE No.		Cu	Zn	Pb					
1	AQ	803	5	5	30	WD 7	314·00	347·00		
2		04	5	5	30	"	347·00	348·00		
3		05	5	5	30	"	348·00	349·00		
4		06	10	10	35	"	349·00	350·00		
5		07	5	10	30	"	350·00	351·00		
6		08	5	10	35	"	351·00	352·00		
7		09	5	15	35	"	352·00	353·00		
8	AQ	810	25	45	30	"	353·00	354·00		
9		11	20	70	35	"	354·00	355·00		
10		12	45	15	35	"	355·00	356·00		
11		13	30	35	30	"	356·00	357·00		
12		14	20	25	30	"	357·00	358·00		
13		15	45	5	30	"	358·00	359·00		
14		16	25	5	30	"	359·00	360·00		
15		17	15	15	30	"	360·00	361·00		
16		18	75	10	30	"	361·00	362·00		
17		19	10	10	35	"	362·00	363·00		
18	AQ	820	95	110	40	"	363·00	364·00		
19		21	490	775	75	"	364·00	365·00		
20		22	10	560	50	"	365·00	366·00		
21		23	10	625	45	"	366·00	367·00		
22										
23										
24 Repeat	AQ	778	10	20	35	WD 7	321·00	322·00		
25 Repeat	AQ	803	5	5	35	"	314·00	317·00		
Detection			5	5	5					
Standard	FS	5	165	110	20					
Digestion			A1							
Method			A1/1							

RESPONSIBLE OFFICER 19/7/80

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– = element not determined

results in ppm unless otherwise specified

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067

Code No. 14·9 01 3496
Rack No. L90
Page No. 9
Order No.

GEOCHEMICAL RESULT SHEET

TUBE No.	SAMPLE No.		Cu	Zn	Pb					
1	AQ	824	5	1300	40	WD 7	367·00	368·00		
2		25	10	900	120	"	368·00	369·00		
3		26	5	2400	100	"	369·00	370·00	←	
4		27	10	1750	175	"	370·00	371·00	←	
5		28	10	1650	130	"	371·00	372·00	←	
6		29	10	760	105	"	372·00	373·00		
7	AQ	830	10	1400	95	"	373·00	374·00		
8		31	10	90	210	"	374·00	375·00		
9		32	10	50	60	"	375·00	376·00		
10		33	10	110	70	"	376·00	377·00		
11		34	10	65	60	"	377·00	378·00		
12		35	5	480	35	"	378·00	379·00		
13		36	5	405	30	"	379·00	380·00		
14		37	5	620	45	"	380·00	381·00		
15		38	10	295	40	"	381·00	382·00		
16		39	10	260	35	"	382·00	383·00		
17	AQ	840	10	175	30	"	383·00	384·00		
18		41	5	30	25	"	384·00	385·00		
19		42	5	15	20	"	385·00	386·00		
20		43	5	10	20	"	386·00	387·00		
21		44	5	10	20	"	387·00	388·00		
22		45	5	10	20	"	388·00	389·00		
23		46	5	10	20	"	389·00	390·00		
24		47	5	10	15	WD 12	69·15	69·15	←	
25		48	5	10	25	"	69 15	70·15		
Detection			5	5	5					
Standard										
Digestion			Aq							
Method			Aq							

RESPONSIBLE OFFICER ..... 14/ 7 /93

T = element present, but concentration too low to measure
X = element concentration is below detection limit
– = element not determined

Results in ppm unless otherwise specified

ANALABS (AUST.) PTY. LTD.

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Code No. 14-9 01 3496
Rack No. L90
Page No. 10
Order No.

GEOCHEMICAL RESULT SHEET

TUBE No.	SAMPLE No.		Cu	Zn	Pb					
1	AQ	849	5	5	40	WD 12	70·15	71·15		
2	AQ	850	5	10	25	"	72·10	73·10	←	
3		51	5	10	25	"	73·10	74·10		
4		52	10	10	25	"	75·95	76·95		
5		53	5	15	30	"	76·95	77·95	←	
6		54	10	40	45	WD 9	55·60	56·60		
7		55	5	60	55	"	56·60	57·60		
8		56	25	55	65	"	59·44	60·44		
9		57	20	75	75	"	60·44	61·44	←	
10		58	45	10	1200	"	89·71	90·71	←	
11		59	30	20	225	"	90·71	91·71		
12	AQ	860	20	25	145	"	91·71	92·71		
13		61	45	35	255	"	92·71	93·71		
14		62	25	35	115	"	93·71	94·71		
15		63	15	10	105	"	94·71	95·71		
16		64	75	15	110	"	95·71	96·71		
17		65	10	15	25	"	96·71	97·71		
18		66	95	25	335	"	97·71	98·71		
19		67	495	20	125	"	98·71	99·71		
20		68	10	15	60	"	243·50	244·50		
21		69	15	10	90	"	245·68	246·68	←	
22										
23										
24 Repeat	AQ	824	5	1300	30	WD 7	367·00	368·00		
25 Repeat	AQ	849	5	5	30	WD 12	70·15	71·15		
Detection			5	5	5					
Standard	FS	5	165	105	15					
Digestion			A1							
Method			A1/1							

7 Samples.

RESPONSIBLE OFFICER 19/7/90

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

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069

Code No. 149 01 3496
Rack No. L73
Page No. 11
Order No.

GEOCHEMICAL RESULT SHEET

TUBE No.	SAMPLE No.		Cu	Zn	Pb					
1	AQ	870	15	45	100	WD 9	251·30	252·30		
2		71	5	20	30	"	252·30	253·30		
3		72	5	20	30	"	268·20	269·20		
4		73	5	15	30	"	269·20	270·20		
5		74	10	35	40	"	270·20	271·20		
6		75	10	50	55	"	317·78	318·78		
7		76	5	45	10	"	321·97	322·97		
8		77	5	50	10	"	322·97	323·97		
9		78	10	40	40	"	323·97	324·97		
10		79	5	20	35	"	326·85	327·85		
11	AQ	880	10	35	55	"	327·85	328·85		
12		81	5	30	50	"	328·85	329·85		
13		82	5	15	40	"	329·85	330·85		
14		83	5	35	65	"	332·61	333·61		
15		84	5	60	30	"	335·85	336·85		
16		85	5	25	25	"	347·12	348·12		
17		86	5	15	20	"	349·65	350·65		
18		87	5	15	20	"	380·91	381·91		
19		88	5	30	20	"	388·20	389·20		
20		89	5	15	25	"	392·95	393·95		
21	AQ	890	5	40	40	"	341·85	342·85		
22		91	900	130	785	WD 10	107·00	108·00		
23		92	2700	75	675	"	108·00	109·00		
24		93	715	60	485	"	109·00	110·00		
25		94	255	45	310	"	110·00	111·00		
Detection			5	5	5					
Standard										
Digestion			A1							
Method			21							

RESPONSIBLE OFFICER 14/7/80

R = ...nless ...wise ...fied in p
T = element present; but concentration too low to measure
X = element concentration is below detection limit
– = element not determined

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Code No. 14·9 01 3496
Rack No. 473
Page No. 12
Order No.

GEOCHEMICAL RESULT SHEET

TUBE No.	SAMPLE No.		Cu	Zn	Pb					
1	AQ	895	245	55	390	WD 10	111·00	112·00		
2		96	150	30	225	"	112·00	113·00		
3		97	250	40	415	"	113·00	114·00		
4		98	235	55	635	"	114·00	115·00		
5		99	30	20	150	"	128·55	129·55		
6	AQ	900	20	15	90	"	129·55	130·55		
7		01	30	15	105	"	137·50	137·50		
8		02	35	10	50	"	137·50	138·50		
9		03	25	10	60	"	138·50	139·50		
10		04	25	15	105	"	141·45	142·45		
11		05	115	20	120	"	142·45	143·45		
12		06	140	20	40	"	143·45	144·45		
13		07	10	25	25	"	144·45	145·45		
14		08	35	20	50	"	146·35	147·35		
15		09	20	15	30	"	147·35	148·35		
16	AQ	910	45	15	40	"	157·48	158·48		
17		11	15	15	20	"	158·48	159·48		
18		12	525	35	35	"	162·50	163·50		
19		13	60	15	25	"	163·50	164·50		
20		14	65	20	30	"	169·70	170·70		
21		15	2200	30	10	"	183·83	184·83		
22		916	20	10	60	"	184·83	185·83		
23										
Rpt 24	AQ	870	15	40	105	WD 9	251·30	252·30		
Rpt 25	AQ	895	245	55	385	WD 10	111·00	112·00		
Detection			5	5	5					
Standard	FS	S	155	105	20					
Digestion			A1							
Method			A1							

RESPONSIBLE OFFICER 19/7/80

Re ... n pp ... ess c ... vise s ... ed
T = element present; but ...oncentration too low to measure
X = element concentratio ... is below detection limit
– = element not determin...ed

FIG. 1

011

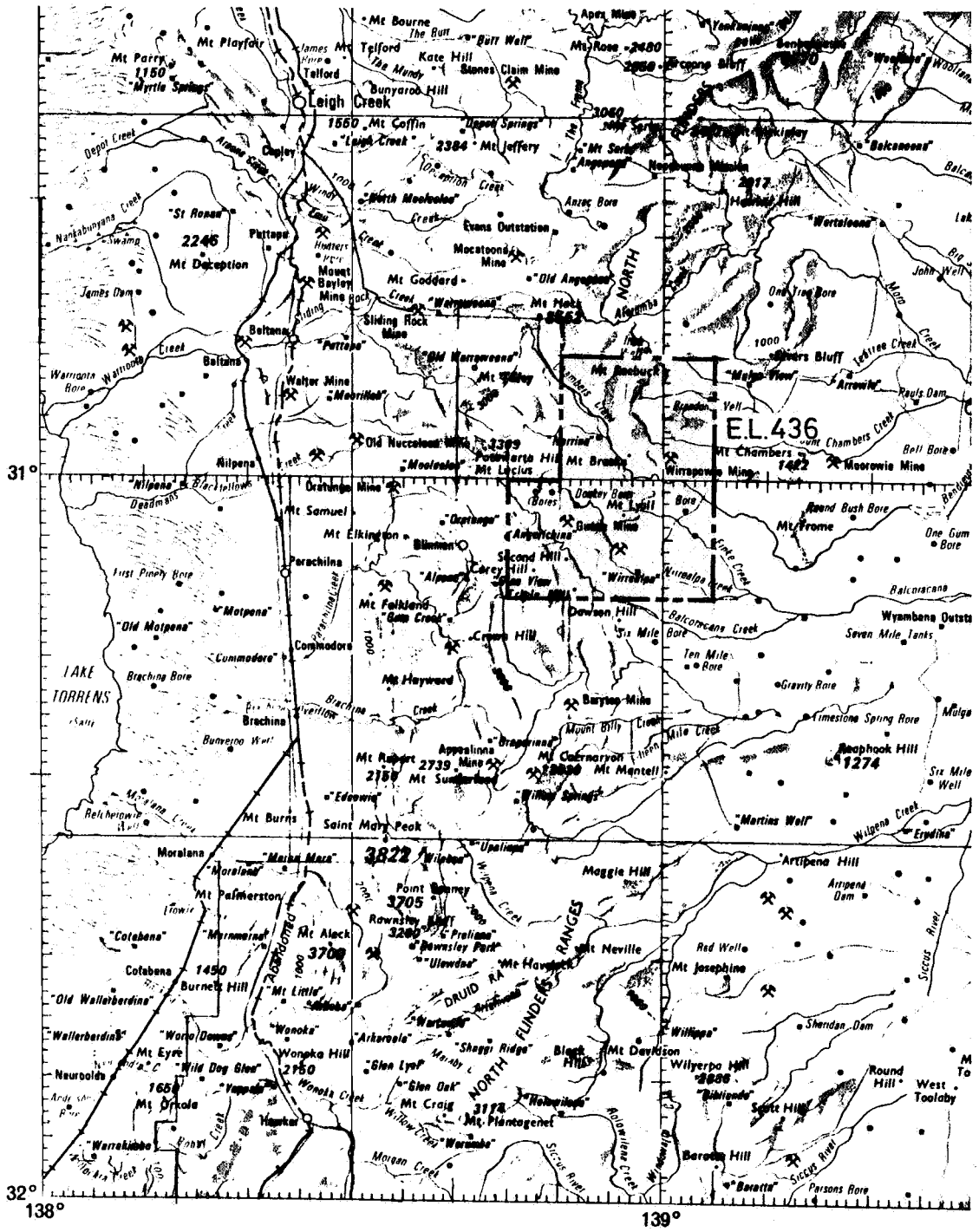
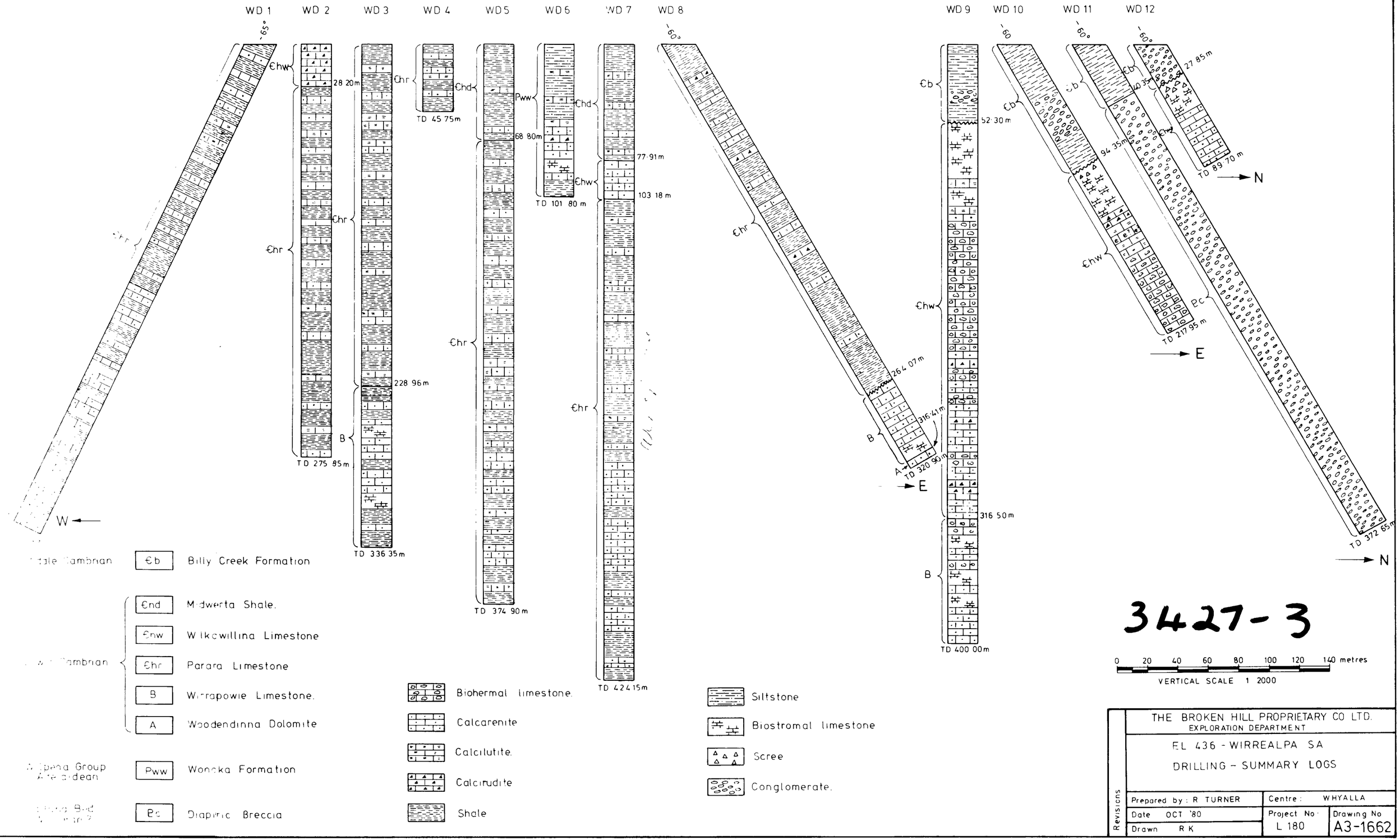

E.L.436
31°
32°
138°
139°
T N
Leigh Creek
Mt Playfair
Mt Parry
1150
Myrtle Springs
Mt Bourne
The Butt
Buff Wolf
Telford
Kate Hill
Stones Claim Mine
Bunyaroo Hill
Mt Rose 2480
1550 Mt Coffin
Upper Springs
2384 Mt Jeffery
Depot Creek
Copley
Nankabunyana Creek
"St Ronan"
2246
Mt Deception
Pattapa
Mount Bayley Mine
James Dam
Mt Godderd
Mocatoondi Mine
Evans Outstation
Anzac Bore
NORTH
Mt Hack
Old Angepena
Sliding Rock Mine
Old Nuccaleena Mine
2309
Mt Lucius
Mt Brumby
Mt Chambers
1482
Moorowie Mine
Wimpawie Mine
Mt Frome
Round Bush Bore
Mt Samuel
Mt Elkington
Oratunga Mine
Blinman
Second Hill
Carey Hill
Dawson Hill
Six Mile Bore
Ten Mile Bore
Gravity Bore
Limestone Spring Bore
Seven Mile Tanks
Wyambena Outstn
Perachilna
Mt Falkland
Gum Creek
Crown Hill
Commodore
Old Motpena
Motpena
LAKE TORRENS
Brachina Bore
Brachina
Mt Hayward
Bunyeroo Well
Baryles Mine
Mount Billy
Mile Creek
Mt Robert
2739
2158
Mt Sumpter
Appealinna
Mt Carnarvon
2880
Mt Mantell
Beaphook Hill
1274
Six Mile Well
Mt Burns
Saint Mary Peak
Edowie
Martins Well
Wilpena Creek
Erudina
Moralana
Mt Palmerston
3822
Wilpena
Point Bonney
3705
Rawnsley Bluff
3260
Rawnsley Park
Maggie Hill
Artipena Hill
Artipena Dam
Mt Alack
3708
Mt Little
Cotabena
1450
Burnett Hill
Old Wallerberdina
Wallerberdina
Mt Eyre
Wild Dog Glen
Wonoka Hill
2150
Wonoka
Arkaroola
Shaggi Ridge
Glen Lyel
Glen Osk
Mt Craig
3172
Mt Plantagenet
Warramba
Mt Neville
Red Well
Mt Josephine
Sheridan Dam
Siccus River
Mt Davidson
Black Hill
Wilyerpa Hill
2886
Round Hill
West Toolaby
Scott Hill
Beraota Hill
Parsons Bore
Neuroodla
1650
Mt Oriole
Hawker
Warrioota Bore
Walter Mine
Mokrillen
Baltana
Nilpena
Deadmans
Blackfellows
Warrioota Creek
Depot Creek
Anzac Spring
Hutters Well
Mocatoondi Creek
Mt Godderd Creek
Old Mangarowena
Mt Hack Creek
Sliding Rock Creek
Pattapa Creek
Nankabunyana Creek
Swamp
James Dam
Mt Lucius Creek
Brumby Creek
Mt Chambers Creek
Joint Chambers Creek
Bell Bore
Brandon Well
Meloo View
Arrowie
Rauls Dam
Big John Well
Mara Creek
Leatree Creek
Rivers Bluff
One Tree Bore
Wertaloona
Hallsdale Hill
Balcanoona
Balcanoona Creek
Wyambena Creek
Mt Lyell
Bore
Dawley Bore
Oratunga
Anglachina
Alpena
Wirrealpa
Kirrealpa Creek
Perachilna Creek
First Pinery Bore
Commodore Creek
Brachina Creek
Brachina Gorge
Mt Haywood Creek
Mt Robert Creek
Edowie Creek
Wilpena Creek
Moralana Creek
Reichelowie Creek
Mt Burns Creek
Mt Palmerston Creek
Cotabena Creek
Burnett Creek
Mt Little Creek
Wonoka Creek
Arkaroola Creek
Willow Creek
Morgan Creek
Siccus River
Aldowlinna Creek
Warramba Creek
Mt Neville Creek
Sheridan Creek
Parsons Bore
Beraota
Scott Hill
Wilyerpa Hill
Mt Josephine
Red Well
Artipena Hill
Maggie Hill
Point Bonney
Rawnsley Bluff
Rawnsley Park
Ulewidna
Mt Hawkstock
Mt Alack
Mt Little
Wonoka Hill
Shaggi Ridge
Glen Lyel
Glen Osk
Mt Craig
Mt Plantagenet
Warramba
Arkaroola
Wertaloona
Mocatoondi Mine
Evans Outstation
Anzac Bore
Hallsdale Hill
Balcanoona
Mt Lyell
Dawley Bore
Oratunga
Anglachina
Alpena
Wirrealpa
Mt Chambers
Moorowie Mine
Wimpawie Mine
Mt Frome
Round Bush Bore
One Gum Bore
Wyambena Outstn
Seven Mile Tanks
Ten Mile Bore
Gravity Bore
Limestone Spring Bore
Beaphook Hill
1274
Six Mile Well
Martins Well
Wilpena Creek
Erudina
Artipena Hill
Artipena Dam
Sheridan Dam
Siccus River
Red Well
Mt Josephine
Mt Neville
Mt Davidson
Black Hill
Wilyerpa Hill
2886
Round Hill
West Toolaby
Scott Hill
Beraota Hill
Parsons Bore
Siccus River
Aldowlinna Creek
Willow Creek
Morgan Creek
Warramba Creek
Mt Craig
3172
Mt Plantagenet
Hawker
Neuroodla
1650
Mt Oriole

FIG. 2



Middle Cambrian	€b	Billy Creek Formation
Lower Cambrian	€nd	Midwerta Shale.
	€nw	Wilkawillina Limestone
	€hr	Parara Limestone
	B	Wirrapowie Limestone.
	A	Woodendinna Dolomite
Archaean Gawler Range Volcanics	Pww	Wooroka Formation
Archaean Basement	Pc	Diapiric Breccia

	Biohermal limestone.
	Calcarenite
	Calcilutite.
	Calcirudite
	Shale
	Siltstone
	Biostromal limestone
	Scree
	Conglomerate.

3427-3

0 20 40 60 80 100 120 140 metres

VERTICAL SCALE 1 2000

THE BROKEN HILL PROPRIETARY CO LTD.
EXPLORATION DEPARTMENT

EL 436 - WIRREALPA SA

DRILLING - SUMMARY LOGS

Revisions

Prepared by : R TURNER	Centre : WHYALLA	
Date OCT '80	Project No : L 180	Drawing No A3-1662
Drawn R K		

EXPLORATION LICENCE 436

WIRREALPA, SOUTH AUSTRALIA

REPORT FOR THE QUARTER ENDED 30th NOVEMBER, 1980

1. GENERAL

Exploration Licence 436 of 1030 square kilometres in the Copley and Parachilna 1:250,000 sheet areas, was granted to Dampier Mining Company Limited for one year on 30th November, 1979.

13

2. FIELD INVESTIGATIONS

Detailed mapping at 1:10,000 scale around the margins of the Wirrealpa diapir was commenced during the quarter.

Further prospecting and geochemical sampling in the same area is planned during the next quarter, on completion of the geological mapping.

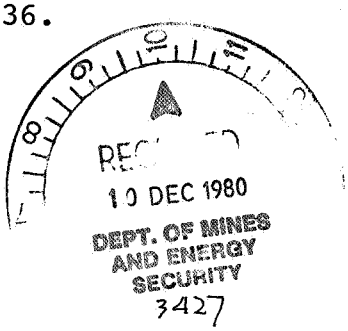
3. EXPENDITURE

Expenditure debited to EL 436 during September and October, 1980, was as follows. Expenditure for November has not yet been consolidated.

Wages and Salaries	$ 2,279
Messing and Accommodation	103
Drilling	156
Transport	724
Surveying/Aerial Photographs	414
Plant Services	80
Sample Analysis	424
Occupancy/Location Expenses	21
	$ 4,201

Total expenditure to 31st October, 1980, is $212,935.

This report is submitted to the Department of Mines & Energy as required by Condition 4 of Exploration Licence 436.



EXPLORATION LICENCE 436/809

WIRREALPA, SOUTH AUSTRALIA

REPORT FOR THE QUARTER ENDED 2nd MARCH, 1981



CONTENTS

1. GENERAL

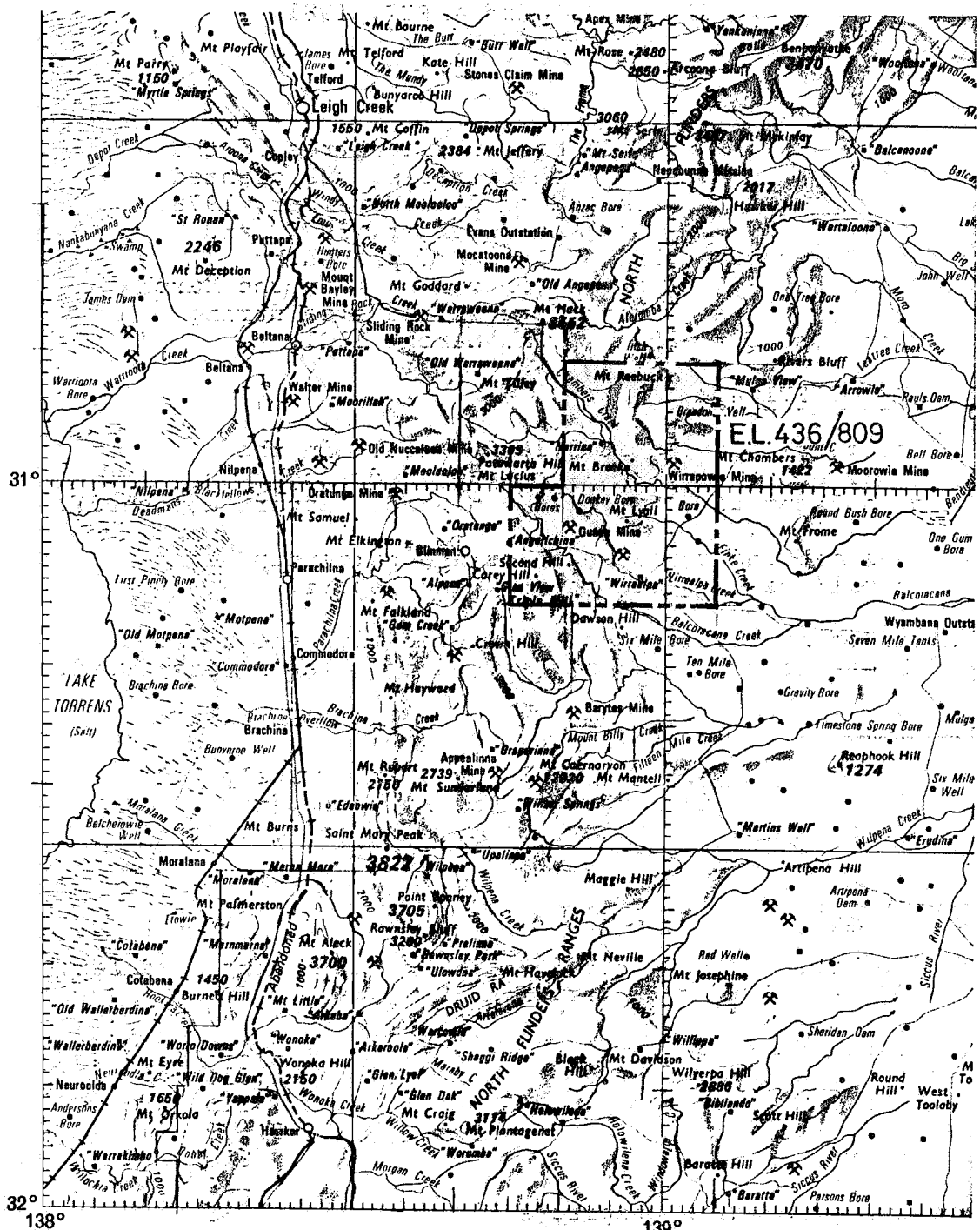
2. FIELD INVESTIGATIONS

3. FUTURE PROGRAMME

4. EXPENDITURE

APPENDIX: Summary report on the Economic Potential of the Wirrealpa Diapir Area South Australia

FIGURE: EL 809 Wirrealpa, South Australia
Location Map



Centre: Melbourne	THE BROKEN HILL PROPRIETARY CO. LTD. E.L.436/809 WIRREALPA, S.A. LOCATION MAP	Project No.
Date: 10·4·80		Drawing No. A4-2085

EXPLORATION LICENCE 436/809

WIRREALPA, SOUTH AUSTRALIA

REPORT FOR THE QUARTER ENDED 2nd MARCH, 1981

1. GENERAL

Exploration Licence 436 of 1030 square kilometres in the Copley and Parachilna 1:250,000 sheet areas, was granted to Dampier Mining Company Limited on 30th November, 1978, renewed for a further year on 30th November, 1979, and expired on 29th November, 1980. It was replaced by Exploration Licence 809, granted for one year on 2nd March 1981. This report details work done in the area during the period 1st December, 1980 to 2nd March, 1981.

2. FIELD INVESTIGATIONS

Detailed geological mapping at 1:10,000 scale in the vicinity of Wirrealpa Diapir was completed during this period by consultant geologist, Mr. D. Ward. (Report attached).

The geological map and cross-sections are currently being drafted, and will be included in the next report.

Further areas of mineralization associated with the karsted contact of Lower Cambrian limestones and the diapir were noted.

3. FUTURE PROGRAMME

A proposed drilling programme involving approximately 2,000 metres of diamond drilling, to test the mineralization associated with the karst system, is planned to commence in mid April.

4. EXPENDITURE

Expenditure debited to EL's 436/809 during the months November, December, 1980 and January, February, 1981, was:

Wages and Salaries	$ 2,212
Messing and Accommodation	1,514
Fares and Mobilisation	115
Drilling	3,019
Transport	848
Radio Communications	52
Surveying/Aerial Photographs	38
Consultants	2,062
Mobilisation of Equipment	386
Sample Analysis	1,375
Tenement Fees, Licences, etc.	773
Vehicles	750
Other Items	124
	$13,268

Total expenditure to 28th February, 1981, is $226,203.

This report is submitted to the Department of Mines & Energy as required by Condition 4 of Exploration Licence 809.

APPENDIX

SUMMARY REPORT ON THE ECONOMIC POTENTIAL OF THE WIRREALPA DIAPIR AREA SOUTH AUSTRALIA

SUMMARY REPORT ON THE ECONOMIC POTENTIAL OF THE WIRREALPA DIAPIR AREA SOUTH AUSTRALIA.

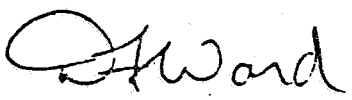
by

D.F. Ward.

2nd February, 1981.

Don F. Ward & Associates.
79 Dunalban Ave.,
WOY WOY. N.S.W. 2256.

Signed
D.F. WARD.



1. ECONOMIC POTENTIAL.

1.1. Style - typical Mississippi Valley with apparent zoning of mineralisation from Zn Pb passing through Barite and Calcite zones outwards and upwards.

1.2. Essential Factors - The Lower Cambrian sediments form a more than adequate source volumetrically for the base metals. In addition, evaporites in the Lower Cambrian and also in the underlying Proterozoic are adequate to form a source of brines. Sulphates and hydrocarbons in the host rocks are adequate to produce the necessary sulphur to fix the base metals.

Penecontemporaneous faulting, sub aerial exposure and Karsting are demonstrable in the area.

Favourable host rocks are present namely the massive and brittle archaeocyathid limestone reefs and associated calcarenites.

The overlying Parara Limestone, mainly composed of thin bedded fine grained limestones and limey muds is an effective seal channelling brines through the more brittle carbonates below. The difficulty of following faults with quite large displacements attests to its effectiveness as a seal.

1.3. Mineralisation - All lenses of brittle massive reef/calcarenite/skeletal grainstone exposed on the western or Donkey Base section of the Diapir contain contemporaneous faulting, karsting, veining with calcite, barite, pyritohedral pyrite, minor to quite rich galena, minor chalcopyrite rare sphalerite.

All lenses contain significant areas of brecciated and mineralised rock. Several superimposed phases of brecciation and mineralisation can be identified.

Similar brecciated and mineralised ground occurs on the opposite side of the Diapir. (Vicinity of WD7)

1.4. Potential - The outcropping base metal mineralisation only locally reaches ore grade (~ 10% Pb + Zn over 2 or more metres).

However the mineralising brines are envisaged as having been channelled upward towards the surface between the impervious Parara Limestone above and the Diapir mass below, following zones of fracturing in the brittle limestones. The massive limestones would thin relatively quickly as they lap on to the Diapir and thus could be expected to thicken rapidly down dip into the basin.

The proportion of prepared ground could be expected to increase down dip above that visible at the surface which in many areas appears adequate to carry ore grades.

This rapid upward thinning of the host limestone is analogous to a "pinch out" and a higher proportion of mineralised ground could be expected than would be the case on a wide sub-horizontal carbonate shelf as in the Bonaparte Basin or on the Lennard Shelf.

This higher proportion of mineralised ground would be a consequence of the steep dip present at the time of mineralisation.

The present day dips are even steeper - 60° or more - and if there were not a reasonable expectation of a rapid increase in grade of mineralisation with depth, the prospect would lose its attraction.

1.5. Potential Tonnages.

6 lenses occur along the western margin of the Diapir. Each of these zones, on surface dimensions, contains between 7 and 50 million tonnes of carbonate to 300 metres depth. Any thickening down dip would increase these figures further. It is evident that sufficient room exists for ore zones of economic dimensions.

In addition, the area downdip and North of WD7 would contain a larger potential but it is possible mineralisation could be more dispersed.

The Wirrealpa mine area is considered to still hold potential for a moderate sized deposit say 1 or 2 million tons between the Wirrealpa mine on the North, the bounding fault on the west and WD9 300 metres to the east of the fault.

1.6. Drilling Programme - On the sections left in Whyalla, one hole only has been drawn on each section. Other holes will be needed to test these lenses, however these cannot be planned until the information on dip and thickness the first holes would yield is to hand.

2. AGE OF MINERALISATION.

The bulk of the mineralisation - Galena, Sphalerite (Siderite) (Dolomite) pyrite barite calcite occurs in the pre Parara carbonates however it extends up into the overlying Parara in several places along the S.W. flank between Donkey Base and extending south and south west from Wirrealpa Spring. This mineralisation in the Parara is mainly calcite and barite, however galena/calcite veins were noted in one area.

The mineralisation does not appear in younger formations and probably occurred in Parara times, however I am unable to pin point it other than that it took place well after commencement of sedimentation as indicated by the onlap arrangement along the Donkey Bore flank.

3. WIRREALPA LEAD BARITE DEPOSIT.

3.1. Host - The mineralisation occurs wholly within the Lower Cambrian carbonates and appears strongest a short distance east of the contact with the Diapir mass on the west (< 50m)

3.2. Zoning - The mineralisation appears to be zoned with the zoning centred on the South West corner of the carbonate mass and extending a short distance north (down section) compared to a greater distance eastwards in the topmost carbonate/evaporite units.

The Zoning - with increasing distance from the focus is

(1) Galena chalcopyrite (Sphalerite) barite.

(2) Barite - Calcite.

(3) Calcite - abundant coarse sparry veins.

3.3. Origin - Typical epigenetic M.V. Brines migrating up dip and along the fault meet H_2S generated by interaction of sulphates in the upper carbonates with the abundant hydrocarbons immediately below. The diapir lacks hydrocarbons and is therefore unable to precipitate base metals.

4. MOTTLED LIMESTONES.

The origin and development of the "Mottles" in the Mottled Limestone and to a lesser extent in the other limestone units and the "Nodules" also, appears to have generated some comment and a number of theories.

The only comment I can pass is that the "Mottles" and "Nodules" are variations on a theme and that I have observed similar textures in the Wollogorang Formation, HYC Shales Lynotts formation and at certain horizons in the Roper Group of the McArthur Basin and again in the Sorby Hills core.

In all cases, the host formations contain
(a) Alternation of black fine grained carbonate and clastic muds.

(b) Evidence of hypersaline conditions of deposition.

5. EVAPORITES.

Chert nodules which occasionally show an enterolithic texture and remnant patches of fibrous felted lutecite (?) after anhydrite (?) similar to the cauliflower cherts in the McArthur Basin were located at the top of the Lower Cambrian carbonates south of the Wirrealpa Mine and fringing the northern margin of the Diapir block immediately west of the Wirrealpa Mine.

The Woodendinna Dolomite contains abundant textures similar to those in such formations as the Myrtle Shale and Tooganinnie Formation in the McArthur Basin which have been demonstrated to have originally been rich in halite.

The top of the Mottled Limestone cycles locally contain probable pseudomorphed anhydrite nodules. Also near the crest of the anticline east of the diapir, chert lenses near the top of 20 metre thick cycles contain small pseudomorphed lenticular gypsum (?) crystals.

6. THE DIAPIR.

Time did not permit an examination of this interesting structure however its relationship with and control of lower Cambrian sedimentation adjacent to it suggest a few points of interest.

It appears to have been a gently rising partly sub-aerial arch bounded mainly by a gently sloping shelf on which archaeocyathid reefs, occasional mottled limestones and the calcarenites which resulted from local uplift and erosion of the reefs were deposited.

Sand, well rounded pebbles and in some areas, angular blocks of diapir material were deposited relatively close to shore.

There is no evidence of Emu Fault type Horst Block/Graben tectonics so that HYC shale basins probably did not develop.

Within the Diapir itself a surprising number of Carbonate/sand lenses were noted which occurred in otherwise fine breccias or simply appeared to intrude other pre Cambrian sediment masses within the Diapir. These carbonate-sand bodies often contain evaporite pseudomorphs and to have behaved in a plastic manner in contrast to the angular breccia in which they often occur.

Some sections of the Diapir in the Donkey Base area at least cannot be considered as subaerial detritus because the relatively large masses of soft fractured green shale here would have been dispersed on exposure.

7. THE ANTICLINE EAST OF THE DIAPIR.

Is it an anticline formed by foreshortening on a listric fault along the N.E. flank of the Diapir and dipping N.E. and post mineralisation i.e. (?) Ordovician.

Or is it a Lower Cambrian drape over another parallel mass of Diapir whose amplitude has been accentuated by Ordovician compression

In the former case it has no particular economic significance.
In the latter case however, it could be of particular importance.

I have not seen enough field evidence to decide either way. In view of the economic potential, a hole should be drilled to establich the cause.
The probable depth to basement would have to be assessed.

Between the anticline and the Diapir abundant outer zone M.V. style mineralisation occurs - dolomitisation (? surface or hydrothermal), calcite, pyrite (pyritohedral crystals) and barite. This style of mineralisation was also intersected in abundance in WD7.
The base metal rich zones can be expected downdip to the north.

EXPLORATION LICENCE 809

WIRREALPA, SOUTH AUSTRALIA

REPORT FOR THE QUARTER ENDED 2nd JUNE, 1981

1. GENERAL

Exploration Licence 809 of 1080 square kilometres in the Copley and Parachilna 1:250,000 sheet areas, was granted to Dampier Mining Company Limited (DAMCO) for one year, on 2nd March, 1981.

This licence replaces EL 436 covering the same area, previously held by DAMCO for two years from 30th November, 1978.

2. FIELD INVESTIGATIONS

2.1 Mapping

Detailed geological mapping at 1:10,000 scale is in progress in the vicinity of the Eregunde Fault Zone. A detailed stream sediment sampling survey is being carried out in the same area in order to appraise the significance of this fault zone on the mineralizing events in the vicinity of the Wirrealpa diapir.

2.2 Drilling

The diamond drilling programme as outlined in the separate report to the Mines Department (16.3.81), commenced during the first week of May, 1981.

The first hole (WD13) is still in progress.

3. PROPOSED PROGRAMME

(a) Completion of drilling programme-8 holes totalling approximately 2,000 metres.

(b) Appraisal of drilling/assay results.

(c) Further mapping and geochemical sampling.

(d) Further drilling, if warranted.

4. EXPENDITURE

Expenditure debited to EL 809 during March, April and May 1981, was :



Wages and Salaries	$ 9,367
Messing and Accommodation	2,549
Fares and Mobilisation	104
Surveying/Aerial Photographs	198
Consultants	3,104
Drilling	17,720
Sample Analysis	1,131
Radio Communications	3
Transport	7,708
	$41,884

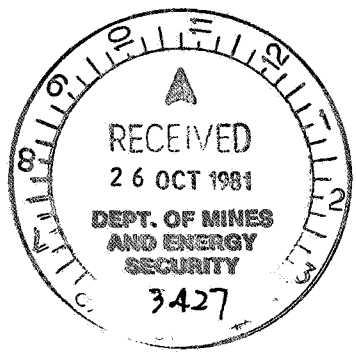
Total expenditure on EL 436/809 to 31st May, 1981 is $268,087.

This report is submitted to the Department of Mines & Energy as required by Condition 4 of Exploration Licence 809.

EXPLORATION LICENCE 809

WIRREALPA, SOUTH AUSTRALIA

REPORT FOR THE QUARTER ENDED 2nd SEPTEMBER, 1981



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2.2 Drilling

2.3 Proposed Work

3. EXPENDITURE

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1. Drill Logs

2. Analysis Results from Drilling Samples

3. Analysis Results from Stream Sediment Sampling

FIGURES

1. E.L. 809 Wirrealpa, S.A. Location Map

2. Geochemical Sampling Areas and Drillsite Locations 1792

3. Sample Sites in Vicinity of WD6 A4-316-1
   - Pb Values (ppm) -20 mesh fraction A4-316-2
   - Pb Values (ppm) +20 mesh fraction A4-316-3
   - Zn Values (ppm) -20 mesh fraction A4-316-4
   - Zn Values (ppm) +20 mesh fraction A4-316-5
   - Cu Values (ppm) -20 mesh fraction A4-316-6
   - Cu Values (ppm) +20 mesh fraction A4-316-7

4. Sample Sites in Vicinity of WD7 - Nos. SS5084 to SS5126 A4-320-1
   - Pb Values (ppm) -20 mesh fraction A4-320-7
   - Pb Values (ppm) +20 mesh fraction A4-320-4
   - Zn Values (ppm) -20 mesh fraction A4-320-5
   - Zn Values (ppm) +20 mesh fraction A4-320-3
   - Cu Values (ppm) -20 mesh fraction A4-320-6
   - Cu Values (ppm) +20 mesh fraction A4-320-2
   - Reproduction of Stream Sediment Geochemistry as carried out by A.S.A.R.C.O. (S.A.D.M.E. Envelope 975) A4-320-8
   - Reproduction of Stream Sediment Geochemistry as carried out by A.S.A.R.C.O. (S.A.D.M.E. Envelope 975) A4-320-9

5. Wirrealpa Springs Area Sample Site Locations Nos. SS5009 to SS5083 A2-1781-1
   - Pb Values (ppm) -20 mesh fraction A2-1781-9
   - Pb Values (ppm) +20 mesh fraction A2-1781-4
   - Zn Values (ppm) -20 mesh fraction A2-1781-5
   - Zn Values (ppm) +20 mesh fraction A2-1781-2
   - Cu Values (ppm) -20 mesh fraction A2-1781-3
   - Cu Values (ppm) +20 mesh fraction A2-1781-8
   - Reproduction of Stream Sediment Geochemistry as carried out by A.S.A.R.C.O. (S.A.D.M.E. Envelope 975) A2-1781-6
   - Reproduction of Stream Sediment Geochemistry as carried out by A.S.A.R.C.O. (S.A.D.M.E. Envelope 975) A2-1781-7

cont./..

Figures (continued)

6. Geophysical Down Hole Logs

WD 13	A2-122
WD 14	A4-153
WD 15	A4-152
WD 17	G-18
WD 18	A1-373
WD 19	A2-123

EXPLORATION LICENCE 809

WIRREALPA, SOUTH AUSTRALIA

REPORT FOR THE QUARTER ENDED 2nd SEPTEMBER, 1981

1. GENERAL

Exploration Licence 809 of 1,080 square kilometres in the Copley and Parachilna 1:250,000 sheet areas, was granted to Dampier Mining Company Limited (DAMCO) for one year, on 2nd March, 1981. This licence replaces E.L. 436 covering the same area, previously held by DAMCO for two years from 30th November, 1978.

2. FIELD INVESTIGATIONS

2.1 Stream Sediment Sampling

2.1.1 General

A total of 126 stream sediment samples were collected from three areas (see Figure 2) within the exploration licence area. All relevant assay results, sample site location maps, and drafted geochemical results are included in this report.

2.1.2 Sampling Technique

Sample sites were located with the assistance of 1:10,000 colour aerial photography. All samples were collected from the mid-stream at each site, and dry sieved in the field utilizing a 6 mesh sieve. The -6 mesh size fraction was then placed in Kraft geochemical sample bags.

2.1.3 Analytical Technique

All samples were sent to ANALABS laboratories in Perth, W.A. for analysis. All samples were sieved at the laboratory (20 mesh). Both the undersize (-20 mesh) and the oversize (+20 mesh) fractions were pulverized (separately), prepared for analysis by perchloric/ hydrochloric digestion, and then analysed for copper, lead, zinc, silver, iron, manganese by atomic absorption.

Assay results as reported by ANALABS are on Figures 3-5 and in Appendix 3. Results are in p.p.m. unless otherwise stated.

Samples and pulps from this survey are being stored with ANALABS for a period of two months, after which they will be returned to Whyalla and stored in the core storage shed at the B.H.P. Steelworks, Whyalla.

cont./..

2.1.4 Results

Area A: Vicinity of WD 6 - TiTree Gorge Well (Figure 3)

Eight (8) samples were collected from streams draining a mineralized calcarenite outcrop within the Wilpena Group (Adelaidean) Wonoka Formation.

A channel rock chip sampling program carried out by DAMCO in late 1979 resulted in assays over an interval of 18 metres, averaging 3.4% Pb + Zn.

This mineralized horizon was not detected by stream sediment surveys carried out by previous companies who had explored this area.

This present geochemical survey was designed to sample small gullies draining the mineralized horizon and to test any difference between sampling a coarse and a fine fraction. Previous stream sediment surveys had sampled and assayed only the -80 mesh fraction.

As can be seen from the results, the more mobile element zinc, displays anomalous values in both the coarse and fine fraction in all streams draining the mineralized horizon.

The lead results satisfactorily detected the known mineralization in both size fractions, although the anomalies are more sporadic than the zinc anomalies.

Area B: Vicinity of WD 7 - Donkey Bore (Figure 4)

As a follow-up to the stream sediment sampling program carried out previously by ASARCO (reproduced in Figure 4), and to assist in delineating mineralized zones for further drilling, forty-three (43) stream sediment samples were collected in the vicinity of WD 7.

The results from this survey are on Figure 4. Diamond drill holes WD 13, WD 14, WD 15 have subsequently been completed in this area, the results of which are included in this report (Appendix 2).

Area C: Wirrealpa Springs Area (Figure 5)

Seventy-five (75) stream sediment samples were collected in the area south-west of the Wirrealpa Springs. Follow up ground investigations are presently being undertaken in this area.

cont./..

2.2 Drilling

2.2.1 General

Seven diamond drill holes totalling 1749.32 metres were completed during this quarter. Drilling details are shown on Table 1. Drill hole locations are on Figure 2. Geological logs and assay results from sampled core are in Appendices 1 and 2 respectively.

This drilling program was undertaken utilising a DAMCO-owned Longyear 38 drill rig, operated by Casey Drilling Company.

The recovered core is presently stored in the core storage shed at the B.H.P. Steelworks, Whyalla.

2.2.2 Geology

All drill holes were collared in the Lower Cambrian Parara Limestone unit. The target zones for this drilling program included mineralized fracture zones in the Lower Cambrian Wilkawillina Limestone (WD 13, WD 14, WD 15) and the mineralized karsted surface along the western side of the Wirrealpa diapir (WD 16, WD 17, WD 18, WD 19).

2.2.3 Mineralization

Mineralized intersections of core (as detected in geological logging) were split in Whyalla, utilising a diamond saw. Half core samples over one metre intervals were then sent to ANALABS laboratories in Perth.

Samples were crushed, split and pulverized, prepared for analysis by a perchloric acid digestion and then assayed for copper, lead, zinc and silver by atomic absorption.

Assay results as reported by ANALABS are in Appendix 2, values being reported in ppm, unless otherwise stated.

Results summary:

(a) WD 15

10.3 - 11.3m	1.6%	Pb + Zn
16.3 - 17.3m	1.0%	Pb + Zn

(b) WD 18

228 - 229m	2.35%	Pb + Zn
229 - 230m	1.16%	Pb + Zn
232 - 233m	2.0%	Pb + Zn
233 - 234m	1.1%	Pb + Zn
237 - 238m	1.9%	Pb + Zn
238 - 239m	1.7%	Pb + Zn

cont./..

(c) WD 19

44.0 - 45.0m	5.75%	Pb + Zn
47.0 - 48.0m	1.4%	Pb + Zn
48.0 - 49.0m	2.3%	Pb + Zn

Geological drill sections are presently being prepared and will be included in the next quarterly report.

2.2.4 Geophysical Logs

Where possible, drill holes were logged using single point resistivity, self potential and gamma profiles. The unit used was a portable FIE T No. 450E logger. Results are on Figure 6.

2.3 Proposed Work

(1) Follow up ground work from stream sediment survey.

(2) Preparation of drill sections.

(3) Complete appraisal of recent drilling program, outlining potential reserves.

(4) Further drilling.

3. EXPENDITURE

Expenditure debited to E.L. 809 during June, July and August, 1981, was:

Wages and Salaries	$ 12,304
Messing and Accommodation	2,088
Fares and Mobilisation	486
Drilling	34,249
Transport	3,419
Radio Communications	12
Surveying/Aerial Photographs	218
Geophysics/Geochemistry	1,184
Plant Services	45
Mobilisation of Equipment	262
Sample Analysis	3,005
Occupancy/Location Expenses	8
Capital Items	2,124
Administration/Overheads	2,970
	$ 62,374

Total expenditure to 31st August, 1981, is: $330,461

This report is submitted to the Department of Mines and Energy as required by Condition 4 of Exploration Licence 809.

HOLE NO.	DATE COMPLETED	CO-ORDINATES (A.M.G.) NORTH (m)	CO-ORDINATES (A.M.G.) EAST (m)	TOTAL DEPTH	R.L. (m) COLLAR	BEARING COLLAR	DECLINATION COLLAR	OTHER
WD 13	5.6.81	6565370	296070	364.4	505	-	Vertical	
WD 14	24.6.81	6565915	296055	313.8	530	105	69°	
WD 15	1.7.81	6565125	295650	120.8	495	180	70°	
WD 16	12.7.81	6562725	297558	151.66	435	050	50°	
WD 17	24.7.81	6562680	297455	305.06	420	050	70°	
WD 18	10.8.81	6561990	297990	323.0	405	050	70°	
WD 19	18.8.81	6561550	298435	170.6	405	270	70°	
					Datum: MSL			

TABLE 1 DRILLING DETAILS

APPENDIX 1

DRILL LOGS

WD 13

0.0 - 16.0	PARARA LIMESTONE - finely bedded light grey dirty calcarenite grading into dark grey calcilutite. Minor calcite veining.
16.0 - 37.0	Partially recrystallized skeletal calcarenite, conglomeratic in places; traces of fine grain pyrite. Local slump breccia.
37.0 - 60.0	Silty calcarenite, finely bedded; graded bedding in places; rare calcite veining; grades into grey silty calcilutite.
60.0 - 68.0	Partially oxidized skeletal calcarenite; trace recrystallized calcite.
68.0 - 91.0	Poorly bedded silty calcilutite; trace galena; minor calcite veining.
91.0 - 138.0	WILKAWILLINA LIMESTONE - grey mottled limestone (brecciated vein at contact), calcite veining throughout; trace fluorite at 107.5m.
138.0 - 156.0	Grey, oxidized mottled to massive limestone. Large cavities (up to 5 metres wide)filled with silts and sands.
156.0 - 236.0	Grey mottled limestone, partially oxidized in places, minor calcite veining throughout; occasional vein breccia; fine grained pyrite dissemination throughout.
236.0 - 273.0	Grey mottled to massive limestone; more intensive calcite filled fracturing; occasional conglomeratic bands; traces of late stage pink calcite.
273.0 - 281.0	Finely bedded calcilutite/calcarenite beds; occasional graded bedding; trace pyrite.
281.0 - 364.4	Grey massive limestone - intensive calcite filled fracturing; up to 50% calcite in places. Trace of pyrite as blebs and coating fragments in mottled breccia.

WD 14

0.00 - 6.6	Strongly oxidized mottled limestone; Mn dendrites.
6.6 - 27.96	Grey mottled limestone; occasional stromatolites (17.46m), strongly oxidized in places (liesegang banding).
27.96 - 28.27	Brown clay - grey limestone.
28.27 - 84.44	Grey mottled to flaggy limestone; occasional bands of skeletal mottled talus debris. Rare stromatolites (80.09-80.22). Trace disseminated pyrite throughout.
84.44 - 149.82	Unconformable contact - oxidized, trace pyrite and chalcopyrite; calcrete nodules, vadose pisolites grading into grey mottled limestone (pyritic), with interbedded flaggy limestone beds. Occasional archaeocyathid. Thin bands of calcarenite.
149.82 - 150.86	Transitional zone - broken core, oxidized zone, Mn staining.
150.86 - 240.35	Grey massive limestone, generally stylolitic. Increased intensity of calcite filled fracturing from 220.0-240.35.
240.35 - 240.84	Fault breccia.
240.84 - 241.82	Intense calcite filled fracturing with grey flaggy limestone.
241.82 - 253.41	Generally grey mottled limestone with blebs of sphalerite, trace of fine grained pyrite throughout.
253.41 - 313.80	Grey/blue mottled stylolitic limestone; occasional thin calcite filled veins; trace of fine grained pyrite throughout.

WD 15

0.0 - 3.0	Precollar: grey oxidized limestone.
3.0 - 10.3	Parara Limestone Grey flaggy/shaly limestone with coarse calcite veining.
10.3 - 22.0	Wilkawillina Limestone Grey massive archaeocyathid limestone; laminar fill; stromatoparoid; galena and sphalerite in veins; three phases of calcite filled fractures; abundant stylolites.
22.0 - 69.7	Grey massive stylolitic limestone - generally fossil deplete. Occasional large calcite filled fractures (e.g. 63.3-65.0m).
69.7 - 89.0	Intensive milky calcite overprinting of grey massive limestone; dolomitic oxidized (unconformity) contact; trace pyrite throughout.
89.0 - 102.0	Dark grey/blue micrite - several stages of calcite filled fracturing; thin fault breccia. Trace pyrite throughout; dolomitic oxidized contact.
102.0 - 120.8	(Faulted contact); grey mottled stylolitic limestone trace thin calcite filled veining.

WD 16

0.00 - 3.00	Precollar.
3.00 - 10.00	Mottled limestone - fractured and oxidized - calcite filled fractures.
10.00 - 10.49	Calcarenite.
10.49 - 21.10	Mottled limestone as above; extensive pyrite mineralization.
21.10 - 23.00	Massive calcite.
23.00 - 32.20	Mottled limestone with gritty conglomerate matrix - trace pyrite. Massive calcite 25.43-25.63.
32.20 - 46.00	Fractured mottled limestone (calcite filled), trace pyrite throughout.
46.00 - 71.73	Mottled limestone - fractured in places - massive calcite veins; oxidized in parts.
71.73 - 74.71	Black shaley limestone (thin calcite veins).
74.71 - 75.06	Massive calcite.
75.06 - 81.42	Calcarenite, trace pyrite.
81.42 - 89.07	Mottled limestone - calcite infilling veins - thin breccia bands.
89.09 - 98.50	Massive calcite veins - pale grey calcarenite breccia.
98.50 - 104.00	Transition zone: grey lime-rich clays and calcite veins.
104.00 - 106.38	Oxidized zone.
106.38 - 151.66	Diapiric breccia - talus conglomerate.

WD 17

0.00 - 11.00	Precollar; stream sands and gravels.
11.00 - 21.12	Parara Limestone; grey shaley micrite, oxidized in places. Minor calcite veining. Some mottled bands.
21.12 - 23.00	Cavity - weathered zone - poor core recovery.
23.00 - 26.41	Grey mottled limestone as above.
26.41 - 26.78	Cavity - weathered zone.
26.78 - 29.78	Grey mottled limestone as above with coarser bands.
29.78 - 39.20	Grey calcarenite - minor calcite veining - oxidized in parts, grading into gritty calcirudite. Rare detrital archaeocyathid. Trace pyrite.
39.20 - 41.90	Mottled grey limestone.
41.90 - 43.00	Cavity.
43.00 - 51.68	Calcarenite grading into calcirudite as above.
51.68 - 57.16	Mottled limestone with coarse gritty matrix, increasing calcite veining.
57.16 - 77.36	Grey calcirudite as above - occasional calcite filled vughs.
77.36 - 90.51	Alternating black micrite with fine calcite veining.
90.51 - 128.77	As above with gritty conglomerate, mottled in places - calcite and pyrite disseminated in the mottled and the gritty conglomerate (e.g. 95.0-95.5m).
128.77 - 135.00	Black shaley limestone with interbedded massive black oolitic limestone - minor calcite veins.
135.00 - 149.26	Black shaley limestone with interbedded gritty conglomerate and oolitic bands - minor calcite veins. Pyrite infilling veins and vughs.
149.26 - 185.42	Grey-black mottled limestone (Type C), thin calcite veins, occasional pyrite. Thin gritty conglomerate bands (10cm thick) - occasional oxidized zones (10cm thick).
185.42 - 190.28	Karst fill - brecciated in places, calcite and pyrite infilling fractures.

...2/

190.28 - 228.58	Mottled limestone (type C), coarse crystalline calcite at 209.96. Calcite filled breccia at 212.22. Karst fill(?) at 216.45-218.10.
228.58 - 244.46	Brecciated mottled limestone - minor calcite - vughs in places.
244.46 - 245.08	Calcarenite band.
245.08 - 282.62	Mottled limestone (type C) occasional thin breccia bands - trace pyrite.
282.62 - 305.06	Basal conglomerate - minor calcite, trace pyrite.

WD 18

0.00 - 5.5	Precollar - generally sand, gravels and limestone rubble.
5.50 - 6.02	Weathered limestone.
6.02 - 36.00	Grey/black shaley Parara Limestone - large blebs of pyrite in places.
36.00 - 76.41	Grey mottled limestone - occasional thin calcite veins; trace pyrite blebs in black calcarenous matrix.
76.41 - 99.00	Grey mottled limestone with gritty conglomeratic matrix; blebs of pyrite throughout; thin vughy calcarenite bands (81.98-82.08); oxidized zone (86.74) within black shale unit.
99.00 - 131.00	Generally grey mottled limestone; occasional thin calcite filled veins with calcarenite bands up to 1 metre wide, thin intraformational breccia bands (117.88).
131.00 - 209.80	Grey to red (oxidized) finely laminated to occasionally mottled limestone; thin calcite veining with occasional vein up to 2cm wide; trace sulphide pseudomorph in weathered veins. Wispy "horse tail" red stylolites. 138.66-138.91 - oxidized intraformational breccia. Occasional calcite filled vughs.
209.80 - 211.80	Basal conglomerate.
211.30 - 211.70	Red (oxidized) algae soil horizon; pyrite blebs.
211.70 - 213.45	Laminated (finely) grey/black calcarenite.
213.45 - 248.75	Cave fill; red oxidized soil horizons; gypsum; fractured pale grey calcilutite; laminar fill; galena, sphalerite and pyrite mineralization.
248.75 - 323.00	Oxidized basal conglomerate grading into "diapir" talus conglomerate. Contact uncertain. 'Erratics' of limestone in mainly clastic conglomerate. Occasional calcite (recrystallized) infilling fractures and vughs. Iron and manganese staining. Trace of pyrite throughout. Liesegang banding.

APPENDIX 2

ANALYSIS RESULTS FROM DRILLING SAMPLES

ANALABS

A DIVISION OF MACDONALD HAMILTON & CO. PTY. LTD.
52 Murray Road, Welshpool, W.A. 6106
Phone (09) 458 7999

WD 15

104

ANALYTICAL REPORT

This report must be read in conjunction with the results given for JOB No. 14.9 01 19619

Client: BHP Exploration

(1) P O Box 21
WHYALLA S.A. 5600

Order No. 001826 Date Received 17-6-81
Reference A 41958 Results Required
Delivered by Total No. of Samples 094

(2) SAMPLE NUMBERS	STATE OF SAMPLES Refer to section (5) for terminology	Average Weight	PRETREATMENT Dry	Crush	Split	Pulverize	Sieve	Evaporate	Other (see remarks)	None	ANALYSIS Refer to section (5) for terminology	Preparation	Method	Coefficient of variation (%)
AQ02926 AC5054				1	2	3					Cu,Pb,Zn,Ag	A1	AAS	

3) Number of pages of results:
Date Reported:
Results to: (1) as above (2)
Per: Mr M. ROCHE
Number of Copies: 3

4) Remarks:

(5) STATE OF SAMPLES		ANALYSIS – PREPARATION				ANALYSIS – METHOD	
whole core	WC	perchloric acid	A1	cold acid	CA	atomic absorbtion	AAS
split core	SC	hydrochloric acid	A2	specific sulphide,	SS	x-ray fluorescence	XRF
cutting	CU	nitric acid	A3	other mixed acids	Ma	spectrophotometry	SPEC
rock	Ro	aqua regia	A4	alkaline attack	AA	colorimetry	COL
soil	SO	nitric-perchloric	A5	volatilization	VO	chromatography	CHR
pulp	PU	HF mixture	A6	ignition	IG	titration	TTN
water	WA	HF under pressure	A7	pressed powder (XRF)	PP	other chemicals means	CHEM
tissue	TI	fusion	A8	glass fusion (XRF)	GF	miscellaneous	MISC
stream sediment	SS					fluorescence	FLUOR
heavy mineral	HM						

Authorized Officer

ANALABS

A division of MacDonald Hamilton & Co. Pty. Ltd.
52 Murray Road, Welshpool, W.A. 6106 (Reg. Office)
Phone (09) 458 7999
Division.....
Phone.....

174126

Code No. 14·9 01 19619
Rack No. 13
Page No. 1
Order No. —

RESULT SHEET

TUBE No.	SAMPLE No.		Cu	Zn	Ag	Pb		WD	15	
1	AQ	2926	145	1.6%	1.0	155		10 3 - 11 3		
2		27	x	400	x	35		11 3 - 12 3		
3		28	5	1000	x	40		12 3 - 13 3		
4		29	x	110	x	25		13 3 - 14 3		
5	AQ	2930	x	1400	x	65		14 3 - 15 3		
6		31	10	8000	x	350		15 3 - 16 3		
7		32	15	1.0%	0.5	135		16 3 - 17 3		
8		33	x	2000	x	150		17 3 - 18 3		
9		34	x	1000	x	240		18 3 - 19 3		
10		35	x	600	x	130		19 3 - 20 3		
11		36	x	3800	x	275		20 3 - 21 3		
12		37	x	900	x	100		21 3 - 22 3		
13		38	x	210	x	750		22 3 - 23 3		
14		39	x	1350	x	1350		23 3 - 24 3		
15	AQ	2940	x	2550	x	165		24 3 - 25 3		
16		41	10	7400	x	150		25 3 - 26 3		
17		42	x	200	x	40		26 3 - 27 3		
18		43	x	350	x	45		27 3 - 28 3		
19		44	10	330	x	110		28 3 - 29 3		
20		45	10	220	x	155		29 3 - 30 3		
21		46	x	120	x	160		30 3 - 31 3		
22		47	x	115	x	120		31 3 - 32 3		
23		48	5	190	x	210		32 3 - 33 3		
24		49	5	140	x	180		33 3 - 34 3		
25	AQ	2950	x	195	x	140		34 3 - 35 3		
Detection			5		0.5					
Standard										
Digestion										
Method										

RESPONSIBLE OFFICER 22/7/88

T = element present; but concentration too low to measure
X = element concentration is below detection limit
– = element not determined

ANALABS

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52 Murray Road, Welshpool, W.A. 6106 (Reg. Office)
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Division.....
Phone.....

Code No. 14.9 01 19619
Rack No.
Page No. 2
Order No.

RESULT SHEET

TUBE No.	SAMPLE No.		Cu	Zn	Ag	Pb		WD	IS	
1	AQ	2951	5	470	x	120		35·3 -	36·3	
2		52	10	2600	x	110		36·3 -	37·3	
3		53	15	420	x	195		37·3 -	38·3	
4		54	60	2100	x	300		38·3 -	39·3	
5		55	10	900	x	210		39·3 -	40·3	
6		56	5	210	x	95		40·3 -	41·3	
7		57	x	60	x	60		41·3 -	42·3	
8		58	x	70	x	95		42·3 -	43·3	
9		59	10	140	x	75		43·3 -	44·3	
10	AQ	2960	x	70	x	65		44·3 -	45·3	
11		61	10	160	x	95		45·3 -	46·3	
12		62	25	290	x	150		46·3 -	47·3	
13		63	5	90	x	95		47·3 -	48·3	
14		64	10	120	x	150		48·3 -	49·3	
15		65	10	145	x	100		49·3 -	50·3	
16		66	25	90	x	120		50·3 -	51·3	
17		67	10	70	x	80		51·3 -	52·3	
18		68	10	55	x	70		52·3 -	53·3	
19		69	10	60	x	75		53·3 -	54·3	
20	AQ	2970	15	110	x	105		54·3 -	55·3	
21		71	10	90	x	90		55·3 -	56·3	
22										
23										
24 Repeat	AQ	2926	145	1·06%	1·0	160				
25 Repeat	AQ	2951	5	420	x	110				
Detection			5	1	0·5	5				
Standard	FS	4	330	790	0·5	110				
Digestion										
Method										

RESPONSIBLE OFFICER 22/7/85

T = element present; but concentration too low to measure
X = element concentration is below detection limit
– = element not determined

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Code No. 14.9 01 19619
Rack No. 38
Page No. 3
Order No.

RESULT SHEET

TUBE No.	SAMPLE No.		Cu	Zn	Ag	Pb				
1	AQ	2972	25	105	x	80		56.3	- 57.3	-
2		73	20	70	x	70		57.3	- 58.3	-
3		74	20	115	x	60		58.3	- 59.3	-
4		75	35	175	x	95		59.3	- 60.3	-
5		76	265	80	x	40		60.3	- 61.3	-
6		77	25	95	x	50		61.3	- 62.3	-
7		78	25	60	x	50		62.3	- 63.3	-
8		79	20	40	x	45		63.3	- 64.3	-
9	AQ	2980	35	70	x	50		64.3	- 65.3	-
10		81	20	55	x	50		65.3	- 66.3	-
11		82	20	40	x	65		66.3	- 67.3	-
12		83	35	185	x	110		67.3	- 68.3	-
13		84	30	115	x	90		68.3	- 69.3	-
14		85	15	110	x	40		69.3	- 70.3	-
15		86	10	40	x	30		70.3	- 71.3	-
16		87	10	25	x	30		71.3	- 72.3	-
17		88	15	30	x	40		72.3	- 73.3	-
18		89	20	35	x	30		73.3	- 74.3	-
19	AQ	2990	10	30	x	30		74.3	- 75.3	-
20		91	10	30	x	35		75.3	- 76.3	-
21		92	10	25	x	30		76.3	- 77.3	-
22		93	10	25	x	35		77.8	- 78.3	-
23		94	10	25	x	30		78.3	- 79.3	-
24		95	10	30	x	35		79.3	- 80.3	-
25		96	10	25	x	30		80.3	- 81.3	-
Detection										
Standard										
Digestion										
Method										

RESPONSIBLE OFFICER 22.7.81

T = element present; but concentration too low to measure
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Division.....
Phone.....

Code No. 14.9 01 19619
Rack No. _____
Page No. 4
Order No. _____

RESULT SHEET

TUBE No.	SAMPLE No.		Cu	Zn	Ag	Pb				
1	AQ	2997	10	20	x	35		81.3 - 82.3		
2		98	10	20	x	30		82.3 - 83.3		
3		99	5	25	x	35		83.3 - 84.3		
4	AQ	3000	15	25	x	25		84.3 - 85.3		
5	AC	5036	10	25	x	30		85.3 - 86.3		
6		37	10	25	x	30		86.3 - 87.3		
7		38	10	25	x	30		87.3 - 88.3		
8		39	15	385	x	35		88.3 - 89.3		
9	AC	5040	25	145	x	40		89.3 - 90.3		
10		41	15	60	x	40		90.3 - 91.3		
11		42	15	35	x	30		91.3 - 92.3		
12		43	10	25	x	35		92.3 - 93.3		
13		44	10	20	x	40		93.3 - 94.3		
14		45	10	20	x	30		94.3 - 95.3		
15		46	10	25	x	30		95.3 - 96.3		
16		47	10	25	x	30		96.3 - 97.3		
17		48	5	20	x	40		97.3 - 98.3		
18		49	10	20	x	40		98.3 - 99.3		
19	AC	5050	10	20	x	40		99.3 - 100.3		
20		51	10	20	x	30		100.3 - 101.3		
21		52	10	60	x	50		101.3 - 102.3		
22										
23										
R24 Repeat	AQ	2972	20	115	x	95				
R25 Repeat	AQ	2997	10	30	x	35				
Detection			5	5	0.5	5				
Standard	FS	4	310	740	1.0	110				
Digestion										
Method										

RESPONSIBLE OFFICER Jon Davy 22/7/81

T = element present; but concentration too low to measure
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– = element not determined

ANALABS

A division of MacDonald Hamilton & Co. Pty. Ltd.
52 Murray Road, Welshpool, W.A. 6106 (Reg. Office)

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Division.....

Phone.....

L--109

Code No. 14·9 01 19619

Rack No. _____

Page No. 5

Order No. _____

RESULT SHEET

TUBE No.	SAMPLE No.		Cu	Zn	Ag	Pb				
1	AC	5053	10	60	x	40	102·3 - 103·3 -			
2	AC	5054	15	55	x	50	103·3 - 104·3 -			
3										
4										
5										
6										
7										
8										
9										
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										
21										
22										
23										
24										
Repeat 25	AC	5053	10	55	x	40				
Detection			5	5	0·5	5				
Standard	FS	4	310	750	1·0	105				
Digestion			A1							
Method			A1/1							

RESPONSIBLE OFFICER .....Donald.....

24 7 /.....

T = element present; but concentration too low to measure
X = element concentration is below detection limit
– = element not determined

...lts i... ...unl... ...herw... ...ecifi...

ANALABS

A division of MacDonald Hamilton & Co. Pty. Ltd.

Phone (09) 458 7999 — 52 Murray Road, Welshpool, W.A. 6106 — Telex AA92560

L--110

ANALYTICAL REPORT No. 14.9 01 28182

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

The B.H.P. Co Ltd
PO Box 21
Whyalla
S.A. 5600

ORDER No.	PROJECT
001838	L.110

DATE RECEIVED	RESULTS REQUIRED
14/8/1981	ASAP

No. OF PAGES OF RESULTS	DATE REPORTED	No. OF COPIES	TOTAL No. OF SAMPLES
		3	44

STATE OF SAMPLES		PRE-TREATMENT								ANALYSIS			
REFER BELOW	AVERAGE WEIGHT	DRY	CRUSH	SPLIT	PUL-VERISE	SIEVE	EVAPO-RATE	OTHER SEE REMARKS	NONE	REFER TO ANALYSIS SECTION	PREPARATION	METHOD	COEFFICIENT OF VARIATION %
	MC5052 MC5053									Cu,Pb,Zn,Ag	A1	AAs	

RESULTS TO

Mr M Roche
as above

RESULTS TO

REMARKS

WD 18 17&131

STATE OF SAMPLES		ANALYSIS — PREPARATION				ANALYSIS — METHOD	
whole core	WC	perchloric acid	A1	cold acid	CA	atomic absorbtion	AAS
split core	SC	hydrochloric acid	A2	specific sulphide	SS	x-ray fluorescence	XRF
cutting	CU	nitric acid	A3	other mixed acids	Ma	spectrophotometry	SPEC
rock	Ro	aqua regia	A4	alkaline attack	AA	colorimetry	COL
soil	SO	nitric-perchloric	A5	volatilization	VO	chromatography	CHR
pulp	PU	HF mixture	A6	ignition	IG	titration	TTN
water	WA	HF under pressure	A7	pressed powder (XRF)	PP	other chemicals means	CHEM
tissue	TI	fusion	A8	glass fusion (XRF)	GF	miscellaneous	MISC
stream sediment	SS					fluorescence	FLUOR
heavy mineral	HM					inductively coupled plasma	ICP

AUTHORISED OFFICER

ANALABS
A division of MacDonald Hamilton & Co. Pty. Ltd.
52 Murray Road, Welshpool, W.A. 6106 (Reg. Office)
Phone (09) 458 7999

Division.....
Phone.....

Code No. 14·9 01 20182
Rack No. 48
Page No. 1
Order No.

RESULT SHEET

TUBE No.	SAMPLE No.		Cu	Zn	Ag	Pb		Pb+Zn	wt 18
1	AC	5055	10	50	x	35	207-208	85	174131
2		56	5	20	x	25	208-209	45	
3		57	10	10	x	15	209-210	25	
4		58	10	15	x	25	210-211	40	
5		59	20	40	x	25	211-212	65	
6	AC	5060	10	20	x	20	212-213	40	
7		61	20	55	x	25	213-214	80	
8		62	20	55	x	50	214-215	105	
9		63	20	110	x	80	215-216	190	
10		64	15	155	x	145	216-217	300	
11		65	30	330	x	320	217-218	650	
12		66	20	210	x	195	218-219	405	
13		67	20	115	x	65	219-220	180	
14		68	25	75	x	260	220-221	335	
15		69	20	245	x	685	221-222	930	
16	AC	5070	20	280	x	520	222-223	800	
17		71	20	715	x	485	223-224	1200	
18		72	20	205	0.5	325	224-225	530	
19		73	15	40	x	155	225-226	195	
20		74	40	115	x	150	226-227	265	
21		75	40	125	x	670	227-228	795	
22		76	25	55	x	2·35%	228-229	2·35%	]
23		77	20	155	x	1·15%	229-230	1·16%	
24		78	15	80	x	1200	230-231	1280	
25		79	25	1300	x	3450	231-232	4750	
Detection									
Standard									
Digestion									
Method									

RESPONSIBLE OFFICER 20/8/81

T = element present; but concentration too low to measure
X = element concentration is below detection limit
– = element not determined

ANALABS
A division of MacDonald Hamilton & Co. Pty. Ltd.
52 Murray Road, Welshpool, W.A. 6106 (Reg. Office)
Phone (09) 458 7999
Division.....
Phone.....

Code No. 14901 20182
Rack No. 48
Page No. 2
Order No.

RESULT SHEET

TUBE No.	SAMPLE No.		Cu	Zn	Ag	Pb		Zn + Pb.	WD 18.
1	AC.	5080	20	3950	x	1.6%	232-233	2.0%	—
2		81	25	4600	1.0	6650	233-234	1.13%	
3		82	20	4400	x	2950	234-235	7350	
4		83	15	1050	x	635	235-236	1685	
5		84	10	25	0.5	45	236-237	70	
6		85	25	6350	0.5	1.3%	237-238	1.93%	]
7		86	25	6450	0.5	1.1%	238-239	1.74%	]
8		87	10	129	x	255	239-240	384	
9		88	10	191	0.5	245	240-241	436	
10		89	20	285	x	745	241-242	1030	
11	AC	5090	20	95	x	235	242-243	330	
12		91	20	120	x	220	243-244	340	
13		92	20	105	0.5	675	244-245	780	
14		93	25	505	x	5550	245-246	6055	
15		94	15	470	1.0	1600	246-247	2070	
16		95	30	550	x	1750	247-248	2300	
17		96	40	555	x	1450	248-249	2005	
18		97	25	330	x	945	249-250	1275	
19	AC	5098	25	320	0.5	1450	250-251	1770	
20									
21			% values to be checked by a more accurate						
22			method						
23									
24 Repeat	AC	5055	10	40	x	35	[redacted]		
25 Repeat	AC	5080	20	3900	0.5	1.55%	[redacted]		
Detection			5	5	0.5	5			
Standard	FS	4	320	705	1.0	105			
Digestion			A1						
Method			A1/1						

RESPONSIBLE OFFICER 20/6/88

T = element present; but concentration too low to measure
X = element concentration is below detection limit
– = element not determined

ANALABS

A division of MacDonald Hamilton & Co. Pty. Ltd.

Phone (09) 458 7999 — 52 Murray Road, Welshpool, W.A. 6106 — Telex AA92560

113

ANALYTICAL REPORT No. 20654

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

The B.H.P. Co Ltd
PO Box 21
Whyalla
S.A. 5608

ORDER No.	PROJECT
1834	L110

DATE RECEIVED	RESULTS REQUIRED
11/9/1981	ASAP

No. OF PAGES OF RESULTS	DATE REPORTED	No. OF COPIES	TOTAL No. OF SAMPLES
		3	85

STATE OF SAMPLES	SAMPLE	PRE-TREATMENT								ANALYSIS			
DIFFER FROM LOW	AVERAGE WEIGHT	DRY	CRUSH	SPLIT	PULVERISE	SIEVE	EVAPORATE	OTHER SEE REMARKS	NONE	REFER TO ANALYSIS SECTION	PREPARATION	METHOD	COEFFICIENT OF VARIATION %
	50gm 5.1kg		1	2	3					Cu,Pb,Zn,Ag	A1	AAS	

RESULTS TO

as above

RESULTS TO

REMARKS

WD 19.

STATE OF SAMPLES		ANALYSIS — PREPARATION				ANALYSIS — METHOD	
whole core	WC	perchloric acid	A1	cold acid	CA	atomic absorbtion	AAS
split core	SC	hydrochloric acid	A2	specific sulphide	SS	x-ray fluorescence	XRF
cutting	CU	nitric acid	A3	other mixed acids	Ma	spectrophotometry	SPEC
rock	Ro	aqua regia	A4	alkaline attack	AA	colorimetry	COL
soil	SO	nitric-perchloric	A5	volatilization	VO	chromatography	CHR
pulp	PU	HF mixture	A6	ignition	IG	titration	TTN
water	WA	HF under pressure	A7	pressed powder (XRF)	PP	other chemicals means	CHEM
tissue	TI	fusion	A8	glass fusion (XRF)	GF	miscellaneous	MISC
stream sediment	SS					fluorescence	FLUOR
heavy mineral	HM					inductively coupled plasma	ICP

AUTHORISED OFFICER _____

ANALABS
A division of MacDonald Hamilton & Co. Pty. Ltd.
52 Murray Road, Welshpool, W.A. 6106 (Reg. Office)
Phone (09) 458 7999

Division.....
Phone.....

I--114

Code No. 14.9.01.20654
Rack No. 37
Page No. 1
Order No.

RESULT SHEET

TUBE No.	SAMPLE No.		Cu	Zn	Ag	Pb		WD 19.	
1	AC	5099	15	95	x	500		35-0	36-0 m.
2	AC	5100	5	60	x	65		36-0	- 37-0
3		01	20	90	x	200		37-0	- 38-0
4		02	15	70	x	165		38-0	- 39-0
5		03	10	50	0-5	250		39-0	- 40-0
6		04	10	60	x	265		40-0	- 41-0
7		05	25	105	x	460		41-0	- 42-0
8		06	20	90	0-5	5200		42-0	- 43-0
9		07	15	55	x	3400		43-0	- 44-0
10		08	10	45	7-5	5-75%		44-0	- 45-0
11		09	10	55	x	820		45-0	- 46-0
12	AC	5110	15	70	x	1400		46-0	- 47-0
13		11	115	55	2-5	1-4%		47-0	- 48-0
14		12	60	125	0-5	2-3%		48-0	- 49-0
15		13	10	110	0-5	3350		49-0	- 50-0
16		14	5	25	x	120		50-0	- 51-0
17		15	25	65	1-0	8000		51-0	- 52-0
18		16	10	45	x	215		52-0	- 53-0
19		17	10	50	x	225		53-0	- 54-0
20		18	10	45	0-5	145		54-0	- 55-0
21		19	10	45	x	185		55-0	- 56-0
22	AC	5120	10	30	x	90		56-0	- 57-0
23		21	15	70	x	245		57-0	- 58-0
24		22	10	40	0-5	90		58-0	- 59-0
25		23	5	45	x	100		59-0	- 60-0
Detection									
Standard									
Digestion									
Method									

RESPONSIBLE OFFICER Gary Acey 22/2/87

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

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Code No. 4.9.01 · 3065
Rack No. 37
Page No. 2
Order No.

RESULT SHEET

TUBE No.	SAMPLE No.		Cu	Zn	Ag	Pb				
1	AC	5124	10	50	x	130		60.0	61.0	
2		25	5	30	x	105		61.0	62.0	
3		26	10	50	x	90		62.0	63.0	
4		27	15	85	0.5	390		63.0	64.0	
5		28	20	50	x	120		64.0	65.0	
6		29	10	25	x	40		65.0	66.0	
7	AC	5130	15	40	x	110		66.0	67.0	
8		31	20	35	x	70		67.0	68.0	
9		32	15	40	x	85		68.0	69.0	
10		33	20	50	0.5	130		69.0	70.0	
11		34	20	45	0.5	145		70.0	71.0	
12		35	60	25	0.5	55		71.0	72.0	
13		36	10	20	0.5	25		72.0	73.0	
14		37	10	20	x	15		73.0	74.0	
15		38	15	35	x	30		74.0	75.0	
16		39	5	15	0.5	15		75.0	76.0	
17	AC	5140	5	35	0.5	25		76.0	77.0	
18		41	10	15	x	40		77.0	78.0	
19		42	10	25	x	25		78.0	79.0	
20		43	10	25	x	30		79.0	80.0	
21		44	10	20	x	20		80.0	81.0	
22										
23										
Repeat 24	AC	5099	15	95	x	495				
Repeat 25	AC	5124	10	45	x	120				
Detection			5	5	0.5	5				
Standard	FS4		290	740	1.0	100				
Digestion										
Method										

RESPONSIBLE OFFICER 22/9/81

Results in ppm unless otherwise specified
- = element present, but concentration too low to measure
X = element concentration is below detection limit
– = element not determined

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Code No. 14·9·01·20654

Rack No. 60

Page No. 3

Order No.

RESULT SHEET

TUBE No.	SAMPLE No.		Cu	Zn	Ag	Pb.				
1	AC	5145	10	15	x	20		81.0 - 82.0		
2		46	45	25	x	x		82.0 - 83.0		
3		47	40	45	x	30		83.0 - 84.0		
4		48	105	35	x	45		84.0 - 85.0		
5		49	35	30	x	25		85.0 - 86.0		
6	AC	5150	15	20	x	25		86.0 - 87.0		
7		51	35	55	x	75		87.0 - 88.0		
8		52	20	30	x	35		88.0 - 89.0		
9		53	20	30	x	25		89.0 - 90.0		
10		54	15	30	x	60		90.0 - 91.0		
11		55	15	35	x	45		91.0 - 92.0		
12		56	25	30	x	60		92.0 - 93.0		
13		57	35	45	x	40		93.0 - 94.0		
14		58	5	25	x	15		94.0 - 95.0		
15		59	5	45	x	35		95.0 - 96.0		
16	AC	5160	15	30	x	30		96.0 - 97.0		
17		61	55	35	x	30		97.0 - 98.0		
18		62	35	40	x	15		98.0 - 99.0		
19		63	35	50	x	50		99.0 - 100.0		
20		64	45	30	x	45		100.0 - 101.0		
21		65	35	35	x	30		101.0 - 102.0		
22		66	30	40	x	85		102.0 - 103.0		
23		67	50	115	x	95		103.0 - 104.0		
24		68	20	45	x	35		104.0 - 105.0		
25		69	15	45	x	25		105.0 - 106.0		
Detection										
Standard										
Digestion										
Method										

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T = element present; but concentration too low to measure
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– = element not determined

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Code No. 14.9.01. 20654
Rack No. 60
Page No. 4
Order No.

RESULT SHEET

TUBE No.	SAMPLE No.		Cu	Zn	Ag	Pb				
1	AC	5170	40	55	x	70		106.0 - 107.0 -		
2		71	15	20	x	20		107.0 - 108.0 -		
3		72	25	15	x	15		108.0 - 109.0 -		
4		73	15	10	x	15		109.0 - 110.0 -		
5		74	25	5	x	10		110.0 - 111.0 -		
6		75	45	10	x	20		111.0 - 112.0 -		
7		76	20	15	x	20		112.0 - 113.0 -		
8		77	20	10	x	25		113.0 - 114.0 -		
9		78	10	5	x	115		114.0 - 115.0 -		
10		79	5	10	x	20		115.0 - 116.0 -		
11	AC	5180	15	150	x	25		116.0 - 117.0 -		
12		81	60	800	x	55		117.0 - 118.0		
13		82	40	150	x	50		118.0 - 119.0		
14		83	50	55	x	65		119.0 - 120.0 -		
15										
16	% values to be checked by a more accurate method.									
17										
18										
19										
20										
21										
22										
23										
Repeat 24	AC	5145	10	15	x	25				
Repeat 25		5170	40	55	x	75				
Detection			5	5	0.5	5				
Standard	F54		305	740	0.5	100				
Digestion										
Method										

RESPONSIBLE OFFICER 22/9/01

T = element present; but concentration too low to measure
X = element concentration is below detection limit
– = element not determined

APPENDIX 3

ANALYSIS RESULTS FROM STREAM SEDIMENT SAMPLING

ANALABS

A DIVISION OF MACDONALD HAMILTON & CO. PTY. LTD.
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Phone (09) 458 7999

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ANALYTICAL REPORT

This report must be read in conjunction with the results given for JOB No. 14.9 01 19188

ent B H P Exploration

P O Box 21 Order No. 1823 Date Received 23.6.1981

WHYALLA S.A. 5600 Reference Results Required

Delivered by Total No. of Samples 126

SAMPLE NUMBERS	STATE OF SAMPLES (Refer to section (5) for terminology)	Average Weight	PRETREATMENT: Dry	Crush	Split	Pulverize	Sieve	Evaporate	Other (see remarks)	None	ANALYSIS (Refer to section (5) for terminology)	Preparation	Method	Coefficient of variation (%)
5001-5126						2	1				Cu,Pb,Zn,Ag,Mn,Fe	A1/2	AAS	

Number of pages of results:

Date Reported:

Results to: (1) as above (2)

Per: M.Roche

Number of Copies: 3

Remarks:

STATE OF SAMPLES		ANALYSIS – PREPARATION				ANALYSIS – METHOD	
whole core	WC	perchloric acid	A1	cold acid	CA	atomic absorbtion	AAS
split core	SC	hydrochloric acid	A2	specific sulphide,	SS	x-ray fluorescence	XRF
cutting	CU	nitric acid	A3	other mixed acids	Ma	spectrophotometry	SPEC
rock	Ro	aqua regia	A4	alkaline attack	AA	colorimetry	COL
soil	SO	nitric-perchloric	A5	volatilization	VO	chromatography	CHR
pulp	PU	HF mixture	A6	ignition	IG	titration	TTN
water	WA	HF under pressure	A7	pressed powder (XRF)	PP	other chemicals means	CHEM
tissue	TI	fusion	A8	glass fusion (XRF)	GF	miscellaneous	MISC
stream sediment	SS					fluorescence	FLUOR
heavy mineral	HM						

Authorized Officer KR / Dik.

ATTENTION Please advise us regarding the disposal of your samples.

JOB No. 14.9 01 19188

☐ DISCARD IMMEDIATELY ☐ KEEP UNTIL ADVISED (A STORAGE CHARGE WILL BE MADE)

☐ DISCARD AFTER 2 MONTHS ☐ RETURN TO:

(PLEASE TICK APPROPRIATE BOX)

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14901 19188

Code No.

Rack No. 2-3 1

Page No.

Order No.

RESULT SHEET

TUBE No.	SAMPLE No.			Fe	Mn	Cu	Zn	Ag	Pb	
1	SS	5001	+20	2·2%	1100	25	390	x	30	
2			-20	2·5%	670	30	300	x	50	
3		02	+20	2·6%	695	30	110	x	45	
4			-20	2·9%	1000	30	125	x	40	
5		03	+20	3·0%	1650	25	240	x	80	
6			-20	3·0%	1400	25	265	0·5	75	
7		04	+20	2·3%	3450	30	240	x	90	
8			-20	2·4%	1050	25	230	x	80	
9		05	+20	2·3%	585	25	120	x	35	
10			-20	2·7%	800	25	125	x	40	
11		06	+20	2·6%	1350	20	235	x	65	
12			-20	3·0%	1150	25	300	x	80	
13		07	+20	2·0%	1500	15	470	x	140	
14			-20	2·0%	515	15	280	x	160	
15		08	+20	2·7%	1350	30	1550	x	200	
16			-20	3·0%	1400	30	710	x	245	
17		09	+20	2·1%	1540	40	140	x	80	
18			-20	2·1%	1250	40	110	x	70	
19	SS	5010	+20	1·6%	3000	20	115	x	15	
20			-20	2·1%	2500	20	55	x	20	
21		11	+20	9050	1650	15	40	x	15	
22			-20	1·8%	2000	25	70	x	20	
23		12	+20	1·4%	1400	20	40	x	20	
24			-20	1·7%	1300	20	50	x	25	
25		13	+20	1·3%	2250	20	50	x	15	
Detection										
Standard										
Digestion										
Method										

RESPONSIBLE OFFICER ..... 7/.../81

F ... s in ... nless ... rwise ... ified

T = element present; but concentration too low to measure

X = element concentration is below detection limit

– = element not determined

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Code No. 14 9 01 19188
Rack No. 1 S 3
Page No. 4
Order No.

RESULT SHEET

TUBE No.	SAMPLE No.			Fe	Mn	Cu	Zn	Ag	Pb	
1	SS	5013	-20	1·6%	2000	20	60	0·5	20	
2		14	+20	1·5%	2000	20	90	x	15	
3			-20	1·5%	1800	20	75	0·5	20	
4		15	+20	3·4%	1600	70	65	x	80	
5			-20	2·3%	1350	50	55	x	20	
6		16	+20	1·7%	1650	30	50	x	15	
7			-20	2·3%	1950	45	60	x	25	
8		17	+20	2·3%	1150	70	40	x	15	
9			-20	2·1%	1100	50	50	x	20	
10		18	+20	2·7%	1300	40	60	x	25	
11			-20	2·1%	755	30	55	x	20	
12		19	+20	1·1%	1500	20	50	x	20	
13			-20	1·6%	1250	20	80	x	15	
14	SS	5020	+20	1·2%	3000	15	50	x	10	
15			-20	1·5%	2750	15	55	x	5	
16		21	+20	1·2%	2650	15	55	x	5	
17			-20	1·4%	2750	15	55	x	15	
18		29	+20	1·9%	630	40	60	x	35	
19			-20	1·8%	800	40	70	x	30	
20		23	+20	2·7%	795	60	180	x	25	
21			-20	2·0%	590	45	100	x	15	
22										
23										
24	SS	5001	+20	2·1%	1100	25	385	x	25	
25	SS	5013	-20	1·7%	2100	20	65	x	20	
Detection				5	5	5	5	0·5	5	
Standard	FS	4		7·6%	600	300	700	0·5	95	
Digestion										
Method										PC

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

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Division.....

Phone.....

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14.9 01 19188

Code No. 2118
Rack No. 5
Page No.
Order No.

RESULT SHEET

TUBE No.	SAMPLE No.			Fe	Mn	Cu	Zn	Ag	Pb	
1	SS	5021	+20	1·3%	3800	15	55	x	25	
2			-20	1·6%	2050	15	45	x	15	
3		25	+20	1·7%	2900	20	55	x	35	
4			-20	2·0%	2950	20	60	x	20	
5		26	+20	1·4%	2100	15	45	x	25	
6			-20	2·1%	2150	20	60	x	20	
7		27	+20	1·3%	1250	15	50	x	15	
8			-20	2·3%	1200	20	70	x	5	
9		28	+20	1·5%	1900	15	45	x	20	
10			-20	2·0%	1600	20	60	x	35	
11		29	+20	1·6%	2900	20	60	x	25	
12			-20	2·1%	2500	20	75	x	20	
13	SS	5030	+20	1·4%	3400	15	30	x	20	
14			-20	2·2%	4850	20	50	x	25	
15		31	+20	1·7%	3000	20	40	x	45	
16			-20	2·5%	2750	20	60	x	40	
17		32	+20	1·5%	4300	15	60	x	30	
18			-20	2·4%	3800	20	95	x	40	
19		33	+20	1·4%	3200	15	40	x	30	
20			-20	2·3%	3300	20	65	x	90	
21		34	+20	1·0%	900	15	40	x	35	
22			-20	2·0%	1150	20	65	x	25	
23		35	+20	2·3%	5200	20	395	x	105	
24			-20	3·3%	2800	30	300	x	85	
25		36	+20	2·4%	3400	20	300	x	50	
Detection										
Standard										
Digestion										
Method										

RESPONSIBLE OFFICER .....

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

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Code No. 14901 19188
Rack No. 2118
Page No. 4
Order No.

RESULT SHEET

TUBE No.	SAMPLE No.			Fe	Mn	Cu	Zn	Ag	Pb	
1	SS	5036	-20	2·7%	2800	20	300	x	50	
2		37	+20	2·6%	4200	20	445	x	70	
3			-20	3·0%	3300	25	340	0·5	75	
4		38	+20	1·7%	3100	30	345	x	80	
5			-20	1·8%	3600	40	470	x	110	
6		39	+20	2·4%	6300	20	1050	x	145	
7			-20	2·9%	8500	25	1150	0·5	230	
8	SS	5040	+20	1·6%	12·0%	20	335	x	60	
9			-20	2·4%	3800	20	365	0·5	80	
10	SS	5040	B	54·0%	245	10	200	x	30	
11		41	+20	2·5%	2300	15	65	x	30	
12			-20	2·7%	2950	20	95	x	40	
13		42	+20	1·6%	2000	15	50	x	35	
14			-20	2·2%	1950	20	70	x	30	
15		43	+20	1·3%	1750	15	90	x	50	
16			-20	2·2%	1600	30	150	x	50	
17		44	+20	1·6%	1800	6500	215	0·5	80	
18			-20	3·3%	2350	140	475	x	90	
19		45	+20	1·7%	2300	20	150	x	45	
20			-20	2·6%	2400	30	175	x	60	
21		46	+20	1·9%	4900	15	320	x	140	
22										
23										
24	SS	5024	+20	1·4%	3800	15	60	x	25	
Repeat 25	SS	5036	-20	2·7%	2850	20	30	x	50	
Detection				5	5	5	5	0·5	5	
Standard	FS	6		8·0%	1.00	200	150	1·0	110	
Digestion										
Method										

RESPONSIBLE OFFICER .....

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

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14 9 01 19188

Code No. L15
Rack No. 5
Page No.
Order No.

RESULT SHEET

TUBE No.	SAMPLE No.			Fe	Mn	Cu	Zn	Ag	Pb	
1	SS	5046	-20	2·0%	4250	20	400	x	125	
2		47	+20	2·7%	3450	50	230	x	5	
3			-20	2·4%	1400	50	95	x	x	
4		48	+20	1·5%	515	20	85	x	x	
5			-20	1·5%	350	30	75	x	x	
6		49	+20	1·7%	1900	40	60	x	25	
7			-20	2·1%	2000	35	100	x	30	
8	SS	5050	+20	2·2%	1450	20	20	x	x	
9			-20	1·5%	1250	20	20	x	x	
10		51	+20	1·3%	800	15	20	x	x	
11			-20	1·9%	1150	20	35	x	5	
12		52	+20	1·7%	1100	15	15	x	x	
13			-20	2·1%	1250	30	50	x	x	
14		53	+20	2·2%	495	20	20	x	x	
15			-20	2·5%	645	30	35	x	x	
16		54	+20	2·7%	4550	30	75	x	x	
17			-20	3·0%	795	45	40	x	x	
18		55	+20	2·0%	2550	30	145	x	45	
19			-20	2·7%	2650	25	180	x	85	
20		56	+20	1·9%	2700	30	165	x	260	
21			-20	2·2%	2650	40	170	0·5	365	
22		57	+20	1·7%	1450	20	160	x	45	
23			-20	2·5%	2250	30	205	x	160	
24		58	+20	1·5%	3300	20	180	x	x	
25			-20	2·2%	2400	30	240	x	5	
Detection										
Standard										
Digestion										
Method										

RESPONSIBLE OFFICER 21.7.93

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

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14-9-01 19188

Code No. L15
Rack No. 6
Page No.
Order No.

RESULT SHEET

TUBE No.	SAMPLE No.			Fe	Mn	Cu	Zn	Ag	Pb	
1	SS	5059	+20	1·1%	2450	15	140	0·5	20	
2			-20	1·9%	2950	25	260	x	60	
3	SS	5060	+20	7000	2500	10	35	x	15	
4			-20	1·6%	1600	10	60	0·5	20	
5		61	+20	1·0%	1800	10	25	0·5	10	
6			-20	1·8%	2550	15	55	x	15	
7		62	+20	1·0%	1550	10	40	x	5	
8			-20	1·5%	7000	10	45	x	x	
9		63	+20	1·7%	1400	10	30	x	x	
10			-20	1·4%	800	10	40	x	x	
11		64	+20	9000	1500	10	40	x	x	
12			-20	1·2%	1550	15	75	x	20	
13		65	+20	1·4%	2750	10	65	x	290	
14			-20	2·6%	2150	25	155	x	150	
15		66	+20	4·3%	3100	50	235	x	1150	
16			-20	3·1%	23350	40	165	0·5	340	
17		67	+20	1·7%	1300	20	45	x	95	
18			-20	1·7%	615	25	50	x	60	
19		68	+20	8050	1500	10	55	x	5	
20			-20	1·9%	2250	25	160	x	40	
21		69	+20	1·7%	2400	10	115	x	20	
22										
23										
(24)	SS	5046	-20	2·1%	4300	20	430	x	120	
(25)	SS	5059	+20	1·7%	2500	15	150	x	20	
Detection				5	5	5	5	0·5	5	
Standard	F-	4		7·7%	615	200	730	1·0	95	
Digestion										
Method										

RESULTS IN PPM UNLESS OTHERWISE SPECIFIED
T = element present, but concentration too low to measure
X = element concentration is below detection limit
– = element not determined

RESPONSIBLE OFFICER .....

ANALABS

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Phone (09) 458 7999

Division.....

Phone.....

14.9.01 126 M188

Code No. L13
Rack No. 1
Page No.
Order No.

RESULT SHEET

TUBE No.	SAMPLE No.			Fe	Mn	W	Zn	Ag	Pb	
1	SS	5069	-20	1·9%	2000	20	140	x	40	
2	SS	5070	+20	1·1%	2350	10	30	x	5	
3			-20	1·6%	2200	10	50	x	15	
4		71	+20	1·7%	1900	15	115	x	25	
5			-20	1·2%	2000	10	115	x	20	
6		72	+20	1·3%	2450	10	45	x	15	
7			-20	1·8%	2250	15	55	x	20	
8		73	+20	1·1%	4100	10	30	x	10	
9			-20	1·2%	1750	10	30	x	15	
10		74	+20	1·2%	3150	10	35	x	5	
11			-20	1·7%	3500	10	40	x	10	
12		75	+20	1·0%	1800	10	20	x	5	
13			-20	1·9%	2250	15	45	x	15	
14		76	+20	1·0%	2200	10	40	0·5	10	
15			-20	1·8%	2100	10	60	0·5	15	
16		77	+20	1·6%	2500	15	190	0·5	40	
17			-20	2·4%	2150	20	170	x	35	
18		78	+20	1·4%	2200	10	40	0·5	15	
19			-20	2·2%	2450	10	60	x	20	
20		79	+20	1·4%	2350	10	50	0·5	50	
21	SS	5079	-20	1·8%	1600	10	70	x	30	
22	SS	5080	+20	1·8%	1950	100	120	x	25	
23			-20	2·2%	1800	75	130	x	25	
24		81	+20	2·0%	2300	80	75	x	x	
25			-20	2·0%	1350	50	65	x	x	
Detection										
Standard										
Digestion										
Method										

RESPONSIBLE OFFICER 21/7/88

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

ANALABS

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Phone.....

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149 01 19188

Code No. L13
Rack No. 8
Page No.
Order No.

RESULT SHEET

TUBE No.	SAMPLE No.			Fe	Mn	Cu	Zn	Ag	Pb	
1	SS	5082	+20	1·4%	2100	40	160	x	30	
2			-20	2·0%	1700	40	145	x	40	
3		83	+20	2·7%	2000	20	180	x	30	
4			-20	2·2%	1050	20	95	x	10	
5		84	+20	2·9%	4060	10	115	x	20	
6			-20	2·5%	3700	15	130	x	20	
7		85	+20	2·3%	4450	15	170	x	15	
8			-20	2·6%	2900	20	190	x	20	
9		86	+20	2·3%	1750	15	135	x	25	
10			-20	2·8%	2700	15	190	x	15	
11		87	+20	2·6%	4050	15	200	x	20	
12			-20	3·0%	2700	20	225	x	30	
13		88	+20	2·7%	3650	15	165	x	10	
14			-20	2·6%	1800	20	150	x	10	
15		89	+20	2·7%	7200	30	250	x	15	
16			-20	2·6%	2850	20	215	x	20	
17	SS	5090	+20	1·8%	5150	10	75	x	10	
18			-20	2·7%	2200	15	85	x	15	
19		91	+20	1·8%	2650	10	80	x	15	
20			-20	2·2%	1900	15	80	x	5	
21		92	+20	2·4%	2900	20	100	x	10	
22										
23										
Repeat 24	SS	5069	-20	1·9%	1950	20	135	x	40	
Repeat 25	SS	5082	+20	1·5%	2100	40	165	x	40	
Detection				5	5	5	5	0·5	5	
Standard	FS	4		7·9%	700	320	800	1·0	100	
Digestion										
Method										

RESPONSIBLE OFFICER .....

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

ANALABS

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Division..... Phone.....

128
14.9.01 19188

Code No. L79
Rack No. 9
Page No.
Order No.

RESULT SHEET

TUBE No.	SAMPLE No.			Fe	Mn	Cu	Zn	Ag	Pb	
1	SS	5092	-20	2·4%	1650	20	90	x	10	
2		93	+20	2·1%	2300	15	80	x	x	
3			-20	2·4%	1600	15	85	0·5	10	
4		94	+20	2·1%	2550	30	85	x	5	
5			-20	2·3%	2050	15	80	x	5	
6		95	+20	2·1%	2200	15	70	x	x	
7			-20	3·0%	2200	20	100	x	15	
8		96	+20	1·7%	1400	10	130	0·5	30	
9			-20	2·4%	1650	15	190	x	35	
10		97	+20	1·7%	1700	10	230	x	15	
11			-20	1·8%	1400	15	210	x	10	
12		98	+20	2·0%	3950	15	200	x	15	
13			-20	1·8%	2350	15	180	x	15	
14		99	+20	1·6%	2200	10	155	x	20	
15			-20	2·3%	2300	20	225	0·5	35	
16	SS	5100	+20	1·6%	5750	20	185	x	10	
17			-20	1·9%	2450	20	155	x	15	
18		01	+20	1·0%	1350	10	105	0·5	5	
19			-20	1·7%	1600	10	150	x	20	
20		02	+20	1·2%	595	5	70	x	30	
21			-20	2·0%	1200	15	115	0·5	40	
22		03	+20	1·6%	3250	15	95	x	10	
23			-20	2·4%	3300	20	150	x	15	
24		04	+20	1·0%	1700	10	65	x	5	
25			-20	1·8%	1700	15	85	0·5	15	
Detection										
Standard										
Digestion										
Method										

RESPONSIBLE OFFICER 21.7.01

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

ANALABS

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14-9 01 19184

Code No. L79
Rack No. 10
Page No.
Order No.

RESULT SHEET

TUBE No.	SAMPLE No.			Fe	Mn	W	Zn	Hg	Pb	
1	SS	S105	+20	1·2%	2050	10	135	x	20	
2			-20	2·1%	1950	15	175	x	35	
3		06	+20	1·7%	5450	15	280	0·5	115	
4			-20	2·3%	2600	20	275	x	70	
5		07	+20	6·7%	1850	20	145	x	80	
6			-20	2·6%	1700	20	270	0·5	40	
7		08	+20	9050	685	10	85	x	15	
8			-20	1·7%	690	15	110	x	30	
9		09	+20	1·0%	425	10	125	x	15	
10			-20	2·0%	760	15	230	x	25	
11	SS	S110	+20	1·0%	330	10	100	x	10	
12			-20	2·3%	435	20	155	x	25	
13		11	+20	8000	400	10	70	x	25	
14			-20	2·4%	740	20	170	x	45	
15		12	+20	2·2%	2050	10	100	x	25	
16			-20	3·0%	2000	20	120	x	30	
17		13	+20	2·1%	1650	10	120	x	55	
18			-20	1·9%	1600	20	165	x	40	
19		14	+20	1·6%	2100	10	75	0·5	10	
20			-20	1·9%	2100	15	100	x	10	
21		15	+20	1·7%	2800	10	220	x	25	
22										
23										
Rpt 24	SS	S092	-20	2·2%	1600	20	95	x	15	
Rpt 25	SS	S105	+20	1·2%	2150	10	140	x	25	
Detection				5	5	5	5	0·5	5	
Standard	F	4		7·3%	600	200	750	0·5	95	
Digestion										
Method										

RESPONSIBLE OFFICER .....

T = element present; but concentration too low to measure
X = element concentration is below detection limit
– = element not determined

ANALABS

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Division..... Phone.....

130
14·9 01 19188
Code No. L68
Rack No. 11
Page No.
Order No.

RESULT SHEET

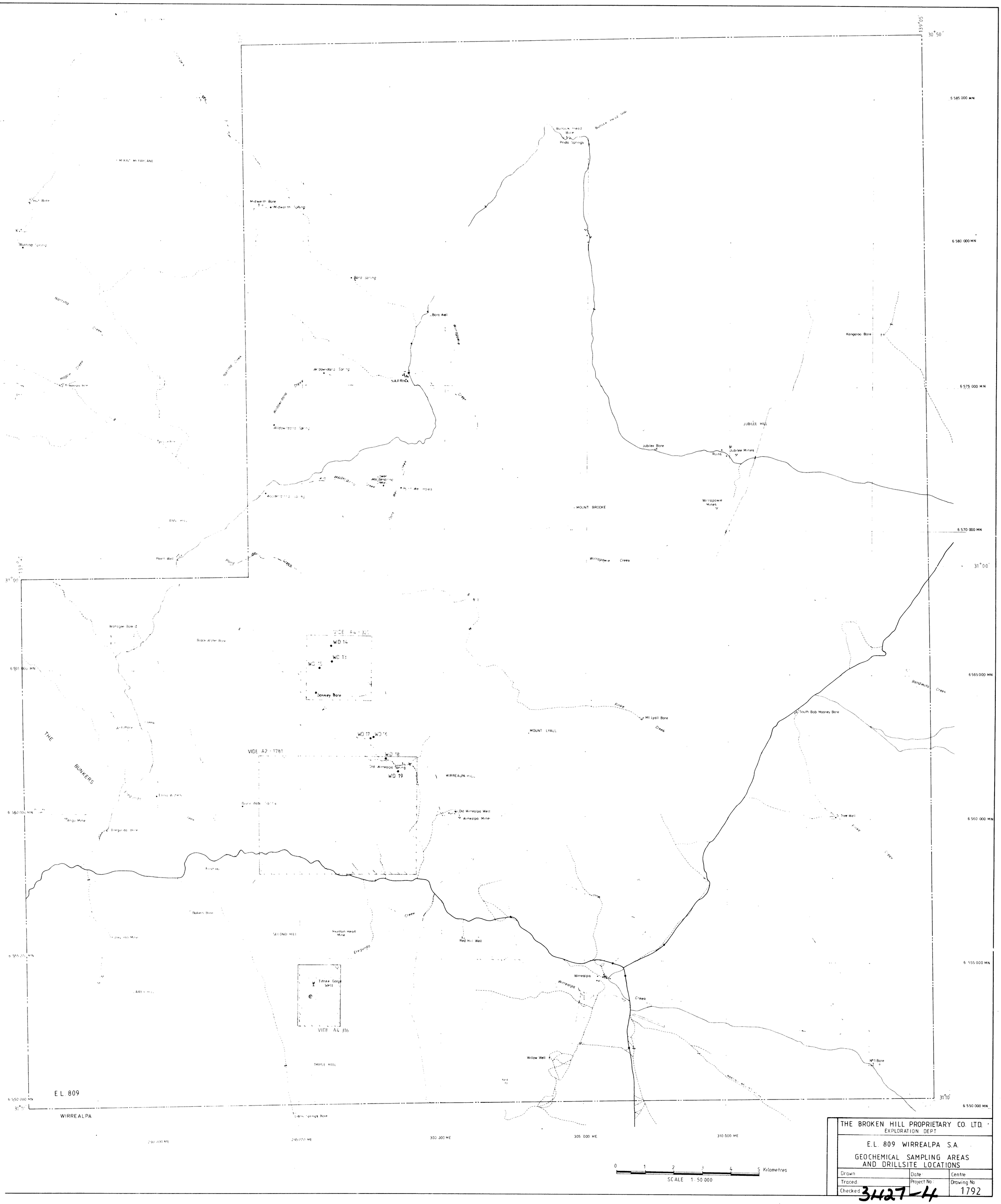
TUBE No.	SAMPLE No.			Fe	Mn	Cu	Zn	Hg	Pb	
1	SS	5115	-20	1·8%	1800	15	330	x	40	
2		16	+20	1·4%	2450	15	185	x	25	
3			-20	2·0%	2050	25	310	x	60	
4		17	+20	2·1%	2800	30	400	x	60	
5			-20	2·7%	2950	35	460	x	95	
6		18	+20	1·7%	1950	20	180	x	30	
7			-20	2·3%	1950	25	265	x	70	
8		19	+20	1·9%	2600	15	105	x	10	
9			-20	2·1%	1500	15	80	x	25	
10	SS	5120	+20	1·4%	2250	10	45	x	x	
11			-20	2·3%	2050	20	75	x	20	
12		21	+20	1·2%	2050	10	70	x	10	
13			-20	2·3%	1900	20	125	x	15	
14		22	+20	1·7%	2950	10	65	x	x	
15			-20	2·4%	2050	20	85	x	10	
16		23	+20	1·8%	2700	10	100	x	x	
17			-20	2·1%	1500	15	100	x	x	
18		24	+20	2·6%	2100	15	90	x	5	
19			-20	2·2%	1250	15	75	x	x	
20		25	+20	1·9%	2050	15	70	x	10	
21			-20	2·0%	1350	15	70	x	x	
22		26	+20	2·4%	1450	10	110	x	10	
23	SS	5126	-20	2·0%	1200	20	160	x	20	
24										
(25)	SS	5115	-20	1·9%	1950	15	345	x	40	
Detection				5	5	5	5	0·5	5	
Standard				7·7%	600	295	760	0·5	90	
Digestion										
Method										

RESPONSIBLE OFFICER .....

T = element present; but concentration too low to measure
X = element concentration is below detection limit
– = element not determined

...is in ... unless otherwise specified

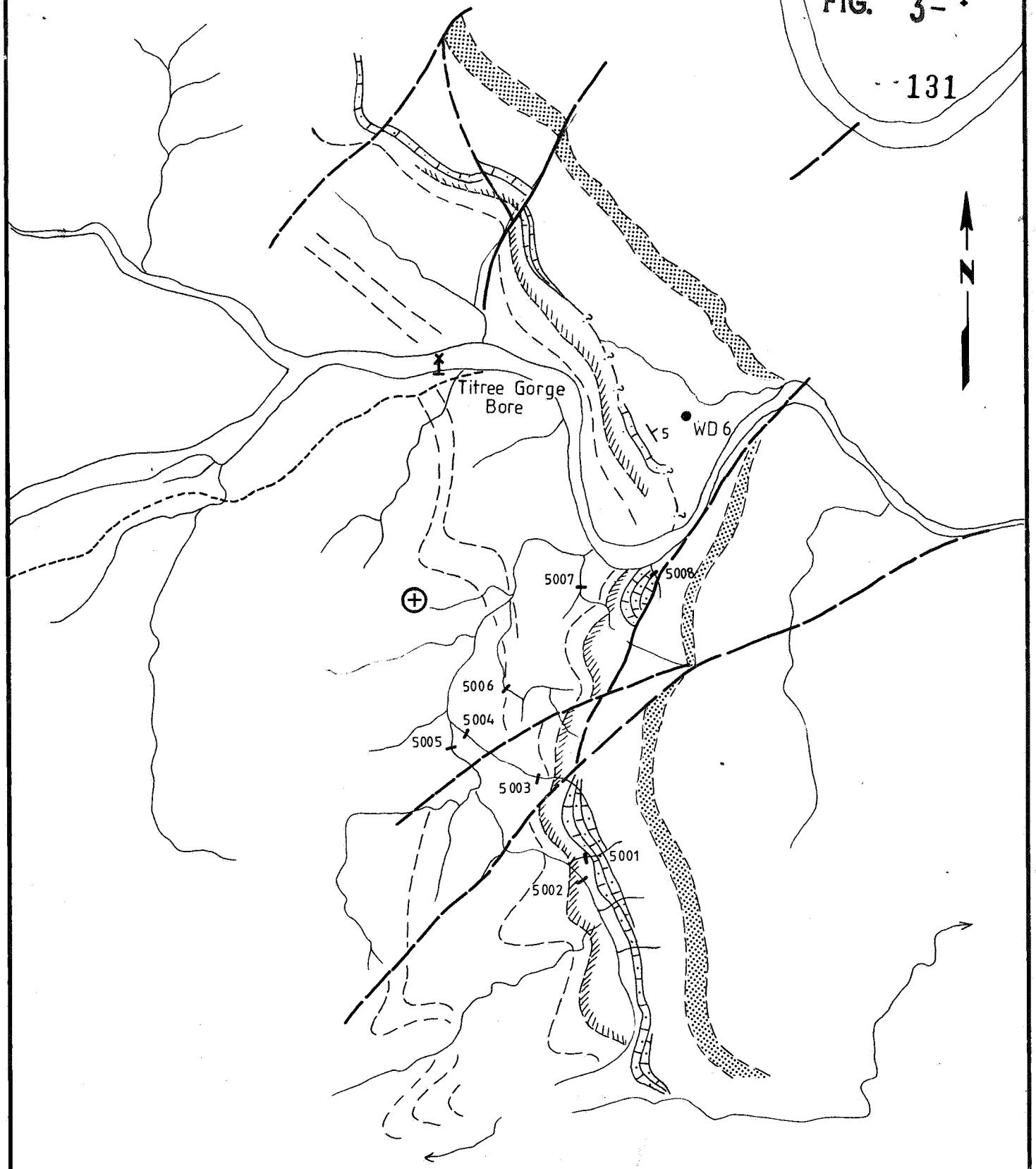
FIG. 2



THE BROKEN HILL PROPRIETARY CO. LTD. EXPLORATION DEPT		
E.L. 809 WIRREALPA S.A. GEOCHEMICAL SAMPLING AREAS AND DRILLSITE LOCATIONS		
Drawn	Date:	Centre
Traced	Project No:	Drawing No
Checked	3427-4	1792

FIG. 3-1

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⊕ Photo centre 2386 / 99.

Drainage systems.

5005 Stream sediment sample site.

Fault.

Pound Quartzite. (Ewp)

Wonoka. (Eww) Calcarenite bands.

Silt unit.

Trend lines.

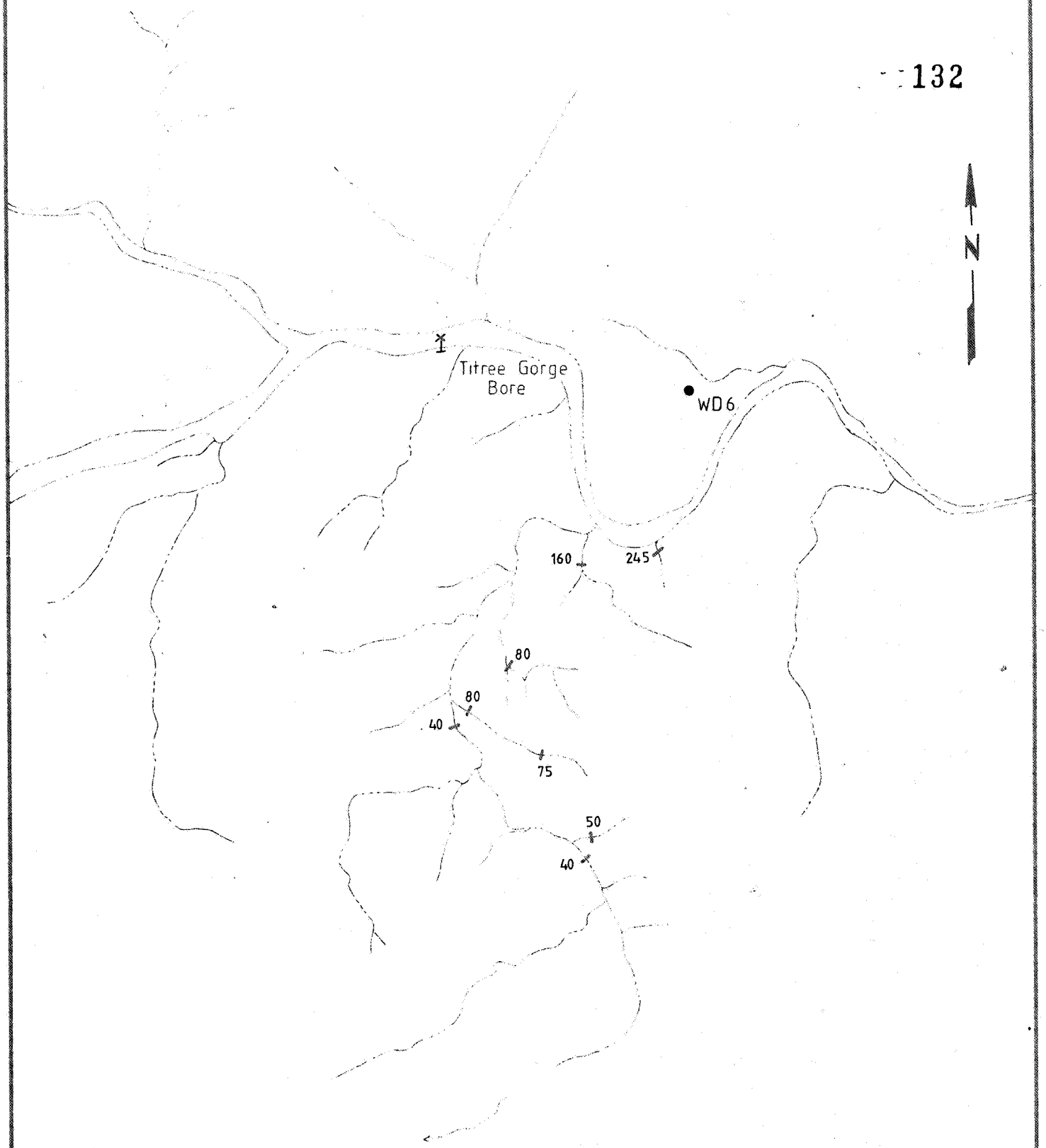
Based on S.A. Dept. of Lands aerial photograph - Svy. 2386

APPROX. SCALE 1: 10 000

Centre: Whyalla	THE BROKEN HILL PROPRIETARY CO. LTD.	Project No.
Date: June 1981	E.L. 436 WIRREALPA S.A. (VICINITY WD 6) SAMPLE SITES IN VICINITY OF WD 6.	Drawing No. A4- 316-1

FIG. 3-2

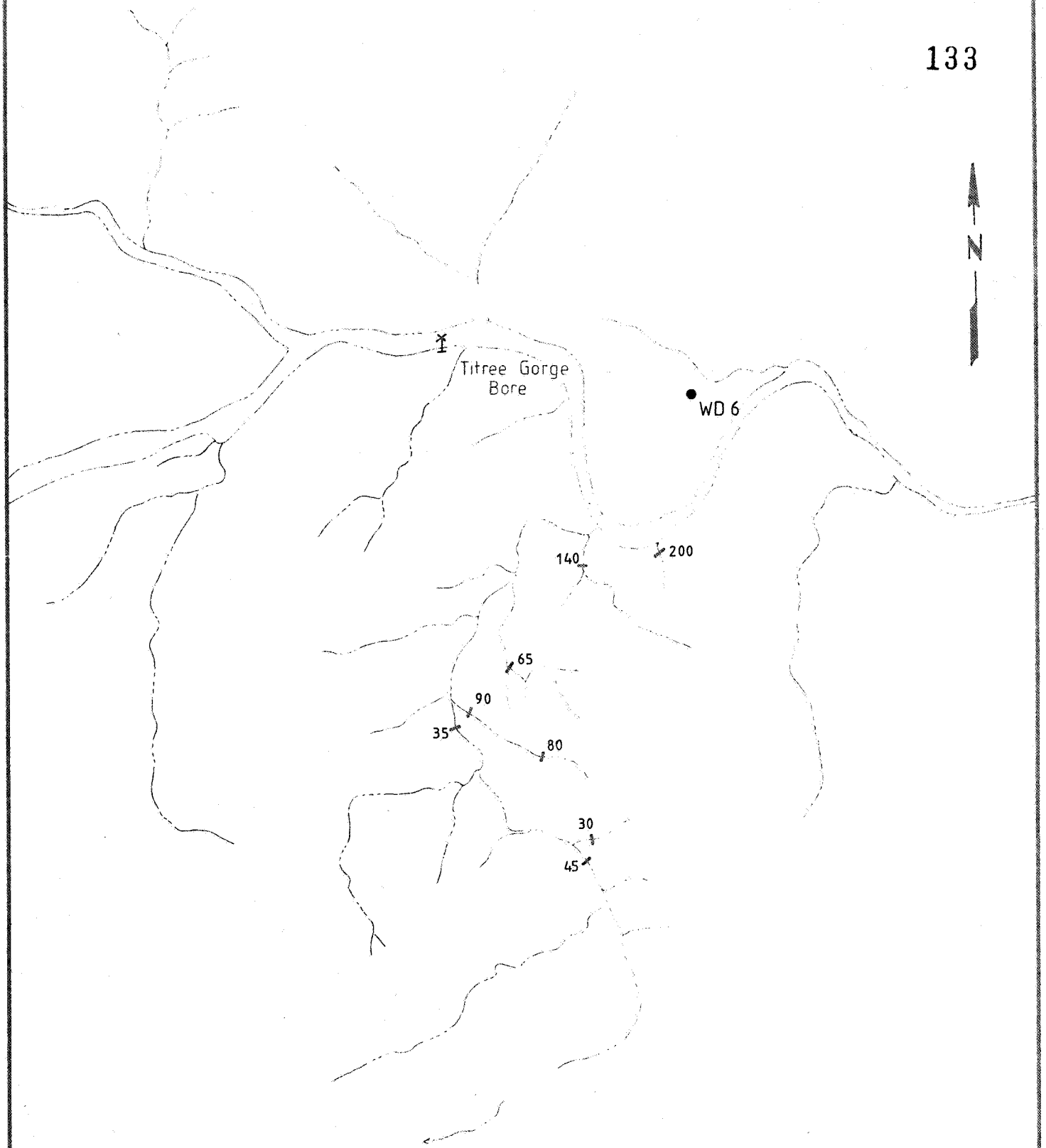
132



Analysis preparation : Perchloric / hydrochloric digestion
Method : A.A.S.

0 100 200 300 400 500 metres
SCALE 1 10 000

Drawn: Whyalla	E.L. 809 WIRREALPA S.A. (VICINITY WD 6)	Project No.
Date: June '81	Pb VALUES (ppm) – 20 MESH FRACTION	Drawing No. A4– 316-2



0 100 200 300 400 500 metres

SCALE 1 10 000

Analysis preparation : Perchloric/ hydrochloric digestion.
Method : A.A.S.

Centre: Whyalla

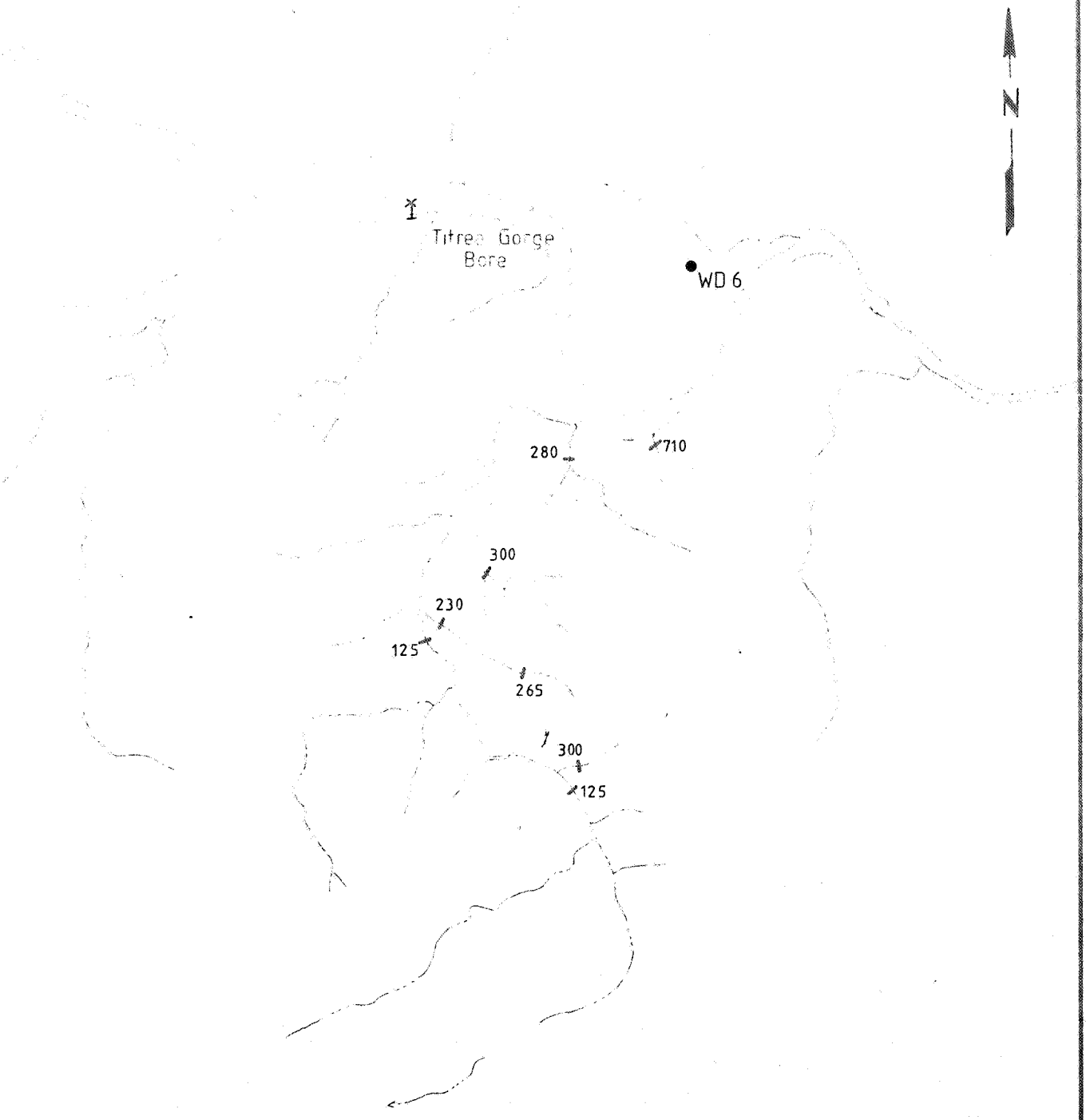
Date: June '81

E.L. 809 WIRREALPA S.A. (VICINITY WD 6)

Pb VALUES (ppm) + 20 MESH FRACTION

Project No.

A4- 316-3



0 100 200 300 400 500 metres

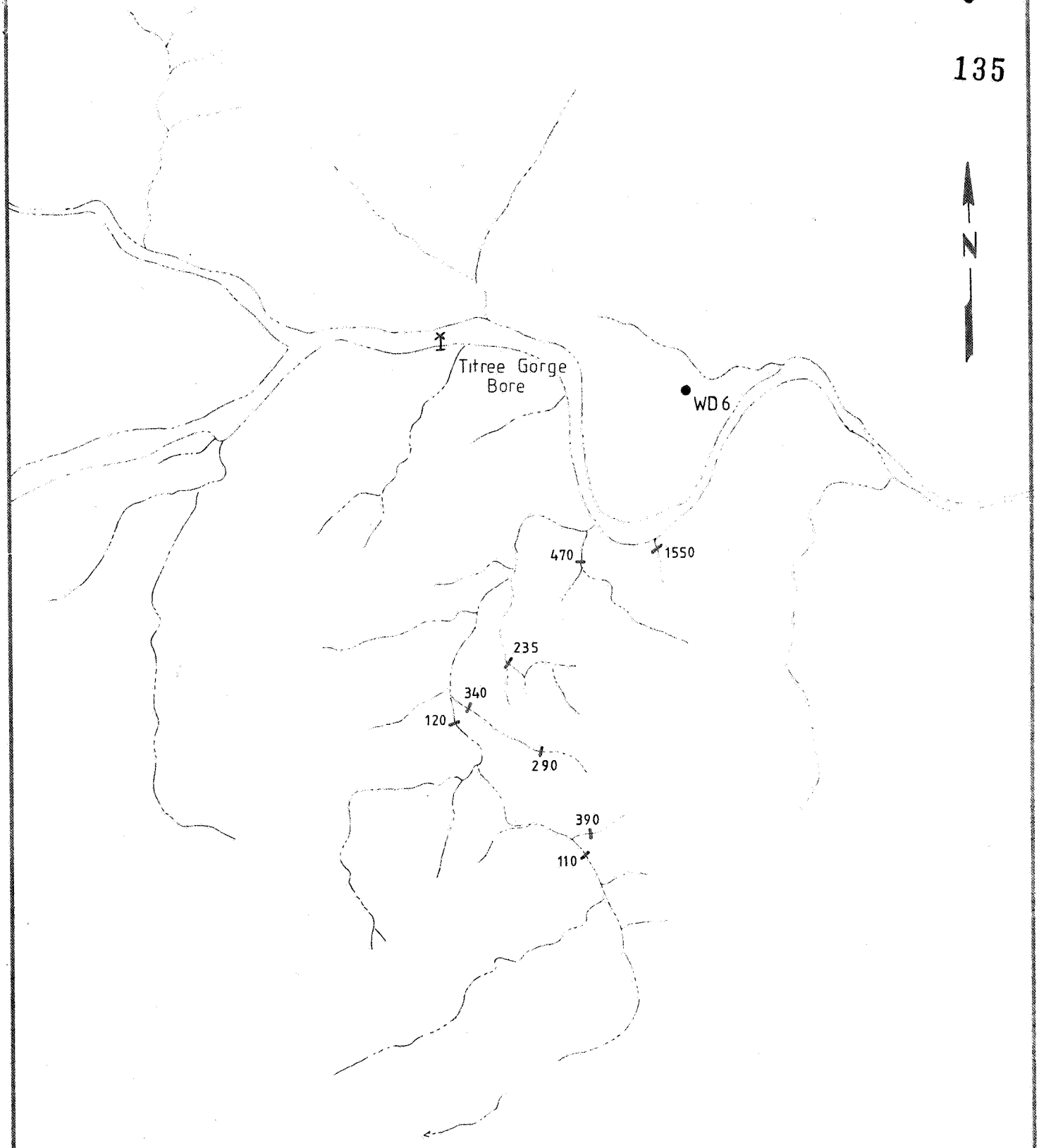
SCALE 1 : 10 000

Analysis preparation: Perchloric/hydrochloric digestion
Method: A.A.S.

Office: Whyalla	E.L. 809 WIRREALPA S.A. (VICINITY WD 6)	Project No
Date: June '81	Zn VALUES (ppm) – 20 MESH FRACTION	Drawing No: A4- 316-4

FIG. 3-5

135



0 100 200 300 400 500 metres

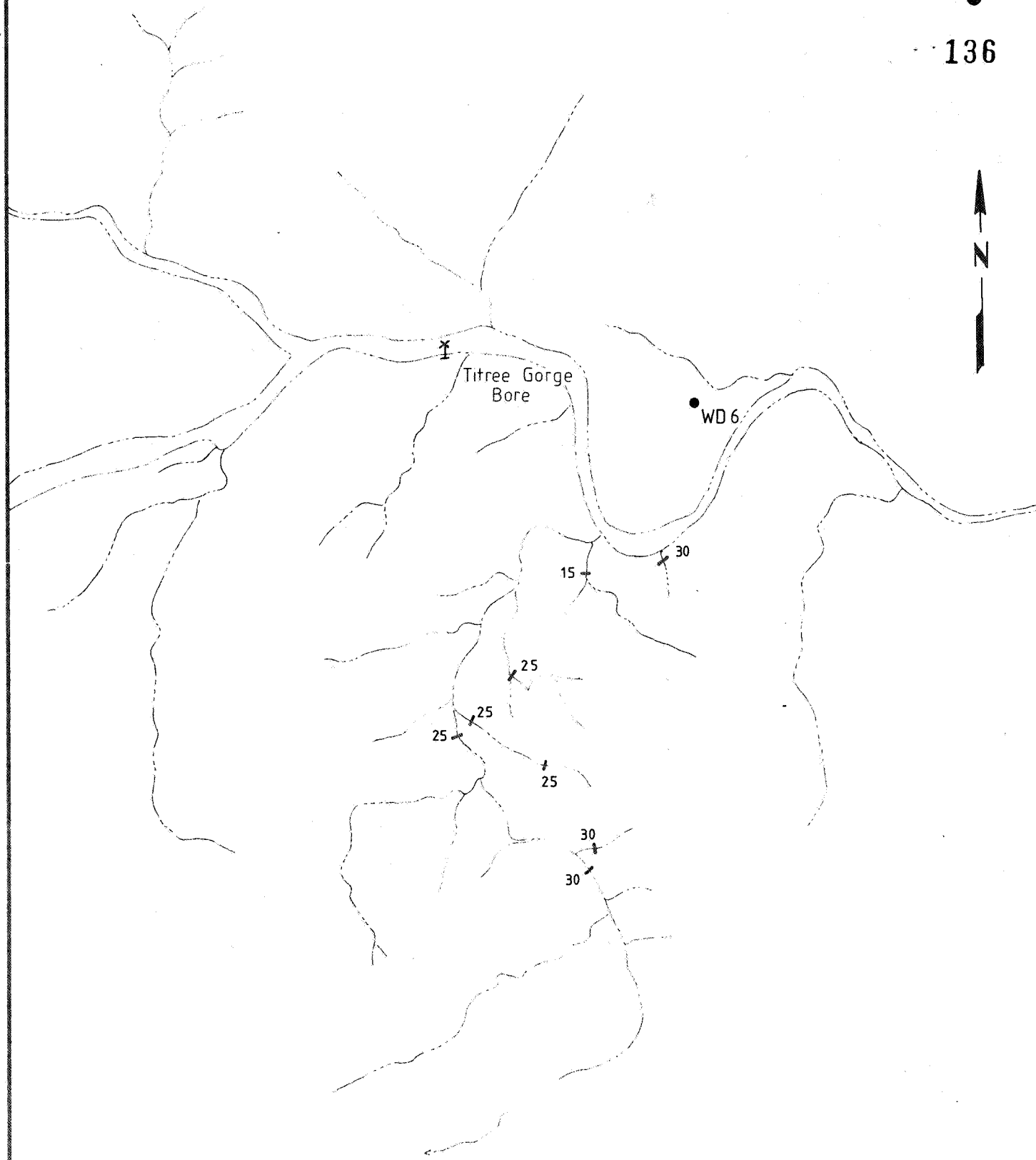
SCALE 1 : 10 000

Analysis preparation : Perchloric / hydrochloric digestion
Method : A.A.S.

Client: Whyalla	E.L. 809 WIRREALPA S.A (VICINITY WD 6)	Page No.
Date: June '81	Zn VALUES(ppm) + 20 MESH FRACTION	A4- 316-5

FIG. 3-6

136



0 100 200 300 400 500 metres

SCALE 1 10000

Analysis preparation: Perchloric/ hydrochloric digestion.
Method: A.A.S.

Date: May 1981	E.L. 809 WIRREALPA S.A. (VICINITY WD 6)	Project No.
Date: June '81	Cu VALUES (ppm) – 20 MESH FRACTION	A4- 3166



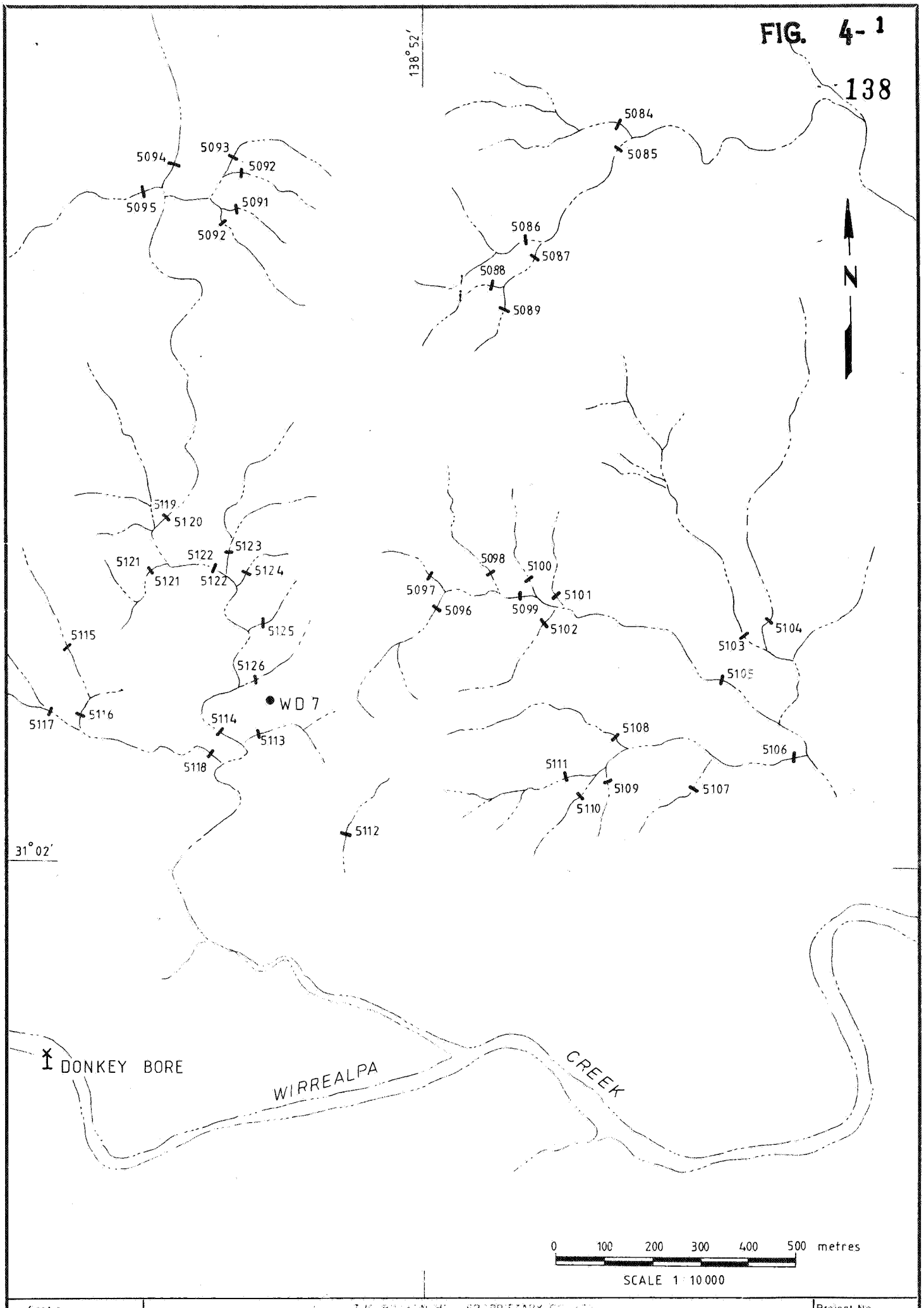
0 100 200 300 400 500 metres

SCALE 1 : 10 000

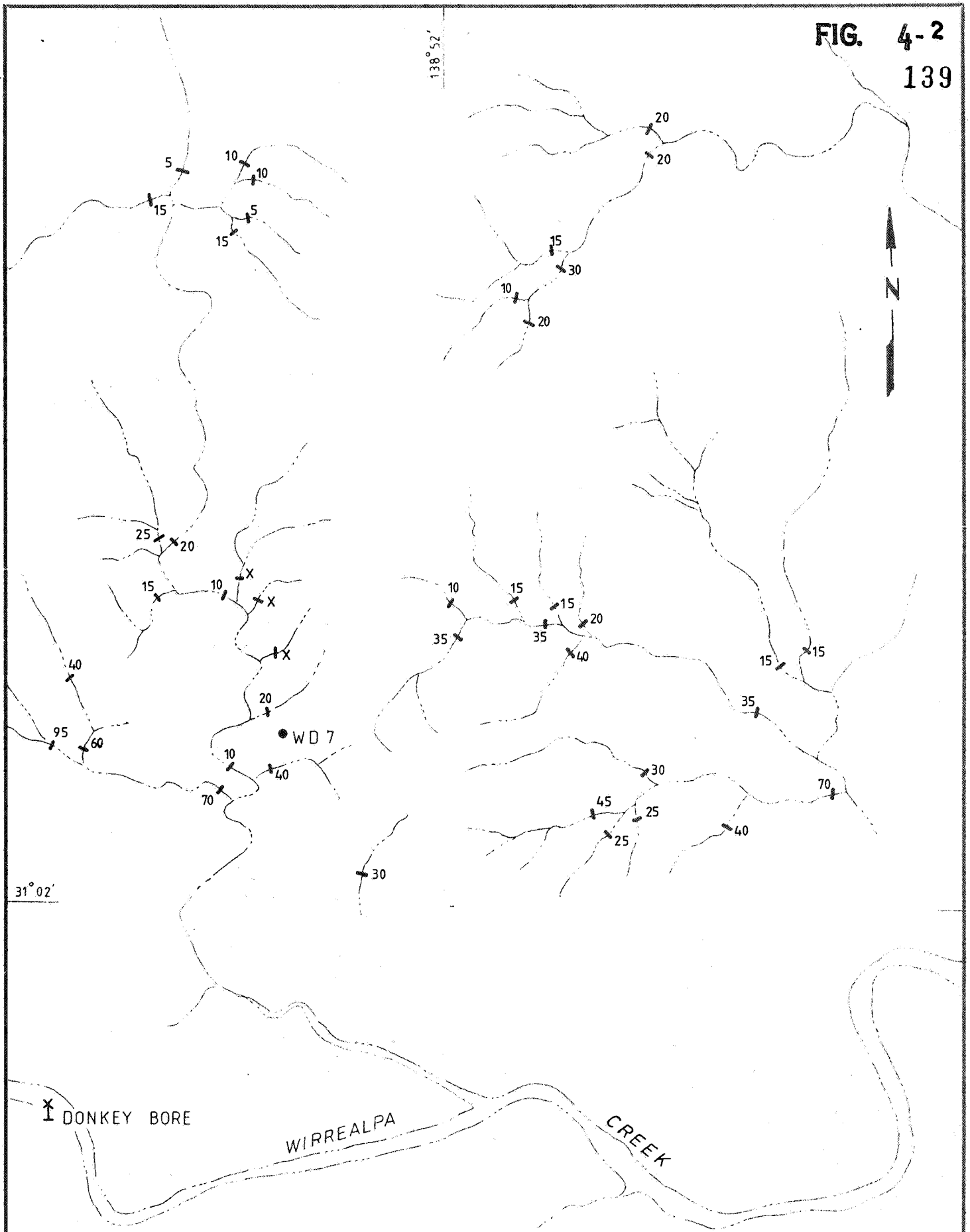
Analysis preparation: Perchloric/ hydrochloric digestion.
Method : A.A.S.

Area: Moyalla	E.L. 809 WIRREALPA S.A. (VICINITY WD 6)	Project No
Date: June '81	Cu VALUES (ppm) + 20 MESH FRACTION	Drawing No. A4- 316-7

FIG. 4-1



Centre: Whyalla	THE BROKEN HILL PROPRIETARY CO. LTD.	Project No.
Date: JULY 81	E.L. 809 WIRREALPA S.A. (VICINITY WD 7) SAMPLE SITES - NOS. SS 5084 TO SS 5126	Drawing No. A4-320-1

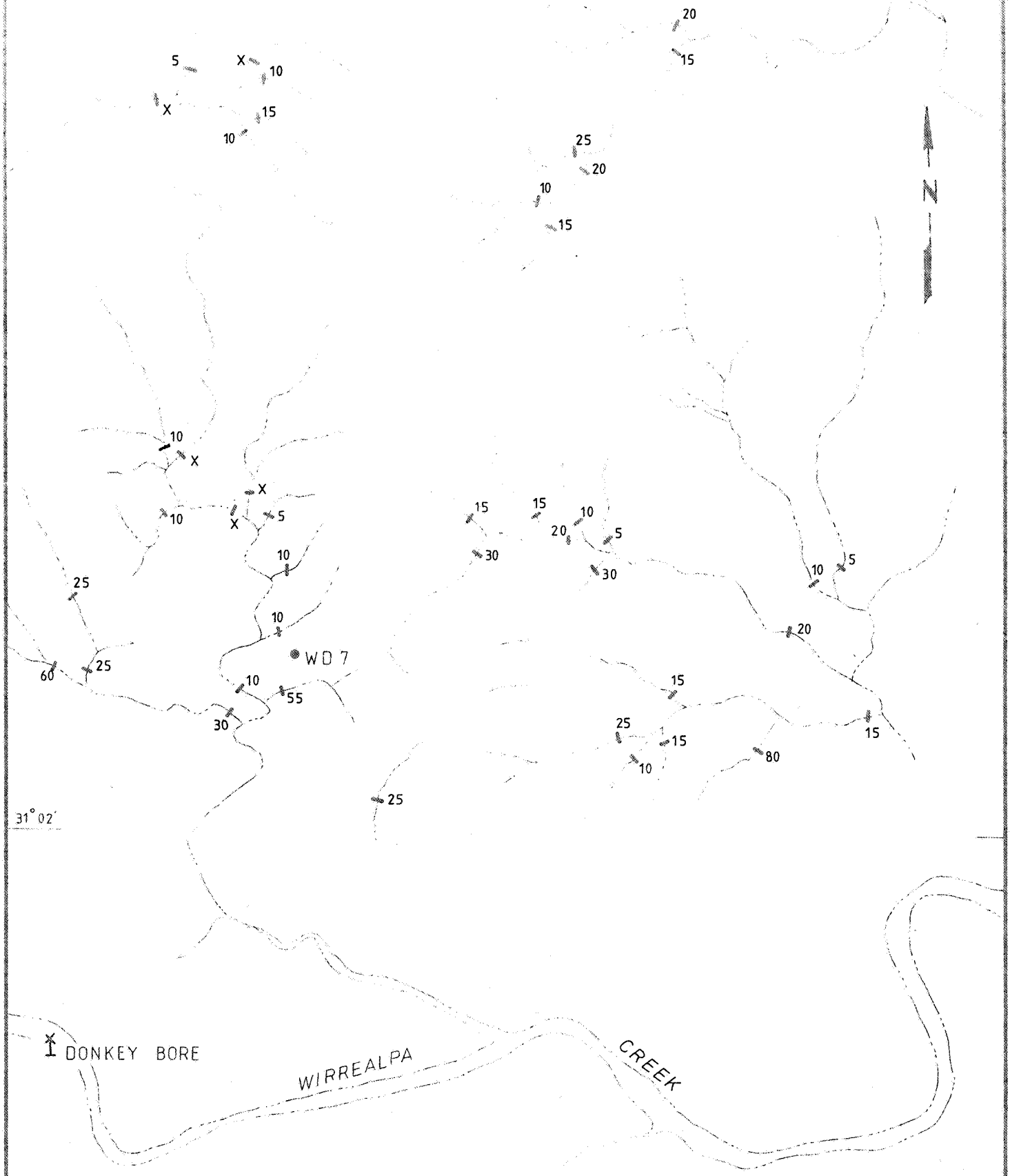


X Element concentration is below detection limit.

Analysis preparation: Perchloric / hydrochloric digestion.
Method: A.A.S.

0 100 200 300 400 500 metres
SCALE 1 10000

Cartographer: Whyalla	E.L. 809 WIRREALPA S.A. (VICINITY WD 7)	Project No.
Date: JULY '81	Pb VALUES (ppm) - 20 MESH FRACTION	Drawing No. A4- 320-7



x Element concentration is below detection limit.

Analysis preparation: Perchloric / hydrochloric digestion.
Method : A.A.S.

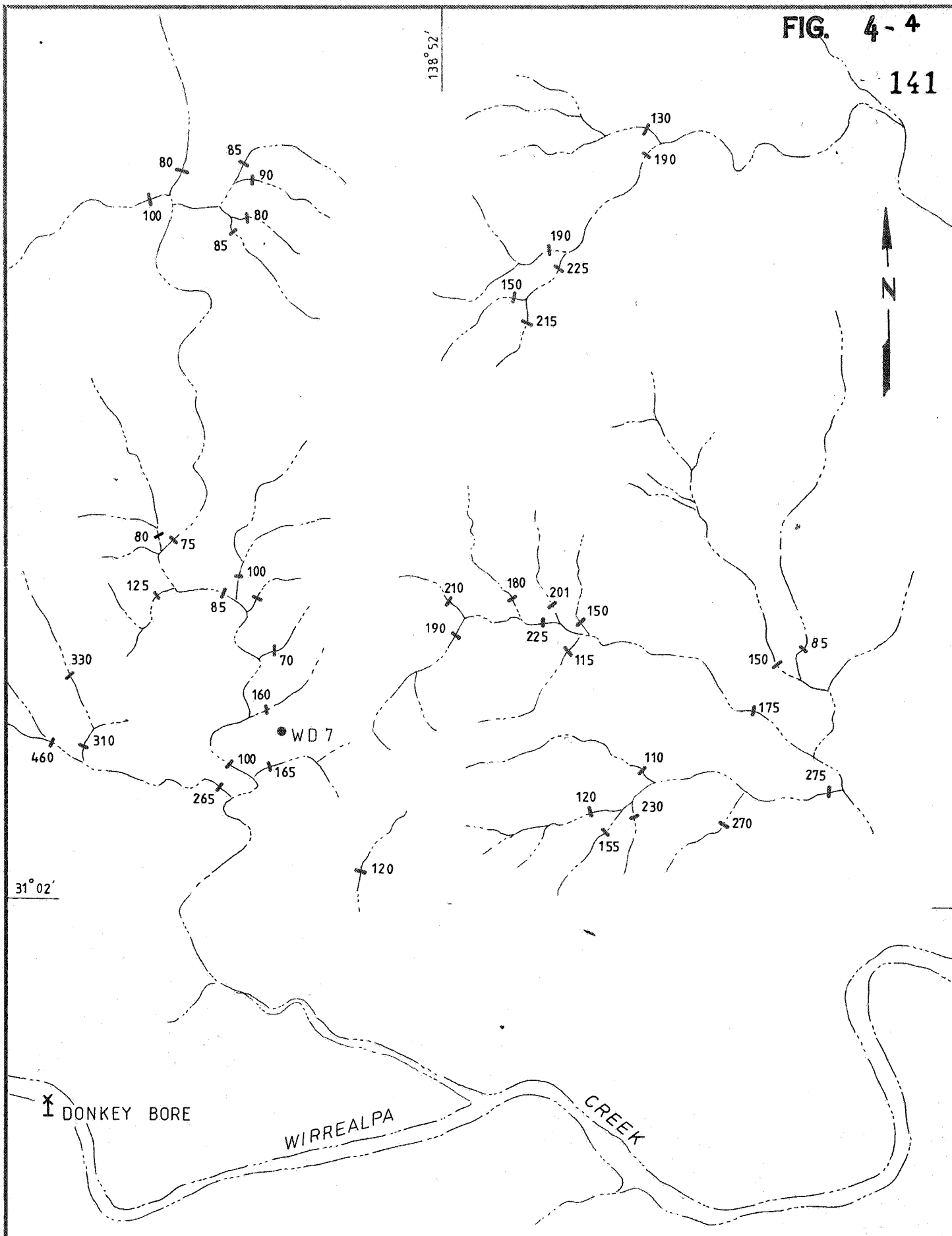
0 100 200 300 400 500 metres
SCALE 1:10 000

E.L. 809 WIRREALPA S.A. (VICINITY WD 7)
Pb VALUES (ppm) + 20 MESH FRACTION

JULY '81

Project No.

A4- 320-4

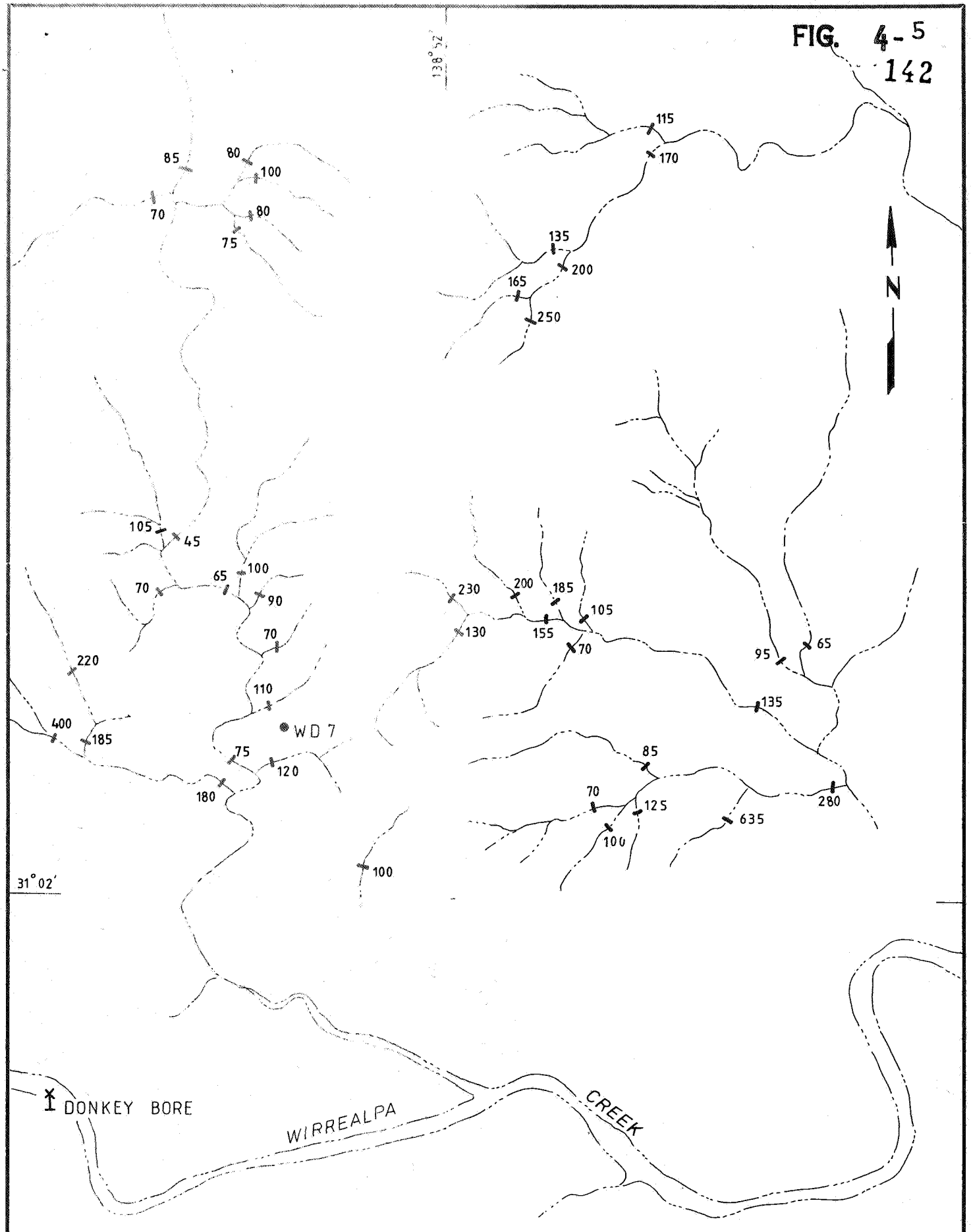


Analysis preparation : Perchloric / hydrochloric digestion.
Method : A.A.S.

0 100 200 300 400 500 metres

SCALE 1 : 10 000

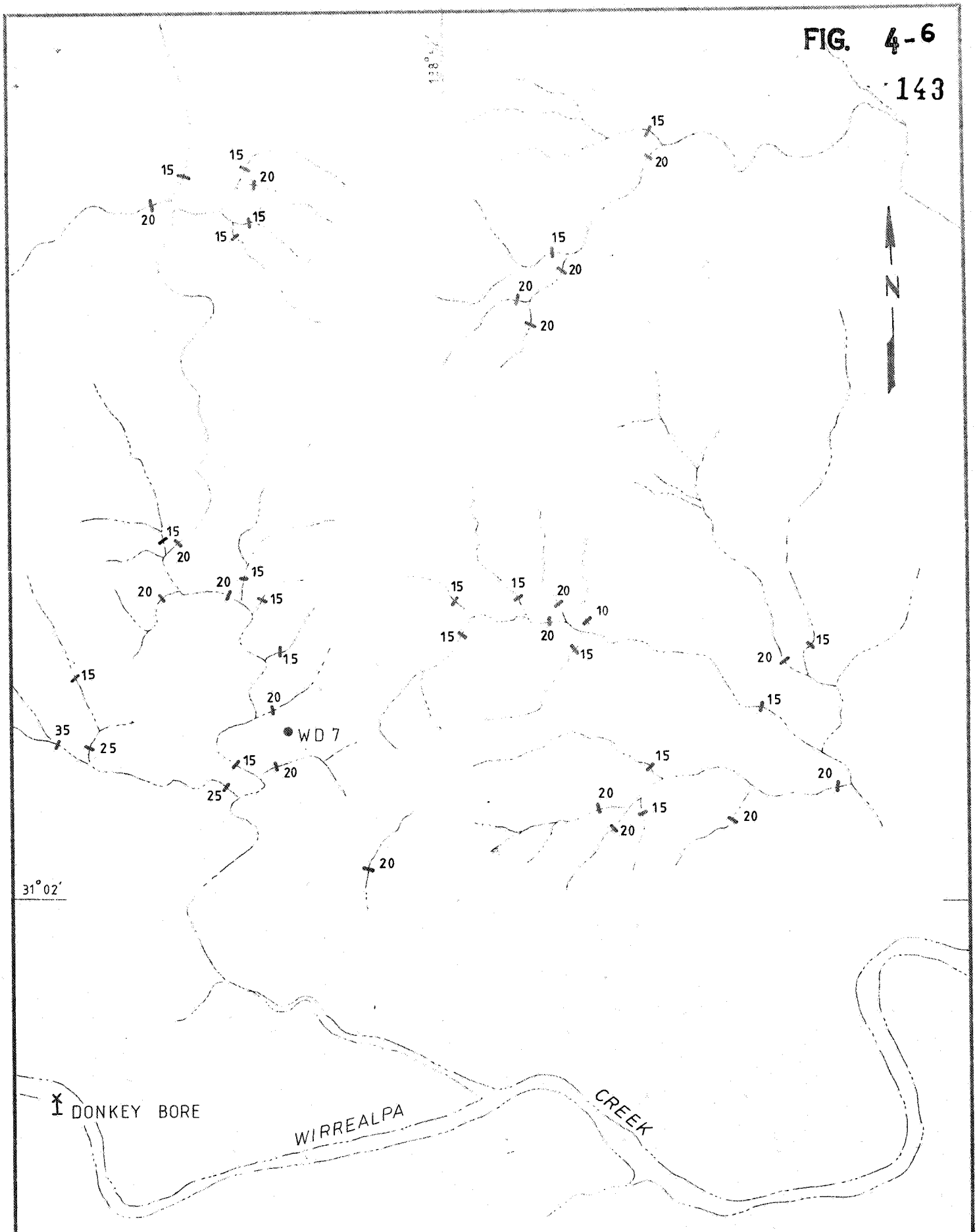
Centre: Whyalla	THE BROKEN HILL PROPRIETARY CO. LTD	Project No.
Date: JULY '81	E.L. 809 WIRREALPA S.A. (VICINITY WD 7) Zn VALUES (ppm) -20 MESH FRACTION	Drawing No. A4- 320-5



Analysis preparation: Perchloric/ hydrochloric digestion
Method: A.A.S.

0 100 200 300 400 500 metres
SCALE 1:10000

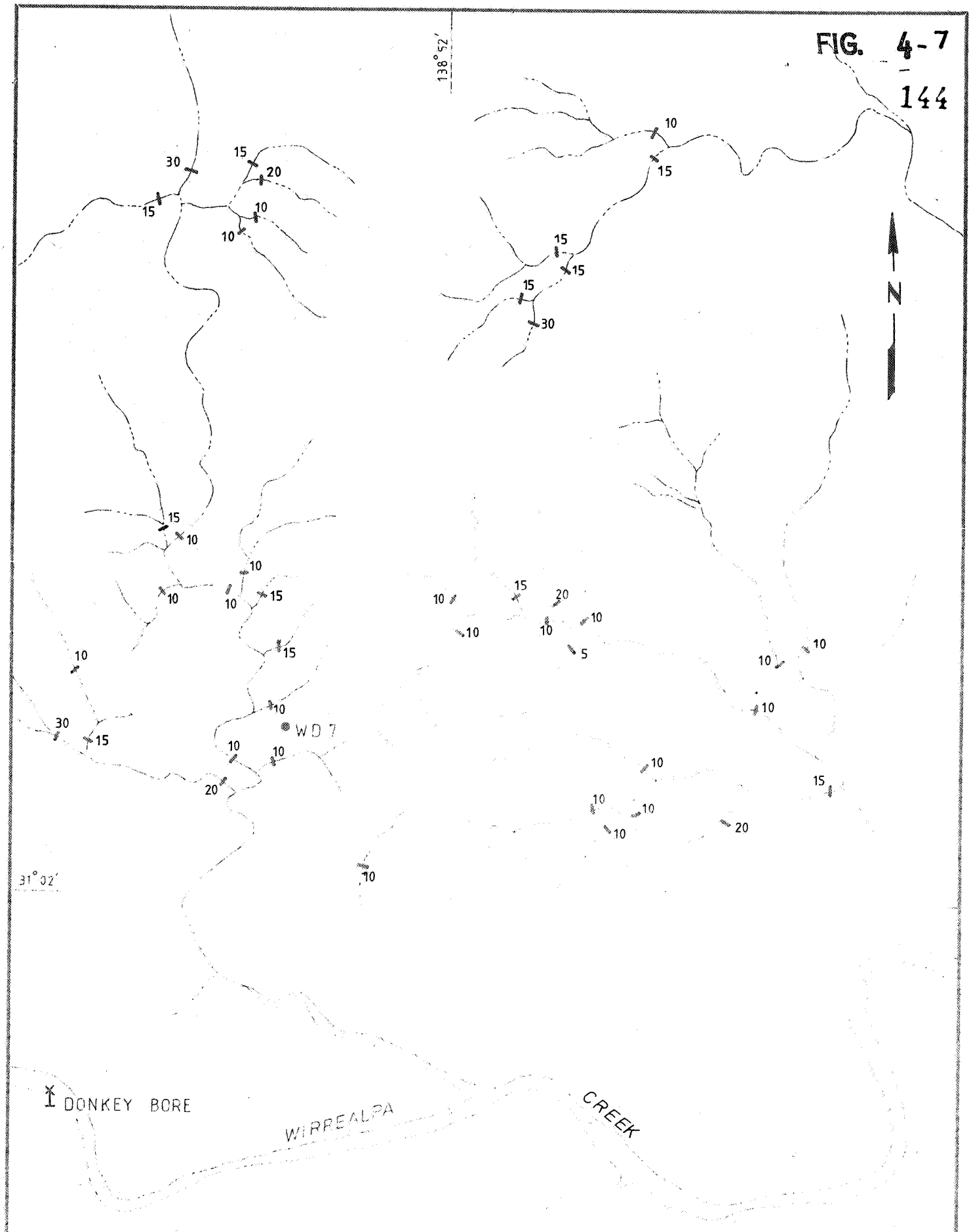
Centre: Whyalla	[illegible] PROPRIETARY CO. LTD.	Project No.
Date: JULY '81	E.L. 809 WIRREALPA S.A. (VICINITY WD 7) Zn VALUES (ppm) +20 MESH FRACTION	Drawing No. A4- 320-3



Analysis preparation: Perchloric / hydrochloric digestion
Method: A.A.S.

0 100 200 300 400 500 metres
SCALE 1 : 10 000

Whyalla	E.L. 809 WIRREALPA S.A. (VICINITY WD 7)	Project No
Date JULY '81	Cu VALUES (ppm) - 20 MESH FRACTION	A4- 320

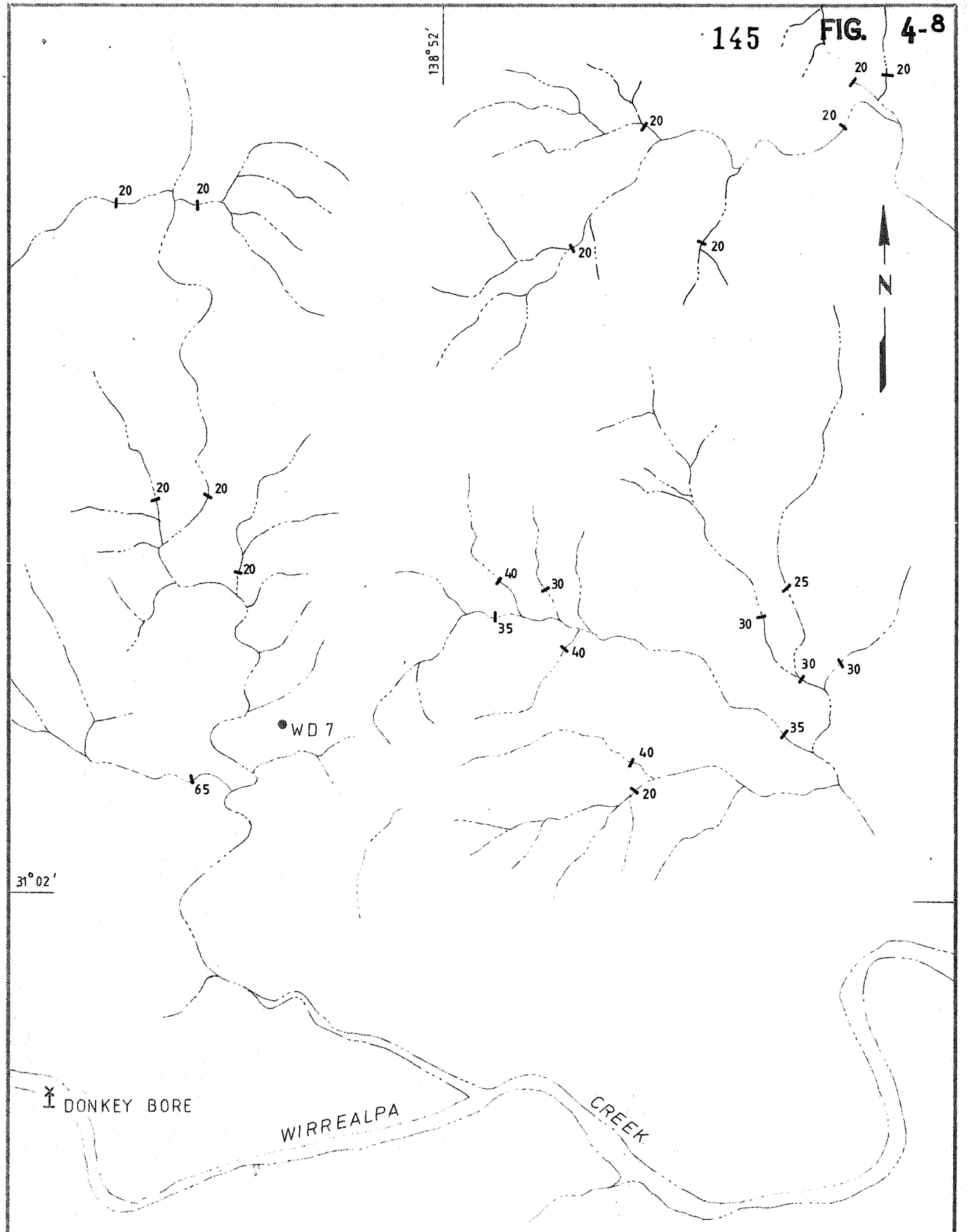


E L 809 WIRREALPA S.A. (VICINITY WD 7)
Cu VALUES (ppm) +20 MESH FRACTION

JULY '81

320-2

FIG. 4-8



Pb VALUES (ppm)

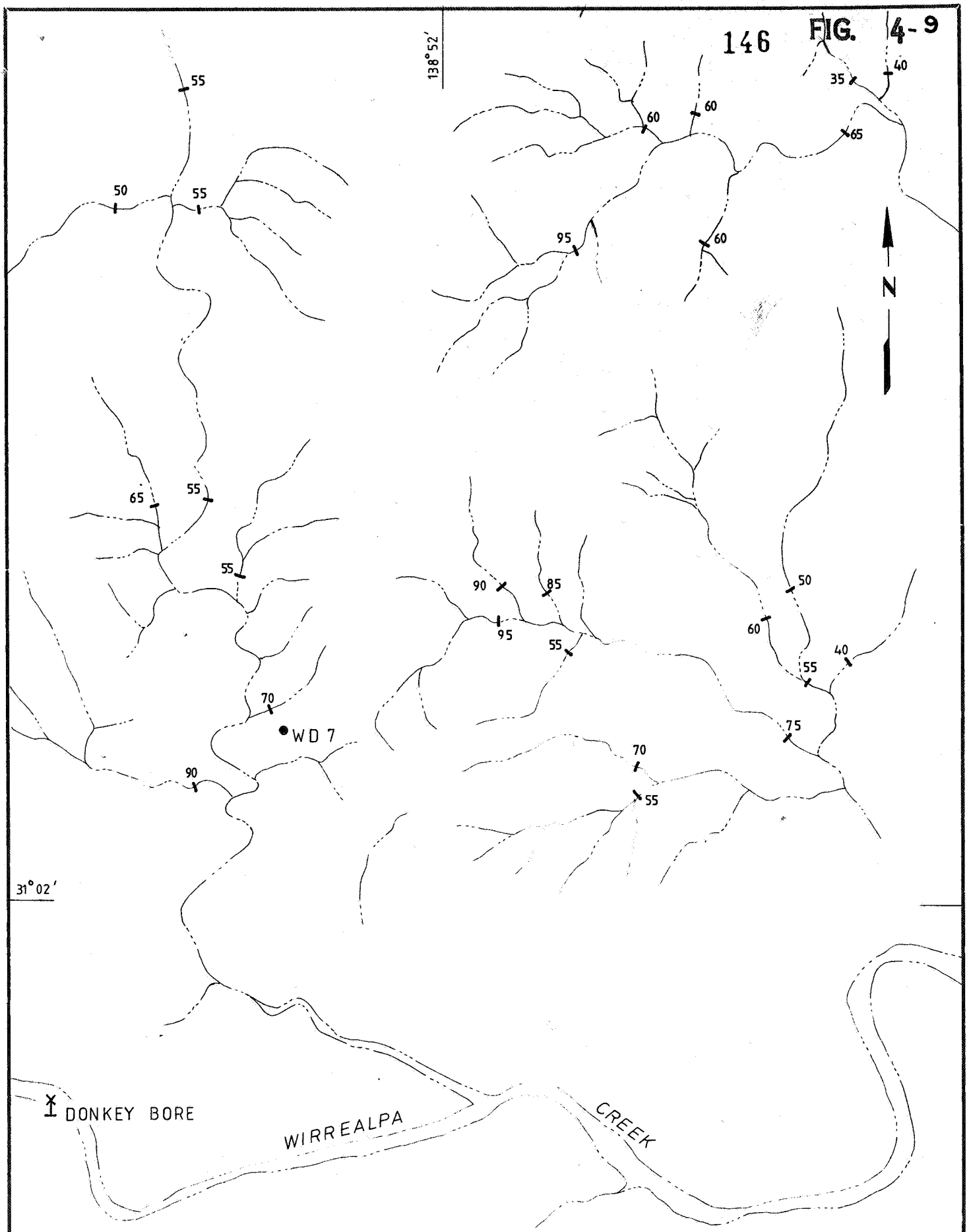
Analysis by A.A.S. following hot 25 % HNO_3 leach on − 80 mesh fraction.

0 100 200 300 400 500 metres

SCALE: 1:10 000

Drawn	E.L. 809 WIRREALPA S.A. (VICINITY WD 7)	Project No.
15/7/81	REPRODUCTION OF STREAM SEDIMENT GEOCHEMISTRY AS CARRIED OUT BY A.S.A.R.C.O. (S.A.D.M.E. Envelope 975)	A4- 320-8

FIG. 4-9



Zn VALUES (ppm)

Analysis by A.A.S. following hot 25% HNO_3 leach on −80 mesh fraction.

0 100 200 300 400 500 metres

SCALE: 1:10 000

Whyalla	E.L. 809 WIRREALPA S.A. (VICINITY WD 7)	Project No
15/7/81	REPRODUCTION OF STREAM SEDIMENT GEOCHEMISTRY AS CARRIED OUT BY A.SARCO (SADME Envelope 975)	Drawing No A4- 320-9

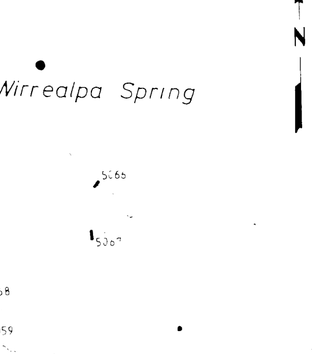
Wirrealpa Spring

N

31°24'

31°05'

5065 5066 5063 5064 5062 5061 5067 5068 5059 5060 5058 5057 5056 5055 5054 5075 5073 5072 5074 5076 5070 5071 5069 5078 5077 5079 5083 5082 5081 5013 5012 5011 5014 5015 5016 5010 5024 5025 5026 5028 5029 5027 5032 5030 5031 5033 5019 5020 5018 5021 5009 5034 5022 5023 5041 5042 5043 5044 5046 5045 5049 5050 5052 5051 5053 5036 5035 5039 5037 5038 5047 5048 5044



LOCALITY MAP

0 500 1000 metres

SCALE 1: 10 000

3427-5

E.L 809 WIRREALPA S.A

WIRREALPA SPRINGS AREA

STREAM SEDIMENTARY GEOCHEMISTRY

SAMPLE SITE LOCATIONS Nos SS 5009 to SS 5083

P.K.	JULY '81	
M.R.		1781:1

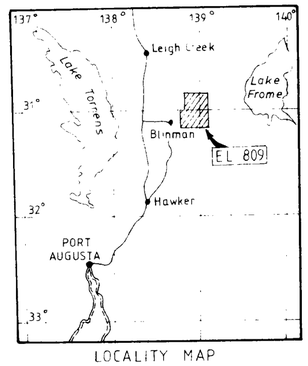
Wirrealpa Spring

N

31°04'

31°05'

150 X 20 340 60 X 15 40 60 20 5 160 365 85 X 15 15 20 10 15 20 15 40 10 40 20 30 35 X 20 25 20 20 20 25 20 25 20 15 5 20 15 30 15 70 25 90 40 25 40 20 35 5 20 15 20 5 X X 40 30 50 125 60 90 80 X X 50 85 340 230 110



LOCALITY MAP

0 500 1000 metres

SCALE 1:20,000

x Element concentration is below detection limit

Analysis preparation : Perchloric / hydrochloric digestion

Method : A.A.S.

THE BROKEN HILL PROPRIETARY CO. LTD.

E.L. 809 WIRREALPA S.A.

WIRREALPA SPRINGS AREA

STREAM SEDIMENT SURVEY

Pb VALUES (ppm) – 20 MESH FRACTION

JULY '81

M.R.

17 81-9

3427-6

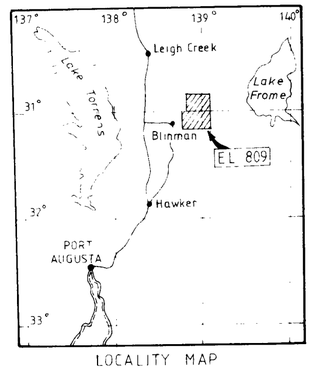
N

Wirrealpa Spring

290
1150
X X
95
5 10
5 20
15
X
45 260
45 X
5 10 15
5 10
25 5 20
15 40 50
30 30
75 25
15 15 80
15 15
15
20 10
25
5
35 80
35 25
X X X
X

25 35 25
20 25 15
20 30 45
30
30 35 50
140 45 80
5 X
60
31°05'
50 105 145 80 70

LOCALITY MAP



x Element concentration is below detection limit.

Analysis preparation: Perchloric / hydrochloric digestion

Method: A.A.S.

0 500 1000 metres

SCALE 1:10,000

THE BROKEN HILL PROPRIETARY CO. LTD.

E.L 809 WIRREALPA S.A.
WIRREALPA SPRINGS AREA
STREAM SEDIMENT SURVEY
Pb VALUES (ppm) + 20 MESH FRACTION

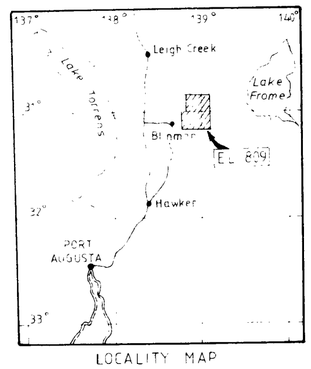
R.K.	JULY '81	
M.R.		1781-4

3427-7

Wirrealpa Spring

155
165
40
75
50
45
55
160
260
60
240
205
170
180
45
30
55
40
40
60
115
50
140
60
170
70
145
95
60
130
70
50
60
75
55
50
60
75
70
95
55
50
60
65
80
55
55
55
65
110
100
70
100
20
50
35
35
60
45
60
95
70
150
400
475
175
300
300
1150
340
470
95
75
65

31°04
31°05



LOCALITY MAP

0 500 1000 metres
SCALE 1 : 10 000

Analysis preparation: Perchloric / hydrochloric digestion
Method: A A S.

E.L. 809 WIRREALPA S.A.
WIRREALPA SPRINGS AREA
STREAM SEDIMENT SURVEY
Zn VALUES (ppm) - 20 MESH FRACTION

R K | JULY '81
M R.

1781-5

3427-8

138°51'

138°52'

138°53'

31°04'

31°05'

N

Wirrealpa Spring

65
30 40
235
45
40 25
55
140
35
180
160
165
145
75
20 30 45
35 40
115 30
115
40 190
50
180
160
75
120
50
40 40
90
65
50 40
45
55
45
60
50
30 60
40
40
50 50
60
55
140
40
60
180
60 20
20 15
20
65 50
90
215
320 150
300
395
1050
445 345
230
85
335

0 500 1000 metres

SCALE 1 10 000

137° 138° 139° 140°
31°
32°
33°
Leigh Creek
Lake Torrens
Lake Frome
Blinman
EL 809
Hawker
PORT AUGUSTA

LOCALITY MAP

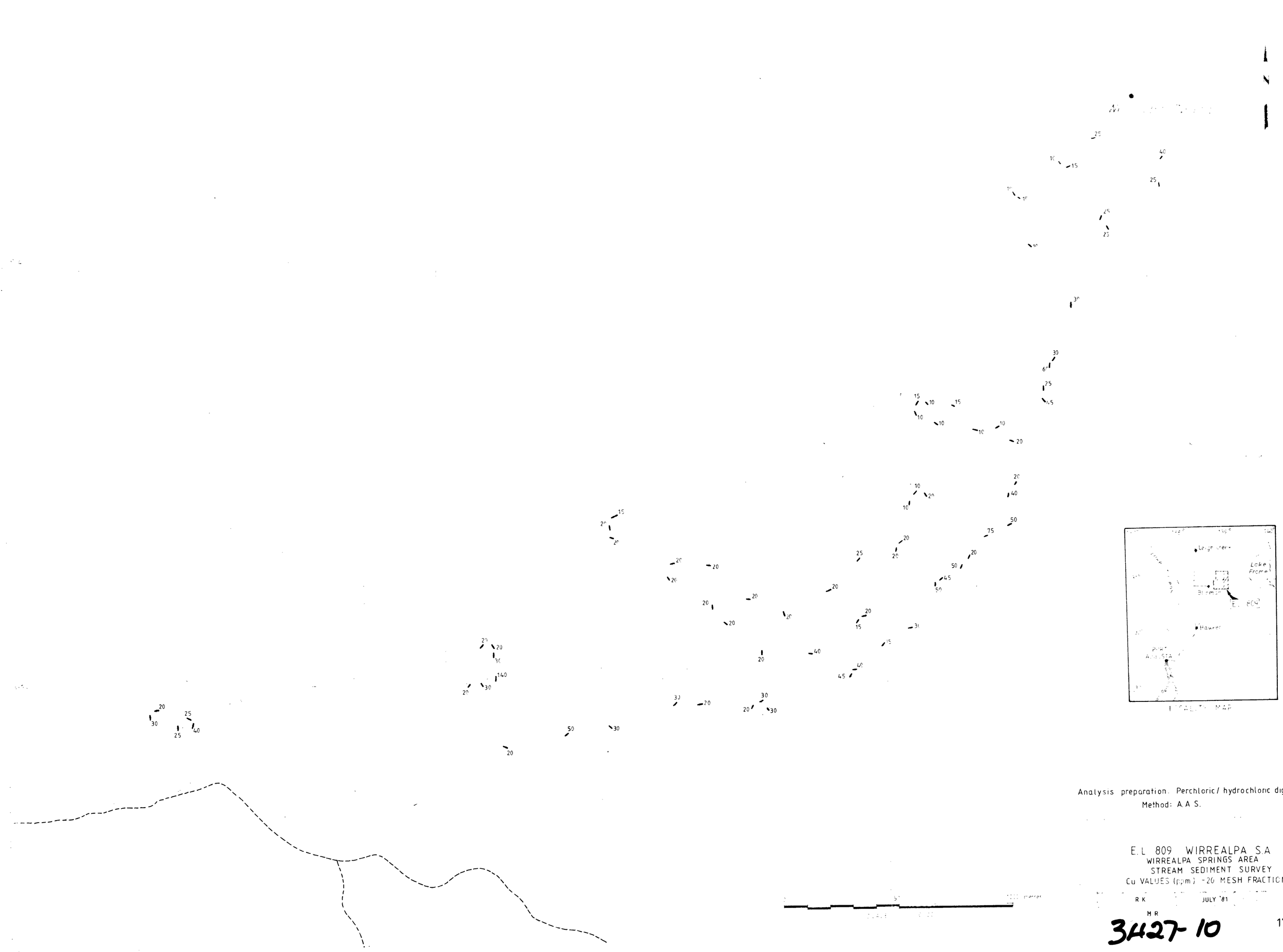
Analysis preparation: Perchloric / hydrochloric digestion
Method: A.A.S.

THE BROKEN HILL PROPRIETARY CO LTD

E.L. 809 WIRREALPA S.A.
WIRREALPA SPRINGS AREA
STREAM SEDIMENT SURVEY
Zn VALUES (ppm) +20 MESH FRACTION

Drawn R.K.	Date JULY '81	Centre ADELAIDE	
Approved M.R.	Project No	Drawing No A2-1781-2	
Checked			

3427-9



Analysis preparation. Perchloric / hydrochloric digestion
Method: A.A.S.

E.L 809 WIRREALPA S.A
WIRREALPA SPRINGS AREA
STREAM SEDIMENT SURVEY
Cu VALUES (ppm) -20 MESH FRACTION

R K JULY '81

M R

3427-10

1781-3



LOCALITY MAP

Analysis preparation: Perchloric/ hydrochloric digestion
Method: A.A.S.

E.L. 809 WIRREALPA S.A.
WIRREALPA SPRINGS AREA
STREAM SEDIMENT SURVEY
Cu VALUES (ppm) + 20 MESH FRACTION

R.K. JULY '81

M.R.

3427-11

1781-8

138°51'

138°52'

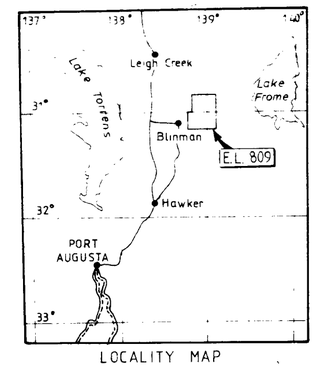
138°53'

31°04'

31°05'

Wirrealpa Spring

N



LOCALITY MAP

Pb VALUES (ppm)

Analysis by A.A.S. following hot 25 % HNO_3 leach on −80 mesh fraction.

0 500 1000 metres

SCALE 1 : 10 000

THE BROKEN HILL PROPRIETARY CO. LTD.

E.L. 809 WIRREALPA S.A.

WIRREALPA SPRINGS AREA

REPRODUCTION OF STREAM SEDIMENT GEOCHEM AS CARRIED OUT BY ASARCO (SADME Envelope 975)

Drawn R.K.	Date JULY '81	Centre WIRREALPA	
Prepared M.R.			Drawing No. A2 1781-6
Checked			

Revisions

3427-12

138°51'

138°52'

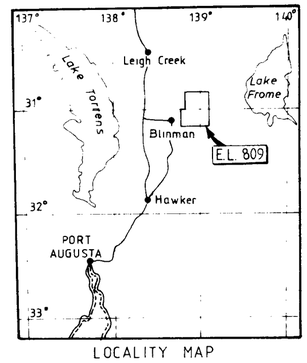
31°04'

31°05'

Wirrealpa Spring

N

55
30
25
40
25
30
45
40
75
40
40
25
55
30
25
30
55
30
20
55
25
25
25
20
25
30
25
55
45
190
210
180
70
160
40
320
50
130
60
270
320
530
60
160
190
35
130



LOCALITY MAP

0 500 1000 metres

SCALE 1 10 000

Zn VALUES (ppm)

Analysis by A.A.S. following hot 25 % HNO_3 leach on −80 mesh fraction.

THE BROKEN HILL PROPRIETARY CO. LTD.

E.L. 809 WIRREALPA S.A.
WIRREALPA SPRINGS AREA
REPRODUCTION OF STREAM SEDIMENT GEOCHEM.
AS CARRIED OUT BY ASARCO (SADME Envelope 975)

Drawn R.K. | Date JULY '81 | Scale

Approved M.R.

Drawing No. A2 1781-7

3427-13

DRILL HOLE :	WD 13
LOCATION :	
DRILL TYPE :	Diamond
CASING TYPE :	Steel - NW to 0·65m
INCLINATION :	Vertical
DEPTH DRILLED :	364·4m
DEPTH LOGGED :	140·3m
LOGGING UNIT :	SIE T450E
DATE :	18-7-81

Geological Log

Gamma
Winding Speed 4 m/min.

Resistivity
Winding Speed m./min.

Self Potential
Winding Speed m./min.

Density
Winding Speed m./min.

0
10
20
30
40
50
60
70
80
90
100
110
120
130
140
150
160

1·0m

140·3m

No electric logs
Hole dry to 136m

0 c.p.s. 100
T.C. = 5 secs.

ohm m. Full scale

millivolts Full scale

T.C.: secs.
Source 50 m. Curies Cs 137

Fig. 6-1

Revisions:

THE BROKEN HILL PROPRIETARY CO. LTD.
EXPLORATION DEPARTMENT

E.L. 809 WIRREALPA, S.A.

GEOPHYSICAL DOWN HOLE LOGS
WD 13

Drawn: D.G.P.	Date: 9-9-81	Centre: Adelaide	
Traced: A.R.V.			
Checked:	Project No.: 6-L110-10	Drawing No.: A2-122	

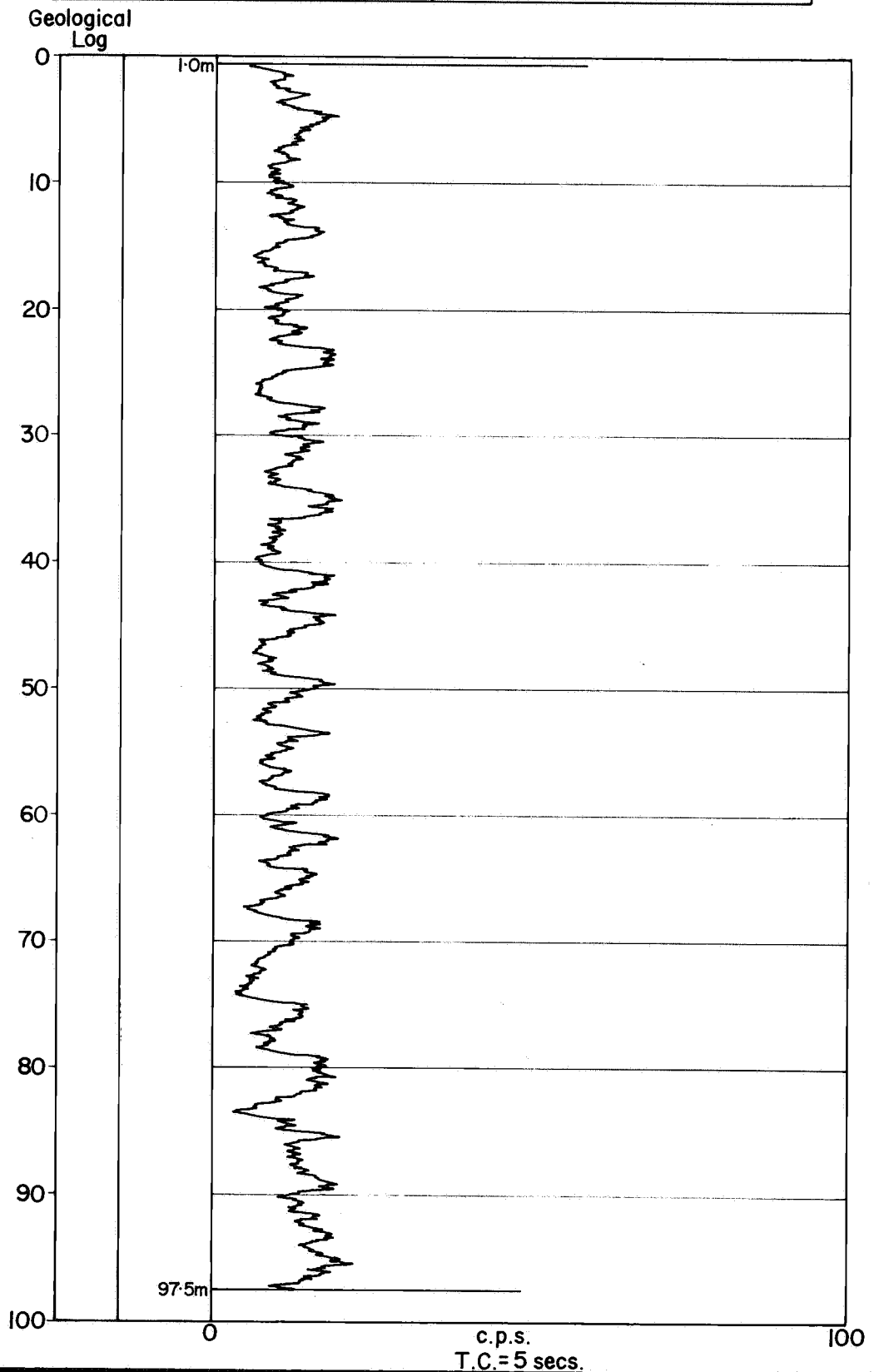
Fig. No.
To accompany
Dated

3427 142

DRILL HOLE: WD 14	DEPTH OF HOLE: 313·8m
LOCATION:	DEPTH LOGGED: 97·5m
	LOGGING UNIT: SIE T450E
TYPE OF LOG: Gamma	CASING TYPE: Steel - B to 3·0m
DATE: 18-7-81	INCLINATION:

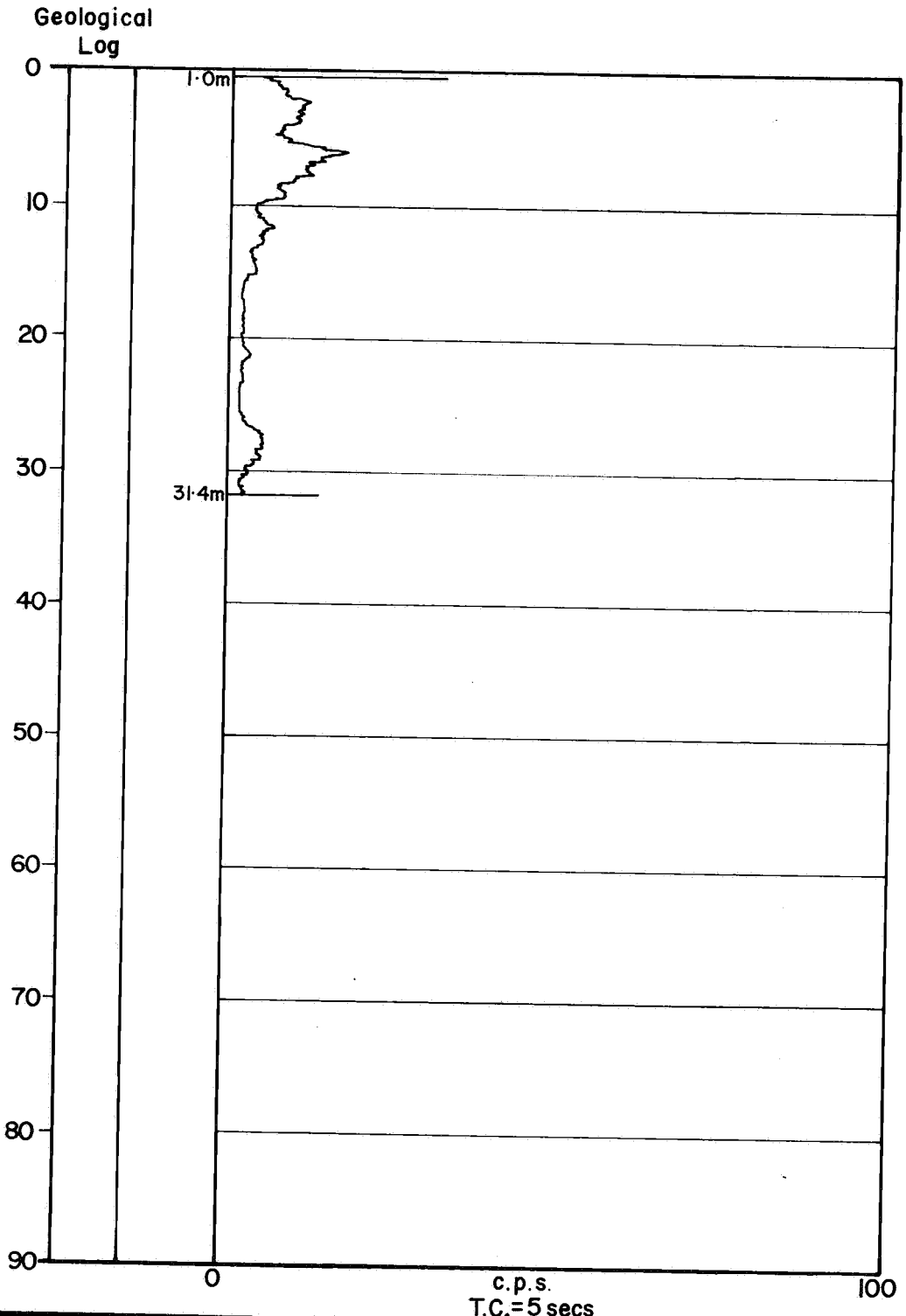
FIG. 6-2

147



Centre: Adelaide	THE BROKEN HILL PROPRIETARY CO LTD E.L.809 WIRREALPA, S.A. GAMMA LOG WD 14	Project No: 6-L110-11
Date: 9-9-81		Drawing No: A4-153

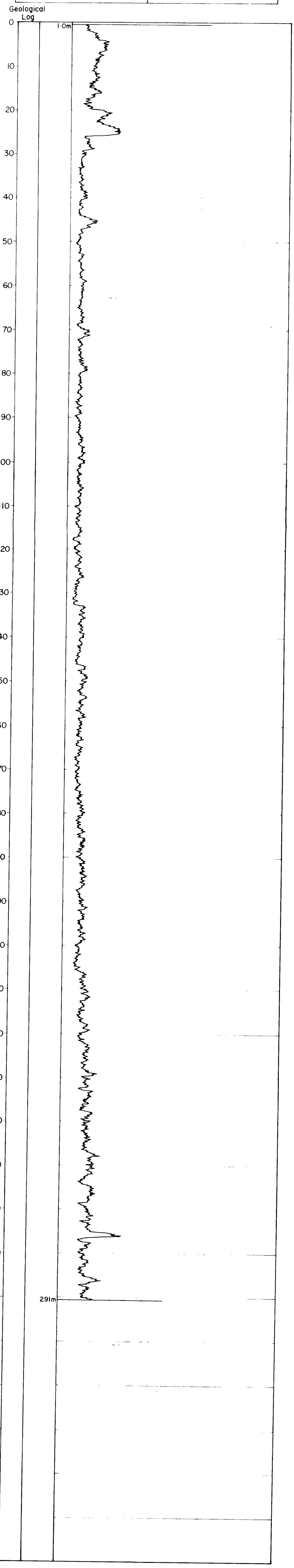
DRILL HOLE : WD 15	DEPTH OF HOLE : 120·8 m
LOCATION:	DEPTH LOGGED: 31·4 m
	LOGGING UNIT: SIE T450E
TYPE OF LOG: Gamma	CASING TYPE: Steel to 3·0 m
DATE: 19-7-81	INCLINATION: Vertical



Centre: Adelaide	THE BROKEN HILL PROPRIETARY CO. LTD. E.L.809 WIRREALPA, S.A. GAMMA LOG WD 15	Project No. 6-L110-9
Date: 21-8-81		Drawing No. A4-152

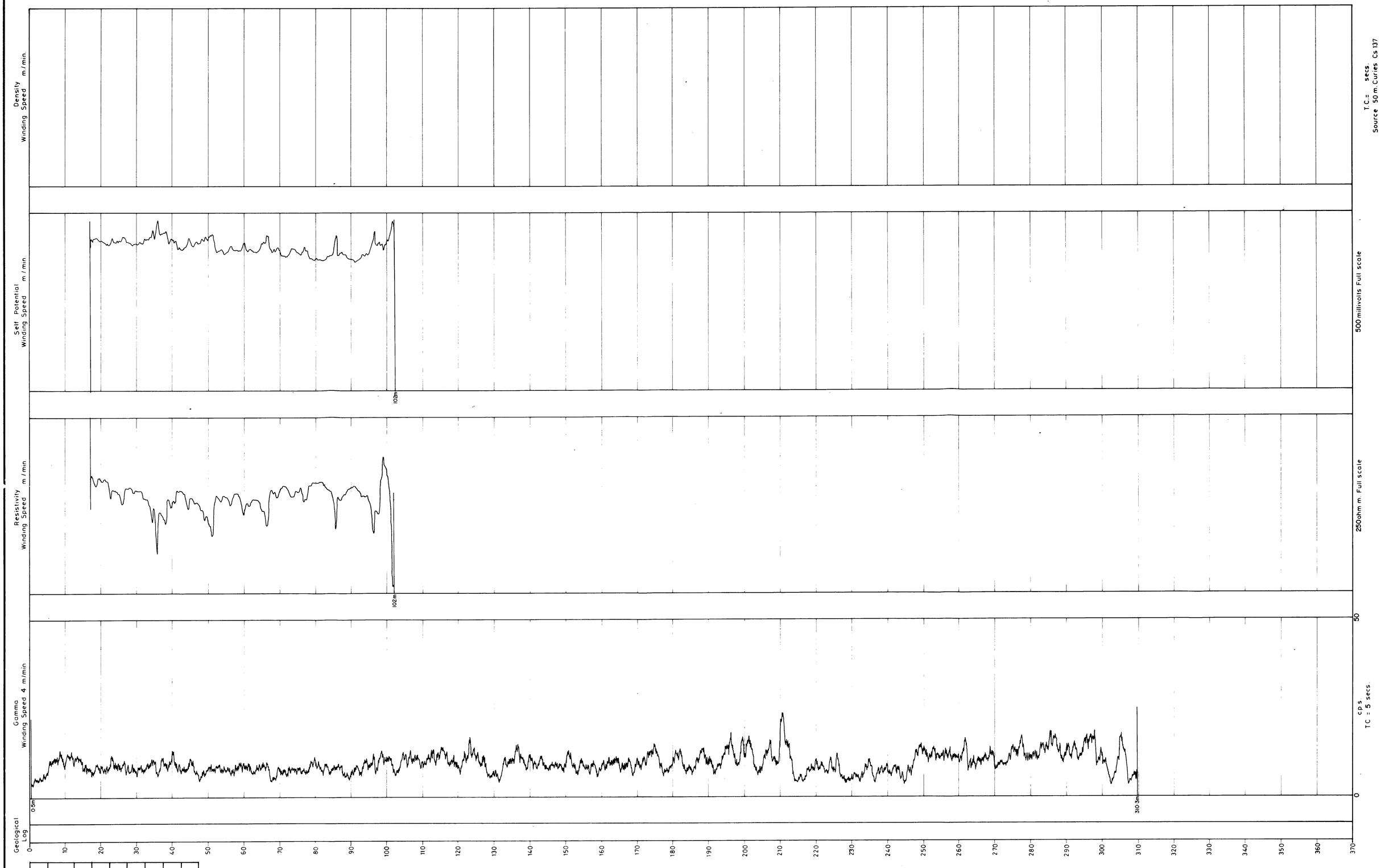
FIG. 6-4

DRILL HOLE WD 17	DEPTH OF HOLE 305·06m
LOCATION	DEPTH LOGGED 291 m
	LOGGING UNIT SIE T450E
TYPE OF LOG Gamma	CASING TYPE Steel –B to 240 m –N to 299·56m
DATE 23-7-81	INCLINATION



3427-15

Centre Adelaide	THE BROKEN HILL PROPRIETARY CO LTD. E.L.809 WIRREALPA, S.A. GAMMA LOG WD 17	Project No. 6-L110-12
Date 9-9-81		Drawing No G - 18



DRILL HOLE	WD 18
LOCATION	
DRILL TYPE	Diamond
CASING TYPE	Steel -99m of B -55m of NW
INCLINATION	
DEPTH DRILLED	322 m
DEPTH LOGGED	Varies
LOGGING UNIT	SIE T450E
DATE	10-8-81

3427-16

THE BROKEN HILL PROPRIETARY CO. LTD.
EXPLORATION DEPARTMENT

E.L.809 WIRREALPA, S.A.

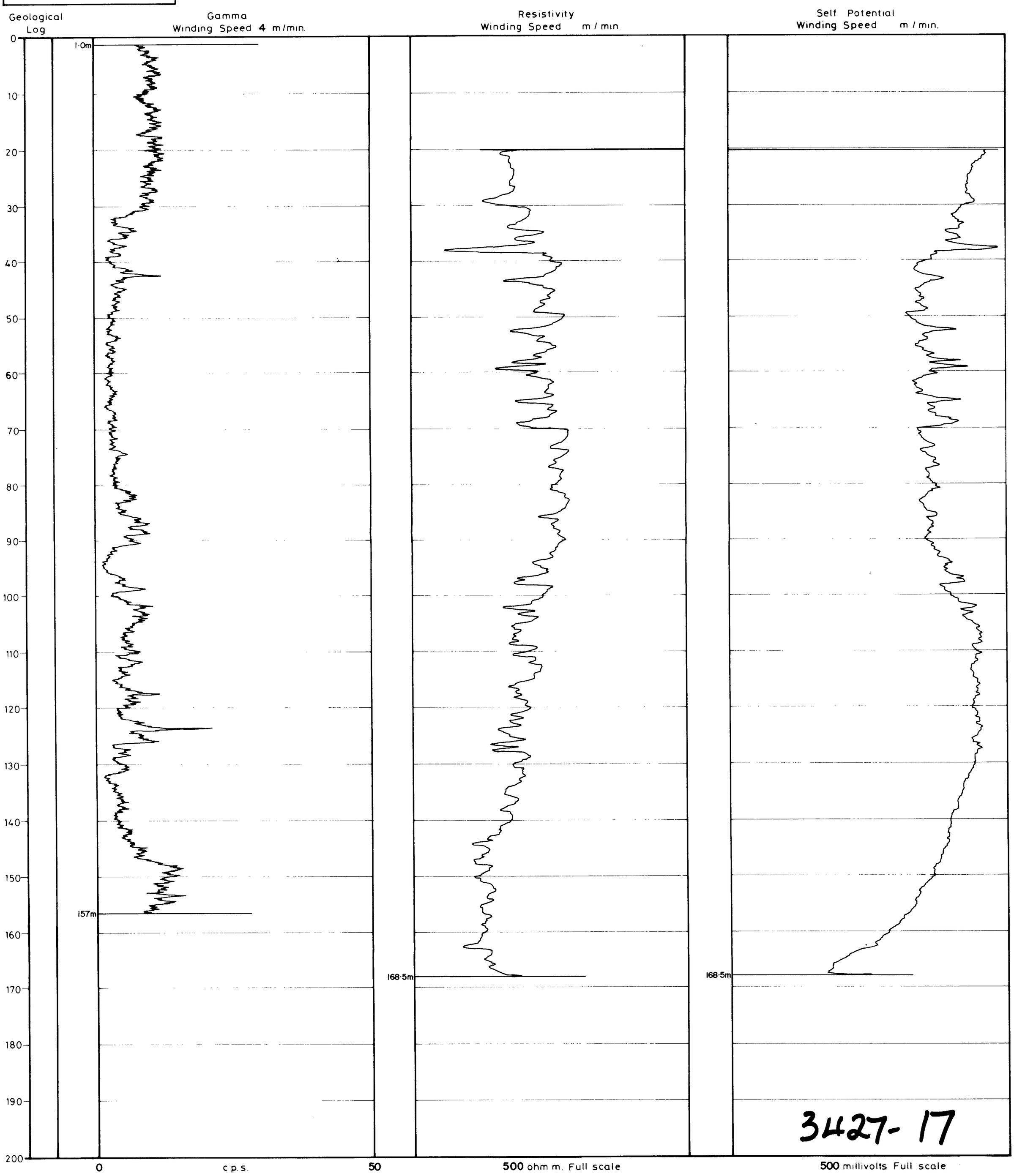
GEOPHYSICAL DOWN HOLE LOGS

WD 18

Revisions			
	Drawn D.G.P.	Date 9-9-81	Centre Adelaide
	Traced A.R.V.	Project No. 6-L110-13	Drawing No. A1-373
	Checked		

FIG. 6-6

DRILL HOLE: WD 19
LOCATION :
DRILL TYPE . Diamond
CASING TYPE: Steel
INCLINATION :
DEPTH DRILLED :
DEPTH LOGGED : Varies
LOGGING UNIT : SIE T450E
DATE : 19-8-81



3427-17

THE BROKEN HILL PROPRIETARY CO. LTD.
EXPLORATION DEPARTMENT

E.L.809 WIRREALPA, S.A.

GEOPHYSICAL DOWN HOLE LOGS
WD 19

Drawn: D.G.P.	Date: 10-9-81	Centre Adelaide
Traced: A.R.V.	Project No 6-L110-14	Drawing No A2-123
Checked:		

Revisions

EXPLORATION LICENCE 809

WIRREALPA, SOUTH AUSTRALIA

REPORT FOR THE QUARTER ENDED 2nd DECEMBER, 1981

CONTENTS

1. GENERAL

2. FIELD INVESTIGATIONS

2.1 Rock Chip (Channel) Sample Survey - Wirrealpa Diapir

3. RESULTS

3.1 Summary of Traverse Mineralization

4. FUTURE PROGRAMME

5. EXPENDITURE

APPENDICES

1. Analysis Results

2. Channel Sample Traverses - Total Metal Content Graphs

FIGURES

1. EL 809 Wirrealpa, S.A. Location Map A -

2. Geology AO-1763

EXPLORATION LICENCE 809

WIRREALPA, SOUTH AUSTRALIA

REPORT FOR THE QUARTER ENDED 2nd DECEMBER, 1981

1. GENERAL

Exploration Licence 809 of 1,080 square kilometres in the COPLEY and PARACHILNA 1:250,000 sheet areas, was granted to BHP Minerals Limited (formerly Dampier Mining Company Limited) for one year on the 2nd March, 1981 (see Figure 1), replacing EL 436.

2. FIELD INVESTIGATIONS

2.1 Rock Chip (channel) Sample Survey - WIRREALPA DIAPIR

General

Seventeen (17) traverses of channel sampling across the karsted Cambrian limestone surface on the western side of the Wirrealpa diapir were recently completed (see Figure 2).

The samples were collected continuously and bagged after one metre intervals.

Results are being used in conjunction with the previous drilling results to enable an overall assessment to be made of this prospect.

Analysis

All samples were sent to COMLABS in Adelaide where they were crushed, pulverized and split, dissolved by acid attack and analysed for copper, lead, zinc and silver by atomic absorption spectrophotometry.

All samples were initially assayed by COMLABS method AAS 1 (Range D.L. -1% Accuracy ± 5%) for copper, lead, zinc and subsequently re-analysed by method AAS 1A (Range 1% - Max. Accuracy ± 5%). The samples were separately analysed for silver using method AAS 3 (Range 1-250ppm, Accuracy ± 5%).

3. RESULTS

3.1 Summary of Traverse Mineralization

General

Analysis results are in Appendix 1. The total metal content (Pb + Zn) for each traverse was plotted on

cont./..

semi-log graph paper; the resultant graphs are in Appendix 2. The mineralized sections for each traverse are outlined below:

Traverse 1 CS0054 - CS0075

Total Length :	22 metres
Average Total Metal Contents :	515 ppm
This includes 3 metres av.	0.14%

Traverse 2 CS0038 - CS0053

Length :	16 metres
Av. Pb + Zn :	219 ppm

Traverse 3 CS0008 - CS0036

Length :	29 metres
Av. Pb + Zn :	1.23%
Includes :	2m av. 4.53% Pb + Zn
	5m av. 3.42% Pb + Zn
	1m of 3.6% Pb + Zn
	1m of 1.45% Cu

Traverse 4 CS0001 - CS0007

Length :	7 metres
Av. Pb + Zn :	208 ppm

Traverse 5 CS0076 - CS0095

Length :	20 metres
Av. Pb + Zn :	44 ppm

Traverse 6 CS0096 - CS0143

Length :	48 metres
Av. Pb + Zn :	65 ppm

Traverse 7 CS0144 - CS0174

Length :	31 metres
Av. Pb + Zn :	37 ppm

Traverse 8 CS0241 - CS0300

Length :	60 metres
Av. Pb & Zn :	20 ppm

cont./..

Traverse 9 CS0175 - CS0212

Length : 38 metres
Av. Pb + Zn : 0.67%
Including 1m at 1.10% Pb
4m at 3.6% Pb
1m at 9.7% Pb 14 ppm Ag.

Traverse 10 CS0213 - CS0240

Length : 28 metres
Av. Pb + Zn : 19 ppm

Traverse 11 CS0301 - CS0350

Length : 50 metres
Av. Pb + Zn : 35 ppm

Traverse 12 CS0351 - CS0359, CS0376 - CS0385

Length : 19 metres
Av. Pb + Zn : 13 ppm

Traverse 13 CS0464 - CS0495

Length : 32 metres
Av. Pb + Zn : 1.75%
Including 1m 6.75% Pb
1m 5.7% Pb
1m 1.25% Pb
7m av. 5.3% Pb
1m at 1.65% Pb

Traverse 14 CS0436 - CS0463

Length : 28 metres
Av. Pb + Zn : 8.43%
Including 6m at 18% Pb (3m at 37 ppm Ag)
10m at 12.5% Pb (3m at 26 ppm Ag)
1m at 3.05% Pb

Traverse 15 CS0411 - CS0435

Length : 25 metres
Av. Pb + Zn : 2.88%
Including 1m 1.13% Pb + Zn (0.58% Cu, 39 ppm Ag)
2m 8.2% Pb
5m 5.4% Pb
1m 2.85%
1m 2.5%
1m 1.9%

cont./..

Traverse 16	CS0386 - CS0410
Length :	25 metres
Av. Pb + Zn :	2.7%
Including	5m at 10.56% Pb
	1m at 4.3% Pb
	1m at 1.85% Pb
	1m at 5.2% Pb
Traverse 17	CS0496 - Cs0521
Length :	26 metres
Av. Pb + Zn :	1.6%
Including	12m at 3.36% Pb

4. FUTURE PROGRAMME

A further four traverses of channel sampling are presently being collected; results will be given in the next quarterly report.

5. EXPENDITURE

Expenditure debited to EL 809 during September, October and November, 1981, was:

Wages and Salaries	$ 8,142
Messing and Accommodation	1,935
Fares and Mobilisation	69
Drilling	9,500
Transport	998
Surveying/Aerial Photographs	273
Sample Analysis	4,304
Geophysics/Geochemistry	1,152
Mobilisation of Equipment	10
Administration/Overheads	1,319
	$ 27,702

Total expenditure to 30th November, 1981, is $358,163

This report is submitted to the Department of Mines and Energy as required by Condition 4 of Exploration Licence 809.

APPENDIX 1

ANALYSIS RESULTS

COMLABS Pty. Ltd.
COMPUTERISED ANALYTICAL LABORATORIES

NATA REGISTERED No. 1526

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

Queensland Preparation Laboratory
172 LAVARACK AVE.,
EAGLE FARM,
QUEENSLAND. 4007
TEL.: (07) 268 4748

OUR REF.: COM 811627

YOUR REF.: Project No L110
Sheet No 001836

Mr. M. Roche,
BHP Exploration,
P.O. Box 21,
WHYALLA. S.A. 5600.

30.10.81

Dear Mick,

RE: JOB COM 811627

Enclosed are the assays for the samples delivered to our laboratory on the 6th October, 1981.

Yours sincerely,

Harry Fishman
Managing Director

2 copies

COMLABS Pty Ltd
COMPUTERISED ANALYTICAL LABORATORIES

ANALYTICAL REPORT

JOB COM811627 O/N : L110

Results in ppm

SAMPLE	Cu	Pb	Zn	Ag
CS0001	22	12	16	<1
CS0002	34	16	40	<1
CS0003	40	100	160	<1
CS0004	42	135	210	1
CS0005	34	130	165	<1
CS0006	14	70	80	<1
CS0007	16	210	105	<1
CS0008	125	1450	470	<1
CS0009	30	220	90	<1
CS0010	38	550	210	<1
CS0011	85	1350	4700	<1
CS0012	24	890	200	<1
CS0013	180	1.25%	420	4
CS0014	110	7.80%	190	22
CS0015	510	5800	280	2
CS0016	1.45%	1550	510	6
CS0017	850	1000	400	<1
CS0018	1900	8000	710	2
CS0019	8500	5300	1000	3
CS0020	2700	3.10%	410	7
CS0021	300	4.80%	135	10
CS0022	210	1.75%	140	5
CS0023	50	3.40%	340	7
CS0024	40	3.60%	290	9
CS0025	12	9500	70	2

.../ 2

COMLABS Pty Ltd
COMPUTERISED ANALYTICAL LABORATORIES

ANALYTICAL REPORT

JOB COM811627 O/N : L110

Results in ppm

SAMPLE	Cu	Pb	Zn	Ag
CS0026	14	5100	135	1
CS0027	38	8000	270	2
CS0028	18	1000	220	<1
CS0029	30	1300	310	<1
CS0030	55	3.60%	150	11
CS0031	14	440	200	<1
CS0032	16	300	180	<1
CS0033	8	6100	115	1
CS0034	8	165	110	<1
CS0035	10	210	710	<1
CS0036	8	4300	360	<1
CS0037	Listed not Received			
CS0038	60	400	400	<1
CS0039	28	60	240	<1
CS0040	20	32	38	<1
CS0041	30	40	34	<1
CS0042	14	135	65	<1
CS0043	16	26	24	<1
CS0044	12	44	22	<1
CS0045	22	65	60	<1
CS0046	42	24	80	<1
CS0047	85	24	100	<1
CS0048	55	70	100	<1
CS0049	42	22	220	<1
CS0050	18	20	210	<1

.../ 3

COMLABS Pty Ltd
COMPUTERISED ANALYTICAL LABORATORIES

ANALYTICAL REPORT

JOB COM811627 O/N : L110

Results in ppm

SAMPLE	Cu	Pb	Zn	Ag
CS0051	135	50	680	<1
CS0052	24	40	80	<1
CS0053	8	20	80	<1

Method of Analysis : Cu Pb Zn : AAS1/1A
Ag : AAS3

COMLABS Pty. Ltd.

COMPUTERISED ANALYTICAL LABORATORIES

NATA REGISTERED No. 1526

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

Queensland Preparation Laboratory
172 LAVARACK AVE.,
EAGLE FARM,
QUEENSLAND. 4007
TEL.: (07) 268 4748

OUR REF.: COM 811708

YOUR REF.: L110

Sheet No 001837

Mr. M Roche,
BHP Exploration,
P.O. Box 21,
WHYALLA. S.A. 5600.

3.11.81

Dear Mick,

RE: JOB COM 811708

Enclosed are the assays for the samples delivered to our laboratory on the 14th October, 1981.

Yours sincerely,

Harry Fishman
Managing Director

2 copies

COMLABS Pty Ltd
COMPUTERISED ANALYTICAL LABORATORIES

ANALYTICAL REPORT

JOB CON811708 O/N : L110

Results in ppm

SAMPLE	Cu	Pb	Zn	Ag
CS0054	125	75	48	<1
CS0055	36	60	14	<1
CS0056	34	85	24	<1
CS0057	40	155	32	<1
CS0058	120	190	55	<1
CS0059	80	730	36	<1
CS0060	46	190	34	<1
CS0061	420	520	95	<1
CS0062	75	280	50	<1
CS0063	65	250	42	<1
CS0064	85	400	60	<1
CS0065	95	450	50	<1
CS0066	250	870	75	<1
CS0067	410	1500	140	<1
CS0068	260	1150	105	<1
CS0069	240	1050	165	<1
CS0070	125	420	145	<1
CS0071	65	400	100	<1
CS0072	28	220	65	<1
CS0073	44	330	80	<1
CS0074	16	270	95	<1
CS0075	50	170	55	<1
CS0076	14	14	22	<1
CS0077	16	20	22	<1
CS0078	6	16	18	<1

.../ 2

COMLABS Pty Ltd
COMPUTERISED ANALYTICAL LABORATORIES

ANALYTICAL REPORT

JOB COM811708 O/N : L110

Results in ppm

SAMPLE	Cu	Pb	Zn	Ag
CS0079	6	<4	16	<1
CS0080	8	<4	20	<1
CS0081	4	6	18	<1
CS0082	6	8	20	<1
CS0083	4	<4	18	<1
CS0084	32	16	50	<1
CS0085	6	<4	14	<1
CS0086	8	6	22	<1
CS0087	8	8	20	<1
CS0088	8	<4	22	<1
CS0089	4	<4	44	<1
CS0090	16	22	34	<1
CS0091	6	6	40	<1
CS0092	10	6	90	<1
CS0093	6	4	48	<1
CS0094	175	16	48	<1
CS0095	14	6	110	<1
CS0096	24	8	16	<1
CS0097	16	6	14	<1
CS0098	12	8	18	<1
CS0099	40	10	32	<1
CS0100	10	<4	28	<1
CS0101	10	<4	20	<1
CS0102	14	10	24	<1
CS0103	10	6	30	<1

.../ 3

COMLABS Pty Ltd
COMPUTERISED ANALYTICAL LABORATORIES

ANALYTICAL REPORT

JOB CON811708 O/N : L110

Results in ppm

SAMPLE	Cu	Pb	Zn	Ag
CS0104	14	16	24	<1
CS0105	10	6	14	<1
CS0106	12	6	16	<1
CS0107	14	6	24	<1
CS0108	10	10	24	<1
CS0109	24	14	30	<1
CS0110	24	10	34	<1
CS0111	18	10	44	<1
CS0112	14	8	32	<1
CS0113	14	8	30	<1
CS0114	22	20	46	<1
CS0115	14	16	20	<1
CS0116	30	22	44	<1
CS0117	20	30	38	<1
CS0118	16	16	100	<1
CS0119	12	18	34	<1
CS0120	12	14	55	<1
CS0121	24	16	60	<1
CS0122	36	26	48	<1
CS0123	55	50	48	<1
CS0124	32	28	40	<1
CS0125	26	24	65	<1
CS0126	40	32	160	<1
CS0127	24	18	70	<1
CS0128	80	75	135	<1

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COMLABS Pty Ltd
COMPUTERISED ANALYTICAL LABORATORIES

ANALYTICAL REPORT

JOB COM811708 O/N : L110

Results in ppm

SAMPLE	Cu	Pb	Zn	Ag
CS0129	46	65	75	<1
CS0130	28	24	185	<1
CS0131	18	8	70	<1
CS0132	18	18	55	<1
CS0133	16	8	28	<1
CS0134	30	12	50	<1
CS0135	42	30	40	<1
CS0136	32	14	26	<1
CS0137	26	18	32	<1
CS0138	34	16	170	<1
CS0139	85	10	24	<1
CS0140	44	18	55	<1
CS0141	22	12	34	<1
CS0142	20	8	34	<1
CS0143	40	12	20	<1
CS0144	20	4	14	<1
CS0145	8	6	14	<1
CS0146	10	6	14	<1
CS0147	14	<4	16	<1
CS0148	42	<4	26	<1
CS0149	80	14	36	<1
CS0150	135	32	65	<1
CS0151	85	10	36	<1
CS0152	46	6	20	<1
CS0153	16	<4	14	<1

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COMLABS Pty Ltd
COMPUTERISED ANALYTICAL LABORATORIES

ANALYTICAL REPORT

JOB COM811708 O/N : L110

Results in ppm

SAMPLE	Cu	Pb	Zn	Ag
CS0154	30	<4	14	<1
CS0155	42	<4	20	<1
CS0156	32	<4	18	<1
CS0157	50	<4	26	<1
CS0158	32	<4	24	<1
CS0159	14	<4	22	<1
CS0160	50	6	28	<1
CS0161	30	<4	24	<1
CS0162	50	12	36	<1
CS0163	24	<4	32	<1
CS0164	22	<4	30	<1
CS0165	28	8	26	<1
CS0166	32	16	28	<1
CS0167	34	8	36	<1
CS0168	34	8	20	<1
CS0169	22	12	28	<1
CS0170	20	6	22	<1
CS0171	46	8	14	<1
CS0172	40	16	16	<1
CS0173	22	18	20	<1
CS0174	26	130	42	<1
CS0175	210	4	12	<1
CS0176	160	6	10	<1
CS0177	12	8	14	<1
CS0178	14	4	10	<1

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COMLABS Pty Ltd
COMPUTERISED ANALYTICAL LABORATORIES

ANALYTICAL REPORT

JOB COM811708 O/N : L110

Results in ppm

SAMPLE	Cu	Pb	Zn	Ag
CS0179	12	8	12	<1
CS0180	46	10	18	<1
CS0181	12	4	14	<1
CS0182	55	280	18	<1
CS0183	60	250	24	<1
CS0184	50	100	18	<1
CS0185	90	490	20	<1
CS0186	24	1300	14	<1
CS0187	20	490	10	<1
CS0188	24	300	18	<1
CS0189	24	46	12	<1
CS0190	16	30	8	<1
CS0191	145	230	10	<1
CS0192	20	100	12	<1
CS0193	26	22	18	<1
CS0194	60	70	24	<1
CS0195	30	36	20	<1
CS0196	40	32	12	<1
CS0197	70	175	12	<1
CS0198	20	32	8	<1
CS0199	18	36	10	<1
CS0200	75	90	12	<1
CS0201	18	30	10	<1
CS0202	16	380	14	<1
CS0203	80	1.10%	36	1

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COMLABS Pty Ltd
COMPUTERISED ANALYTICAL LABORATORIES

ANALYTICAL REPORT

JOB COM811708 O/N : L110

Results in ppm

SAMPLE	Cu	Pb	Zn	Ag
CS0204	38	590	12	<1
CS0205	26	5.00%	6	7
CS0206	20	1.90%	10	3
CS0207	16	4.00%	16	6
CS0208	24	3.50%	6	6
CS0209	75	1450	14	<1
CS0210	10	185	6	<1
CS0211	18	5600	8	<1
CS0212	44	9.70%	10	14
CS0213	8	70	6	<1
CS0214	10	26	4	<1
CS0215	10	16	8	<1
CS0216	10	10	6	<1
CS0217	8	8	4	<1
CS0218	10	10	8	<1
CS0219	8	10	14	<1
CS0220	16	12	10	<1
CS0221	18	6	6	<1
CS0222	18	8	8	<1
CS0223	16	6	8	<1
CS0224	12	8	8	<1
CS0225	14	6	8	<1
CS0226	18	8	8	<1
CS0227	36	4	6	<1
CS0228	24	4	8	<1

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COMLABS Pty Ltd
COMPUTERISED ANALYTICAL LABORATORIES

ANALYTICAL REPORT

JOB COM811708 O/N : L110

Results in ppm

SAMPLE	Cu	Pb	Zn	Ag
CS0229	18	6	8	<1
CS0230	24	6	12	<1
CS0231	30	6	10	<1
CS0232	18	4	12	<1
CS0233	28	6	10	<1
CS0234	18	8	10	<1
CS0235	18	8	10	<1
CS0236	12	8	8	<1
CS0237	8	8	8	<1
CS0238	8	8	10	<1
CS0239	8	8	10	<1
CS0240	8	12	12	<1
CS0241	36	8	30	<1
CS0242	14	4	26	<1
CS0243	16	12	26	<1
CS0244	16	4	16	<1
CS0245	28	8	14	<1
CS0246	22	4	10	<1
CS0247	8	4	8	<1
CS0248	8	4	8	<1
CS0249	16	4	12	<1
CS0250	10	4	14	10
CS0251	34	8	18	<1
CS0252	14	4	20	<1
CS0253	10	4	12	<1

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COMLABS Pty Ltd
COMPUTERISED ANALYTICAL LABORATORIES

ANALYTICAL REPORT

JOB COM811708 O/N : L110

Results in ppm

SAMPLE	Cu	Pb	Zn	Ag
CS0254	18	4	34	<1
CS0255	14	4	34	<1
CS0256	34	8	18	<1
CS0257	8	4	12	<1
CS0258	14	4	12	<1
CS0259	50	12	18	<1
CS0260	18	8	18	<1
CS0261	16	8	20	<1
CS0262	22	8	16	<1
CS0263	24	8	10	<1
CS0264	42	8	16	<1
CS0265	8	<4	10	<1
CS0266	8	<4	10	<1
CS0267	8	<4	10	<1
CS0268	6	<4	12	<1
CS0269	12	<4	10	<1
CS0270	12	<4	12	<1
CS0271	4	<4	10	<1
CS0272	4	<4	10	<1
CS0273	10	<4	10	<1
CS0274	10	4	8	<1
CS0275	14	4	12	<1
CS0276	12	4	10	<1
CS0277	18	16	26	<1
CS0278	12	<4	10	<1

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COMLABS Pty Ltd
COMPUTERISED ANALYTICAL LABORATORIES

ANALYTICAL REPORT

JOB COM811708 O/N : L110

Results in ppm

SAMPLE	Cu	Pb	Zn	Ag
CS0279	12	<4	8	<1
CS0280	16	<4	10	<1
CS0281	46	4	18	<1
CS0282	22	<4	12	<1
CS0283	14	8	14	<1
CS0284	14	8	12	<1
CS0285	12	8	12	<1
CS0286	10	8	10	<1
CS0287	8	8	12	<1
CS0288	10	8	12	<1
CS0289	12	8	14	<1
CS0290	10	8	10	<1
CS0291	8	8	14	<1
CS0292	10	8	10	<1
CS0293	8	8	10	<1
CS0294	8	4	10	<1
CS0295	4	12	10	<1
CS0296	14	<4	10	<1
CS0297	14	4	10	<1
CS0298	14	8	12	<1
CS0299	26	4	10	<1
CS0300	14	4	8	<1
CS0301	4	<4	38	<1
CS0302	4	<4	8	<1
CS0303	6	<4	8	<1

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COMLABS Pty Ltd
COMPUTERISED ANALYTICAL LABORATORIES

ANALYTICAL REPORT

JOB COM811708 O/N : L110

Results in ppm

SAMPLE	Cu	Pb	Zn	Ag
CS0304	8	<4	10	<1
CS0305	22	<4	14	<1
CS0306	110	12	20	<1
CS0307	12	8	16	<1
CS0308	20	8	12	<1
CS0309	20	4	10	<1
CS0310	30	8	12	<1
CS0311	165	8	16	<1
CS0312	24	8	32	<1
CS0313	12	16	22	<1
CS0314	65	48	50	<1
CS0315	14	44	24	<1
CS0316	8	20	20	<1
CS0317	8	12	18	<1
CS0318	4	16	20	<1
CS0319	4	4	14	<1
CS0320	10	85	55	<1
CS0321	6	75	34	<1
CS0322	8	32	38	<1
CS0323	8	28	34	<1
CS0324	12	32	42	<1
CS0325	12	14	22	<1
CS0326	10	24	20	<1
CS0327	12	18	44	<1
CS0328	22	24	26	<1

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COMLABS Pty Ltd
COMPUTERISED ANALYTICAL LABORATORIES

ANALYTICAL REPORT

JOB COM811708 O/N : L110

Results in ppm

SAMPLE	Cu	Pb	Zn	Ag
CS0329	12	14	14	<1
CS0330	10	4	12	<1
CS0331	10	8	14	<1
CS0332	8	10	14	<1
CS0333	12	16	22	<1
CS0334	8	40	16	<1
CS0335	6	10	12	<1
CS0336	8	8	12	<1
CS0337	6	12	14	<1
CS0338	8	18	18	<1
CS0339	6	8	10	<1
CS0340	6	8	12	<1
CS0341	4	6	10	<1
CS0342	4	10	10	<1
CS0343	4	10	10	<1
CS0344	4	6	8	<1
CS0345	4	<4	8	<1
CS0346	4	6	10	<1
CS0347	4	16	12	<1
CS0348	4	24	14	<1
CS0349	6	12	12	<1
CS0350	4	16	10	<1
CS0351	32	4	10	<1
CS0352	8	<4	12	<1
CS0353	6	<4	8	<1

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COMLABS Pty Ltd
COMPUTERISED ANALYTICAL LABORATORIES

ANALYTICAL REPORT

JOB COM811708 O/N : L110

Results in ppm

SAMPLE	Cu	Pb	Zn	Ag
CS0354	6	<4	8	<1
CS0355	2	<4	8	<1
CS0356	2	<4	8	<1
CS0357	4	<4	8	<1
CS0358	28	4	8	<1
CS0359	2	<4	8	<1
CS0376	2	<4	8	<1
CS0377	2	4	8	<1
CS0378	4	<4	10	<1
CS0379	2	<4	8	<1
CS0380	4	4	8	<1
CS0381	2	<4	10	<1
CS0382	<2	<4	10	<1
CS0383	6	4	14	<1
CS0384	2	<4	8	<1
CS0385	2	<4	8	<1

Method of Analysis : Cu Pb Zn : AAS1/1A
Ag : AAS3

COMLABS Pty. Ltd.
COMPUTERISED ANALYTICAL LABORATORIES

NATA REGISTERED No. 1526

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

Queensland Preparation Laboratory
172 LAVARACK AVE.,
EAGLE FARM,
QUEENSLAND. 4007
TEL.: (07) 268 4748

OUR REF.: COM 811808

YOUR REF.: Project No. L 110
Sheet No. 001838

Mr. M. Roche,
B.H.P. Exploration Pty Ltd.,
P.O. Box 21,
WHYALLA. S.A. 5600.

11.11.81

Dear Mick,

RE: JOB COM 811808

Enclosed are the assays for the samples delivered to our laboratory on the 28th October, 1981.

Yours sincerely,

Harry Fishman
Managing Director

c.c: 2 Copies

COMLABS Pty Ltd
COMPUTERISED ANALYTICAL LABORATORIES

ANALYTICAL REPORT

JOB COM811808 O/N : L 110

Results in ppm

SAMPLE	Cu	Pb	Zn	Ag
CS0386	12	110	330	<1
CS0387	12	1950	160	1
CS0388	10	9.00%	100	4
CS0389	10	17.8%	85	4
CS0390	8	16.3%	65	5
CS0391	6	5.10%	38	2
CS0392	8	4.60%	40	2
CS0393	6	950	16	<1
CS0394	18	960	85	<1
CS0395	10	1400	24	<1
CS0396	8	310	28	<1
CS0397	8	790	65	<1
CS0398	6	1450	165	<1
CS0399	12	1350	55	<1
CS0400	6	770	36	<1
CS0401	6	6100	36	1
CS0402	6	4.30%	330	3
CS0403	4	7200	28	1
CS0404	6	1050	60	<1
CS0405	4	1.85%	70	<1
CS0406	8	270	195	<1
CS0407	4	910	60	<1
CS0408	4	220	46	<1
CS0409	4	4600	125	<1
CS0410	6	5.20%	2500	<1

.../ 2

COMLABS Pty Ltd
COMPUTERISED ANALYTICAL LABORATORIES

ANALYTICAL REPORT

JOB COM811808 O/N : L 110

Results in ppm

SAMPLE	Cu	Pb	Zn	Ag
CS0411	6	670	40	<1
CS0412	18	3500	80	<1
CS0413	6	720	32	<1
CS0414	8	4800	36	<1
CS0415	14	5.10%	90	<1
CS0416	10	4.95%	30	2
CS0417	16	8.55%	95	4
CS0418	5800	2700	8600	39
CS0419	12	1350	36	1
CS0420	30	7.20%	38	1
CS0421	42	9.20%	30	1
CS0422	6	2000	20	<1
CS0423	12	2.40%	28	<1
CS0424	34	8.15%	44	<1
CS0425	36	11.4%	44	<1
CS0426	12	2.90%	26	1
CS0427	34	2.20%	30	1
CS0428	20	550	28	<1
CS0429	10	830	30	<1
CS0430	14	2.85%	16	<1
CS0431	10	330	12	<1
CS0432	14	2.5%	14	<1
CS0433	12	120	10	<1
CS0434	8	140	18	<1
CS0435	145	1.90%	22	2

.../ 3

COMLABS Pty Ltd
COMPUTERISED ANALYTICAL LABORATORIES

ANALYTICAL REPORT

JOB COM811808 O/N : L 110

Results in ppm

SAMPLE	Cu	Pb	Zn	Ag
CS0436	10	4.20%	24	3
CS0437	6	34.1%	14	36
CS0438	8	5000	26	<1
CS0439	6	36.1%	16	48
CS0440	14	27.1%	24	32
CS0441	6	5.40%	36	7
CS0442	6	350	16	<1
CS0443	8	2.85%	32	4
CS0444	10	9.40%	18	17
CS0445	10	5.85%	18	10
CS0446	8	14.3%	24	12
CS0447	12	2.90%	22	3
CS0448	16	10.8%	40	9
CS0449	12	5.00%	28	3
CS0450	22	19.3%	55	20
CS0451	30	26.7%	60	26
CS0452	38	27.4%	65	33
CS0453	14	3300	26	<1
CS0454	10	780	36	<1
CS0455	8	490	32	<1
CS0456	8	165	16	<1
CS0457	8	310	22	<1
CS0458	16	3.05%	42	2
CS0459	10	4400	34	<1
CS0460	12	280	32	<1

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COMLABS Pty Ltd
COMPUTERISED ANALYTICAL LABORATORIES

ANALYTICAL REPORT

JOB CON811808 O/N : L 110

Results in ppm

SAMPLE	Cu	Pb	Zn	Ag
CS0461	6	120	30	<1
CS0462	14	340	55	<1
CS0463	12	470	50	<1
CS0464	6	6.75%	22	4
CS0465	4	280	14	<1
CS0466	4	880	20	<1
CS0467	6	5.70%	18	5
CS0468	4	2200	24	<1
CS0469	4	1.25%	32	<1
CS0470	4	1050	32	<1
CS0471	4	6500	26	<1
CS0472	6	2500	42	<1
CS0473	10	6.80%	34	3
CS0474	12	11.4%	32	5
CS0475	10	4.05%	24	2
CS0476	16	8.60%	24	4
CS0477	16	4.30%	38	2
CS0478	12	5800	75	<1
CS0479	10	1.60%	26	<1
CS0480	8	2400	28	<1
CS0481	8	4300	30	<1
CS0482	16	1.65%	42	<1
CS0483	14	7300	22	<1
CS0484	32	960	22	<1
CS0485	55	330	28	<1

.../ 5

COMLABS Pty Ltd
COMPUTERISED ANALYTICAL LABORATORIES

ANALYTICAL REPORT

JOB COM811808 O/N : L 110

Results in ppm

SAMPLE	Cu	Pb	Zn	Ag
CS0486	10	160	18	<1
CS0487	8	195	26	<1
CS0488	20	1650	70	<1
CS0489	6	60	16	<1
CS0490	10	80	30	<1
CS0491	6	190	44	<1
CS0492	6	38	18	<1
CS0493	4	44	18	<1
CS0494	10	160	18	<1
CS0495	22	360	22	<1
CS0496	6	390	65	<1
CS0497	4	240	18	<1
CS0498	6	48	14	<1
CS0499	4	95	18	<1
CS0500	4	130	22	<1
CS0501	4	85	24	<1
CS0502	4	1550	36	<1
CS0503	6	85	24	<1
CS0504	4	85	26	<1
CS0505	4	130	80	<1
CS0506	8	610	90	<1
CS0507	2	320	100	<1
CS0508	<2	810	320	<1
CS0509	2	7000	460	<1
CS0510	2	1.41%	160	<1

.../ 6

COMLABS Pty Ltd
COMPUTERISED ANALYTICAL LABORATORIES

ANALYTICAL REPORT

JOB COM811808 O/N : L 110

Results in ppm

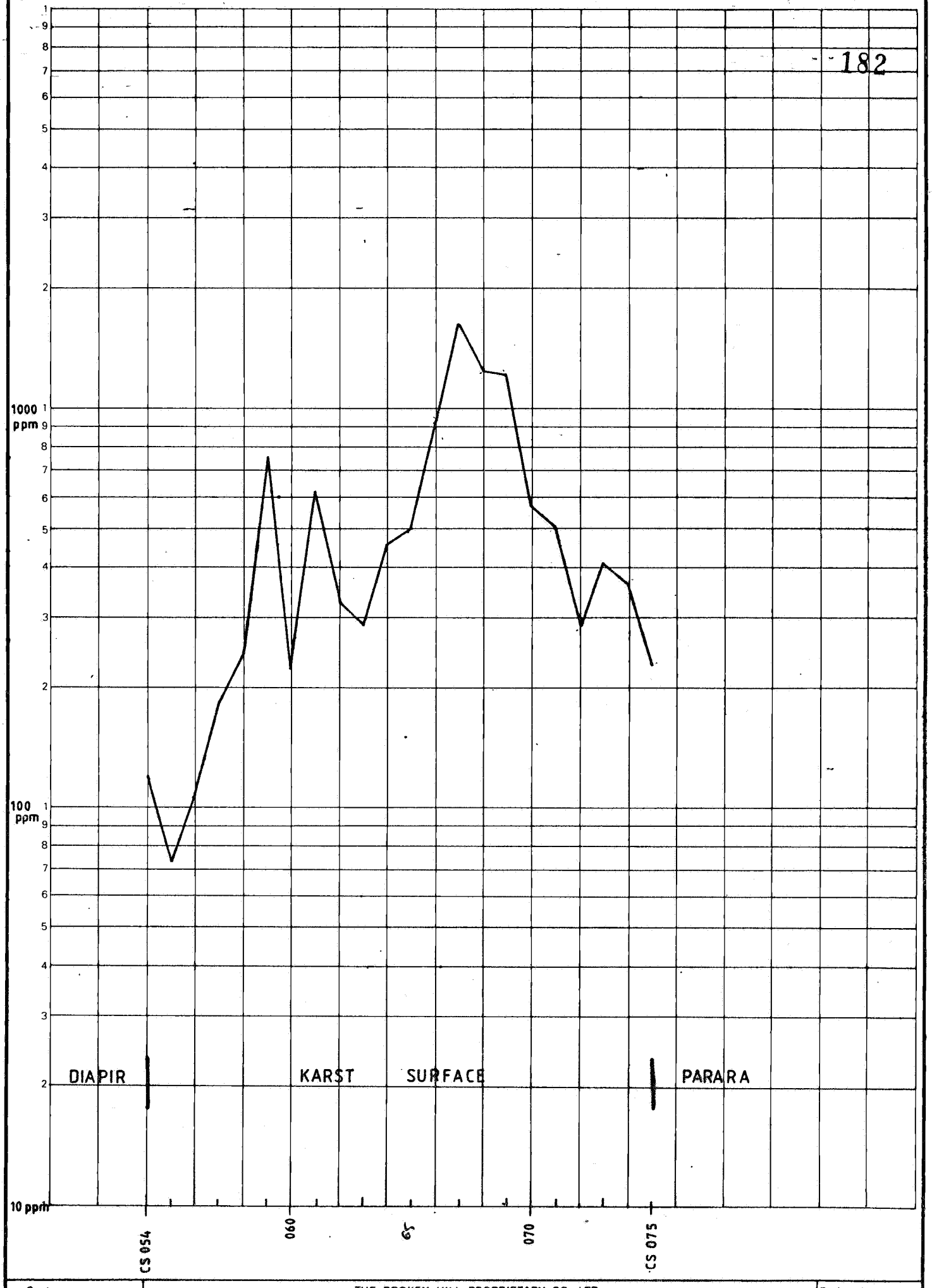
SAMPLE	Cu	Pb	Zn	Ag
CS0511	4	1.80%	70	<1
CS0512	6	11.9%	135	<1
CS0513	4	6.20%	90	<1
CS0514	6	7700	60	<1
CS0515	4	1.56%	300	<1
CS0516	2	1.32%	350	<1
CS0517	<2	4.20%	135	<1
CS0518	4	5700	460	<1
CS0519	4	3.45%	200	<1
CS0520	2	3.15%	160	<1
CS0521	2	3.95%	240	<1

Method of Analysis : Cu Pb Zn : AAS1/1A
Ag : AAS3

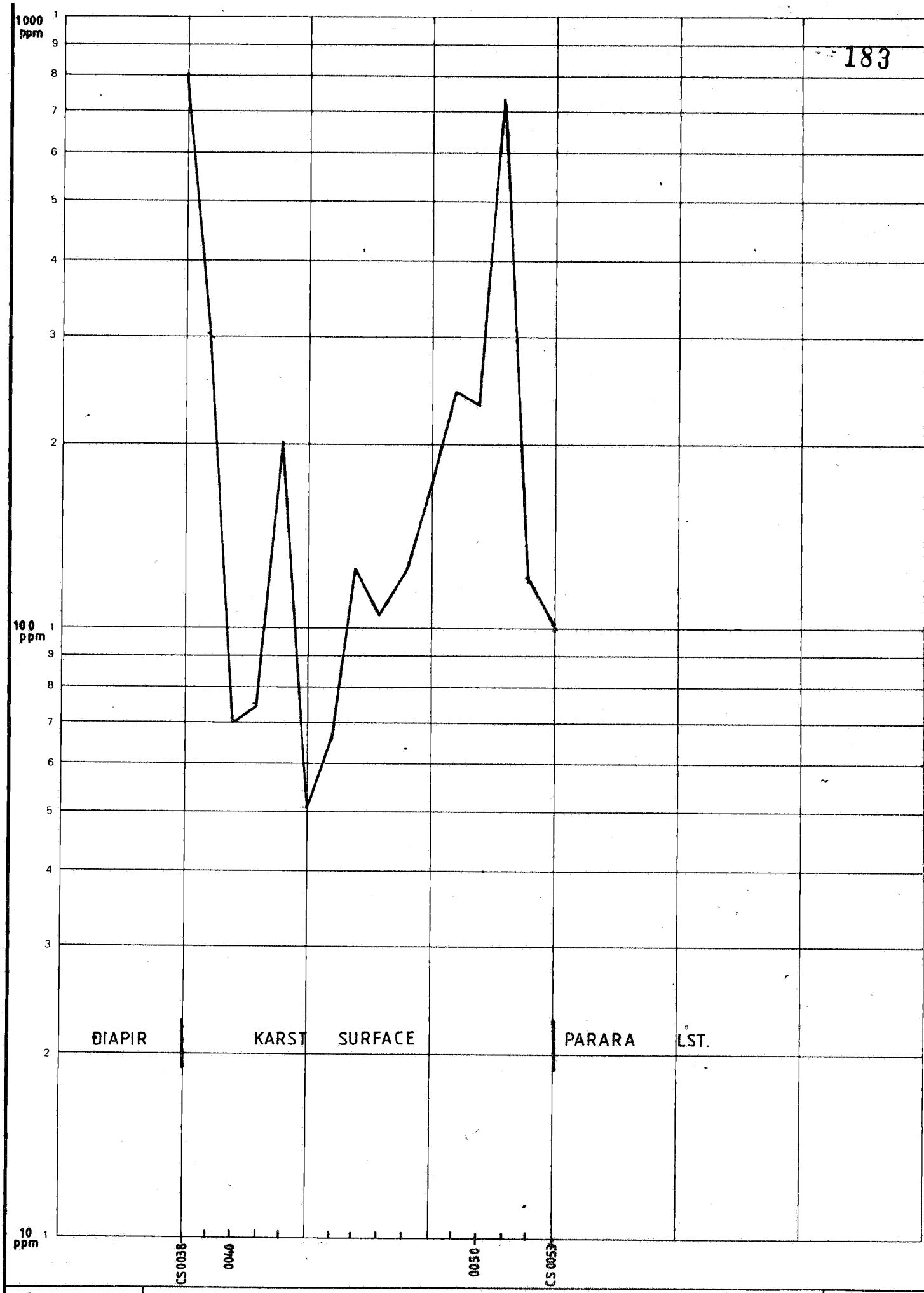
APPENDIX 2

CHANNEL SAMPLE TRAVERSES

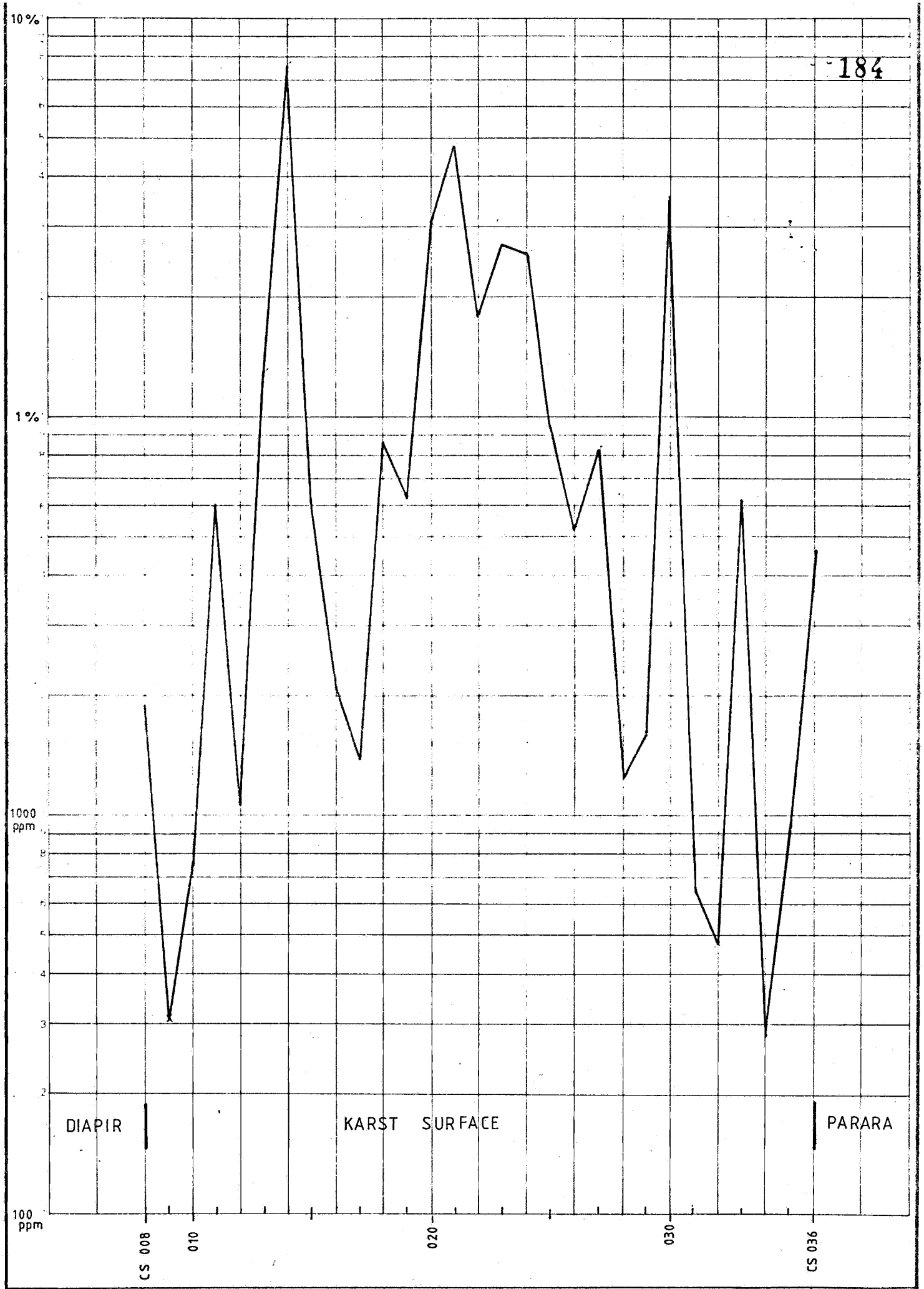
TOTAL METAL CONTENT GRAPHS



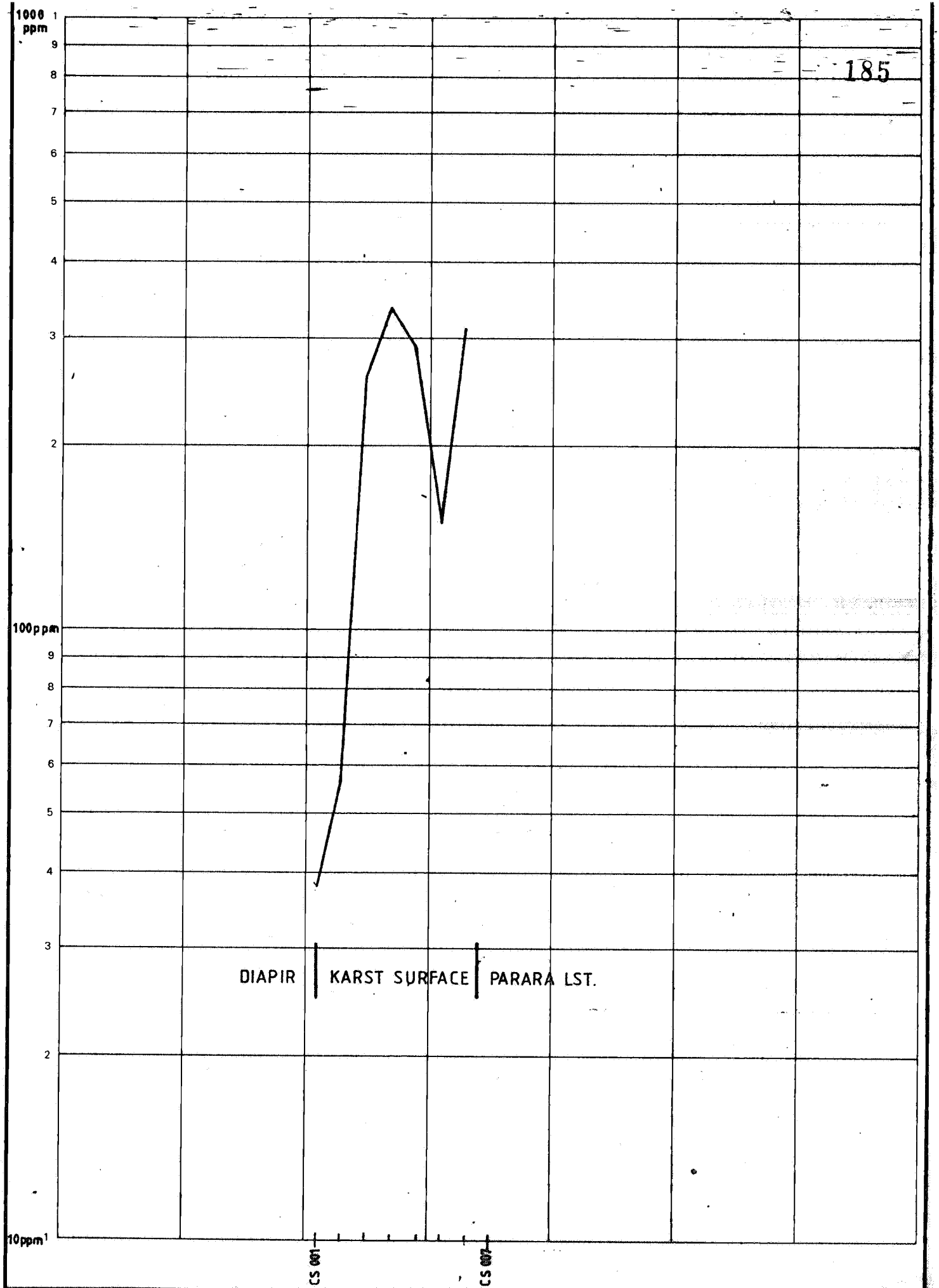
Centre: Whyalla	THE BROKEN HILL PROPRIETARY CO. LTD.	Project No.
Date: Dec '81	E.L. 809 WIRREALPA DIAPIR CHANNEL SAMPLE TRAVERSES Traverse No. 1 Sample Nos. CS 054 – CS 075 Total Metal Content (Pb + Zn)	Drawing No. A4-365



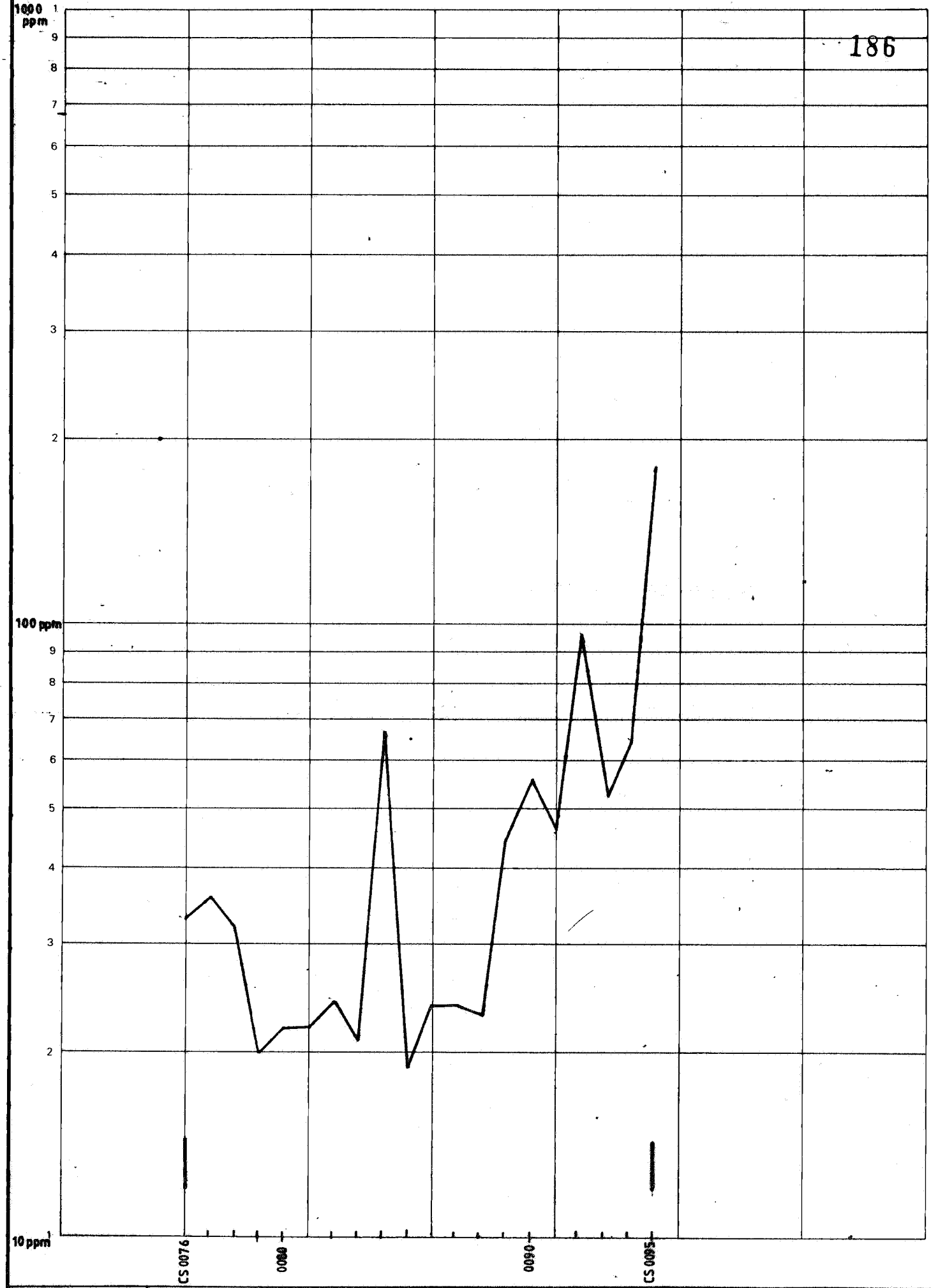
Centre: Whyalla	THE BROKEN HILL PROPRIETARY CO. LTD.	Project No.
Date: Dec. '81	E.L. 809 WIRREALPA DIAPIR CHANNEL SAMPLE TRAVERSES Traverse No. 2 Sample Nos. CS 0038 - CS 0053 Total Metal Content (Pb + Zn)	Drawing No. A4-366



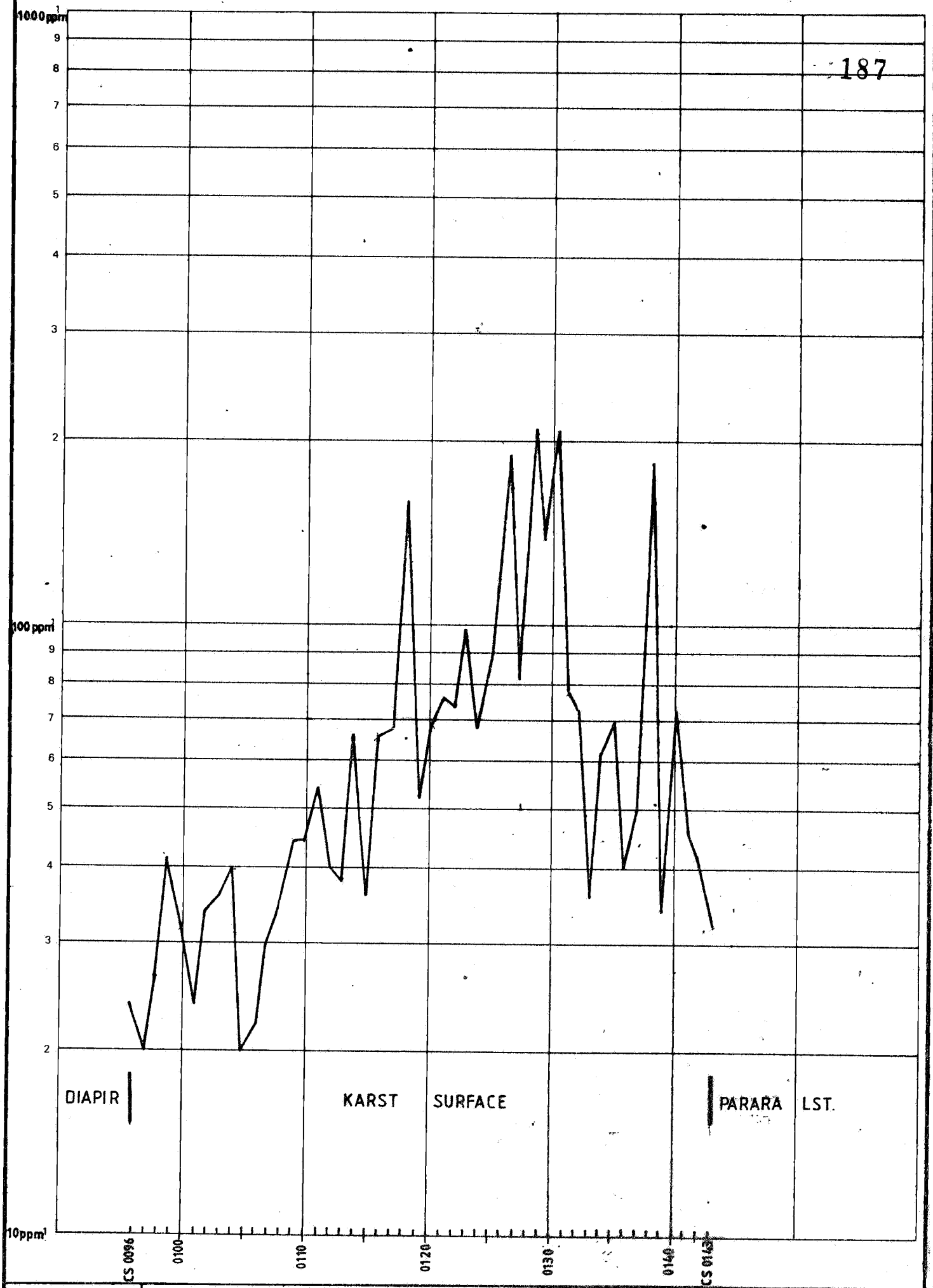
Centre: Whyalla	THE BROKEN HILL PROPRIETARY CO. LTD.	Project No.
Date: Dec. '81	E.L. 809 WIRREALPA DIAPIR CHANNEL SAMPLE TRAVERSES Traverse No. 3 Sample Nos. CS 008 – CS 036 Total Metal Content (Pb+Zn)	Drawing No. A4-367



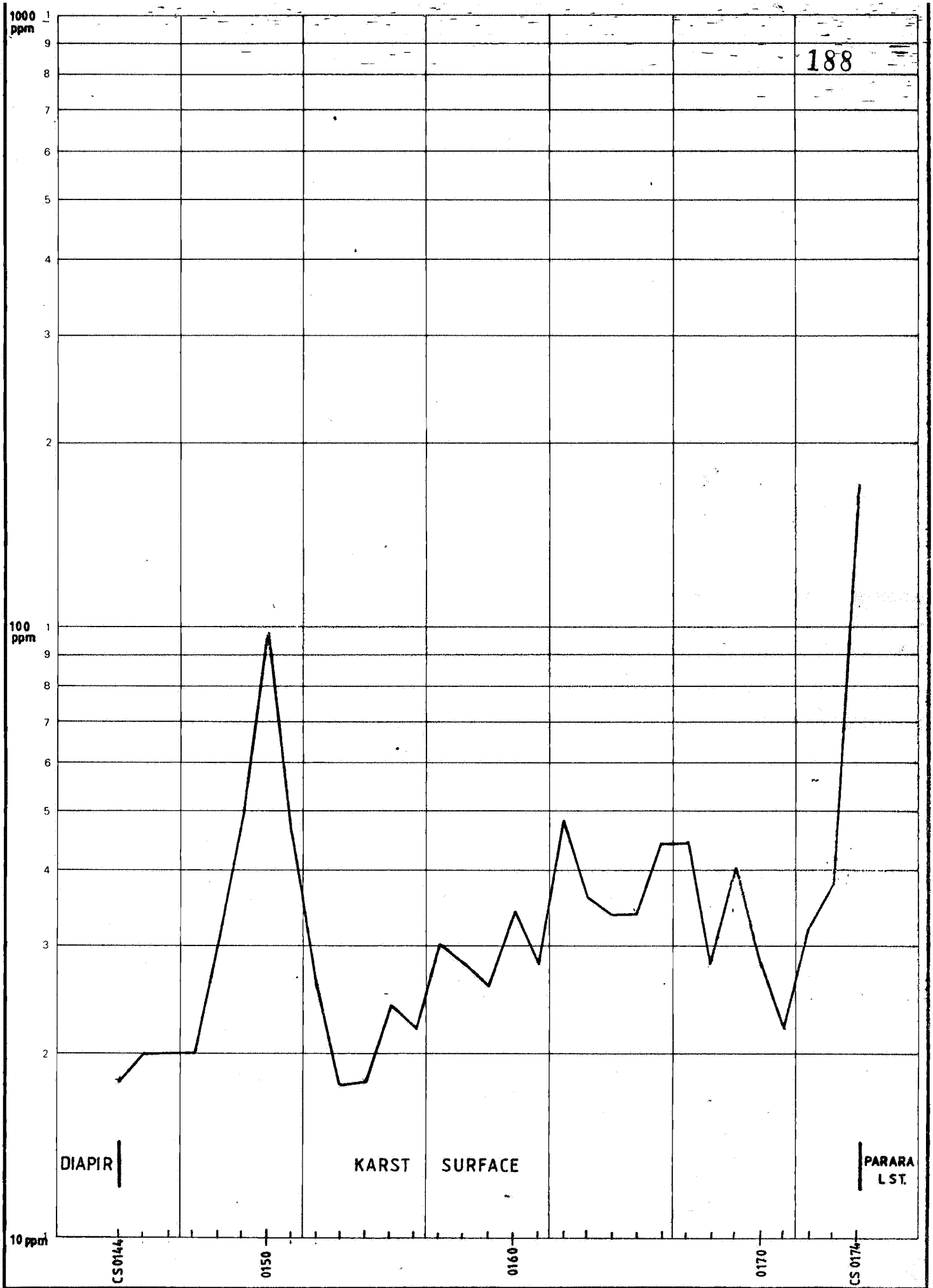
Centre: Whyalla	THE BROKEN HILL PROPRIETARY CO. LTD.	Project No.
Date: Dec. '81	E.L. 809, WIRREALPA DIAPIR, CHANNEL SAMPLE TRAVERSES Traverse No. 4 Sample Nos. CS 001 - CS 007 Total Metal Content (Pb + Zn)	Drawing No. A4-368



Centre: Whyalla	THE BROKEN HILL PROPRIETARY CO. LTD.	Project No.
Date: Dec '81	E.L. 809 WIRREALPA DIAPIR CHANNEL SAMPLE TRAVERSES Traverse No. 5 Sample Nos. CS 0076 - CS 0095 Total Metal Content (Pb + Zn)	Drawing No. A4-369

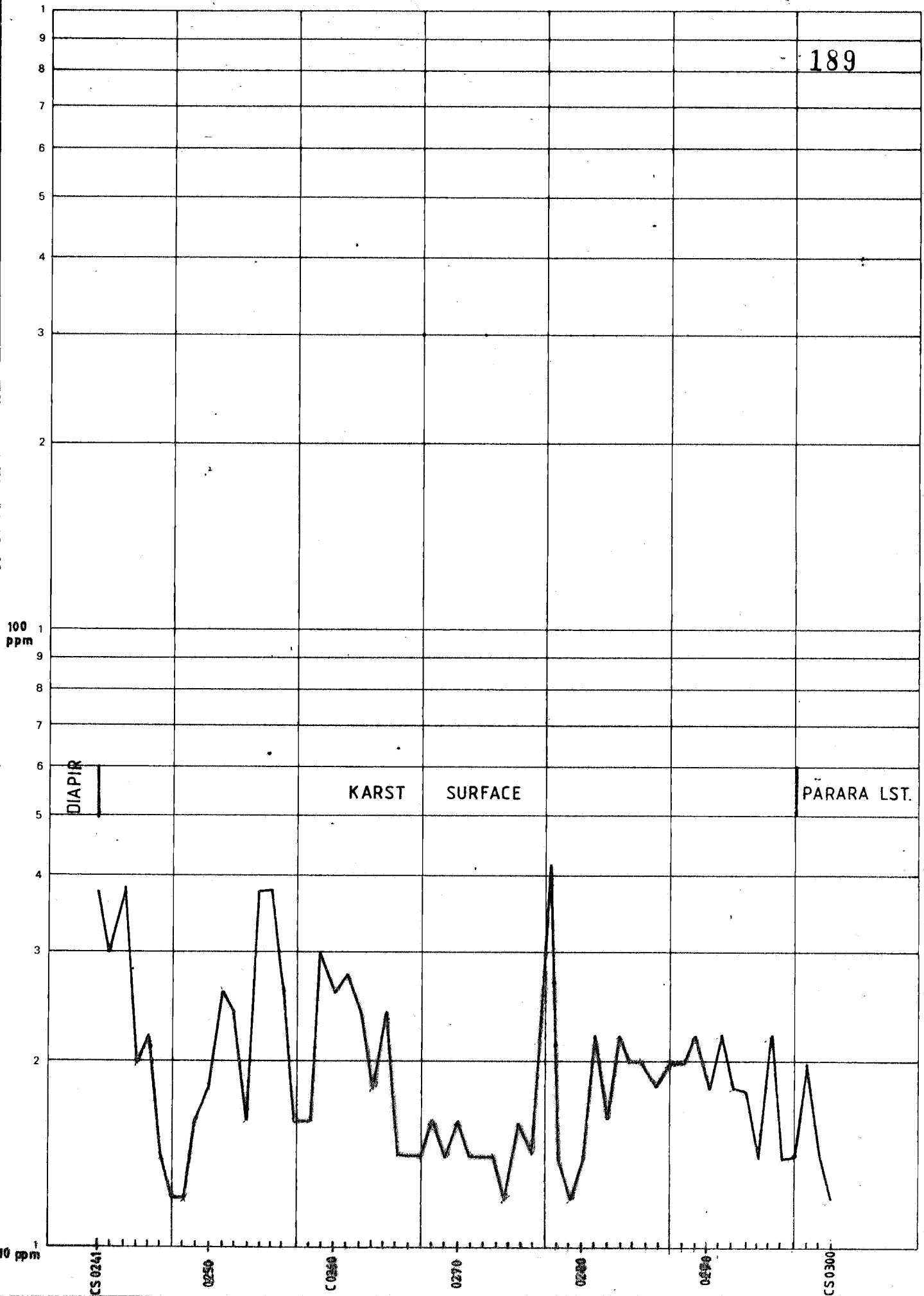


Centre: Whyalla	THE BROKEN HILL PROPRIETARY CO. LTD.	Project No.
Date: Dec. '81	E.L. 809 WIRREALPA DIAPIR CHANNEL SAMPLE TRAVERSES Traverse No. 6 Sample Nos. CS 0096 – CS 0143 Total Metal Content (Pb + Zn)	Drawing No. A4-370

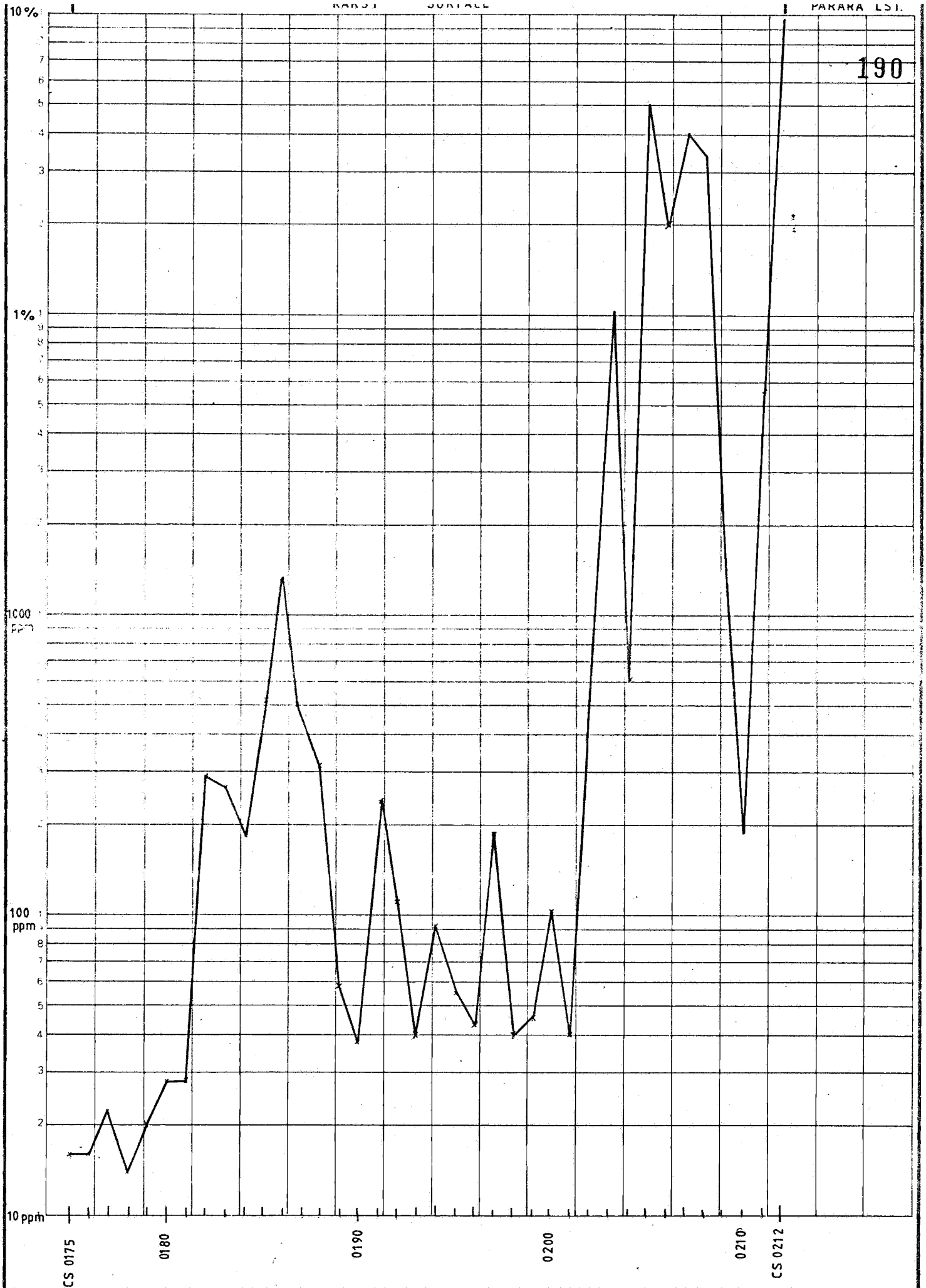


Centre: Whyalla	THE BROKEN HILL PROPRIETARY CO. LTD.	Project No.
Date: Dec '81	E.L. 809 WIRREALPA DIAPIR - CHANNEL SAMPLE TRAVERSES Traverse No. 7 Sample Nos. CS 0144 - CS 0174 Total Metal Content (Pb + Zn)	Drawing No. A4-371

189

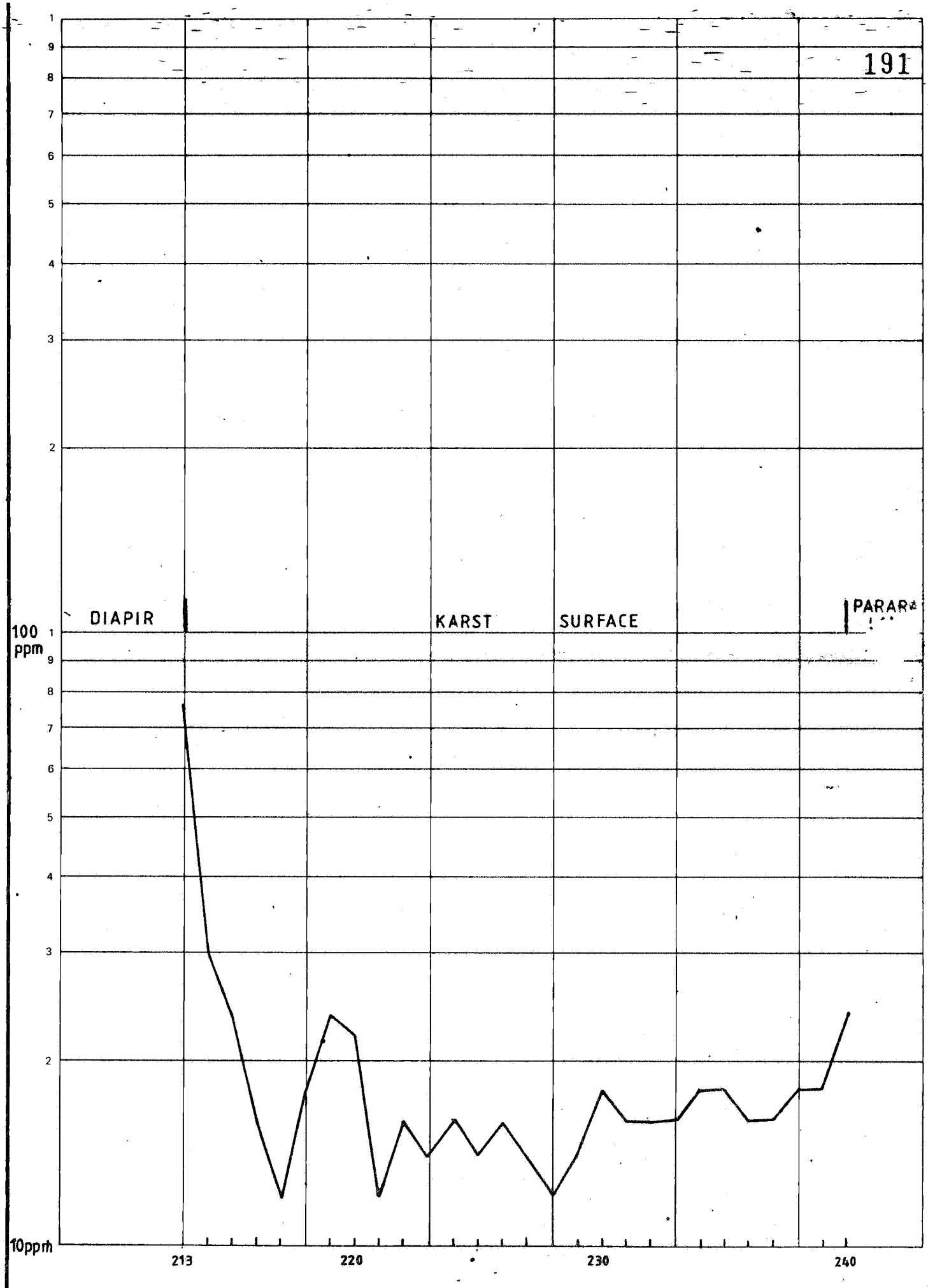


Centre: Whyalla	THE BROKEN HILL PROPRIETARY CO. LTD.	Project No.
Date: Dec. '81	E.L. 809, WIRREALPA DIAPIR, CHANNEL SAMPLE TRAVERSES Traverse No. 8 Sample Nos. CS 0241 – CS 0300 Total Metal Content (Pb + Zn)	Drawing No. A4-372



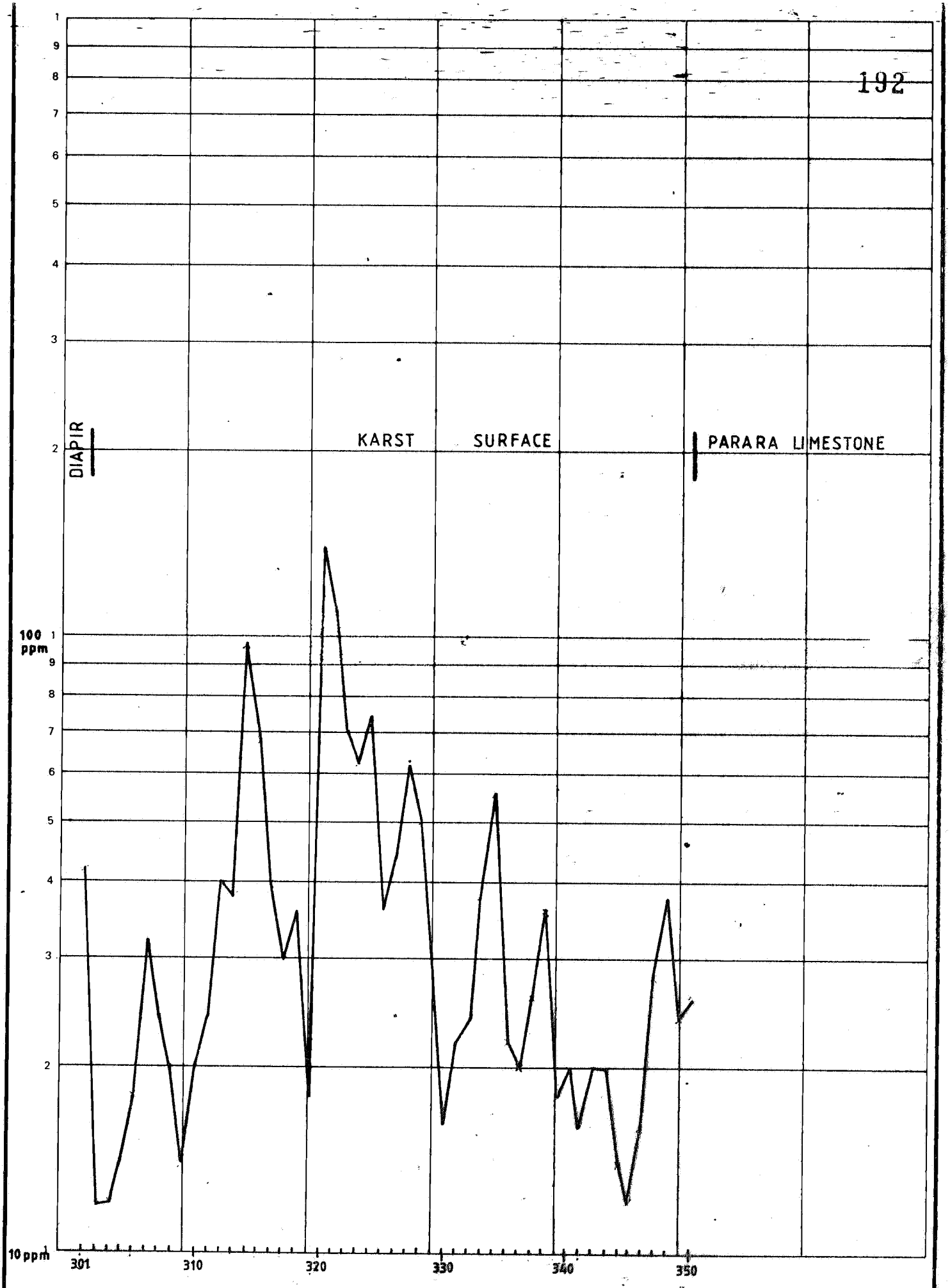
Centre: Whyalla	THE BROKEN HILL PROPRIETARY CO. LTD. E.L.809 WIRREALPA DIAPIR CHANNEL SAMPLE TRAVERSES	Project No.
Date: Dec.'81	Traverse No. 9 Sample Nos. CS 0175 - CS 0212 Total Metal Content (Pb+Zn)	Drawing No. A4-373

191



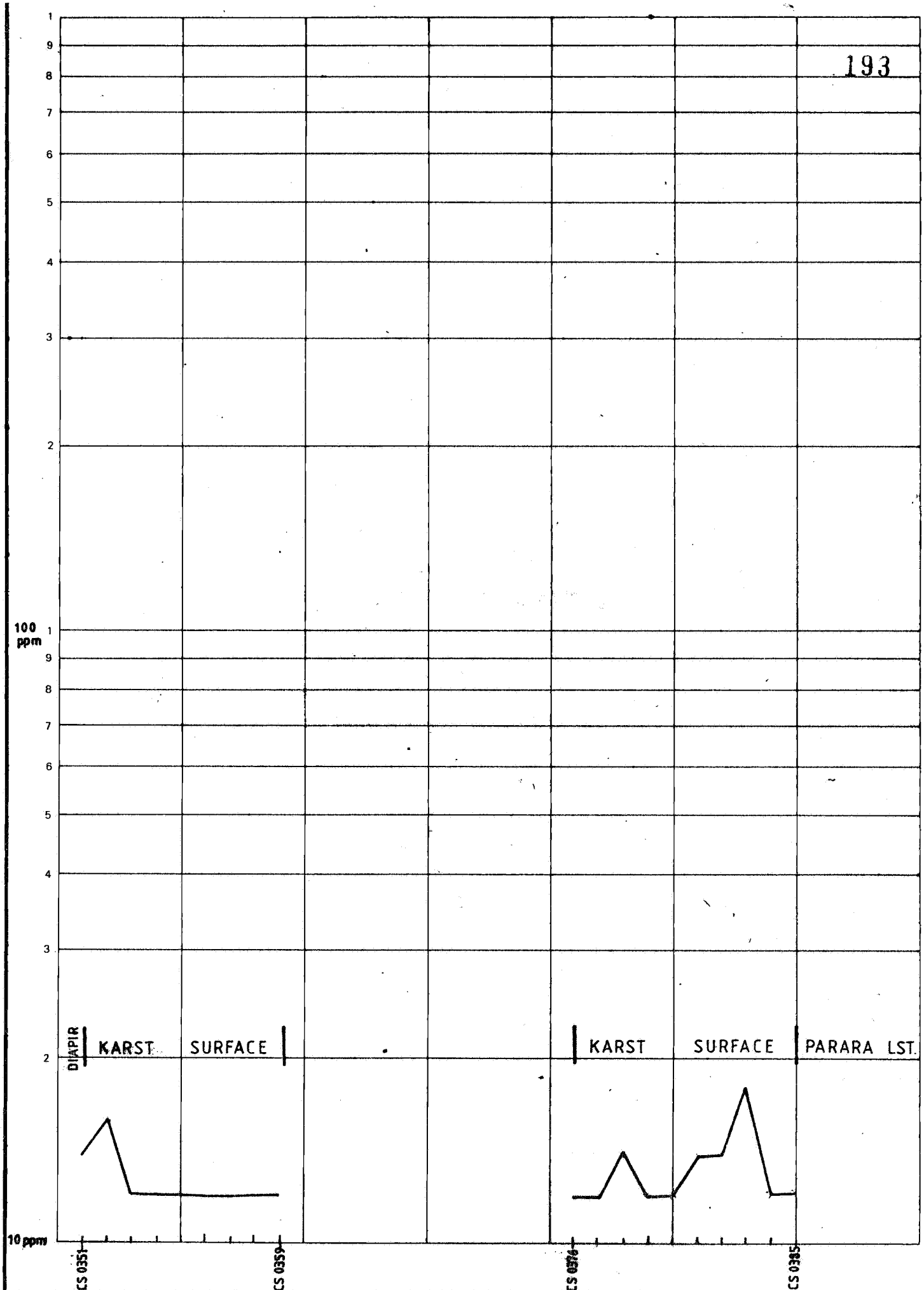
Centre	THE BROKEN HILL PROPRIETARY CO. LTD.	Project No.
Whyalla	E.L. 809, WIRREALPA DIAPIR, CHANNEL SAMPLE TRAVERSES.	
Date: Dec '81	Traverse No. 10 Sample Nos. CS 0213 - CS 0240 Total Metal Content (Pb + Zn)	Drawing No. A4-374

192

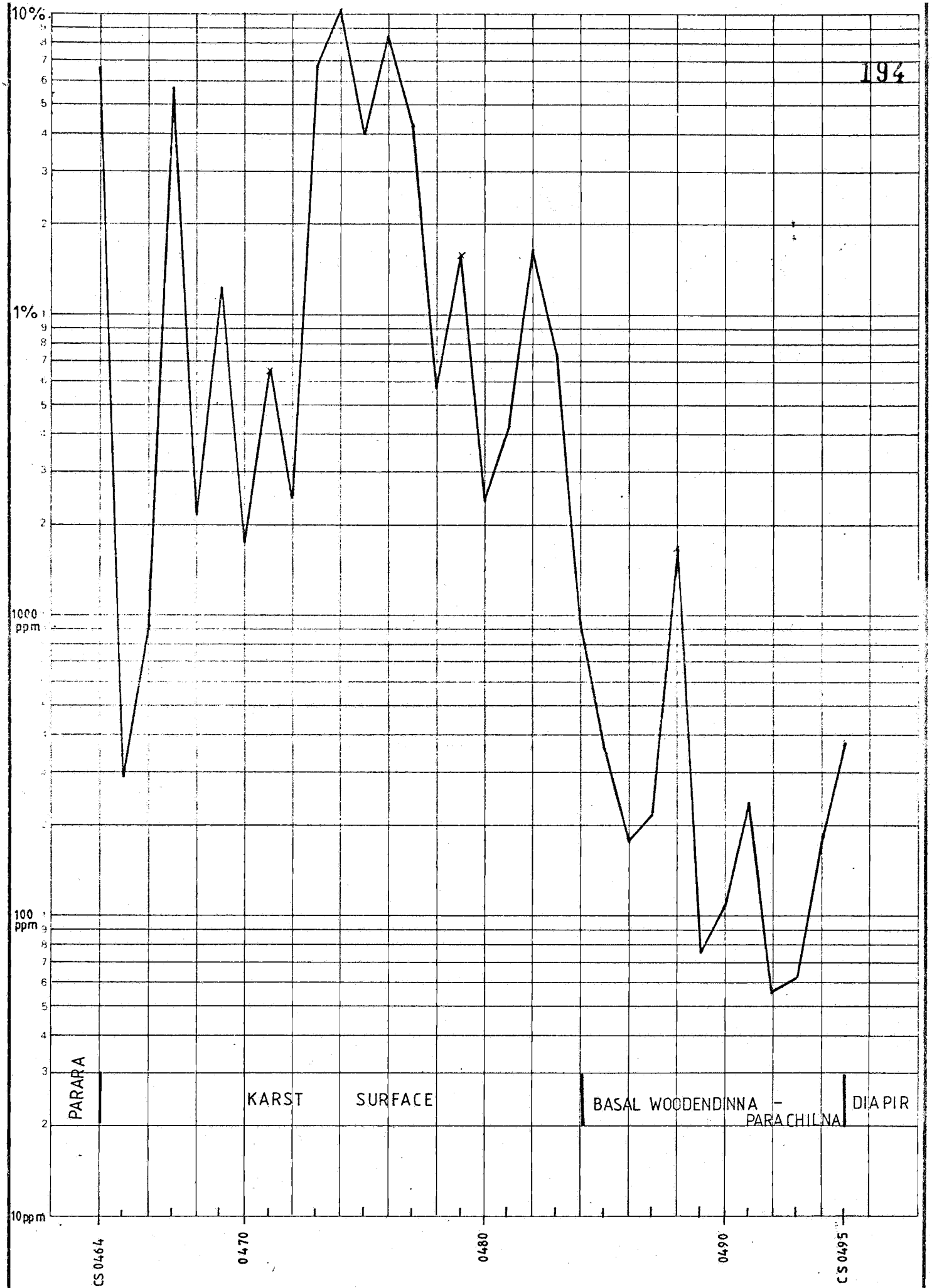


Centre: Whyalla	THE BROKEN HILL PROPRIETARY CO. LTD.	Project No.
Date: Dec '81	E.L. 809, WIRREALPA DIAPIR, CHANNEL SAMPLE TRAVERSES	Drawing No. A4-375
	Traverse No. 11 Sample Nos. CS 0301 – CS 0350 Total Metal Content (Pb + Zn)	

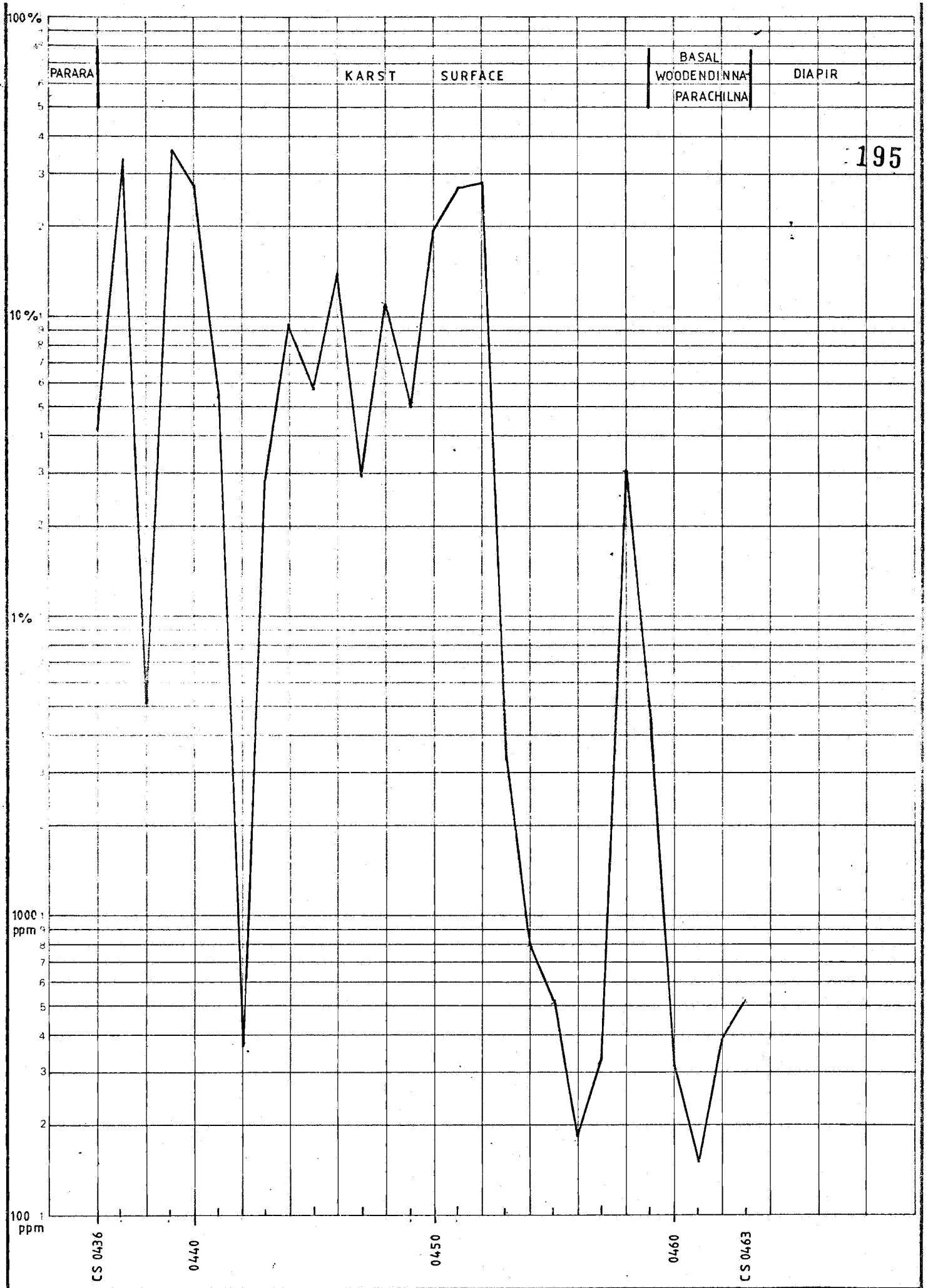
193



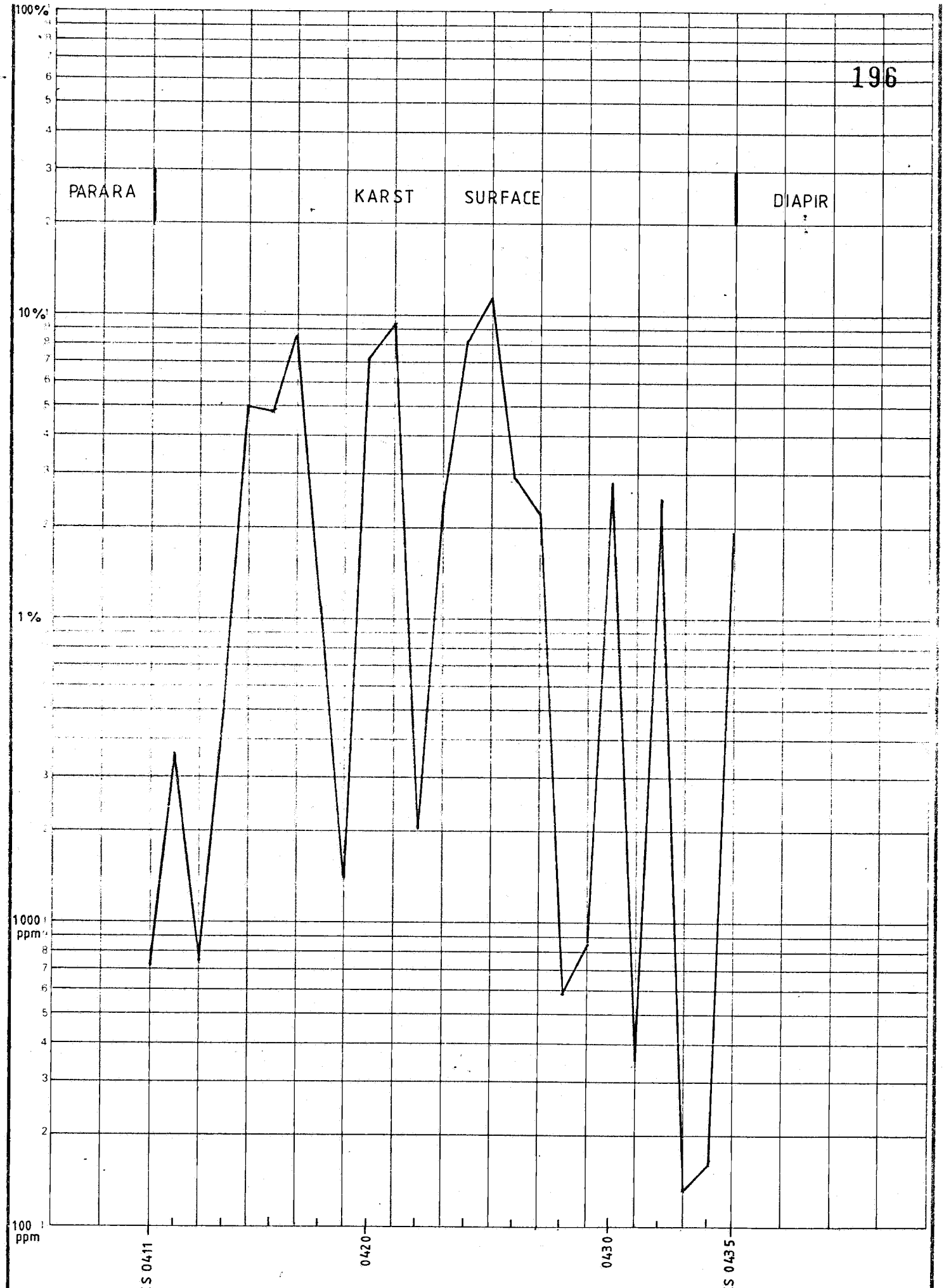
Centre: Whyalla	THE BROKEN HILL PROPRIETARY CO. LTD.	Project No.
Date: Dec '81	E.L.809 WIRREALPA DIAPIR — CHANNEL SAMPLE TRAVERSES Traverse No. 12 Sample Nos. CS 0351 - CS 0359, CS 0376 - CS 0385 Total Metal Content (Pb + Zn)	Drawing No. A4-376



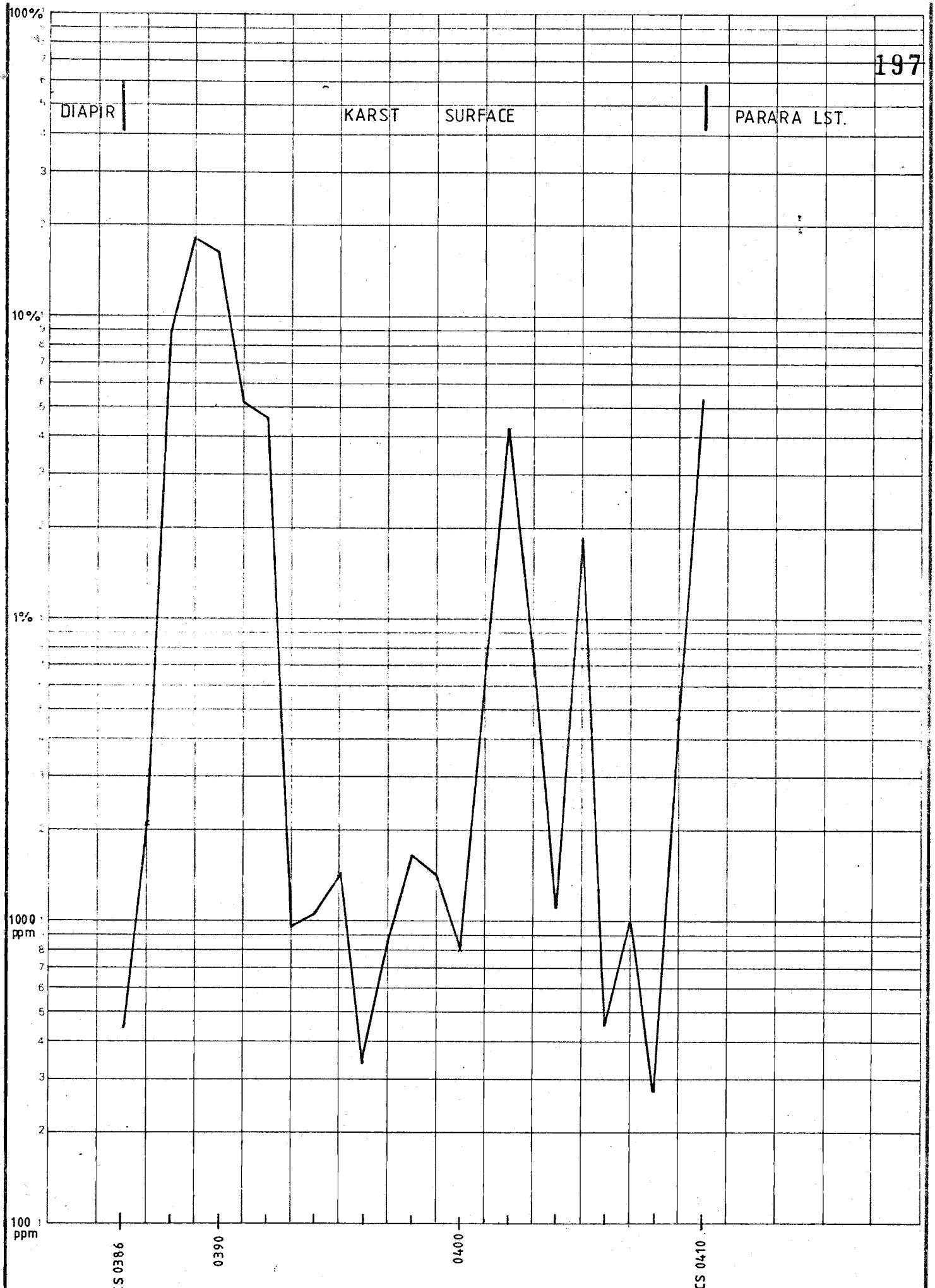
Centre: Whyalla	THE BROKEN HILL PROPRIETARY CO. LTD.	Project No.
Date: Dec.'81	EL. 809 WIRREALPA DIAPIR CHANNEL SAMPLE TRAVERSES Traverse No. 13 Sample Nos. CS 0465 - CS 0495 Total Metal Content (Pb+Zn)	Drawing No. A4-377



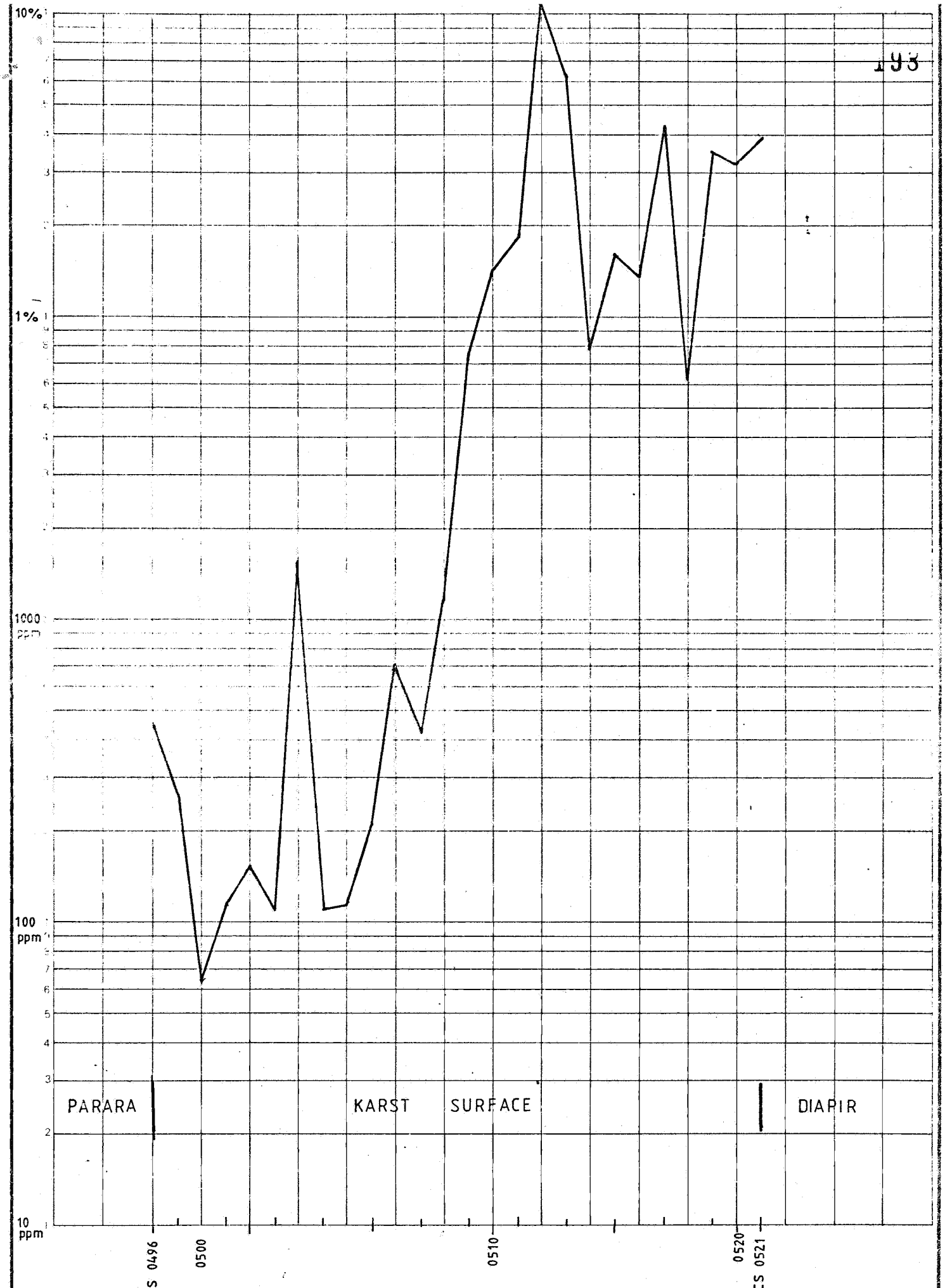
Centre: Whyalla	THE BROKEN HILL PROPRIETARY CO. LTD.	Project No.
Date: Dec.'81	E.L. 809 WIRREALPA DIAPIR CHANNEL SAMPLE TRAVERSES Traverse No. 14 Sample Nos. CS 0436 - CS 0463 Total Metal Content (Pb+Zn)	Drawing No. A4-378



Centre: Whyalla	THE BROKEN HILL PROPRIETARY CO. LTD.	Project No.
Date: Dec.'81	E.L. 809 WIRREALPA DIAPIR CHANNEL SAMPLE TRAVERSES Traverse No. 15 Sample Nos. C.S. 0411 – CS 0435 Total Metal Content (Pb+Zn)	Drawing No. A4-379



Centre: Whyalla	THE BROKEN HILL PROPRIETARY CO. LTD.	Project No.
Date: Dec.'81	E.L. WIRREALPA DIAPIR — CHANNEL SAMPLE TRAVERSES Traverse No. 16 — Sample Nos. CS 0386 - CS 0410 — Total Metal Content (Pb+Zn)	Drawing No. A4-380



Centre: Whyalla	THE BROKEN HILL PROPRIETARY CO. LTD.	Project No.
Date: Dec.'81	E.L. 809 WIRREALPA DIAPIR CHANNEL SAMPLE TRAVERSES Traverse No. 17 Sample Nos. CS 0496 - CS 0521 Total Metal Content (Pb+Zn)	Drawing No. A4-381

FIG. 2

275 000 m E

300 000 m E

6 565 000 m N

6 560 000 m N

WD 14

WD 13

WD 19

WD 7

WD 8

WD 16

WD 17

WD 18

WD 15

WD 12

WD 11

WD 10

WD 9

SECTION 1

SECTION 2

SECTION 3

DONKEY BORE

WIRREALPA

CREEK

WIRREALPA SPRING

WIRREALPA HILL

WIRREALPA LEAD MINE

FAULT

Calcareous Mudstone (Flat undulating)

Lime mud Calc. shale, pum portions of coarse calcite

Mottled limest calcarenite, lime muds + fossils in places

17 52 m cycle - Archaeos at base mottled at top

Mottled limestone some Archaeos

Calc conglom grit breccia

Massive Limestone + Archaeos + stromat + Karsted

Sandstone

Karsted surface

Polyphecia Coenzii abundant

Abundant grits, pebbles & cobbles, sometimes use dolomitic base (Woodendinna Dol)

Minor Laminar Calcrete

Mottled Limestone - minor Calcrete horizon

Mottled sandstone (Evaporite Nodules)

Nodular and mottled limestone

Sandstone dominant

Disseminated fine grain ZnS in skeletal grainstone rich in hydrocarbons (after brachs) Also clasts to 2m Cc >Bo(Cu)

Patsora Ribbon Limestone + black shale Limest

Blonte, Calcite

Mottled Limestone

Fault Zone contains 6 metre + wide zone of Mesa + Py

Cherty + gypsum in cycle tops

Mottled cycles

Float of dolomite native sulphur chert vesicular

Ribbon Cherts

Dolomite laminated slightly sandy cherty after anhydrite

Cherty Lenses in Dolomite Shaft in Barney (cherts) Mottled Limestone some Archaeos

Woodendinna Dolomite

Wirrapowie Limestone

Massive Archaeo

Limestone Sandy

Sandy Horizon

Massive Arch Limestone

Shaly silty Archaeo Reef

Shaly Listone + Karst Mottled Limestone - Mineralised Ph, Cu, Bo Algal Gal, evaporites - same sequence here but thinner

Archaeo Reef

Massive Archaeo Limestone

Shaly Mottled Dolomite Algae, Evaporites

Red Shale mC

mC Red beds

? Lower Cambrian

? Syndepositional Fault similar to Wirrealpa Mine area ?

Pound Quartzite

? Parachilna Formation ?

Woodendinna Dolomite

Parachilna Fm ?

Pound Quartzite

? Parachilna Formation ?

Woodendinna Dolomite

Wirrapowie Limestone

Massive Archaeo Limestone

Shaly Mottled Dolomite Algae, Evaporites

Red Shale mC

mC

SECTION 4

SECTION 5

LOCATION MAP

139°E

30°S

31°30'S

0 5 10 15 Km

Nonning

Mirrealpa Spring

MAP AREA

Wirrealpa HS

Wirrealpa Ck

LEGEND

- Diapir.
- mC Middle Cambrian units
- P Miscellaneous Proterozoic
- Arch(Archaeo) Archaeocyathid
- Ca Calcite
- Py Pyrite
- Bo Barite
- Cu Copper
- Zn Zinc
- Pb Lead
- Dol Dolomite
- Fault
- Fault - showing relative horizontal movement
- Geological boundary
- Trend lines
- Strike and dip
- Track
- Creek
- Shaft
- WD9 Drillhole (Dome)

0 500 1000 metres

SCALE 1:10 000

3427-18

THE BROKEN HILL PROPRIETARY CO. LTD.
EXPLORATION DEPARTMENT

E.L. 809 WIRREALPA S.A.

GEOLOGY

Drawn R.K.	Date 30-3-81	Centre WHYALLA	
Prepared D.F.WARD 26.1.81	Project No.	Drawing No. AO-1763	
Checked W. ROCHE			

REVISIONS

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EXPLORATION LICENCE 809

WIRREALPA, SOUTH AUSTRALIA

REPORT FOR THE QUARTER ENDED 2nd MARCH, 1982

CONTENTS

1. GENERAL

2. FIELD INVESTIGATIONS

2.1 Rock-Chip (Channel) Sample Survey - Wirrealpa Diapir

2.2 Mapping

3. EXPENDITURE

APPENDIX : Analysis Results

FIGURE : EL 809, Wirrealpa, S.A. Location Map

EXPLORATION LICENCE 809
WIRREALPA, SOUTH AUSTRALIA
REPORT FOR QUARTER ENDED
2ND MARCH, 1982

1. GENERAL

Exploration Licence 809 of 1080 square kilometres in the COPLEY and PARACHILNA 1:250,000 sheet areas, was granted to BHP Minerals Limited (formerly Dampier Mining Company Limited) for one year, on 2nd March, 1981. This licence replaces EL 436 covering the same area, previously held by Dampier Mining Company Limited for two years from 30th November, 1978.

An application for renewal of this licence for a further twelve months from 2nd March, 1982 has been submitted.

2. FIELD INVESTIGATIONS

2.1 Rock-chip (Channel) Sample Survey - Wirrealpa Diapir

An additional five (5) traverses of channel sampling across the karsted Cambrian surface on the western side of the Wirrealpa Diapir were completed during the quarter. The samples were collected continuously along each traverse and bagged after one metre intervals.

All samples were sent to COMLABS in Adelaide, where they were crushed, pulverized and split, dissolved by acid attack and analysed for lead and zinc. The initial batch of samples were additionally analysed for copper, magnesium and calcium. Samples with a total metal content (Lead+Zinc) greater than 0.5% were re-analysed for silver, cadmium, cobalt, arsenic, barium and gold.

Method of analysis for each element is as follows:-

Cu, Pb, Zn, Cd, Co	:	AAS 1
Ag	:	AAS 3
As, Ba	:	XRF 1
Au	:	AAS 5A
Ca, Mg	:	AAS 6

Sample numbers for each traverse are as follows:-

Traverse	Sample Nos.
18	CS 0586 - CS 0648
19	CS 0522 - CS 0585
20	CS 0649 - CS 0748
21	CS 0749 - CS 0868
22	CS 0869 - CS 0981

A location map for these additional traverse lines is being drafted, and will be included in the next quarterly report.

2.2 Mapping

Geological mapping at 1:10,000 scale along the Bunkers Ranges was completed during the last quarter. The resultant geological map is being drafted, and will be included in the next quarterly report.

3. EXPENDITURE

Expenditure debited to EL 809 during December, 1981, and January, 1982, was as follows. Expenditure for February has not yet been consolidated.

Wages and Salaries	$5,153
Messing and Accommodation	655
Fares and Mobilisation	75
Transport	274
Sample Analysis	25
Vehicles	253
Surveying/Aerial Photographs	10
Administration/Overheads	295
	$6,740

Revised total expenditure on EL 436/809 to 31st January, 1982, is $364,348.

This report is submitted to the Department of Mines and Energy as required by Condition 4 of Exploration Licence 809.

APPENDIX

Analysis Results

COMLABS Pty. Ltd.
COMPUTERISED ANALYTICAL LABORATORIES

NATA REGISTERED No. 1526

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

Queensland Preparation Laboratory
172 LAVARACK AVE.,
EAGLE FARM,
QUEENSLAND. 4007
TEL.: (07) 268 4748

OUR REF.: COM 820021

YOUR REF.: Project No L160
Sheet No 001845

Mr. M. Roche,
BHP Exploration,
P.O. Box 21,
WHYALLA. S.A. 5600.

5.2.82

Dear Mick,

RE: JOB COM 820021

Enclosed are assays for the samples delivered to our laboratory on the 6th January, 1982.

Some of the Ca values appear to be higher than the theoretical for 100% $CaCO_3$. The Ca may be present as other minerals such as CaF_2.

The Ca by AAS 6 at the 40% level is only accurate to about $\pm$ 3% due to the large dilutions involved. If more accurate Ca values are required then a volumetric method would be the recommended technique at these high levels.

Yours sincerely,

Harry Fishman
Managing Director

COMLABS Pty. Ltd.
COMPUTERISED ANALYTICAL LABORATORIES

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ANALYTICAL REPORT

L - 205

JOB COM820021 O/N : L 160 Sheet 001845

LINE 19

Results in ppm

SAMPLE	Cu	Pb	Zn	%Mg	%Ca
CS 0522	14	560	80	0.22	37.4
CS 0523	28	730	75	0.21	37.1
CS 0524	22	540	80	0.21	37.6
CS 0525	16	7500	185	0.29	34.9
CS 0526	14	3600	660	0.33	35.1
CS 0527	14	1.25%	520	0.47	32.5
CS 0528	12	2400	200	0.39	38.4
CS 0529	20	1.20%	250	0.32	37.7
CS 0530	12	2500	150	0.18	37.6
CS 0531	10	440	85	0.15	37.4
CS 0532	6	1250	105	0.53	36.2
CS 0533	12	42	55	0.75	35.7
CS 0534	12	30	48	0.43	36.2
CS 0535	48	90	110	0.20	34.0
CS 0536	16	46	22	0.21	35.4
CS 0537	10	26	26	0.20	34.6
CS 0538	12	38	42	0.19	34.7
CS 0539	10	12	32	0.27	34.1
CS 0540	14	8	28	0.19	34.0
CS 0541	8	12	26	0.17	33.6
CS 0542	8	10	30	0.14	42.2
CS 0543	18	38	55	0.13	41.5
CS 0544	14	34	55	0.14	40.4
CS 0545	14	40	65	0.13	41.7
CS 0546	14	32	46	0.13	40.7

.../ 2

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ANALYTICAL REPORT

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JOB COM820021 O/N : L 160 Sheet 001845

Results in ppm

SAMPLE	Cu	Pb	Zn	%Mg	%Ca
CS 0547	12	24	34	0.16	41.6
CS 0548	14	36	40	0.18	42.0
CS 0549	12	32	40	0.14	41.7
CS 0550	10	24	34	0.14	42.6
CS 0551	6	26	30	0.13	42.2
CS 0552	8	16	24	0.23	42.3
CS 0553	4	8	18	0.22	39.9
CS 0554	6	10	22	0.22	43.7
CS 0555	8	10	22	0.20	43.5
CS 0556	14	20	36	0.14	41.3
CS 0557	8	20	26	0.18	42.6
CS 0558	10	22	36	0.12	43.4
CS 0559	10	14	32	0.16	42.9
CS 0560	6	10	26	0.18	42.6
CS 0561	10	10	28	0.15	42.8
CS 0562	12	12	24	0.17	43.5
CS 0563	16	16	28	0.14	41.2
CS 0564	16	20	38	0.11	41.6
CS 0565	12	18	32	0.11	42.0
CS 0566	8	22	30	0.10	42.2
CS 0567	4	10	32	0.14	41.3
CS 0568	10	12	28	0.18	41.3
CS 0569	6	12	32	0.28	40.8
CS 0570	8	14	100	0.31	39.1
CS 0571	6	16	75	0.20	41.7

.../ 3

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ANALYTICAL REPORT

JOB COM820021 O/N : L 160 Sheet 001845

Results in ppm

SAMPLE	Cu	Pb	Zn	%Mg	%Ca
CS 0572	8	6	44	0.22	42.6
CS 0573	8	12	50	0.16	41.7
CS 0574	4	16	50	0.22	41.5
CS 0575	8	8	55	0.23	41.9
CS 0576	6	6	48	0.31	40.9
CS 0577	8	10	65	0.18	41.8
CS 0578	10	8	100	0.17	42.0
CS 0579	8	<4	40	0.12	41.3
CS 0580	10	<4	34	0.18	41.7
CS 0581	8	8	34	0.17	42.7
CS 0582	10	16	120	0.16	41.5
CS 0583	10	14	145	0.20	40.0
CS 0584	8	14	135	0.25	39.9
CS 0585	12	18	175	0.21	32.2
LINE 18 CS 0586	8	310	360	0.27	33.2
CS 0587	32	9100	5400	0.23	30.4
CS 0588	12	220	470	0.27	32.9
CS 0589	6	360	830	0.23	33.2
CS 0590	8	380	1200	0.29	31.8
CS 0591	6	18	32	0.24	31.5
CS 0592	4	95	50	0.50	29.8
CS 0593	6	16	55	0.38	28.6
CS 0594	6	8	26	0.24	28.9
CS 0595	6	55	150	0.32	38.7
CS 0596	4	44	65	0.27	37.9

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ANALYTICAL REPORT

JOB COM820021 O/E : L 160 Sheet 001845

Results in ppm

SAMPLE	Cu	Pb	Zn	%Mg	%Ca
CS 0597	2	65	870	0.28	37.2
CS 0598	10	730	5500	0.40	35.4
CS 0599	4	200	510	0.27	36.8
CS 0600	6	80	560	0.40	36.3
CS 0601	12	14	38	0.27	34.1
CS 0602	10	18	46	0.27	33.6
CS 0603	12	14	75	0.29	31.2
CS 0604	8	14	40	0.30	31.8
CS 0605	10	4	36	0.31	32.7
CS 0606	10	8	42	0.31	31.8
CS 0607	10	8	44	0.27	33.7
CS 0608	12	28	70	0.31	32.9
CS 0609	14	28	46	0.23	35.4
CS 0610	12	18	28	0.29	35.4
CS 0611	10	10	28	0.34	32.2
CS 0612	16	12	34	0.31	32.6
CS 0613	16	12	34	0.31	33.4
CS 0614	12	14	24	0.33	33.0
CS 0615	10	30	28	0.29	35.5
CS 0616	8	12	50	0.32	36.3
CS 0617	8	14	40	0.35	36.2
CS 0618	8	14	24	0.37	35.0
CS 0619	8	18	115	0.42	34.7
CS 0620	8	34	260	0.37	42.8
CS 0621	10	30	120	0.45	42.6

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ANALYTICAL REPORT

JOB COM820021 O/N : L 160 Sheet 001845 L - 209

Results in ppm

SAMPLE	Cu	Pb	Zn	%Mg	%Ca
CS 0622	12	18	26	0.40	34.4
CS 0623	22	180	1050	0.48	31.6
CS 0624	36	12	60	0.27	33.7
CS 0625	14	32	36	0.41	33.7
CS 0626	20	14	32	0.31	35.1
CS 0627	32	12	30	0.27	34.7
CS 0628	20	10	18	0.41	33.0
CS 0629	20	10	22	0.50	29.2
CS 0630	8	10	16	0.47	32.6
CS 0631	12	12	18	0.41	32.8
CS 0632	6	12	24	0.43	33.7
CS 0633	18	18	34	0.31	34.4
CS 0634	12	12	18	0.43	34.9
CS 0635	14	10	16	0.39	34.4
CS 0636	30	10	16	0.35	35.4
CS 0637	18	12	22	0.36	36.2
CS 0638	26	16	22	0.29	36.3
CS 0639	32	14	24	0.26	36.2
CS 0640	44	10	16	0.35	35.5
CS 0641	18	12	14	0.39	34.7
CS 0642	30	8	16	0.38	33.9
CS 0643	26	6	16	0.39	34.1
CS 0644	16	6	18	0.39	33.2
CS 0645	18	4	20	0.37	33.3
CS 0646	16	6	22	0.31	34.1

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ANALYTICAL REPORT

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JOB COM820021 O/N : L 160 Sheet 001845

Results in ppm

SAMPLE	Cu	Pb	Zn	%Mg	%Ca
CS 0647	14	6	18	0.33	38.6
CS 0648	8	<4	14	0.43	38.8
LINE —20 CS 0649	4	14	20	0.49	38.8
CS 0650	6	55	24	0.45	39.9
CS 0651	16	105	20	0.42	39.3
CS 0652	8	75	16	0.38	39.8
CS 0653	6	135	18	0.32	40.9
CS 0654	4	75	14	0.43	40.1
CS 0655	12	220	18	0.29	41.4
CS 0656	4	12	16	0.44	39.8
CS 0657	6	12	16	1.42	38.1
CS 0658	6	8	20	0.46	38.5
CS 0659	4	<4	18	0.37	39.4
CS 0660	10	6	14	0.31	39.9
CS 0661	4	6	14	0.38	38.5
CS 0662	6	34	16	0.39	40.2
CS 0663	6	6	14	0.31	40.1
CS 0664	10	10	20	0.34	40.2
CS 0665	6	28	16	0.58	41.6
CS 0666	26	22	20	0.76	39.0
CS 0667	4	18	14	0.31	40.5
CS 0668	4	30	16	0.33	38.6
CS 0669	4	18	18	0.35	39.4
CS 0670	2	10	16	0.40	38.2
CS 0671	4	8	16	0.39	39.7

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ANALYTICAL REPORT

JOB COM820021 O/N : L 160 Sheet 001845

Results in ppm

SAMPLE	Cu	Pb	Zn	%Mg	%Ca
CS 0672	2	12	18	0.38	38.4
CS 0673	24	12	14	0.33	39.9
CS 0674	10	14	16	0.35	39.2
CS 0675	6	16	18	0.29	40.8
CS 0676	10	12	18	0.33	39.5
CS 0677	2	10	14	0.36	37.8
CS 0678	4	16	16	0.42	35.0
CS 0679	<2	8	14	0.41	34.6
CS 0680	2	18	12	0.39	34.7
CS 0681	<2	8	16	0.37	33.9
CS 0682	2	10	14	0.43	32.7
CS 0683	6	50	36	0.29	33.3
CS 0684	8	100	26	0.30	32.5
CS 0685	4	42	14	0.30	33.1
CS 0686	6	14	16	0.30	32.6
CS 0687	4	8	18	0.28	32.0
CS 0688	10	24	18	0.33	29.9
CS 0689	8	48	28	0.27	30.5
CS 0690	4	18	18	0.33	32.5
CS 0691	6	38	18	0.25	31.3
CS 0692	4	55	20	0.28	28.7
CS 0693	8	70	22	0.34	29.1
CS 0694	10	65	20	0.34	37.9
CS 0695	4	125	24	0.24	38.3
CS 0696	6	90	44	0.25	36.9

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ANALYTICAL REPORT

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JOB COM820021 O/N : L 160 Sheet 001845

Results in ppm

SAMPLE	Cu	Pb	Zn	%Mg	%Ca
CS 0697	6	32	28	0.33	37.4
CS 0698	4	40	22	0.36	38.0
CS 0699	6	18	16	0.22	39.1
CS 0700	8	38	20	0.19	38.9
CS 0701	6	10	16	0.21	39.6
CS 0702	4	30	18	0.27	38.9
CS 0703	6	28	16	0.22	38.6
CS 0704	2	34	18	0.22	38.1
CS 0705	4	50	18	0.27	38.3
CS 0706	4	30	20	0.51	38.2
CS 0707	6	42	18	0.45	37.8
CS 0708	6	26	18	0.67	36.7
CS 0709	2	18	16	0.63	41.6
CS 0710	<2	24	18	0.64	40.9
CS 0711	10	75	14	0.27	40.9
CS 0712	6	14	18	0.28	39.8
CS 0713	2	10	18	0.32	39.9
CS 0714	4	10	18	0.26	40.9
CS 0715	4	14	22	0.26	39.5
CS 0716	4	14	16	0.25	39.9
CS 0717	4	14	18	0.31	39.0
CS 0718	2	14	12	0.27	39.5
CS 0719	2	10	14	0.34	39.9
CS 0720	4	10	16	0.27	39.5
CS 0721	6	18	18	0.26	39.9

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ANALYTICAL REPORT

JOB COM820021 O/N : L 160 Sheet 001845

Results in ppm

SAMPLE	Cu	Pb	Zn	%Mg	%Ca
CS 0722	4	14	22	0.29	39.2
CS 0723	4	12	24	0.25	39.9
CS 0724	4	18	20	0.26	40.3
CS 0725	4	16	18	0.31	41.2
CS 0726	2	24	22	0.27	41.3
CS 0727	4	50	32	0.21	40.9
CS 0728	4	120	32	0.22	40.0
CS 0729	2	8	22	0.29	39.0
CS 0730	6	18	18	0.27	40.0
CS 0731	4	12	16	0.27	39.6
CS 0732	4	20	26	0.24	39.8
CS 0733	6	16	22	0.22	38.8
CS 0734	6	10	20	0.24	37.9
CS 0735	4	12	22	0.20	39.2
CS 0736	4	12	16	0.20	39.7
CS 0737	2	42	60	0.28	39.9
CS 0738	6	14	22	0.56	39.6
CS 0739	4	26	24	0.27	40.6
CS 0740	4	10	22	0.29	40.3
CS 0741	6	14	20	0.30	40.5
CS 0742	4	10	22	0.27	39.4
CS 0743	8	32	50	0.18	40.3
CS 0744	4	12	24	0.22	41.0
CS 0745	4	16	20	0.21	41.6
CS 0746	2	8	16	0.19	42.2

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ANALYTICAL REPORT

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JOB COM820021 O/N : L 160 Sheet 001845

Results in ppm

SAMPLE	Cu	Pb	Zn	%Mg	%Ca
CS 0747	8	18	18	0.29	39.4
CS 0748	6	6	20	0.34	40.6
CS 0749	6	8	14	0.37	38.5
CS 0750	32	20	24	0.39	40.1
CS 0751	16	20	18	0.41	37.0
CS 0752	16	8	16	0.30	38.8
CS 0753	20	8	16	0.41	37.7
CS 0754	28	20	22	0.38	39.9
CS 0755	12	12	18	0.31	40.4
CS 0756	22	12	50	0.35	38.9
CS 0757	30	8	18	0.67	36.3
CS 0758	24	8	18	0.73	36.8
CS 0759	28	14	20	0.36	40.5
CS 0760	100	16	22	0.81	39.6
CS 0761	60	14	22	0.33	38.0
CS 0762	16	8	16	0.36	38.1
CS 0763	22	8	22	0.26	39.6
CS 0764	12	12	20	0.27	40.0
CS 0765	8	12	20	0.35	39.6
CS 0766	8	14	20	0.33	38.6
CS 0767	36	22	20	0.33	39.8
CS 0768	28	16	18	0.34	39.6
CS 0769	18	24	16	0.30	39.7
CS 0770	6	20	22	0.18	41.6
CS 0771	6	12	24	0.29	40.0

LINE 21

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ANALYTICAL REPORT

JOB COM820021 O/N : L 160 Sheet 001845

Results in ppm

SAMPLE	Ag	Cd	Co	As	Ba	Au
CS 0525	2	6	<4	2	30	<0.05
CS 0526	1	10	<4	6	40	<0.05
CS 0527	4	10	<4	6	55	<0.05
CS 0528	1	3	<4	<2	40	<0.05
CS 0529	4	4	<4	16	65	<0.05
CS 0530	1	4	<4	4	40	<0.05
CS 0587	3	26	8	100	7200	<0.05
CS 0598	1	18	<4	8	1650	<0.05

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

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NATA REGISTERED No. 1526

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

Queensland Preparation Laboratory
172 LAVARACK AVE.,
EAGLE FARM,
QUEENSLAND. 4007
TEL.: (07) 268 4748

OUR REF.: COM 820082

YOUR REF.: Project No. L 110
Sheet No. 001847

Mr. M. Roche,
B.H.P. Exploration Pty Ltd.,
Exploration Dept.,
P.O. Box 21,
WHYALLA. S.A. 5600.

11.2.82

Dear Mick,

RE: JOB COM 820082

Enclosed are the assays for the samples delivered to our laboratory on the 18th January, 1982.

Yours sincerely,

Harry Fishman
Managing Director

COMLABS Pty. Ltd.
COMPUTERISED ANALYTICAL LABORATORIES

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ANALYTICAL REPORT

JOB COM820082 O/N : L110 Sheet No.001847

Results in ppm

SAMPLE	Pb	Zn
CS0783	70	10
CS0784	40	14
CS0785	70	10
CS0786	28	10
CS0787	16	6
CS0788	28	10
CS0789	170	12
CS0790	46	12
CS0791	100	8
CS0792	80	14
CS0793	50	10
CS0794	70	8
CS0795	250	12
CS0796	100	14
CS0797	700	20
CS0798	150	14
CS0799	36	14
CS0800	44	10
CS0801	14	8
CS0802	16	6
CS0803	18	8
CS0804	12	6
CS0805	110	8
CS0806	800	12
CS0807	130	10

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ANALYTICAL REPORT

JOB COM820082 O/N : L110 Sheet No.001847

Results in ppm

SAMPLE	Pb	Zn
CS0808	150	8
CS0809	120	12
CS0810	40	24
CS0811	28	12
CS0812	22	12
CS0813	34	16
CS0814	30	12
CS0815	24	16
CS0816	28	12
CS0817	22	10
CS0818	8	8
CS0819	30	12
CS0820	30	12
CS0821	16	24
CS0822	10	10
CS0823	12	10
CS0824	26	44
CS0825	8	20
CS0826	16	20
CS0827	10	12
CS0828	16	8
CS0829	8	6
CS0830	10	8
CS0831	18	12
CS0832	40	20

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ANALYTICAL REPORT

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JOB COM820082 O/N : L110 Sheet No.001847

Results in ppm .

SAMPLE	Pb	Zn
CS0833	60	34
CS0834	50	16
CS0835	10	20
CS0836	6	8
CS0837	34	16
CS0838	18	18
CS0839	50	60
CS0840	10	24
CS0841	36	20
CS0842	22	22
CS0843	10	20
CS0844	4	12
CS0845	44	60
CS0846	24	38
CS0847	32	32
CS0848	32	36
CS0849	120	36
CS0850	110	38
CS0851	550	140
CS0852	350	90
CS0853	300	100
CS0854	50	32
CS0855	80	50
CS0856	60	100
CS0857	18	20

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ANALYTICAL REPORT

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JOB COM820082 O/N : L110 Sheet No.001847

Results in ppm

SAMPLE	Pb	Zn
CS0858	80	70
CS0859	70	100
CS0860	22	44
CS0861	8	32
CS0862	18	22
CS0863	20	28
CS0864	16	32
CS0865	12	24
CS0866	60	28
CS0867	170	36
CS0868	4	16
CS0869	12	70
CS0870	4	38
CS0871	4	24
CS0872	6	16
CS0873	8	20
CS0874	<4	18
CS0875	<4	20
CS0876	<4	10
CS0877	<4	10
CS0878	<4	22
CS0879	4	16
CS0880	4	14
CS0881	4	24
CS0882	<4	14

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ANALYTICAL REPORT

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JOB COM820082 O/N : L110 Sheet No.001847

Results in ppm

SAMPLE	Pb	Zn
CS0883	<4	18
CS0884	4	32
CS0885	12	32
CS0886	<4	10
CS0887	<4	12
CS0888	<4	12
CS0889	4	20
CS0890	<4	16
CS0891	<4	16
CS0892	<4	8
CS0893	<4	12
CS0894	<4	16
CS0895	8	24
CS0896	<4	20
CS0897	<4	6
CS0898	<4	6
CS0899	<4	8
CS0900	<4	6
CS0901	<4	10
CS0902	<4	8
CS0903	<4	14
CS0904	<4	6
CS0905	<4	6
CS0906	<4	8
CS0907	<4	10

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ANALYTICAL REPORT

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JOB COM820082 O/N : L110 Sheet No.001847

Results in ppm

SAMPLE	Pb	Zn
CS0908	<4	8
CS0909	<4	8
CS0910	<4	6
CS0911	<4	6
CS0912	<4	6
CS0913	<4	6
CS0914	<4	4
CS0915	<4	4
CS0916	<4	8
CS0917	<4	8
CS0918	<4	8

Method of Analysis : Pb Zn : AAS1

EXPLORATION LICENCE 809
WIRREALPA, SOUTH AUSTRALIA

REPORT FOR THE QUARTER ENDED 2ND JUNE, 1982

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1. GENERAL

2. INVESTIGATIONS

3. EXPENDITURE

Table 1: Rock Chip Sampling - Donkey Bore Prospect

FIGURES

1. EL 809, Wirrealpa, S.A. Location Map A4-2085

2. Wirrealpa Spring Area Stream Sediment Survey Analytical Values Cu-Pb-Zn - 80# AO-1947

3. Wirrealpa Spring Area Detail Geology AO-1763

EXPLORATION LICENCE 809

WIRREALPA, SOUTH AUSTRALIA

REPORT FOR THE QUARTER ENDED 2ND JUNE, 1982

1. GENERAL

Exploration Licence 809 of 1080 square kilometres was granted to BHP Minerals Ltd for one year on 2nd March, 1981, and was renewed for a further year on 2nd March, 1982. (Figure 1)

This licence replaces EL 436 covering the same area, previously held by BHP Minerals Limited for two years from 30th November, 1978.

2. INVESTIGATIONS

No field work was undertaken during the quarter.

A compilation of all previous stream geochemistry data, together with data gathered by BHP Minerals Ltd, was drafted for the area in the vicinity of Wirrealpa Diapir. (Figure 2)

A revised plan showing all rock chip survey lines is included as Figure 3. 901 samples (at one metre intervals) have now been collected along the karsted surface adjacent to Wirrealpa Diapir. Analysis of this data is shown in Table 1.

3. EXPENDITURE

Expenditure debited to EL 809 during the four months February to May, 1982 was:

Wages and Salaries	$ 9,812
Messing and Accommodation	982
Transport	609
Surveying/Aerial Photographs	107
Drilling	431
Sample Analysis	435
Tenement Fees, Licences etc.	333
Administration/Overheads	658
Other Items	452
	$13,819

Total expenditure on EL 436/809 to 31st May, 1982 is $378,167.

This report is submitted to the Department of Mines & Energy as required by Condition 4 of Exploration Licence 809.

TABLE 1

ROCK CHIP SAMPLING - DONKEY BORE PROSPECT. E.L.809 WIRREALPA

Total number of samples = 901

Intervals (% Pb+Zn)	No. of Samples	% of Total	(Cumulative %)
x $\geqslant$ 20	5	.55	(.55)
10 $\leqslant$ x $<$ 20	8	.89	(1.44)
5 $\leqslant$ x $<$ 10	20	2.22	(3.66)
1 $\leqslant$ x $<$ 5	42	4.66	(8.32)
.5 $\leqslant$ x $<$ 1	20	2.22	(10.54)
.1 $\leqslant$ x $<$ .5	40	4.44	(14.98)
500ppm $\leqslant$ x $<$ .1	40	4.44	(19.42)
100ppm $\leqslant$ x $<$ 500ppm	124	13.76	(33.19)
50ppm $\leqslant$ x $<$ 100ppm	139	15.43	(48.61)
x $<$ 50ppm	463	51.39	(100)

295 000 m E

300 000 m E

6 565 000 m N

6 560 000 m N

WD 14
WD 13
WD 15
WD 7
WD 8
WD 16
WD 17
WD 18
WD 19
WD 12
WD 11
WD 10
WD 9
WD 6

Wirrealpa Creek

Wirrealpa Spring

LOCATION MAP

E.L. 809

0 5 10 15 km

MAP AREA

Wirrealpa Spring

Wirrealpa H.S.

Mulligha Ck.

Nurina

Mt. Gregory

LEGEND

Stream sediment sample site (A.S.A.R.C.O. SADME Envirospa 975)
and analytical value ppm Cu-Pb-Zn
-80 mesh

Stream sediment sample site (B.H.P.)
and analytical value ppm Cu-Pb-Zn (-20#)

Diamond drill hole

Perchloric/hydrochloric digestion - A.A.S.

0 500 1000 metres

SCALE 1 10 000

3427-19

THE BROKEN HILL PROPRIETARY CO. LTD.
EXPLORATION DEPARTMENT

E.L. 809 WIRREALPA S.A.
WIRREALPA SPRING AREA
STREAM SEDIMENT SURVEY
Analytical values Cu-Pb-Zn -80 #

Drawn: R.K. | Date: 20-4-82 | Centre: WHYALLA
Prepared: M.R. | Project No: L 110 | Drawing No: AO-1947
Checked:
Revisions:

FIG. 3

HOLE N°	INTERVAL (m)	Pb + Zn
WD 7	332 - 336	0 26 %
	367 - 374	0 2 %
WD 8	270 - 271	0 5 %
	274 - 275	1 2 %
	276 - 277	0 6 %
	279 - 280	1 5 %
	280 - 281	2 7 %
	281 - 282	0 3 %
	282 - 283	0 2 %
	283 - 284	0 5 %
	284 - 285	0 4 %
	285 - 286	0 2 %
	286 - 287	1 3 %
	287 - 288	0 4 %
WD 15	10 - 11	1 6 %
	14 - 15	0 15 %
	15 - 16	3 8 %
	16 - 17	1 6 %
	17 - 18	0 2 %
	20 - 21	0 4 %
	23 - 24	0 3 %
	24 - 25	0 3 %
	25 - 26	0 15 %
	36 - 37	0 3 %
	38 - 39	0 2 %
WD 18	223 - 224	0 1 %
	228 - 229	2 35 %
	229 - 230	1 16 %
	230 - 231	0 13 %
	231 - 232	0 5 %
	232 - 233	2 0 %
	233 - 234	1 13 %
	234 - 235	0 75 %
	235 - 236	0 17 %
	237 - 238	1 53 %
	238 - 239	1 74 %
	241 - 242	0 4 %
	245 - 246	1 6 %
	246 - 251	1 2 %
WD 19	42 - 43	0 5 %
	43 - 44	0 3 %
	44 - 45	5 75 %
	46 - 47	0 15 %
	47 - 48	1 4 %
	48 - 49	2 35 %
	49 - 50	0 35 %
	51 - 52	0 8 %
WD 10	108 - 109	0 1 % Cu

LOCATION MAP

139°E

E.L 809

0 5 10 15 Km

Nonning

MAP AREA

Wirrealpa Spring

Wirrealpa H.S.

Wirrealpa Lk

31°00'S

LEGEND

- Diapir
- mЄ — Middle Cambrian units
- Z — Undifferentiated Proterozoic
- Arch?(Archean) — Archaeozatnd
- MINERAL OCCURRENCES
  - Cu — Calcite
  - Py — Pyrite
  - Ba — Barite
  - Cu — Copper
  - Zn — Zinc
  - Pb — Lead
  - Dol — Dolomite
- Fault and movement
- Geological boundary
- Trend lines
- Strike and dip of bedding
- Track
- Creek
- Shaft
- WD9 — Diamond Drillhole (B.H.P. Minerals)
- Channel sampling traverses, and sampling others

Geology from photo interpretation and field checked

Ehn	Narina Greywacke
Eho	Oraparinna Shale
Ehs	Bunkers Sandstone
Ehr	Parara Limestone
B	Wirrapowie Limestone

3H27-20

THE BROKEN HILL PROPRIETARY C LTD.
EXPLORATION DEPARTMENT

E.L 809 WIRREALPA S.A.
WIRREALPA SPRING AREA

DETAIL GEOLOGY

Drawn R.K.	Date 32 3 81	Centre ADELAIDE
Prepared D.F.WARD 26 1 81	Project No. L 111	Drawing No. AO-1763
Checked M. ROCHE		

Revised 30/3/81 (R.K.)

EXPLORATION LICENCE 809

WIRREALPA, SOUTH AUSTRALIA

REPORT FOR THE QUARTER ENDED 2nd SEPTEMBER, 1982

1. GENERAL

Exploration Licence 809 of 1080 square kilometres (replacing E.L. 436) was granted to BHP Minerals Limited for one year on 2nd March, 1981, and was renewed for a further year on 2nd March, 1982.

2. FIELD INVESTIGATIONS

Due to commitments in adjacent areas, no exploration was carried out during this quarter on E.L. 809 Wirrealpa.

3. EXPENDITURE

Expenditure debited to E.L. 809 during the three months June, July and August, 1982, was:

Wages and Salaries	$2,594
Messing and Accommodation	275
Transport	415
Fares and Mobilisation	190
Radio Communications	47
Sample Analysis	151
Occupancy/Location Expenses	193
Administration/Overheads	170
	$4,035

Revised total expenditure on E.L. 436/809 to 31st August, 1982 is $382,202



This report is submitted to the Department of Mines and Energy as required by Condition 4 of Exploration Licence 809.

EXPLORATION LICENCE 809

WIRREALPA, SOUTH AUSTRALIA

REPORT FOR THE QUARTER ENDED 2nd DECEMBER, 1982

1. GENERAL

Exploration Licence 809 of 1080 square kilometres (replacing E.L. 436) was granted to BHP Minerals Limited for one year on 2nd March, 1981 and was renewed for a further year on 2nd March, 1982.

2. FIELD INVESTIGATIONS

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

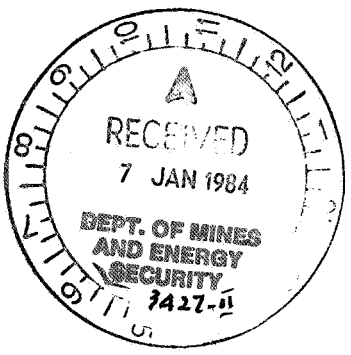
3. EXPENDITURE

Expenditure debited to E.L. 809 during September, October and November, 1982 was:

Wages and Salaries	$777
Messing and Accommodation	439
Fares and Mobilisation	11
Transport	755
Surveying and Aerial Photographs	15
Sample Analysis	119
Administration	106
	$2222

Total expenditure on E.L. 436/809 to 30th November, 1982 is $384,424.

This report is submitted to the Department of Mines and Energy as required by Condition 4 of Exploration Licence 809.



EXPLORATION LICENCE 809

WIRREALPA, SOUTH AUSTRALIA

REPORT FOR THE QUARTER ENDED 2nd MARCH, 1983

1. GENERAL

Exploration Licence 809 of 1080 square kilometres (replacing E.L. 436) was granted to BHP Minerals for one year on 2nd March, 1981 and was renewed for a further year expiring on 2nd March, 1983.

2. FIELD INVESTIGATIONS

Due to commitments in adjacent tenements (drilling/ geophysical surveys), no field work was carried out during this quarter.

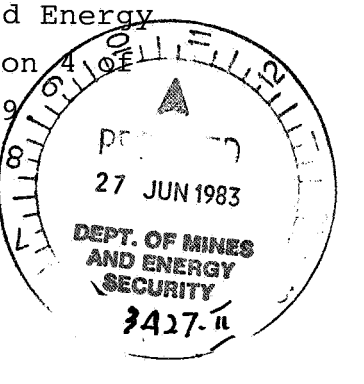
3. EXPENDITURE

Expenditure debited to E.L. 809 during December, 1982 and January and February, 1983 was:

Wages and Salaries	$2,455
Messing and Accommodation	91
Fares and Mobilisation	37
Transport	110
Tenement Fees, Licences etc.	1,620
Occupancy and Location Expenses	37
Administration and Overheads	218
	$4,568

Total expenditure on E.L. 436/809 to 28th February, 1983 is: $388,992

This report is submitted to the Department of Mines and Energy as required by Condition 4 of Exploration Licence 809.



EXPLORATION LICENCE 1129

WIRREALPA, SOUTH AUSTRALIA

REPORT FOR THE QUARTER ENDED 28th JUNE, 1983

1. GENERAL

Exploration Licence 1129 of 1080 square kilometres (formerly E.L. 436, then E.L. 809) was granted to BHP Minerals Limited for one year on 28th March, 1983.

2. FIELD INVESTIGATIONS

Ground checking of several stream sediment sample geochemical anomalies in the vicinity of Balcoracana Creek (results previously submitted) failed to detect any surface mineralisation.

A proposed soil sampling survey in this area was hampered by excessive rains which restricted access to the area.

3. EXPENDITURE

Expenditure debited to E.L. 1129 during March, April, May and June, 1983 was:

Wages and Salaries	$ 5,528
Fares and Mobilisation	375
Messing and Accommodation	154
Transport	70
Surveying and Aerial Photographs	15
Mobilisation of Equipment	45
Sample Analysis	282
Occupancy and Location Expenses	43
Tenement Fees, Licences etc.	4
Administration and Overheads	325
	$ 6,841

Total expenditure to 30th June, 1983 is: $395,833

RECEIVED
12 AUG 1983
DEPT. OF MINES AND ENERGY SECURITY
$427.

This report is submitted to the Department of Mines and Energy as required by Condition 4 of Exploration Licence 1129.

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.

18 MAY 1984

Dear Sir,

QUARTERLY REPORT EXPLORATION LICENCE 1129
WIRREALPA - S.A. - 28/9/83

No field work was carried out during the period, due to commitments in adjacent exploration licence areas.

A summary report of the entire Flinders Project is presently being compiled.

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
E6/20/3-

RECEIVED
22 MAY 1984
DEPT. OF MINES AND ENERGY
SECURITY
3427-II

THE FLINDERS PROJECT

EXPLORATION FOR CARBONATE - HOSTED BASE METALS

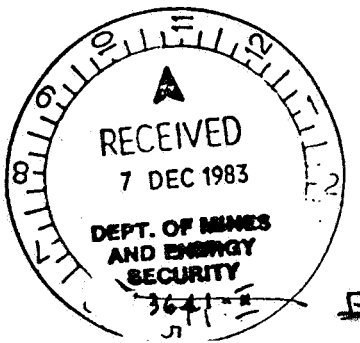
IN THE

FLINDERS RANGES, SOUTH AUSTRALIA.

Compiled by

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

September 1983



Env. 3427.

~~Env. 3968~~

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Appendix Available Data.

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.

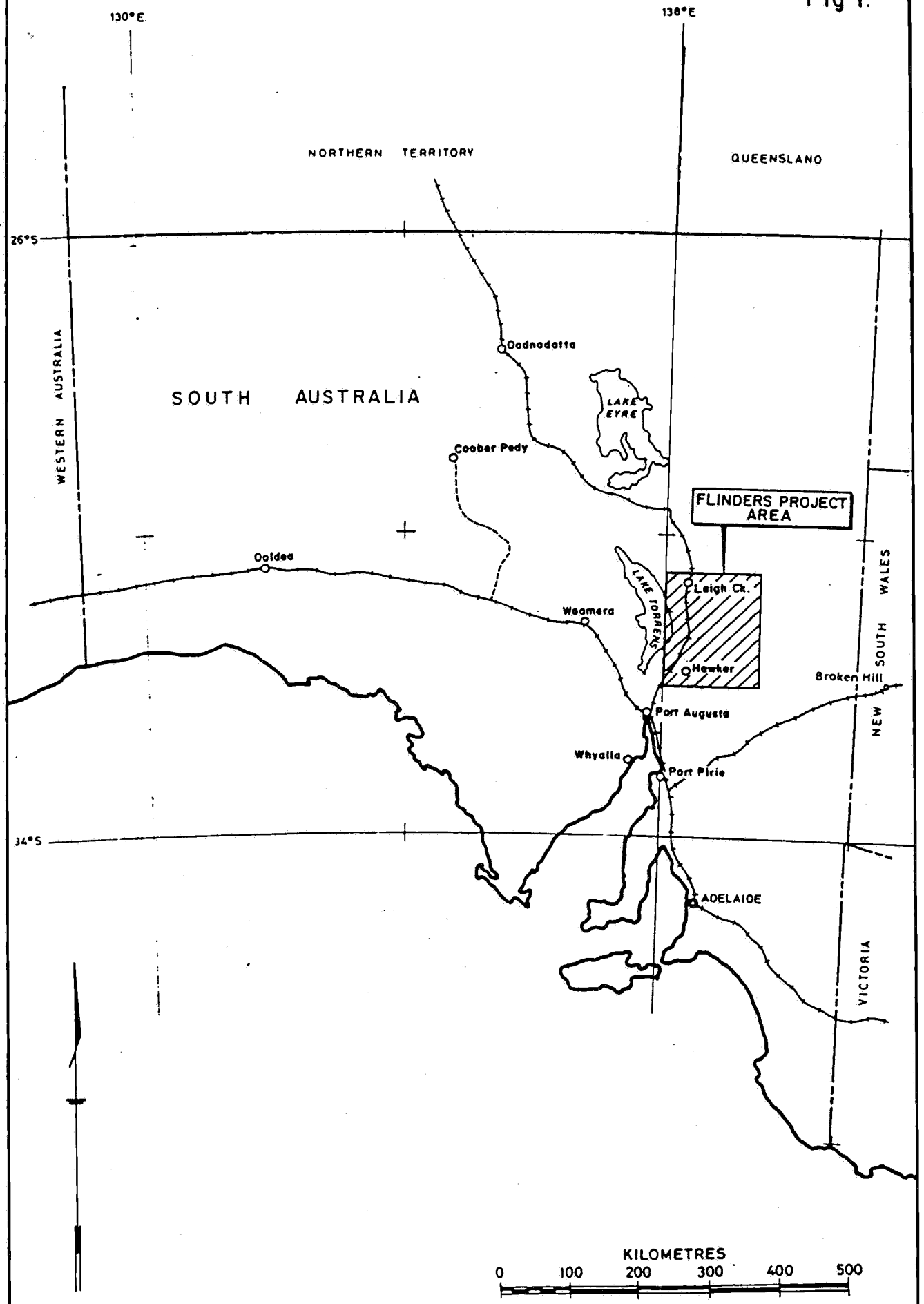
Exploration to date has concentrated on recognizing and evaluating the significance of features characteristic of MVT deposits, the most important of which are the occurrences of lead-zinc mineralization as open-space filling, the development of reefs and unconformities, and dolomitization. The evidence 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).

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

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.

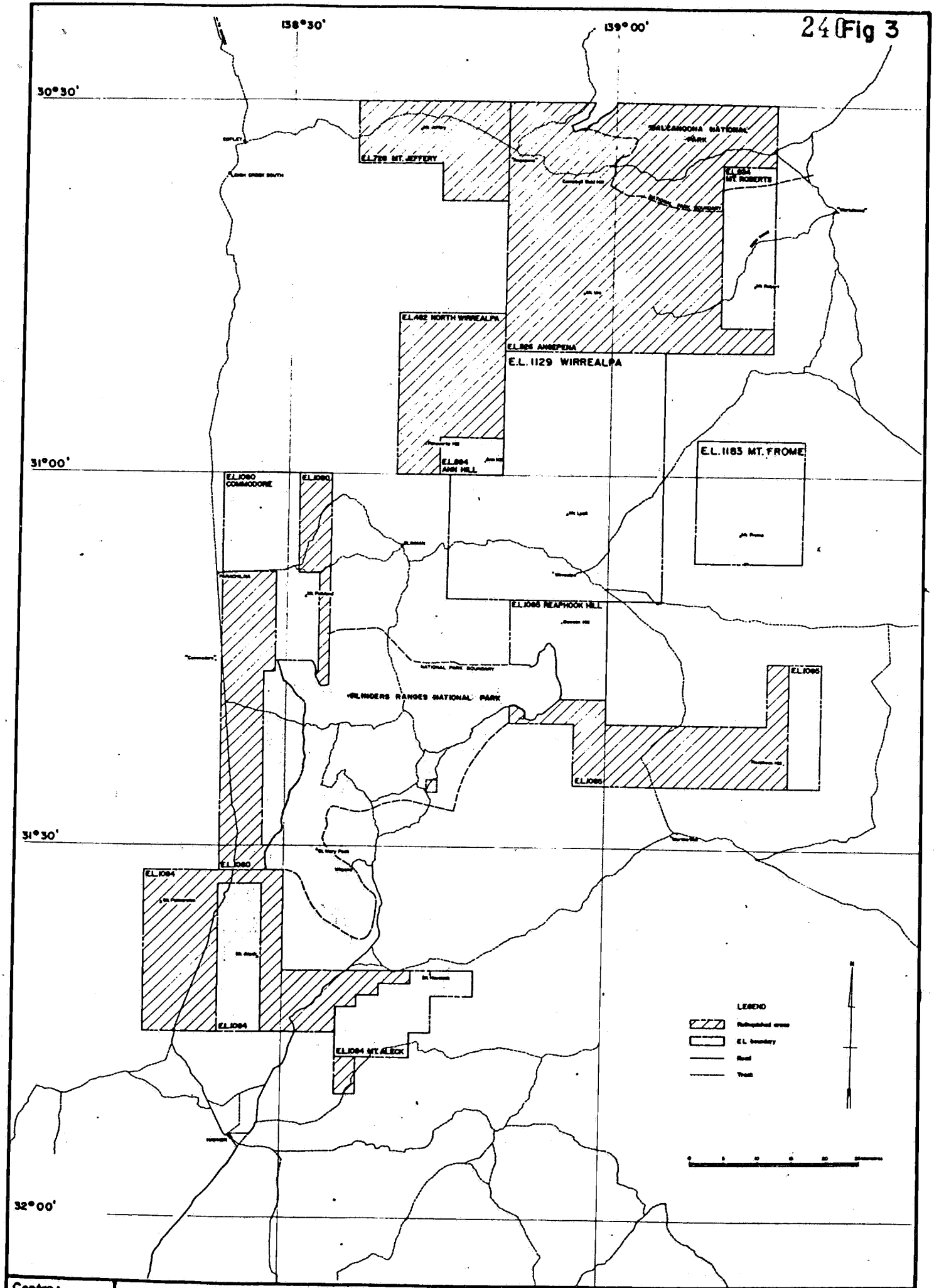
As the Flinders Ranges is a region of general environmental interest, we are required to observe special work conditions on some tenements. These are not restrictive.

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

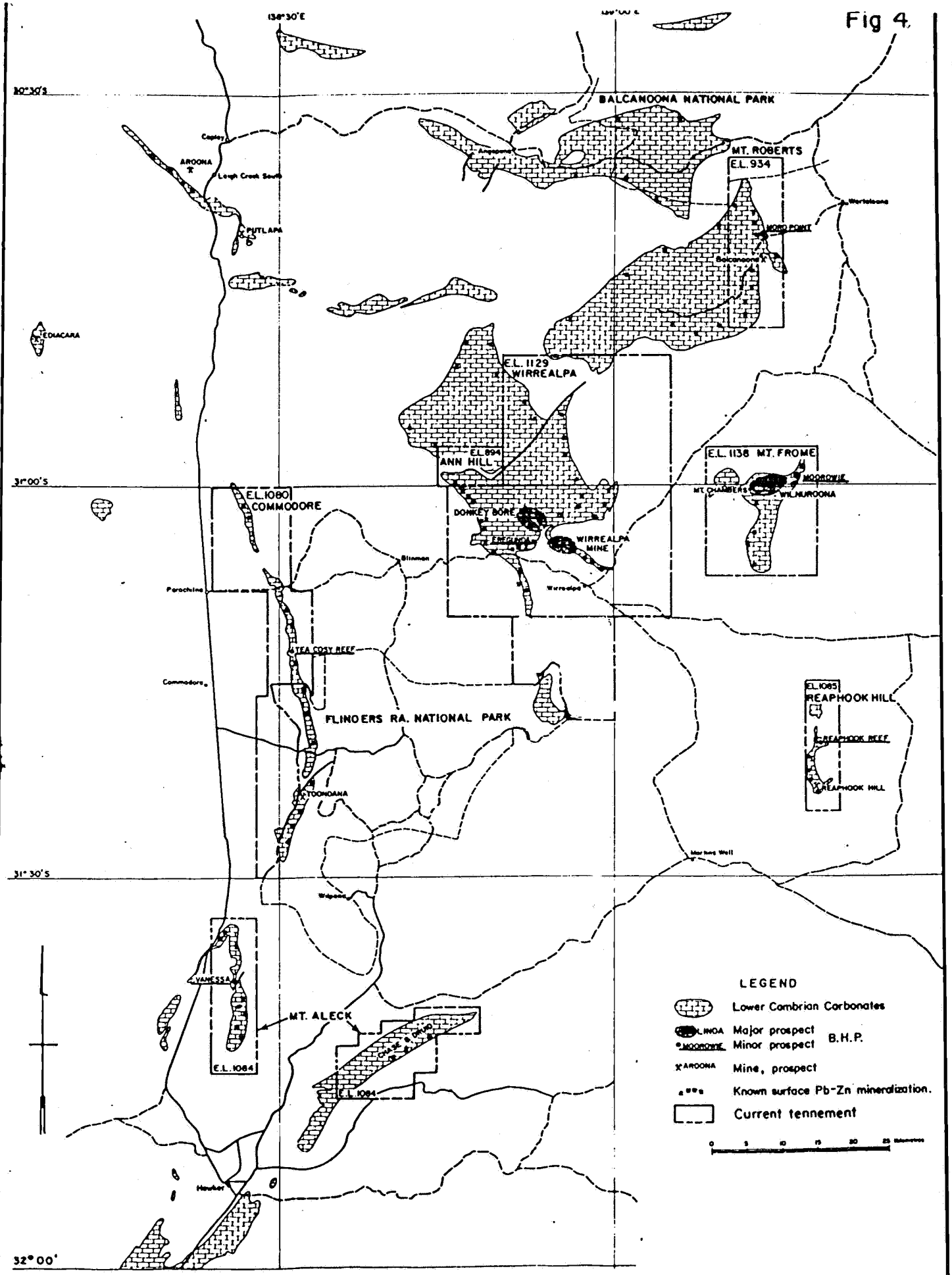
Cumulative where appropriate.

240 Fig 3



Centre: Melbourne	THE BROKEN HILL PROPRIETARY CO. LTD.	Project No:
Date: 11-10-83	FLINDERS RANGES PROJECT, S.A.	Drawing No.
	EXPLORATION LICENCES	

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

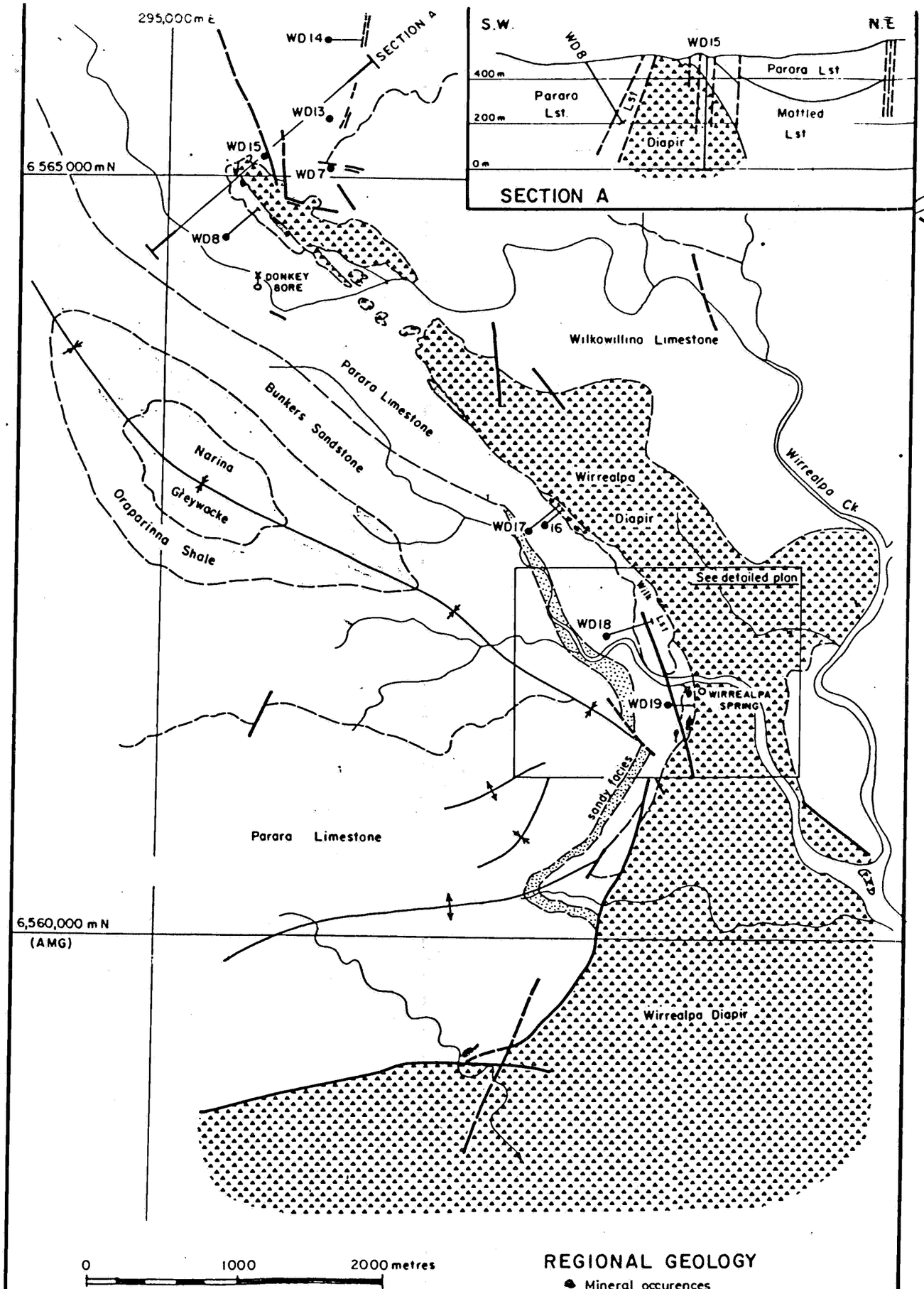
The Donkey Bore prospect is on the north eastern limb of an assymetrical syncline of lower Cambrian carbonates. At this locality which abuts the north-western extension of the Wirrealpa Diapir approximately 600 metres of section known from the western limb of the syncline is missing. A major unconformity 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.



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

245

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

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

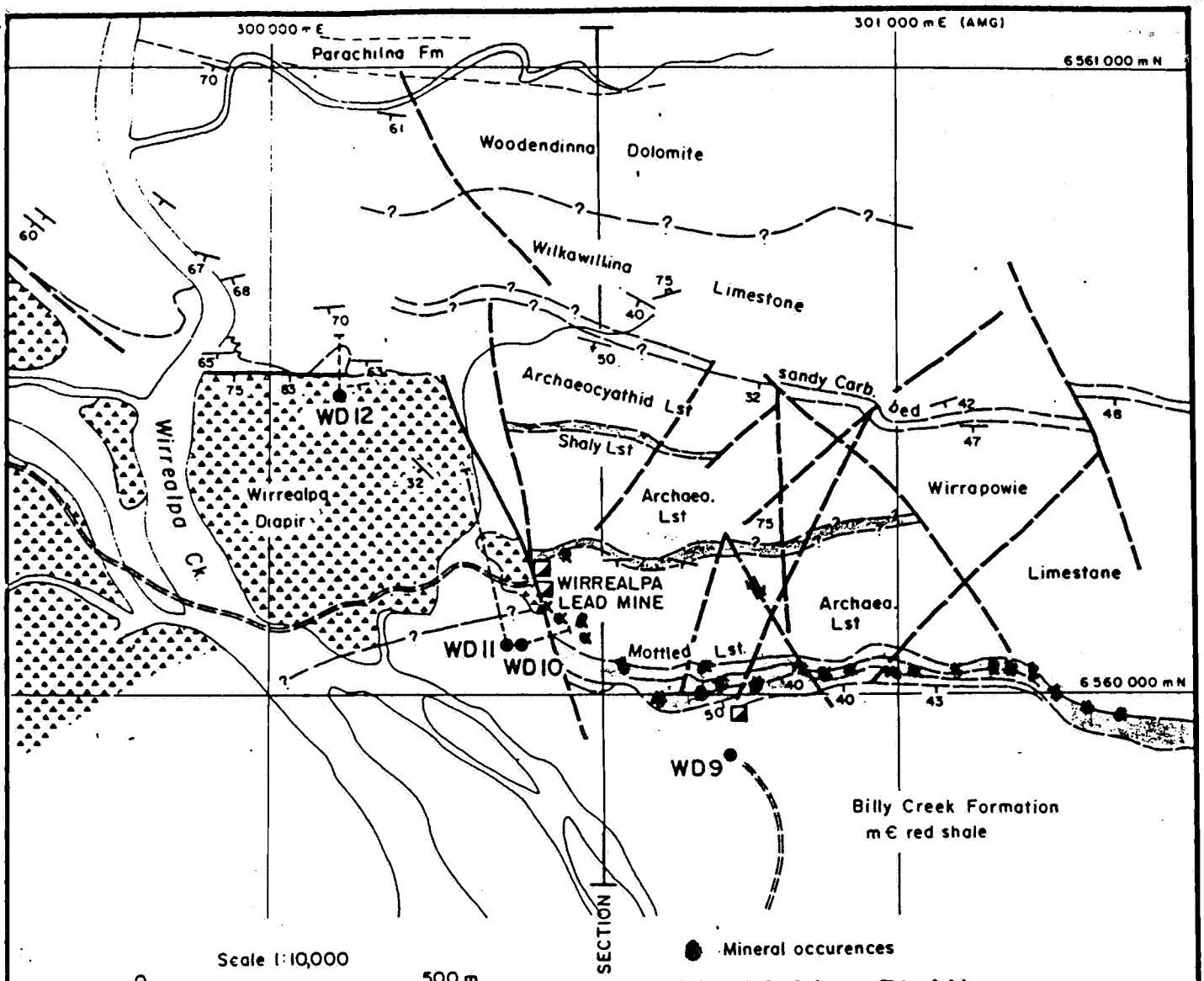
The prospect lies within lower Cambrian archaeocyathid-rich limestones below an unconformity and adjacent to the faulted contact between the lower Cambrian and the Wirrealpa Diapir. Sandstones and shales of middle Cambrian Billy Creek Formation overlie the unconformity. Recent drilling by BHP suggests 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.



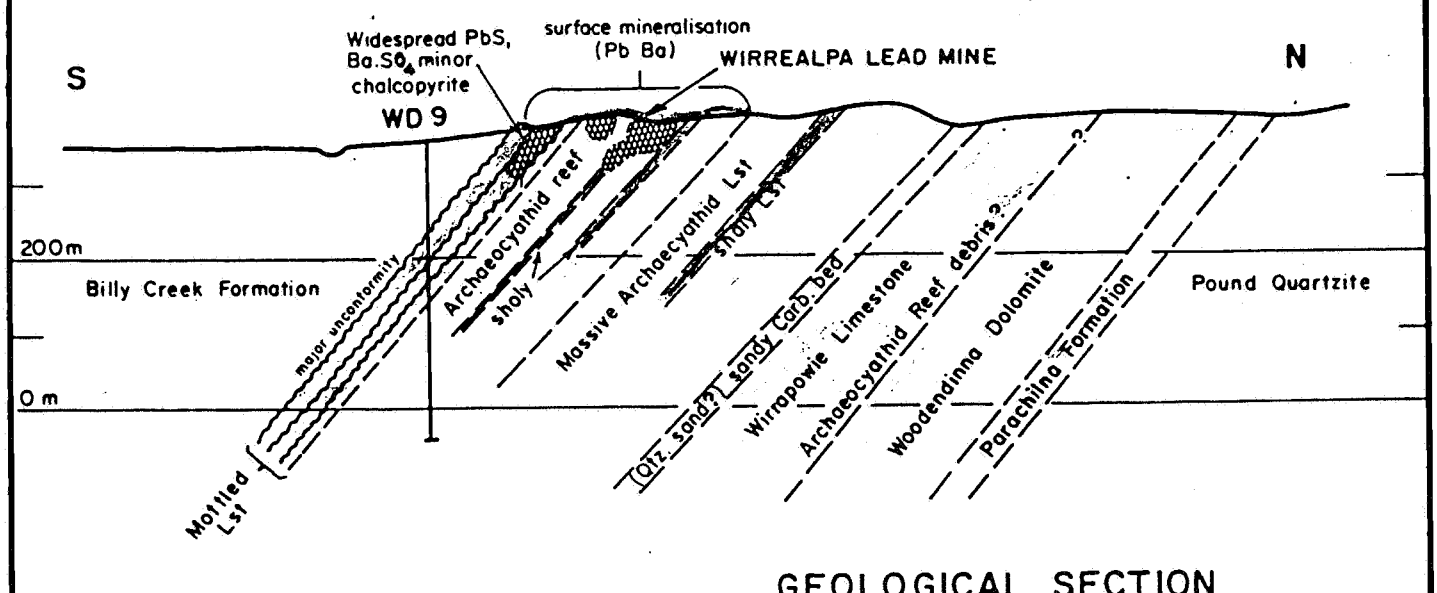


Fig 8

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.

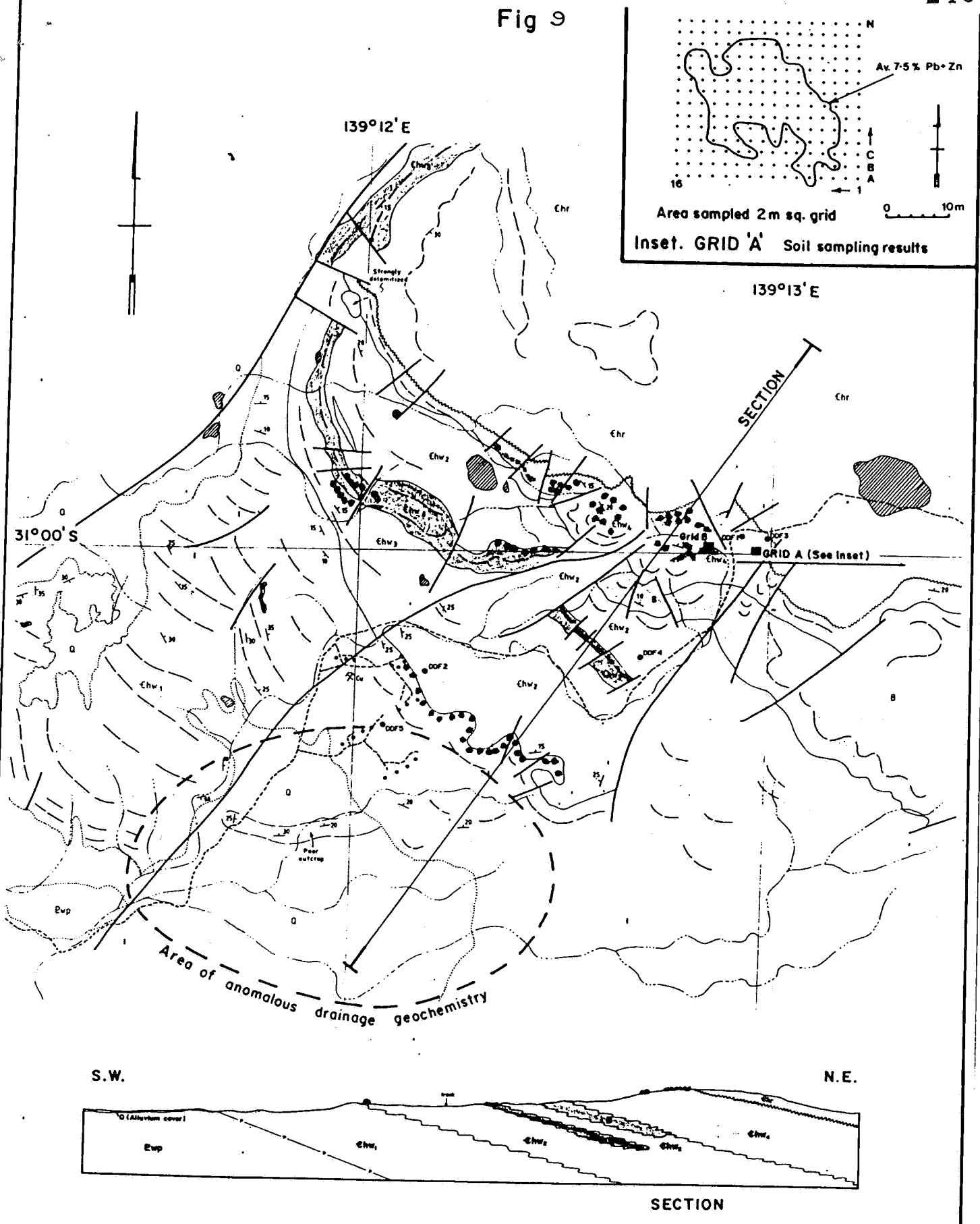
Prepared Ground/Mineralization

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



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 Whyt, 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.

18 MAY 1984

Dear Sir,

QUARTERLY REPORT EXPLORATION LICENCE 1129
WIRREALPA - S.A. - 28/12/83

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: SH:ls
E6/20/3-T

RECEIVED
22 MAY 1984
DEPT. OF MINES AND ENERGY SECURITY
3427

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

18 MAY 1984

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

Dear Sir,

QUARTERLY REPORT EXPLORATION LICENCE 1129
WIRREALPA - S.A. - 28TH MARCH, 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 Ltd.

B.J. VIVIAN

RECEIVED
31 MAY 1984
DEPT. OF MINES AND ENERGY SECURITY

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Our Ref: SH:JOH
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[Incorporated in WA]
"Wolfstep Building" 695 Burke Road
Camberwell Victoria 3124
Australia

The Director General,
Department of Mines and Energy,
P.O. Box 157,
EASTWOOD, S.A., 5063.

13 SEP 1984

Dear Sir,

QUARTERLY REPORT EXPLORATION LICENCE 1129
WIRREALPA - S.A. - 28TH SEPTEMBER, 1984

No field work was carried out during the last quarter.

The Joint Venture Agreement with Esso Minerals on the Flinders Ranges Project has been executed and an application for ministerial consent is underway.

Yours faithfully,
for BHP Minerals Limited

B. J. VIVIAN

Telephone 813 3666
Telegrams
'Hematite' Melbourne
Telex 30 408

Postal Address
P.O. Box 559
Camberwell
Victoria 3124

Your Ref:
Our Ref: SH:ls
E6/20/31

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17 SEP 1984
DEPT. OF MINES AND ENERGY SECURITY
3427-II

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 16 January, 1985

YOUR REF:

OUR REF: 6180/RH/598

SUBJECT Wirrealpa - Mines Department Report

The Director-General
Department of Mines and Energy
191 Greenhill Road
PARKSIDE WA 5063

Dear Sir,

In accordance with Clause 3.1 of Flinders Range Joint Venture Agreement, Esso submits the following quarterly report in respect to Exploration Licence 1129 (Wirrealpa).

The exploration conducted during the quarter ending 28 December 1984 consisted of a total of 496 metres reverse circulation and 185 metres core drilling which was recently completed at the Donkey Bore and Wirrealpa Mine prospects. A full report on this drilling programme is being compiled and will be forwarded with the next quarterly report. No field work is proposed for the next quarter.

We advise expenditures on the above joint venture for the quarter are as follows:

	Cumulative Previous Periods	This Period	Cumulative to Date
Geological	-	14,940	14,940
Geophysical	-	-	-
Geochemical	-	711	711
Drilling	-	22,998	22,998
Technical Service	-	-	-
Computer	-	-	-
Other	-	950	950
Overheads (5%)	-	1,980	1,980
TOTAL	-	41,579	41,579

Yours faithfully,

Russell Hetherington
Senior Landman
Minerals Department

Encl.

RECEIVED
22 JAN 1985
DEPT. OF MINES AND ENERGY
SECURITY
3427-A

FLINDERS RANGES JOINT VENTURE (ESSO/BHP)

REPORT OF THE 1984 DRILLING PROGRAMME

E.L. 1085 REAPHOOK HILL

E.L. 1129 WIRREALPA

E.L. 1138 MT. FROME, SOUTH AUST.

RECEIVED
12 MAR 1985
DEPT. OF MINES AND ENERGY SECURITY
3427-III
3427

M. ROCHE
PROJECT GEOLOGIST
BHP MINERALS LTD.
DECEMBER, 1984.

SUMMARY

A total of 1370 metres reverse circulation (34 holes), 1100 metres rotary air blast (107 holes) and 185 metres core (1 hole) drilling was completed in five of the prospects in the Flinders Ranges Joint Venture Project areas, during the latter part of 1984.

The most significant results from this drilling were:-

(b)	WILNUROONA Prospect: (RC drill)	PWP1	:	40m @ 1.96% Pb + Zn (including 8m @ 7.9%)
		PWP2	:	8m @ 1.9% Pb + Zn
		PWP3	:	6m @ 1.0% Pb + Zn
(c)	ERIC Prospect (RAB drill)	REP38	:	4m @ 1% Pb
		REP43	:	10m @ 4% Pb
		REP56	:	6m @ 3.5% Pb
		REP69	:	11m @ 1.4% Pb
		REP86	:	8m @ 2.0% Pb
		REP87	:	2m @ 1.1% Pb
		REP99	:	4m @ 1.8% Pb
(d)	WIRREALPA MINE Prospect: (Core drill)	DWM1A	:	6m @ 1.1% Pb

Further core drilling is warranted in each of these areas in 1985.

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~~3.1.1~~	~~LINDA Prospect~~	
3.2	E.L. 1138 Mt. Frome	
3.2.1	WILNUROONA Prospect	
3.2.2	ERIC Prospect	
3.3	E.L. 1129 Wirrealpa	
3.3.1	DONKEY BORE Prospect	
3.3.2	WIRREALPA MINE Prospect	
4.	CONCLUSIONS AND RECOMMENDATIONS	4.

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C Drill Logs
D ERIC Prospect - RAB drillhole profiles

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Figure 5. WILNUROONA & ERIC Prospects (A4-372)

Figure 6. WILNUROONA Prospect - Fence Diagram (A3-256)

Figure 7. ERIC Prospect - Drillhole Location/Profiles (A2-717)

Figure 8. DONKEY BORE Prospect - Drillhole Location (GS-69)

Figure 9. WIRREALPA MINE Prospect - Drillhole Location (A3-233)

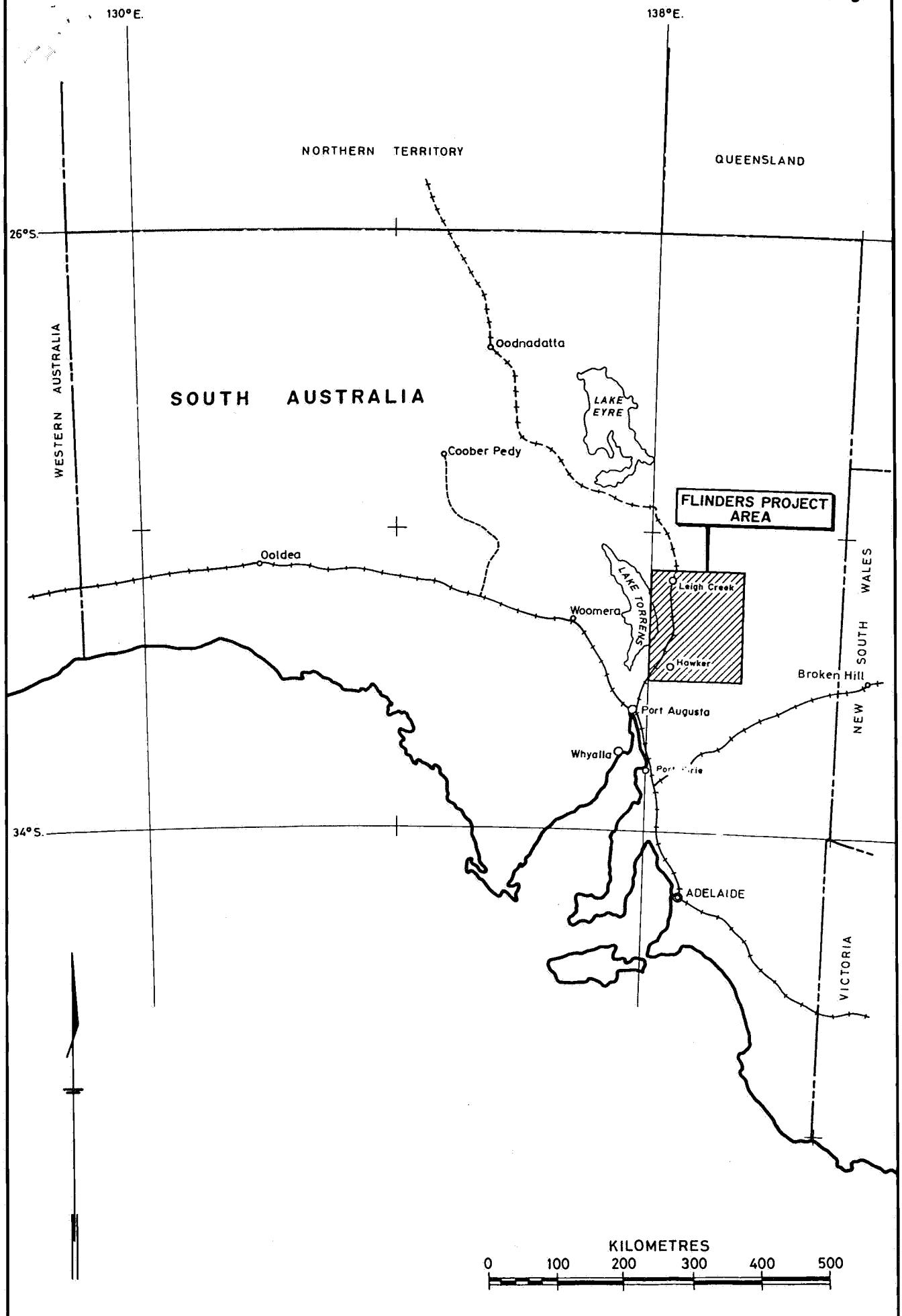
~~PLATES Photographs of Drillcore from DWM1A~~

~~Plate 1 133.55 to 139.34~~

~~Plate 2 139.39 to 146.00~~

~~Plate 3 146.00 to 151.84~~

~~Plate 4 151.84 to 157.96~~



Centre: Melbourne	THE BROKEN HILL PROPRIETARY CO LTD FLINDERS PROJECT J.V., S.A. LOCATION MAP	Project No.: 6 - L15 - 8
Date: 2 - 1 - 85		Drawing No: A4- 381

1. INTRODUCTION

The 1984 Drilling programme in the Flinders Ranges Joint Venture areas commenced on September 15th and terminated on 7th December having completed 1368.5m (34 holes) reverse circulation, 1106.6m rotary air-blast (107 holes) and one diamond drill hole total depth 185 metres.

This report gives details of the drilling with geological and geo-chemical results from the ~~five~~ prospects drilled: viz., ~~LINDA,~~ WILNUROONA, ERIC, DONKEY BORE and WIRREALPA MINE.

A complete list of geological drill logs and assay results are included in this report.

The original proposals and rationale for this drilling programme is summarized as follows:-

(b) WILNUROONA: Six drillholes each to 50 metres depth to test depth extension of mineralization at Grid A. Two holes each to 75m to test Flinders unconformity adjacent to i) Grid A and ii) the fluorite occurrence.

(c) ERIC: Up to 150 RAB holes at 100m centres to locate source of highly anomalous stream geochemistry results (up to 6,000 ppm Zn, 4,000 ppm Pb) in an area of probable major collapse. Hole depths estimated to average 10 metres.

(d) DONKEY BORE: Approximately 9 holes to be drilled in the vicinity of WD 19, 15, 16, 18 to test lateral extension of mineralization detected in these previously drilled diamond holes.

(e) WIRREALPA MINE: Two diamond drill holes both to be collared in the "Wirrealpa Diapir", and ~~targetted~~ to intersect the "Mine mineralization" in both "diapir" fill and Cambrian "karst" fill at approximately 200m. Values of up to 40% Pb and 8 ozs/ton Ag have been recorded from samples collected from the underground workings at the Wirrealpa Mine.

The emphasis of this drilling programme was to give geochemical evidence to several hypothetical scenarios proposed for the Flinders Ranges MVT Model. To further the depth of geological knowledge on facies, controls and mineralization it is vital that further drilling be predominatly core drilling.

2. DRILL-HOLE CLASSIFICATION

Due to erratic distribution of mineralization in MVT deposits, it is necessary, for both estimating ore reserves and assessing results of exploratory drilling, to adopt a statistical approach in the early stages of drilling within prospect area.

The practise in most operating MVT mines worldwide is to classify drill-holes depending on the thickness and degree of mineralization intercepted in each hole. No universal classification exists, as variables such as economic mining thickness and grade vary from district to district. However, one can get a "ball-park" classification which can be applied to the Flinders Ranges area.

These classifications when plotted on plans allow, an immediate appreciation for mineralizing trends, extent of mineralization and facilitate in planning detailed follow-up drilling.

The following standard classification types are proposed for the Joint Venture areas:-

"PAY" - 10 metre percent (10m%) or more over a minimum of 4m thickness. A pay hole should be followed up by four (4) holes drilled on a 100m grid around the discovery. Any additional new pay intercepts should be regarded as sufficiently encouraging to further expand the grid drilling in the direction implied by the mineralization and geological information gained.

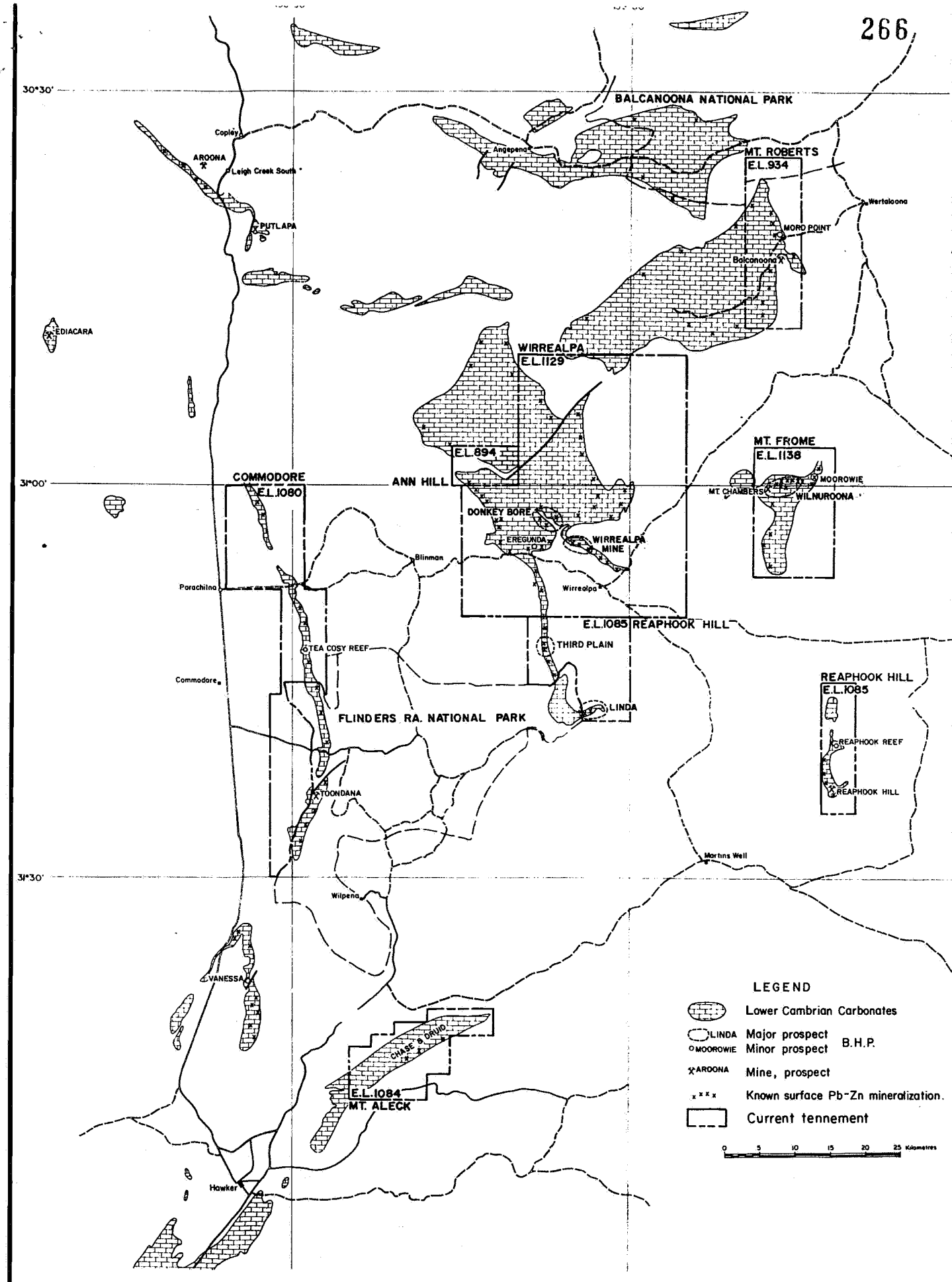
"INDICATIVE" - 5 to 9.9m% over a minumum thickness of 4 metres. An indicative hole in the reconnaissances stage of exploration is encouraging and should be followed up by four (4) holes drilled on a 300m grid with the aim of gaining valuable knowledge on facies and nature/extent of ground preparation and hopefully intercepting "pay" horizons.

"TRACE" - 1 to 4.9m% over a minimum thickness of 4 metres. Trace holes are expected to be common in a mineralized district (e.g. Flinders Ranges) and do not require follow-up drilling (unless geological/lithological knowledge gained suggest otherwise).

"SHINE" - less than 1m%.

"BLANK" - no detectable minerlization.

It is anticipated that these classifications will change as more drilling is undertaken in the project areas; for the assessment of the present state of knowledge and to assist in future planning I suggest the above classification be adopted



Centre	THE BROKEN HILL PROPRIETARY CO. LTD.	Project Nº
Adelaide	FLINDERS RANGES PROJECT, S.A.	6 - L15 - 1
Date	LOCATION OF PROSPECTS	Drawing Nº
2 - 10 - 84		A4-370

3. DRILLING DETAILS

3.2 E.L. 1138 MT. FROME

3.2.1 WILNUROONA PROSPECT

INTRODUCTION

A total of 370 metres of reverse circulation drilling was completed within the Wilnuroona Prospect. Drilling was commenced on 1st October, 1984 and was completed on 19th October, 1984 (i.e. average of 18 metres per day). W.L. Sides and Son were contracted to undertake this drilling programme utilising an Atlas Copco B80 rotary rig.

DRILLING/SAMPLING DETAILS

Seven (7) reverse circulation holes, totalling 370 metres were completed (PWP3 abandoned at 45m) in the Wilnuroona Prospect. The drillholes are indentified by the prefix PWP.

Five (5) of these drillholes tested the depth of mineralization at Grid A (PWP1-5), whilst one hole (PWP6) tested one area of mineralization adjacent to and stratigraphically above Grid A and the last hole (PWP7) tested an area of fluorite/smithsonite/galena mineralization along strike from PWP6. All of the drillholes were vertical, except for PWP3 which was drilled 62°/240.

The percussion samples were collected at 2 metre intervals, split (with riffle) to approximately 2kg samples and bagged. Half of the sample from the first split of each 2 metre interval was placed in calico bags and is stored at Point Well homestead (base camp) for future reference.

The 2kg samples were periodically transported to COMLABS (Adelaide), where they were dried, pulverized, dissolved by acid attack and analysed for Cu, Pb and Zn using atomic absorption spectrophotometry. Selected samples (mainly Pb >1%) were also later analysed for Ag.

All assay results are included in this report.

RESULTS

Assay results from this drilling were most encouraging including one of the most mineralized intersections ever drilled in the Lower Cambrian of the Flinders Ranges (2m of 7.45% Pb, 6.15% Zn). PWP1 averaged 40m of 2.0% Pb + Zn (which included 8 metres of 7.9% Pb + Zn) and along with PWP2 (8m of 1.9% Pb + Zn) is classified as a pay hole.

As can be seen from figure 5 , PWP1 was drilled outside the zone of high grade mineralization, and PWP2 within this zone, however, PWP1 returned the best assay values. PWP3 which was collared in "apparent" outcrop, drilled through 34 metres of clay/sand before intersecting solid limestone. This represents either a very strongly weathered remnant of a Cambrian karst zone, or, more likely, a recent/tertiary fill which is reflecting a paleokarst development.

PWP4, although only 20 metres away from PWP3, intersecting generally "fresh" calcarenite with only minor dolomitization.

The brecciated nature of the dolarenite from PWP1 and 2, the irregular karst surface reflected in PWP3 supports the areas interpretation of this zone as being one of a fault affected (increasing ground preparation/porosity) karst system related to the Flinders Unconformity.

Two factors which have enhanced the assay values from this area are i) surface enrichment and ii) Mn scavaging. When the values intersected in the drilling are compared with those from a jack-hammer sampling programme in this area the former results are greatly diminished. This is seen in all elements including Ag, which reached a maximum of 158 ppm on the surface but only 18 ppm maximum in the drilling.

More detailed studies (petrological) will quantifythis enhancement of the mineralization. The drilling in this area has however, shown that a minimum thickness of the mineralized horizon is 50 metres (PWP1).

Drillhole PWP6 was drilled to test any depth extension to "ore-grade" surface mineralization. The maximum 2 metre interval from this hole was 0.28% Pb + Zn. The lithology, prepared ground and mineralization has changed greatly, over the 10 metres from surface outcrop to corresponding depth intersection. This suggests that this zone is also part of a major collapse zone, associated with karst development beneath the Flinders Unconformity.

PWP7 did not intersect any of the fluorite, smithsonite or galena as seen on the surface over a stratigraphic thickness of about 4 metres. Zones of massive pyrite/calcite were intersected in the hole, reflecting the karst development associated with the Unconformity, however was barren of lead or zinc sulphides.

3.2.2 ERIC PROSPECT

INTRODUCTION

A total of 1106.6 metres of rotary air blast (RAB) drilling was completed within the Eric Prospect. Drilling commenced on 20th October, 1984 and was completed on 28th October, 1984 (i.e. average of 123 metres per day).

W.L. Sides and Son were contracted to undertake this drilling programme utilising an Atlas Copco B80 drill rig.

DRILLING/SAMPLING DETAILS

One hundred and seven (107) rotary air blast holes, totalling 1106.6 metres (average depth 10.3 metres) were completed within the ERIC prospect. The drillholes are identified by the prefix REP.

A grid measuring 1000m (E-W) by 1500m (N-S) was surveyed (tape & compass) at 100m spacing over an area of generally non-outcrop which reflected highly anomalous stream geochemistry. The most anomalous values from the drainage system is the approximate centre of the grid.

This area has very few tracks within it and access to drillsites (unprepared) was by unmade routes directed so as to cause as little disturbances as possible to the vegetation.

As is the case with all areas drilled, photographs (from both ground and air) have been taken before, during and after drilling, to show the negligible effect this drilling programme has had on the environment.

Several grid locations were not drilled, either due to that site having outcrop or site was inaccessible. Approximately 20 holes were not drilled due to inaccessible country.

The samples were collected over 1 metre intervals, split (with riffle) to approximately 1.5kg samples and bagged. A reference sample for each interval was collected in plastic tackle boxes. The bagged samples were periodically transported to COMLABS (Adelaide) where they were dried, pulverized, dissolved by acid attack and analysed for Cu, Pb and Zn using atomic absorption spectrophotometry. Selected samples (mainly Pb >1%) were later analysed for Ag.

All assay results are included in this report.

RESULTS

The target depth (bedrock) for the RAB drillholes was estimated to average 10m; the holes were ceased when i) hit rock, ii) unable to continue (caving etc.) or iii) depth of 38m reached (this was the total of drill rods).

Several of the northernmost holes (REP1, 3, 4) were sited adjacent (2-5 metres away) to outcrop yet drilled 38 metres of sand and clays - indicative of a collapse environment.

The lithologies were similar for all drillholes - viz., variegated calcareous sand and silt with strongly weathered calcarenite/dolarenite and traces of calcrete and silcrete.

A predominantly lead-rich anomalous zone, measuring approximately 1200 x 400 metres, was detected during this drill programme. The mineralized drillholes included REP38 (4m @ 1% Pb), REP43 (10m @ 4.0% Pb), REP56 (6m @ 3.5% Pb), REP69 (1.1m @ 1.4% Pb), REP86 (8m @ 1.97% Pb), REP87 (2m @ 1.06% Pb), REP99 (4m @ 1.8% Pb). The zinc values were generally low, with maximum values being located in the northernmost area (REP2-5) where the average maximum was 2300 ppm. The copper values were generally background to slightly anomalous, with maximum value of 1000 ppm (REP39, 95). Silver values were slightly anomalous (REP56 - 3 ppm).

It is proposed that the anomalous zone is part of a major "plumbing system" associated with a strongly weathered collapse zone. It is difficult to estimate the degree of influence of metal source (i.e. primary, secondary dispersion, secondary enrichment) reflected in these results.

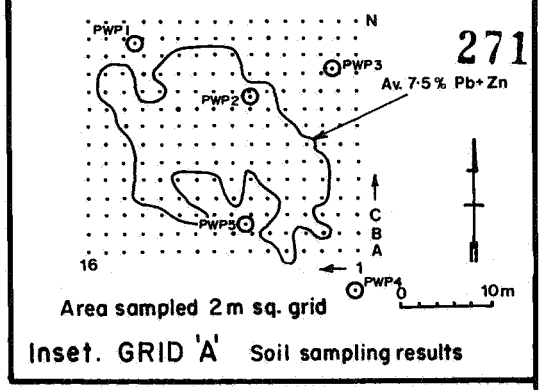
However, it is proposed that Lower to Middle Cambrian karst developement of the Lower Cambrian carbonate units has since (possible in Tertiary) been reactivated (tectonically) and subsequently "rekarsted". Intense weathering since then has resulted in the present landscape of limited outcrop.

The source and timing of the metals is enigmatic at this stage; it is tentatively suggested that the initial mineralizing event was post primary karst development (i.e. during Lower to Middle Cambrian) and that secondary enrichment has resulted from the development of the later prepared ground.

In areas of outcrop adjacent to ERIC Prospect (e.g. WILNUROONA) lead, zinc, silver, fluorite has been found within the "primary" porosity (vughs, stylolites etc.,) of the massive Wilkawillina limestone, with areas of "secondary" porosity (fault breccia) reflecting secondary enrichment of the primary ore (e.g. WILNUROONA Prospect).

Further drilling in this area should clarify further the lithologies, a metal source and potential of this area.

Computer generated plots and profiles are included in this report.



Area sampled 2m sq. grid

Inset. GRID 'A' Soil sampling results

139°12'E

328000mE

139°13'E

330000mE

65700000mN

65680000mN

31°00'S

SECTION

WILNUROONA PROSPECT

GRID A (See Inset)

Grid B

PWP6

PWP7

DDF1

DDF2

DDF3

DDF4

DDF5

Strongly dolomitized

Poor outcrop

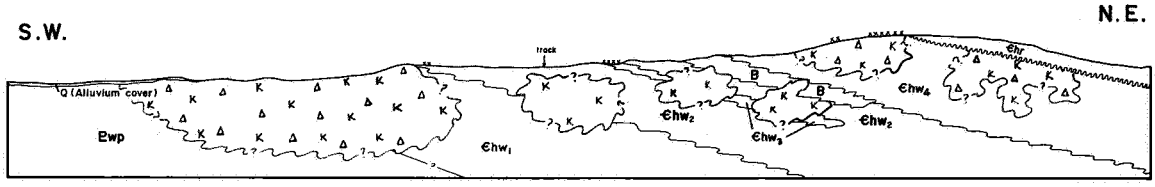
R.A.B. drilling at 100metre spacing

Area of anomalous drainage geochemistry

ERIC PROSPECT

S.W.

N.E.



SECTION

BENDIEUTA FORMATION	Q	ALLUVIUM
	K K K Δ Δ	KARST/ BRECCIA
	€hr	PARARA LIMESTONE
		FLINDERS UNCONFORMITY
	€hw4	
	B €hw3	
	€hw2	WILKAWILLINA LIMESTONE
	€hw1	
	F	FLAGGY LIMESTONE
	Wood	WOODENDINNA DOLOMITE
	Pwp	POUND QUARTZITE
		"DIAPIRIC" BRECCIA

× MINERALIZATION (Cu/Pb/Zn)

FAULT

DRAINAGE

TREND LINES

LITHOLOGICAL BOUNDARIES

OUTCROP BOUNDARY

TRACK

DDF4 B H P DIAMOND DRILLHOLE

• UNION MINIÈRE PERCUSSION DRILLHOLE

PWP4 Reverse Circulation drillhole

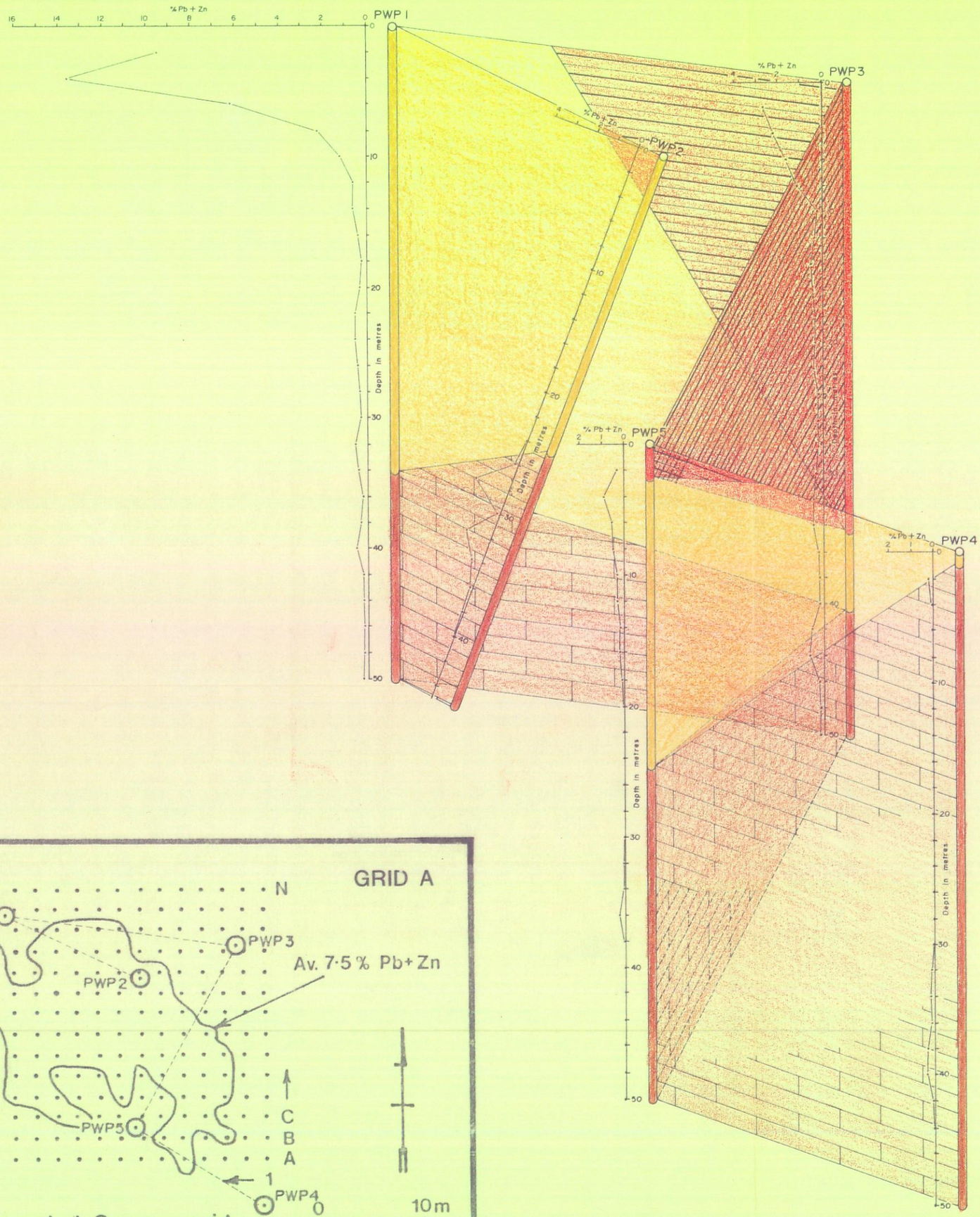
0 200 400 600 800 1000 metres

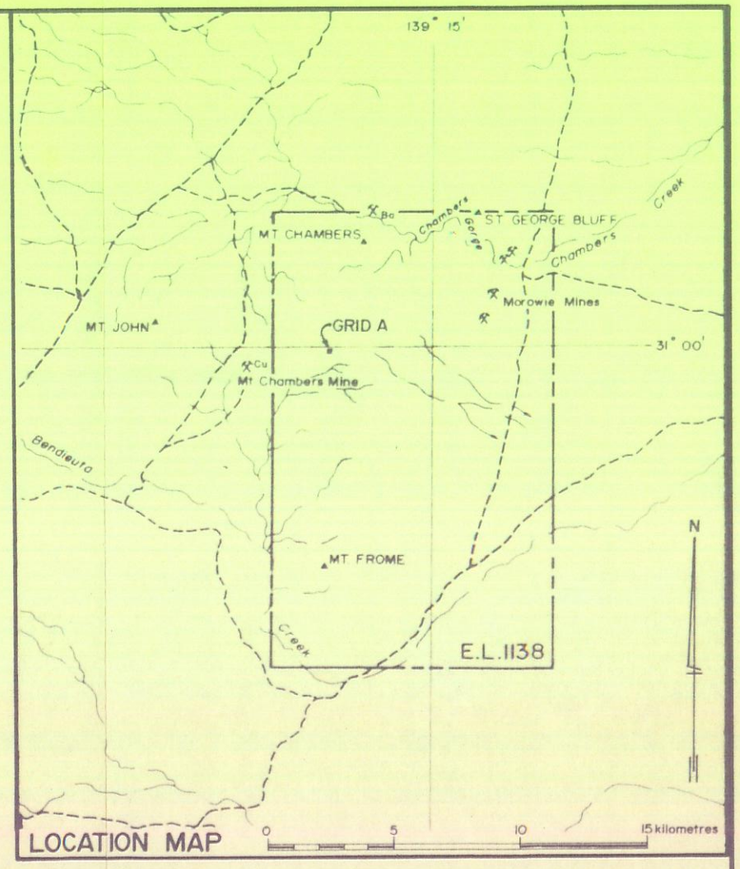
THE BROKEN HILL PROPRIETARY CO. LTD.
EXPLORATION DEPARTMENT

E.L.1138 MT. FROME, S.A.
WILNUROONA AND ERIC PROSPECTS

Drawn: M.T.R.	Date: 6-81, 9-83	Centre: Why, Adel.
Traced: R.K., A.R.V.	Project No: 6 - L15 - 5	Drawing No: A4-372
Checked:		

Revisions: 4-10-84, 3-1-85





Dolomitization

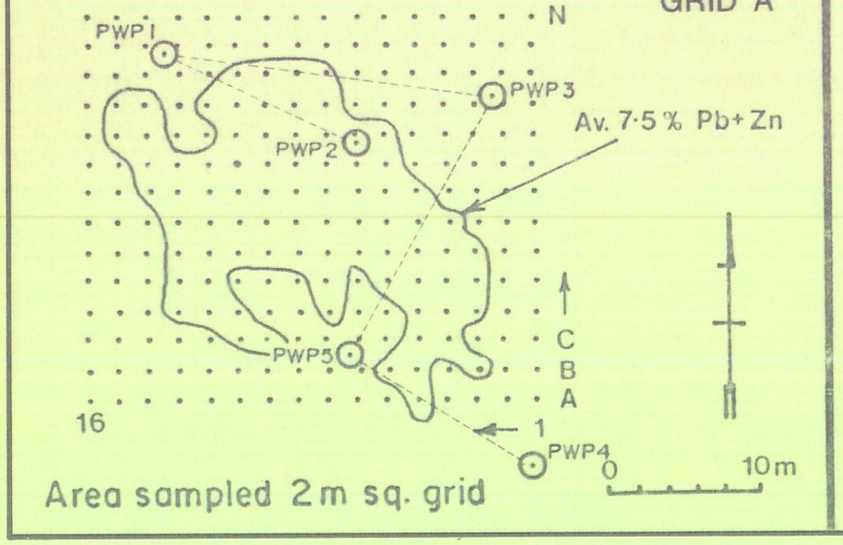
Limestone

Recent (?) fill

Downhole geochemistry (sample interval: 2 metres) 1cm = 2% Pb + Zn

Drillhole depth scale 1:333

Note: GRID A was sampled on the surface using a jack-hammer



SCALE 1:200

0 5 10 15 metres

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E.L.1138 MT. FROME, S.A.
ERIC PROSPECT
FENCE DIAGRAM OF PWP1 - PWP5

272

Revisions:			
Prepared by: M.T. Roche	Centre: ADELAIDE		
Date: 7 - 1 - 85	Project No 6 - L15 - 9	Drawing No A3-256	
Drawn: A.R. Veale			

3.3. E.L. 1129 WIRREALPA

3.3.1 DONKEY BORE PROSPECT

INTRODUCTION

A total of 496.5 metres of reverse circulation drilling was completed within the Donkey Bore Prospect. Drilling commenced on 31st October and was completed on 11th November, 1984 (average 42 metres/day).

W. L. Sides and Son were contracted to undertake this drilling programme utilising an Atlas Copco B80 rotary rig.

DRILLING/SAMPLING DETAILS

Seven (7) reverse circulation holes, totalling 496.5 metres were completed (4 abandoned) in the Donkey Bore Prospect. The drillholes are identified by the prefix PDP.

Five (5) of the drillholes were sited to test the lateral extent of mineralization found previously in WD19, whilst two (2) holes were sited to test the lateral extent of prepared ground found in WD16.

The percussion samples were collected at 2 metre intervals, split (with riffle) to approximately 2kg samples and bagged. Half of the sample from the first split of each 2 metre interval was placed in calico bags and is stored at Point Well homestead (base camp) for future reference.

The 2kg samples were periodically transported to COMLABS (Adelaide), where they were dried, pulverized, dissolved by acid attack and analysed for Cu, Pb and Zn using atomic absorption spectrophotometry. Selected samples (mainly Pb > 1%) were also later analysed for Ag.

All assay results are included in this report.

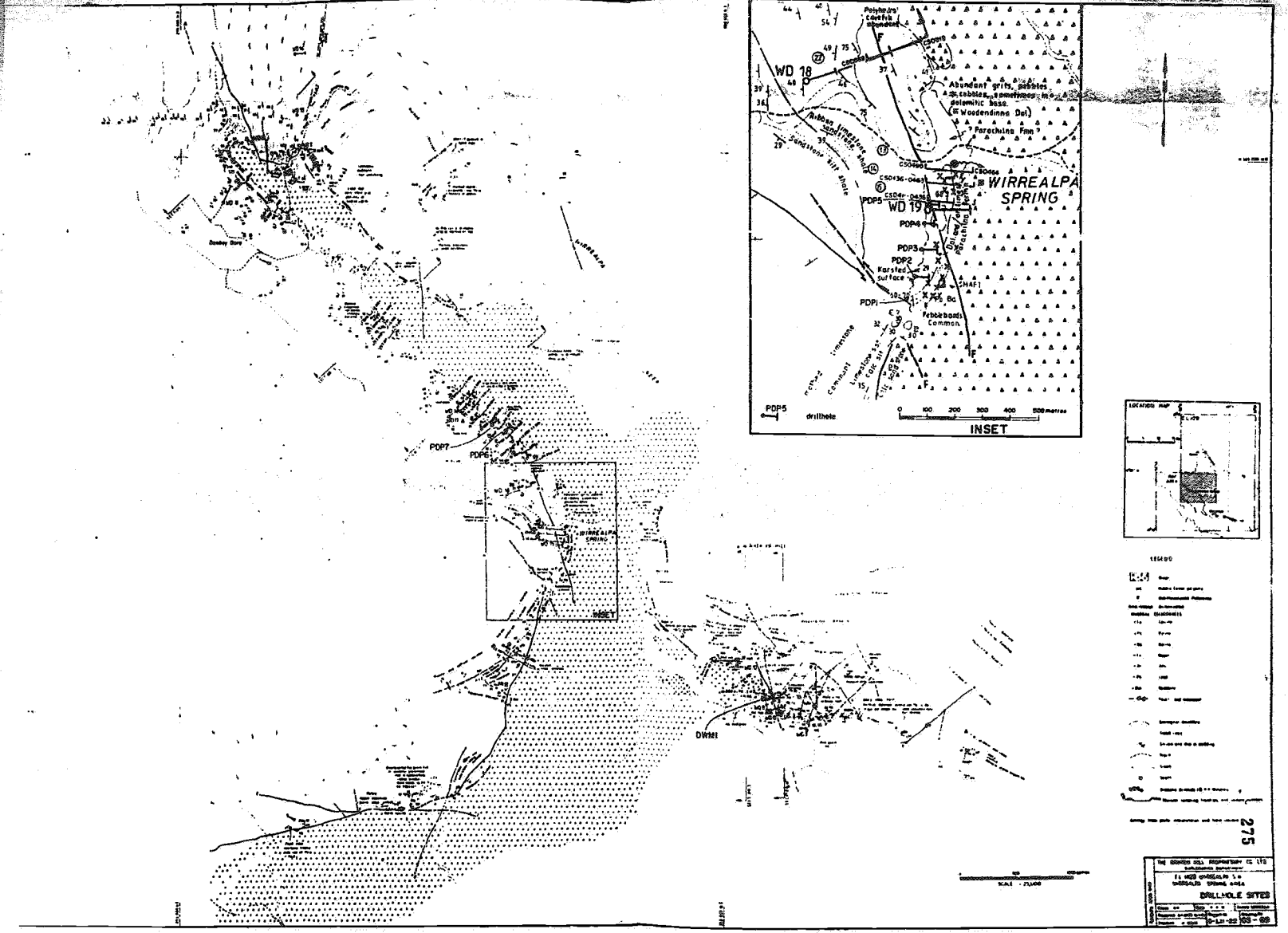
The four (4) holes which were abandoned, did not reach target depth due to high water pressure and jamming of hammer in hole.

RESULTS

Overall, the assay results from the drillholes in this area were disappointing, with the maximum metal values over a 2 metre interval being, 0.175% Cu, 0.635% Pb and 0.11% Zn. Three of the five holes drilled adjacent to WD18 did not reach the unconformity and the other two holes drilled approximately 40 metres below the unconformity.

Drilling problems and limitations of drill rods (78 metres) resulted in the inadequate testing of this horizon (PDP1-5). All drillholes have been left open should it be decided to deepen the holes.

Both PDP6 and 7, drilled in the vicinity of the diamond drillhole WD16, intersected the unconformity and minor karst related prepared ground. No anomalous mineralization was detected in either drillhole.


WD 18
WD 19
WIRREALPA SPRING
Abundant grits, pebbles & cobbles, sometimes in a dolomitic base.
Woodendinna Dol.
? Parachilna Fm ?
Ribbon limestone and shale
Sandstone Silt shale
Pebbleband Common
Limestone of Coat Shale
Karsted surface
PDP1
PDP2
PDP3
PDP4
PDP5
PDP6
PDP7
CHAF1
CSD0066
CSD0136-0463
CSD4r-0463
DWM1
INSET
drillhole
LOCALITY MAP
DRILLHOLE SITES
275

3.3.2 WIRREALPA MINE PROSPECT

INTRODUCTION

One diamond drillhole, total depth of 185 metres was drilled (second attempt) in the vicinity of the Wirrealpa Mine. W. L. Sides and Son were contracted to undertake this drilling, utilising an Atlas Copco B80 rotary rig. The drilling commenced on 12th November, 1984 and the hole was abandoned on 7th December, 1984 (average 7 metres/day).

DRILLING/SAMPLING DETAILS

The diamond drillhole DWM1 was drilled approximately 50 metres west of the Wirrealpa Mine Shaft. The hole was abandoned at 140m due to equipment failure and DWM1A was sited 3 metres west of DWM1. This hole was abandoned at 185 metres due to equipment failure.

The core recovered, (NQ size), was measured and placed in core trays and is stored at Point Well Homestead (base camp) in core racks. Core recovery was generally greater than 95%.

Several sections of core were split (diamond saw) on site and bagged at 1 metre intervals. The samples were sent to COMLABS (Adelaide) where they were dried, pulverized, dissolved by acid attack and analysed for Cu, Pb, Zn, Ag using atomic absorption spectrophotometry.

Assay results from these samples are in this report.

RESULTS

Drillhole DWM1 was abandoned 10 metres into the karstic fill of the Lower Cambrian. Drillhole DWM1A drilled approximately 40 metres into this same lithology and when abandoned was within a highly pyritic breccia zone.

As was expected from this hole, the "diapiric breccia", was predominantly chocolate brown and olive green calcareous siltstones. In general the clast size was less than 5cm; no large "rafts" were intersected.

Lead mineralization was intersected at approximately 138 metres, occuring as veins, blebs, vugh fill and finely disseminated in the brecciated "diapiric" and "karstic" breccia.

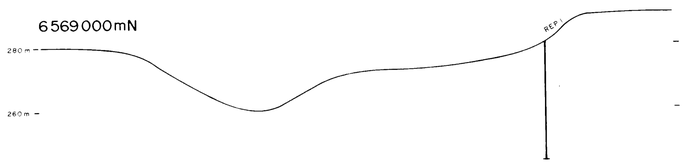
The best mineralized interval from DWM1A was 6 metres at 1.1% Pb including 1m of 2.15% Pb. As is noted from surface samples zinc values are low (maximum 380 ppm); silver values were surprisingly low in DWM1A (maximum 9 ppm) compared to values recorded from samples in mine shaft (up to 160 ppm Ag). It is interesting to note however the strong correlation of silver to copper, especially in samples of low lead values (e.g. 667992: 860 ppm Pb, 3700 ppm Cu, 9 ppm Ag: 667993: 580 ppm Pb, 1350 ppm Cu, 3 ppm Ag).

Detailed petrological studies of the various types of breccia is being undertaken to try and identify and differentiate the cause of the breccia (thrust, karst, etc.) This work will be supplemented by the detailed geological mapping of the Wirrealpa diapir recently completed by Dr. W. Nyman (Utrecht University); a report on this mapping is presently being prepared.

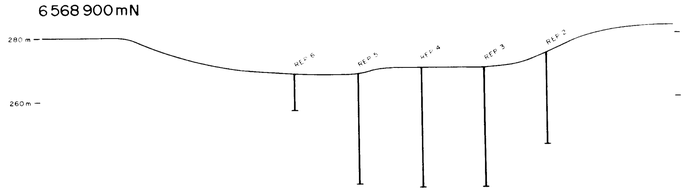
327 700mE

328 700mE

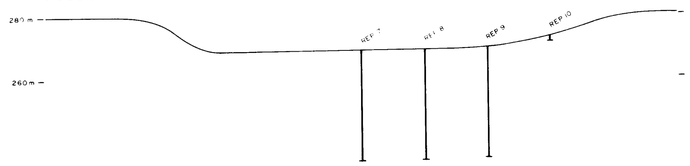
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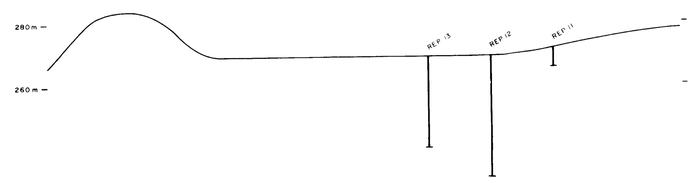
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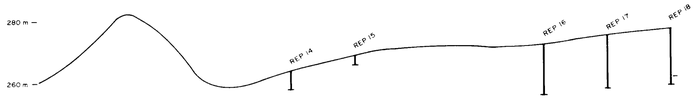
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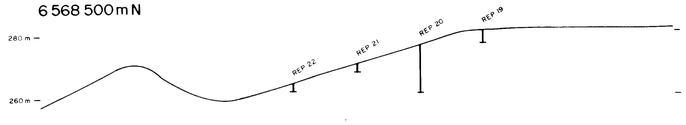
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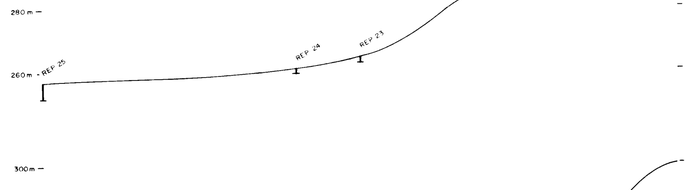
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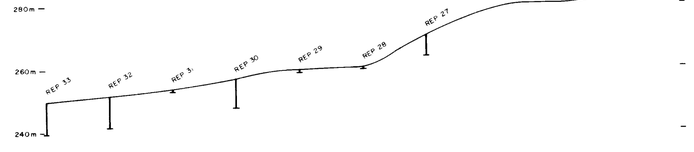
6568500mN



6568400mN



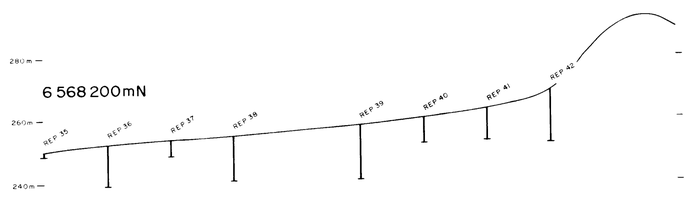
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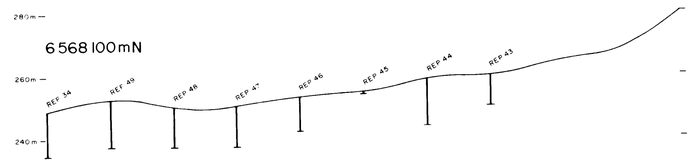
327 700mE

328 700mE

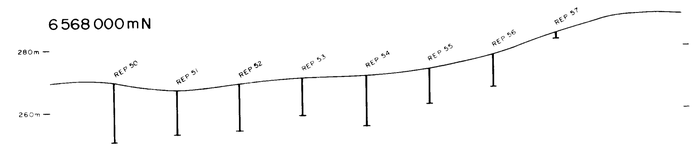
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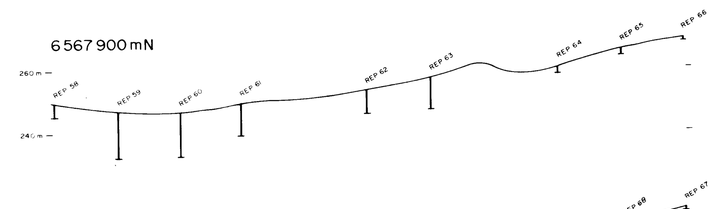
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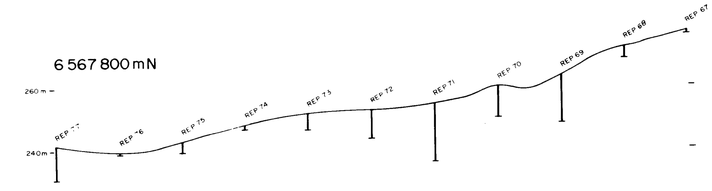
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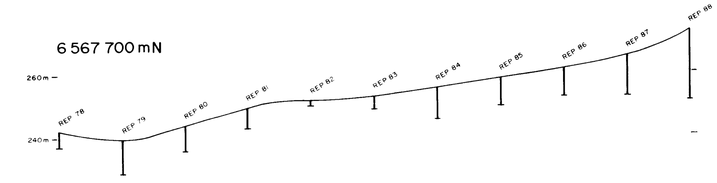
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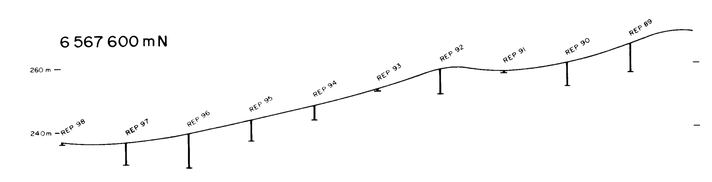
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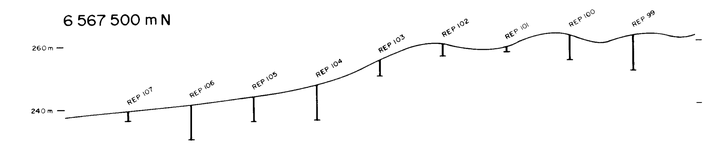
6567700mN



6567600mN



6567500mN



328 000mE

329 000mE

6569 000mN

6568 000mN

DEP 1

DEP 2

DEP 3

DEP 4

12 holes

N

LEGEND

RAB drillhole, prefixed REP (*depth m*)

Creek

Scale 1:5,000

0 100 200 300 400metres

LOCALITY MAP

QLD

NSW

VIC

E.L.1138

Mares

Lake Frome

Broken Hill

Pt Augusta

ADELAIDE

LOCATION MAP

MT CHAMBERS

ST GEORGE BLUFF

Chambers Creek

Morowie Mines

MT JOHN

Mt Chambers Mine Area

ERIC PROSPECT

Bendouro Creek

MT FROME

E.L.1138

Vertical scale 1cm = 10m

Horizontal scale 1 : 5,000

0 100 200 300 400 500metres

3427-21

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EXPLORATION DEPARTMENT

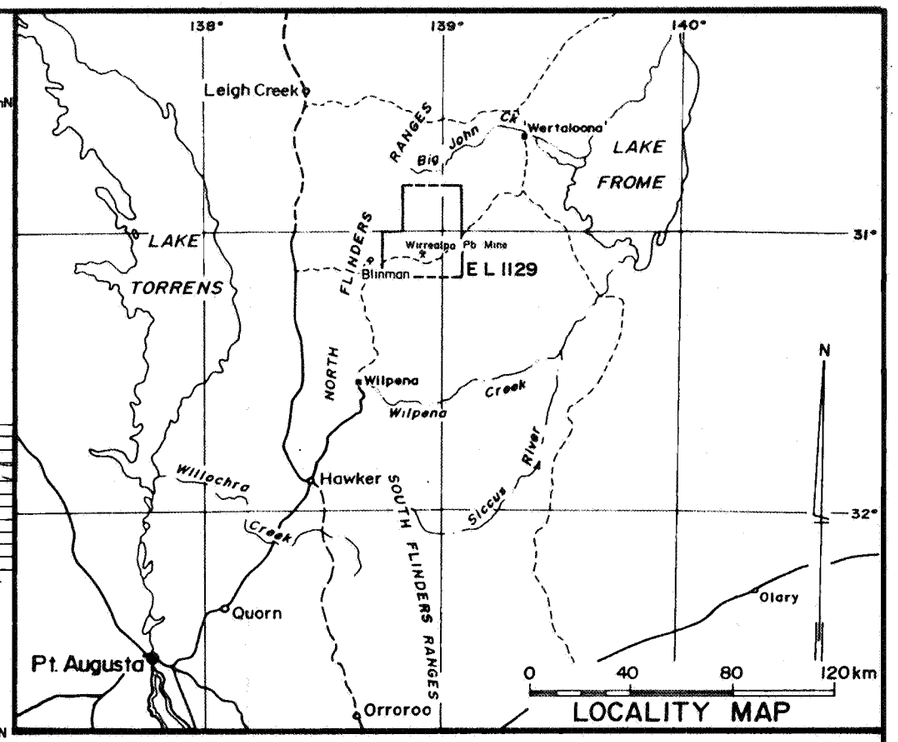
E.L.1138 MT FROME, S.A.
ERIC PROSPECT
R.A.B. DRILLING PROGRAMME

Drawn: M T Roche	Date: 11 – 12 – 84	Centre: Adelaide
Traced: S C Skipworth	Project NO: 6 – L15 – 6	Drawing NO: A1- 717
Checked:		

Revisions:

FIGURE 8
IS MISSING

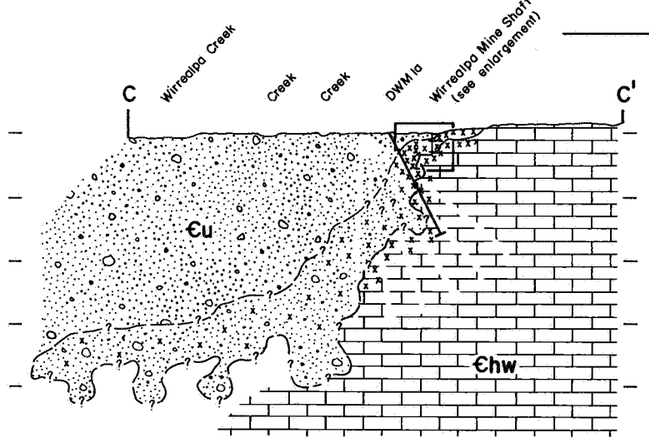
299000mE
300000mE
301000mE
6561000mN
6560000mN
PARACHILNA FORMATION ?
RUBBLE COVER
Wirrealpa
Wirrealpa Lead Mine
DWM1a
WD12
WD11
WD10
WD 9
Creek
m€
B'
C'
A'
C
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42
48
47
43

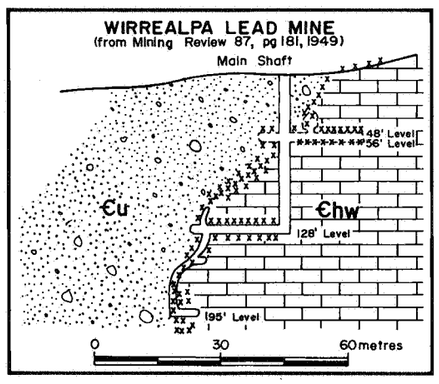


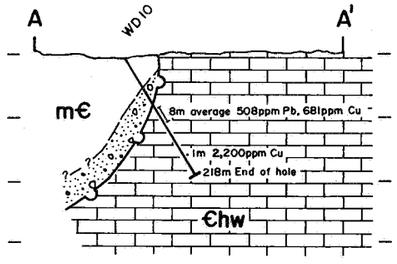
REFERENCE

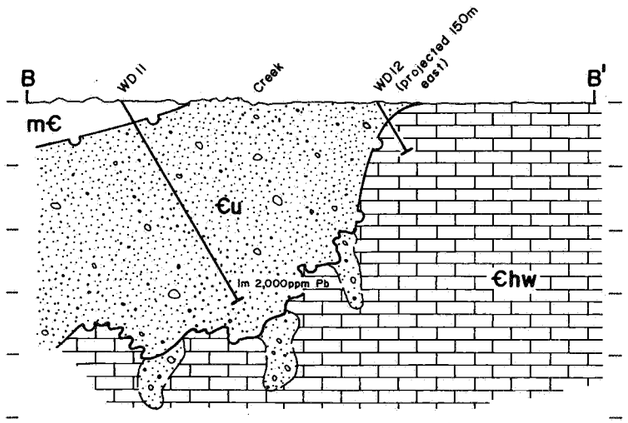
- m€ — Billy Creek Formation
- €hw — Wilkawillina Limestone
- €u — Conglomerate / breccia (age uncertain)
- Diapir
- x — Mineralization
- WD 9 — Diamond drillhole
- Shaft
- Geological boundaries
- Trend lines
- 70 — Dip and strike
- Track
- Fault
- Unconformity

Vertical and Horizontal Scales 1 : 10,000
0 200 400 600 800metres









THE BROKEN HILL PROPRIETARY CO. LTD.
EXPLORATION DEPARTMENT

E.L.1129 WIRREALPA, S.A.
WIRREALPA MINE PROSPECT
CROSS-SECTIONS AND DRILLSITES

278

Revisions:

Prepared by: M T Roche	Centre: ADELAIDE	
Date: 3-4-84	Project No 6-LI1-21	Drawing No A3-233
Drawn: S C Skipworth		

CONCLUSIONS

Although severely hampered by mechanical breakdowns and contractors' incompetence, the 1984 drilling programme was technically very successful.

A mineralized "pod" was tested at WILNUROONA Prospect and although the assay results were not as high as the surface geochemistry, significant results were achieved with one hole (PWP1) recording 40 metres averaging 2% Pb + Zn (including 8 metres of 7.9% Pb + Zn). This hole including 2 metres of 7.45% Pb, 6.15% Zn which is one of the most mineralized intersections ever drilled in the Flinders Ranges.

The RAB drilling programme at ERIC Prospect was designed to localize a possible source of the anomalous drainage geochemistry detected several years ago. A highly anomalous lead zone measuring 1200 x 400 metres was detected, with mineralized intersections of up to 10 metres averaging 4% Pb.

Mechanical problems during the drilling of the Donkey Bore Prospect resulted in a reduced drilling programme for this area and most drillholes being abandoned prior to reaching target depth. No new information on the lithologies, mineralization, prepared ground or controls was gained from this drilling.

The abandonment of the second attempt to drill a 200 metre diamond drill hole in the WIRREALPA MINE Prospect resulted in 6 metres averaging 1.1% Pb and the potential for more mineralization if the hole had continued. The drilling contract was terminated on the abandonment of this hole (due to mechanical failures).

The curtailment of the proposed drilling in several of the prospects, limited the full extent of knowledge we hoped to have gained from this programme. However, the very encouraging assay results from the drilling which was completed necessitates an extensive programme of drilling to be undertaken in 1985.

Detailed proposals for the 1985 Drilling Programme are presently being prepared.

APPENDIX A

Drillhole Summary.

Eric Prospect (1106.6m RAB drilling)		Interval > 1%	Maximum Value in hole (ppm)		
Hole No.	T.D.		Cu	Pb	Zn
REP1	38m	-	70	250	490
REP2	28.5m	-	650	620	2100
REP3	37m	-	400	960	2400
REP4	38m	-	360	1700	2350
REP5	35m	-	680	1550	2400
REP6	12m	-	300	1500	810
REP7	35m	-	300	830	640
REP8	35m	-	330	380	910
REP9	35m	-	260	630	840
REP10	2m	-	24	46	210
REP11	6m	-	32	130	240
REP12	35.8m	-	320	820	460
REP13	28m	-	230	280	530
REP14	3m	-	36	420	320
REP15	6m	-	105	280	400
REP16	15m	-	80	135	160
REP17	16m	-	185	260	340
REP18	12m	-	280	400	470
REP19	4m	-	450	650	1550
REP20	0.5m	-	-	-	-
REP21	2.5m	-	310	2300	320
REP22	2.5m	-	155	280	400
REP23	1.5m	-	155	1500	550
REP24	1.5m	-	160	220	470
REP25	5m	-	540	940	950
REP26	0.5m	-	-	-	-
REP27	6.5m	-	350	3600	1350
REP28	0.5m	-	28	350	180
REP29	1m	-	36	300	210
REP30	9m	-	36	1050	80
REP31	0.5m	-	32	290	95
REP32	10m	-	24	590	34
REP33	10m	-	34	1750	60
REP34	14m	-	165	340	710
REP35	1.1m	-	60	140	250
REP36	13m	-	700	860	990

Eric Prospect (cont.) Hole No.	T.D.	Interval >1%	Maximum Value in hole (ppm) Cu	Pb	Zn
REP37	5m	-	34	270	90
REP38	14m	4m @ 1% Pb	165	144	60
REP39	17m	-	1000	3000	740
REP40	8m	-	44	8050	90
REP41	10m	-	430	2000	135
REP42	17m	-	80	490	320
REP43	10m	10m @ 4.0% Pb	800	5.05%	410
REP44	15m	-	730	3650	730
REP45	0.5m	-	90	360	135
REP46	11m	-	46	1350	65
REP47	13m	-	46	2050	70
REP48	13m	-	28	640	28
REP49	15m	-	410	360	930
REP50	19m	-	390	340	590
REP51	14m	-	75	610	75
REP52	15m	-	75	720	40
REP53	12m	-	60	810	175
REP54	16m	-	185	4300	340
REP55	11m	-	175	850	410
REP56	10m	6m @ 3.5% Pb	660	4.2%	1750
REP57	1.7m	-	130	1700	105
REP58	4.2m	-	520	320	730
REP59	14m	-	105	130	60
REP60	14m	-	195	260	95
REP61	10m	-	360	360	400
REP62	7.2m	-	320	650	450
REP63	10m	-	30	780	50
REP64	2m	-	44	1700	90
REP65	2m	-	36	240	75
REP66	1m	-	46	220	90
REP67	0.8m	-	30	165	30
REP68	3.75m	-	75	1200	38
REP69	15m	11m @ 1.4% Pb	450	1.67%	330
REP70	10m	-	135	3300	60
REP71	18.5m	-	145	2650	290
REP72	9m	-	36	340	70
REP73	5.2m	-	270	175	160

Eric Prospect (cont.)		Interval >1%	Maximum Value in hole (ppm)		
Hole No.	T.D.		Cu	Pb	Zn
REP74	1m	-	-	-	-
REP75	3.5m	-	570	90	440
REP76	0.3m	-	28	36	50
REP77	11m	-	65	530	60
REP78	5.25m	-	55	65	80
REP79	11m	-	220	140	130
REP80	8m	-	300	850	350
REP81	6.5m	-	760	200	510
REP82	1.8m	-	60	150	48
REP83	4m	-	300	390	190
REP84	10m	-	48	530	60
REP85	8.75m	-	240	1050	145
REP86	9m	8m @ 1.97% Pb	120	3.4%	115
REP87	12.75m	2m @ 1.06% Pb	430	1.07%	250
REP88	22m	-	140	9600	90
REP89	9m	-	185	5450	90
REP90	7.5m	-	270	3850	340
REP91	0.5m	-	38	100	28
REP92	8.75m	-	700	520	280
REP93	0.5m	-	40	85	30
REP94	4.5m	-	890	230	610
REP95	6.5m	-	1000	340	450
REP96	11m	-	195	400	90
REP97	6.5m	-	36	75	90
REP98	0.5m	-	38	65	105
REP99	10.5m	4m @ 1.8% Pb	450	1.94%	290
REP100	8m	-	670	2050	480
REP101	1.5m	-	46	115	38
REP102	4m	-	220	410	120
REP103	5m	-	180	400	170
REP104	11m	-	90	440	100
REP105	7.75m	-	570	440	400
REP106	11m	-	50	430	125
REP107	3m	-	40	120	110

Wilnuroona Prospect (370m RC drilling)

			Cu	Pb	Zn
		40m@ 2.0% (inc			
PWP1	50m	8m @ 7.9% Pb+Zn)	55	8.0%	6.15%
PWP2	50m (62°/240)	8m @ 1.9% Pb+Zn	34	1.2%	1.46%
PWP3	45m	6m @ 1% Pb+Zn	85	1.28%	4800
PWP4	50m	-	22	1600	1900
PWP5	50m	-	32	5550	3100
PWP6	50m	-	14	1550	1350
PWP7	75m	-	6	55	210

Donkey Bore Prospect (496.5m)		Interval >1%	Maximum Value in hole (ppm)		
Hole No.	T.D.		Cu	Pb	Zn
PDP1	68m	-	70	440	1100
PDP2	78.5m	-	34	115	690
PDP3	62m	-	36	6350	490
PDP4	78m	-	32	2100	750
PDP5	68m	-	28	1000	240
PDP6	64m	-	1750	22	165
PDP7	78m	-	480	85	400
Wirrealpa Mine Prospect					
DWM1A	185m	6m @ 1.1%	3700	2.15%	380
DWM2	-				
TOTALS					
RC	1368.5m				
RAB	1106.6m				
CORE	185m				

APPENDIX B

Assay Results

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ANALYTICAL REPORT

287

JOB COM842217
O/N : 3HBG 0310 AL 079543

SAMPLE	Cu	Pb	Zn
666346	55	8.00%	1.51%
666347	40	7.45%	6.15%
666348	24	2.50%	3.70%
666349	12	1.04%	1.14%
666350	9	5150	6400
666351	8	2500	3800
666352	8	2400	3550
666353	12	1750	2850
666354	10	1150	1900
666355	14	1400	2050
666356	22	2350	2950
666357	16	2200	2750
666358	24	2000	2300
666359	22	930	2700
666360	18	1500	2450
666361	14	2250	3300
666362	16	1450	2800
666363	8	1000	1350
666364	9	1250	1900
666365	12	1250	4050
666366	8	740	1350
666367	6	800	1150
666368	4	380	370
666369	4	500	420
666370	3	690	1250
666371	5	730	1300
UNITS	ppm	ppm	ppm
SCHEME	AAS1	AAS1 AAS1A	AAS1 AAS1A

8 m av. 7.87%.

PWP 1

50 m av. 1.6%

Duplicate

ANALYTICAL REPORT

JOB COM842217 - 288
O/N : 3HBG 0310 AL 079543

SAMPLE	Cu	Pb	Zn
666372	12	1.20%	1.45%
666373	10	7800	1.46%
666374	12	6150	9550
666375	9	4700	6300
666376	2	780	1400
666377	8	1050	2350
666378	12	1100	3500
666379	10	830	3450
666380	10	730	2300
666381	14	770	2300
666382	34	1150	3200
666383	28	790	1650
666384	20	670	1250
666385	22	510	1750
666386	18	600	2250
666387	18	820	3700
666388	18	800	3000
666389	12	610	1150
666390	10	520	1100
666391	5	310	680
666392	8	1200	3850
666393	14	1050	4850
666394	5	400	1150
666395	4	130	290
666396	<2	105	240
UNITS	ppm	ppm	ppm
SCHEME	AAS1	AAS1 AAS1A	AAS1 AAS1A

8m. av. 1.89%.

PWP 2.

46m av. 0.58%.

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ANALYTICAL REPORT

JOB COM842217
O/N : 3HBG 0310 AL 079543

289

SAMPLE	Cu	Pb	Zn	
666397	3	110	230	Duplicate.
666398	20	320	500	
666399	32	80	560	
666400	40	130	610	
666401	65	65	470	
666402	60	40	320	PWP3.
666403	65	10	220	
666404	85	<4	160	
666405	70	<4	160	
666406	80	<4	280	
666407	85	105	400	combined sample (ie. av 4m)
666408	LNR	LNR	LNR	
666409	50	40	270	
666410	46	150	470	
666411	48	1.28%	3250	10m av. 0.7%
666412	32	600	720	
666413	38	7350	4750	
666414	34	1500	3150	
666415	20	350	980	
666416	12	270	730	
666417	12	165	360	
666418	18	220	310	
666419	8	155	260	
666420	7	70	80	
666421	6	70	80	Duplicate
UNITS	ppm	ppm	ppm	
SCHEME	AAS1	AAS1 AAS1A	AAS1	

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ANALYTICAL REPORT

290

JOB COM842300
O/N : 3HBG 0310A1 N079553

SAMPLE	Cu	Pb	Zn	Ag	
666498	2	130	230	<1	
666499	2	130	230	<1	Dup.
666500	6	16	38	<1	
666501	3	8	8	<1	PWP 7.
666502	4	8	7	<1	
666503	3	6	8	<1	
666504	3	8	12	<1	
666505	3	6	6	<1	
666506	3	6	10	<1	
666507	3	6	12	<1	
666508	3	8	10	<1	
666509	3	10	22	<1	
666510	3	10	10	<1	
666511	4	16	42	<1	
666512	6	32	210	<1	
666513	5	55	95	<1	
666514	4	22	65	<1	
666515	5	48	140	<1	
666516	4	28	120	<1	
666517	4	10	24	<1	
666518	6	16	24	<1	Dup.
UNITS	ppm	ppm	ppm	ppm	
SCHEME	AAS1	AAS1	AAS1	AAS3	

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ANALYTICAL REPORT

291

JOB COM842217
O/N : 3HBG 0310 AL 079543

SAMPLE	Cu	Pb	Zn
666422	22	860	1550
666423	8	180	350
666424	4	140	310
666425	2	140	200
666426	3	85	150
666427	2	75	220
666428	3	75	220
666429	2	44	200
666430	<2	60	170
666431	7	290	530
666432	10	290	390
666433	4	270	450
666434	<2	145	280
666435	3	240	370
666436	2	290	560
666437	7	380	990
666438	12	730	1300
666439	6	570	910
666440	22	1600	1900
666441	6	1400	1300
666442	3	180	260
666443	5	75	140
666444	<2	20	42
666445	2	18	46
666446	3	24	60
UNITS	ppm	ppm	ppm
SCHEME	AAS1	AAS1	AAS1

PWP 4

10m av. 0.2%

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ANALYTICAL REPORT

292

JOB COM842217
O/N : 3HBG 0310 AL 079543

SAMPLE	Cu	Pb	Zn
666447	2	24	65
UNITS	ppm	ppm	ppm
SCHEME	AAS1	AAS1	AAS1

Duplicate

COMLABS Pty. Ltd.
COMPUTERISED ANALYTICAL LABORATORIES

305 South Road,
Mile End South,
Sth. Aust. 5031.
Tel: (08) 43 5722
Telex: AA89323

NATA REGISTERED No. 1526

293

OUR REF.: COM842300

YOUR REF.: 3HBG 0310A1 NO79553

Mr. M. Roche
BHP Minerals Ltd.
P.O. Box 860

NORWOOD
SA 5067

November 2, 1984

Dear Sir

RE: JOB COM842300

Enclosed are the assays for the samples delivered to our laboratory on October 23, 1984

Yours Sincerely,
COMLABS PTY LTD

per :

c.c.: Blinman No. of copies : 1
c.c.: Sydney No. of copies : 1

Report Length 3 pages

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ANALYTICAL REPORT

JOB COM842300
O/N : 3HBG 0310A1 N079553

294

pwp 5

SAMPLE	Cu	Pb	Zn	Ag
666448	32	2000	670	1 (0-2)
666449	55	5550	3100	1
666450	24	3050	1650	<1
666451	30	3550	1600	<1
666452	24	1800	1300	<1
666453	30	1550	1700	1
666454	18	680	1300	1
666455	18	900	1500	1
666456	20	810	1350	1
666457	12	380	840	<1
666458	14	400	580	<1
666459	9	420	430	<1
666460	9	360	420	1
666461	8	250	350	1
666462	4	155	390	<1
666463	4	125	330	<1
666464	6	115	270	<1
666465	3	95	140	<1
666466	3	260	530	<1
666467	4	790	1700	1
666468	4	550	950	1
666469	4	450	560	1
666470	2	100	180	<1
666471	2	32	50	<1
666472	3	42	70	<1
UNITS	ppm	ppm	ppm	ppm
SCHEME	AAS1	AAS1	AAS1	AAS3

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ANALYTICAL REPORT

295

JOB COM842300
O/N : 3HBG 0310A1 N079553

SAMPLE	Cu	Pb	Zn	Ag	
666473	3	42	75	<1	Dupl.
666474	10	165	330	<1	
666475	14	600	890	<1	PWP 6.
666476	12	540	860	<1	
666477	10	520	740	<1	
666478	14	1550	1350	<1	
666479	5	210	520	<1	
666480	7	165	370	<1	
666481	9	340	550	<1	
666482	4	110	390	<1	
666483	4	115	280	<1	
666484	2	36	120	<1	
666485	3	70	185	<1	
666486	4	90	260	<1	
666487	3	46	140	<1	
666488	3	44	460	<1	
666489	3	48	260	1	
666490	5	50	270	<1	
666491	3	42	210	<1	
666492	3	55	195	<1	
666493	2	65	230	<1	
666494	2	65	240	<1	
666495	2	95	310	<1	
666496	2	95	290	<1	
666497	3	210	330	<1	
UNITS	ppm	ppm	ppm	ppm	
SCHEME	AAS1	AAS1	AAS1	AAS3	

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

NATA REGISTERED No. 1526

296

OUR REF.: COM842339

YOUR REF.: 3HBG 0310 A1 N079563

Mr. M. Roche
BHP Minerals
125-129 Rundle Street
KENT TOWN
South Australia
S.A 5067

November 20, 1984

Dear Sir

RE: JOB COM842339

Enclosed are the assays for the samples delivered to our laboratory on October 26, 1984

Yours Sincerely,
COMLABS PTY LTD

per :

c.c.: Blinman No. of copies : 1
c.c.: Sydney No. of copies : 1

Report Length 22 pages

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ANALYTICAL REPORT

JOB COM842339
O/N : 3HBG 0310 A1 N079563

297

SAMPLE	Cu	Pb	Zn	
666519	20	8	34	PwP7.
666520	12	10	26	
666521	85	10	20	
666522	14	115	300	
666523	14	75	350	
666524	16	46	115	
666525	50	115	590	
666526	40	135	760	
666527	22	38	400	
666528	16	6	135	
666529	14	14	2	
666530	12	8	6	
666531	14	14	170	
666532	20	30	330	
666533	12	10	65	
666534	12	12	32	
666535	10	4	26	
666536	14	10	22	
666537	9	8	20	
666538	12	4	18	
666539	12	6	16	Duplicate
666540	42	75	220	
666541	85	310	540	Rep 2.
666542	100	1700	900	
666543	85	500	600	
UNITS	ppm	ppm	ppm	
SCHEME	AAS1	AAS1	AAS1	

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ANALYTICAL REPORT

JOB COM842339

298

O/N : 3HBG 0310 A1 N079563

SAMPLE	Cu	Pb	Zn
666544	80	300	480
666545	65	590	380
666546	55	470	320
666547	70	380	360
666548	75	320	380
666549	70	185	330
666550	60	250	350
666551	420	60	570
666552	650	75	750
666553	380	200	710
666554	400	185	950
666555	460	65	1600
666556	350	135	2100
666557	125	400	1500
666558	105	370	1200
666559	85	270	810
666560	100	350	1150
666561	100	260	1100
666562	380	170	2000
666563	470	250	2100
666564	260	350	1650
666565	155	540	1550
666566	110	600	1000
666567	175	610	1400
666568	145	620	1150
UNITS	ppm	ppm	ppm
SCHEME	AAS1	AAS1	AAS1

Rep 2.

0.1452 2m.

14m.

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ANALYTICAL REPORT

JOB COM842339

299

O/N : 3HBG 031C A1 N079563

SAMPLE	Cu	Pb	Zn
666569	65	230	430
666570	65	290	540
666571	60	150	530
666572	55	120	900
666573	70	160	1500
666574	105	280	1200
666575	50	280	480
666576	60	200	460
666577	155	230	1000
666578	135	170	1100
666579	85	190	570
666580	90	350	1300
666581	38	195	390
666582	22	140	170
666583	75	125	370
666584	90	145	500
666585	125	190	840
666586	110	250	860
666587	90	410	760
666588	150	290	1250
666589	240	350	1450
666590	210	390	1250
666591	195	390	1200
666592	200	360	1150
666593	195	450	1050
UNITS	ppm	ppm	ppm
SCHEME	AAS1	AAS1	AAS1

Rep 3

Rep 3

6 - a - 01252

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ANALYTICAL REPORT

JOB COM842339

O/N : 3HBG 0310 A1 N079563

300

SAMPLE	Cu	Pb	Zn
666594	140	290	740
666595	120	330	620
666596	115	340	550
666597	90	380	610
666598	90	350	590
666599	75	370	520
666600	70	400	390
666601	80	890	420
666602	125	960	530
666603	210	700	1100
666604	330	550	1600
666605	400	470	2400
666606	60	210	350
666607	90	320	680
666608	210	570	1300
666609	310	1000	1150
666610	150	980	710
666611	110	450	800
666612	110	200	590
666613	120	200	450
666614	130	290	510
666615	270	1400	1600
666616	350	1700	2350
666617	270	840	1450
666618	250	760	1400
UNITS	ppm	ppm	ppm
SCHEME	AAS1	AAS1	AAS1

REP 3.

REP 4

30.- 0.132762

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ANALYTICAL REPORT

JOB COM842339
O/N : 3HBG 0310 A1 N079563

301

SAMPLE	Cu	Pb	Zn
666619	195	930	1300
666620	130	490	940
666621	160	490	860
666622	190	490	990
666623	200	490	1100
666624	180	680	970
666625	360	820	1250
666626	350	820	1300
666627	350	850	1400
666628	360	870	1600
666629	300	790	1350
666630	270	720	1300
666631	280	690	1350
666632	280	680	1400
666633	260	670	1350
666634	250	680	1300
666635	250	640	1400
666636	250	640	1450
666637	230	620	1350
666638	210	590	1250
666639	190	570	1250
666640	240	600	1600
666641	200	560	1550
666642	190	530	1500
666643	180	530	1400
UNITS	ppm	ppm	ppm
SCHEME	AAS1	AAS1	AAS1

REP 4.

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ANALYTICAL REPORT

JOB COM842339
O/N : 3HBG 0310 A1 N079563

302

SAMPLE	Cu	Pb	Zn
666644	55	175	270
666645	95	290	450
666646	90	270	400
666647	120	390	600
666648	135	380	550
666649	115	370	480
666650	220	770	870
666651	180	550	700
666652	280	790	930
666653	330	970	910
666654	300	1000	730
666655	600	1000	1350
666656	460	1300	1300
666657	470	970	1050
666658	300	430	630
666659	340	310	750
666660	270	220	630
666661	540	640	1200
666662	520	850	1250
666663	400	810	1050
666664	610	1150	1750
666665	470	1200	1400
666666	450	1350	1350
666667	600	1550	2050
666668	680	1550	2400
UNITS	ppm	ppm	ppm
SCHEME	AAS1	AAS1	AAS1

Reps.

20 ~ av. 0.12262n. 939n~ Pb.

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ANALYTICAL REPORT

JOB COM842339
O/N : 3HBG 0310 A1 N079563

303

SAMPLE	Cu	Pb	Zn
666669	500	1400	1500
666670	510	770	1350
666671	340	530	950
666672	280	500	770
666673	190	420	590
666674	230	450	690
666675	250	420	710
666676	260	480	710
666677	250	470	710
666678	220	460	640
666679	34	125	105
666680	22	75	55
666681	16	42	24
666682	14	34	22
666683	18	26	30
666684	30	370	50
666685	85	1500	160
666686	230	1100	420
666687	300	1200	790
666688	260	890	720
666689	230	680	810
666690	180	580	550
666691	100	280	260
666692	100	230	210
666693	55	90	130
UNITS	ppm	ppm	ppm
SCHEME	AAS1	AAS1	AAS1

REP 5

REP 6

3m av. 0.1262 Pb

REP 7

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ANALYTICAL REPORT

JOB COM842339
O/N : 3HBG 0310 A1 N079563

304

SAMPLE	Cu	Pb	Zn
666694	48	85	170
666695	40	65	95
666696	44	75	115
666697	60	105	90
666698	75	170	95
666699	70	300	95
666700	55	330	90
666701	48	460	85
666702	55	400	105
666703	65	330	120
666704	70	300	160
666705	55	300	135
666706	55	420	150
666707	70	350	230
666708	65	430	220
666709	85	470	300
666710	115	460	400
666711	165	360	490
666712	150	360	430
666713	160	400	510
666714	270	460	640
666715	260	490	630
666716	200	560	500
666717	165	260	310
666718	155	290	320
UNITS	ppm	ppm	ppm
SCHEME	AAS1	AAS1	AAS1

LGP 7

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ANALYTICAL REPORT

JOB COM842339
O/N : 3HBG 0310 A1 N079563

305

SAMPLE	Cu	Pb	Zn
666719	140	350	330
666720	115	220	230
666721	105	165	250
666722	130	130	290
666723	85	200	195
666724	250	830	570
666725	300	610	640
666726	36	65	120
666727	24	36	55
666728	28	65	280
666729	22	38	60
666730	55	120	550
666731	42	135	470
666732	16	230	65
666733	24	85	75
666734	46	95	230
666735	34	75	80
666736	32	110	200
666737	24	220	115
666738	20	280	85
666739	18	210	46
666740	14	360	28
666741	24	270	65
666742	36	120	210
666743	40	135	240
UNITS	ppm	ppm	ppm
SCHEME	AAS1	AAS1	AAS1

REP 7.

REP 8.

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ANALYTICAL REPORT

JOB COM842339
O/N : 3HBG 0310 A1 N079563

- 30(

SAMPLE	Cu	Pb	Zn
666744	44	100	210
666745	42	70	240
666746	42	70	210
666747	42	75	195
666748	46	80	210
666749	55	70	240
666750	60	110	250
666751	70	125	260
666752	80	140	300
666753	120	180	450
666754	320	380	910
666755	330	340	900
666756	320	370	870
666757	310	250	750
666758	300	300	690
666759	240	250	530
666760	165	270	410
666761	40	200	360
666762	48	195	370
666763	36	135	410
666764	44	190	480
666765	38	135	390
666766	36	105	380
666767	40	95	350
666768	48	44	230
UNITS	ppm	ppm	ppm
SCHEME	AAS1	AAS1	AAS1

REP 8

REP 9.

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ANALYTICAL REPORT

JOB COM842339 307

O/N : 3HBG 0310 A1 N079563

SAMPLE	Cu	Pb	Zn
666769	44	70	260
666770	55	80	340
666771	34	70	230
666772	48	125	280
666773	60	120	320
666774	120	150	790
666775	125	125	840
666776	90	200	580
666777	48	240	440
666778	65	270	430
666779	44	220	360
666780	42	230	400
666781	48	260	480
666782	75	320	470
666783	75	540	540
666784	60	260	530
666785	85	310	660
666786	55	280	530
666787	60	520	620
666788	65	570	550
666789	55	560	390
666790	65	630	360
666791	60	600	350
666792	95	330	380
666793	115	380	520
UNITS	ppm	ppm	ppm
SCHEME	AAS1	AAS1	AAS1

REP 9.

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ANALYTICAL REPORT

JOB COM842339
O/N : 3HBG 0310 A1 N079563

308

SAMPLE	Cu	Pb	Zn	
666794	155	360	540	REP 9.
666795	260	270	580	
666796	24	42	175	REP 10.
666797	18	46	210	
666798	24	28	90	
666799	22	55	125	
666800	32	130	240	REP 11
666801	24	105	195	
666802	12	90	80	
666803	12	90	60	
666804	30	130	270	
666805	26	100	195	
666806	16	46	75	REP 12
666807	22	38	70	
666808	16	48	55	
666809	14	46	65	
666810	9	60	50	
666811	6	70	22	
666812	9	95	30	
666813	16	170	50	
666814	120	300	310	
666815	320	820	330	
666816	310	480	160	
666817	160	370	165	
666818	125	360	130	
UNITS	ppm	ppm	ppm	
SCHEME	AAS1	AAS1	AAS1	

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ANALYTICAL REPORT

309

JOB COM842339
O/N : 3HBG 0310 A1 N079563

SAMPLE	Cu	Pb	Zn
666819	90	250	185
666820	95	145	250
666821	90	330	160
666822	95	310	95
666823	90	195	155
666824	90	185	220
666825	90	230	400
666826	95	165	460
666827	90	195	330
666828	95	180	310
666829	85	540	290
666830	110	670	380
666831	75	450	330
666832	70	400	350
666833	65	340	310
666834	65	320	280
666835	60	300	310
666836	55	340	340
666837	65	340	370
666838	65	430	360
666839	90	400	370
666840	28	75	120
666841	26	95	135
666842	14	60	50
666843	10	70	42
UNITS	ppm	ppm	ppm
SCHEME	AAS1	AAS1	AAS1

Rep 12.

Rep 13

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ANALYTICAL REPORT

JOB COM842339
O/N : 3HBG 0310 A1 N079563

310

SAMPLE	Cu	Pb	Zn
666844	22	165	50
666845	18	140	55
666846	14	155	40
666847	12	155	46
666848	12	120	28
666849	12	140	38
666850	12	150	22
666851	14	210	30
666852	14	120	24
666853	80	90	370
666854	85	110	360
666855	160	280	320
666856	220	160	530
666857	230	210	430
666858	60	160	110
666859	40	105	75
666860	46	160	70
666861	36	180	55
666862	20	150	42
666863	30	180	55
666864	10	165	42
666865	16	140	40
666866	16	135	46
666867	26	135	55
666868	28	105	180
UNITS	ppm	ppm	ppm
SCHEME	AAS1	AAS1	AAS1

Rep 13.

Rep 15

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ANALYTICAL REPORT

JOB COM842339
O/N : 3HBG 0310 A1 N079563

311

SAMPLE	Cu	Pb	Zn	
666869	40	155	270	Rep 15
666870	105	280	400	
666871	36	185	210	Rep 14
666872	28	230	320	
666873	16	270	170	
666874	20	320	120	
666875	20	400	100	
666876	20	420	65	
666877	28	28	105	Rep 1
666878	22	28	110	
666879	24	38	155	
666880	20	38	115	
666881	16	34	75	
666882	16	30	36	
666883	18	36	32	
666884	34	26	60	
666885	18	95	36	
666886	14	100	34	
666887	12	140	38	
666888	10	140	36	
666889	9	140	60	
666890	24	175	65	
666891	22	140	85	
666892	12	125	55	
666893	20	105	48	
UNITS	ppm	ppm	ppm	
SCHEME	AAS1	AAS1	AAS1	

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ANALYTICAL REPORT

312

JOB COM842339
O/N : 3HBG 0310 A1 N079563

SAMPLE	Cu	Pb	Zn	
666894	14	150	60	
666895	18	145	95	
666896	20	95	65	
666897	22	60	60	
666898	38	150	250	
666899	40	180	320	
666900	26	110	220	
666901	26	85	300	
666902	34	95	360	Rep 1
666903	40	80	320	
666904	38	85	370	
666905	28	85	350	
666906	38	125	490	
666907	60	80	450	
666908	55	115	430	
666909	55	130	380	
666910	70	250	430	
666911	60	210	250	
666912	32	125	130	
666913	44	135	290	
666914	40	135	290	
666996	32	290	95	Rep 31
666997	24	270	26	Rep 32
666998	10	510	34	
666999	6	540	7	
UNITS	ppm	ppm	ppm	
SCHEME	AAS1	AAS1	AAS1	

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ANALYTICAL REPORT

JOB COM842339
O/N : 3HBG 0310 A1 N079563

313

SAMPLE	Cu	Pb	Zn	
667000	9	440	6	
667001	7	510	5	
667002	9	590	7	
667003	7	390	8	Rep 32
667004	8	145	2	
667005	6	90	<2	
667006	6	85	3	
667007	10	520	6	Duplicate
667008	26	125	60	
667009	22	360	38	
667010	20	810	18	Rep 33
667011	14	370	10	
667012	14	280	10	
667013	32	1750	24	
667014	34	1500	28	
667015	30	630	22	
667016	34	610	20	
667017	32	450	18	
667018	32	440	18	Duplicate
667019	48	350	140	
667020	70	470	110	Rep 25
667021	190	940	260	
667022	350	830	670	
667023	540	580	950	
667024	34	100	145	Rep 35
UNITS	ppm	ppm	ppm	
SCHEME	AAS1	AAS1	AAS1	

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ANALYTICAL REPORT

JOB COM842339
O/N : 3HBG 0310 A1 N079563

314

SAMPLE	Cu	Pb	Zn	
667025	60	140	250	REP 35
667026	34	165	80	REP 36
667027	26	260	48	
667028	22	860	30	
667029	22	590	30	
667030	50	800	90	
667031	310	330	470	
667032	570	380	830	
667033	700	290	990	
667034	230	270	390	
667035	175	320	670	
667036	165	370	630	
667037	180	360	640	
667038	120	380	370	
667039	115	380	370	
667040	30	55	85	REP 37
667041	22	105	90	
667042	28	145	80	
667043	34	185	80	
667044	22	270	38	
667045	28	135	60	REP 38
667046	20	36	32	
667047	9	90	12	
667048	10	105	12	
667049	9	110	5	
UNITS	ppm	ppm	ppm	
SCHEME	AAS1	AAS1	AAS1	

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ANALYTICAL REPORT

JOB COM842339 315

O/N : 3HBG 0310 A1 N079563

SAMPLE	Cu	Pb	Zn
667050	10	145	7
667051	105	7300	40
667052	110	1.44%	38
667053	75	9900	26
667054	90	5200	44
667055	165	9900	60
667056	75	4400	34
667057	80	2450	46
667058	75	2400	46
667059	65	580	185
667060	60	890	130
667061	30	710	44
667062	46	1900	30
667063	210	780	165
667064	340	710	340
667065	680	520	400
667066	170	680	410
667067	320	660	290
667068	640	570	620
667069	1000	530	740
667070	430	610	430
667071	210	3000	220
667072	55	1800	60
667073	34	990	32
667074	30	700	30
UNITS	ppm	ppm	ppm
SCHEME	AAS1	AAS1 AAS1A	AAS1

Rep 38

8m av. 0.699%

Duplicate

Rep 39

3m av. 547ppm Cu. 0.133% Pb 963ppm Zn.

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ANALYTICAL REPORT

JOB COM842339
O/N : 3HBG 0310 A1 N079563

316

SAMPLE	Cu	Pb	Zn	
667075	34	470	30	Rep 39
667076	34	450	32	
667077	60	340	125	Duplicate
667078	44	800	90	
667079	28	1000	34	Rep 40.
667080	32	3900	32	0.3483% Pb.
667081	44	8050	32	6m av.
667082	26	3550	24	
667083	28	2700	22	
667084	26	1700	24	
667085	24	1750	24	Duplicate
667086	145	970	460	
667087	410	2000	1150	Rep 41
667088	430	2000	1200	
667089	400	2150	1250	
667090	270	1100	1350	11m av. 0.109% Zn 0.129% Pb 260ppm Cu.
667091	220	1150	1100	
667092	195	1050	1300	
667093	120	480	820	
667094	195	640	970	
667095	240	1300	1200	
667096	240	1350	1250	
667097	38	140	170	Rep 26
667098	44	165	100	Rep 42
667099	55	250	135	
UNITS	ppm	ppm	ppm	
SCHEME	AAS1	AAS1	AAS1	

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ANALYTICAL REPORT

JOB COM842339
O/N : 3HBG 0310 A1 N079563

317

SAMPLE	Cu	Pb	Zn
667100	70	260	145
667101	48	230	140
667102	40	230	120
667103	38	200	125
667104	32	200	110
667105	55	270	165
667106	34	210	95
667107	24	195	60
667108	48	220	85
667109	80	350	140
667110	75	490	140
667111	75	360	280
667112	70	330	320
667113	55	270	260
667114	55	280	280
667115	220	1.95%	125
667116	370	3.45%	230
667117	630	4.90%	320
667118	670	5.05%	320
667119	650	4.40%	250
667120	750	4.45%	370
667121	660	3.75%	270
667122	680	3.65%	250
667123	800	4.20%	280
667124	810	4.35%	410
UNITS	ppm	ppm	ppm
SCHEME	AAS1	AAS1 AAS1A	AAS1

Rep 42.

Rep 43

10m av. 4.0% Pb
av 624ppm Cu
av 282.5ppm Zn

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ANALYTICAL REPORT

JOB COM842339 318

O/N : 3HBG 0310 A1 N079563

SAMPLE	Cu	Pb	Zn	
667125	810	4.45%	370	Duplicate
667126	200	3100	190	
667127	175	1150	190	
667128	240	3650	230	
667129	300	3500	280	
667130	290	3000	320	
667131	230	2450	240	
667132	340	2500	330	
667133	370	2400	390	
667134	600	2300	580	
667135	730	2300	530	
667136	650	1900	560	
667137	520	2650	580	
667138	490	2250	710	
667139	470	2000	590	
667140	410	1500	730	
667141	400	1550	730	Duplicate
UNITS	ppm	ppm	ppm	
SCHEME	AAS1	AAS1 AAS1A	AAS1	

Rec 44

15m av. 0.29% Pb
av. 930ppm Zn.
4000ppm Cu.

COMLABS Pty. Ltd.
COMPUTERISED ANALYTICAL LABORATORIES

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

NATA REGISTERED No. 1526

319

OUR REF.: COM842428

YOUR REF.: 3HBG0310A1 N079573

Mr. M. Boots
Esso Australia Ltd.
127 Kent St

SYDNEY
NSW 2000

November 29, 1984

Dear Sir

RE: JOB COM842428

Enclosed are the assays for the samples delivered to our laboratory on November 5, 1984

Yours Sincerely,
COMLABS PTY LTD

per :

P R Harvey

c.c.: Norwood No. of copies : 1
c.c.: Blinman No. of copies : 1

Report Length 30 pages

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ANALYTICAL REPORT

JOB COM842428 320

O/N : 3HBG0310A1 N079573

SAMPLE	Cu	Pb	Zn	
666915	36	210	220	REQ 18
666916	65	195	400	
666917	75	125	320	
666918	90	90	330	
666919	110	70	410	
666920	120	90	370	
666921	85	90	240	
666922	175	85	310	
666923	280	145	470	
666924	175	400	420	
666925	165	370	360	
666926	145	270	320	
666927	145	280	320	Duplicate
666928	40	60	80	
666929	28	110	155	REQ 17
666930	20	85	60	
666931	28	80	90	
666932	26	105	65	
666933	60	125	115	
666934	145	120	190	
666935	185	130	340	
666936	185	210	270	
666937	120	185	230	
666938	85	210	240	
666939	70	260	230	
UNITS	ppm	ppm	ppm	
SCHEME	AAS1	AAS1	AAS1	

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ANALYTICAL REPORT

321

JOB COM842428
O/N : 3HBG0310A1 N079573

SAMPLE	Cu	Pb	Zn	
666940	105	145	230	
666941	115	125	230	REP 17
666942	100	150	230	
666943	125	155	260	
666944	120	155	270	Duplicate
666945	30	70	75	
666946	18	75	50	REP 16
666947	18	100	100	
666948	14	70	55	
666949	14	60	50	
666950	20	65	48	
666951	34	85	50	
666952	60	95	80	
666953	65	100	100	
666954	80	135	160	
666955	30	100	55	
666956	22	80	40	
666957	18	80	28	
666958	32	130	65	
666959	44	125	150	
666960	44	130	140	Duplicate
666961	310	370	820	
666962	450	470	1300	REP 19
666963	290	370	840	
666964	410	650	1550	
UNITS	ppm	ppm	ppm	
SCHEME	AAS1	AAS1	AAS1	

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ANALYTICAL REPORT

JOB COM842428 - 322
O/N : 3HBG0310A1 N079573

SAMPLE	Cu	Pb	Zn	
666965	390	710	1500	Duplicate
666966	LNR	LNR	LNR	Rep 20
666967	115	330	175	Rep 21
666968	130	240	145	
666969	310	2300	320	
666970	340	2200	360	Duplicate
666971	70	175	80	Rep 22
666972	95	240	185	
666973	155	280	400	
666974	160	220	430	
666975	145	125	470	Rep 24
666976	60	750	180	
666977	155	1500	550	Rep 23
666978	28	350	180	Rep 28
666979	36	300	210	Rep 29
666980	70	590	270	Rep 27
666981	80	1150	380	
666982	140	1400	630	
666983	135	1400	580	
666984	170	1850	730	
666985	290	3600	1250	
666986	350	2800	1350	
666987	36	140	80	Rep 30
666988	22	120	65	
666989	14	120	26	
UNITS	ppm	ppm	ppm	
SCHEME	AAS1	AAS1	AAS1	

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ANALYTICAL REPORT

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JOB COM842428
O/N : 3HBG0310A1 N079573

SAMPLE	Cu	Pb	Zn	
666990	14	1050	20	
666991	14	1000	22	
666992	12	1050	16	Rep 30
666993	12	950	14	
666994	12	1050	14	
666995	10	700	20	
667142	90	360	135	Rep 45
667143	46	320	65	Rep 46
667144	20	520	20	
667145	22	520	22	
667146	12	630	10	
667147	12	740	10	
667148	14	600	7	
667149	14	570	7	
667150	14	880	10	
667151	18	1350	14	
667152	12	540	12	
667153	12	520	8	
667154	14	480	12	Duplicate
667155	46	370	70	Rep 47
667156	32	900	55	
667157	18	1250	26	
667158	10	1850	16	
667159	14	1850	14	
667160	22	1700	26	
UNITS	ppm	ppm	ppm	
SCHEME	AAS1	AAS1	AAS1	

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ANALYTICAL REPORT

JOB COM842428
O/N : 3HBG0310A1 N079573

SAMPLE	Cu	Pb	Zn	
667161	18	2050	24	
667162	8	790	10	
667163	4	330	2	REP 47
667164	4	260	5	
667165	9	800	5	
667166	9	630	4	
667167	12	460	3	
667168	10	450	2	Duplicate
667169	22	260	12	
667170	28	300	22	REP 48
667171	22	320	22	
667172	24	320	22	
667173	18	270	20	
667174	18	200	24	
667175	18	390	7	
667176	12	440	18	
667177	12	570	18	
667178	12	630	10	
667179	16	610	28	
667180	12	620	12	
667181	16	640	22	
667182	14	600	20	Duplicate
667183	22	145	32	REP 49
667184	20	260	26	
667185	16	210	26	
UNITS	ppm	ppm	ppm	
SCHEME	AAS1	AAS1	AAS1	

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ANALYTICAL REPORT

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JOB COM842428
O/N : 3HBG0310A1 N079573

SAMPLE	Cu	Pb	Zn	
667186	75	220	105	
667187	180	360	240	
667188	145	330	180	
667189	170	320	180	REP 49
667190	150	290	180	
667191	200	260	250	
667192	410	290	530	
667193	280	290	530	
667194	250	320	610	
667195	270	240	930	
667196	155	250	660	
667197	155	150	750	
667198	145	120	670	Duplicate
667199	55	145	175	REP 34
667200	70	155	140	
667201	90	195	165	
667202	135	180	270	
667203	120	165	240	
667204	150	240	690	
667205	135	250	710	
667206	105	195	680	
667207	100	260	400	
667208	110	340	460	
667209	105	340	360	
667210	135	320	410	
UNITS	ppm	ppm	ppm	
SCHEME	AAS1	AAS1	AAS1	

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ANALYTICAL REPORT

JOB COM842428
O/N : 3HBG0310A1 N079573

SAMPLE	Cu	Pb	Zn	
667211	165	300	380	
667212	155	270	390	Duplicate
667213	32	75	95	Rep 50
667214	20	85	44	
667215	14	85	26	
667216	14	105	22	
667217	22	135	22	
667218	30	230	34	
667219	90	310	70	
667220	230	320	165	
667221	390	340	330	
667222	380	280	320	
667223	330	195	310	
667224	290	220	310	
667225	160	180	210	
667226	110	200	200	
667227	190	210	390	
667228	280	175	590	
667229	260	120	590	
667230	210	170	500	
667231	280	180	590	
667232	240	195	520	Duplicate
667233	LNR	LNR	LNR	
667234	60	195	75	Rep 51
667235	48	195	32	
UNITS	ppm	ppm	ppm	
SCHEME	AAS1	AAS1	AAS1	

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ANALYTICAL REPORT

JOB COM842428
O/N : 3HBG0310A1 N079573

SAMPLE	Cu	Pb	Zn	
667236	48	260	36	
667237	48	210	24	
667238	55	190	30	
667239	65	195	32	
667240	48	200	18	Rep 51
667241	75	310	40	
667242	75	400	36	
667243	65	360	36	
667244	50	310	30	
667245	38	160	24	
667246	34	400	24	
667247	75	610	60	
667248	75	620	60	Duplicate
667249	14	520	18	Rep 52
667250	12	720	10	
667251	12	340	14	
667252	10	390	10	
667253	20	175	8	
667254	9	310	12	
667255	14	165	10	
667256	16	185	9	
667257	48	340	12	
667258	60	220	12	
667259	75	130	24	
667260	38	360	24	
UNITS	ppm	ppm	ppm	
SCHEME	AAS1	AAS1	AAS1	

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JOB COM842428
O/N : 3HBG0310A1 N079573

SAMPLE	Cu	Pb	Zn	
667261	46	460	38	
667262	50	195	40	
667263	38	105	34	
667264	36	90	34	Duplicate
667265	55	240	120	RE 53
667266	60	400	145	
667267	40	330	175	
667268	22	810	38	
667269	16	470	28	
667270	18	550	30	
667271	20	670	20	
667272	14	400	18	
667273	12	320	16	
667274	14	330	12	
667275	9	220	12	
667276	16	250	18	
667277	12	260	12	Duplicate
667278	75	260	180	
667279	60	340	145	RE 54
667280	65	820	165	
667281	38	1500	105	
667282	46	2050	125	
667283	28	1200	40	
667284	28	1700	38	
667285	38	840	38	
UNITS	ppm	ppm	ppm	
SCHEME	AAS1	AAS1	AAS1	

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ANALYTICAL REPORT

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JOB COM842428
O/N : 3HBG0310A1 N079573

SAMPLE	Cu	Pb	Zn	
667286	55	1850	50	
667287	170	2100	340	
667288	185	4300	165	REP 54
667289	70	2050	65	
667290	115	3050	125	
667291	30	2750	26	
667292	20	2400	20	
667293	18	2250	28	
667294	22	2150	34	Duplicate
667295	230	200	170	
667296	250	320	185	REP 58
667297	510	290	730	
667298	520	180	710	
667299	300	110	380	
667300	105	40	60	REP 59.
667301	90	50	60	
667302	26	22	16	
667303	14	12	10	
667304	6	<4	3	
667305	6	10	4	
667306	5	16	4	
667307	8	8	4	
667308	9	30	2	
667309	16	42	6	
667310	12	70	7	
UNITS	ppm	ppm	ppm	
SCHEME	AAS1	AAS1	AAS1	

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ANALYTICAL REPORT

330

JOB COM842428
O/N : 3HBG0310A1 N079573

SAMPLE	Cu	Pb	Zn	
667311	16	130	4	
667312	18	65	7	
667313	16	30	6	
667314	65	250	95	Rep 60
667315	60	260	80	
667316	60	260	50	
667317	40	260	24	
667318	40	240	30	
667319	28	210	18	
667320	28	200	18	
667321	32	170	22	
667322	120	105	18	
667323	195	130	90	
667324	175	135	48	
667325	115	140	60	
667326	75	115	32	
667327	80	165	55	
667328	75	160	42	Duplicate
667329	50	300	105	Rep 61
667330	44	360	70	
667331	48	260	44	
667332	75	240	70	
667333	80	260	105	
667334	65	260	65	
667335	85	230	55	
UNITS	ppm	ppm	ppm	
SCHEME	AAS1	AAS1	AAS1	

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ANALYTICAL REPORT

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JOB COM842428
O/N : 3HBG0310A1 N079573

SAMPLE	Cu	Pb	Zn	
667336	165	230	130	REP 61
667337	360	180	400	
667338	210	195	290	
667339	220	180	290	Duplicate
667340	42	300	44	REP 62
667341	60	460	38	
667342	320	650	310	
667343	200	530	165	
667344	135	530	95	
667345	200	450	150	
667346	170	500	290	
667347	140	320	450	
667348	30	360	50	REP 63
667349	16	600	26	
667350	10	630	12	
667351	8	620	12	
667352	9	700	18	
667353	16	650	18	
667354	18	580	22	
667355	12	570	12	
667356	14	700	14	
667357	26	780	16	
667358	44	1700	70	REP 64
667359	34	890	90	
667360	34	240	60	REP 65
UNITS	ppm	ppm	ppm	
SCHEME	AAS1	AAS1	AAS1	

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ANALYTICAL REPORT

JOB COM842428
O/N : 3HBG0310A1 N079573

SAMPLE	Cu	Pb	Zn	
667361	36	115	75	Rep 65
667362	46	220	90	Rep 66
667363	70	870	55	
667364	130	1700	105	Rep 57
667365	65	2550	100	
667366	95	7900	165	
667367	320	2.55%	240	
667368	660	3.60%	610	
667369	420	4.20%	540	Rep 5C
667370	580	3.20%	980	
667371	660	3.40%	1750	
667372	630	3.95%	950	
667373	450	9300	1150	
667374	420	7700	1500	
667375	420	8050	1550	Duplicate
667376	48	400	65	Rep 55
667377	26	310	38	
667378	30	360	46	
667379	65	330	200	
667380	105	170	330	
667381	175	90	410	
667382	145	250	280	
667383	70	420	115	
667384	70	700	95	
667385	50	850	65	
UNITS	ppm	ppm	ppm	
SCHEME	AAS1	AAS1 AAS1A	AAS1	

ANALYTICAL REPORT

333

JOB COM842428
O/N : 3HBG0310A1 N079573

SAMPLE	Cu	Pb	Zn	
667386	48	380	70	Rep 55
667387	50	400	65	Duplicate
667388	30	165	30	Rep 67
667389	40	1200	26	Rep 68
667390	38	640	26	
667391	75	680	38	
667392	26	190	26	
667393	75	3600	50	Rep 69.
667394	70	8150	50	
667395	80	1.46%	44	
667396	90	1.52%	48	
667397	135	1.43%	105	
667398	120	1.47%	85	
667399	140	1.50%	95	
667400	170	1.57%	100	
667401	310	1.67%	140	
667402	450	1.35%	300	
667403	350	1.26%	250	
667404	420	1.08%	330	
667405	420	1.13%	380	
667406	300	9650	250	
667407	280	9150	230	
667408	270	8850	220	Duplicate
667409	90	2300	60	Rep 70
667410	120	3300	55	
UNITS	ppm	ppm	ppm	
SCHEME	AAS1	AAS1	AAS1	

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ANALYTICAL REPORT

JOB COM842428 L - 334
O/N : 3HBG0310A1 N079573

SAMPLE	Cu	Pb	Zn	
667411	135	2850	46	
667412	120	2450	60	
667413	135	2100	60	Rep 70
667414	110	1500	50	
667415	70	990	46	
667416	65	990	50	
667417	50	740	42	
667418	60	700	55	
667419	32	450	55	Rep 71
667420	42	840	90	
667421	60	2650	70	
667422	48	1700	70	
667423	40	1150	75	
667424	44	660	70	
667425	44	730	65	
667426	50	600	75	
667427	70	670	95	
667428	75	500	100	
667429	65	600	95	
667430	120	610	170	
667431	110	570	150	
667432	125	470	175	
667433	155	460	250	
667434	140	490	230	
667435	145	540	290	
UNITS	ppm	ppm	ppm	
SCHEME	AAS1	AAS1	AAS1	

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ANALYTICAL REPORT

335

JOB COM842428
O/N : 3HBG0310A1 N079573

SAMPLE	Cu	Pb	Zn	
667436	125	470	240	R00 71
667437	120	410	260	
667438	120	390	260	Duplicate
667439	30	165	50	R00 72
667440	36	340	70	
667441	32	200	42	
667442	12	65	12	
667443	8	55	6	
667444	8	28	7	
667445	12	38	8	
667446	24	32	10	
667447	24	46	10	
667448	48	65	44	R00 73
667449	95	125	65	
667450	105	130	80	
667451	150	160	105	
667452	270	175	160	
667453	125	95	85	
667454	105	125	80	R00 81
667455	65	130	70	
667456	120	230	125	
667457	330	185	250	
667458	760	240	510	
667459	115	65	155	
667460	370	250	310	
UNITS	ppm	ppm	ppm	
SCHEME	AAS1	AAS1	AAS1	

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ANALYTICAL REPORT

JOB COM842428
O/N : 3HBG0310A1 N079573

SAMPLE	Cu	Pb	Zn	
667461	42	60	28	Rep 82
667462	60	150	48	
667463	150	300	75	Rep 83
667464	180	340	95	
667465	300	320	190	
667466	240	220	160	
667467	50	390	34	
667468	50	770	40	
667469	60	860	38	
667470	60	880	40	Rep 85
667471	65	1050	46	
667472	55	1000	34	
667473	48	900	40	
667474	75	1050	48	
667475	240	880	145	
667476	48	870	48	~~Rep 84~~
667477	32	530	34	
667478	14	320	14	
667479	7	65	5	
667480	5	55	3	
667481	7	38	60	
667482	10	60	3	
667483	9	42	7	
667484	7	34	10	
667485	7	36	<2	
UNITS	ppm	ppm	ppm	
SCHEME	AAS1	AAS1	AAS1	

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ANALYTICAL REPORT

JOB COM842428
O/N : 3HBG0310A1 N079573

337

SAMPLE	Cu	Pb	Zn	
667486	46	1.35%	26	
667487	44	2.10%	32	REP 86
667488	60	3.40%	26	
667489	60	2.30%	26	
667490	85	2.35%	34	
667491	60	2.15%	26	
667492	60	9850	32	
667493	95	1.11%	60	
667494	120	7150	115	
667495	150	4900	55	REP 87
667496	155	5850	55	
667497	170	6900	60	
667498	230	8350	75	
667499	320	8100	80	
667500	430	8350	130	
667501	170	6350	60	
667502	170	1.04%	70	
667503	190	1.07%	65	
667504	270	9600	120	
667505	330	5700	210	
667506	200	5800	130	
667507	420	4300	250	
667508	400	4350	260	Duplicate
667509	65	580	75	REP 88
667510	48	1050	80	
UNITS	ppm	ppm	ppm	
SCHEME	AAS1	AAS1 AAS1A	AAS1	

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ANALYTICAL REPORT

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JOB COM842428
O/N : 3HBG0310A1 N079573

SAMPLE	Cu	Pb	Zn	
667511	28	1450	20	REP 88
667512	20	910	9	
667513	32	3750	36	
667514	36	2500	36	
667515	28	2350	30	
667516	28	2050	22	
667517	40	3550	30	
667518	44	3500	36	
667519	38	2450	26	
667520	46	3400	34	
667521	40	2950	28	
667522	50	3800	40	
667523	55	3850	30	
667524	140	9600	65	
667525	120	5400	90	
667526	75	1400	40	REP 89.
667527	85	1800	46	
667528	115	3100	70	
667529	85	2250	48	
667530	100	1900	65	
667531	85	2350	55	
667532	100	2650	65	
667533	100	3350	65	
667534	185	5450	90	
667535	110	1000	105	REP 90
UNITS	ppm	ppm	ppm	
SCHEME	AAS1	AAS1	AAS1	

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ANALYTICAL REPORT

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JOB COM842428
O/N : 3HBG0310A1 N079573

SAMPLE	Cu	Pb	Zn	
667536	85	2700	70	
667537	85	1450	80	
667538	135	840	150	REP 90
667539	100	3850	90	
667540	165	2650	250	
667541	220	1950	270	
667542	270	1950	340	
667543	38	100	28	REP 91
667544	95	220	65	
667545	160	280	100	
667546	260	290	130	
667547	125	460	70	
667548	185	470	85	REP 92
667549	95	360	55	
667550	240	400	120	
667551	700	520	280	
667552	380	440	220	
667553	40	85	30	REP 93
667554	85	2100	85	REP 99
667555	165	1.62%	120	
667556	210	1.87%	120	
667557	250	1.94%	130	
667558	270	1.59%	140	
667559	360	6750	210	
667560	450	6450	290	
UNITS	ppm	ppm	ppm	
SCHEME	AAS1	AAS1 AAS1A	AAS1	

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ANALYTICAL REPORT

JOB COM842428 340
O/N : 3HBG0310A1 N079573

SAMPLE	Cu	Pb	Zn	
667561	200	2050	210	
667562	210	4300	220	
667563	175	5200	165	
667564	180	5250	165	
667565	230	680	105	REP 100
667566	470	1000	240	
667567	490	1800	200	
667568	590	1900	280	
667569	650	1650	480	
667570	670	2050	400	
667571	70	1050	55	
667572	380	1200	290	
667573	46	115	36	REP 101
667574	44	95	38	
667575	85	160	65	
667576	140	190	120	REP 102
667577	120	410	80	
667578	220	370	120	
667579	42	80	44	
667580	60	260	55	
667581	90	360	65	REP 103
667582	120	400	85	
667583	180	290	170	
667584	44	60	60	
667585	38	70	100	REP 104
UNITS	ppm	ppm	ppm	
SCHEME	AAS1	AAS1	AAS1	

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ANALYTICAL REPORT

341

JOB COM842428
O/N : 3HBG0310A1 N079573

SAMPLE	Cu	Pb	Zn	
667586	42	185	80	REP 104
667587	46	250	60	
667588	50	320	50	
667589	55	350	46	
667590	50	410	55	
667591	60	420	75	
667592	46	360	65	
667593	55	420	55	
667594	90	440	70	
667595	80	440	36	Duplicate
667596	38	70	65	REP 105
667597	50	90	95	
667598	120	165	160	
667599	570	230	400	
667600	430	165	240	
667601	240	230	140	
667602	190	440	195	
667603	180	330	190	
667604	36	60	85	REP 106
667605	38	80	90	
667606	50	100	125	
667607	26	430	42	
667608	28	390	36	
667609	24	370	24	
667610	28	380	34	
UNITS	ppm	ppm	ppm	
SCHEME	AAS1	AAS1	AAS1	

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ANALYTICAL REPORT

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JOB COM842428
O/N : 3HBG0310A1 N079573

SAMPLE	Cu	Pb	Zn	
667611	18	250	34	
667612	16	135	14	REP 106
667613	10	65	26	
667614	9	36	5	
667615	40	60	105	
667616	40	65	110	REP 107
667617	34	120	90	
667618	38	65	105	REP 98
667619	32	55	60	REP 97
667620	36	75	90	
667621	26	50	75	
667622	10	12	16	
667623	7	<4	5	
667624	7	4	6	
667625	6	4	2	
667626	42	75	90	REP 96.
667627	50	260	75	
667628	34	290	55	
667629	20	120	20	
667630	22	48	30	
667631	22	55	10	
667632	26	34	7	
667633	70	125	12	
667634	165	115	32	
667635	195	140	22	
UNITS	ppm	ppm	ppm	
SCHEME	AAS1	AAS1	AAS1	

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ANALYTICAL REPORT

343

JOB COM842428
O/N : 3HBG0310A1 N079573

SAMPLE	Cu	Pb	Zn	
667636	130	400	26	REP 76
667637	30	36	36	REP 78
667638	34	50	44	
667639	46	65	60	
667640	34	50	50	
667641	40	55	60	
667642	55	55	80	
667643	44	80	34	REP 79
667644	60	85	40	
667645	90	125	55	
667646	115	140	60	
667647	130	125	60	
667648	200	125	90	
667649	220	115	100	
667650	185	110	105	
667651	190	110	115	
667652	180	120	130	
667653	170	120	110	
667654	165	130	110	Duplicate
667655	38	38	48	REP 77
667656	38	44	50	
667657	20	26	18	
667658	12	12	12	
667659	10	14	3	
667660	14	65	7	
UNITS	ppm	ppm	ppm	
SCHEME	AAS1	AAS1	AAS1	

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ANALYTICAL REPORT

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JOB COM842428
O/N : 3HBG0310A1 N079573

SAMPLE	Cu	Pb	Zn	
667661	18	310	16	REP 77
667662	48	530	16	
667663	65	115	60	
667664	48	220	36	
667665	48	310	26	
667666	28	36	50	REP 76
667667	85	550	180	REP 74
667668	570	55	360	REP 75
667669	430	90	330	
667670	420	85	410	
667671	390	85	440	
667672	155	850	190	
667673	300	300	350	REP 80
667674	240	180	300	
667675	185	155	250	
667676	210	270	270	
667677	LNR	LNR	LNR	
667678	200	90	260	REP 80
667679	290	220	280	
667680	220	155	230	
667681	300	280	110	REP 95
667682	1000	280	240	
667683	850	240	290	
667684	520	340	300	
667685	470	340	310	
UNITS	ppm	ppm	ppm	
SCHEME	AAS1	AAS1	AAS1	

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ANALYTICAL REPORT

JOB COM842428
O/N : 3HBG0310A1 N079573

SAMPLE	Cu	Pb	Zn	
667686	480	330	310	REP 95
667687	410	320	450	
667688	150	140	70	REP 94
667689	280	190	120	
667690	240	185	125	
667691	890	230	610	
667692	600	230	400	
667693	LNR	LNR	LNR	
667694	34	75	380	FDP 1
667695	34	85	660	
667696	30	85	650	
667697	30	360	770	
667698	20	105	370	
667699	28	105	580	
667700	44	135	390	
667701	20	50	175	
667702	24	155	550	
667703	60	330	1000	
667704	65	440	900	
667705	70	350	1100	
667706	18	90	210	
667707	20	105	200	
667708	20	85	115	
667709	16	95	120	
667710	16	80	110	
UNITS	ppm	ppm	ppm	
SCHEME	AAS1	AAS1	AAS1	

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ANALYTICAL REPORT

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JOB COM842428
O/N : 3HBG0310A1 N079573

SAMPLE	Cu	Pb	Zn
667711	16	55	65
667712	14	65	80
667713	14	70	130
667714	12	24	42
667715	12	36	60
667716	14	40	55
667717	14	44	100
667718	12	28	60
667719	9	20	70
667720	16	22	95
667721	10	22	110
667722	10	18	48
667723	10	18	36
667724	12	50	42
667725	12	32	28
667726	16	28	26
667727	12	18	24
667728	12	18	18
667729	10	36	34
667730	9	22	20
667731	8	10	20
667732	9	12	18
667733	12	30	42
667734	9	12	26
667735	9	14	26
UNITS	ppm	ppm	ppm
SCHEME	AAS1	AAS1	AAS1

PDP 1

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ANALYTICAL REPORT

347

JOB COM842428
O/N : 3HBG0310A1 N079573

SAMPLE	Cu	Pb	Zn
667736	12	44	100
667737	14	22	30
667738	10	14	26
667739	10	16	28
667740	14	30	75
667741	16	20	32
667742	12	18	42
667743	10	12	38
667744	12	36	42
667745	LNR	LNR	LNR
667746	18	115	500
667747	12	34	300
667748	14	44	690
667749	10	30	270
667750	12	85	160
667751	12	38	85
667752	14	70	140
667753	16	30	46
667754	16	55	140
667755	12	115	145
667756	12	42	70
667757	8	55	110
667758	10	36	95
667759	12	26	110
667760	18	40	210
UNITS	ppm	ppm	ppm
SCHEME	AAS1	AAS1	AAS1

PDP 1

PDP 2

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ANALYTICAL REPORT

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JOB COM842428
O/N : 3HBG0310A1 N079573

SAMPLE	Cu	Pb	Zn
667761	12	30	55
667762	14	24	22
667763	12	28	14
667764	10	24	12
667765	8	8	10
667766	8	8	12
667767	12	12	18
667768	12	18	55
667769	9	12	22
667770	8	10	14
667771	8	10	20
667772	24	28	36
667773	34	24	60
667774	26	12	30
667775	20	14	30
667776	20	18	18
667777	18	16	22
667778	16	14	16
667779	20	8	16
667780	14	8	12
667781	9	8	8
667782	12	8	7
667783	14	8	10
667784	28	8	18
667785	16	12	12
UNITS	ppm	ppm	ppm
SCHEME	AAS1	AAS1	AAS1

PDP2.

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ANALYTICAL REPORT

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JOB COM842428
O/N : 3HBG0310A1 N079573

SAMPLE	Cu	Pb	Zn
667786	LNR	LNR	LNR
667787	14	80	440
667788	10	38	200
667789	16	48	160
667790	12	135	490
667791	16	200	170
667792	12	120	40
667793	12	1550	85
667794	12	6350	105
667795	12	490	95
667796	12	810	140
667797	8	370	75
667798	10	330	115
667799	10	270	110
667800	7	38	22
667801	8	40	24
UNITS	ppm	ppm	ppm
SCHEME	AAS1	AAS1	AAS1

PDP3

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

350

OUR REF.: COM842514

YOUR REF.: N 079583

Mr. M. Boots
Esso Australia Ltd.
127 Kent St

SYDNEY
NSW 2000

December 5, 1984

Dear Sir

RE: JOB COM842514

Enclosed are the assays for the samples delivered to our laboratory on November 19, 1984

Yours Sincerely,
COMLABS PTY LTD

per :

c.c.: Blinman No. of copies : 1
c.c.: Norwood No. of copies : 1

Report Length 8 pages

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ANALYTICAL REPORT

JOB COM842514
O/N : N 079583

SAMPLE	Cu	Pb	Zn	
667802	12	110	60	PDP 3.
667803	16	95	70	(32-34m)
667804	16	50	40	
667805	36	160	55	
667806	16	32	22	
667807	14	65	42	
667808	10	160	40	
667809	8	38	26	
667810	14	38	26	
667811	26	55	55	
667812	10	55	24	
667813	12	46	24	
667814	14	105	165	
667815	10	60	90	
667816	9	36	20	
667817	10	36	18	(60-62m).
667818	14	38	26	PDP 4
667819	12	28	36	
667820	12	28	100	
667821	14	38	280	
667822	12	28	180	
667823	14	50	130	(10-12m).
667824	10	50	410	
667825	12	28	125	
667826	10	50	185	
UNITS	ppm	ppm	ppm	
SCHEME	AAS1	AAS1	AAS1	

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ANALYTICAL REPORT

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JOB COM842514
O/N : N 079583

SAMPLE	Cu	Pb	Zn	
667827	12	135	250	PDP4.
667828	12	140	220	
667829	14	175	210	
667830	16	320	750	
667831	18	550	430	
667832	18	530	240	
667833	9	250	60	(30-32)
667834	9	195	44	
667835	9	195	50	
667836	14	470	75	
667837	16	680	60	
667838	10	260	55	(40-42)
667839	12	2100	75	
667840	12	730	42	
667841	14	210	42	
667842	32	820	165	
667843	18	520	80	(50-52)
667844	22	200	55	
667845	16	250	75	
667846	20	175	48	
667847	46	120	36	
667848	24	195	60	(60-62)
667849	24	165	80	
667850	18	170	34	
667851	20	165	34	
UNITS	ppm	ppm	ppm	
SCHEME	AAS1	AAS1	AAS1	

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ANALYTICAL REPORT

JOB COM842514
O/N : N 079583

353

SAMPLE	Cu	Pb	Zn	
667852	28	130	40	
667853	14	290	44	(70-72)
667854	22	700	145	
667855	18	350	40	
667856	28	510	85	
667857	28	135	65	PDPS
667858	16	40	105	
667859	12	30	32	
667860	12	28	22	
667861	12	26	22	
667862	30	28	22	(10-12)
667863	14	30	16	
667864	14	28	40	
667865	14	26	24	
667866	16	30	26	
667867	14	34	16	(20-22)
667868	14	30	70	
667869	18	50	165	
667870	16	28	150	
667871	10	26	80	
667872	22	60	105	(30-32)
667873	12	55	100	
667874	12	50	85	
667875	18	145	125	
667876	16	320	240	
UNITS	ppm	ppm	ppm	
SCHEME	AAS1	AAS1	AAS1	

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ANALYTICAL REPORT

JOB COM842514
O/N : N 079583

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SAMPLE	Cu	Pb	Zn	
667877	14	540	100	(40-42) PDP5
667878	14	740	55	
667879	16	920	65	
667880	18	1000	65	
667881	16	580	50	
667882	18	145	40	(50-52)
667883	16	140	22	
667884	18	165	44	
667885	18	175	60	
667886	18	220	55	
667887	20	55	26	(60-62)
667888	12	60	28	
667889	12	36	36	
667890	10	50	36	
667891	40	22	18	(0-4) PDP6
667892	60	14	16	
667893	34	10	10	
667894	40	8	14	
667895	38	8	14	
667896	50	6	14	
667897	48	6	14	
667898	40	10	20	
667899	75	12	16	
667900	24	4	9	(20-22)
667901	12	4	8	
UNITS	ppm	ppm	ppm	
SCHEME	AAS1	AAS1	AAS1	

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ANALYTICAL REPORT

JOB COM842514
O/N : N 079583

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SAMPLE	Cu	Pb	Zn	
667902	30	4	9	
667903	1750	6	9	
667904	480	10	12	
667905	28	4	10	
667906	10	<4	6	
667907	10	6	12	
667908	7	4	12	
667909	10	6	12	
667910	7	8	12	
667911	18	8	10	
667912	5	8	16	
667913	6	4	24	
667914	12	8	60	
667915	5	6	14	
667916	6	4	18	
667917	18	6	46	
667918	55	10	90	
667919	75	10	170	(55-62)
667920	55	10	165	(62-64)
667921	20	26	24	(0-2)
667922	14	28	12	
667923	16	32	9	
667924	14	34	16	
667925	20	26	10	
667926	22	22	32	(10-12)
UNITS	ppm	ppm	ppm	
SCHEME	AAS1	AAS1	AAS1	

PDP 6.

PDP 7

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ANALYTICAL REPORT

JOB COM842514
O/N : N 079583

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SAMPLE	Cu	Pb	Zn	
667927	42	24	28	PD? 7
667928	36	26	14	
667929	16	28	18	
667930	18	65	16	
667931	480	85	9	(20-22)
667932	65	28	12	
667933	40	20	12	
667934	38	26	12	
667935	14	22	18	
667936	44	16	20	(30-32)
667937	36	10	12	
667938	30	12	9	
667939	18	12	14	
667940	18	14	14	
667941	26	14	12	(40-42)
667942	90	20	22	
667943	LNR	LNR	LNR	CAVITY NO SAMPLE
667944	LNR	LNR	LNR	
667945	LNR	LNR	LNR	
667946	85	36	100	(50-52)
667947	80	20	105	
667948	130	24	170	
667949	230	30	400	
667950	160	30	260	
667951	90	20	75	
UNITS	ppm	ppm	ppm	
SCHEME	AAS1	AAS1	AAS1	

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ANALYTICAL REPORT

JOB COM842514
O/N : N 079583

SAMPLE	Cu	Pb	Zn	
667952	46	14	105	
667953	48	12	100	
667954	75	30	185	
667955	44	24	150	
667956	115	36	190	
667957	95	18	110	
667958	85	22	105	(7673)
667959	85	22	110	Duplicate
UNITS	ppm	ppm	ppm	
SCHEME	AAS1	AAS1	AAS1	

PDP7.

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ANALYTICAL REPORT

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JOB COM842514
O/N : N 079583

SAMPLE	Ag
666300	1
666301	1
666302	1
666346	16
666347	18
666348	4
666349	3
666350	<1
666351	<1
666352	<1
666353	<1
666354	<1
666355	1
666372	5
666373	6
666374	4
666375	3
UNITS	ppm
SCHEME	AAS3

COMLABS Pty. Ltd.
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305 South Road,
Mile End South,
Sth. Aust. 5031.
Tel: (08) 43 5722
Telex: AA89323

NATA REGISTERED No. 1526

OUR REF.: COM842679

YOUR REF.: 3HBG0310A1 N079593

Mr. M. Boots
Esso Australia Ltd..
127 Kent St

SYDNEY
NSW 2000

December 20, 1984

Dear Mick

RE: JOB COM842679

Enclosed are the assays for the samples delivered to our laboratory on December 10, 1984.

Yours Sincerely,
COMLABS PTY LTD

per :

c.c.: Norwood No. of copies : 1

Report Length 4 pages

COMLABS Pty. Ltd.
COMPUTERISED ANALYTICAL LABORATORIES

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ANALYTICAL REPORT

JOB COM842679
O/N : 3HBG0310A1 N079593

360

SAMPLE	Cu	Pb	Zn	Ag	
667961	36	16	20	<1	98.99
667962	38	16	28	<1	99-100
667963	24	30	100	<1	130-131
667964	20	100	130	<1	
667965	38	1400	350	<1	
DWM1 667966	160	7250	230	3	
667967	90	480	145	<1	
667968	30	300	160	<1	
667969	40	210	145	<1	
667970	46	230	195	<1	
667971	12	300	250	1	
667972	24	36	160	<1	138 - 139
667973	12	480	270	<1	129-130
667974	18	550	270	<1	137-138
667975	125	1150	180	1	-139
667976	250	7350	65	2	-140
667977	32	380	185	<1	-141
DWM1A 667978	42	3900	165	1	-142
667979	26	100	165	<1	-143
667980	60	340	165	<1	-144
667981	18	165	310	<1	-145
667982	8	300	360	<1	-146
667983	40	5200	210	<1	146 - 147
667984	42	7250	380	1	-148
667985	44	2.15%	145	4	-149
UNITS	ppm	ppm	ppm	ppm	
SCHEME	AAS1	AAS1 AAS1A	AAS1	AAS3	

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361

ANALYTICAL REPORT

JOB COM842679
O/N : 3HBG0310A1 N079593

SAMPLE	Cu	Pb	Zn	Ag
667986	70	8900	110	2
667987	26	1.53%	120	3
667988	70	7850	70	2
667989	270	210	55	2
667990	300	470	44	2
667991	330	1750	48	2
667992	3700	860	230	9
667993	1350	580	110	3
667994	32	195	44	<1
UNITS	ppm	ppm	ppm	ppm
SCHEME	AAS1	AAS1 AAS1A	AAS1	AAS3

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ANALYTICAL REPORT

JOB COM842679
O/N : 3HBG0310A1 N079593

362

SAMPLE	Ag
667115	<1
667116	<1
667117	1
667118	<1
667119	1
667120	<1
667121	<1
667122	<1
667123	<1
667124	1
667367	<1
667368	<1
667369	<1
667370	<1
667371	1
667372	3
667395	<1
667396	<1
667397	1
667398	<1
667399	<1
667400	1
667401	<1
667402	<1
667403	<1
UNITS	ppm
SCHEME	AAS3

RDP 43

RDP 56

RDP 69.

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ANALYTICAL REPORT

JOB COM842679
O/N : 3HBG0310A1 N079593

363

SAMPLE	Ag
667404	<1
667405	<1
667555	<1
667556	2
667557	2
667558	2
667486	<1
667487	<1
667488	<1
667489	<1
667490	2
667491	1
667492	1
667493	1
UNITS	ppm
SCHEME	AAS3

APPENDIX C

Drill Logs

HOLE No. PWP 1	EASTING	DETAILS	PRECOLLAR	MAIN HOLE	DEPTH	DECL'N	BEARING	HOLE DIAM.	FROM	TO	PROJECT FLINDERS JV	AREA WILLYAMA
DEPTH 50m	NORTHING	Contractor	WL SIDES & SONS		0	VERTICAL.	—				JOB No.	SCALE
GRID AMG	LOGGED BY MTR	Machine	Atlas Copco B80								MINERAL TENEMENT EL 1138 MT. FROME	
RL	DATUM MSL	Commenced	021084								SHEET 1 OF 2	
		Completed	021084									
		Method	RC									

METRES	MINERALIZATION % CONTENT Zn	Pb	Fe	TYPE	SAMPLE Int	NUMBER	ASSAY RESULTS Zn%	Pb%	Ag ppm	Cu(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
2						666346	1·51	8·0	16	55	€	BY																						Calcrete, hydrous oxide, stain intense Mn staining
4						666347	6·15	7·45	18	40		GB																						Trace Mn
6						666348	3·7	2·5	4	29		GBk																						Mn staining
8						666349	1·14	1·04	3	12		GBf				1	C_3																	Trace Mn
10						666350	0·64	0·515	<1	9		BBk				1	C_3																	Intense Mn staining
12						666351	0·58	0·25	<1	8		BBk																						a a
16						666352	0·355	0·29	<1	8		BfB				1	C_3																	Intense Mn staining
16						666353	0·285	0·175	<1	12		BfB				1	C_3		1	C_3														Intense Mn staining
18						666354	0·19	0·115	<1	10		Bf																						Intense Mn staining
20						666355	0·205	0·14	1	14		BkB				1	C_3		1	C_3														a a
22						666356	0·295	0·235		22		BkB				2	C_3		2	C_3														Intense Mn staining
24						666357	0·275	0·22		16		BkB				1	C_3																	a m.
26						666358	0·23	0·20		24		BkB				1	C_3																	a a.
28						666359	0·27	·093		22		BkB				1	C_3																	a a.
30						666360	0·295	0·15		18		BkB				1	C_3		1	d_2														Intense Mn staining
32						666361	0·33	0·225		14		BkB				1	C_3																	Intense Mn staining
34						666362	0·28	0·145		16		BkB				1	C_3		1	d_2														a a.
36						666363	0·135	0·10		8		PB				1	C_3																	Trace malachite
38						666364	0·19	0·125		9		PB				i	Mn																	
40						666365	0·405	0·125		12		B																						Intense Mn staining
42						666366	0·135	·074		8		G																						
44						666367	0·115	·08		6		PB																						Partly dolomitized Mn dendrite
						666368	·037	·038		4		PB																						

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 (Bl
- C
- O
- Fenestrae
- Bedding/layering
- Veins
- Conformable contact
- Unconformable contact

HOLE No. PWP 1	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 2	
		Completed										
		Method										

METRES	MINERALIZATION % CONTENT Zn	Pb	Fe	TYPE	SAMPLE Int	NUMBER	ASSAY RESULTS Zn%	Pb%	Ag ppm	Cu%	STRAT AGE	COLOUR	LITHOS	LCA	TEXTURE	OPEN SPACE FRACTURING I	F	F	I	F	F	I	F	F	Vugh	Coat	Calc	STYL Con	Dis	Res	FOSSILS Abun	Comm	Rare	REMARKS
46												PB				1	C3																
						666369	.042	.05		4																							
48												PB				1	C3																
						666370	0.12	.09		3																							
50																																	

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 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
- 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 (Bl
- C
- D
- Fenestrae
- Bedding/layering
- Veins
- Conformable contact
- Unconformable contact

HOLE No. PWP2	EASTING	DETAILS	PRECOLLAR	MAIN HOLE	DEPTH	DECL'N	BEARING	HOLE DIAM.	FROM	TO	PROJECT FUNDERS JV	AREA WILKAROONIA
DEPTH 50m	NORTHING	Contractor	WL Sides + Sons		0	60	240°				JOB No.	SCALE
GRID AMG	LOGGED BY MTR	Machine	Atlas Copco 350								MINERAL TENEMENT EL 1138 MT. FRome	
RL	DATUM MSL	Commenced									SHEET 1 OF 2	
		Completed										
		Method	RC									

METRES	MINERALIZATION % CONTENT Zn	Pb	Fe	TYPE	SAMPLE int	NUMBER	ASSAY RESULTS Zn%	Pb%	Ag ppm	Cu (ppm)	STRAT AGE	COLOUR	LITHOS	L.C.A.	TEXTURE	OPEN SPACE FRACTURING I	F	F	I	F	F	I	F	F	Vugs	Oxid	Calc	STYL Con	Dis	Res	FOSSILS Abun	Comm	Rare	REMARKS
1																																		
2	1				666372	1.45	1.2	5	12		GB			1	G	l																	Coarse grain galena
4					666373	1.46	0.78	6	10		GB			1	G		1	G	l													Trace Mn dendrites, c.g. ga
6					666374	0.95	0.65	4	12		GB																					Trace Mn staining
8					666375	0.63	0.47	3	9		GB			1	G																	Minor Mn staining
10	1				666376	0.14	.078		2		GB			1	G	l																Trace Mn staining, c.g. galena
12					666377	0.255	0.105		8		BG			1	G																	
14					666378	0.35	0.11		12		BG			1	G		1	G														Intense Mn staining
16					666379	0.345	.083		10		B																					Intense Mn staining
18					666380	0.23	.073		10		BBk			1	G																	Mn staining
20					666381	0.23	.077		14		BBk			1	G																	"
22					666382	0.32	0.115		34		CB																					
24					666383	0.165	.079		28		GBk			1	G																	Minor Mn staining
26					666384	0.125	.067		20		GBf																					Intense Mn staining
28					666385	0.175	.051		22		GBf			1	G																	Trace Mn dendrites
30					666386	0.25	.06		18		GBf			1	G																	Trace Mn dendrites
32					666387	0.37	.082		18		GBf																					
34					666388	0.3	.08		18		GB			1	G																	Trace Mn dendrites
36					666389	0.115	.061		12		GD			1	G																	(A) Trace Mn dendrites
38					666390	0.11	.052		10		GP			1	G																	Trace Mn dendrites
40					666391	.068	.031		5		GP			1	G		1	3_1													
42					666392	0.385	0.12		8		GP			1	G																	
44					666393	0.195	0.105		14		PBf			1	G																	
					666394	0.119	.04		5		GP																					

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
- 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 (Wh; 2. Matrix (Bl;
- B
- C
- D
- Fenestrae
- Bedding/layering
- Veins
- Conformable contact
- Unconformable contact

HOLE No. PWP 2	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 2	
		Completed										
		Method										

METRES	MINERALIZATION % CONTENT Zn	Pb	Fe	TYPE	SAMPLE Int	NUMBER	ASSAY RESULTS Zn%	Pb%	Ag ppm	Cu	STRAT AGE	COLOUR	LITHOS	L.C.A.	TEXTURE	OPEN SPACE FRACTURING I	F	F	I	F	F	I	F	F	Vugh	Oomt	Colla	STYL Con	Dis	Res	FOSSILS Abun	Comm	Rare	REMARKS
46												GP																						
						66395	.029	.013		4		GP																						
48																																		
						66396	.024	.011		2		GP																						
50																																		

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
- 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
- A 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. PWP3	EASTING	DETAILS	PRECOLLAR	MAIN HOLE	DEPTH	DECL'N	BEARING	HOLE DIAM.	FROM	TO	PROJECT FLINDERS J.V. / AREA WILLURARA
DEPTH 45m	NORTHING	Contractor	WL Sidey & Sons			VERTICAL					JOB No. / SCALE
GRID	LOGGED BY MTR	Machine	Atlas Copco RBO								MINERAL TENEMENT EL 1138 MT. FROME
RL	DATUM	Commenced									
		Completed									SHEET / OF
		Method	RC								

METRES	MINERALIZATION % CONTENT Zn	Pb	Fe	TYPE	SAMPLE Int	NUMBER	ASSAY RESULTS Zn%	Pb%	Ag ppm	Cu(m)	STRAT AGE	COLOUR	LITHOS	L.C.A.	TEXTURE	OPEN SPACE FRACTURING I	F	F	I	F	F	I	F	F	Vugh	Oolic	STYL Con	Dis	Res	FOSSILS Abun	Comm	Rare	REMARKS
0						666398	.05	.032		20	€	R																					
2						666399	.056	.008		32		YB																					
4						666400	.061	.013		40		BY																					
6						666401	.047	.007		65		B																					
8						666402	.032	.004		60		YB																					
10						666403	.022	.001		65		PB																					
12						666404	.016	<4		85		RB																					
14						666405	.016	<4		70		RB																					
16						666406	.028	<4		80		BRB																					
18						666407	.04	.011		85		YB																					
20						666408						YB																					
22						666409	.027	.004		50		YB																					
24						666410	.047	.015		46		YB																					
26						666411	0.325	1.28		48		YB																					
28						666412	.072	.060		32		BFY																					
30						666413	0.475	0.735		38		BBK																					
32						666414	0.315	0.15		34		BBK																					
34						666415	.098	.035		20		GBK				1G																Mn staining
36						666416	.073	.027		12		GBK				1G			1G												Intense Mn staining
38						666417	.036	.017		12		PG																					
40						666418	.031	.022		18		PG																					
42						666419	.026	.015		8		PG																				Trace Mn dendrites	
44						666420	.003	.007		7		PG																					

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

THE BROKEN HILL PROPRIETARY COMPANY LIMITED — EXPLORATION DEPARTMENT — HOLE No. PWP3

HOLE No. PWP4	EASTING	DETAILS	PRECOLLAR	MAIN HOLE	DEPTH	DECL'N	BEARING	HOLE DIAM.	FROM	TO	PROJECT FLINDERS JV	AREA WILNURAONIA
DEPTH 50m	NORTHING	Contractor	W L Sides & Sons								JOB No.	SCALE
GRID	LOGGED BY MTR	Machine	Atlas Copco 280			VERTICAL					MINERAL TENEMENT EL 1138 MT FRAME	
RL	DATUM	Commenced									SHEET 1 OF 2	
		Completed										
		Method	RC									

METRES	MINERALIZATION % CONTENT Zn	Pb	Fe	TYPE	SAMPLE Int	NUMBER	ASSAY RESULTS Zn%	Pb%	Ag ppm	Cu ppm	STRAT AGE	COLOUR	LITHOS	L.C.A.	TEXTURE	OPEN SPACE FRACTURING I	F	F	I	F	F	I	F	F	Vugh	Cont	Colla	STYL Con	Dis	Res	FOSSILS Abun	Comm	Rare	REMARKS
2						666422	0.155	.086		22	€	BRk				1	G																	Soil calcrete, Mn staining
																																		weathered calcarenite
4						666423	.035	.018		8		BRk				1	G																	Partly dolomitized
																																		Mn staining
6						666424	.031	.014		4		GB				1	G																	Some Mn staining
																																		white calcite
8						666425	.020	.014		2		GB																						
						666426	.015	.009		3		GB				2	G																	
10																																		
						666427	.022	.008		2		G																						
12																																		
						666428	.022	.008		3		GB																						
14																																		Partly dolomitized
						666429	.026	.004		2		GB																						
16																																		
						666430	.017	.006		<2		GB																						
18																																		
						666431	.053	.029		7		GB																						
20																																		
						666432	.039	.029		10		GB				1	G																	Mn dendrites
22																																		
						666433	.045	.027		4		GB				1	G																	
24																																		
						666434	.028	.015		<2		BG																						Partly dolomitized
26																																		Mn dendrites
						666435	.037	.024		3		BG																						Some Mn dendrite
28																																		
						666436	.056	.029		2		GB																						Some Mn staining
30																																		
						666437	.099	.038		7		BBk				1	G																	Mn staining throughout
32																																		
						666438	0.13	.073		12		BKB				1	G																	Mn staining
34																																		
						666439	.091	.057		6		PB																						Mn staining
36																																		
						666440	0.19	0.16		22		BKB				1	G																	Intense Mn staining
38																																		
						666441	0.13	0.14		6		GB																						Part dolomitized Trace
40																																		Mn dendrites
						666442	.026	.018		3		GB																						Trace chlorite
42																																		
						666443	014	.008		5		GB																						
44						666444	.004	.002		<2																								

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
- 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
- A 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 (Bl
- C
- O
- Fenestrae
- Bedding/layering
- Veins
- Conformable contact
- Unconformable contact

HOLE No. PWP4	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 2	
		Completed										
		Method										

METRES	MINERALIZATION % CONTENT Zn	Pb	Fe	TYPE	SAMPLE Int	NUMBER	ASSAY RESULTS Zn%	Pb%	Ag ppm	C_u	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
46																																		
48						66645	.005	.002		2		GB																							
50						66646	.006	.002		3		G																							

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
- A 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 (W
- B — 2. Matrix (B
- C
- D
- Fenestrae
- Bedding/layering
- Veins
- Conformable contact
- Unconformable contact

HOLE No. PWP5	EASTING	DETAILS	PRECOLLAR	MAIN HOLE	DEPTH	DECL'N	BEARING	HOLE DIAM.	FROM	TO	PROJECT FLINDERS JV	AREA WILNURRA
DEPTH 50m	NORTHING	Contractor	ABL Sidey + Sons			VERTICAL					JOB No.	SCALE
GRID	LOGGED BY MTR	Machine	Atlas Copco 2RC3								MINERAL TENEMENT EL 1138 MT. FROME	
RL	DATUM	Commenced									SHEET 1 OF 2	
		Completed										
		Method	RC									

METRES	MINERALIZATION % CONTENT Zn	Pb	Fe	TYPE	SAMPLE Int	NUMBER	ASSAY RESULTS Zn%	Pb%	Ag ppm	Cu 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
2						666448	.067	0.2	1	32		B																					
4						666449	0.31	0.55	1	55		B				IG																	Partly dolomitized Mn staining
6						666450	0.16	0.30	1	24		B				IG																	a a
8						666451	0.16	0.35	1	30		BBK				IG																	Intense Mn staining
10						666452	0.13	0.18	1	24		BBK				IG																	a a
12						666453	0.17	0.15	1	30		BBK				IG																	a a
14						666454	0.13	0.068	1	18		BBK				IG																	a a
16						666455	0.15	0.090	1	18		BBK				IG																	a a
18						666456	0.13	0.081	1	20		BBK				IG																	a a
20						666457	0.084	0.038	1	12		BBK				IG																	Mn staining
22						666458	0.058	0.040	1	14		B				IG																	a a
24						666459	0.043	0.042	1	9		B				IG																	Trace Mn
26						666460	0.042	0.036	1	9		B																					
28						666461	0.035	0.025	1	8		BG																					
30						666462	0.039	0.015	1	4		GB																					Trace Mn
32						666463	0.033	0.012	1	4		GB																					Trace Mn.
34						666464	0.027	0.011	1	6		BG																					Trace Mn
36						666465	0.014	0.009	1	3		PG																					
38						666466	0.053	0.026	1	3		PG																					
40						666467	0.17	0.079	1	4		PG																					
42						666468	0.095	0.055	1	9		PB																					
44						666469	0.056	0.045	1	4		PB																					Trace Mn
						666470	0.018	0.010	1	2		GR																					

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
- A 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 (Bl
- C
- D
- Fenestrae
- Bedding/layering
- Veins
- Conformable contact
- Unconformable contact

HOLE No PWP5	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 2	
		Completed										
		Method										

METRES	MINERALIZATION % CONTENT Zn	Pb	Fe	TYPE	SAMPLE Int	NUMBER	ASSAY RESULTS Zn%	Pb%	Ag ppm	Cu	STRAT AGE	COLOUR	LITHOS	L.C.A.	TEXTURE	OPEN SPACE FRACTURING I	F	F	I	F	F	I	F	F	Vugh	Crist	Colla	STYL Con	Dis	Res	FOSSILS Abun	Comm	Rare	REMARKS
46													·1·1																				
47													·1·																				
48						666471	·005	·003	1	2		G	-1·1																				
49													-1·																				
50						666472	·009	·004	1	3		RG	-1·1																				

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 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
- 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
- O
- Fenestrae
- Bedding/layering
- Veins
- Conformable contact
- Unconformable contact

HOLE No PWP6	EASTING	DETAILS	PRECOLLAR	MAIN HOLE	DEPTH	DECL'N	BEARING	HOLE DIAM.	FROM	TO	PROJECT FLINDERS J.V.	AREA W/WWoomera
DEPTH 50m	NORTHING	Contractor	w/ Sides Drilling			VERTICAL					JOB No.	SCALE
GRID	LOGGED BY MTR	Machine	Atlas Copco 980								MINERAL TENEMENT EL 1138 MT. FROME	
RL	DATUM	Commenced									SHEET 1 OF 2	
		Completed										
		Method	RC									

METRES	MINERALIZATION % CONTENT Zn Pb Fe	TYPE	SAMPLE Int	NUMBER	ASSAY RESULTS Zn%	Pb%	Ag ppm	Cu ppm	STRAT AGE	COLOUR	LITHOS	L.C.A.	TEXTURE	OPEN SPACE FRACTURING I	F	F	I	F	F	I	F	F	Vugh	Cont Calla	STYL Con	Dis	Res	FOSSILS Abun	Comm	Rare	REMARKS
0																															
2				666474	.033	.016	<1	10		B				1	C3															Mn staining-calcrete. Sandy
4				666475	.089	.060	<1	14		B				1	C3															Mn staining
6				666476	.086	.054	<1	12		B				1	C3															" "
8				666477	.074	.052	<1	10		B				1	C3															Mn stains
10				666478	0.13	0.15	<1	14		B				1	C3															" "
12				666479	.052	.021	<1	5		B				2	C3															" "
14				666480	.037	.016	<1	7		BG																				" "
16				666481	.055	.034	<1	9		BG				1	C3															" "
18				666482	.039	.011	<1	4		B																				
20				666483	.028	.018	<1	4		PBG																				
22				666484	.012	.003	<1	2		PBG				1	C3															
24				666485	.018	.007	<1	3		PB																				
26				666486	.026	.009	<1	4		PBG																				
28				666487	.014	.005	<1	3		PBG				1	C3															
30				666488	.046	.004	<1	3		PBG																				
32				666489	.026	.005	<1	3		PBG																				
34				666490	.027	.005	<1	5		PBG																				
36				66649/	.021	.004	<1	3		PB																				
38				666492	.019	.005	<1	3		PB																				
40				666493	.023	.006	<1	2		GB				1	C3															
42				666494	.029	.006	<1	2		BP				1	C3															
44				666495	.031	.009	<1	2		GB																				
				666496	.029	.009	<1	2		B																				

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 Stromatoporoid
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 1 Clasts (Wh
B 2 Matrix (Bl
C
D
Fenestrae
Bedding/layering
Veins
Conformable contact
Unconformable contact

HOLE No. PWP6	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 2
		Completed									
		Method									

METRES	MINERALIZATION % CONTENT Zn	Pb	Fe	TYPE	SAMPLE Int	NUMBER	ASSAY RESULTS Zn%	Pb%	Ag ppm	Cu 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
46																																		
						666497	.033	.027	1	3		B																						
49																																		
50						666498	.023	.013	1	2		PB																						

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 (W
- B — 2 Matrix (B
- C
- O
- Fenestrae
- Bedding/layering
- Veins
- Conformable contact
- Unconformable contact

THE BROKEN HILL PROPRIETARY COMPANY LIMITED — EXPLORATION DEPARTMENT — HOLE No. PWP6

HOLE No. PWP7	EASTING	DETAILS	PRECOLLAR	MAIN HOLE	DEPTH	DECL'N	BEARING	HOLE DIAM.	FROM	TO	PROJECT FLINDERS JV / AREA WILUNA
DEPTH 75m	NORTHING	Contractor	WL Sidey & Sons			VERTICAL					JOB No. / SCALE
GRID	LOGGED BY MTR	Machine	Atlas Copco RB30								MINERAL TENEMENT GL 1138 MT. FROME
RL	DATUM	Commenced									SHEET 1 OF 2
		Completed									
		Method	RC								

METRES	MINERALIZATION % CONTENT Zn	Pb	Fe	TYPE	SAMPLE Int	NUMBER	ASSAY RESULTS Zn%	Pb%	Ag ppm	Cu 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
2						666500	.004	.001		6	€																					A		
4						666501	.001	.001		3																								
6						666502	.01	.001		4																						A		
8						666503	.001	.001		3																								
10						666504	.001	.001		3																								
12						666505	.001	.001		3																								
14						666506	.001	.001		3	€																					A		
16						666507	.001	.001		3																								
18						666508	.001	.001		3																								
20						666509	.001	.001		3																						A		
22						666510	.001	.001		3																								
24						666511	.001	.001		4																								
26						666512	.021	.003		6																								
28						666513	.009	.005		5																								
30						666514	.006	.002		4																						A		
32						666515	.014	.004		5																								
34						666516	.012	.002		4	€																							
36						666517	.002	.001		4																								
38						666519	.003	.001		20																						A		
40						666520	.003	.001		12																								
42						666521	.002	.001		85																						A		
44						666522	.030	.011		14	€																							
						666523	.035	.007		19																								

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
- A 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. PWP7	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 2	
		Completed										
		Method										

METRES	MINERALIZATION % CONTENT Zn	Pb	Fe	TYPE	SAMPLE Int	NUMBER	ASSAY RESULTS Zn%	Pb%	Ag ppm	Cu ppm	STRAT AGE	COLOUR	LITHOS	L.C.A.	TEXTURE	OPEN SPACE FRACTURING I	F	F	I	F	F	I	F	F	Vugh	Cmt	Calla	STYL Con	Dis	Res	FOSSILS Abun	Comm	Rare	REMARKS
46																																		
48						666524	.011	.009		115																								
50						666525	.059	.010		590																								
52						666526	.076	.013		760																								
54						666527	.040	.004		400																								
56						666528	.013	.001		135																								
58						666529	.001	.001		2																								
60						666530	.001	.001		6																								
62						666531	.017	.001		170																								
64						666532	.033	.003		330																								
66						666533	.006	.001		65																								
68						666534	.003	.001		32																								
70						666535	.002	.001		26																								
72						666536	.002	.001		22																								
74						666537	.002	.001		20																								
75						666538	.001	.001		18																								

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
- A 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 (Bl
- C
- D
- Fenestrae
- Bedding/layering
- Veins
- Conformable contact
- Unconformable contact

EF. 2490

THE BROKEN HILL PROPRIETARY COMPANY LIMITED — EXPLORATION DEPARTMENT — HOLE No. PWP7

HOLE No. PDP 1	EASTING	DETAILS	PRECOLLAR	MAIN HOLE	DEPTH	DECL'N	BEARING	HOLE DIAM	FROM	TO	PROJECT Flinders J.V.	AREA Donkey Bore
DEPTH 69m	NORTHING	Contractor	W.L. Sides & Sons		0	Vertical		4 1/2"	0	69	JOB No.	SCALE "
GRID AMG	LOGGED BY MR.	Mechine	Atlas Copco RD6								MINERAL TENEMENT EL 1129 Willoughby PA	
RL	DATUM MSL	Commenced	31/08/84								SHEET OF	
		Completed	01/11/84									
		Method	RC									

METRES	MINERALIZATION % CONTENT Zn	Pb	Fe	TYPE	SAMPLE Int	NUMBER	ASSAY RESULTS Zn%	Pb%	Ag ppm	Cu ppm	STRAT AGE	COLOUR	LITHOS	L.C.A.	TEXTURE	OPEN SPACE FRACTURING I	F	F	I	F	F	I	F	F	STYL Vugh	Crist	Calc	Con	Dis	Res	FOSSILS Abun	Comm	Rare	REMARKS
						667694	.038	.007	-	34	€		= | =			1	C1																	Patrom Limestone
						667695	.066	.008	-	34	€		= | = | =																				
						667696	.065	.008	-	34			= | =			1	C1															A	
						667697	.077	.036	-	30		BkG	= | =																				
						667698	.087	.011	-	20			= | =			1	C1																trans pyl.
						667699	.058	.011	-	28			= | = | =																				
						669700	.039	.019	-	44			= | =			1	C1																
						669701	.018	.005	-	20			= | = | =																				
						667702	.055	.016	-	29			= | =			1	C1															A	
				→		667703	0.1	.033	-	60			= | =																				
						667705	0.11	.035	-	70			= | =			1	C1																trans pyl.
						667707	.020	.011	-	20			= | = | =																				
						667709	.012	.009	-	36		BkG	= | =																				
						667711	.006	.008	-	16			= | = | =																				
						667713	.013	.007	-	14			= | =																				
						667715	.006	.004	-	12			= | = | =																				
						667717	.010	.004	-	14	€		= | =			1	C1																
						667719	.007	.001	-	9			= | = | =			1	C1																
						667721	.010	.002	-	10			= | =			1	C1																
				→		667723	.002	.004	-	10			= | = | =			1	C1																
						667725	.003	.003	-	12			= | =																				
						667727	.002	.001	-	12			= | = | =																				
						667729	.003	.003	-	10			= | =																			A	
						667731	.002	.007	-	8		BkG	= | = | =																				
						667733	.004	.003	-	12			= | =																				
						667735	.003	.001	-	9			= | = | =																				
						667737	.003	.002	-	14			= | =																				
						667738	.003	.001	-	10			= | = | =																				
						667739	.003	.001	-	10			= | =																				
						667740	.009	.003	-	14			= | = | =																				
						667748	.003	.002	-	16			= | =																				
						667749	.004	.002	-	12			= | = | =																				
						667743	.004	.001	-	10	€		= | =																			A	
				—		667744	.004	.004	-	12			= | = | =																				Hole abandoned. Propose to deepen hole with core drilling - hole did not reach target depth.
						EOH : 69m.																											
70																																	

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 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
- 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 (Bl
- C
- D
- Fenestrae
- Bedding/layering
- Veins
- Conformable contact
- Unconformable contact

HOLE No PDP2	EASTING	DETAILS	PRECOLLAR	MAIN HOLE	OEPTH	DECL'N	BEARING	HOLE DIAM	FROM	TO	PROJECT FLINDERS JV / AREA DENLOY BORD
DEPTH 79m	NORTHING	Contractor	WL SIDDS	TSENS	0.0	60°	090	4⅝"	0	79	JOB No. / SCALE
GRID AMG	LOGGED BY MTR	Machine	Atlas Copco	R80							MINERAL TENEMENT EL 1129 WIRRALPA
RL	DATUM MSL	Commenced	011184								SHEET OF
		Completed	021184								
		Method	RC								

METRES	MINERALIZATION % CONTENT Zn Pb Fe	TYPE	SAMPLE Int	NUMBER	ASSAY RESULTS (ppm) Zn	Pb	Ag	Cu	STRAT AGE	COLOUR	LITHOS	LCA	TEXTURE	OPEN SPACE FRACTURING I F F	I F F	I F F	Vugh	Coat	Calc	STYL Con	Dis	Res	FOSSILS Abun	Comm	Rare	REMARKS
				667746	500	115		18																		
				667747	300	34		12	€	B																
		→		667748	690	44		14																		
				667749	270	30		10	ØB					1	C											
40				667750	160	85		12						1	C											
		✓		667751	85	38		12	G					1	C											
				667752	140	70		14						1	C											
				667753	46	30		16						1	C											
				667754	140	55		16						1	C											
20				667755	145	115		12						1	C											
				667756	70	42		12						1	C											
				667757	110	55		8						1	C											
		→		667758	95	36		10						1	C											
				667759	110	26		12						1	C											
30				667760	210	40		18						1	C											
				667761	55	20		12						1	C											
				667762	22	24		14						1	C											
				667763	14	28		12	€					1	C											
				667764	12	24		10						1	C											
40				667765	10	8		8						1	C										(A)	trace pyr.
				667766	12	8		8						1	C											
				667767	18	12		12						1	C											
				667768	55	18		12																		
				667769	22	12		9																		
		→		667770	14	10		8																		
50				667771	20	10		8																		
				667772	36	28		24																		trace karst fill - angular &
				667773	60	24		34																		rounded clasts < 5mm
				667774	30	12		26																		
60				667775	30	14		20																		
				667776	18	18		20																		
				667777	22	16		18																		~1% pyrite
				667778	16	14		16																		
				667779	16	8		20																		
70				667780	12	8		14																		
				667781	8	8		9																		
				667782	7	8		12																		
				667783	10	8		14																		
		→		667784	18	8		28	€																	trace pyr.
80				EOH : 79m.																						

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
S	Stromatactoid
	Geopetal

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

FOSSILS	
	Algae
	Stromatolites
	Renalcis
	Brachiopods
	Oncolites
	Coral
A	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
Oolomite (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 1. Clasts (Wh
B 2 Matrix (Bl
C
D
Fenestrae
Bedding/layering
Veins
Conformable contact
Unconformable contact

Oolitic in part, locally silicified + pyrite shale fill

Trace spherulitic anhydrite ± rare "palmoxal" calcite/dolomite

unconformity

Laminar calcite

Slight marking e.g. pyr/calcite

HOLE No. PDP3	EASTING	DETAILS	PRECOLLAR	MAIN HOLE	DEPTH	DECL'N	BEARING	HOLE DIAM.	FROM	TO	PROJECT FLINDERS JV
DEPTH 62-5m	NORTHING	Contractor	WL 5DD 150m S		0·0	60·5°	080	4 1/5"	0	62·5	JOB No.
GRID AMG	LOGGED BY MTR	Machine	Atlas Copco B80								MINERAL TENEMENT EL 1129 WIRRALPA
RL	DATUM MSL	Commenced	02 11 84								SHEET OF
		Completed	03 11 84								AREA DON JAY BORE
		Method	RC								SCALE

METRES	MINERALIZATION % CONTENT Zn	Pb	Fe	TYPE	SAMPLE int	NUMBER	ASSAY RESULTS (ppm) Zn	Pb	Ag	Cu	STRAT AGE	COLOUR	LITHOS	L.C.A.	TEXTURE	OPEN SPACE FRACTURING I	F	F	I	F	F	I	F	F	Vugh	Cont	Colla	STYL Con	Dis	Res	FOSSILS Abun	Comm	Rare	REMARKS
						667787	440	80		14	€		·1·																				
						667788	200	38		10			1·1·																				
						667789	160	48		16			·1·																				
						667790	490	135		12		G/B	·1·1·																				
10						667791	170	200		16			·1·																				
						667792	40	120		12			1·1																			A	
						667793	85	1550		12			·1·																				
						667794	105	6350		12			·1·1·																				
						667795	95	490		12	€		·1·			1	C$_1$																
20						667796	140	810		12			·1·1·																			A	
						667797	75	370		8			·1·																				
						667798	115	330		10			·1·1·																				
						667799	110	270		10			·1·																			A	
						667800	22	38		7			·1·1·																				
						667801	29	40		8			·1·																				
30						667802	60	110		12		G/B	·1·1·			1	K$_1$																
						667803	70	95		16			·1·																				trace pyrite
						667804	40	50		16			·1·1·																				
						667805	55	160		36	€		·1·																				
40						667806	22	32		16			1·1·																			A	
						667807	92	65		14			·1·																				
						667808	40	160		10			·1·1·			1	C$_3$																
						667809	26	38		8			·1·																				
						667810	26	38		14			·1·1·																				
50						667811	55	55		26			·1·																				
						667812	29	55		10		G/B	·1·1·																				trace pyrite
						667813	29	46		12			·1·																				
						667814	165	105		14			·1·1·																				
						667815	90	60		10			·1·																				
60						667816	20	36		9			·1·1·																				
						667817	18	36		10	€		·1·1·																			A	
						EOH	62.5m																										

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 (Bl
- C
- O
- Fenestrae
- Bedding/layering
- Veins
- Conformable contact
- Unconformable contact

HOLE No PDP 4	EASTING	DETAILS	PRECOLLAR	MAIN HOLE	DEPTH	DECL'N	BEARING	HOLE DIAM	FROM	TO	PROJECT FLINDERS JV / AREA DONKEY BORE
DEPTH 78m	NORTHING	Contractor	WL SIDES & SONS		0.0	60°	080	4½"	0	78	JOB No. / SCALE
GRID AMG	LOGGED BY MTR	Machine	Atlas Copco 880								MINERAL TENEMENT E.L. 1129 WIRRIALPA
RL	DATUM MSL	Commenced	04 11 84								SHEET / OF
		Completed	05 11 84								
		Method	RC								

METRES	MINERALIZATION % CONTENT Zn	Pb	Fe	TYPE	SAMPLE Int	NUMBER	ASSAY RESULTS (ppm) Zn	Pb	Ag	Cu	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
						667818	26	38		14																								
						667819	36	28		12																								
						667820	100	28		12																								
						667821	280	38		14																								
						667822	180	28		12																								
70						667823	130	50		14																								
						667829	410	50		10																								
						667825	125	28		12																								
						667826	185	50		10																								
90						667827	250	135		12																								
						667828	220	140		12																								
						667829	210	175		14																								
	→					667830	750	320		16																								
						667831	430	550		18																						A		
						667832	240	530		18																								
30						667833	60	250		9																							trace M—	
						667834	44	195		9																						M		
						667835	50	195		9																								
						667836	75	470		14																								
						667837	60	680		16																								
40						667838	55	260		10																								
						667839	75	2100		12																								
						667840	42	730		12																								
						667841	42	210		14																							Hit wate	
						667842	165	820		32																						A		
50	→					667843	80	520		18																								
						667844	55	280		22																								
						667845	75	250		16																								
						667846	48	175		20																								
						667847	36	120		46																								
60						667848	60	195		24																						A		
						667849	80	165		24																								
						667850	34	170		18																								
						667851	34	165		20																								
						667852	40	130		28																								
70						667853	44	290		14																								
						667854	145	700		22																								
						667855	40	350		18																						A		
	→					667856	85	510 EOH 78m		28																								
80																																		

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/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 1. Clasts (Wh
B 2. Matrix (Bl
C
D
Fenestrae
Bedding/layering
Veins
Conformable contact
Unconformable contact

HOLE No. PDP5	EASTING	DETAILS	PRECOLLAR	MAIN HOLE	OEPTH	OECL'N	BEARING	HOLE DIAM	FROM	TO	PROJECT FLINDERS JV / AREA DONKEY BORE
OEPTH 68m	NORTHING	Contractor	WL Sides + Sons		0	62.5°	087	4½"	0	68	JOB No. / SCALE
GRID AMG	LOGGED BY MTR	Machine	Atlas Copco RD80								MINERAL TENEMENT EL 1179 WILLYAMA
RL	OATUM MSL	Commenced	08 11 89								SHEET OF
		Completed	08 11 89								
		Method	RC								

METRES	MINERALIZATION % CONTENT Zn	Pb	Fe	TYPE	SAMPLE int	NUMBER	ASSAY RESULTS (ppm) Zn	Pb	Ag	Cu	STRAT AGE	COLOUR	LITHOS	L.C.A.	TEXTURE	OPEN SPACE FRACTURING I	F	F	I	F	F	I	F	F	Vugh.	Cont.	Colla.	STYL Con.	Dis.	Res.	FOSSILS Abun	Comm	Rare	REMARKS
0						667857	65	135		28			= | =																				
						667858	105	40		16			= | = | -																				
						667859	32	30		12			= | -																				
						667860	22	28		12			= | = | -																				
						667861	22	26		12			= | =																				
10						667862	22	28		80			= | - | =			1	C3																
						667863	16	30		14			- | =																				
						667864	40	28		14			= | = | =																				
						667865	29	26		14			= | =																				
20						667866	26	30		16			= | = | =																				
						667867	16	34		14			= | =																				
						667868	70	30		14			= | = | =																				
						667869	165	50		18			= | =																				
						667870	150	28		16			= | = | =																				
30						667871	80	26		10			= | =																				trace pyrite
						667872	105	60		22			= | = | =																				
						667873	100	55		12			= | =																				
						667874	85	50		12			= | = | =																				
						667875	125	145		18			= | =																				
40						667876	240	320		16			= | = | =																				
	+					667877	100	540		14			~			1	C3																
	+					667878	55	740		14			· | - | -			1	C3															A	
	+					667879	65	920		16			· | ·			1	C3																
	+					667880	65	1000		18			· | - | -			1	C3																Partial dolomitisation trace pyrite
50	+					667881	50	580		16			· | ·			1	C3																
						667882	40	145		18			· | · | ·																				
						667883	22	140		16			· | ·																			A	
						667884	44	165		18			· | · | ·																				
						667885	60	175		18			· | ·																				
60						667886	55	220		18			· | · | ·																				
						667887	26	55		20			· | ·																			A	
						667888	28	60		12			· | · | ·																				
						667889	36	36		12			· | ·																				
70						667890	36	50		10			· | · | -																			A	
								EOH 68m																									

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

Laminar Stromotoporoid
Stromatactoid
Geopetal

STYLOLITES

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

FOSSILS

Algae
Stromatolites
Ranalcis
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
- A 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 (Bl
C
O
Fenestrae
Bedding/layering
Veins
Conformable contact
Unconformable contact

HOLE No. PDP6	EASTING	DETAILS	PRECOLLAR	MAIN HOLE	DEPTH	DECL'N	BEARING	HOLE DIAM	FROM	TO	PROJECT FLINDERS JV / AREA DONKEY BORE
DEPTH 64m	NORTHING	Contractor	WLS Drilling		0	-62.5°	075	4 1/8"	0	64	JOB No. / SCALE
GRID AM6	LOGGED BY MTR	Machine	Atlas Copco RBU								MINERAL TENEMENT EL 1129 WILLOUGHBY
RL	DATUM MSL	Commenced	08 11 84								SHEET OF
		Completed	10 11 84								
		Method	RC								

METRES	MINERALIZATION % CONTENT Zn	Pb	Fe	TYPE	SAMPLE Int	NUMBER	ASSAY RESULTS (ppm) Zn	Pb	Ag	Cu	STRAT AGE	COLOUR	LITHOS	L.C.A.	TEXTURE	OPEN SPACE FRACTURING I	F	F	I	F	F	I	F	F	Vugh	Coat	Calc	STYL Con	Dis	Res	FOSSILS Abun	Comm	Rare	REMARKS
						667891	18	22		90	€																							Brown Limestone
						"	"	"	"	"																							
						667892	16	14		60																								
						667893	10	10		34																								
						667894	14	8		40																								
10						667895	14	8		38																								
						667896	14	6		50																								
						667897	14	6		48		Gy/Bf																						Mica Ma veining throughout
						667898	20	10		40																								
20						667899	16	12		75																								Wilkawatha Limestone
						667900	9	4		24																								
						667901	8	4		12	€																							
						667902	9	4		30		G/B																						
						667903	9	6		1750																								
						667904	12	10		480																								
30						667905	10	4		28																								
						667906	6	<4		10																								
						667907	12	6		10																								
						667908	12	4		7																								
						667909	12	6		10																								
40						667910	12	8		7																								
						667911	10	8		18		G/B																						CAVITY
						667912	16	8		5																								
						667913	24	4		6																								
						667914	60	8		12																								
50						667915	14	6		5																								
						667916	18	4		6																								Strong weathering
						667917	46	6		18																								Mn/Fe staining throughout
						667918	90	10		55																								
						667919	170	10		75																								Hot water at 58m
60						"	"	"	"	"	€	G/B																						
						667920	EOH	64m		55																								

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 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
- A 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 PDP 7	EASTING	DETAILS	PRECOLLAR	MAIN HOLE	DEPTH	DECL'N	BEARING	HOLE DIAM	FROM	TO	PROJECT FLINDERS JV / AREA DON CAT EXTN
DEPTH 78m	NORTHING	Contractor	WL STOKES & SON		0	62°		5"	0		JOB No. / SCALE
GRID ASNG	LOGGED BY MTR	Machine	Atlas Copco 880								MINERAL TENEMENT GL 1124 WIRRAGULLA
RL	DATUM MSL	Commenced	10/11/84								SHEET OF
		Completed	11/11/84								
		Method	DC								

METRES	MINERALIZATION % CONTENT Zn	Pb	Fe	TYPE	SAMPLE NUMBER	int	ASSAY RESULTS (ppm) Zn	Pb	Ag	Cu	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
					667921		24	26		20	€																						
					667922		12	28		14		G/Bk																					
					667923		9	32		16																							
					667924		16	34		14																							
10					667925		10	26		20																							
					667926		32	22		22																							
					667927		28	24		42																							
					667928		14	26		36																							
					667929		18	28		16																							
20					667930		16	65		18																							
					667931		9	85		490																							
					667932		12	28		65	€																						
					667933		12	20		40		G/B																					
					667934		12	26		38																							
30					667935		18	22		14																							
					667936		20	16		44																							
					667937		12	10		36																							
					667938		9	12		30																							
					667939		14	12		18																							
40					667940		14	14		18																							
					—		—	—	—	—																							
					667941		12	14		26																							
					667942		22	20		90																							
					667943		-	-		—																							
					667944		-	-		—																							
50					667945		-	-		—																							
					667946		100	36		85																							
					667947		105	20		80																							
					667948		170	24		130	€																						
60	ft				667949		400	30		230																							
	ft				667950		260	30		160																							
					667951		75	20		50																							
					667952		105	14		46																							
					667953		100	12		48																							
70					667954		195	20		75																							
					667955		150	24		44																							
					667956		170	36		115																							
					667957		110	18		95																							
					667958		105	32		85	€																						
							EOH:	78m																									

Major Mn deposition throughout

CAVITY

Trace goethite

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. Week
2. Week
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. DWM1	EASTING 300373	DETAILS	PRECOLLAR	MAIN HOLE	DEPTH	DECL'N	BEARING	HOLE DIAM	FROM	TO	PROJECT FLINDERS JV / AREA WIRRAMPA MINE
DEPTH 139.10	NORTHING 6560148	Contractor	WL Sides	+Sons	0	61.5	080	NQ	0	139.10	JOB No. / SCALE
GRID AMG	LOGGED BY MTPL	Machine	Atlas Copco RBU								MINERAL TENEMENT CL 1127 WIRRAMPA
RL	DATUM MSL	Commenced	12 11 84								SHEET 1 OF 2
		~~Completed~~ Abandoned	25 11 84								
		Method	CORE								

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	Colla	STYL Con	Dis	Res	FOSSILS Abun	Comm	Rare	REMARKS
0												?	V																						Weathered variegated polymict breccia (VPB)
10													G																						Grey calcareous fillhams - fractured.
													V																						VPB
20													G																						Trace talc
					1	VCD							Bf																						Massive and bedded capillaries dolomite (c.f. Blinman Mine)
					1	VCD																													
					1	VCD																													
					1	VCD																													
30													G																						Pseudomorphs of chertitl(?) Brown clay matrix clast breccia/tuff VPB
40													V																						VPB
																																			VPB
50																																			Dolomitic siltstone Mudstone
60																																			Pink sandstone and VPB Specularite/pyrite throughout Pink/green interbedded siltstone/sandstone fresh spec./py. throughout
																																			VPB
70																																			VPB - clasts up to 5cm generally 1-2cm. Grey calc. sist
80													C																						
													V																						
90																																			

(281) 2490

THE BROKEN HILL PROPRIETARY COMPANY LIMITED — EXPLORATION DEPARTMENT — HOLE No. DWM1

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 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
- A lead
- Z_1 red zinc
- Z_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 (Whit-
- B — 2. Matrix (Blac
- C
- O
- Fenestrae
- Bedding/layering
- Veins
- Conformable contact
- Unconformable contact

HOLE No. DWM 1	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 2	
		Completed										
		Method										

METRES	MINERALIZATION % CONTENT Zn	Pb	Fe	TYPE	SAMPLE Int	NUMBER	ASSAY RESULTS (ppm) Zn	Pb	Ag	Cu	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
											?																							
												P																						Some IFR
102						667961	20	16	<1	36																							
						667962	28	16	<1	38																							
												RBG																					RBG silts. Some lamy, minor bioturbation, trace spec. foss. Long calcite fibre veins
110																																	
																																	Breccia clasts are generally red brown and green siltstone (Middle Cambrian ?)
116																																	
						667973	270	480	<1	12	?																							Probably carbonate with karstic lower Cambrian limestone clasts
132						667965	1400	350	<1	38																							
						667966	7250	230	3	160																							
						667969	210	145	<1	40																							
						667972	36	160	<1	29																							
140						EOH	139.10																										Hole abandoned due to equipment failure

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

- Laminar Stromotoporoid
- Stromatactoid
- Geopetal
- 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
- A 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 (Bl
- C
- D
- Fenestrae
- Bedding/layering
- Veins
- Conformable contact
- Unconformable contact

HOLE No. DWM1A	EASTING 300370	DETAILS	PRECOLLAR	MAIN HOLE	DEPTH	DECL'N	BEARING	HOLE DIAM.	FROM	TO	PROJECT FLINDERS JV / AREA WHR MINE
DEPTH 185m	NORTHING 6560148	Contractor	WLS (Dia)	Hsar	0	62·5	080	HQ	0	84·9	JOB No. / SCALE
GRID AMG	LOGGED BY MTR	Machine	Atlas Copco RBU					NQ	84·4	185	MINERAL TENEMENT EL 1129 WIRRALLA
RL	DATUM MSL	Commenced	26/11/84	28/11/84							SHEET 1 OF 3
		Completed	28/11/84	07/12/84							
		Method	RC	core							

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	Cavit	Calc	STYL Con	Dis	Rare	FOSSILS Abun	Comm	Rare	REMARKS
10																																	DWM1A collared 3 metres west from DWM1.
20																																	
30																																	
40																																	
50																																	
60																																	
70																																	
80																																	
											?	V	△ △ △ △																				VPB

PRE-COLLAR - NO SAMPLE

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 Stromatoporoid
- Stromatactoid
- Geopetal

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
- A 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 (W; 2. Matrix (Bi
- B
- C
- D
- Fenestrae
- Bedding/layering
- Veins
- Conformable contact
- Unconformable contact

(IE) 2490

THE BROKEN HILL PROPRIETARY COMPANY LIMITED — EXPLORATION DEPARTMENT — HOLE No. DWM1A

HOLE No. DWM1A	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 3	
		Completed										
		Method										

SAMPLE int	NUMBER	Pb	Zn	Ag	Cu	MINERALIZATION TYPE	STRAT AGE	COLOUR	LITHOS	LCA	TEXTURE	REMARKS
												VDB
												VDB
												VDB
B	667975	1150	180	1	125			G				Breccia (karstified?) grading to calcareous fragments in yellow matrix (dolomitic) Sandy calcareous breccia = UBB clasts; poorly sorted
B	667976	7350	65	2	250							
B	667978	3900	165	1	42							
B	667983	5200	210	<1	40							
	667984	7250	380	1	42							
	667985	2.15%	145	4	49							Karstic nodular breccia = oldish mint Travertine
	669986	8900	110	2	70							
	667987	1.55%	120	3	26			G				
	667988	7850	70	2	70							
	667991	1350	48	2	330							
	667992	8.60%	230	9	3700							
	667993	580	110	3	1350							Pink/grey nodular lst. Cg. calcite infilling Nuggets
								G				

OPEN SPACE FRACTURING: I | F | F | I | F | F | I | F | F | Vugh | Cont | Colla

STYL: Con | Dis | Res

FOSSILS: Abun | Comm | Rare

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
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- 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

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- 3_1 red zinc
- 3_2 yellow/white zinc
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- d_1 pink dolomite
- d_2 grey other dolomite
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- q quartz
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- A
- Anm — 1. Clasts (WI
- B — 2. Matrix (BI
- C
- D
- Fenestrae
- Bedding/layering
- Veins
- Conformable contact
- Unconformable contact

HOLE No. DWM 1A	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 3 OF 3	
		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	Coral	Colla	STYL Con	Dis	Res	FOSSILS Abun	Comm	Rare	REMARKS
													010		K	2	C	d_1																
													9510		K	2	C	d_1																
													210		K	2	C	d_1																Core/Pot log
						EOH	185.0																											
190																																		

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

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

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- Calcarenite
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- 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
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3. Moderate
4. Strong
5. V. Strong

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- 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 opal

TEXTURES

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

GEH 2490

THE BROKEN HILL PROPRIETARY COMPANY LIMITED — EXPLORATION DEPARTMENT — HOLE No. DWM 1A

APPENDIX D

ERIC Prospect -
RAB drillhole profiles.

(see separate folio)

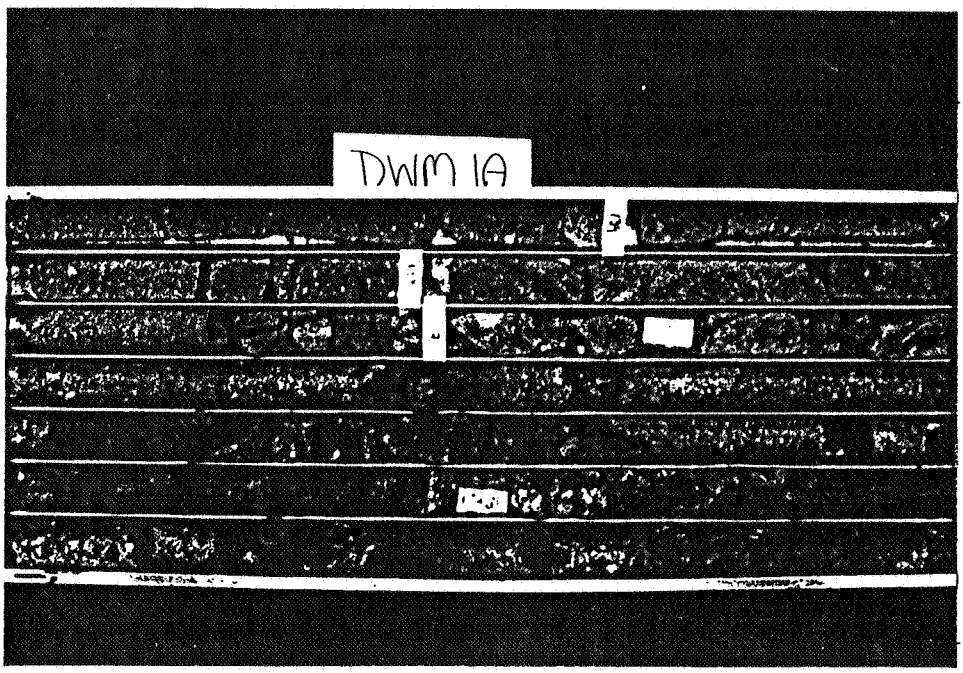


Plate 1. DWM1A: 133.55 to 139.34m.
The predominantly brown and green calcareous siltstones ("diapir"?) unconformably overlies the Cambrian karst (?) breccia of grey calcarenite clasts in a brown medium to coarse grained calcareous matrix. The contact is at 135m (approx.).

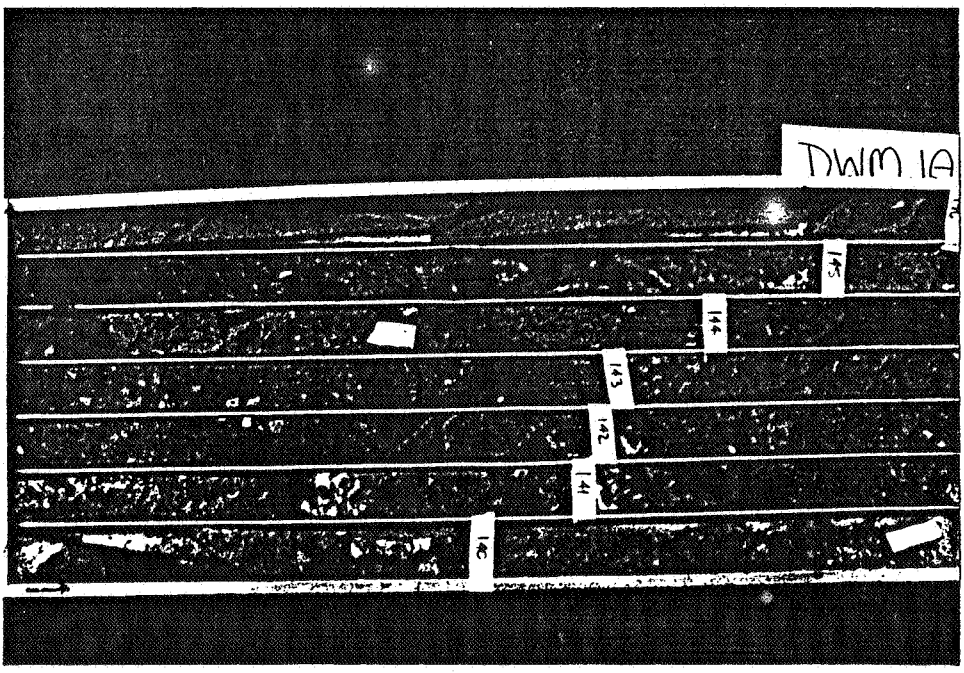


Plate 2. DWM 1A: 139.34 to 146.00m.
Cambrian karst breccia, including reworked conglomerates and breccia. Blebs of galena and disseminated pyrite throughout.

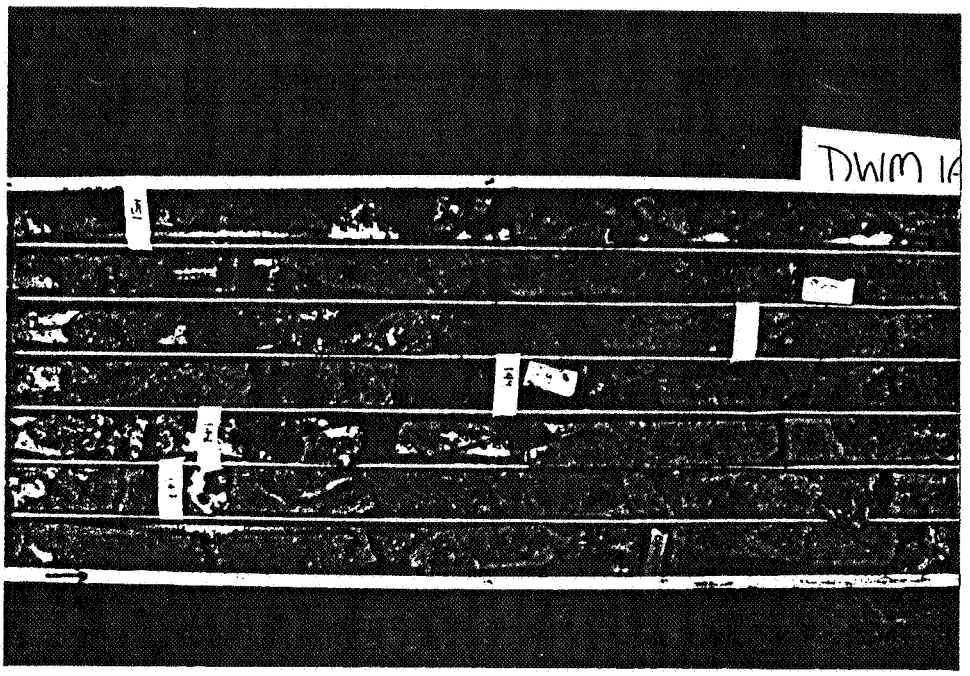


Plate 3. DWM1A: 146.00 to 151.84m.
Cambrian karst breccia. Disseminated galena and pyrite and some barite filled vughs.

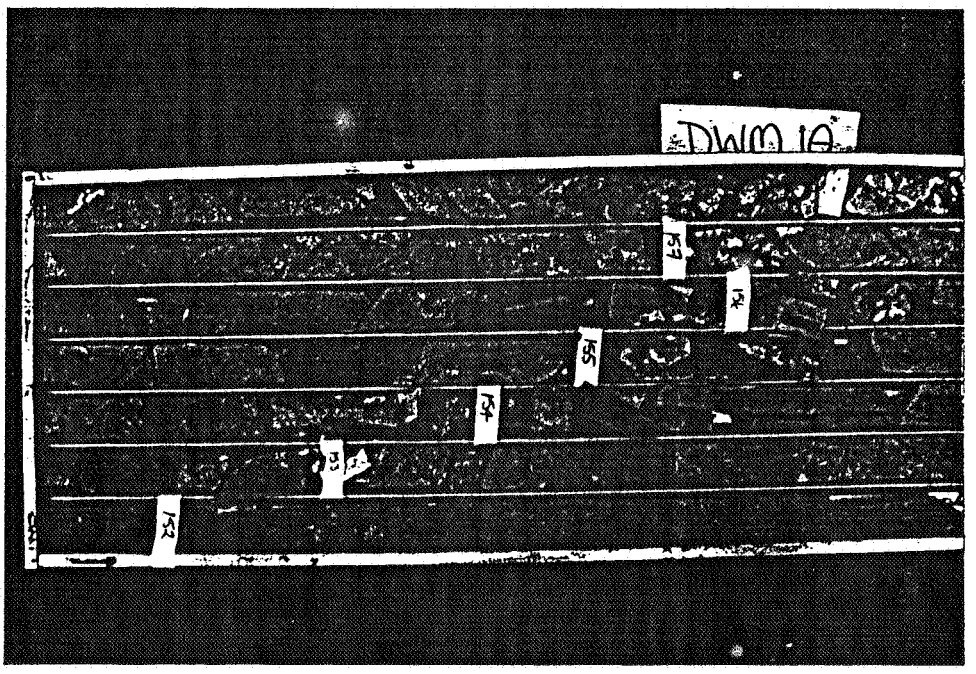


Plate 4. DWM1A: 151.84 to 157.96m.
Brecciated (karst?) reefal Cambrian. Veins and disseminated galena; some barite filled vughs.

FLINDERS RANGES JOINT VENTURE (ESSO/BHP)

1984 DRILLING PROGRAMME

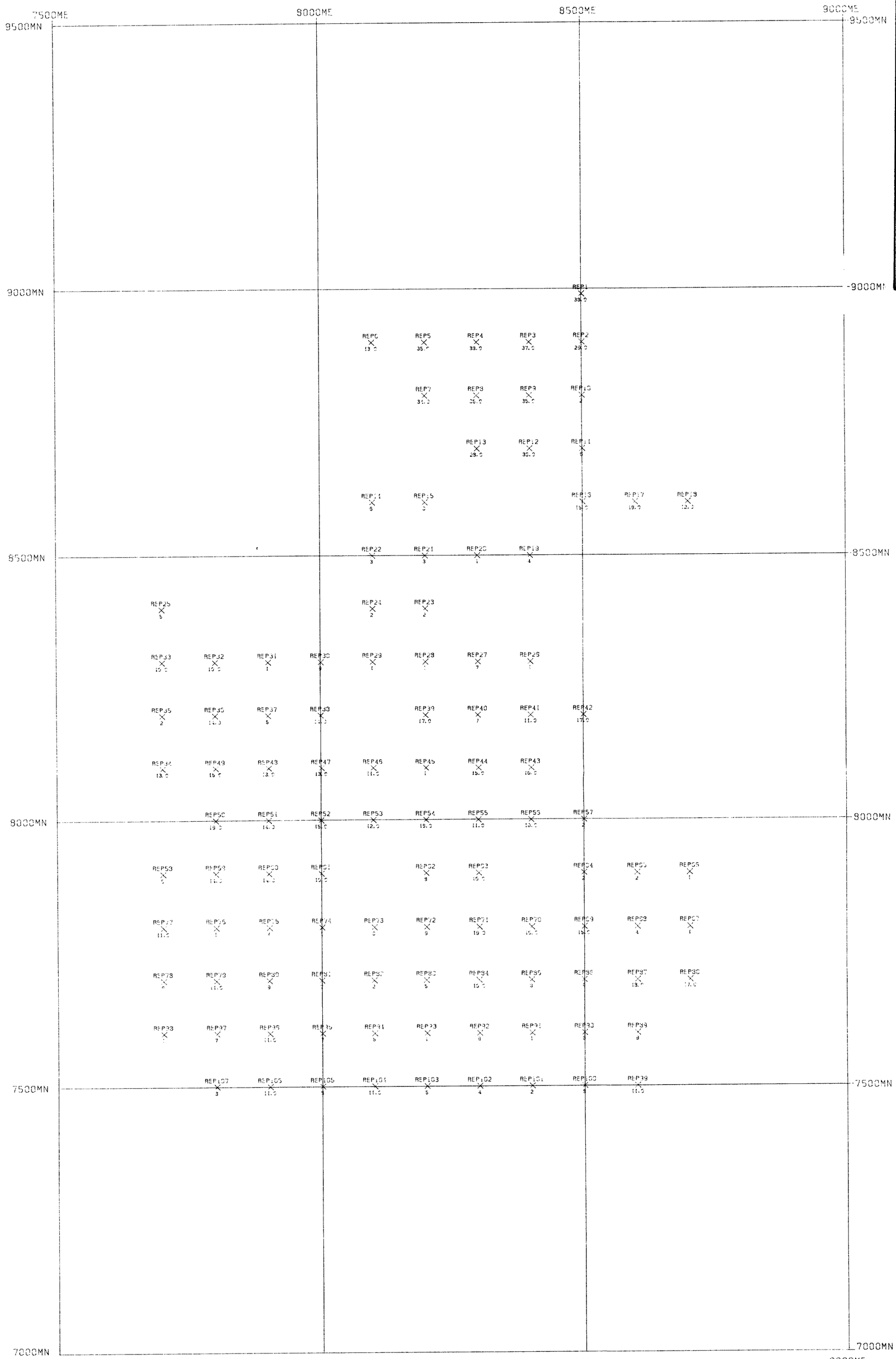
VOL. V ERIC PROSPECT

RAB DRILL HOLES – PLOTS AND PROFILES

PLANS

MR. MICK ROCHE
Project Geologist
BHP. MINERALS Ltd.
December 1984

RECEIVED
27 FEB 1985
DEPT. OF MINES AND ENERGY SECURITY
3427-II



BORE HOLE COLLAR LOCATION AND DEPTH

SCALE 1:5000

THE BROKEN HILL PROPRIETARY CO. LTD. MINE DEVELOPMENT - WHYALLA		
ERIC PROSPECT FLINDERS RANGES S.A. ESSO-BHP J.V. DEC. 1984		
DRAWN:	DATE: 8/1/1985	CENTRE:

ERIC1.PL

3427-22

7500ME 8000ME 8500ME 9000ME

9500MN 9500MN

9000MN 9000MN

8500MN 8500MN

8000MN 8000MN

7500MN 7500MN

7000MN 7000MN

7500ME 8000ME 8500ME 9000ME

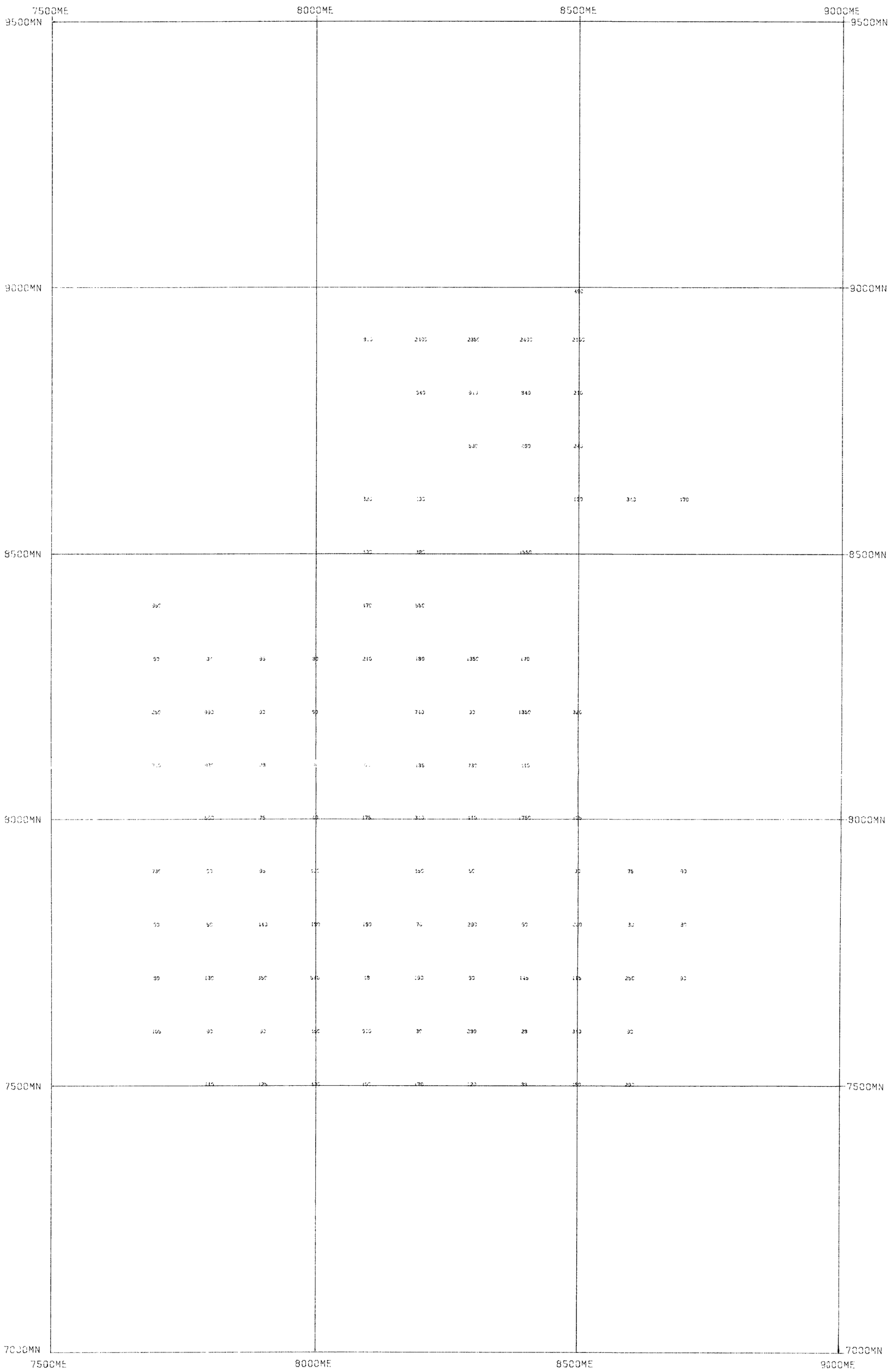
BLAST HOLE DATA S102 ASSAY VALUES

SCALE 1:5000

THE BROKEN HILL PROPRIETARY CO. LTD. MINE DEVELOPMENT - WHYALLA		
ERIC PROSPECT MAX PB VALUES PER HOLE VALUES IN PPM		
DRAWN:	DATE: 19/12/1984	CENTRE:

⊗ ERIC4.PL

3427 23



BLAST HOLE DATA @ 203 ASSAY VALUES

SCALE 1:5000

THE BROKEN HILL PROPRIETARY CO. LTD. MINE DEVELOPMENT - WHYALLA		
ERIC PROSPECT MAX ZN VALUES PER HOLE VALUES IN PPM		
DRAWN.	DATE: 19/12/1984	CENTRE.

⊗ ERIC5.PL

3427-24

7500ME 8000ME 8500ME 9000ME

9500MN 9500MN

9000MN 9000MN

8500MN 8500MN

8000MN 8000MN

7500MN 7500MN

7000MN 7000MN

7500ME 8000ME 8500ME 9000ME

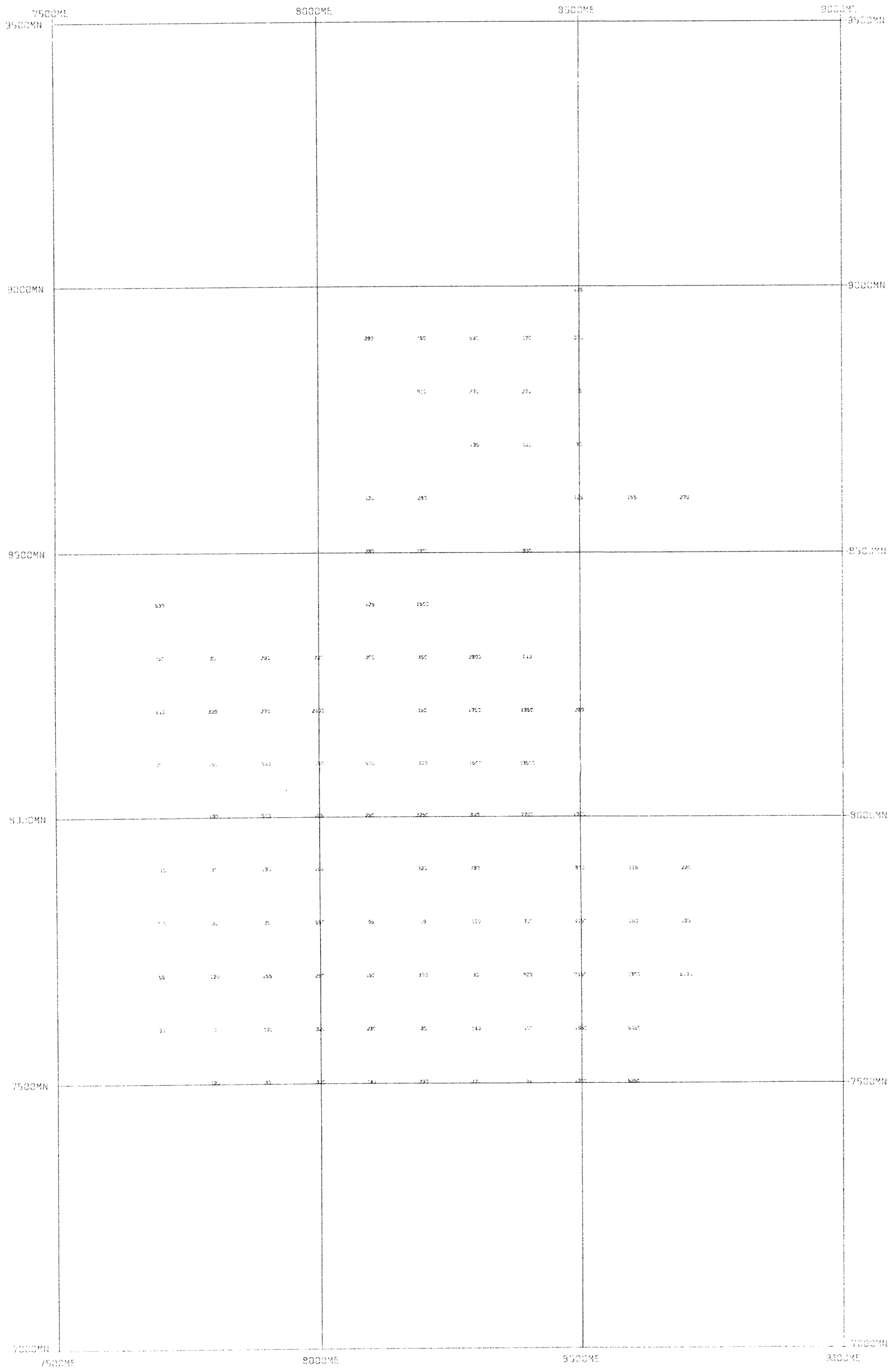
BLAST HOLE DATA FF ASSAY VALUES

SCALE 1:5000

THE BROKEN HILL PROPRIETARY CO. LTD. MINE DEVELOPMENT - WHYALLA		
ERIC PROSPECT MAX CU VALUES PER HOLE VALUES IN PPM		
DRAWN:	DATE: 19/12/1984	CENTRE:

ERIC3.PL

3427-25



BLAST HOLE DRILL SIGN ASSAY VALUES

SCALE 1:5000

THE BROKEN HILL PROPRIETARY CO. LTD.
MINE DEVELOPMENT MELBOURNE

ERIC PROSPECT
LEAD PB VALUE IN EACH HOLE
PB VALUES IN PPM

DRAWN	DATE 8/1/1980	CENTRE

3427-26

7500ME
8000ME
8500ME
9000ME
9500MN
9000MN
8500MN
8000MN
7500MN
7000MN

BLAST HOLE DRILL & ASSAY VALUES

SCALE 1:5000

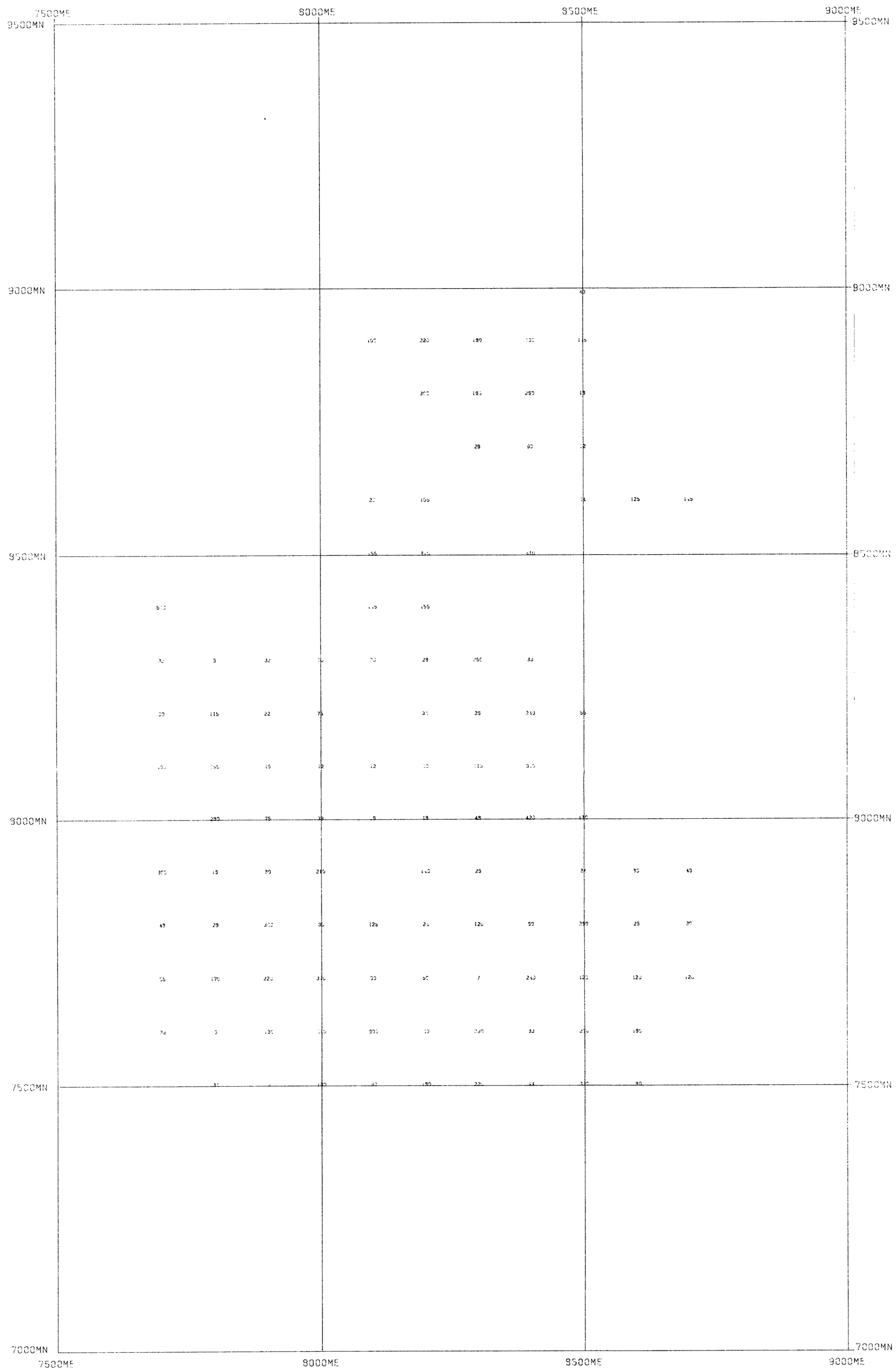
THE BROKEN HILL PROPRIETARY CO. LTD.		
MINE DEVELOPMENT - WESTERN		
ERIC PROSPECT LAST ZN VALUE IN EACH HOLE ZN VALUES IN PPM		
DRAWN:	DATE: 9/1/1995	CENTRE:

ERIC92.PL

3427-27

7500ME 8000ME 8500ME 9000ME

9500MN 9000MN 8500MN 8000MN 7500MN 7000MN



BLAST HOLE DATA EF ASSAY VALUES

SCALE 1:5000

THE BROKEN HILL PROPRIETARY CO. LTD.
MINE DEVELOPMENT - WHYALLA

ERIC PROSPECT
LAST CU VALUE IN EACH HOLE
CU VALUES IN PPM

DRAWN:	DATE: 8.1.1990	STATUS:

© ERICSO PL

3427-28

9500MN

9000MN

8500MN

8000MN

7500MN

7000MN

7500ME

8000ME

8500ME

9000ME

BLAST HOLE DATA FF ASSAY VALUES

SCALE 1:5000

THE BROKEN HILL PROPRIETARY CO. LTD.
MINE DEVELOPMENT - WESTERN

PRICE PROSPECT
VALUES AVERAGED OVER THE HOLE
Pb VALUES IN %

DRAWN | DATE: 13/ /1985 | CHECKED

2) ERIC84.PL

3427-29

7500ME 8000ME 8500ME 9000ME

9500MN 9000MN 8500MN 8000MN 7500MN 7000MN

BLAST HOLE DATA S103 ASSAY VALUES

SCALE 1:5000

THE BROKEN HILL PROPRIETARY CO. LTD.
MINE DEVELOPMENT AUSTRALIA

ERIC PROFILE
MINE % VALUES FOR HOLE
PB VALUES IN %

DRAWN:	DATE: 12/1/1985	CENTRE:

ERICSO, P.L.

3427-30

7500ME
9500MN
8000ME
8500ME
9000ME
9500MN
9000MN
9000MN
8500MN
8500MN
9000MN
9000MN
7500MN
7500MN
7000MN
7000MN
7500ME
8000ME
8500ME
9000ME

BLAST HOLE DRILLED ASSAY VALUES

SCALE 1:5000

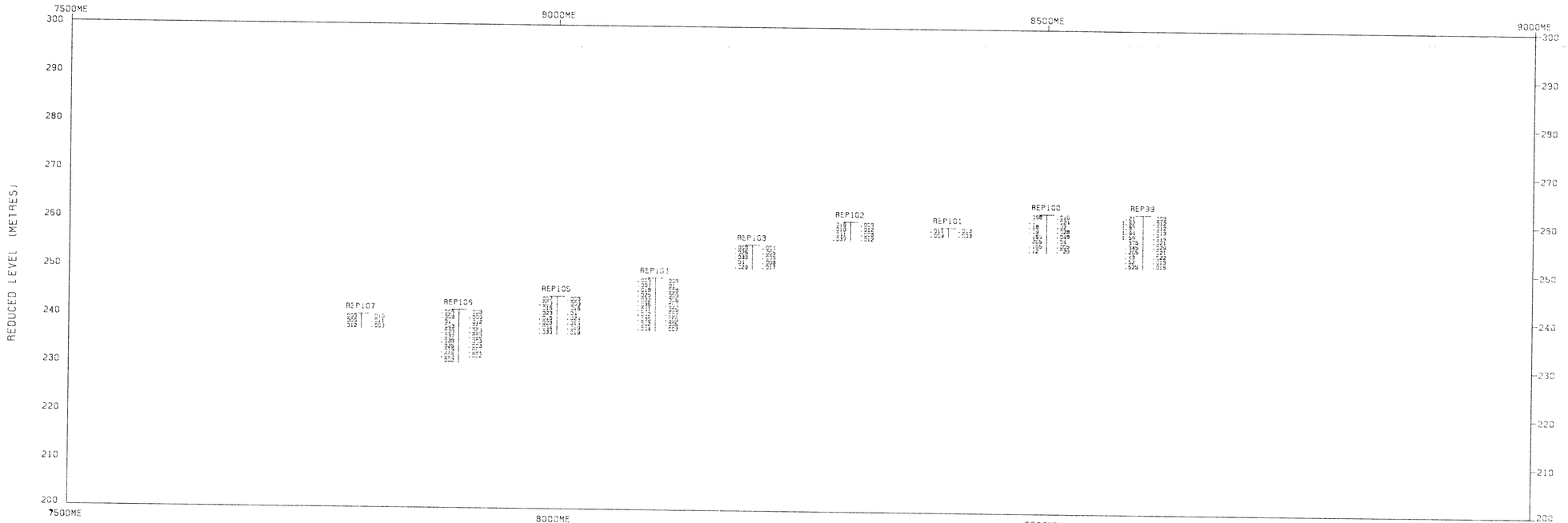
THE BROKEN HILL PROPRIETARY CO. LTD.
MINE DEVELOPMENT - WHYALLA

ERIC PROSPECT
ZN VALUES AVERAGED OVER HOLE
VALUES IN PPM

DRAWN.	DATE: 9/2/1995	CENTRE.

ERICLOC.PL

3427-31



7500 NORTH

FLINDERS RANGES JOINT VENTURE (ESSO/BHP)

1984 DRILLING PROGRAMME

VOL. V ERIC PROSPECT

RAB DRILL HOLES - PLOTS AND PROFILES

CROSS - SECTIONS

MR. MICK ROCHE
Project Geologist
BHP. MINERALS Ltd.
December 1984

PB % VALUES PLOTTED ON LEFT OF BORE HOLES
ZN % VALUES PLOTTED ON RIGHT OF BORE HOLES

BORE HOLE SEARCH RADIUS: 25 METRES

HORIZONTAL SCALE 1:2500
VERTICAL SCALE 1:500
VERTICAL EXAGGERATION 5 X

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27 FEB 1985
DEPT. OF MINES AND ENERGY SECURITY
3427

THE BROKEN HILL PROPRIETARY CO. LTD.
MINE DEVELOPMENT - WHYALLA

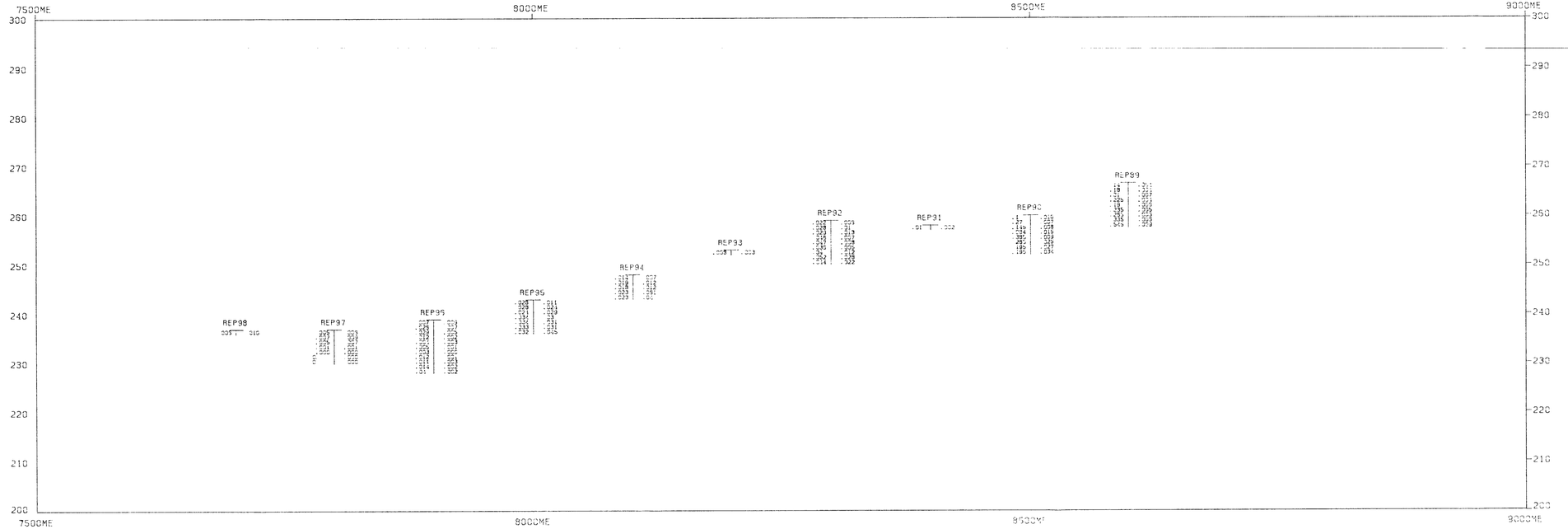
ERIC PROSPECT
EAST-WEST CROSS SECTION
VALUES IN %

DRAWN:	DATE: 4/1/1985	CENTRE:

ERICG.PL

3427-32

7600 NORTH



PB % VALUES PLOTTED ON LEFT OF BORE HOLES
ZN % VALUES PLOTTED ON RIGHT OF BORE HOLES

BORE HOLE SEARCH RADIUS: 25 METRES

HORIZONTAL SCALE 1:2500
VERTICAL SCALE 1:500
VERTICAL EXAGGERATION 5 X

THE BROKEN HILL PROPRIETARY CO. LTD.
MINE DEVELOPMENT - WHYALLA

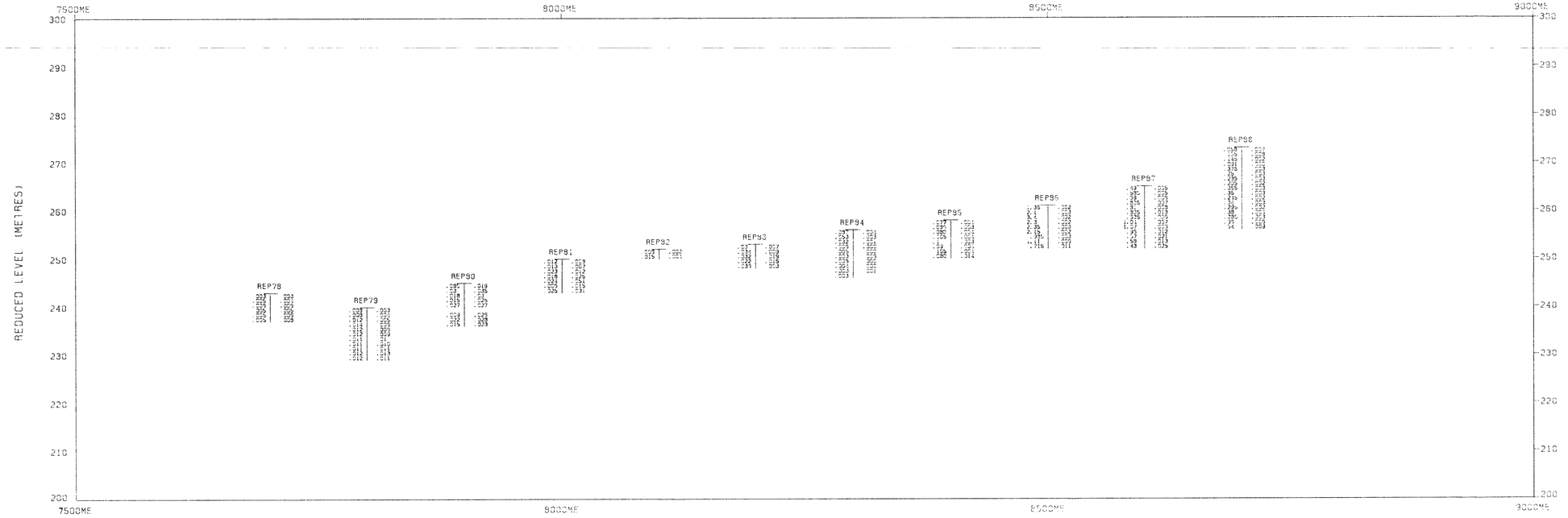
EPIC PROSPECT
EAST-WEST CROSS SECTION
VALUES IN %

DRAWN	DATE: 6/11/1990	CENTRE:

EPIC7.PL

3427-33

7700 NORTH



PB % VALUES PLOTTED ON LEFT OF BORE HOLES
ZN % VALUES PLOTTED ON RIGHT OF BORE HOLES

BORE HOLE SEARCH RADIUS: 25 METRES

HORIZONTAL SCALE 1:2500
VERTICAL SCALE 1:500
VERTICAL EXAGGERATION 5 X

THE BROKEN HILL PROPRIETARY CO. LTD.
MINE DEVELOPMENT - WHYALLA

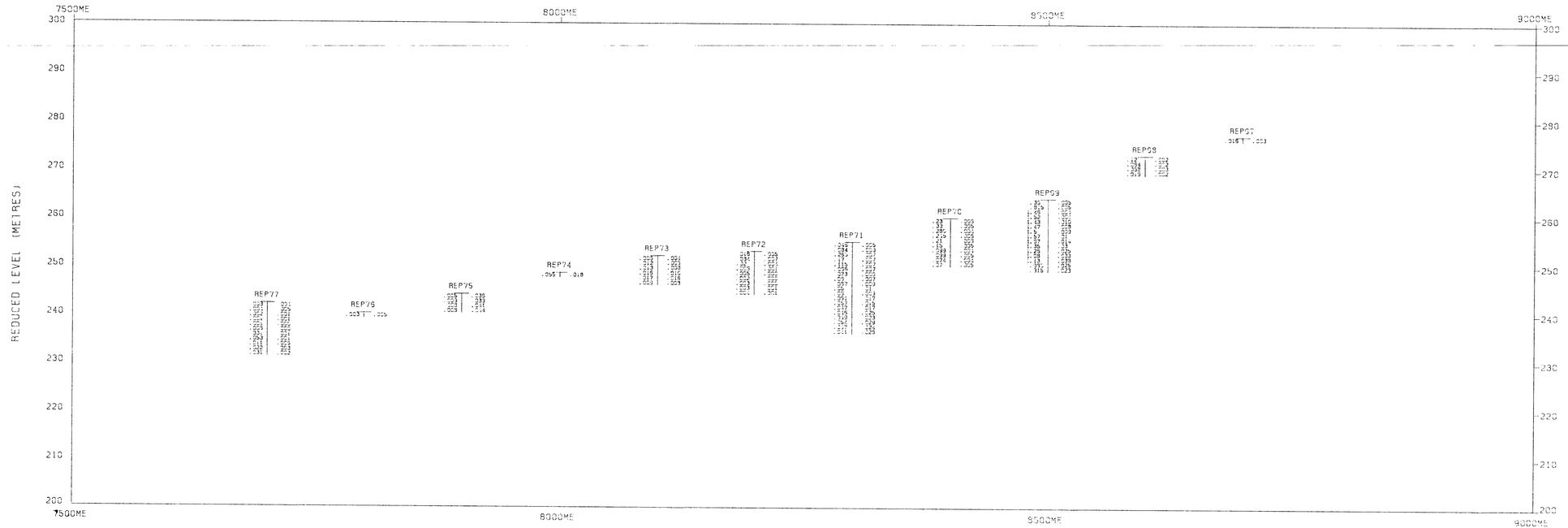
ERIC PROSPECT
EAST-WEST CROSS SECTION
VALUES IN %

DRAWN.	DATE. 4/1/1985	CENTRE.

ERIC8.PL

3427-34

7800 NORTH



PB % VALUES PLOTTED ON LEFT OF BORE HOLES
ZN % VALUES PLOTTED ON RIGHT OF BORE HOLES

BORE HOLE SEARCH RADIUS: 25 METRES

HORIZONTAL SCALE 1:2500
VERTICAL SCALE 1:500
VERTICAL EXAGGERATION 5 X

THE BROKEN HILL PROPRIETARY CO. LTD.
MINE DEVELOPMENT - WHYALLA

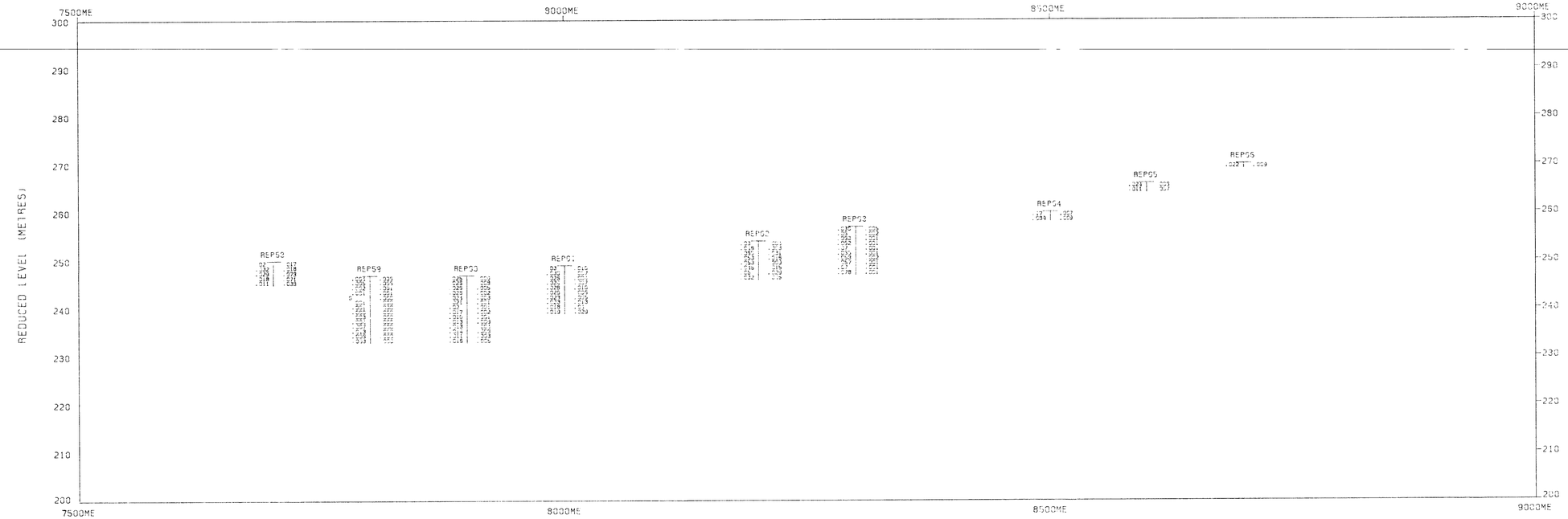
ERIC PROSPECT
EAST-WEST CROSS SECTION
VALUES IN %

DRAWN.	DATE. 4/11/1980	CENTRE.

ERIC9.PL

3427-35

7900 NORTH



PB % VALUES PLOTTED ON LEFT OF BORE HOLES
ZN % VALUES PLOTTED ON RIGHT OF BORE HOLES

BORE HOLE SEARCH RADIUS: 25 METRES

HORIZONTAL SCALE 1:2500
VERTICAL SCALE 1:500
VERTICAL EXAGGERATION 5 X

THE BROKEN HILL PROPRIETARY CO. LTD.
MINE DEVELOPMENT - WHYALLA

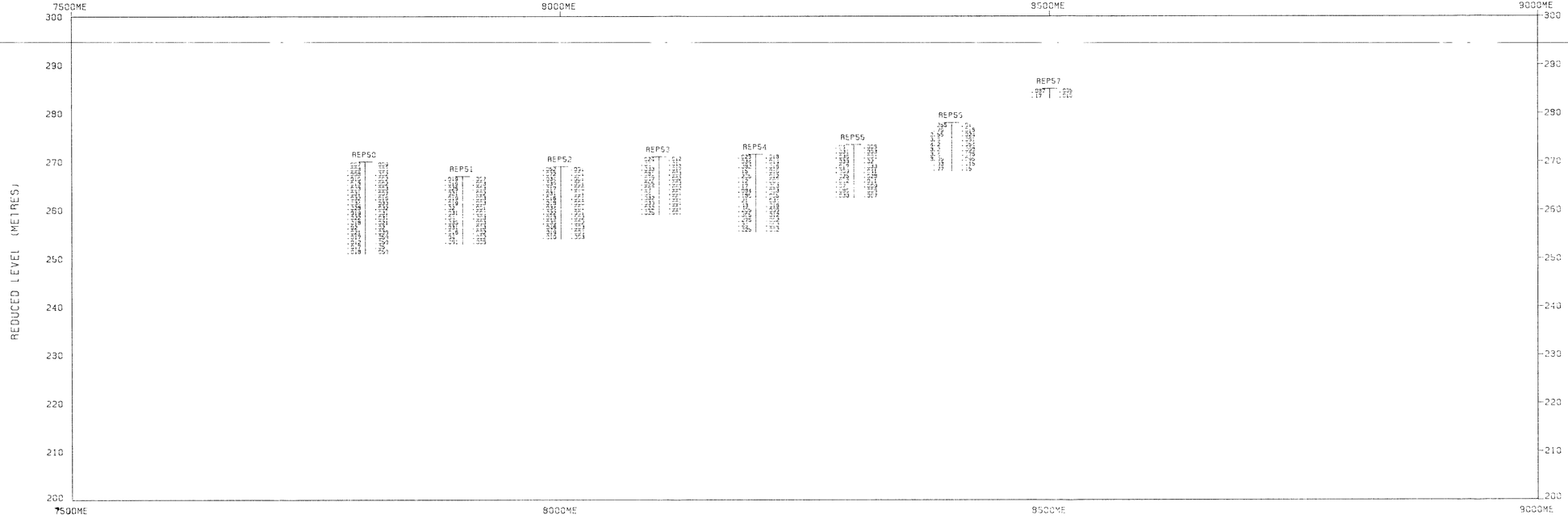
ERIC PROSPECT
EAST-WEST CROSS SECTION
VALUES IN %

DRAWN.	DATE. 4/4/1985	CENTRE.

ERICIO.PL

3427-36

8000 NORTH



PB % VALUES PLOTTED ON LEFT OF BORE HOLES
ZN % VALUES PLOTTED ON RIGHT OF BORE HOLES

BORE HOLE SEARCH RADIUS. 25 METRES

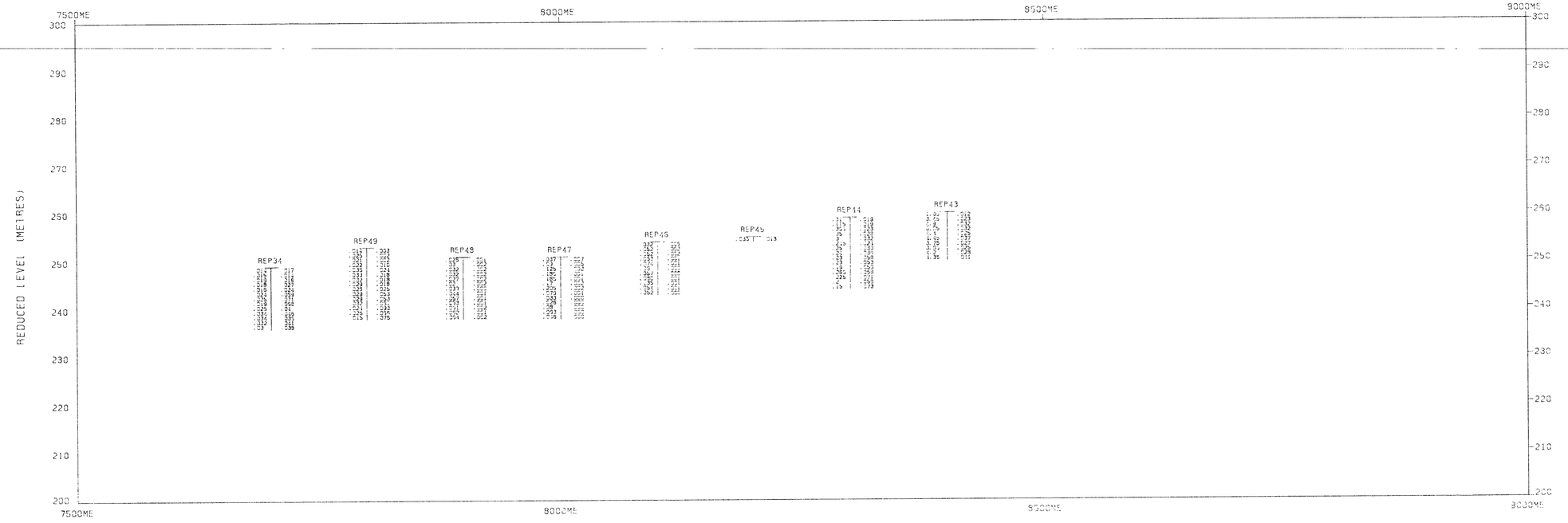
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VERTICAL SCALE 1:500
VERTICAL EXAGGERATION 5 X

THE BROKEN HILL PROPRIETARY CO. LTD. MINE DEVELOPMENT - WHYALLA		
ERIC PROSPECT EAST-WEST CROSS SECTION VALUES IN %		
DRAWN.	DATE. 4/1/1985	CENTRE:

ERIC11.PL

3427-37

8100 NORTH



PB % VALUES PLOTTED ON LEFT OF BORE HOLES
ZN % VALUES PLOTTED ON RIGHT OF BORE HOLES

BORE HOLE SEARCH RADIUS. 25 METRES

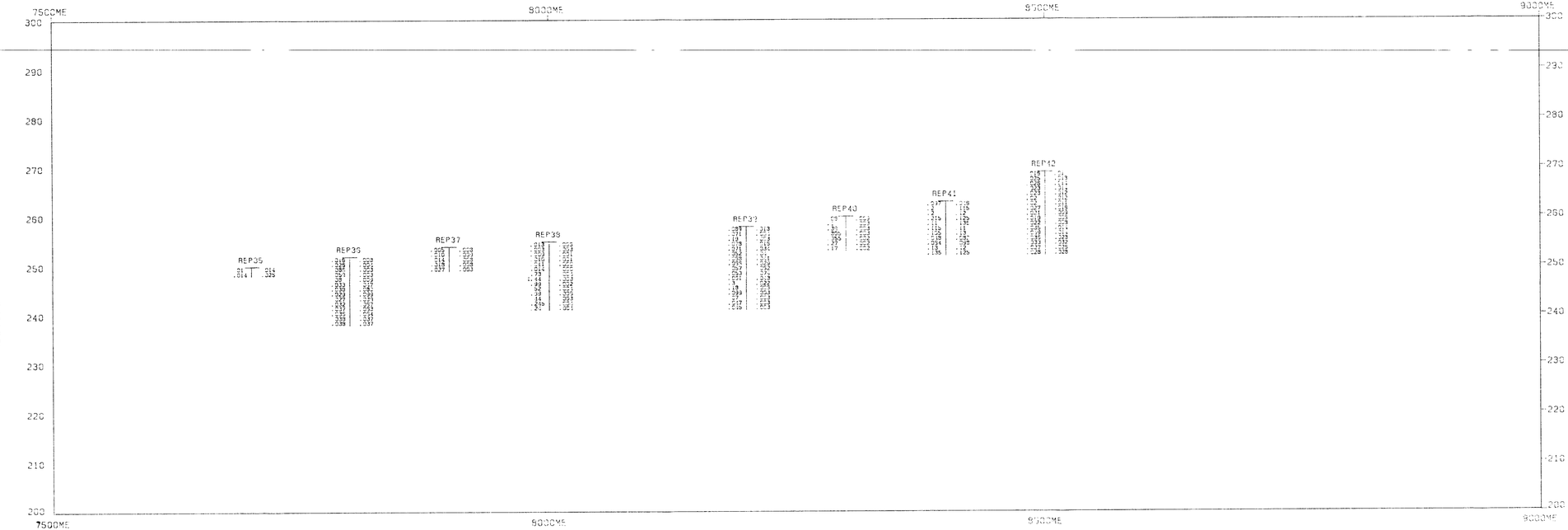
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VERTICAL SCALE 1:500
VERTICAL EXAGGERATION 5 X

THE BROKEN HILL PROPRIETARY CO. LTD. MINE DEVELOPMENT - WHYALLA		
ERIC PROSPECT EAST-WEST CROSS SECTION VALUES IN %		
DRAWN.	DATE. 6/1/1988.	FEATRE.

ERIC12.PL

3427-38

8200 NORTH



PB % VALUES PLOTTED ON LEFT OF BORE HOLES
ZN % VALUES PLOTTED ON RIGHT OF BORE HOLES

BORE HOLE SEARCH RADIUS: 25 METRES

HORIZONTAL SCALE 1:2500
VERTICAL SCALE 1:500
VERTICAL EXAGGERATION 5 X

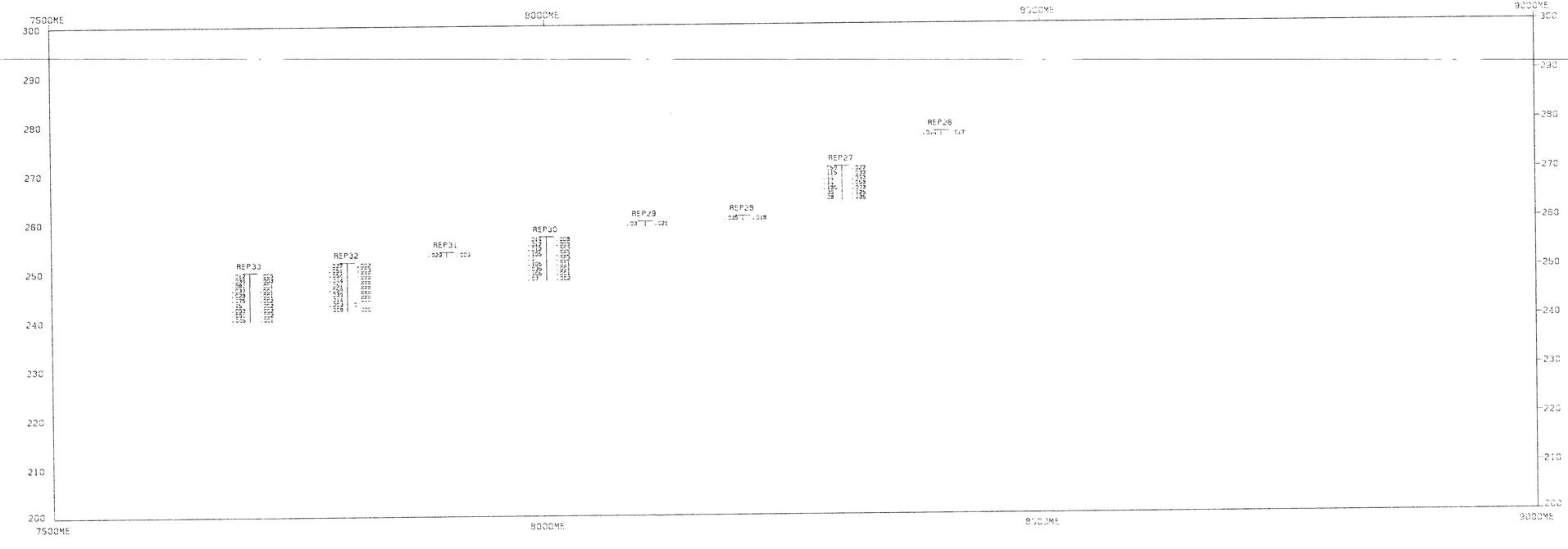
THE BROKEN HILL PROPRIETARY CO. LTD.
MINE DEVELOPMENT - KANALA

ERIC PROSPECT
EAST-WEST CROSS SECTION
VALUES IN %

DRAWN:	DATE: 4/1/1985	CENTRE:

ERIC13.PL

3427-39



PB % VALUES PLOTTED ON LEFT OF BORE HOLES
ZN % VALUES PLOTTED ON RIGHT OF BORE HOLES

BORE HOLE SEARCH RADIUS: 20 METRES

HORIZONTAL SCALE 1:2500
VERTICAL SCALE 1:500
VERTICAL EXAGGERATION 5 X

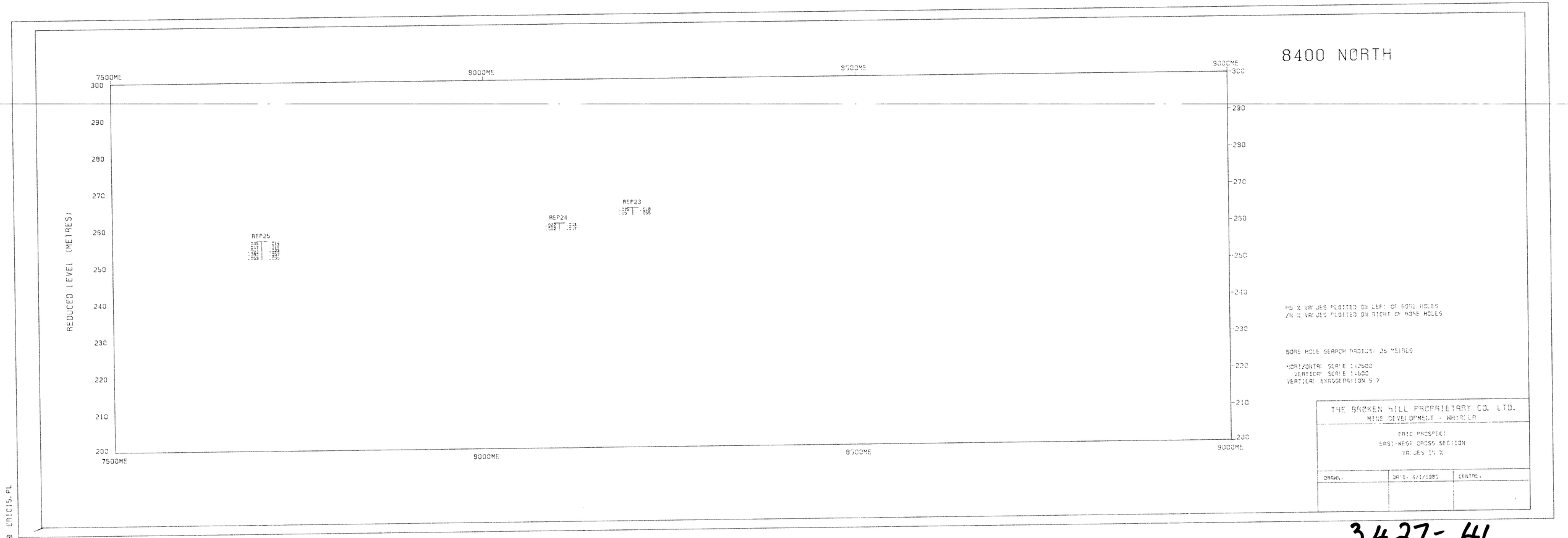
THE BROKEN HILL PROPRIETARY CO. LTD.
MINE DEVELOPMENT - WHYALLA

ERIC PROSPECT
EAST-WEST CROSS SECTION
VALUES IN %

DRAWN:	DATE: 4/1/1985	CHECKED:

ERIC14.PL

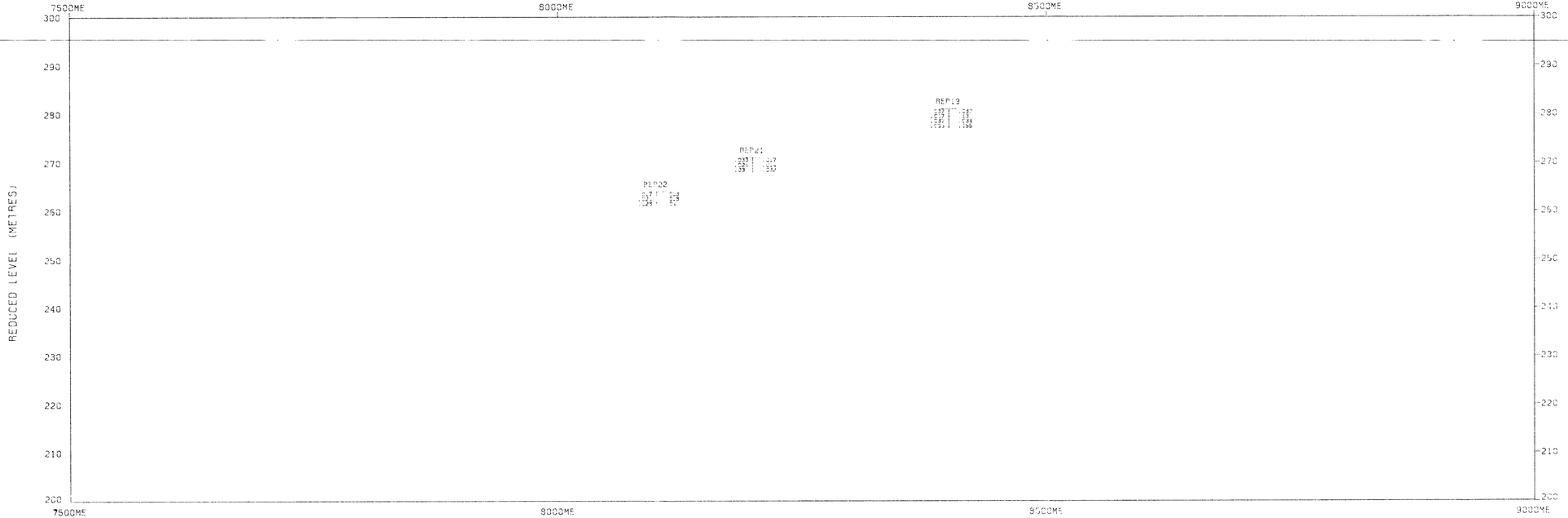
3427-40



ERIC15.PL

3427-41

8500 NORTH



P9 % VALUES PLOTTED ON LEFT OF BORE HOLES
AN % VALUES PLOTTED ON RIGHT OF BORE HOLES

BORE HOLE SEARCH RADIUS: 25 METRES

HORIZONTAL SCALE 1:2500
VERTICAL SCALE 1:500
VERTICAL EXAGGERATION 5 X

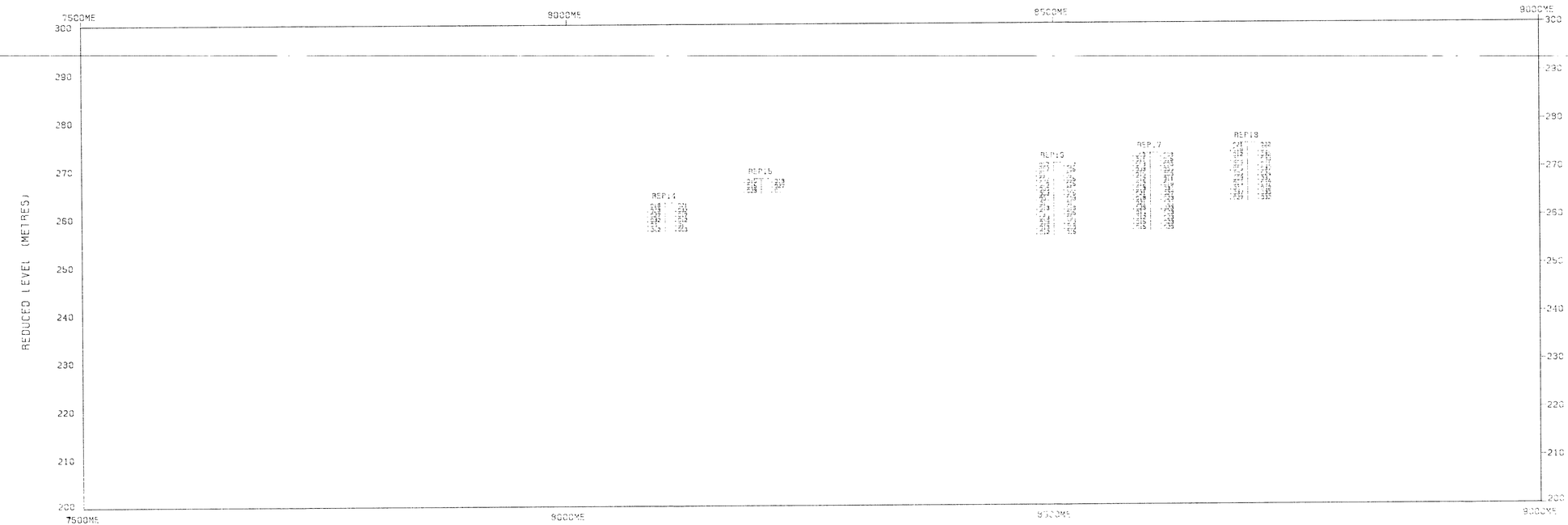
THE BROKEN HILL PROPRIETARY CO. LTD.
MINE DEVELOPMENT - WHYALLA

ERIC PROSPECT
EAST-WEST CROSS SECTION
VALUES IN %

DRAWN:	DATE: 1/2/1985	CENTRE:

ERIC15.PL

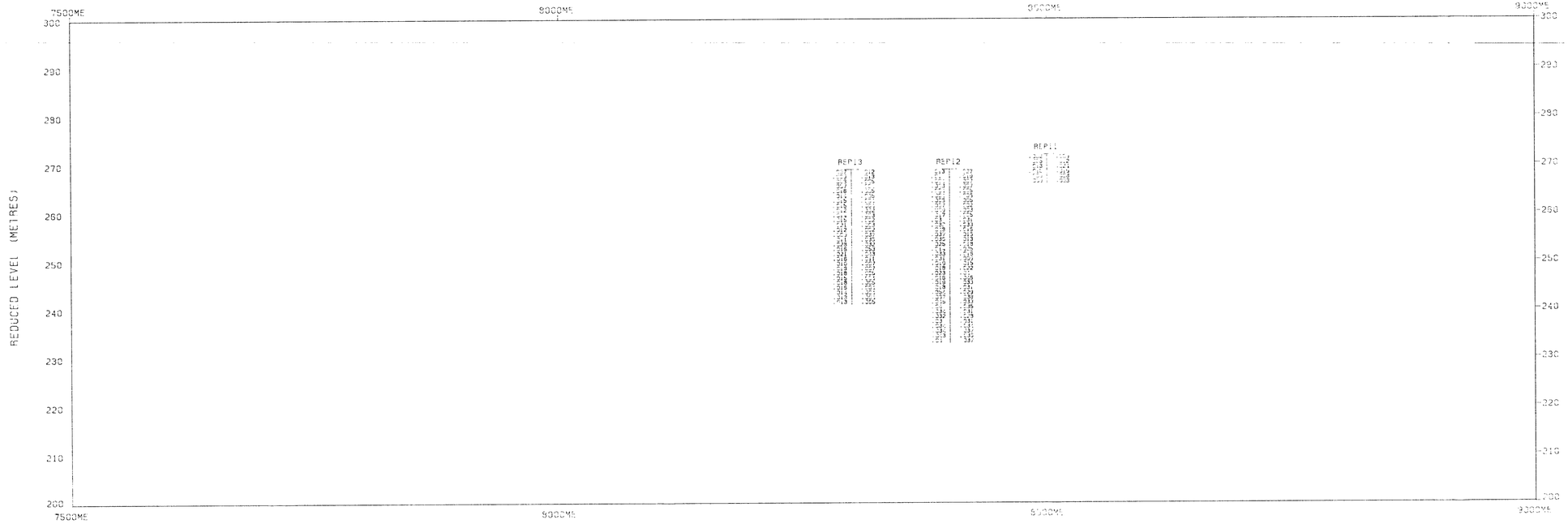
3427-42



ERIC17.PL

3427-43

8700 NORTH



PB % VALUES PLOTTED ON LEFT OF BORE HOLES
ZN % VALUES PLOTTED ON RIGHT OF BORE HOLES

BORE HOLE SEARCH RADIUS. 25 METRES

HORIZONTAL SCALE 1:2500
VERTICAL SCALE 1:500
VERTICAL EXAGGERATION 5 X

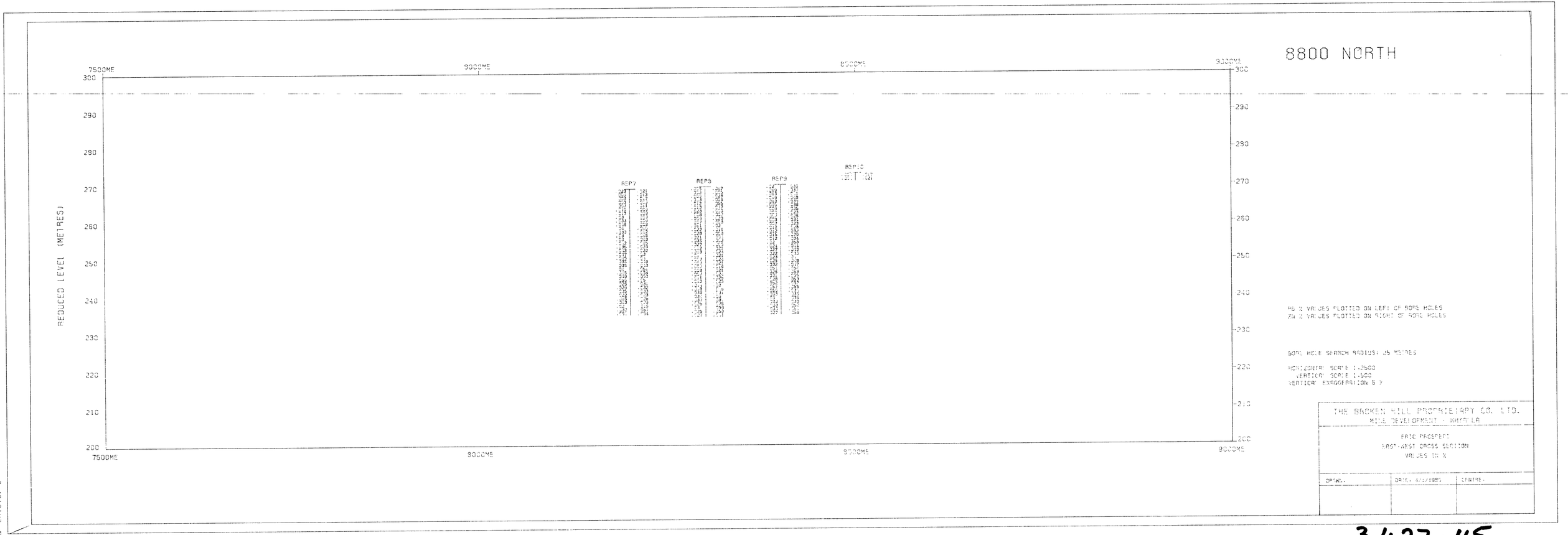
THE BROKEN HILL PROPRIETARY CO. LTD.
NEW DEVELOPMENT - WESTERN

FAIR PROSPECT
EAST-WEST CROSS SECTION
VALUES IN %

DRAWN.	DATE. 17/7/80	CENTRE.

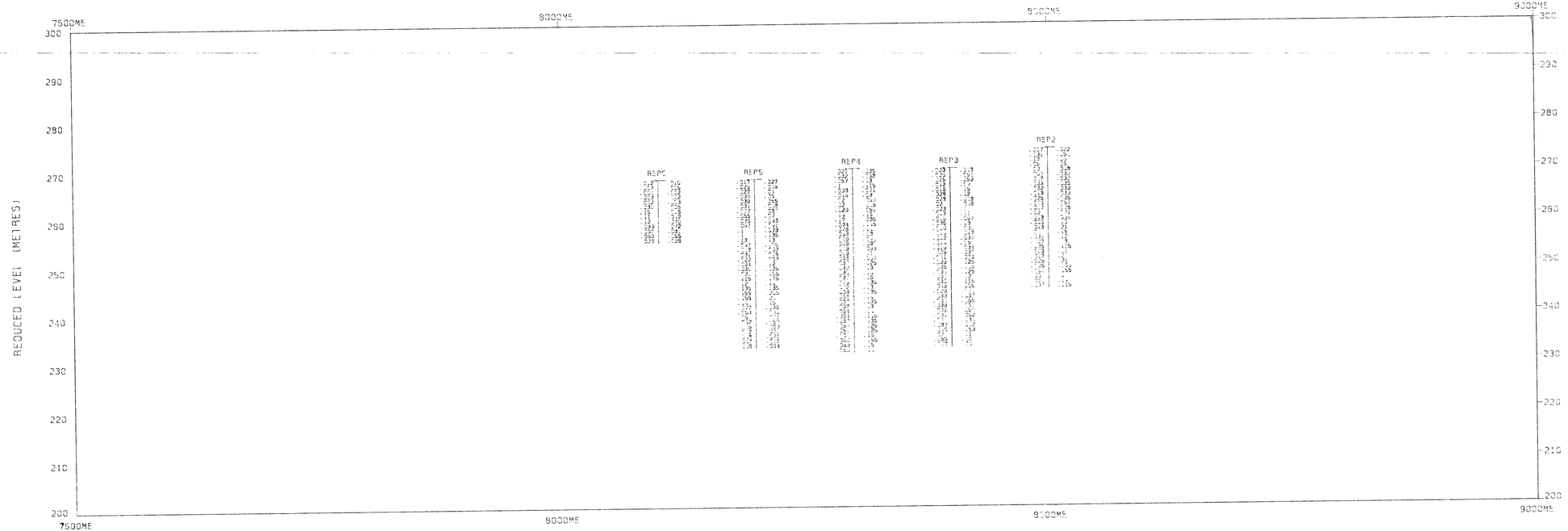
ER1019.PL

3427-44



ERIC19.PL

3427-45



PB % VALUES PLOTTED ON LEFT OF BORE HOLES
ZN % VALUES PLOTTED ON RIGHT OF BORE HOLES

BORE HOLE SEARCH RADIUS: 25 METRES

HORIZONTAL SCALE 1:2500
VERTICAL SCALE 1:500
VERTICAL EXAGGERATION 5 X

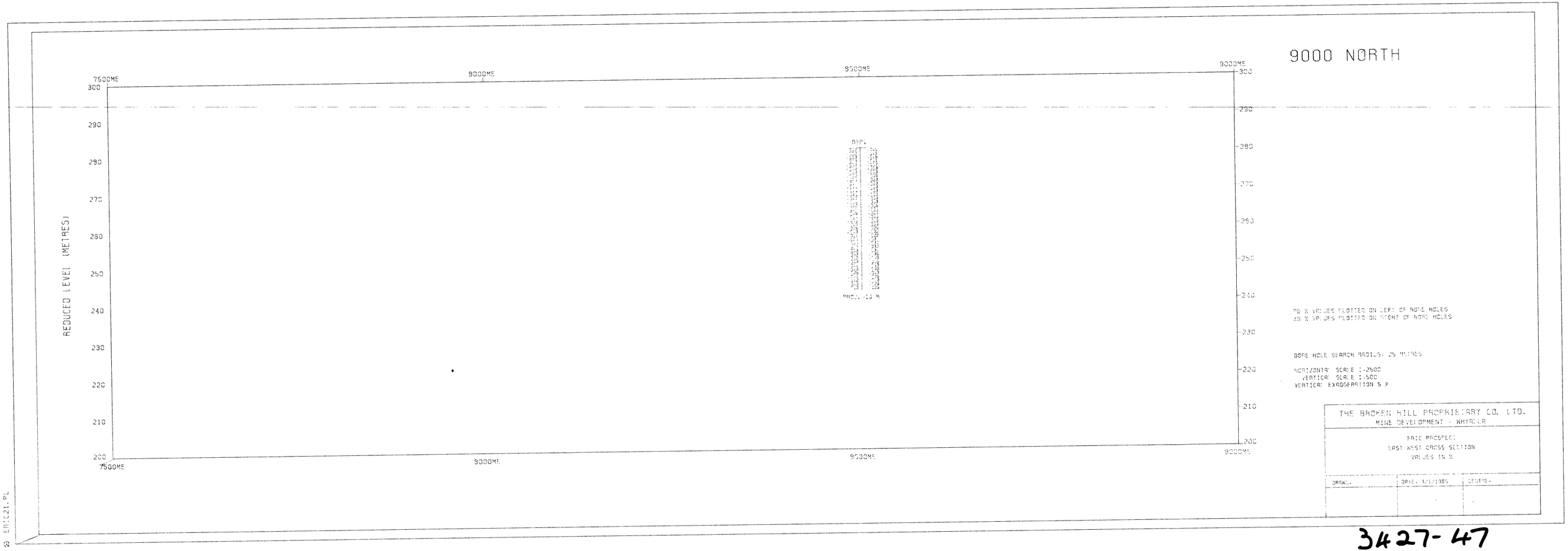
THE BROKEN HILL PROPRIETARY CO. LTD.
MINE DEVELOPMENT - WHYALLA

ERIC PROSPECT
EAST-WEST CROSS SECTION
VALUES IN %

DRAWN.	DATE: 4/4/1995	CENTRE.

ERIC20.PL

3427-46


9000 NORTH
7500ME
8000ME
8500ME
9000ME
REDUCED LEVEL (METRES)
300
290
280
270
260
250
240
230
220
210
200
BRPL
PB% -10 M
PB % VALUES PLOTTED ON LEFT OF BORE HOLES
AN % VALUES PLOTTED ON RIGHT OF BORE HOLES
BORE HOLE SEARCH RADIUS: 25 METRES
HORIZONTAL SCALE 1:2500
VERTICAL SCALE 1:500
VERTICAL EXAGGERATION 5 X
THE BROKEN HILL PROPRIETARY CO. LTD.
MINE DEVELOPMENT - WHYALLA
BHP PROSPECT
EAST WEST CROSS SECTION
VALUES IN %
DRAWN:
DATE: 12/4/1985
CENTRE:
ER121.PL

3427-47

E.L. 1129

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 26 April, 1985

YOUR REF:

OUR REF: 6180/RH/598

SUBJECT Wirrealpa

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

Dear Sir,

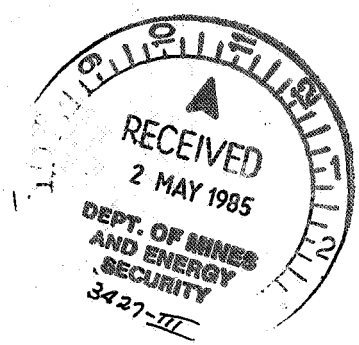
I refer to the Flinders Range Joint Venture Agreement between Esso Exploration and Production Australia Inc. and BHP Minerals Limited, and Exploration Licence No. 1129. In accordance with Clause 3.1 of the above Agreement Esso, as operator in respect to this Licence, submit hereunder the Quarterly Report due in respect to this title.

Exploration Licence 1129 (Wirrealpa) - Quarterly Report for the period ending 28 March 1985.

No field work was carried out this quarter. Future work in the area will be dependent on the assessment of drilling recently undertaken and that proposed in adjacent licence areas.

I advise expenditures on the above project for the quarter to 28.3.85 and cumulative to 28.3.85 are as follows:

	Cumulative Previous Periods	This Period	Cumulative to Date
Geological	14,940	4,989	19,929
Geophysical	-	-	-
Geochemical	711	379	1,090
Drilling	22,998	(2,674)	20,324
Technical Service	-	-	-
Computing	-	-	-
Other	950	-	950
Overheads (18%)	1,980	260	2,240
Title Maintenance	19	2,496	2,515
TOTAL	41,598	5,450	47,048



Yours faithfully,

Russell Hetherington
Senior Landman
Minerals Department

FLINDERS RANGES JOINT VENTURE (ESSO/BHP)

1985 DRILLING PROGRAMME

M. ROCHE
PROJECT GEOLOGIST
BHP MINERALS LTD.,
JULY 1985

RECEIVED
25 NOV 1985
DEPT. OF MINES AND ENERGY SECURITY
3427

SUMMARY

Nine (9) drillholes totalling 1,028 metres (118 metres pre-collar, 910 metres core), were completed within four (4) of the prospects in the Flinders Ranges Joint Venture (FRJV) areas during April to June, 1985.

The most significant results from this drilling were:

(a) ERIC Prospect DEP 3 (0-26 m) average 3.6% Pb

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3. DRILLING DETAILS AND RESULTS

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3.3. EL 1129 Wirrealpa

3.3.1. DONKEY BORE Prospect

4. DISCUSSION

4.1. ERIC Prospect

4.2. DONKEY BORE Prospect

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Table 2. Drilling Summary

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2. Location of Prospects (A4-370)
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5. ERIC Prospect - Overburden thickness (A2-429)
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~~I. Photographs of selected core.~~

II. Drill logs.

III. Assay results.

1. INTRODUCTION

The 1985 drilling programme in the Flinders Ranges Joint Venture (FRJV) areas commenced on 19th April, 1985 and completed on 12th June, 1985. Peter Nitschke Drilling Pty. Ltd. were contracted to undertake this drilling programme.

The original proposals for this drilling programme were:-

a). ERIC Prospect: 4 x 200 m drill holes (pre-collared) spaced at 400 metres centres along the zone of anomalous geochemistry (Pb + Zn) detected during the 1984 RAB drilling programme at this prospect.

(c). DONKEY BORE Prospect: Deepening two holes not completed during last years' drilling programme, in order to test extent of ground preparation and mineralization intersected in WD19.

Further details on the 1984 drilling programme have previously been reported.

2. OPERATIONAL DETAILS

Peter Nitschke Drilling Pty. Ltd. of Hahndorf, South Australia, were contracted to undertake this drilling programme.

The contractor provided a Bourne 1000 THD drillrig mounted on a custom-made 6 x 6 wheel drive truck, supported by a drill rod truck, a 12,000 litre capacity water truck, two Toyota Landcruisers, and two caravans. It was originally proposed to work two shifts (10 hour day and 9 hour night), however, the contractor had trouble employing a second experienced driller, hence only day shift was worked for most of the programme.

In marked contrast to the previous drilling programme, this programme was carried out by experienced personnel, using efficient equipment and having reliable back-up support.

It is recommended that Peter Nitschke Drilling Pty. Ltd. be considered for any further drilling contracts.

Water supplies for the drilling were obtained from existing bores Table 1).

The drilling was carried out in Environmental Class B areas, ~~except LINDA Prospect which lies within an Environmental Class A area.~~ For this reason, and so as to reduce the deterioration of tracks by water trucks, etc., water was pumped from the water bore via black poly-pipe to the drill site - a distance of approximately three (3) kilometres.

Apart from pre-collar drilling, and HQ coring for casing top of holes, all drilling was cored utilising NQ II size drill bits and equipment. Both surface set multi-step and impregnated drill bits were used. Extensive use was made of Hydropol drilling additive.

All core was placed in Statco galvanized NQ core trays; selected sections of core (in some cases the entire hole), were split using a Clipper portable diamond saw. All core is presently stored at Pt Well Homestead, via Blinman. Any core sampled was bagged, forwarded to Comlabs (Adelaide) and assayed for Cu, Pb, Zn by AAS methods. If samples resulted in Pb + Zn $\geq$ 0.5%, then they were re-assayed for Co, Cd, Ag, Ca, Mg.

All core trays have been photographed and 35 mm slides of the core are presently held at BHP Minerals Ltd., Adelaide Office.

Bore Name	Location	Total Depth (m)	Casing (125mm) Type/Depth(m)	Capacity ('000 litres/day)
Lemon Bore (Mt Frome Area)	325150mE 6565300mN	50	PVC/49.5	160
Wirrealpa Well (Wirrealpa Mine Area)	300200mE 6560000mN	37	PVC/12.0	90
Donkey Bore	294750mE 6565150mN	50	PVC/50	25
Roche Bore (Linda Prospect)	303770mE 6538800mN	36	Steel/36	140
Third Plain	294750mE 6545710mN	35	Steel/30	90

TABLE 1 Water Supplies for Drilling Purposes.

	Hole No.	Pre-collar (m)	HQ(m)	NQ(m)	T.D.(m)
A. ERIC PROSPECT	DEP 1	50	-	50.98	100.98
	DEP 2	4	-	96.00	100.00
	DEP 3	26.2	-	71.80	98.00
	DEP 4	*(10)	-	88.20	98.20
C. DONKEY BORE PROSPECT	DDB 1	20	-	132.00	152.00

(* Drilled last drilling programme REP86)

Drilling commenced: 19th April, 1985

Drilling completed: 12th June, 1985

Field break (drillers) 17th - 26th May, 1985 (10 days)

Total standby hours: 65.5

TABLE 2 Drilling Summary

3. DRILLING DETAILS - RESULTS

3.1 EL 1138 Mt Frome

3.1.1. ERIC Prospect

Four holes were drilled at 400 metre spacing along the lead anomaly detected during the 1984 RAB drilling programme. Details are tabulated below:

Hole No.	Coordinates		
DEP 1	328300mE	6568870mN	(adjacent REP 4)
DEP 2	328200mE	6568500mN	(adjacent REP 21)
DEP 3	328400mE	6568100mN	(adjacent REP 43: 10m av.4%Pb)
DEP 4	328500mE	6567700mN	(continuation of REP 86: 8m av. 2% Pb)

Hole DEP 1 drilled adjacent to REP 4 (TD 38m) was precollared to 50 metres; overburden consisted mainly of calcareous and siliceous sands and clays with calcarenite, dolarenite, calcrete and silcrete fragments. Manganese rich zones were noted at irregular intervals. The hole was then cored from 50 to 100.98 metres with the major facies being a mottled calcarenite which was dolomitized in places. This is the equivalent of the $\epsilon hw_2/\epsilon hw_1$ facies of the Wilkawillina limestone, as mapped. Although the overlying weathered zone was geochemically anomalous (maximum of 1250 ppm Zn, 2900 ppm Pb, 300 ppm Cu), no base metals were noted in the underlying core. Ground preparation was only slight, with only weak fracturing (calcite filled) and common vughs (calcite and/or dolomite filled).

Hole DEP 2 (drilled adjacent to REP 21) was sited 5 metres east of the 10 metre shaft of the Mt. Chambers Cu Mine, which was dug over 100 years ago. The vughy and stylolitic grey brown calcarenite intersected over the total depth of this hole was typical of the ϵhw_3 facies of the Wilkawillina Limestone. Several fractured (clay filled) zones were intersected; the vughs were filled with either dolomite, calcite or recent (?) clays. Manganese dendrites were evident throughout, but were most common in the slightly dolomitized zones. Although the surrounding outcrops were well

mineralized (malachite, azurite, cerussite) no indications of mineralization were detected in this drillhole.

Hole DEP 3 (drilled 2 metres east of REP 43 (TD 10 metres)) was pre-collared to 26 metres, indicative of the highly irregular nature of the underlying limestone topography in this area. The overburden assayed an average of 860 ppm Zn, 3.6% Pb, 770 ppm Cu over 26 metres. The lithology of this overburden is similar to that in DEP 1, but with little calcareous fill. As was the case with REP 43, no galena was evident in the samples and it is assumed that the lead anomalism is due to cerussite. As can be seen from the accompanying assays (or log sheets) there is a sharp geochemical boundary between the overburden and cored limestone. The bottom (24-26 m) sample of the overburden assayed 790 ppm Zn, 1.0% Pb and 570 ppm Cu, whilst the top metre of the cored limestone (26-27 m) assayed 210 ppm Zn, 590 ppm Pb and 100 ppm Cu and second metre (27-28 m) 18 ppm Cu, 46 ppm Pb and 79 ppm Zn.

The cored limestone (Wilkawillina mottled to archaeocyathid limestone - weathered and dolomitized in places), was generally devoid of any base metal mineralization with lead values being less than 90 ppm (except for "anomalous" zone 34-41 metres which averaged 64 ppm Cu 510 ppm Pb, 172 ppm Zn)

Hole DEP 4 was set up over REP 86 (TD 10 metres); whereas REP 86 averaged 2% Pb over 8 metres with the bottom assay (8-9 metres) assaying 120 ppm Cu, 7150 ppm Pb, 115 ppm Zn, the top metre of the cored limestone assayed 7 ppm Cu, 30 ppm Pb, 30 ppm Zn.

3.3. EL 1129 Wirrealpa

3.3.1. DONKEY BORE Prospect

One hole was cored into the Flinders Unconformity, south-west of Wirrealpa Springs, and approximately 500 metres along strike from the previously drilled WD 19.

Hole No.	Declination/Bearing	Coordinates	TD (m)
DDB 1	$55^{o}/090$	298340mE 6561260mN	152.0

Hole DDB1 was collared in Parara Limestone and intersected the red (FeO) paleosol of the Flinders Unconformity at 38 metres. The underlying Wilkawillina Limestone was characterized by vughy, stylolitic and generally pyritic, grey-brown calcarenite. Thin intraformational conglomerate and weathered breccia bands (less than 5 cm) were common; many vughs were filled with either calcite (generally laminar) and/or later micrite.

Towards the base of this facies the conglomerate lenses (blocks and bedded) become more common, with up to 1% pyrite disseminated throughout. The Woodendinna Dolomite was intersected at 116 metres; this was underlain by the diapiric breccia at 136 metres.

No base metals were noted in DDB 1 and from the samples selected for assay, maximum values for Cu, Pb, Zn were 65 ppm, 32 ppm, 180 ppm respectively.

4. DISCUSSION

4.1. ERIC Prospect

The origin of the base metal mineralization into this area, still remains enigmatic. In karst terminology, the area delineated as the ERIC Prospect would appear to be a polje. Stream sinks called ponors, lie between the generally doline-riddled hums (residual hills) which result in the "undulating" bedrock pattern found in the RAB drilling programme in 1984.

The ponors are usually filled with later sedimentation hence are generally inconspicuous on the present day surface.

The age of the "filling" process could be either a) Recent/Holocene or b) Delamarian.

If it is Recent/Holocene in age then the deposits would be colluvial; the climate of this period was thought to be temperate, with higher annual rainfall (500-700 mm) than present day, resulting in large mud slides and development of alluvial fans.

The source of the colluvium would then be the surrounding base metal rich (Lower Cambrian) carbonate units. This would be supplemented by aeolian products transported into the polje.

This would be reflected in the present day surface by a vast area of occasional (possibly irregular) outcrop (i.e. hums) with intervening areas of non-outcrop (ponors), and would be classified as modern buried karst. If, however, this development is circa Delamarian in origin then the deposit would be eluvial.

Grikes and tower karsts developed in this area would be prone to deep weathering, if the right conditions prevailed. This karst "fill" would also be a channelway (plumbing system) for any metal rich brines being transporting. Differential porosity and permeability in this karst system may result in more metal enriched zones. Subsequent weathering and colluvial input would result in the same present day surface as described above.

From the RAB drilling programme it is apparent that the Cambrian topography was deeply karsted (maximum of 50 metres), and that these "sink-holes" could be either barren or mineralized (e.g. REP 43

10 metres averaging 4.0% Pb). If only a colluvial process is evoked then it would be expected that the mineralization would be blanketted more uniformly across the polje.

The lead anomalous area is quite linear and would seem to represent a channelway for mineralized fluids.

From an exploration and economic point of view, it is important to locate the source of this mineralization. It is not, at this stage, imperative to know which of the two processes is more valid; in both cases the source of the mineralization would be from the south-south-east, which is still open-ended on the geochemical RAB grid. Proposals to extend this grid are discussed later.

4.2. DONKEY BORE Prospect

Whilst the Flinders Unconformity is well developed and mineralized on the surface, the drilling to date has not reflected the surface indications. Apart from WD 18, 19 only sporadic base metal sulphides have been intersected in the drillholes. The prospective zone (i.e. the Unconformity) extends over seven (7) kilometres; the six (6) diamond drill holes completed to date may not have (statistically) adequately tested this zone. However, further drilling will require hole depths to be greater than 200 metres each, and at this stage it is proposed to give this area a low priority.

APPENDIX 2 GEOLOGICAL DRILL LOGS

DEP 1-4

DDB 1

(Note: Assay results for cored section as shown on the drill logs are for one (1) metre intervals only. Every second sample number and assay result from the hole is shown on logs.)

HOLE No. DEP 1	EASTING 328300	DETAILS	PRECOLLAR	MAIN HOLE	DEPTH	DECL'N	BEARING	HOLE DIAM.	FROM	TO	PROJECT FLINDERS J.V. / AREA ERIC
DEPTH 100.98	NORTHING 6568870	Contractor	P. NITSCH	KE	0	VERTICAL		4.5"	0	50m	JOB No. / SCALE
GRID AMG	LOGGED BY RTR	Machine	BOURNE	1000THD				NQ	50	100.98	MINERAL TENEMENT E.L. 1138 MT. FROME
RL 270m.	DATUM MSL	Commenced	20.4.85	20.4.85							SHEET 1 OF 2.
		Completed	20.4.85	22.4.85							
		Method	ROTARY	CORE							

METRES	MINERALIZATION % CONTENT Zn	Pb	Fe	TYPE	Int	SAMPLE NUMBER	ASSAY RESULTS ppm Zn	Pb %	Ag ppm	Cu	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
						669001	85	65		44																								Re-collar: strongly weathered dolomitic Wilkawillina Limestone throughout.
						669002	460	115		75																								
						669003	55	42		42																								
						669004	65	38		24																								
						669005	220	240		36																								
10						669006	280	300		48																								
						669007	1000	240		65																								
						669008	870	250		80																								
						669009	670	150		85																								
						669010	780	260		95																								
20						669011	890	2900		130	£?																							
						669012	960	1700		150																								
						669013	780	1300		130																								
						669014	890	1350		145																								
30						669015	620	810		90																								
						669016	210	300		42																								
						669017	115	145		20																								
						669018	130	210		29																								
						669019	95	100		34																								
40						669020	195	220		55	£?																							
						669021	550	480		165																								
						669022	740	410		220																								
						669023	1250	600		300																								
						669024	880	350		145																								
						669025	690	210		105																								
50													·|·			1	C3								c	c						Wilkawillina Limestone: Generally mottled facies with occasional thin bands of (A) limestone; strongly dolomitised in places
													·|m|·			1	C3								c	c					(A)	
													·|··			1	C3								c	c					(A)	
												GB	·|m|·			1	C3								c	c					(A)	
													·|··			1	C3								c	c					(A)	
60													·|m|·			1	C3								c	c					(A)	
											£		·|··			1	C3								K	c					(A)	
													·|m|·			1	C3								C	F					(A)	
													·|··			2	C3								c	c					(A)	
												GB	·|m|·			2	C3								c	c					(A)	
70													·|··			2	C3								c	c					(A)	
													·|m|·			1	C3								c	c					(A)	
													·|··			1	C3								c	c					(A)	
													·|m|·			1	C3								c	c					(A)	
											£		·|··			1	C3								c	c					(A)	
80													·|m|·			1	C3								c	c					(A)	
													·|··			1	C3								c	c					(A)	
												GB	·|m|·			1	C3								c	c					(A)	
													·|··			1	C3								c	c					(A)	
90													·|m|·			1	C3								c	c					(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 Stromatoporoid
- Stromatactoid
- Geopetal

LITHOLOGY

- Limestone (m-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. 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

Mn - manganese

TEXTURES

- A
- Anm 1. Clasts (W
- B 2. Matrix (Bl
- C
- D
- Fenestrae
- Bedding/layering
- Veins
- Conformable contact
- Unconformable contact
- KA Karstic breccia

HOLE No. DEP 1	EASTING	DETAILS	PRECOLLAR	MAIN HOLE	DEPTH	DECL'N	BEARING	HOLE DIAM.	FROM	TO	PROJECT / AREA
DEPTH 100·98	NORTHING	Contractor									JOB No. / SCALE
GRID	LOGGED BY	Machine									MINERAL TENEMENT
RL	DATUM	Commenced									SHEET 2 OF 2
		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	Vugs	Cavity Fill	STYL Con	Dis	Res	FOSSILS Abun	Comm	Rare	REMARKS
													· 1 ·			1	C_1								C	C							A
													· 1 · 1 ·			1	C_2								C								A
											£	GB	· 1 ·			1	C_3								C	C							A
													· 1 · 1 ·			1	C_3								C	C							A
													· 1 ·			1	C_3								C	C							
100											END OF HOLE		1 · 1		100·98																		

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 Stromatoporoid
- Stromatactoid
- Geopetal

LITHOLOGY

- Limestone (m-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. Moderate
4. Strong
5. V. Strong

Lithology of Fill (F)

- C_1 laminar calcrete
- C_2 pink calcite
- C_3 white calcite
- A lead
- 3_1 red zinc (Mn - manganese)
- 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 (A); 2. Matrix (B)
- B
- C
- O
- Fenestrae
- Bedding/layering
- Veins
- Conformable contact
- Unconformable contact
- KΔ Karstic breccia

HOLE No. DEP 2	EASTING 328200	DETAILS	PRECOLLAR	MAIN HOLE	DEPTH	DECL'N	BEARING	HOLE DIAM.	FROM	TO	PROJECT FLINDERS JV. / AREA ERIC
DEPTH 100.00	NORTHING 6568500	Contractor	P. NITSCHKE		0.0	VERTICAL		4.50"	0	4.0	JOB No. / SCALE
GRID AMG	LOGGED BY MTR	Machine	BOYNE	1000 MD				NQ	4.0	100.0	MINERAL TENEMENT E.L. 1138 MT. FROME
RL 272m.	DATUM MSL	Commenced	23.4.85	23.4.85							SHEET 1 OF 2
		Completed	23.4.85	25.4.85							
		Method	ROTARY	CORE							

METRES	MINERALIZATION % CONTENT Zn Pb Fe	TYPE	SAMPLE Int	NUMBER	ASSAY RESULTS (ppm) Zn%	Pb%	Ag ppm	Cu	STRAT AGE	COLOUR	LITHOS	L.C.A.	TEXTURE	OPEN SPACE FRACTURING I F F	I F F	I F F	Vugh. Cryst.	Coll.	STYL Con	Dis	Res	FOSSILS Abun	Comm	Rare	REMARKS
				669026	260	230		130																	Pre-collar.
				669027	150	130		120									A	A							Wilkawillina Limestone
10									C	GB							A	A							Grey-brown slightly dolomitic (in places mottled) calcarenite.
20																	A	A							Large clay filled fractures.
30									C	GB							A	A							Dolomite - filled vugs throughout, rare calcite filled vugs + fractures
40																	A	A							
50									C	GB							A	A							
60									C	GB							A	A							
70																	A	A							Large clay filled fractures
80									C	GB							A	A							
90																	A	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 Stromatoporoid
- Stromatactoid
- Geopetal

LITHOLOGY

- Limestone (m-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. 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

Mn - manganese

TEXTURES

- A
- Anm 1. Clasts (W
- B 2. Matrix (B
- C
- D
- Fenestrae
- Bedding/layering
- Veins
- Conformable contact
- Unconformable contact
- KΔ Karstic breccia

HOLE No. DEP2	EASTING	DETAILS	PRECOLLAR	MAIN HOLE	DEPTH	DECL'N	BEARING	HOLE DIAM	FROM	TO	PROJECT		AREA
DEPTH 100.0	NORTHING	Contractor									JOB No.		SCALE
GRID	LOGGED BY	Machine									MINERAL TENEMENT		
RL	DATUM	Commenced									SHEET 2 OF 2		
		Completed											
		Method											

METRES	MINERALIZATION % CONTENT Zn+b Fe	MINERALIZATION 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	Calla	STYL Con	Dis	Res	FOSSILS Abun	Comm	Rare	REMARKS
									.1.				A	A						(A)	As above
							£	GB	.(m).				A	A							
									.1.				A	A						(A)	
									.1.1.				P	A							
100							E.O.H.		.1.		100.0		D	D							

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 (m.-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. Moderate
4. Strong
5. V. Strong

Lithology of Fill (F)

- C_1 laminar calcrete
- C_2 pink calcite
- C_3 white calcite
- f lead
- 3_1 red zinc Mn - manganese
- 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 in
- B 2 Matrix of
- C
- D
- Fenestrae
- Bedding/layering
- Veins
- Conformable contact
- Unconformable contact
- K Δ karstic breccia

HOLE No. DEP 3	EASTING 328 400	DETAILS	PRECOLLAR	MAIN HOLE	DEPTH	DECL'N	BEARING	HOLE DIAM	FROM	TO	PROJECT FLINDERS JV	AREA ERIC
DEPTH 98 0	NORTHING 6568 100	Contractor	P.N. ITSCHKE		0.0	VERTICAL		9.5"	0	26.2	JOB No.	SCALE
RL AMG	LOGGED BY MTR	Machine	BOURNE	600 TMD				NQ	26.2	98.0	MINERAL TENEMENT EL 1138 MT. FROME	
Inc 258m	DATUM MSL	Commenced	26.4.85	26.4.85							SHEET 1 OF 2	
		Completed	26.4.85	28.4.85								
		Method	ROTARY	CORE								

METRES	MINERALIZATION % CONTENT Zn Pb Fe	TYPE	SAMPLE Int	NUMBER	ASSAY RESULTS Zn (ppm)	Pb (ppm)	Ag ppm	Cu	STRAT AGE	COLOUR	LITHOS	L C A	TEXTURE
10				669028	750	2.8%		310					
				669029	670	3.4%		420					
				669030	2900	4.3%		1100					
				669031	1350	5.3%		900					
20				669032	650	5.2%		1100					
				669033	530	4.8%		900					
				669034	570	4.5%		830					
				669035	520	4.5%		850					
				669036	560	4.5%		940					
30				669037	570	3.2%		810					
				669038	630	2.0%		720					
				669039	690	1.2%		600					
				669040	790	1.0%		570					
				669192	70	46		18					
				669194	80	75		34		GB			
40				669196	70	20		12	E				
				669198	140	80		16					
				669200	195	540		65					
				669202	190	450		55					
				669204	115	300		28					
50				669206	70	90		34					
				669208	60	32		16					
				669210	55	36		8					
				669212	65	18		8					
				669214	32	8		6		GB			
				669216	22	40		7					
				669218	14	14		5					
60				669220	22	8		9					
				669222	22	6		10	E				
				669224	26	12		5					
				669226	50	10		6					
				669228	50	28		5					
				669230	85	26		4					
				669232	42	28		2		GB			
70				669234	46	30		5					
				669236	36	20		3					
				669238	14	10		4					
				669240	48	6		5					
				669242	50	26		4					
80				669244	44	42		6					
				669246	75	80		10					
				669248	60	40		6	E				
				669250	100	98		8		GD			
				669252	100	30		9					
90				669254	110	68		9					

OPEN SPACE FRACTURING										STYL			FOSSILS		
I	F	I	F	F	I	F	F	Vugh	Cryst	Colla	Con	Dis	Res	Abun	Comm	Rare

REMARKS

Re-collar : strongly weathered limestone & dolomite fragments with fill : Trace Mn in places.

Wilkawillina Limestone

Generally massive fairly fine occasional dolomite filled vugs. Some thin beds of archaeocyathid lst.

(A)

(A)

(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 (m-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. Moderate
4. Strong
5. V. Strong

Lithology of Fill (F)

- C_1 laminar calcrete
- C_2 pink calcite
- C_3 white calcite
- A 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
- y opal

Mn - manganese

TEXTURES

- A
- Anm 1 Clasts (W
- B 2 Matrix (h
- C
- D
- Fenestrae
- Bedding/layering
- Veins
- Conformable contact
- Unconformable contact
- KΔ Karstic breccia

412

HOLE No. DEP3	EASTING	DETAILS	PRECOLLAR	MAIN HOLE	DEPTH	DECL'N	BEARING	HOLE DIAM.	FROM	TD	PROJECT	AREA
DEPTH 98.0 m	NORTHING	Contractor									JOB No.	SCALE
GRID	LOGGED BY	Machine									MINERAL TENEMENT	
RL	DATUM	Commenced									SHEET 2 OF 2	
		Completed										
		Method										

METRES	MINERALIZATION % CONTENT Zn Pb Fe	TYPE	SAMPLE Int	NUMBER	ASSAY RESULTS Zn %	Pb %	Ag ppm	Cu	STRAT AGE	COLOUR	LITHOS	L.C.A	TEXTURE	OPEN SPACE FRACTURING I F	F I F	F I F	F	STYL Vugs Cavity Calla Con Dis Res	FOSSILS Abun	Comm	Rare	REMARKS
				669256	115	55		10			- | .											
				669258	70	38		10	€	GB	. | . | .										
				669260	140	85		12			- | .										
99										COM	. | .		98.0								

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 Stromatoporoid
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 (m-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. 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 opal

Mn - manganese

TEXTURES

- A
- Anm — 1. Clasts (W
- B — 2. Matrix (F
- C
- D
- Fenestrae
- Bedding/layering
- Veins
- Conformable contact
- Unconformable contact
- KA Karstic breccia

413

HOLE No. DEP 4	EASTING 328500	DETAILS	PRECOLLAR	MAIN HOLE	DEPTH	DECL'N	BEARING	HOLE DIAM	FROM	TO	PROJECT FLINDERS JV / AREA ERIC
DEPTH 98.2	NORTHING 6567700	Contractor	WILSONS	P. NITSCHKE	0	VERTICAL		4.5"	0	10	JOB No. / SCALE
GRID AMG	LOGGED BY MTR	Machine	A.C. 880	BOURNE 1000				NQ	10	98.2	MINERAL TENEMENT EL 1138 (MT. FRONC
RL 262m.	DATUM MSL	Commenced	24.10.84	30.4.85							SHEET 1 OF 2
		Completed	24.10.84	3.5.85							
		Method	ROTARY	CORE							

WEATHERING	MINERALIZATION % CONTENT Zn Pb Fe	TYPE	SAMPLE Int	NUMBER	ASSAY RESULTS (ppm) Zn	Pb	Ag ppm	Cu	STRAT AGE	COLOUR	LITHOS	L.C.A	TEXTURE	OPEN SPACE FRACTURING I F	I F	F	I F	F	VUGS Vugh	Cross	STYL Conc	Colla	Dis	Res	FOSSILS Abun	Comm	Rare	REMARKS
																												Recolla : See REP 86
10				669077	30	30		7						4 C						A		A	A		A			
				669079	30	14		7	£	GB																		Wilkawillina Limestone - abundant calcite filled vugs + fractures
				669081	55	30		28																				
				669083	18	30		4																				
20																												Archaeocyathid limestone with calcite filled (& empty) vugs.
30														2 C	2	0				A		A	A		A			
									£	G																		
40																				A		A	A		A			
																												Clay filled fractures
50									£	G				2 C	2	0												
																				A		A	A		A			
60				669076	70	20		34																				
				669074	125	30		38																				
				669072	55	24		17																				
				669070	135	75		20																				
70										G				2 C						A		A	A		A			
									£																			
80																												
										G										A		A	A		A			
90				669068	85	22		20																				

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 Stromatoporoid
- Stromatactoid
- Geopetal

LITHOLOGY

- Limestone (m-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

Mn - manganese

TEXTURES

- A
- Anm — 1 Clasts (W
- B — 2 Matrix (B
- C
- D
- Fenestrae
- Bedding/layering
- Veins
- Conformable contact
- Unconformable contact
- KA Karstic breccia

HOLE No	DEP 4	EASTING	DETAILS	PRECOLLAR	MAIN HOLE	DEPTH	DECL'N	BEARING	HOLE DIAM.	FROM	TO	PROJECT	AREA
DEPTH	98.2m.	NORTHING	Contractor									JOB No.	SCALE
GRID		LOGGED BY	Machine									MINERAL TENEMENT	
RL		DATUM	Commenced									SHEET 2 OF 2	
			Completed										
			Method										

METRES	MINERALIZATION % CONTENT Zn	Pb	Fe	TYPE	SAMPLE Int	NUMBER	ASSAY RESULTS Zn%	Pb% (ppm)	Ag ppm	Cu	STRAT AGE	COLOUR	LITHOS	L.C.A.	TEXTURE
						669066	105	8		18					
						669064	100	12		18	E	G			
						669062	65	14		16					
											EOH				98.2
98															

OPEN SPACE FRACTURING I	F	F	I	F	F	I	F	F	Vugh.	Cryst.	Colla.	STYL Con	Dis	Res	FOSSILS Abun	Comm	Rare	REMARKS

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

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 (unmottled)
- 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

Mn - manganese

TEXTURES

- A
- Anm — 1. Clasts (w
- B — 2. Matrix (B
- C
- O
- Fenestrae
- Bedding/layering
- Veins
- Conformable contact
- Unconformable contact
- KΔ Karstic breccia

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HOLE No DDB 1	EASTING 298340	DETAILS	PRECOLLAR	MAIN HOLE	DEPTH	DECL'N	BEARING	HOLE DIAM.	FROM	TO	PROJECT FLINDERS J.V.	AREA DONKEY BORE
DEPTH 152.0	NORTHING 6561260	Contractor	P. PITSCH P/L		0.0	55°	090	4.5"	0	20m.	JOB No.	SCALE
GRID AMG	LOGGED BY MTR	Machine	BOWEN 1000 MD					NQ			MINERAL TENEMENT E.L. 1129	WILLOUGHBY
RL 415m.	DATUM AHD	Commenced	2.6.85	3.6.85							SHEET OF	
		Completed	2.6.85	6.6.85								
		Method	ROLLER	CORE								

METRES	MINERALIZATION % CONTENT Zn Pb Fe Ba	TYPE	SAMPLE Int	NUMBER	ASSAY RESULTS ppm Zn	Pb	Ag ppm	Cu	STRAT AGE	COLOUR	LITHOS	L.C.A.	TEXTURE	OPEN SPACE FRACTURING I	F	F	I	F	F	I	F	F	Vugh Coat	Calc Con	STYL Con	Dis	Res	FOSSILS Abun	Comm	Rare	REMARKS
																															Pre collar - strongly weathered calcilutite (Parna limestone)
																															Occasional bands of Mn staining + vughs up to 1m thick
10																															
20																															
									€	G				1	C3								A		A						Grey calcarenite - occasional pink/brown dolomitic clay filled vughs. Thin conglomerate lenses.
														1	C3								A		A						
														1	C3								A		A						
														1	C3								A		A						
30														1	C3	1	C3						A		A						
														1	C3								A		A						
														1	C3								A		A						Thin red FeO band
														1	C3								A		A				1		
														1	C3								A		A						
				669262	16	22		8		RG				1	C3								A		A						Red oxide zone.
40				669264	9	10		5		G															A						Calcite filled vugh + dolomite blebs.
				669266	44	8		12																	A						
				669268	22	20		12						1	m										A				1		
				669270	12	18		9						1	m										A						Calcite + pyrite filled vughs.
				669272	4	10		6						1	C3	1	m								A						Porous laminar calcilutite full of
50				669274	20	10		20		G				1	C3	1	m								A				1		laths micrite full
				669276	10	16		6															C		A				1		Red paleosol + pyrite
				669278	7	24		6															C		A						
				669280	6	14		7		G				1	C3	1	m			1	C3		C		A						
				669282	8	12		7																	A						
				669284	7	16		7						1	C1	1	m			1	C2	C3			A						Thin breccia bands with black calcilutite matrix
				669286	8	14		4																	A						
				669288	7	14		7		G															A						Thin interbedded cgl. slightly reddened + pyritic
				669290	8	10		5																	A						
				669292	8	8		5																	A						
										GB															A				A		Strongly weathered breccia zone - clay breccia
				669294	30	14		46																	A				A		
				669296	18	14		24																	A				A		
				669298	105	24		24		GB															A				A		Trace pyrite throughout.
				669300	180	32		65						1	C3	1	C3						A		A						
														1	C3	1	C3						A		A				A		
														1	C3	1	C3						A		A				A		
										G				1	C3	1	C3						A		A				A		
														1	C3	1	C3						A		A				A		Trace PYRITE → BASE

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

HOLE No. DDB1	EASTING	DETAILS	COLLAR	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 2	
		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	Calc	STYL Con	Dis	Res	FOSSILS Abun	Comm	Rare	REMARKS
100									G				1 C_3		2 C_3		1 C_3		A		A					A	Thin conglomerate
													1 C_3		2 C_3		1 C_3		A		A					A	bases (blocks in bedded)
													1 C_3		2 C_3		1 C_3		A		A					A	some clasts of "diapiric"
													1 C_3		2 C_3		1 C_3		A		A					A	origin. Up to 2% pyrite
													1 C_3		2 C_3		1 C_3		A		A					A	throughout.
													1 C_3		1 C_3				A		A					A	
													1 C_3		1 C_3				A		A					A	Conglomerate (as seen above)
									G				1 C_3		1 C_3				A		A					A	
													1 C_3		1 C_3				A		A					A	
110													1 C_3		1 C_3				A		A					A	
									G				1 C_3						A		A					A	
													1 C_3						A		A					A	
									B				1 C_3						A		A					A	Wonderdrive dolomite
													1 C_3						A		A					A	
120													1 C_3						A		A					A	Occasional thin conglomerate
									GB				1 C_3						R		C					C	bands, strongly weathered
													1 C_3						R		C					C	in places FeO staining
									GB				1 C_3						R		C					C	(Cleiserang banding)
													1 C_3						R		C					C	
													1 C_3						R		C					C	
130									GB																		
																											Diapiric breccia
140																											
150																											

APPENDIX 3 ASSAY RESULTS

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COMPUTERISED ANALYTICAL LABORATORIES

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ANALYTICAL REPORT

JOB COM850821
O/N : N079613

SAMPLE	Cu	Pb	Zn	DEP 1
669001	44	65	185	0-2
669002	75	115	460	2-4
669003	42	42	55	4-6
669004	24	38	65	6-8
669005	36	240	220	8-10
669006	48	300	280	10-12
669007	65	240	1000	12-14
669008	80	250	870	14-16
669009	85	150	670	16-18
669010	95	260	780	18-20
669011	130	2900	890	20-22
669012	150	1700	960	22-24
669013	130	1300	780	24-26
669014	145	1350	890	26-28
669015	90	810	620	28-30
669016	42	300	210	30-32
669017	20	145	115	32-34
669018	24	210	130	34-36
669019	34	100	95	36-38
669020	55	220	195	38-40
669021	165	400	550	40-42
669022	220	410	740	42-44
669023	300	600	1250	44-46
669024	145	350	880	46-48
669025	105	210	690	48-50
UNITS	ppm	ppm	ppm	
SCHEME	AAS1	AAS1	AAS1	

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ANALYTICAL REPORT

JOB COM850821
O/N : N079613

SAMPLE	Cu	Pb	Zn	DEP 2
669026	130	230	260	0-2
669027	120	130	150	2-4
669028	310	2.80%	750	0-2 ←
669029	420	3.40%	670	2-4
669030	1100	4.30%	2900	4-6
669031	900	5.30%	1350	6-8 ←
669032	1100	5.15%	650	8-10
669033	900	4.80%	530	10-12
669034	830	4.45%	570	12-14
669035	850	4.45%	520	14-16
669036	940	4.45%	560	16-18 ←
669037	810	3.20%	570	18-20
669038	720	1.95%	630	20-22
669039	600	1.20%	690	22-24
669040	570	1.01%	790	24-26 ←

DEP 3:

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ANALYTICAL REPORT

JOB COM850821
O/N : N079613

SAMPLE	Co	Cd	Ag	Ca	Mg	
669028	4	<1	<1	8.90	0.61	0-2 DBP 3
669029	6	<1	<1	5.05	0.44	2-4
669030	22	2	<1	0.08	0.23	4-6
669031	10	1	<1	0.07	0.18	6-8
669032	8	<1	<1	0.07	0.24	8-10
669033	8	<1	<1	0.09	0.26	10-12
669034	6	<1	<1	0.08	0.25	12-14
669035	8	<1	<1	0.08	0.27	14-16
669036	10	<1	<1	0.07	0.28	16-18
669037	10	<1	<1	0.07	0.26	18-20
669038	14	<1	<1	0.41	0.25	20-22
669039	16	1	1	5.60	0.35	22-24
669040	18	1	1	6.60	0.28	24-26
669047	<4	14	<1	11.7	6.80	
669048	<4	20	<1	14.6	8.00	
UNITS	ppm	ppm	ppm	%	%	
SCHEME	AAS1	AAS1	AAS3	AAS6	AAS6	

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ANALYTICAL REPORT

JOB COM851014
O/N : N 079643

DEP 3.

SAMPLE	Cu	Pb	Zn	
669191	100	590	210	26-27
669192	18	46	70	27-28 ←
669193	24	180	60	28-29
669194	34	75	80	29-30
669195	46	22	130	30-31
669196	12	20	70	31-32
669197	6	22	48	32-33
669198	16	80	140	33-34
669199	95	810	185	34-35
669200	65	540	195	35-36
669201	105	740	230	36-37
669202	55	450	190	37-38
669203	38	530	130	38-39
669204	28	300	115	39-40
669205	60	200	165	40-41
669206	34	90	70	41-42
669207	42	105	80	42-43 ←
669208	16	32	60	43-44
669209	10	20	80	44-45
669210	8	36	55	45-46
669211	4	12	44	46-47
669212	8	18	65	47-48
669213	6	20	40	48-49
669214	6	8	32	49-50
669215	5	14	18	50-51
UNITS	ppm	ppm	ppm	
SCHEME	AAS1	AAS1	AAS1	

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ANALYTICAL REPORT

JOB COM851014
O/N : N 079643

DEP 3

SAMPLE	Cu	Pb	Zn	
669216	7	40	22	51-52
669217	7	26	26	52-53
669218	5	14	14	53-54
669219	5	6	12	54-55
669220	9	8	22	55-56
669221	5	10	18	56-57
669222	10	6	22	57-58
669223	4	18	28	58-59
669224	5	12	26	59-60
669225	4	14	22	60-61
669226	6	10	50	61-62
669227	5	28	55	62-63
669228	5	28	50	63-64
669229	5	20	48	64-65
669230	4	26	85	65-66
669231	5	38	55	66-67
669232	2	28	42	67-68
669233	5	28	42	68-69
669234	5	30	46	69-70
669235	4	10	24	70-71
669236	3	20	36	71-72
669237	5	38	32	72-73
669238	4	10	14	73-74
669239	4	24	48	74-75
669240	5	6	48	75-76
UNITS	ppm	ppm	ppm	
SCHEME	AAS1	AAS1	AAS1	

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ANALYTICAL REPORT

JOB COM851014
O/N : N 079643

SAMPLE	Cu	Pb	Zn	DEP3
669241	4	8	40	76-77
669242	4	26	50	77-78
669243	6	30	46	78-79
669244	6	42	44	79-80
669245	6	48	38	80-81
669246	10	80	75	81-82
669247	6	42	80	82-83
669248	6	40	60	83-84
669249	6	46	70	84-85
669250	8	48	100	85-86
669251	6	22	95	86-87
669252	9	30	100	87-88
669253	10	75	85	88-89
669254	9	60	110	89-90
669255	7	42	95	90-91
669256	10	55	115	91-92
669257	7	32	80	92-93
669258	10	38	70	93-94
669259	12	42	110	94-95
669260	12	85	140	95-96
669261	10	24	42	37-38
669262	8	22	16	38-39
669263	7	12	14	39-40
669264	5	10	9	40-41
669265	9	16	10	41-42
UNITS	ppm	ppm	ppm	
SCHEME	AAS1	AAS1	AAS1	

DDB1.

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COMPUTERISED ANALYTICAL LABORATORIES

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ANALYTICAL REPORT

JOB COM851014
O/N : N 079643

SAMPLE	Cu	Pb	Zn	DDB1
669266	12	8	44	42-43
669267	14	14	34	43-44
669268	12	20	22	44-45
669269	8	14	8	45-46
669270	9	18	12	46-47
669271	6	16	4	47-48
669272	6	10	4	48-49
669273	7	22	12	49-50
669274	20	10	20	50-51
669275	4	46	12	51-52
669276	6	16	10	52-53
669277	8	10	12	53-54
669278	6	24	7	54-55
669279	6	22	8	55-56
669280	7	14	6	56-57
669281	6	12	6	57-58
669282	7	12	8	58-59
669283	7	10	7	59-60
669284	7	16	7	60-61
669285	7	12	10	61-62
669286	4	14	8	62-63
669287	6	14	4	63-64
669288	7	14	7	64-65
669289	7	12	9	65-66
669290	5	10	8	66-67
UNITS	ppm	ppm	ppm	
SCHEME	AAS1	AAS1	AAS1	

COMLABS Pty. Ltd.
COMPUTERISED ANALYTICAL LABORATORIES

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ANALYTICAL REPORT

JOB COM851014
O/N : N 079643

SAMPLE	Cu	Pb	Zn
669291	12	28	16
669292	5	8	8
669293	30	26	16
669294	46	14	20
669295	50	34	20
669296	24	14	18
669297	24	14	16
669298	24	24	105
669299	22	18	80
669300	65	32	180
UNITS	ppm	ppm	ppm
SCHEME	AAS1	AAS1	AAS1

DDB1
67 - 68
68 - 69
73 - 74
74 - 75
75 - 76
76 - 77
77 - 78
78 - 79
79 - 80
80 - 81

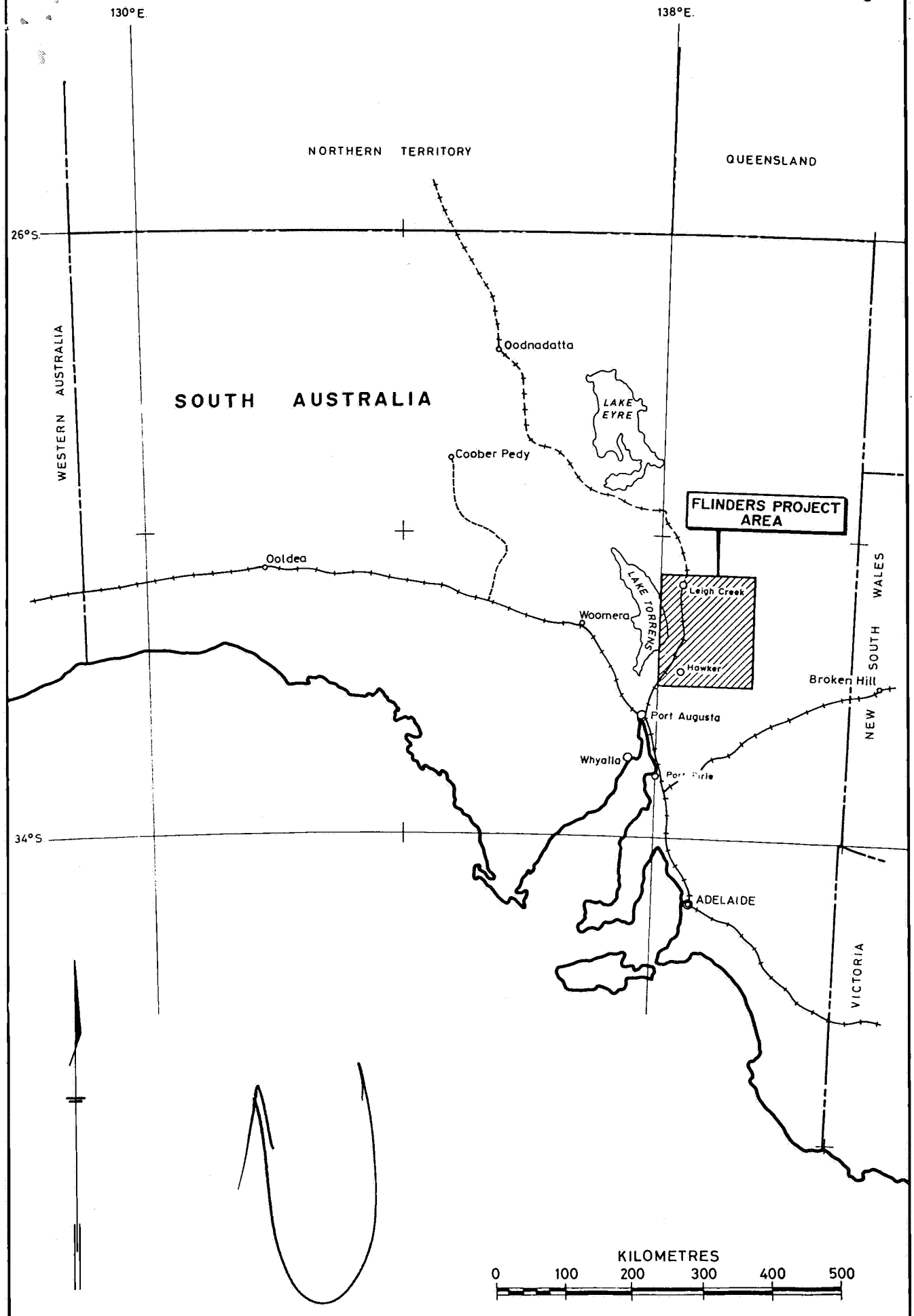
COMLABS Pty. Ltd.
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ANALYTICAL REPORT

JOB COM850871
O/N : N 079623

SAMPLE	Cu	Pb	Zn	DEP 4
669061	16	12	44	97.2 - 98.2
669062	16	14	65	96.2 - 97.2
669063	22	14	65	95.2 - 96.2 ←
669064	18	12	100	94.2 - 95.2
669065	4	12	110	93.2 - 94.2
669066	18	8	105	92.2 - 93.2
669067	34	24	110	91.2 - 92.2
669068	30	22	85	90.2 - 91.2
669069	12	22	95	66.9 - 67.9
669070	10	75	135	65.9 - 66.9
669071	16	34	70	64.9 - 65.9 ←
669072	14	24	55	63.9 - 64.9
669073	34	28	85	62.9 - 63.9
669074	32	30	125	61.9 - 62.9
669075	26	36	70	60.9 - 61.9
669076	34	20	70	59.9 - 60.9
669077	7	30	30	10.0 - 11.0
669078	3	10	18	11.0 - 12.0
669079	7	14	30	12.0 - 13.0
669080	20	24	40	13.0 - 14.0
669081	28	30	55	14.0 - 15.0 ←
669082	10	28	20	15.0 - 16.0
669083	4	30	18	16.0 - 17.0



Centre Melbourne	THE BROKEN HILL PROPRIETARY CO LTD FLINDERS PROJECT J.V., S.A. LOCATION MAP	Project No 6 - L15 - 8
Date 2 1 85		Drawing No A4- 381

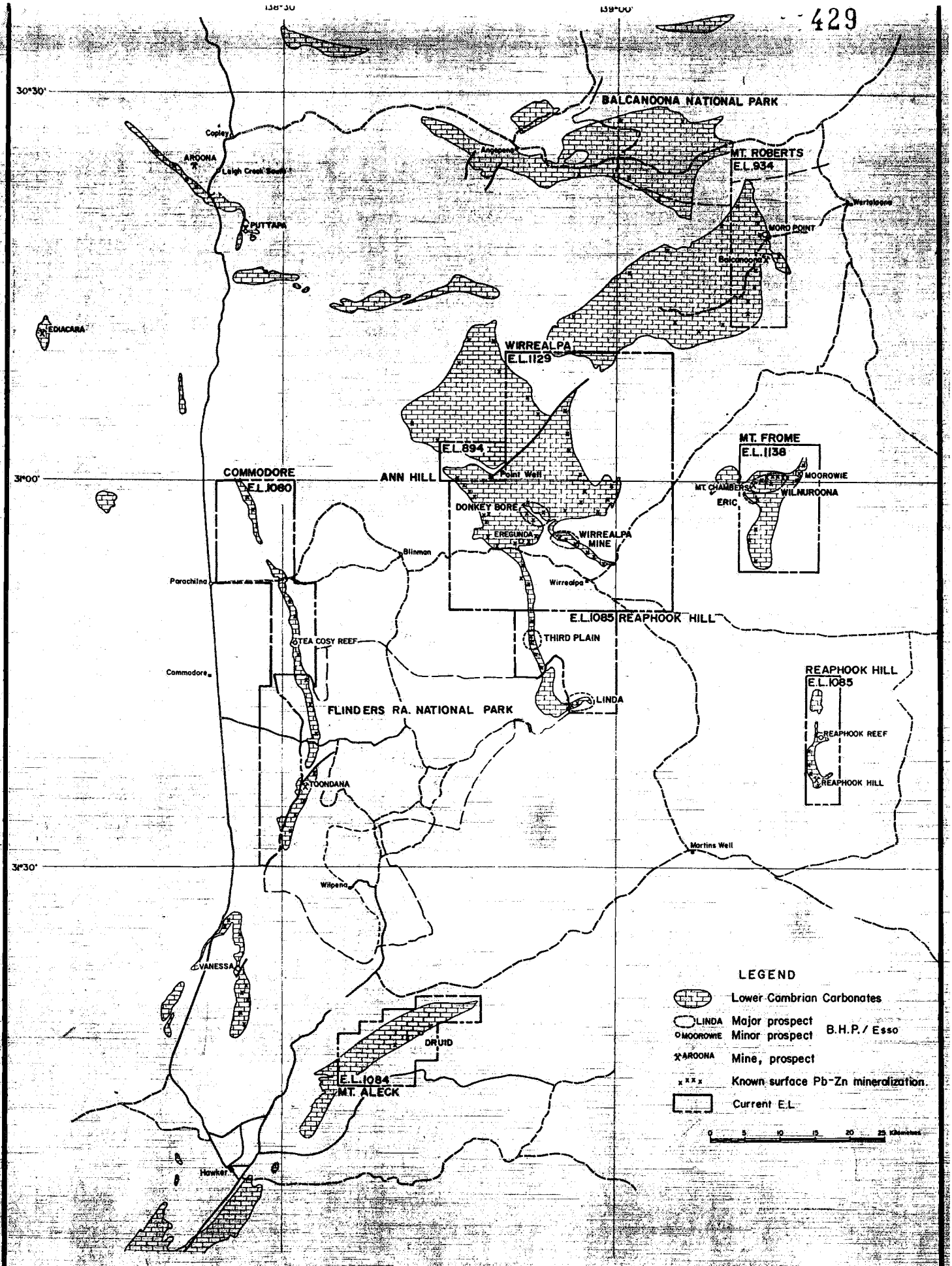
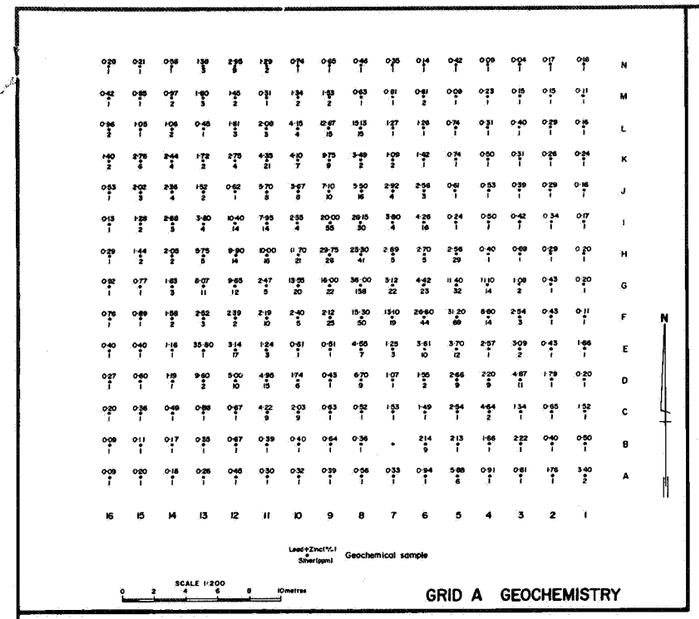
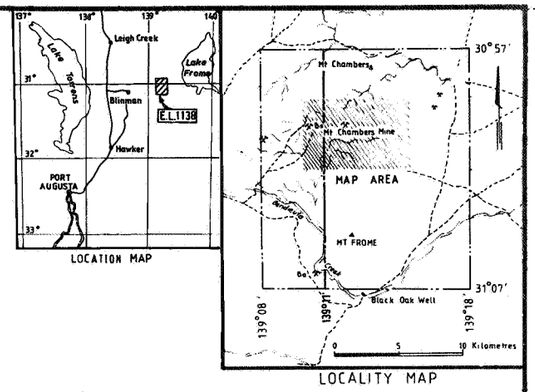


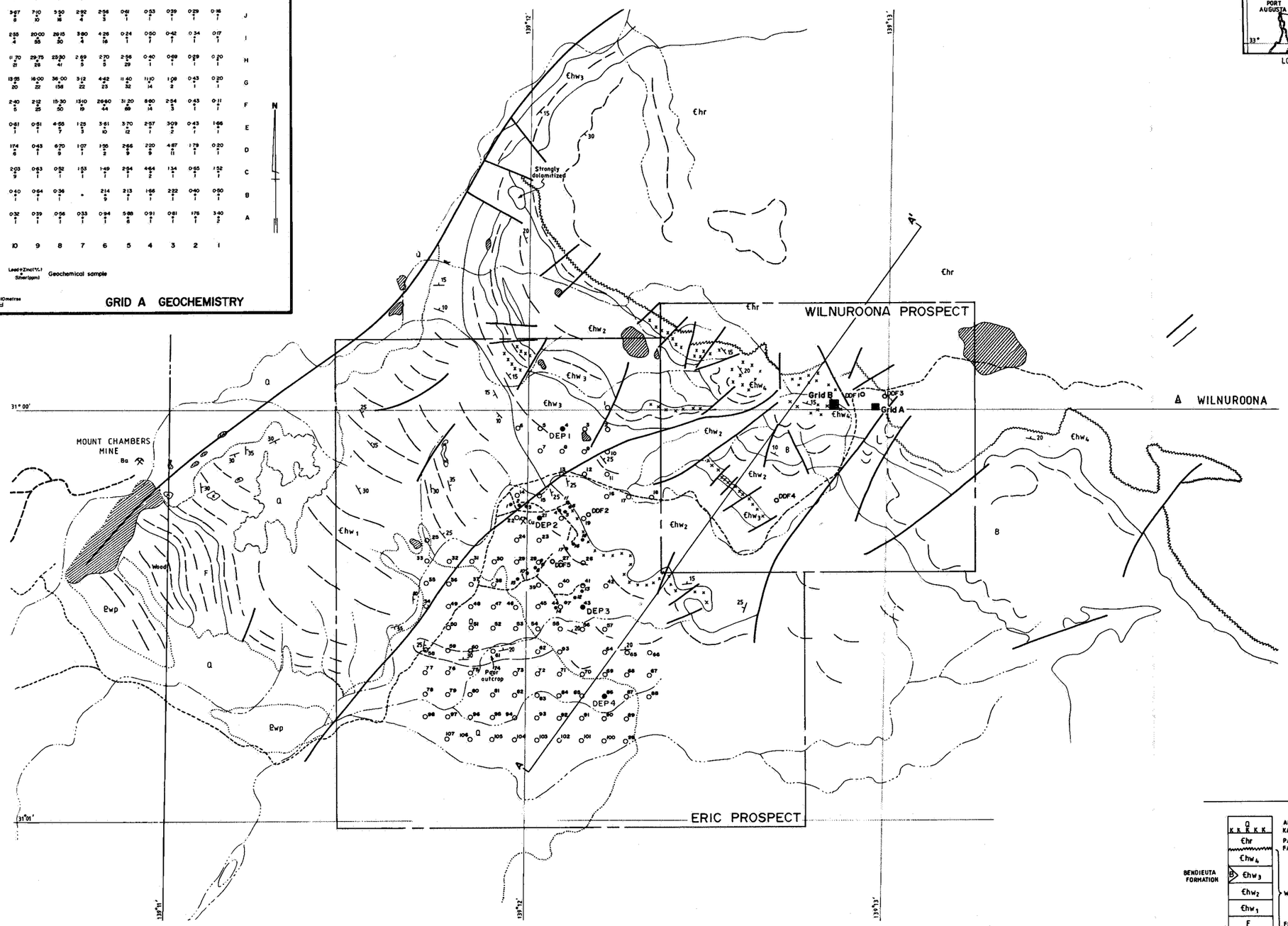
Fig 2.

Centre Adelaide	THE BROKEN HILL PROPRIETARY CO. LTD.	Project No 6 - L15 - 1
Date 2 - 10 - 64	FLINDERS RANGES JOINT VENTURE ESSO/BHP, S.A. LOCATION OF PROSPECTS	Drawing No A4-370



GRID A GEOCHEMISTRY





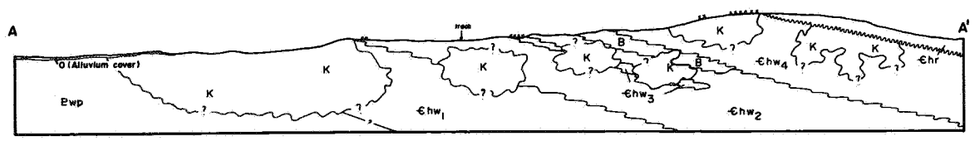
LEGEND

Q	ALUVIUM	x	MINERALIZATION (Cu/Pb/Zn)
K K K K	KARST.		
€hr	PARARA LIMESTONE FAUNAL ASSEMBLAGE No 2. UNCONFORMITY.		FAULT
€hw4			DRAINAGE
€hw3			TREND LINES.
€hw2	WILKAWILLINA LIMESTONE.		LITHOLOGICAL BOUNDARIES.
€hw1			OUTCROP BOUNDARY.
F	FLAGGY LIMESTONE.		TRACK.
Wood.	WOODENDINNA DOLOMITE.		
Ewp	POUNO QUARTZITE.	DDF4	B.H.P DIAMOND DRILLHOLE
	DIAPIR		UNION MINIÈRE PERCUSSION DRILLHOLE (prefixed MCP)
	R.A.B. DRILLHOLE, PREFIXED REP		

BENDIEUTA FORMATION

SCALE 1:10,000
0 200 400 600 800 1000 metres

SECTION A - A'



SCALE 1:10,000 (Natural Scale: V/H = 1/1)

HOLE	INTERVAL (m)	AVERAGE Pb + Zn (%)
MCP7	9 - 15	0·3
8	38 - 46	0·75
9	10 - 17	1·6 (+0·1% Cu)
10	41 - 46	0·33
12	3 - 9	0·83

Union Minière drilling results from ENV. 2373

4730

Fig 3

THE BROKEN HILL PROPRIETARY CO. LTD.
EXPLORATION DEPARTMENT

E.L.1138 MT. FROME, S.A.
WILNUROONA PROSPECT
SUMMARY OF EXPLORATION

Drawn: M.T.R.	Date: 6-8i, 9-83	Centre: Why, Adel.
Traced: R.K., A.R.V.	Project No: 6 - L15 - 17	Drawing No: A3 - 274
Checked:		

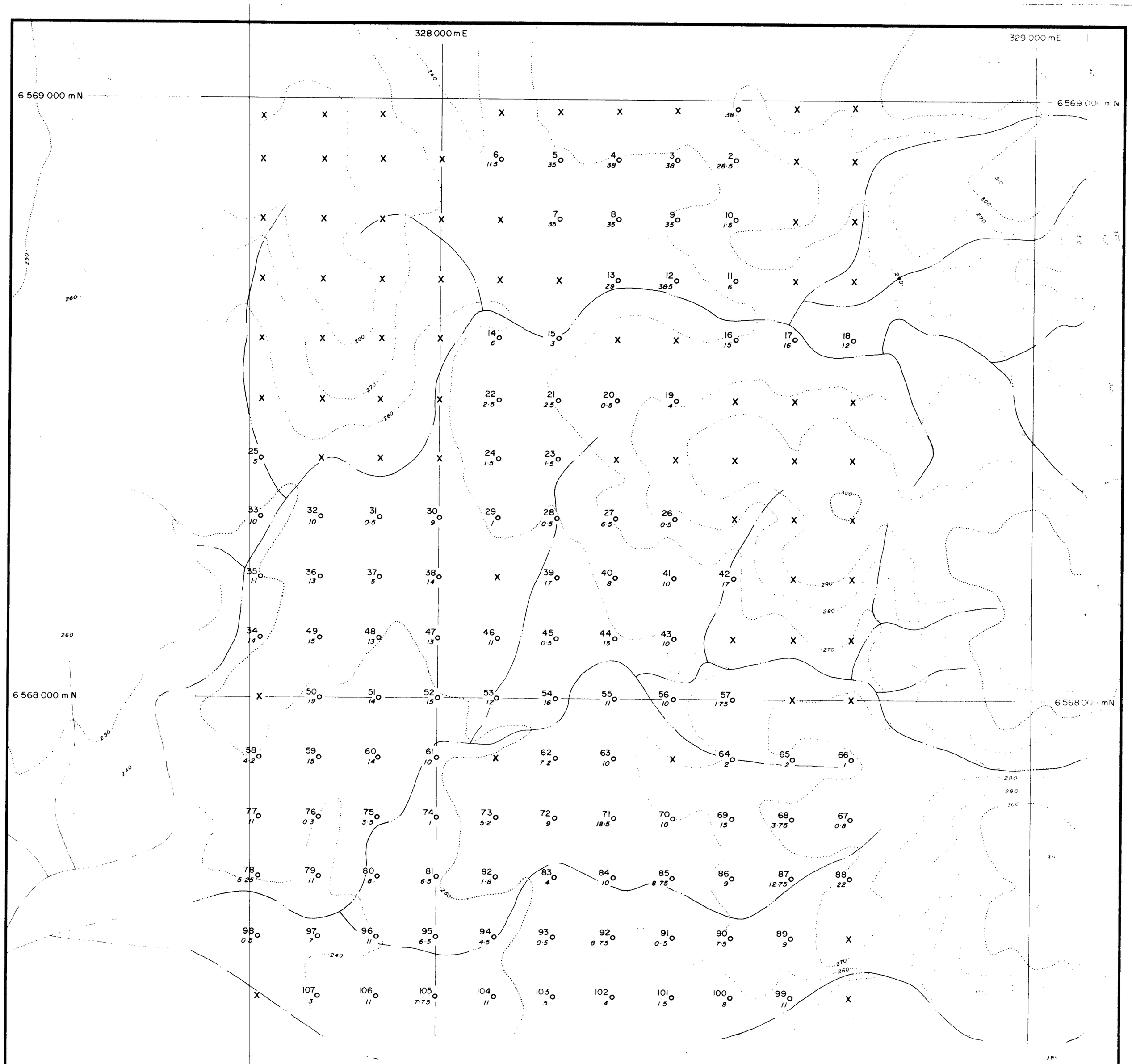
Revisions:

328 000 mE

329 000 mE

6 569 000 mN

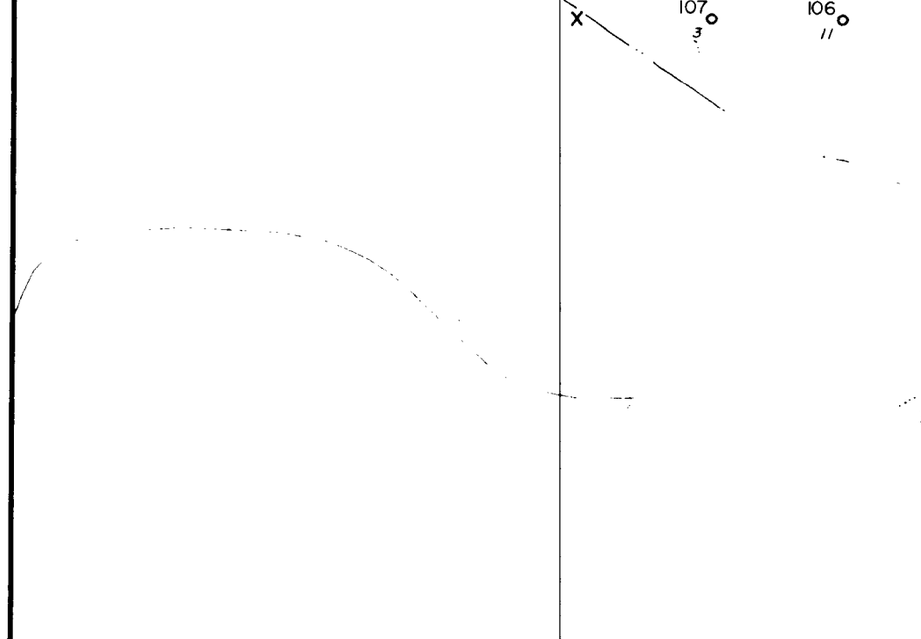
6 568 000 mN



328 000 mE

329 000 mE

N



LEGEND

- o^{54}_{16} R.A.B. drillhole, prefixed REP (*depth metres*)
- 250 Topographic contours
- Creek

3427-48

Scale 1:5,000

0 100 200 300 400 metres

Fig 4.

THE BROKEN HILL PROPRIETARY CO. LTD.
EXPLORATION DEPARTMENT

E.L.1138 MT. FROME, S.A.
ERIC PROSPECT
TOPOGRAPHIC CONTOURS

Compiled M T Roche	Date 27 - 6 - 85	Centre ADELAIDE
Drawn : S C Skipworth	Project No 6 - L15 - 18	Drawing No A2-427
Checked:		

Revisions.

328 000 mE

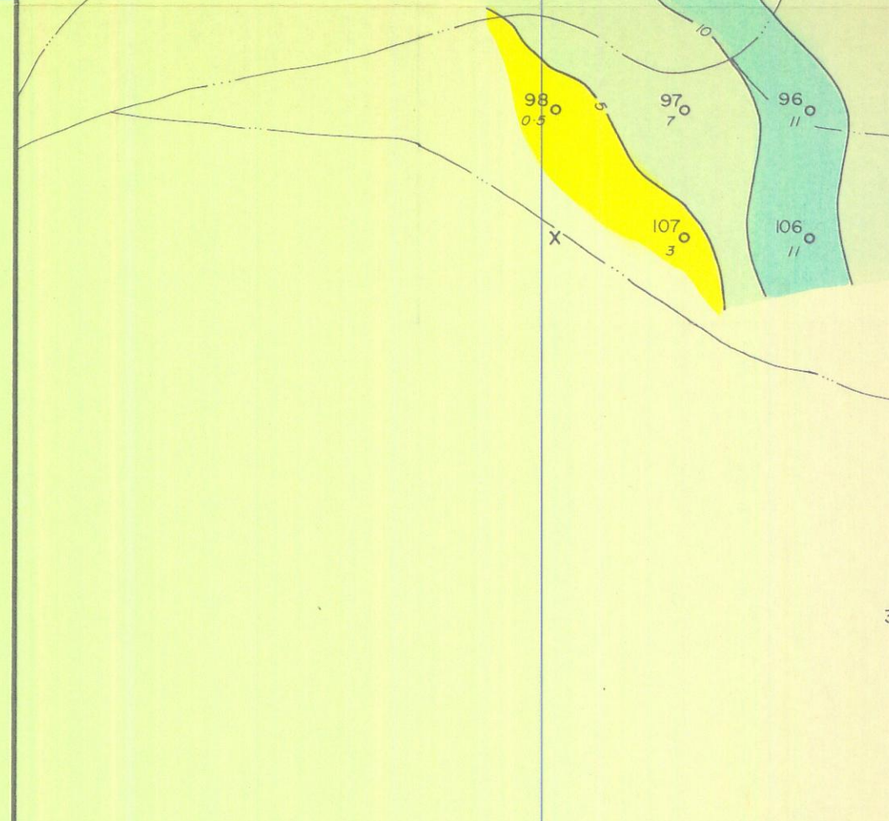
329 000 mE

6 569 000 mN

6 568 000 mN

328 000 mE

329 000 mE



LEGEND

5 — Depth of hole contours (metres)

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

——·—— Creek

N

3427-49

Scale 1:5,000

0 100 200 300 400 metres

Fig. 5.

THE BROKEN HILL PROPRIETARY CO. LTD.
EXPLORATION DEPARTMENT

E.L.1138 MT. FROME, S.A.
ERIC PROSPECT
OVERBURDEN THICKNESS

Compiled: M T Roche	Date: 27 - 6 - 85	Centre: ADELAIDE
Drawn: S C Skipworth	Project No: 6 - L15 - 20	Drawing No: A2-429
Checked:		

Revisions:

328 000 mE

329 000 mE

6 569 000 mN

6 568 000 mN

1 38 500ppm
2 28·5 1000ppm 500ppm
3 38
4 38
5 35
6 11·5 1000 ppm
7 35
8 35 500 ppm
9 35
10 1·5
11 6
12 38·5
13 29
14 6
15 3
16 15
17 16
18 12
19 4
20 0·5
21 2·5
22 2·5
23 1·5
24 1·5
25 5
26 0·5
27 6·5
28 0·5
29 1
30 9
31 0·5
32 10
33 10 1000ppm
34 14
35 11
36 13
37 5 500ppm
38 14 0·5%
39 17 500 ppm 1000 ppm
40 8
41 10
42 17
43 10
44 15
45 0·5
46 11
47 13
48 13
49 15
50 19
51 14
52 15
53 12 1000ppm
54 16
55 11
56 10
57 1·75
58 4·2
59 15
60 14
61 10
62 7·2
63 10
64 2
65 2
66 1
67 0·8 500ppm 1000ppm
68 3·75 0·5% 1%
69 15
70 10
71 18·5
72 9 500ppm
73 5·2
74 1
75 3·5
76 0·3
77 11 500ppm
78 5·25
79 11
80 8
81 6·5
82 1·8
83 4
84 10
85 8·75
86 9
87 12·75
88 22
89 9
90 7·5
91 0·5
92 8·75
93 0·5
94 4·5
95 6·5
96 11
97 7
98 0·5
99 11 1%
100 8
101 1·5
102 4
103 5
104 11
105 7·75
106 11
107 3

328 000 mE

329 000 mE

N

LEGEND

—— 500 ppm —— Maximum Pb value contours

$\circ^{80}_{8}$ R.A.B. drillhole, prefixed REP (*depth metres*)

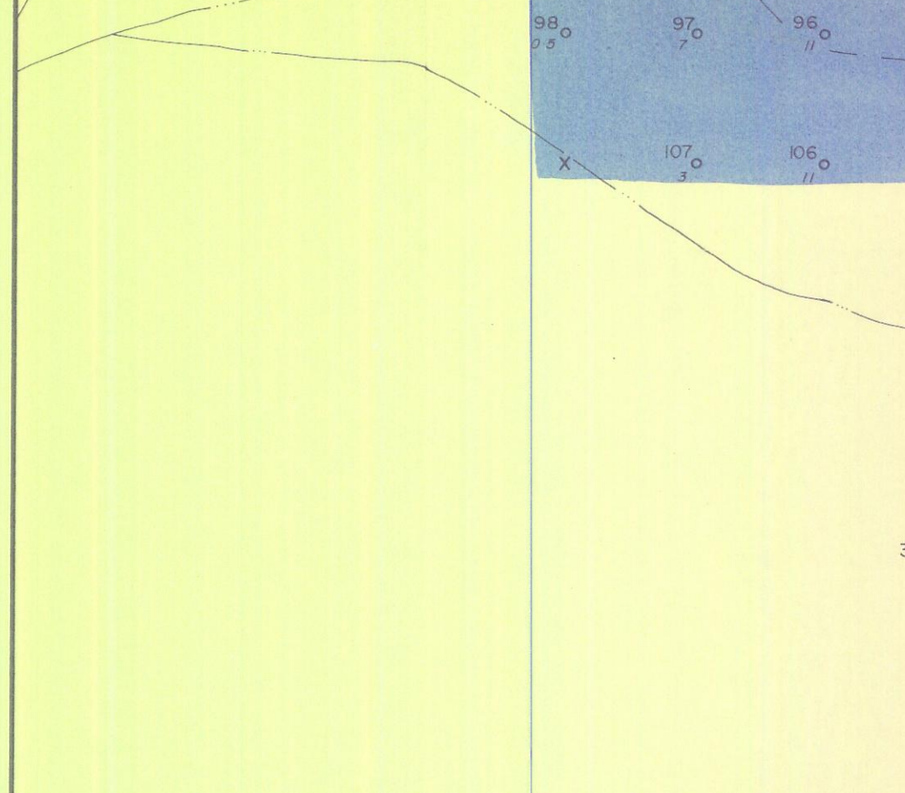
——·—— Creeks

3427-50

Scale 1:5,000

0 100 200 300 400 metres

Fig. 6.

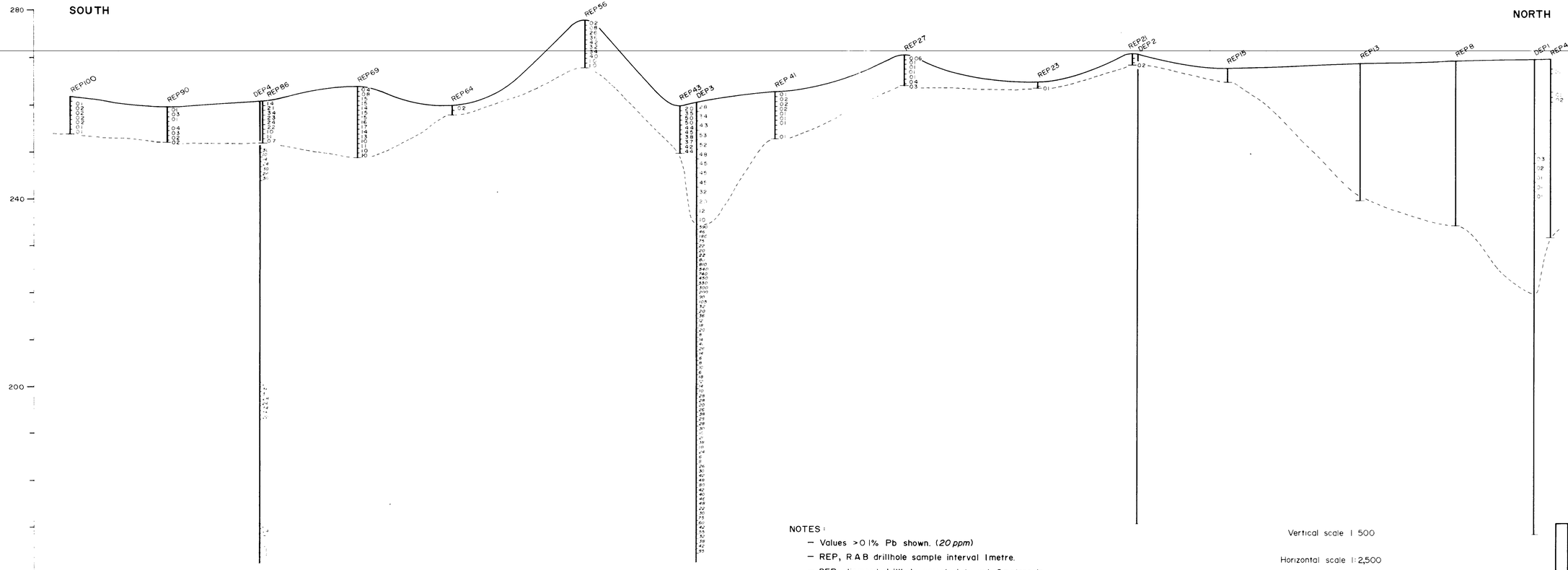


THE BROKEN HILL PROPRIETARY CO. LTD.
EXPLORATION DEPARTMENT

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

Compiled: M T Roche	Date: 27 - 6 - 85	Centre: ADELAIDE
Drawn: S C Skipworth	Project No: 6 - L15 - 19	Drawing No: A2-428
Checked:		

Revisions:



NOTES:

- Values >0.1% Pb shown. (*20 ppm*)
- REP, R.A.B. drillhole sample interval 1metre.
- DEP, diamond drillhole sample interval 2metres in precollar and 1metre in core.
- For location of cross-section refer to A3-274.

Vertical scale 1:500

Horizontal scale 1:2,500

0 100 200 metres

3427-51

Fig. 7.

THE BROKEN HILL PROPRIETARY CO. LTD.
EXPLORATION DEPARTMENT

E.L.1138 MT. FROME, S.A.
ERIC PROSPECT
N-S CROSS-SECTION–DIAMOND AND R.A.B. DRILLHOLES WITH ASSAYS

Revisions:	Prepared by: M. T. Roche	Centre: ADELAIDE
	Date: 1-7-85	Project No: 6-L15-22
	Drawn: S. C. Skipworth	Drawing No: A3-275

INSET

Polyhedra cavefill abundant

WD 18

Abundant grits, pebbles ± cobbles, sometimes in dolomitic base. (≡ Woodendinna Dol.)

? Parachilna Fmn ?

Ribbon Limestone sandstone shale

Sandstone silt shale

CS0495

CS0464

CS0436-0463

CS0411-0435

WIRREALPA SPRING

PDP5

WD 19

PDP4

PDP3

PDP2

Karsted surface

DDB1

SHAFT

PDP1

Pb Ba

Pebble bands Common.

Dol. and Limestone of Parachilna Fm.

mottled limestone dominant

Limestone s'st

calc silt

Calc sandstone

drillhole

0 100 200 300 400 500 metres

INSET

LOCATION MAP

E.L.1129

MAP AREA

Wirreapa Spring

LEGEND

- Diapir
- mC Middle Cambrian units
- P Undifferentiated Proterozoic
- Arch (Archeo) Archeocyathid

MINERAL OCCURRENCES

- ×Ca Calcite
- ×Py Pyrite
- ×Ba Barite
- ×Cu Copper
- ×Zn Zinc
- ×Pb Lead
- ×Dol Dolomite
- Fault and movement
- Geological boundary
- Trend lines
- Strike and dip of bedding
- Track
- Creek
- Shaft
- WD9 Diamond drillhole (B.H.P. Minerals)
- Channel sampling traverses, and sample numbers
- DDB1 Diamond drillhole (ESSO/BHP J.V.)

Geology from photo interpretation and field checked

0 500 1000 metres

SCALE 1:25,000

431

Fig 11

THE BROKEN HILL PROPRIETARY CO. LTD.
EXPLORATION DEPARTMENT

E.L. 1129 WIRREALPA S.A.
WIRREALPA SPRING AREA

DRILLHOLE LOCATIONS

Drawn R.K.	Date 30 : 3 : 81	Centre WHYALLA
Prepared D.F.WARD 26-3-81	Project No. 6-LII-22	Drawing No. GS - 69
Checked H. ROCHE		

Revisions MAPA 11/82

EXPLORATION LICENCE 1129

WIRREALPA, SOUTH AUSTRALIA

REPORT FOR THE QUARTER ENDED 28TH SEPTEMBER, 1985.

CONTENTS

1. GENERAL

2. FIELD INVESTIGATIONS

3. EXPENDITURE

FIGURES

1. Location map for E.L. 1129, Wirrealpa, S.A.

EXPLORATION LICENCE 1129

WIRREALPA, SOUTH AUSTRALIA

REPORT FOR THE QUARTER ENDED 28TH SEPTEMBER, 1985.

1. GENERAL

Exploration Licence 1129 of 1080 square kilometres (formerly E.L. 436, then E.L. 809) was granted to BHP Minerals Limited on 28th March, 1983. On the 13th August, 1984 it became part of a Joint Venture Agreement with ESSO Exploration & Production (Australia) Inc.

* 2. FIELD INVESTIGATIONS

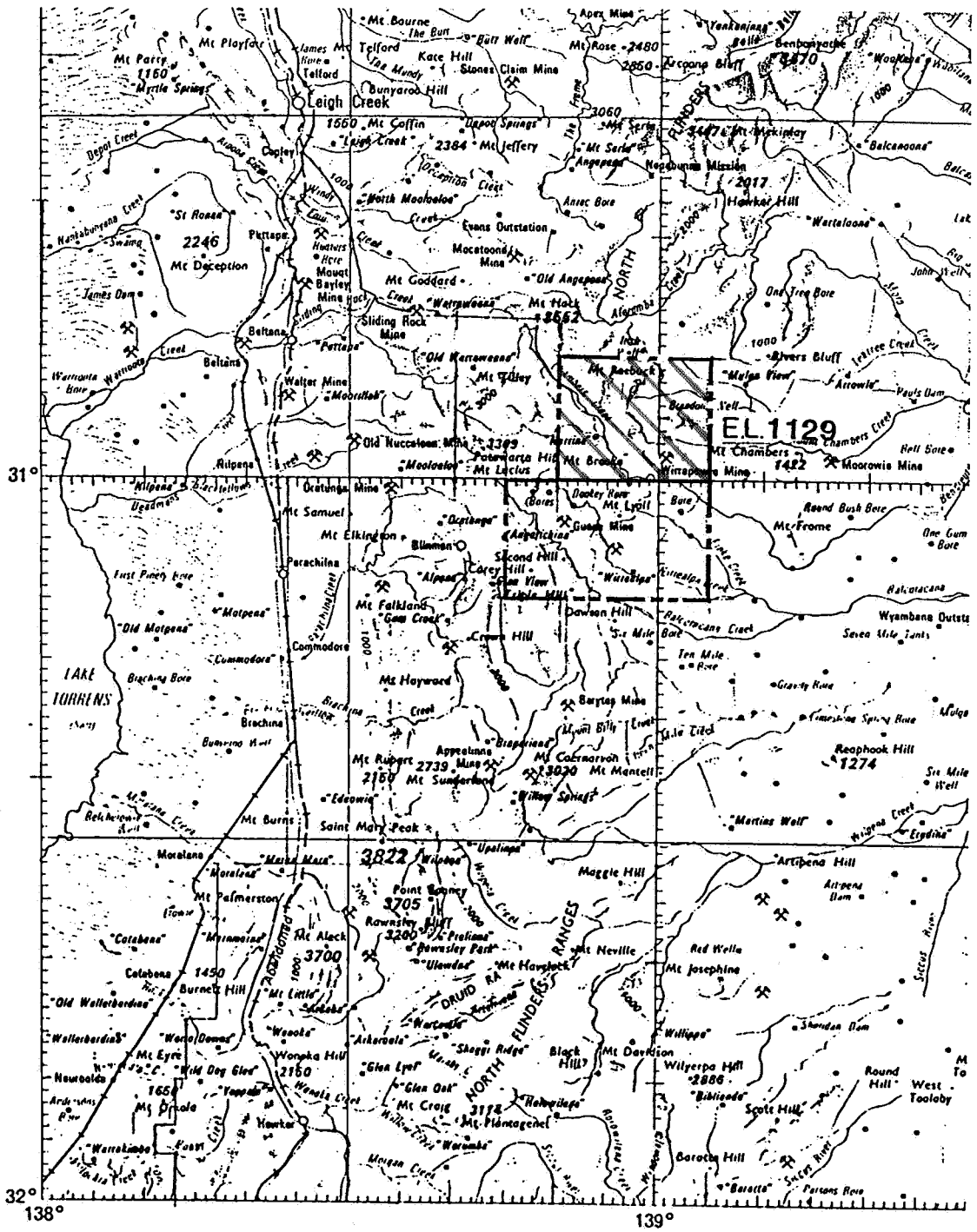
No field work was carried out during this period. We will advise on proposed exploration programmes within this tenement in the near future.

** 3. EXPENDITURE

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

* Drilling was completed at Donkey Bore during the 6 month period ended 27.9.85

** Total ESSO expenditure ~~during~~ for the duration of the JV was $90,383 giving an expenditure of $43 335 for the 6 month period ended 27.9.85.


EL 1129
Leigh Creek
Mt Deception
Mt Elkington
Mt Samuel
Mt Hayward
Mt Rupert
Mt Sunderland
Mt Burns
Saint Mary Peak
Mt Palmerston
Mt Aleck
Mt Eyre
Mt Arrowie
Mt Craig
Mt Plantagenet
Mt Neville
Mt Josephine
Mt Chambers
Mt Frome
Mt Lyell
Mt Coleman
Mt Mantell
Mt Hack
Mt Goddard
Mt Jeffery
Mt Coffin
Mt Parry
Mt Playfair
Mt Rose
Mt Serle
Mt Mackinlay
Mt Bourne
Mt Tolley
Mt Brooks
Mt Lucius
Mt Falkland
Mt Little
Mt Davidson
Lake TORRENS
FLINDERS RANGES
NORTH FLINDERS RANGES
DRUID RA
Telford
Kate Hill
Bunyaroo Hill
Stones Claim Mine
Depot Creek
Copley
Pittapa
Beltana
Walter Mine
Old Nuccaleena Mine
Oratunga Mine
Perachilna
Blinman
Second Hill
Carey Hill
Triple Hill
Dawson Hill
Commodore
Brachina
Appealinna
Wilkinson Springs
Moralana
Point Bonney
Rawsley Hill
Rawsley Park
Ulawodna
Burnett Hill
Wooka
Wonoka Hill
Yarrowie
Hawker
Warrakimbo
Glen Leyf
Glen Osa
Shaggy Ridge
Black Hill
Wilpena
Maggie Hill
Artipena Hill
Red Wells
Wilyerpa Hill
Round Hill
West Tooloby
Scott Hill
Baroota Hill
Reaphook Hill
Wyambana Outstn
Mt Lock
Mt Hack
Mt Coffey
Mt Goddard
Old Angepena
Angepena
Nepabunna Mission
Hawker Hill
Wertaloona
Evans Outstation
Mocatoona Mine
Sliding Rock Mine
Mt Rockett
Rivers Bluff
Mt Chambers Mine
Moorowie Mine
Oratunga Mine
Mt Lyell Mine
Gum Creek
Burtys Mine
Mt Coleman Mine
Wilpena Creek
Brachina Creek
Parachilna Creek
Depot Creek
Copley Creek
Windy Gap Creek
Deception Creek
Warrioota Creek
Beltana Creek
Mt Hack Creek
Mt Goddard Creek
Sliding Rock Creek
Old Warrameenga
Mt Brooks
Mt Lucius
Potawarta Hill
Mt Falkland
Gum Creek

(CR 4849)

EXPLORATION LICENCE 1129
WIRREALPA, SOUTH AUSTRALIA

REPORT FOR THE QUARTER ENDED
28th DECEMBER, 1985.

by: S.T. Mann
Adelaide

CONTENTS

1. GENERAL

2. EXPENDITURE

FIGURE

1. Flinders Ranges, S.A.
Location Map. A4-443

EXPLORATION LICENCE 1129

WIRREALPA, SOUTH AUSTRALIA

REPORT FOR THE QUARTER ENDED 28th DECEMBER, 1985

1. GENERAL

Exploration Licence 1129, Wirrealpa of 1080 square kilometres (formerly E.L. 436, then E.L. 809) was granted to BHP Minerals Limited on 28th March, 1983. On the 13th August, 1984 it became part of a Joint Venture Agreement with ESSO Exploration and Production (Australia) Inc. This agreement was terminated on the 2nd September, 1985.

The location of E.L. 1129, Wirrealpa is shown on Figure 1.

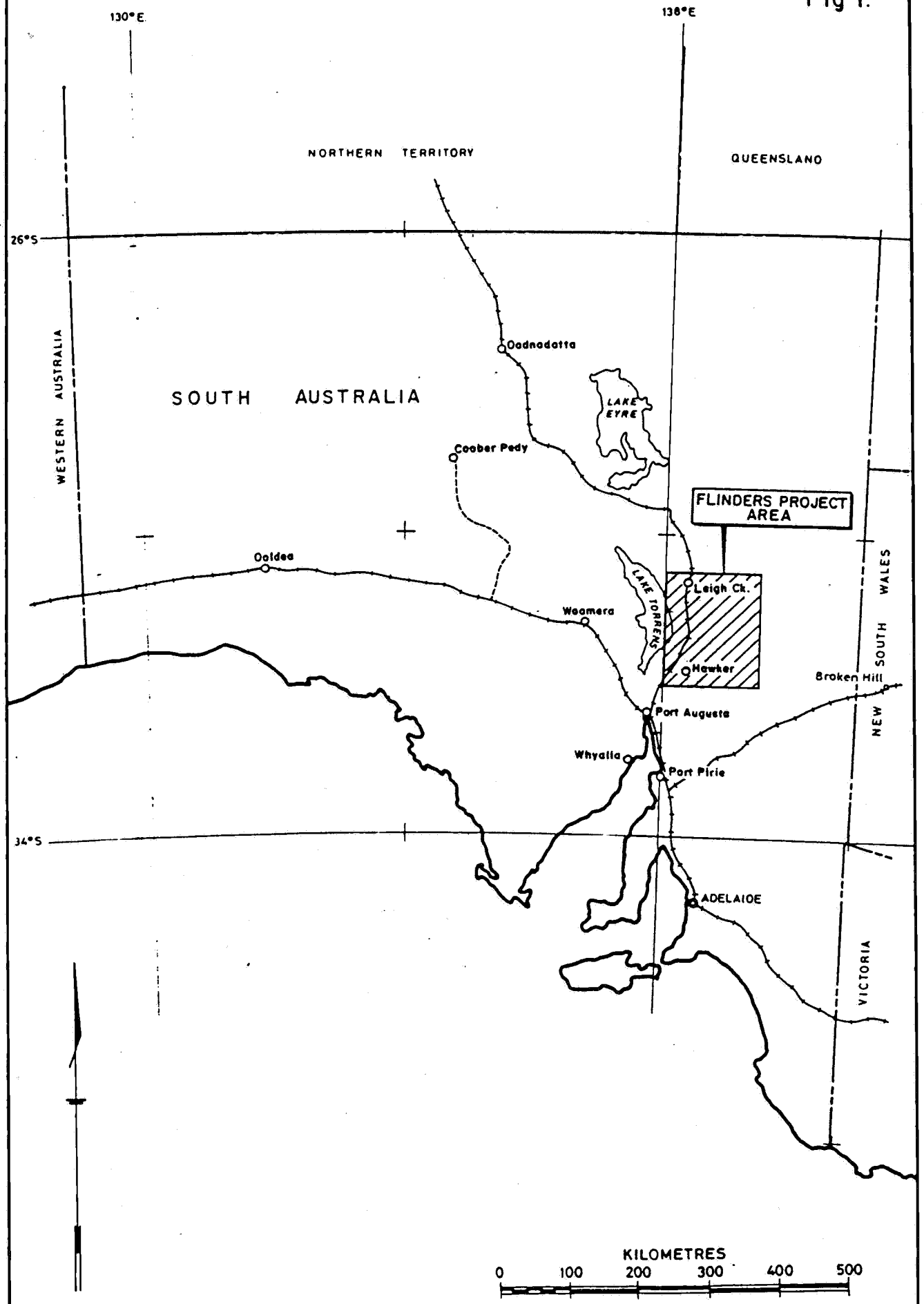
Since the last quarterly report was submitted, no fieldwork has been undertaken within the Exploration Licence.

2. EXPENDITURE

Minor expenditure has been incurred against this tenement during the quarter under review. Details of this expenditure are as follows:

	$
Wages & Salaries	125
Vehicles	120
Field Support	23
Drafting	363
Administration Charges	31
	$662

Fig 1.

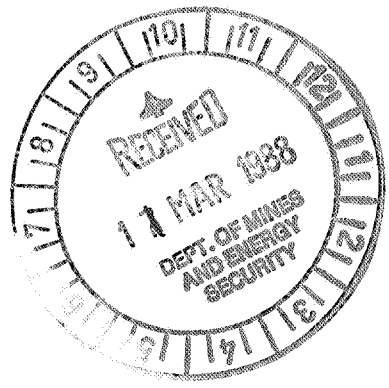


Centre: Melbourne	THE BROKEN HILL PROPRIETARY CO LTD FLINDERS PROJECT, S. A. LOCATION MAP	Project No
Date: 30-9-83		Drawing No: A4-

(CR 5750)

EXPLORATION LICENCE 1129
WIRREALPA, SOUTH AUSTRALIA

PARTIAL RELINQUISHMENT
REPORT. SEPTEMBER, 1986.



CONTENTS

1. GENERAL

2. INVESTIGATIONS

2.1 Geology

2.2 Drilling

3. CONCLUSION

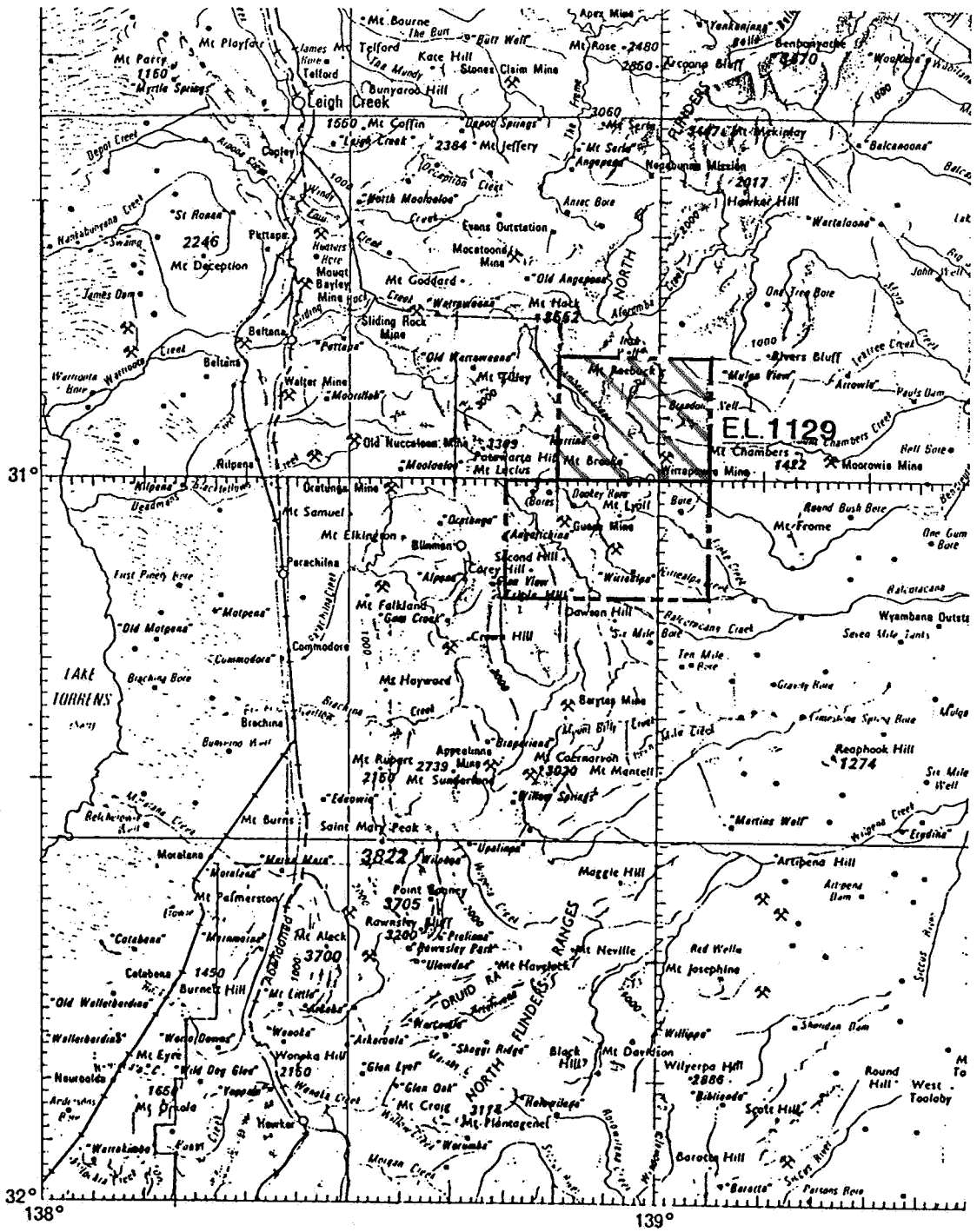
FIGURES

1. EL.1129 Wirrealpa, South Australia Location Map — A4-2085

2. EL.1129 Wirrealpa, South Australia Cambrian Geology, 1:50,000 — G5-60

APPENDIX

1. Drillhole log, graphic log, Geochemistry.


EL 1129
Leigh Creek
Mt Deception
Mt Elkington
Mt Samuel
Mt Hayward
Mt Rupert
Mt Sunderland
Mt Burns
Saint Mary Peak
Mt Palmerston
Mt Aleck
Mt Eyre
Mt Arrowie
Mt Craig
Mt Plantagenet
Mt Neville
Mt Josephine
Mt Chambers
Mt Frome
Mt Lyell
Mt Coleman
Mt Mantell
Mt Hack
Mt Goddard
Mt Jeffery
Mt Coffin
Mt Parry
Mt Playfair
Mt Rose
Mt Serle
Mt Mackinlay
Mt Bourne
Mt Tolley
Mt Brooks
Mt Lucius
Mt Falkland
Mt Little
Mt Davidson
Lake TORRENS
FLINDERS RANGES
NORTH FLINDERS RANGES
DRUID RA
Telford
Kate Hill
Bunyaroo Hill
Stones Claim Mine
Depot Creek
Copley
Pittapa
Beltana
Walter Mine
Old Nuccaleena Mine
Oratunga Mine
Perachilna
Blinman
Second Hill
Carey Hill
Triple Hill
Dawson Hill
Commodore
Brachina
Appealinna
Wilkinson Springs
Moralana
Point Bonney
Rawsley Hill
Rawsley Park
Ulawodna
Burnett Hill
Wooka
Wonoka Hill
Yarrowie
Hawker
Warrakimbo
Glen Leyf
Glen Osa
Shaggy Ridge
Black Hill
Wilpena
Maggie Hill
Artipena Hill
Red Wells
Wilyerpa Hill
Round Hill
West Tooloby
Scott Hill
Baroota Hill
Reaphook Hill
Wyambana Outstn
Mt Lock
Mt Hack
Mt Coffey
Mt Goddard
Old Angepena
Angepena
Nepabunna Mission
Hawker Hill
Wertaloona
Evans Outstation
Mocatoona Mine
Sliding Rock Mine
Mt Rockett
Rivers Bluff
Mt Chambers Mine
Moorowie Mine
Oratunga Mine
Mt Lyell Mine
Gum Creek
Burtys Mine
Mt Coleman Mine
Wilpena Creek
Brachina Creek
Parachilna Creek
Depot Creek
Copley Creek
Windy Gap Creek
Deception Creek
Warrioota Creek
Beltana Creek
Mt Hack Creek
Mt Goddard Creek
Sliding Rock Creek
Old Warrameenga
Mt Brooks
Mt Lucius
Potawarta Hill
Mt Falkland
Gum Creek

138° 45' E
138° 50' E
138° 55' E
139° 00' E
139° 05' E
30° 50' S
30° 55' S
31° 00' S
31° 05' S
31° 10' S

Main Gap
Claypan Dam
Claypan Bore
Yednadunga Well
Veseys Claim Mine
Old Warraweena
Warraweena Spring
MOUNT TILLEY
Magpie Water
MOUNT McFARLANE
Hut Bore
Sheds
Narina Spring
Patawarta Bore
Holkegna Creek
Magpie Creek
Holkegna Bore
Patawarta Gap
Mount Rugged Mine
Bald Hill Spring
PATAWARTA HILL
Lance Bore
ANN HILL
EL 894
Point Well
Chambers Creek
Hidwerta Bore
Hidwerta Spring
Bora Spring
Bora Well
WD 5
NARINA
Wildawildana Spring
Wildawildana Creek
Narina Creek
Woodendinna Spring
Woodendinna Creek
Lower Woodendinna Spring
Point Well Holes
Point Well Creek
Bullock Head Bore
Pinda Springs
Bullock Head Gap
Kangaroo Bore
JUBILEE HILL
Jubilee Bore
Jubilee Mines Ruins
MOUNT BROOKE
Wirrapowie Mines
Wirrapowie Ck
Wirrapowie Ck 1st.
Bendleulta Creek
Finke Creek
Warrager Bore
Mack Water Bore
Armanie Creek
THE BUNKERS
WD 1
WD 2
WD 3
WD 4
WD 7
WD 8
WD 13
WD 14
WD 15
WD 16
WD 17
WD 18
WD 19
Donkey Bore
Old Wirrealpa Spring
MOUNT LYALL
Mt Lyall Bore
South Bob Mooney Bore
WIRREALPA HILL
Old Wirrealpa Well
Wirrealpa Mine
WD 9
WD 10
WD 11
WD 12
Kangaroo Bore
Ti-Tree Well
Eringa Waters
Back Water Spring
Eregunda Bore
Eregunda Creek
Bullocky Soak
Argo Mine
FIRST HILL
Bakers Bore
Gyard
Carey Hill Mine
SECOND HILL
Fountain Head Mine
Red Hill Well
CAREY HILL
WONOKA
TRIPLE HILL
Willow Well
Wirrealpa
Wirrealpa Creek
No. 1 Bore
Linns Springs Bore
EL 1129

LOCATION MAP
0 5 10 15 km
EL 1129
EL 894
"Narina"
Wirrapowie Ck
Wirrealpa Spring
"Wirrealpa" H.S.
Wirrealpa Ck

LEGEND
m€ MIDDLE CAMBRIAN SEQUENCE
€he NEPABUNNA SILTSTONE
€hn NARINA GREYWACKE
€ho ORAPARINNA SHALE
€hs BUNKERS SANDSTONE
€hr, MOTTLED PARARA
€hr PARARA LIMESTONE
€hd MIDWERTA SHALE
E SHALE
D MOTTLED LIMESTONE
G ARCHAEOCYATHID LIMESTONE
C CALCARENITE
B WIRRAPOWIE LIMESTONE (Upper, Lower) Willowcullina Limestone at Old Wirrealpa Mine
A WOODENDINNA DOLOMITE
€hp PARACHILNA FORMATION
Ewp POUND QUARTZITE
Eww WONOKA FORMATION
E MISC. PROTERZOIC (including "Diapir")
LEASE BOUNDARY
GEOLOGICAL BOUNDARY
ROAD
CREEK
FENCE
FAULT
UNCONFORMITY
ANTICLINE
SYNCLINE
DIP AND STRIKE OF STRATA
DRILL HOLE
LEAD/ZINC MINERALIZATION

SCALE 1 : 50 000
0 1000 2000 3000 4000 5000 metres

THE BROKEN HILL PROPRIETARY CO. LTD.
EXPLORATION DEPARTMENT
E.L.1129 WIRREALPA AND
E.L.894 ANN HILL S.A.
CAMBRIAN GEOLOGY

Revisions:	Drawn: M B	Date: 23 APR 82	Centre WHYALLA
	Prepared: M R	Project No. 6 – L11, L31 – 18	Drawing No. GS-60
	Checked:		

FR.020
3427-52

EXPLORATION LICENCE 1129

WIRREALPA, SOUTH AUSTRALIA

PARTIAL RELINQUISHMENT REPORT, SEPTEMBER, 1986.

1. GENERAL

Exploration Licence 1129 (previously EL.436, 809) containing 1080 sq km was granted to BHP Minerals Limited on 28th March 1983. On 13th August 1984 it became part of a Joint Venture Agreement with Esso Exploration. The agreement was terminated on 2nd September 1985.

This report summarizes our exploration of the northern portion of the EL which was relinquished on the 9th September 1986 (fig. 1).

2. INVESTIGATIONS

2.1 Geology

Geological mapping and prospecting of the Cambrian carbonate sequences were completed and a geological map at 1:50,000 scale was compiled.

The three main mineralized horizons were traced almost continuously along their outcrop. Two other horizons stratigraphically below these were not completely traced. The top three and the bottom zinc-rich beds are "mottled" limestone, the fifth bed is calcarenite with calcite filled veins.

The mineralized "mottled" limestones appear to be archaeocyathid-rich beds with a calcilutite matrix which has been pressure solved to produce the mottled effect. The zinc appears to replace the fossils, which are generally difficult to recognize.

2.2 Drilling

One diamond drill hole (WD5) was located just north of Narina (fig. 2) and reached a depth of 374.9 metres. Minor lead/zinc mineralization was encountered but none of economic significance. Drill logs and geochemical analyses are included in Appendix 1.

3. CONCLUSION

The decision to relinquish the northern section of EL.1129 was part of company policy to rationalize the size of extensive lead/zinc tenement holdings and to retain only those areas known to host visible surface mineralization and geochemically anomalous targets.

APPENDIX

DRILLHOLE LOG, GRAPHIC LOG,

GEOCHEMISTRY

NOTES ON SYMBOLS USED IN CORE LOGGING

E.L. 436 - WIRREALPA

The following symbols were used during core logging to denote the more common rock types observed.

A, B, C, D, Anm, BCM, TCF & CFLS.

These are described on the following pages.

A — Breccia - generally monomict and rarely polymict (polymict types are denoted in the logs). The fragments are generally micritic and rarely comprise calcarenite or skeletal rich bands, dissolution (stylolytic) contacts between fragments are common. The matrix is between 10-30% and comprise black calcareous siltstone/mudstone (BCM). (Photo 436/04).

Anm — (no matrix). As for A however the matrix is less than 10%. (Photo 436/06, 436/08).

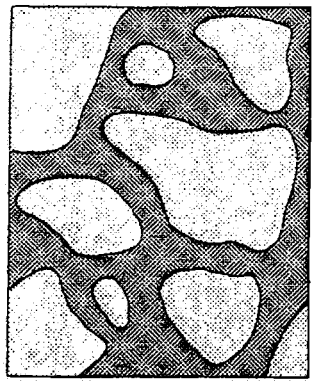
B — Interbedded general parallel beds of grey micrites (4-10cm) with black calcareous siltstone/mudstone (1-5cm). (Photo 436/20).

C — Similar to B however the limestone bands are not as persistent laterally. The limestone fragments usually have rounded ends and with the smaller fragments they have a typically ellipsoidal appearance. (Photo 436/20).

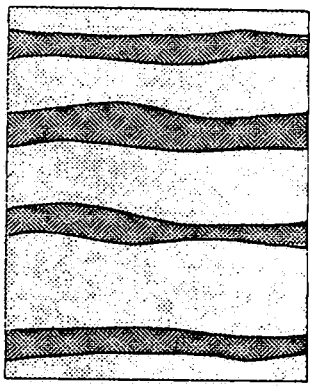
D — Any of A, B or C where the matrix material is greater than 50%. Limestone fragments suspended in the matrix invariably are subrounded or ellipsoidal depending on size.

BCM — Black calcareous matrix. Generally a finely laminated black calcareous siltstone or mudstone.

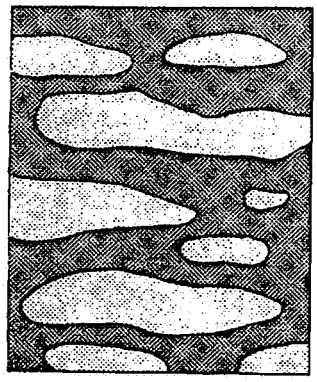
TCF/CFLS — These refer to calcite filled fractures. TCF are fine calcite filled fractures cutting across the limestone and matrix alike. CFLS refers to fractures which are only calcite filled where they cross limestone fragments, the fracture itself can be seen to penetrate the matrix as a thin line only. (Photo 436/18).



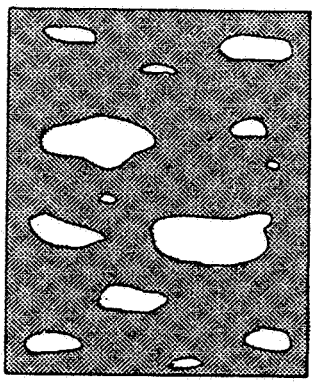
UNIT A



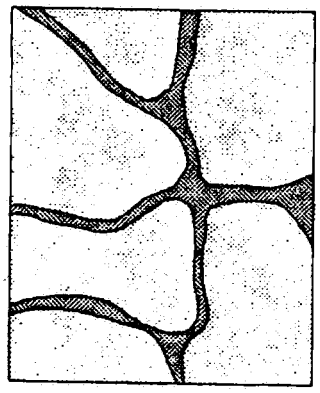
UNIT B



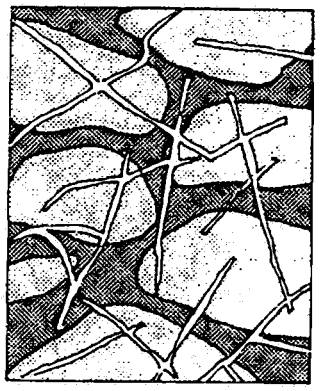
UNIT C



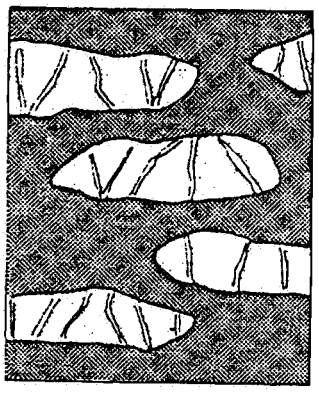
UNIT D



UNIT Anm



A with TCF



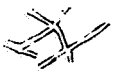
C with CFLS



Generally black calcareous matrix



Generally grey micrite/limestone



Calcite.

TEXTURAL STYLES IN LOWER CAMBRIAN LIMESTONE CORE
E.L. 436 WIRREALPA, E.L.525 ANGEPENA S.A

WD5 WIRREALPA EL 436

0 - 63.80	Green and grey calcilutite with interbedded limestone bands generally 2-5cm. Some soft sediment deformation. Some calcarenite bands (to 10cm) with carbonaceous particles.
63.80- 69.15	B with interbedded calcarenite bands.
69.15- 87.74	B but thicker limestone zones, some Anm zones and some thin bedded zones. Some thin banded B (1-3cm). Minor pyrite in calcite filled vugs.
87.74- 88.04	Calcarenite.
88.04- 88.10	Anm
88.10- 91.29	B with some C. B thicker than usual.
91.29-103.40	C some fine calcarenite, some B type.
103.40-103.80	Calcarenite possibly brecciated at the base.
103.80-104.18	B with some C. B thicker than usual, some sphalerite.
104.18-104.38	Breccia with calcite fill and orange sphalerite and pyrite.
104.38-107.73	B finely banded, some C.
107.73-107.85	Black calcilutite finely banded, pyrite.
107.85-108.02	Calcarenite brecciated at the base, some chert and pyrite.
108.02-108.20	B coarse.
108.20-111.79	B fine.
111.79-111.96	Breccia with disseminated orange-pale brown sphalerite with pyrite in calcite filled vugs.
111.96-112.23	Polymict breccia with black calcareous matrix.
112.23-112.37	Breccia, calcite fill with some sphalerite and pyrite.
112.37-113.10	Polymict breccia, some sphalerite?
113.10-113.34	Coarse B with some breccia and pyrite.
113.34-121.13	B with some C.

...2/

WD5 contd.

121.13-123.09	Polymict breccia with some sphalerite and pyrite.
123.09-123.29	Coarse B with sphalerite and pyrite in CFLS.
123.29-141.13	C
141.13-141.80	Fine grained calcarenite.
141.80-141.98	Evaporites? with sphalerite.
141.98-142.10	B with sphalerite in calcite filled fractures.
142.10-142.38	Fine calcarenite.
142.38-143.60	B finely banded, some C some sphalerite.
143.60-144.05	Evaporites? with pyrite in blebs and disseminated.
144.05-152.88	C with some pyrite in the matrix. Some B and some fossil fragments.
152.88-153.68	B slumped with some pyrite.
153.68-157.12	C with some B and with some pyrite.
157.12-157.65	Slump breccia, cavities fill with calcite and some pyrite.
157.65-169.91	C with some B and occasional pyrite blebs.
169.91-172.02	A
172.02-172.41	Anm
172.41-188.41	A with bands of calcarenite to 4cm thick. Stylolites between bands. Sporadic sphalerite TCF to 1cm wide and .5m long. More regularly bedded towards the base.
188.41-189.35	C with fine bedding visible and some small blebs of sphalerite.
189.35-191.95	Black calcilutite with fine pyrite and some chert zones, some very fine sphalerite (Evap?).
191.95-195.65	D
195.65-195.80	A with calcite filled fractures.
195.80-196.52	B with calcite filled fractures.

...3/

WD5 contd.

196.52-196.71	A
196.71-197.26	B with some calcite filled fractures.
197.26-210.96	C some B and rare calcite filled fractures. Fine veins of pyrite and minor sphalerite in calcite filled fractures. Very minor A.
210.96-211.11	Calcarenite with fossil fragments.
211.11-214.80	B with calcite filled fractures. Limestone is fine calcarenite with fossil fragments? Pyrite in the matrix.
214.80-230.94	A gradational from above. Some B and some pyrite in the matrix. Calcite filled fractures.
230.94-234.35	B with disseminated pyrite in the matrix. Some calcite filled fractures.
234.35-242.49	A with pyrite, some calcite filled fractures.
242.49-247.34	B some calcite filled fractures.
247.34-255.70	Slumped C pyrite in the matrix and in the limestone. Limestone is fine calcarenite with fossil fragments. Some Anm.
255.70-258.83	B with some calcite filled fractures.
258.83-265.66	A with pyrite and some calcite filled fractures.
265.66-271.24	B some sphalerite blebs in matrix, some calcite filled fractures.
271.24-271.35	Anm with fine sphalerite and pyrite in calcite or calcite filled fractures.
271.35-276.43	B some C, fine sphalerite throughout in the matrix.
276.43-295.31	A with 8cm of carbonaceous material at the start with sphalerite and pyrite. Some B zones and some CFLS.
295.31-308.09	Anm with some A fossil rich? Sphalerite in abundant calcite filled fractures.
308.09-313.12	B rare, calcite filled fractures.
313.12-314.92	A some calcite filled fractures.

...4/

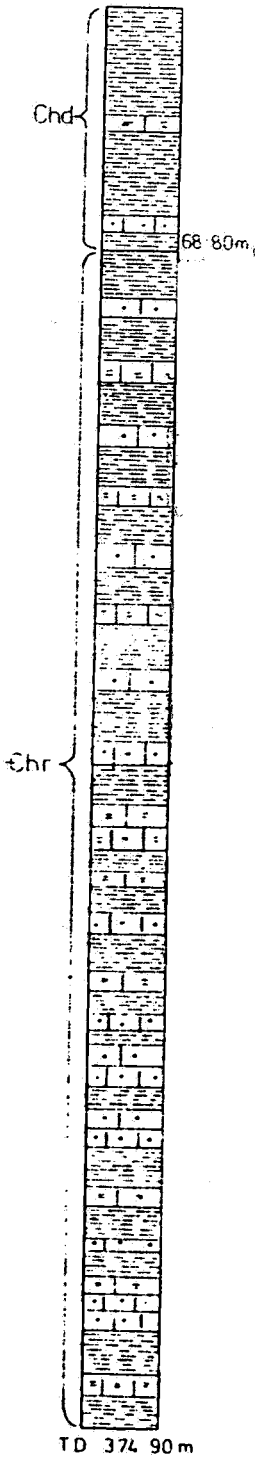
WD5 contd.

314.92-327.30	B with some C and rare A.
327.30-330.59	C some B.
330.59-339.92	A type with fossil fragments and pyrite in the limestone.
339.92-344.90	C with B, some calcite filled fractures.
344.90-346.86	A with strong calcite filled vertical fracture. Limestone is calcarenite? some pyrite in limestone.
346.86-349.82	A with pyrite in limestone and matrix.
349.82-351.76	B some sphalerite, limestones contain fossil fragments. Some calcite filled fractures.
351.76-354.74	A some sphalerite in calcite filled fractures.
354.74-374.90	C small A and B zones.

LOGGED BY R. TURNER

WD5

451



Calcarenite

Calcilutite

Shale

Lower Cambrian

Chd Midwerta Shale

Chr Parara Limestone

0 20 40 60 80 100 120 140 metres

VERTICAL SCALE 1 2000

Centre ADELAIDE	THE BROKEN HILL PROPRIETARY CO. LTD. EL 436 – WIRREALPA, S.A.	Project No L180
Date OCT '80	DRILLING – SUMMARY LOG	Drawing No A3-1662A

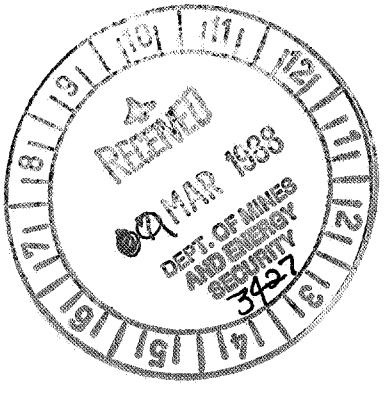
GEOCHEMICAL ANALYSIS OF SECTIONS FROM DDH WD5 (in ppm).

SAMPLE NO.	DEPTH (metres)	Cu	Zn	Pb
AQ 730	257.00 - 258.00	5	20	190
731	104.02 - 105.02	15	455	15
732	111.51 - 112.51	10	1100	35
733	142.90 - 143.90	15	40	35
Repeat AQ 732	111.51 - 112.51	10	1150	25

CR 5749

EXPLORATION LICENCE 1129
WIRREALPA, SOUTH AUSTRALIA

REPORT FOR THE QUARTER ENDING
27TH DECEMBER, 1987



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1. GENERAL

2. INVESTIGATIONS

3. EXPENDITURE

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1. LOCATION MAP,
FLINDERS RANGES, SOUTH AUSTRALIA A4-443A

EXPLORATION LICENCE 1129

WIRREALPA, SOUTH AUSTRALIA

REPORT FOR THE QUARTER ENDING 27TH DECEMBER, 1987

1. GENERAL

Exploration Licence 1129, Wirrealpa of 1080 sq km was granted to BHP Minerals Limited on 28th March 1983. On 13th August, 1984 it became part of a joint venture agreement with Esso Exploration. This agreement was terminated on the 2nd September, 1985. The northern portion of the original EL was relinquished in September 1986.

2. INVESTIGATIONS

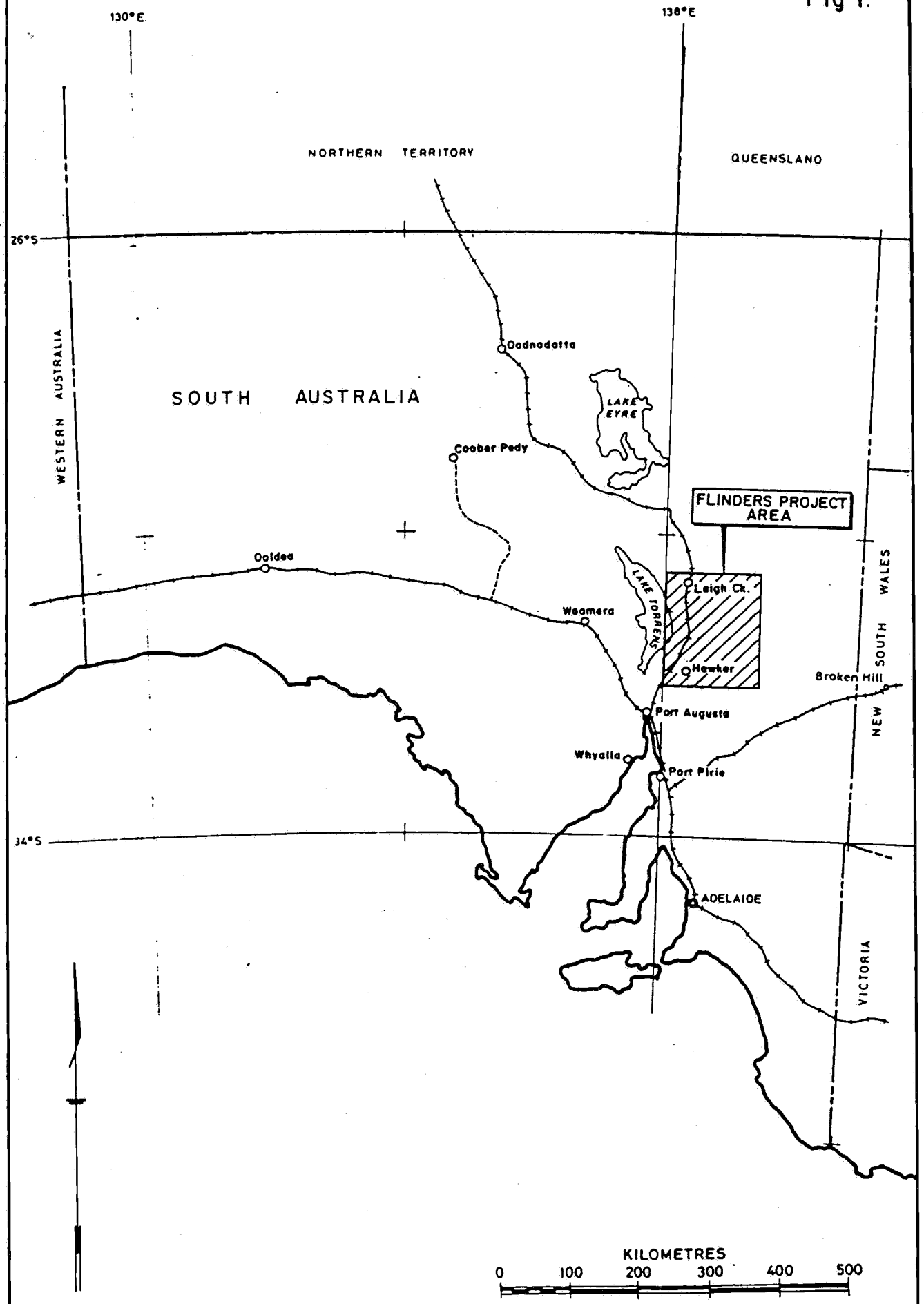
During the period under review a complete reappraisal and evaluation of the results obtained from our work in this area, together with extensive assessment of available regional data has been undertaken. Development of the work program for the coming field season is underway and will be reported in the next quarter.

2. EXPENDITURE

Expenditure for the quarter up to the 27th December, 1987 is as follows:-

Salaries	2413
Field support	925
Vehicles	1642
Equipment	30
Tenement fees	21
Drafting	1440
Geophysics	23
Office Administration	368
	$6862

Fig 1.



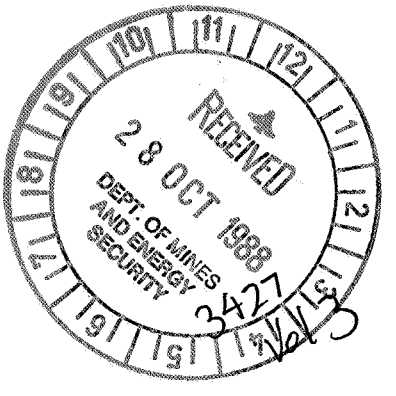
Centre: Melbourne	THE BROKEN HILL PROPRIETARY CO LTD FLINDERS PROJECT, S. A. LOCATION MAP	Project No
Date: 30-9-83		Drawing No: A4-

456

CR 6265

EXPLORATION LICENCE 1129
WIRREALPA, SOUTH AUSTRALIA

SURRENDER REPORT
(PERIOD ENDING 26TH FEBRUARY 1988)



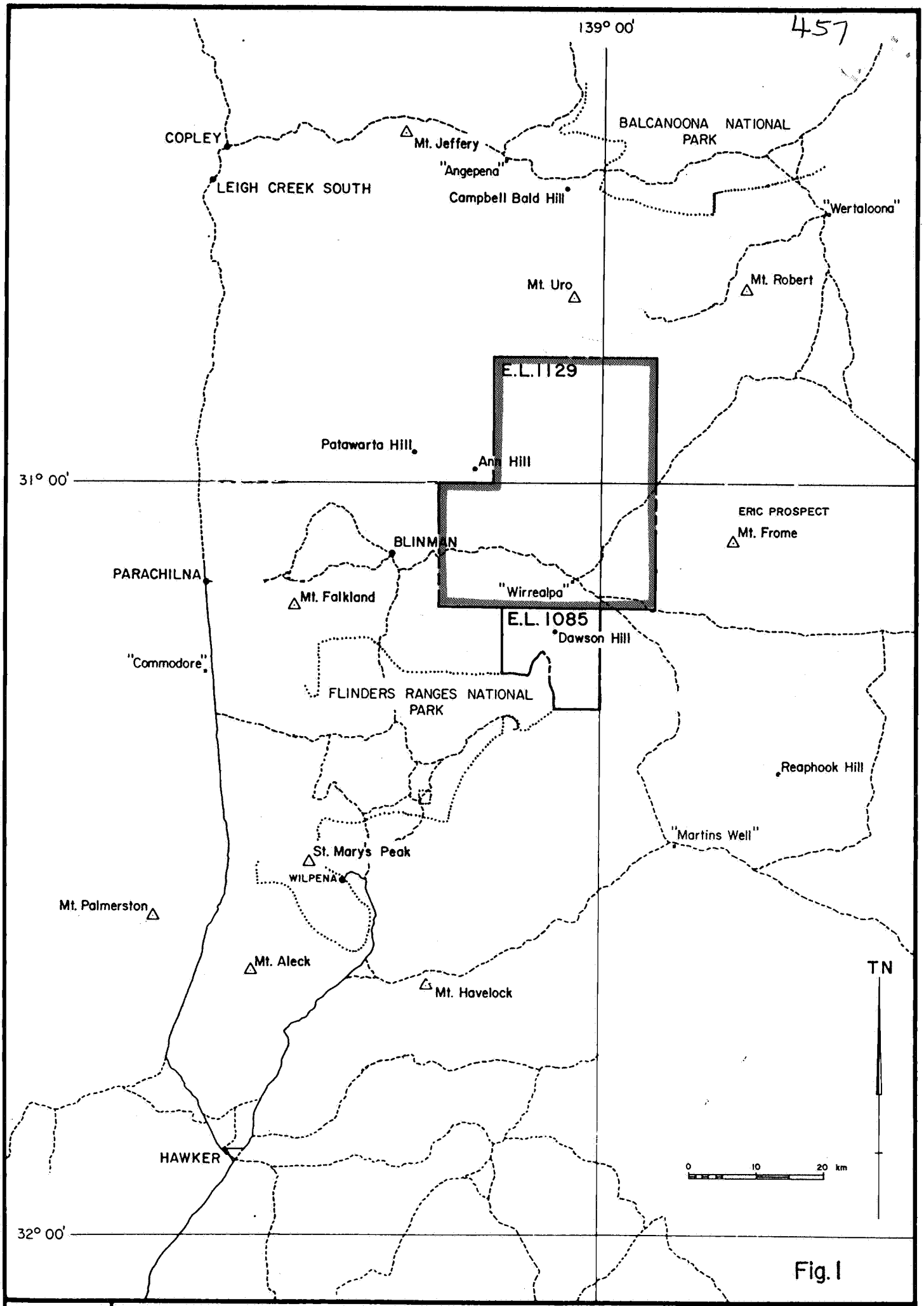


Fig. 1

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

EXPLORATION LICENCE 1129

WIRREALPA, SOUTH AUSTRALIA

SURRENDER REPORT

1. GENERAL

Exploration Licence 1129, Wirrealpa of 1030 sq. km. was granted to BHP Minerals Limited on 28th March 1983. On 13th August, 1984, it became part of a joint venture agreement with Esso Exploration. This agreement was terminated on the 2nd September 1985. The northern portion of the original EL was relinquished on September 1986. The location of EL.1129 is shown in Figure 1.

No fieldwork has been carried out during this period. Reappraisal of the area on the basis of results obtained from previous work and assessment of regional data have led to the conclusion that further exploration at the present time is not warranted. EL.1129 was therefore surrendered on 26th February 1988.

Minor expenditure, being mainly of an administrative nature, amounting to $1509, was incurred during this period.