000

277001

EXPLORATION LICENCE 23/79

WYNYARD, TASMANIA

REPORT FOR THE AREA RELINQUISHED 1ST DECEMBER, 1984

001

277002

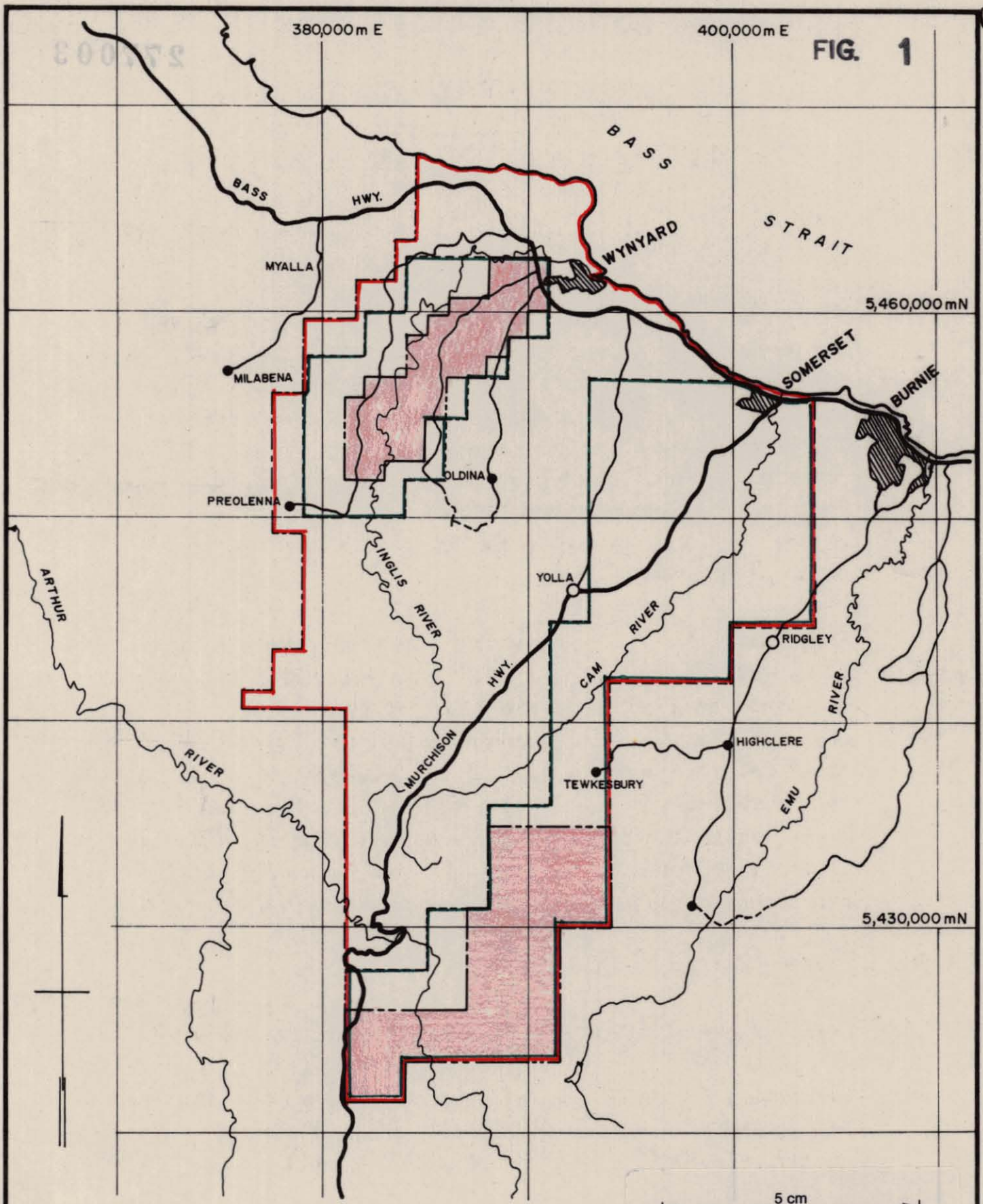
CONTENTS

FIGURES

Trans held

APPENDICES

FIG. 1



Centre Melbourne	THE BROKEN HILL PROPRIETARY CO. LTD.	Project Nº T 64
Date 30-10-84	EL.23/79, WYNYARD, TASMANIA.	Drawing Nº A4-2473
	LOCATION MAP	

EXPLORATION LICENCE 23/79
WYNYARD, TASMANIA
REPORT FOR THE AREA RELINQUISHED 1ST DECEMBER, 1984

1. GENERAL

Exploration Licence 23/79 of 715 square kilometres was granted to The Broken Hill Proprietary Company Limited on 14th December, 1979. The Licence area was reduced to 372 square kilometres on 1st December, 1983, made up to two separate blocks. In late August, 1984, notification was given of a further reduction to 124 square kilometres, this to be effective from 1st December, 1984. This report covers all exploration data relevant to the relinquished area.

Regionally the principal target was a massive sulphide hosted tin deposit of the Renison type. Work done in the relinquished portion of the licence area was restricted to aeromagnetic coverage and very limited geochemical sampling. The area is poorly prospective. In addition to the Tertiary basalt cover large areas also have a thick underlying sequence of Permian sediments, as well as local Jurassic dolerites. The prospective Cambrian and Precambrian lithologies are deeply buried.

2. GEOLOGY

Within the licence area extensive flows of Tertiary basalt and Permian sediments overlie a basement consisting largely of Precambrian and Cambrian rocks which form a major structural extension of sequences in the Mt. Bischoff, Cleveland area to the south west.

The oldest rocks present are the Precambrian Keith Metamorphics which occur in a belt 8-15km wide trending north east from Savage River to Wynyard. Rocks in this belt include pelitic schist, quartzite and minor

amphibolite. Younger Precambrian rocks of the Burnie Quartzite and Slate Formation flank the Keith Metamorphics in the lower Cam River. Dolomite has not been recorded in the Precambrian rocks of the Wynyard area.

Cambrian sediments are exposed in a large window in Tertiary basalt, in the Hellyer River upstream from the Murchison Highway crossing. Lithologies present include red-brown lithicwacke, red shale and pyrite-bearing chert.

Ordovician sediments have not been located within the licence area. They flank a major anticline at Companion Hill to the east of the southern portion of E.L. 23/79.

Permian sediments, up to 300 metres thick, consist of a basal tillite unit, siltstone with thin oil shale and coal horizons, and sandstone.

Jurassic dolerite is exposed in the central part of the licence area where it invades both tillite and siltstone.

Tertiary rocks include basalt of highly variable thickness (locally believed to be up to 350 metres), as well as marine sediments, lacustrine clays, sands and gravels up to 60m in thickness.

3. WORK PROGRAMME

The following is a summary of work carried out:

1. Literature survey and review of data

2. Preliminary photogeological study and interpretation of Landsat image.

3. Reconnaissance geological mapping at 1:50,000 scale, with continuous updating as exploration proceeded.

4. Test Dighem II airborne EM survey.

5. High-resolution aeromagnetic survey covering the total licence area, with eastwest lines spaced at 250 metres and a mean sensor terrain clearance of 90 metres.

6. Stream sediment and pan-concentrate geochemical sampling over areas of basement exposure.

7. Orientation ground water sampling.

4. GEOPHYSICS

4.1 Aeromagnetics

Initially all available aeromagnetic data in the form of contour maps of total field intensity was compiled. In some instances trends due to major structures in basement rocks can be traced beneath the basalt and sedimentary rock cover.

A detailed aeromagnetic survey covering the entire licence area, with east-west lines spaced at 250 metres and a mean sensor terrain clearance of 90 metres, was flown in January, 1982. Coverage relevant to this report appears in Figure 3.

4.2 Dighem II EM

Four test lines of Dighem II were flown in the southern part of the licence area in early 1981. The location of the lines is shown on Figure 2.

Dighem II is a helicopter borne, frequency EM system which measures in In phase and Quadrature EM response in both a coaxial (standard) and coplanar (whaletail) pair of coils mounted in a 9 metre boom. The boom is towed at a nominal height of 36

metres at a speed of around 120 km/hr. A total field magnetometer is also carried with the system, the sensor being suspended at a height of around 50 metres.

Profiles of the measured data plus Dighem's computer generated interpretation functions were presented in the previous relinquishment report.

5. GEOCHEMISTRY

Figure 4 shows stream sediment, rock chip and water sample locations within the relinquished areas, while Figure 5 shows pan-concentrate sample locations with tin values.

Appendix 1 contains results of the stream sediment and pan-concentrate sampling programme. No anomalous values were obtained from the sieved samples, but a number of pan-concentrates confirmed the presence of tin within several drainage systems. Possible sources include Tertiary sediments, Permian tillite and Basement exposures.

It is considered probable that most of the tin is being derived from Tertiary sediments. If this is true large parts of the area sampled will thus be naturally contaminated and this greatly curtails effective anomaly recognition within the prospective Precambrian and Cambrian sediments.

Two quarries with Precambrian exposure were located at pan concentrate sample sites 100P and 118P. Both contained pyritic black shales and heavily veined sandstones and quartzites. Two rockchip samples gave relatively high tin values (55,190 ppm) but follow-up sampling failed to duplicate the earlier results.

Several samples of pyrite rich veins and pods in quartzite float from the Cam River at site 124P were also analysed. These returned high arsenic values (450,700 ppm) but are probably pebbles washed out of the Permian tillites.

Analytical results and petrology relevant to the rock chip samples are given in Appendix 2.

Appendix 3 includes details of an orientation water-sampling programme carried out in 1982. Results were not encouraging and no follow-up was attempted.

APPENDIX 1

STREAM SEDIMENT

AND PAN-CONCENTRATE SAMPLE

RESULTS

009

277010

AUSTRALIAN LABORATORY SERVICES PTY. LTD.

CONSULTING CHEMISTS & ANALYSTS

OFFICE & LABORATORY
44 Balaclava Street
WOOLLOONGABBA Q 4102
Ph (07) 391 6799
A/H 353 2830
TELEX ALSEV 42344

LABORATORY REPORT

Batch No.: B126 | Client: BHP COMPANY LIMITED, | Area Contact: DR. R. HINE
Address: P.O. BOX 559 | Address: G.P.O. BOX 1140 L,
CAMBERWELL | HOBART TAS 7001
Date Received 17/02/81 | VIC
Date Completed 04/03/81

Order No.: T640/000635 | Sample Type: S.SED/ROCK/SOIL | No. of Samples: 37

SAMPLE NO.	Cu	Pb	Zn	Ag	Au	As	Mo	Sn	W	Ni	ELEMENTS
	m	m	m	m	b	m	m	m	m	m	UNITS
	1	1	1	1	120-A	5-B	2	XRF-1A	XRF-1A	1	METHODS
HEL 1	30	35	100	2	170	9	<2	<5	<10	80	
HEL 2	25	30	85	1	10	7	<2	<5	<10	70	
HEL 3	20	35	105	1	10	4	<2	5	<10	85	
HEL 4	10	15	40	1	5	5	<2	<5	<10	15	
HEL 5	5	10	35	<1	5	3	<2	<5	<10	20	
HEL 6	15	15	70	1	5	4	<2	<5	<10	70	
HEL 7	15	20	130	1	10	9	<2	<5	<10	60	
HEL 8	20	20	95	2	5	9	<2	<5	<10	95	
HEL 9	40	20	120	2	10	4	<2	<5	<10	185	
HEL 10	20	15	95	1	10	5	<2	<5	<10	85	
HEL 11	10	15	55	1	5	3	<2	5	<10	50	
HEL 12	10	10	55	1	5	5	<2	<5	<10	60	
HEL 13	15	15	75	1	5	4	<2	5	<10	85	
HEL 14	5	15	30	<1	5	3	<2	<5	<10	15	
HEL 15	35	20	100	1	10	6	<2	<5	<10	125	
HEL 16	40	25	110	2	10	4	<2	<5	<10	180	
KAR 1	205	180	145	2	5	20	45	320	0.27	% 40	
KAR 2	60	160	140	2	5	10	10	170	330	70	
KAR 3	85	225	345	3	10	12	5	180	320	180	
KAR 4	55	345	250	2	10	9	5	175	190	105	
KAR 5	65	40	320	3	10	3	<2	10	<10	230	
KAR 6	100	40	145	2	10	3	<2	15	<10	220	
KAR 7	105	35	95	3	3	3	5	5	<10	195	
KAR 8	150	325	850	2	3	75	2	40	230	40	
WYN 1	15	70	10	4	45	10	<2	<5	<10	20	
VIC 1	125	35	95	4	10	4	5	<5	<10	25	
VIC 2	25	55	95	1	3	20	<2	15	20	5	
VIC 3	10	20	145	1	3	4	<2	<5	<10	5	
ARA 38	160	35	30	1	5	35	<2	<5	<10	10	
ARA 39	0.14	% 40	160	5	50	160	<2	<5	<10	25	

UNITS LEGEND ----- m - Parts per million | b - Parts per billion | % - percent
g - Grams | a - Absorbance

Signature:

010

277011

AUSTRALIAN LABORATORY SERVICES PTY. LTD.

CONSULTING CHEMISTS & ANALYSTS

OFFICE & LABORATORY
44 Balaclava Street
WOOLLOONGABBA Q 4102
Ph (07) 391 6799
A/H 353 2830
TELEX ALSEV 42344

LABORATORY REPORT

Batch No.: B126-1
Date Received 17/02/81
Date Completed 04/03/81
Order No.: T640/000635

Client: BHP COMPANY LIMITED,
Address: P.O. BOX 559
CAMBERWELL
VIC

Sample Type: S.SED/ROCK/SOIL

Area Contact: DR. R. HINE
Address: G.P.O. BOX 1140 L,
HOBART TAS 7001

No. of Samples: 37

SAMPLE NO.	Sb	Co	Cr	Ba	Sr
	m	m	m	m	m
	8	1	1	XRF-1A	XRF-1A
HEL 1	25	30	100	420	100
HEL 2	25	5	95	430	65
HEL 3	20	40	115	320	120
HEL 4	<10	10	85	400	55
HEL 5	30	10	95	340	55
HEL 6	20	35	115	250	60
HEL 7	20	25	65	430	35
HEL 8	25	45	55	520 *	125
HEL 9	20	65 *	130	215	165
HEL 10	<10	35	120	315	140
HEL 11	<10	5	125	235	55
HEL 12	10	25	135	320	60
HEL 13	20	30	135	160	80
HEL 14	15	10	85	415	55
HEL 15	25	5	165	255	70
HEL 16	50 *	80 *	140	410	285
KAR 1	30	45	120	<10	15
KAR 2	40	70	70	60	15
KAR 3	45	70	180	70	20
KAR 4	50	160	265	180	15
KAR 5	45	70	115	110	15
KAR 6	30	80	180	100	35
KAR 7	40	70	145	20	15
KAR 8	55	35	95	30	5
WYN 1	115 *	25	135 *	170 *	5
VIC 1	65	70	85	10	110
VIC 2	20	10	185	20	10
VIC 3	50	5	20	30	40
ARA 38	30	10	145	60	10
ARA 39	450 *	35	55	20	10

UNITS LEGEND ----- m - Parts per million b - Parts per billion % - percent
g - Grams a - Absorbance

Signature:

011

277012

ANALABS

A division of MacDonald Hamilton & Co. Pty. Ltd.
Phone (09) 458 7999 — 52 Murray Road, Welshpool, W.A. 6106 — Telex AA92560

ANALYTICAL REPORT No. 14 4 88 1160

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

E.M.P. Company
GPO Box [illegible]
Perth
[illegible] 6001

ORDER No.	PROJECT
805090	T 656

DATE RECEIVED	RESULTS REQUIRED
3.5.82	

No. OF PAGES OF RESULTS	DATE REPORTED	No. OF COPIES	TOTAL No. OF SAMPLES
	5.5.82	2	17

STATE OF SAMPLES	PRE-TREATMENT								ANALYSIS		
REFER BELOW	SAMPLE NUMBERS	DRY	CRUSH	SPLIT	PULVERISE	SIEVE	OTHER SEE REMARKS	NONE	REQUIRED ANALYSIS SECTION	PREPARATION	METHOD
									Au Pb Zn	101	

RESULTS TO: 1. Mr Howe

RESULTS TO:

REMARKS

— 30#

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	Mo	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 B Dow

012

277013

ANALABS

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

ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
	14.4 MS 1160	5.5.82	005050	1 OF 2

TUBE No.	SAMPLE No.		Cu	Zn	Pb					
1	WYN 50		10	35	5					
2	WYN 51		5	10	5					
3	WYN 52		5	20	5					
4	WYN 53		X	95	5					
5	WYN 54		X	20	X					
6	WYN 55		10	30	5					
7	WYN 56		10	30	X					
8	WYN 57		5	45	5					
9	WYN 58		5	25	X					
10	WYN 59		10	40	10					
11	WYN 60		5	20	X					
12	WYN 61		10	45	5					
13	WYN 62		5	15	5					
14	WYN 63		10	50	5					
15	WYN 64		X	—						
16	WYN 65		X	10	30					
17	WYN 66		10	70	5					
18										
19										
20										
21										
22										
23										
24										
25										

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

AUTHORISED OFFICER

013

277014

ANALABS

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

ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
	14.4 08 1160	6.5.82	005823	3 OF

TUBE No.	SAMPLE No.	Sn	W							
1	WYN 50	X	X							
2	WYN 51	X	X							
3	WYN 52	X	X							
4	WYN 53	X	X							
5	WYN 54	X	X							
6	WYN 55	X	X							
7	WYN 56	X	X							
8	WYN 57	X	X							
9	WYN 61	X	X							
10	WYN 62	X	X							
11	WYN 63	X	X							
12	WYN 64	X	X							
13	WYN 65	X	X							
14	WYN 66	T5	X							
15										
16										
17	WYN 67		X							
18										
19										
20										
21										
22										
23										
24										
25										

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

AUTHORISED OFFICER

014

277015

ANALABS

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

ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
	14.4 08 1160	5.5.82	005090	2 OF 2

TUBE No.	SAMPLE No.		Cu	Zn	Pb					
1	STD PB4		215	850	105					
2	RPT MYN 50		10	80	10					
3										
4										
5										
6										
7										
8										
9										
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										
21										
22										
23	[illegible]		[illegible]		[illegible]					
24	[illegible]		[illegible]	[illegible]	[illegible]					
25										

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

AUTHORISED OFFICER

015

277016

ANALABS

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

ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
	14.4 08 1740	29.12.82	006627	1 OF 2

TUBE No.	SAMPLE No.		Cu	Pb	Zn					
1	T64/70		17	2	60					
2	T64/72		15	7	118					
3	T64/74		22	6	113					
4	T64/76		40	3	200					
5	T64/78		37	6	144					
6	T64/79		10	4	52					
7	T64/80		10	2	48					
8										
9										
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										
21										
22										
23										
24										
25										

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

AUTHORISED OFFICER

016

277017

ANALABS

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

ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
	14.4 08 1740 B	4.1.83	006627	3 OF 3

TUBE No.	SAMPLE No.	Sn	W								
1	T64/70	4	X								
2	T64/72	X	X								
3	T64/74	15	X								
4	T64/76	6	X								
5	T64/78	7	X								
6	T64/79	X	X								
7	T64/80	7	X								
8											
9											
10											
11											
12											
13											
14											
15											
16											
17											
18											
19											
20											
21											
22											
23	DETECTION	3	10								
24	DIGESTION										
25	METHOD	402	401								

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

AUTHORISED OFFICER

017

277018

ANALABS

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

ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
	14.4 08 1741	06.01.83		1 OF 1

TUBE No.	SAMPLE No.	Wt(g)	Sn	W						
1	T64-71P	74.22	6	X 4	/					
2	T64-73P	83.77	3	X 3.	/					
3	T64-75P	49.23	75	X 37	/					
4	T64-77P	36.11	3	X 1	/					
5	T64-81P	22.96	1200	20 276.	/					
6										
7										
8										
9										
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										
21										
22										
23	DETECTION	.01	3	10						
24	DIGESTION									
25	METHOD		402	401						

* Denotes method 404

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

AUTHORISED OFFICER

018

277019

ANALABS

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

ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
	14.4 08 1796	25.1.83	6610	1 OF 2

TUBE No.	SAMPLE No.		Cu	Pb	Zn					
1	T64-83		56	24	161					
2	T64-85		31	32	220					
3	T64-87		33	20	102					
4	T64-89		8	19	29					
5	T64-90		9	18	40					
6	T64-91		18	22	76					
7	T64-93		20	14	98					
8	T64-95		45	19	65					
9	T64-97		23	52	69					
10	T64-99		34	22	110					
11	T64-101		14	26	41					
12	T64-103		20	17	90					
13	T64-105		11	21	34					
14	T64-107		25	12	77					
15	T64-109		28	25	93					
16										
17										
18										
19										
20										
21										
22										
23										
24										
25										

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

AUTHORISED OFFICER

019

277020

ANALABS

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

ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
	14.4 08 1796B	28.1.83	6610	1 OF 1

TUBE No.	SAMPLE No.	Sn	W							
1	T64-83	10	X							
2	T64-85	10	X							
3	T64-87	8	X							
4	T64-89	9	X							
5	T64-90	9	X							
6	T64-91	15	X							
7	T64-93	4	X							
8	T64-95	10	X							
9	T64-97	30	X							
10	T64-99	X	X							
11	T64-101	7	X							
12	T64-103	6	X							
13	T64-105	5	X							
14	T64-107	X	X							
15	T64-109	7	X							
16										
17										
18										
19										
20										
21										
22										
23	DETECTION	3	10							
24	DIGESTION									
25	METHOD	402	401							

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

AUTHORISED OFFICER

020

277021

ANALABS

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

ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
	14.4 08 1795	28.1.83	6609	1 OF 1

TUBE No.	SAMPLE No.	Sn	W	wt(g)						
1	T64-82P	20	X 4	18.07	✓					
2	T64-84P	80	X 24	29.63	✓					
3	T64-86P	95	X 19	20.05	✓					
4	T64-88P	150	X 48	32.06	✓					
5	T64-92P	8	X 4	50.20	✓					
6	T64-94P	60	10 23	38.98	✓					
7	T64-96P	190	X 59	31.21	✓					
8	T64-98P	15	X 15	99.31	✓					
9	T64-100P	10	X 3	30.85	✓					
10	T64-102P	3	X 1	32.18	✓					
11	T64-104P	40	X 13	31.61	✓					
12	T64-106P	7	X 4	49.91	✓					
13	T64-108P	360	10 77	21.45	✓					
14	T64-110P	300	X 153	51.07	✓					
15										
16										
17										
18										
19										
20										
21										
22										
23	DETECTION	3	10							
24	DIGESTION									
25	METHOD	402	401							

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

AUTHORISED OFFICER

021

277022

ANALABS

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

ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
	14.4 08 1813	15.2.83	6613	1 OF 2

TUBE No.	SAMPLE No.		Cu	Pb	Zn	Sn	W			
1	T64-111		40	12	128	6	X			
2	T64-113		19	10	113	8	X			
3	T64-115		47	5	155	X	X			
4	T64-117		30	9	125	4	X			
5	T64-119		25	8	113	5	X			
6	T64-121		35	5	123	8	X			
7	T64-122		51	7	123	4	X			
8	T64-123		24	4	122	6	X			
9	T64-125		33	8	154	3	X			
10	T64-127		32	14	137	5	X			
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										
21										
22										
23										
24										
25										

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

AUTHORISED OFFICER

022

277023

ANALABS

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

ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
	14.4 08 1812	15.2.83	6612	1 OF 1

TUBE No.	SAMPLE No.	Wt(g)	Sn	W						
1	T64-112P	46.48	170	X 79	✓					
2	T64-114P	60.83	150	X 91	✓					
3	T64-116P	47.99	10	X 5	✓					
4	T64-118P	47.93	15	X 7	✓					
5	T64-120P	36.67	20	X 7	✓					
6	T64-124P	43.24	7	X 3	✓					
7	T64-126P	39.82	20	X 8	✓					
8										
9										
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										
21										
22										
23	DETECTION		3	10						
24	DIGESTION									
25	METHOD		402	401						

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

AUTHORISED OFFICER

023

277024

ANALABS

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

ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
164	14.4 88 1877	24.3.88	006616	1 OF 1

TUBE No.	SAMPLE No.	Wt(gm)	Sn	W						
1	129P /	60.89	45	X 27	/					
2	130P /	38.03	8	X 3	/					
3	131P	15.56	X	X						
4	132P /	59.80	5	X 3	/					
5	133P	79.00	X	X						
6	134P	70.02	X	X						
7	135P /	86.24	3	X 3	/					
8	136P /	57.71	3	X 2	/					
9										
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										
21										
22										
23	DETECTION		3	10						
24	DIGESTION									
25	METHOD		40%	40%						

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

AUTHORISED OFFICER

024

277023

ANALABS

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

ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
T64	14.4 00 1901	8.4.83	006626	1 OF 1

TUBE No.	SAMPLE No.	Wt(gm)	Sn	W	
1	143P /	70.68	13	14 9	/
2	144P /	50.84	387	X 194	/
3	145P /	94.66	5	X 5	/
4	146P	94.78	X	X	
5	147P /	66.17	3	X 2	/
6	148P	61.78	X	X	
7	149P	105.29	X	33	
8	150P	67.76	X	X	
9	151P	95.63	X	X	
10	152P	183.05	X	X	
11	153P	72.19	X	X	
12	154P	89.74	X	X	
13	155P /	62.94	3	X 2	/
14	156P	31.68	X	X	
15					
16					
17					
18					
19					
20					
21					
22					
23	DETECTION		2	10	
24	DIGESTION				
25	METHOD		402	401	

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

AUTHORISED OFFICER

025

277026

APPENDIX 2

ROCK CHIPS - SAMPLE RESULTS,

PETROLOGY AND SAMPLE DESCRIPTION

SHEETS

026

277027

SITE FLAGGED ☑ | INTEREST NIL ☐ SOME ☐ DEFINITE ☐

SAMPLE TYPE	MAP/PHOTO NAME	GRID REFERENCE	SAMPLE No.
S.S. / P.C.	BURNIE 1:50,000	036504	T64/72 T64/73P

NATURE OF RIVER	WATER	VEGETATION
Flat, narrow. Rocky. Steep Sth bank.	Flowing. 8" deep.	Ti-Tree Blackberries Ferns

PEBBLES

Amount	Size	Lithology	Shape	Rounding	Packing	Silt %
		Q2 BASALT QTZITE			GOOD	HIGH

SITE

Trap	Bottom	Bedrock	Assessment
Outcrop causing gravel traps in stream centre.	Gravel.	QUARTZITE BASALT upstream.	Good.

FIELD COMMENTS

Bedding 78°S
Strike 100°
Veins 90°, 45°

TENEMENT DETAILS

Coarse rounded heavy minerals, olivine grains, fine grained sst/qtzite, numerous milky qtz veins.

COOEE CREEK.

Example of site description card filled out at each stream sample site.

REGION: NW TAS PROJECT No.: T640 PROSPECT: WYNYARD GENERAL GRID CO-ORDS.: LOCAL A.M.G.

DESCRIPTION Sample Type: Rock Rock Type: Soil/Sediment Size Fraction:

WYN 1: Lt. grey, pyrite rich chert (petrographic description available); float sample only.

WYNA1-1: Lt green, emg, amphibolite, schistose texture, cut by qtz veins c mino limonite disseminated magnetite.

ANALYSIS Laboratory ALS Batch No G219 Date Analysed 19/10/81

Element / Method / Sample #	Sn	W	Mo	As	Au*	Ag	Cu	Pb	Zn	Ni	Co	Cr	Ba	Sr	Sb		
	XRF	XRF															
WYN 1	<5	<10	<2	10	45	4	15	70	10	20	25	135	170	5	115		
WYNA1-1	<5	<10	2	3	50	1	15	20	15	30	15	30	N.R.	N.R.	<10		

REMARKS: * Au in ppb; N.R – no result.

Logged or Sampled by: R. HINE Date: 21/11/81

THE BROKEN HILL PROPRIETARY CO. LTD. GENERAL SAMPLE DESCRIPTION Project No. T640 Drawing No. A4- Centre: HOBART Date: 21/11/81

220

2720728

WYN1 (MRL 12870): Quartz-Pyrite Rock:

Composition: Fine to microgranular, incipiently sericite-stained quartz (60%), evenly disseminated fine sub- to euhedral pyrite. Sparse irregular quartz veinlets; sericite clots.

Fabric: Fractured/quartz-healed massive quartz-pyrite rock. Incipiently re-crystallized quartz. Pyrite mean 100 microns.

Accessories: Semi-pervasive, ultrafine, cloudy ?rutile.

Comments: Sinter-like facies (mildly recrystallized "pyritic chert").

Location: Float in stream between HEL 4 and HEL 5 sites.

CP1 (MRL 12871): Lithic Arkose:

Composition: Framework of angular to sub-angular quartz, subordinate oligoclase-albite, orthoclase, microcline; greenschist metapelite, chert-metaquartzite clasts. Sericitic, quartzo.

Fabric: Poorly sorted, essentially unbedded, silty fine to medium psammite.

Accessories: Conspicuous detrital biotite, garnet (almandine). Minor graphite, muscovite.

Comments: Polymictic sand with granitic and metasedimentary source, apparently weakly volcanomict, but ?felsite clasts sericitic, poorly resolved.

Location: Roadcut below basalt contact on South Basils Road.

CP2 (MRL 12872): Arkose:

Composition: Framework of splintery to angular quartz, alkali feldspar, subordinate metapelite, metagranite, ?metarhyolite clasts, biotite flakes. Sericitic, chloritic quartzofeldspathic.

Fabric: Similar to CP 1, but relatively well-bedded with silty partings, partly slumped.

Accessories: Detrital almandine, minor muscovite graphite flakes, rare cloudy rutile.

Comments: Similar and closely related to CP 1. Slightly finer-grained, relatively feldspathic. Similarly essentially unmetamorphosed. Weakly volcanomict.

Location: Exposure in small creek, 200m downstream from HEL 6.

CP3 (MRL 12873): "Vitric tuff" or "devitrified obsidian":

Composition: Frequent K-feldspathic spherulites in silicified, felsitic matrix with patchy microcrystalline albite, minor sericite.

Fabric: Spherulites mean 500 microns. Weakly flow-structured with faint relict ?eutaxitic microtextures.

Accessories: Sparse degraded/Fe-stained chlorite. Rare, very fine oxidised pyrite.

Comments: Conceivably a devitrified, thoroughly welded vitric tuff, but dependant on field relationships. Mildly altered (quartz-sericite-chlorite), unstressed.

Location: Float sample in Lockwood Creek downstream from CP2.

030

277031

ANALABS

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

ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
	14.4 08 1797	25.1.83	6611	1 OF 2

TUBE No.	SAMPLE No.		Cu	Pb	Zn	Ag				
1	T64-500		29	10	17	0.1				
2	T64-501		54	7	20	X				
3										
4										
5										
6										
7										
8										
9										
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										
21										
22										
23										
24										
25										

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

AUTHORISED OFFICER

031

277032

ANALABS

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

ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
	14.4 88 1797B	28.1.88	6611	1 OF 1

TUBE No.	SAMPLE No.	As	Sn	W						
1	T64-500	40	55	X						
2	T64-501	20	190	X						
3										
4										
5										
6										
7										
8										
9										
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										
21										
22										
23	DETECTION	2	3	10						
24	DIGESTION									
25	METHOD	401	402	401						

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

AUTHORISED OFFICER

032

277033

ANALABS

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

ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
	14.4 88 1814	15.2.88	6614	1 OF 2

TUBE No.	SAMPLE No.		Cu	Pb	Zn	Ag	As	Sn	W	
1	T64-502		30	140	145	X	X	3	X	
2	T64-503		25	105	125	X	X	3	X	
3	T64-504		25	15	55	X	X	X	X	
4	T64-505		25	25	45	X	50	4	X	
	T64-506		15	10	25	X	X	X	X	
6	T64-507		10	10	25	X	X	4	X	
7	T64-508		15	X	20	X	X	X	X	
8	T64-509		55	10	20	X	X	7	X	
9	T64-510		10	5	15	X	X	6	X	
10	T64-511		30	10	20	X	X	3	X	
11	T64-512		15	10	35	X	X	X	X	
12	T64-513		20	55	5	X	X	4	X	
13	T64-514		15	15	25	X	450	X	X	
14	T64-515		10	5	25	X	X	3	X	
15	T64-516		15	15	60	X	700	6	X	
16	T64-517		10	X	90	X	X	3	X	
17										
18										
19										
20										
21										
22										
23										
24										
25										

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

AUTHORISED OFFICER

REPORT CMS 83/2/14

Samples MRL 14.423 - MRL 14.434

Twelve samples were received for thin-section preparation and petrological description; carbonate stain tests were carried out on the offcuts where necessary, and thin-sections were examined under both stereobinocular and petrological microscopes. Each sample is briefly described in the accompanying table.

Summary

Samples T64/900-902 are weakly metamorphosed clastic sediments; it is inferred that they contained significant amounts of feldspars, and hence have been classified as meta-arkoses. They are generally pyritic and carbonaceous, suggesting deposition under reducing conditions. T64/903 is an incipiently metamorphosed orthoquartzite thought to be related to the other three rocks. No Sn minerals were detected, but unless the levels were relatively high, detection would be pure chance; crushing of the rocks and concentration would be necessary to track down any Sn sources. Logically, the quartz veins could be potential sources, but they seem to be virtually monomineralic.

Samples WA 1-1.to 5 and 1-8 are igneous rocks ranging from olivine basalt to andesites and microdiorites; the andesites and microdiorites are certainly genetically related, but the olivine basalt is believed to be unrelated or only distantly so; it is a typical Tertiary basalt.

WA 1-6 and 7 are chemical sediments composed of pelletal chert and fine dolomite (with minor clastic components) in varying proportions.

H.W. Fander, M. Sc.

Sample No.	Rock Type - Composition	Fabric	Minor Minerals	Comments
T 64/900 (T.S. 45260)	Meta-Arkose(?). A few larger quartz, chert grains in fine-sand-sized quartz, fibrous sericite after ?feldspar; leucoxenic films throughout.	Good preferred orientation, almost schistose. Medium-grained.	Detrital zircon, tourmaline, leucoxene. Some chert was dolomitic. Chalcedony veins.	Rock was originally a fine arkos or argillaceous siltstone/fine sandstone. Mildly metamorphosed only.
T 64/901	Meta-Arkose(?). Stretched, stressed grains of quartz and chert, aggregates of fibrous sericite; interstitial pyrite, carbonaceous films, and sericite.	Strong preferred orientation, relict clastic textures. Medium-grained.	Many quartz veins, mostly barren; some carry fine sulphides.	Pyrite probably syngenetic. No Sn minerals recognised, but more detailed investigation required.
T 64/902	Meta-Arkose(?). Stressed, partly recrystallized quartz grains, chert grains and sericite aggregates; many subparallel carbonaceous films.	Good preferred orientation. Medium-grained, well-sorted.	Small pyrite grains throughout. Carbon veins/layers. Quartz veins.	Fine ?pyrrhotite and ?chalcopyri also occurs. Closely resembles 900, 901. Mildly metamorphosed.
T 64/903	Stressed Orthoquartzite. Framework grains dominantly stressed quartz, with minor chert; quartz cement, thin intergranular sericite films.	Well-sorted, weakly bedded, medium-sand size. All stressed.	Quartz veins, predating stress. A few shale fragments. Carbon films, rare oxidised pyrite.	Probably related to the meta-arkoses. No indication of Sn minerals in rock (e.g. detrital cassiterite) or in veins.
WA 1-1	Porphyritic Olivine Basalt. Large phenocrysts of altered olivine, smaller labradorite and augite phenocrysts; groundmass of labradorite, pyroxene, dark glass, magnetite.	Subparallel alignment of phenocrysts and groundmass crystals.	Isolated small chlorite-filled amygdales. Some olivine preserved.	Featureless, typical Tertiary basalt. Altered olivine is now bowlingite-iddingsite (soft, bla
WA 1-2	Magnetite-Andesite. Scattered andesine phenocrysts, groundmass of small andesine laths, interstitial magnetite and devitrified glass.	Random fabric, no flow-features. Crystals in three distinct size ranges.	Small chlorite pseudomorphs after ferromagnesian minerals. Quartz and carbonate veins.	White phenocrysts are andesine. Fabric suggests intrusive rock, rapidly cooled (quench textures).
WA 1-3	Ferruginised Andesite. Clusters of andesine phenocrysts in fine groundmass of andesine, magnetite, glass; bands of fine hematite impregnating rock.	Random fabric with a few phenocrysts. Quench textures in groundmass.	Scattered chloritised ferromagnesian minerals, including ?olivine.	Hematitic banding is post-magmat and may be a type of "Liesegang Ring" effect. Rock correlates wi WA 1-2.
WA 1-4	Microdiorite. Mostly stubby andesine crystals with interstitial magnetite, chloritised ferromagnesian minerals, secondary carbonate; a few andesine phenocrysts.	Uniform, random fabric. Medium-grained, weakly porphyritic.	Conspicuous carbonate-hematite-chlorite veins. Relict augite.	Probably a coarser-grained equivalent of WA 1-2/1-3. Minor intrusive; deuterically altered.

035 277036

REGION: PROJECT No.: T640 PROSPECT: UYNYARD GRID CO-ORDS.: LOCAL A.M.G.

DESCRIPTION	Sample Type:	Rock Type:	Soil/Sediment Size Fraction: BURNIE 1:50,000		
T64/500	Rock Chip:	Black Shale, pyritic	from quarry	985496	Outcrop
501	" "	Sandstone black veins	" stream	"	"
502	" "	Black shale, pyritic	from stream	994436	"
503	" "	" "	" Quarry.	995436	"
504	" "	Vein of haematite/silica	"	"	"
505	" "	" "	pyrite on fractures in sandstone from Quarry.	"	"

ANALYSIS Laboratory ANALABS Batch No Date Analysed

Element / Rolling sample No	Cu	Pb	Zn	Ag	As	Sn	W		Sn check								
500	29	10	17	0.1	40	55	-		80								
501	54	4	20	-	20	190	-		200								
502	30	140	145	-	-	3	-										
503	25	105	125	-	-	3	-										
504	25	15	55	-	-	-	-										
505	25	25	45	-	50	4	-										

REMARKS: 500 same rock as 509. Re-analysed
501 " " " 506

Logged or Sampled by: S. Kerber Date:

THE BROKEN HILL PROPRIETARY CO. LTD.

GENERAL SAMPLE DESCRIPTION

Project No: Drawing No: A4-

Centre: Date:

036

LC0122

REGION: PROJECT Nº.: T640 PROSPECT: WYNYARD GRID CO-ORDS.: LOCAL A.M.G.

DESCRIPTION Sample Type: Rock Type: Soil/Sediment Size Fraction: BURNIE 1 50,000.

T64/ 506 - Rock Chip - Sandstone med. to coarse grained, black veining. Repeat of 502 985496 O.C

507 - " " - Phyllite : light tan, black veining. " O.C

508 - " " - Shale pyritic, black with qz / calcite veins. " O.C

509 - " " - Shale ? siliceous, black pyritic, veined Repeat of 508 " O.C

510 - " " - Sandstone siliceous. black isolated mineral. " O.C

511 - " " - Shale grey, black pyritic, siliceous. calcite veins. " O.C.

ANALYSIS Laboratory ANALABS Batch Nº Date Analysed.

element / Method / Sample Nº	Cu	Pb	Zn	Ag	As	Sn	W		Sn check								
506	15	10	25	-	-	-	-		4								
507	10	10	25	-	-	4	-										
508	15	-	20	-	-	-	-										
509	55	10	20	-	-	7	-		Y								
510	10	5	15	-	-	6	-										
511	30	10	20	-	-	3	-										

REMARKS: 506 and 509 re-analysed.

Logged or Sampled by: S.P. KERBER. Date:

THE BROKEN HILL PROPRIETARY CO. LTD.

GENERAL SAMPLE DESCRIPTION

Project Nº: Drawing Nº: A4-

Centre: Date:

037

27703S

REGION: PROJECT Nº.: T640 PROSPECT: LYNYARD GRID CO-ORDS.: LOCAL A.M.G.

DESCRIPTION Sample Type: Rock Type: Soil/Sediment Size Fraction: YOLLA 1:50,000

T64/	512 - Rock Chip: Sandstone, grey siliceous. adjacent to pyrite band.	946434	float
	513 - " " Pyrite vein 8" wide fine grained.	"	"
	514 - " " Pyrite pods in sandstone pebble. rounded.	945434	"
	515 - " " Sandstone siliceous. veined black mineral	946434	OC.
	516 - " " " veined pyritic, qtz pos boxwork.	945434	float
	517 - " " " "	"	"

ANALYSIS Laboratory ANALABS. Batch Nº Date Analysed

Element / Sample Nº	Cu	Pb	Zn	Ag	As	Sn	W
512	15	10	35	-	-	-	-
513	20	55	5	-	-	4	-
514	15	15	25	-	450	-	-
515	10	5	25	-	-	3	-
516	15	15	60	-	900	6	-
517	10	-	40	-	-	3	-

REMARKS:

Logged or Sampled by: S.P. KERBER. Date:

THE BROKEN HILL PROPRIETARY CO. LTD.

GENERAL SAMPLE DESCRIPTION

Project Nº: Drawing Nº: A4-

Centre: Date:

APPENDIX 3

HYDROGEOCHEMISTRY

WARATAH AND WYNYARD E.L.'S

NORTHWEST TASMANIA

039

277040

HYDROGEOCHEMISTRY

WARATAH AND WYNYARD EL'S

NORTH WEST TASMANIA.

G.WATMUFF

SENIOR GEOCHEMIST

SYDNEY.

WATER SAMPLING PROGRAMME AT WARATAH AND WYNYARD, TASMANIA.

1. INTRODUCTION.

Much of Watatah and Wynyard Exploration Licences in Tasmania are covered by a relatively thin veneer of Tertiary basalt anywhere from 0 to 100 + m thick. The underlying topography appears gently undulating and covered by patches of clean Tertiary quartz gravel locally containing carbonized wood fragments. This appears no more than a few meters thick in the Waratah area, but may be several tens of meters thick locally in the Wynyard EL south of Table Cape. Windows of older Cambrian and Pre cambrian rocks appear through the basalt forming low silicified hills in the Waratah area, rising above the basalt plain.

The target, tin mineralization of the Mt. Bischoff or Cleveland or Renison type, is sought in the Cambrain and Pre cambrian rocks below the gravel/ basalt cover. Present geophysical techniques are severely hampered in their effectiveness to detect mineralization under these conditions. Magnetic bodies will be masked by the strongly magnetic basalt. Aeromagnetic data may best serve to indicate the thin areas of basalt which possibly overlie topographic highs. These may represent more resistant silicified and ? mineralized rocks. Electrical methods may be effected by ground water which is encountered at or within a few meters of the surface the year round.

It was considered therefore that ground water sampling may be a useful approach to get information about the rocks below the basalt. A proposal was put to sample spring water around the scarp of the basalt plateau below the basalt/Cambrian-Pre cambrian sediments contact.

...../2

2. METHODS.

2.1 Time of sampling.

Sampling was carried out in March and April of 1982 at the end of the dry season (monthly rainfall distribution for three NW region centres is given in figure 1). This time was chosen because :

1) dilution of spring water from rainfall run-off was likely to be at a minimum,

2) the recharge rate is at its lowest thereby producing the highest salt content for the spring water and,

3) The springs still running at the end of the dry period are more likely to represent longer and therefore more significant groundwater flow paths than those springs that might run for a couple of days after a rain period.

2.2 Sampling Methods.

The samples were collected in one litre low density polyethylene bottles with plastic screw caps. Three samples were taken at each site, one only being acidified. The acidified and one non acidified samples were despatched to Allison Laboratories Ltd in Hobart and the other non acidified sample was retained for analysis at field base.

The bottles were rinsed with the sample twice in most cases before filling and where possible the bottles were completely filled. When filling, the mouth of the bottle was pointed in the direction from which the water flowed and filled slowly to avoid backwash contamination from the sampler's hand (a source of Na, Cl, Zn and possibly As). Where depth and rate of flow was very low a hole was dug by hand deep enough to immerse the bottle for filling. When the water had completely cleared of visible clay suspension the pool was deemed flushed and the sample carefully taken using a plastic glove to cover the sampler's hand.

.....3/

2.3 Bottle Preparation.

The bottles for sample collection were prepared by East Melbourne Laboratories Pty Ltd in Melbourne and transported by sea and road to field base camp. The acidified sample bottles were acid washed (method 3.2 E.P.A. (1979)) and a glass vial (also acid washed) containing 10ml of double distilled concentrated HNO_3 was placed in each bottle. The non-acidified sample bottles were given a normal wash (method 3.1 EPA (1979)).

The use of a glass vial of pure HNO_3 placed in the bottle prior to going into the field has been shown to reduce the risk of contamination considerably. (Guest and Blutstein (1981)). It is obviously more convenient (and much less dangerous!) than carrying a separate dispenser of concentrated HNO_3 on a difficult bush traverse. The glass vials are simply broken inside the bottles immediately after they have been filled with the sample and sealed by giving the portion of the bottle in contact with the vial a sharp tap from the outside. The bottle is then shaken to disperse the acid.

2.4 Site Analyses.

Four parameters were determined on site : water temperature, conductivity, pH and dissolved oxygen. Conductivity was determined using a TPS LC 81 conductivity meter and K = 1 electrode. pH and dissolved oxygen were determined with an Orion 407 A specific ion meter using an Orion model 91 - 62 glass electrode (pH) and an Orion model 97 - 08 oxygen electrode. The electrodes were calibrated on site before each measurement.

The oxygen electrode is temperature compensating giving corrected dissolved oxygen values even though the temperature of the standardizing medium (water saturated air) is different from the sample temperature. The pH electrode is not temperature compensating but the difference between

.....4/

standards and unknowns did not exceed 10°C and was usually about 5°C. This will produce an error of no more than about 0.05 pH units in the temperature range encountered.

The conductivity electrode was calibrated on 25.4 ppm and 254 ppm NaCl solutions (reading 53.8 and 520μS at 25°C respectively) before going into the field. Only the 25.4 ppm NaCl calibration was used as most waters were found to have conductivities between 30 and 170μS. All conductivity values are temperature corrected to 25°C. Other notes made at each site included an estimation of the average width and depth of the water flow, vegetation, types of rock fragments in the stream bed and any visible outcrop.

2.5 Field Base Analyses.

Five parameters were determined at base camp - pH, HCO_3^-, Ca^{2+}, Na^+ and Cl^-, In addition the temperature for the HCO_3^- determination was noted. The pH was too low (< 8.3) in all cases for any significant CO_3^{2-} species to be present.

Bicarbonate was determined by plotting potentiometric titration curves for each sample. The Orion 407 A specific ion meter and model 91 - 62 glass pH electrode was used and the titration was carried out on 100ml of unknown solution using a 10ml microburette delivering 0.0207 N H_2SO_4. In each case the titration was carried to below pH 4.5 The inflection point usually occuring at about pH 5.0 was noted and the amount of acid consumed used to calculate the HCO_3^- content.

Calcium,sodium and chloride were all determined using appropriate specific ion electrodes. Complexing was considered likely in the case of Ca^{2+} and therefore the standard addition method was used. Calcium

.....5/

will form complexes with HCO_3^- and SO_4^{2-} which cannot be detected with the Ca electrode using the direct reading method. Only free Ca^{2+} ions are detected. It was found in the two cases checked that the standard addition method gave values about 10% higher than the direct method. This proportion of complexing is typical for solutions of this concentration.

Sodium and chloride do not form significant complexes under normal solution conditions. Potentiometric titration for dissolved CO_2 using 0.0454 N Na_2CO_3 was carried out on a few samples and as expected yielded levels closely approximating those of water in equilibrium with the atmosphere. None of the samples could be collected close enough to the point of groundwater emergence to give values of the true ground water levels.

3.0 RESULTS.

3.1 Site and Field Base Analyses.

Site and field base analyses are summarized on the analysis sheets (Appendix 1).

3.1.1 Water Temperature.

Field water temperatures are significantly below maximum daily air temperature by between 5 and 10°C and most commonly in the range of 10 to 12°C.

3.1.2 pH.

Field pH is mostly in the range 6.3 to 7.6 Four samples occured in the range 4.7 to 6.0, but each had oxygen levels below those for water in atmospheric equilibrium and flow cross-sections less than

.....6/

$5cm^2$ (figure 2). It is likely that this water is in various degrees of stagnation and has significant humic acid content. Even within the common range of pH the deviation from saturation with atmospheric oxygen is broadly related to pH. The median pH for water at atmospheric equilibrium is about 7.2 Water containing 0.75 ppm oxygen less than saturation has a median pH of 6.6 (figure 3).

The difference between base camp determined pH and field site determined pH is 0.05 $\pm$ 0.19 (1σ) pH units, the field site determinations being the lower on average .

3.1.3 Conductivity.

Conductivities ranged between 30 and 170 uS with the exception of 007W, mine adit water from Mt. Bischoff. Here the conductivity was extremely variable, depending where the electrode was placed in the pool of water.

3.1.4 Free CO_2.

Free CO_2 was determined on 8 samples and these generally agreed with the nomographically determined values at base camp temperature, pH and HCO_3'. The determinations were carried out potentiometrically using 0.0454 M Na_2CO_3. The determinations were discontinued as it was considered that the CO_2 content of the water would be at equilibrium with the atmosphere and any deviation was likely to be biological rather than a reflection of original groundwater levels.

3.1.5 Calcium, Sodium, Chloride.

Calcium ranged from 1ppm to 7.2ppm and there is no detectable difference between the Waratah and Wynyard samples. In contrast Na is higher in the Wynyard streams (11.5 to 23 ppm) compared to Waratah (4.5 to 9.9 ppm)

.....7/

possibly reflecting the influence of sea spray.

Although chloride determinations were not completed for the Wynyard samples a similar area bias is suggested by the available chloride and conductivity data.

There is no apparent correlation between rock type and Na/Ca or Ca/Conductivity ratios or absolute Ca or Na values in either exploration licence. Hence it is difficult to relate the water back to rock type.

3.2 Laboratory Analyses.

The samples were all submitted to Allison Laboratories Pty Ltd in Hobart for analysis. The non acidified samples were analysed for Na, K, Cl', SO_4", HCO_3', F', pH, conductivity and in most cases Ca and Mg. The acidified samples were analysed for Cu, Pb, Zn, Fe, Ca, Mg, F, As and in some cases Na. The analyses were carried out generally in accord with APHA "Standard Methods for the Examination of Water and Waste Water" 14th Edition (1975).

Corresponding laboratory and field analyses are shown on the sample analysis sheets (Appendix 1).

3.2.1 pH

The pH values show no more than 0.5 pH units difference between field and laboratory determinations and are mostly within 0.1 or 0.2 pH units of each other.

3.2.2 Conductivity.

The field conductivity measurements are about 10% higher than the

...../8

laboratory conductivity measurements over the entire range (30 to 170 microsiemens (uS) @ 25°C) (fig.4). This suggests a calibration difference. The field instrument was calibrated at 53.8 uS for a 25.4 ppm NaCl solution and an automatic temperature compensation coefficient of -2.2%/°C.

3.2.3 Sodium.

Sodium shows an absolute error of 1.6 ppm over the range 3 to 21 ppm (fig.4). This may be explained by the presence of 1.6 ppm Na in the distilled water used to prepare the standard solutions for the field determinations.

3.2.4 Calcium.

Agreement for calcium is poor (fig.4) variation being anywhere between a factor of 1 and 2. Agreement between Ca determined on acidified and non-acidified sample pairs determined by the laboratory is much better, but leaves a little to be desired - of the 14 determinations, 11 non acidified samples returned higher values than their respective acidified samples and 2 were lower. This problem needs further investigation.

3.2.5 Chloride.

Field chloride determinations are higher than the laboratory by between 10 and 30% in most cases (fig.4). This is somewhat puzzling as the chloride electrode showed good response time and little tendency to drift. Chloride does not have complexing tendencies and is not significantly affected by even several months of storage so the variation is not readily explicable.

3.2.6 Bicarbonate.

The bicarbonate values show fairly good agreement. A laboratory vs field plot (fig.4) shows a linear array of points which is slightly deviant from

...../9

the 1:1 line.

3.2.7 Potassium and Magnesium.

Potassium and magnesium range from 0.3 to 1.3 ppm and 0.9 to 5.7 ppm respectively. No correlation is apparent between rock type and K or Mg content. Values for both species are clearly higher in the Wynyard EL than Waratah EL.

3.2.7 Base Metals : Copper, Lead, Zinc.

Values are generally below detection for Cu (1 ppb) and Pb (10 ppb). Zinc gave a background range of 2-7 ppb. The acid blank contained below-detection Cu and Pb and 2 ppb Zn.

Apart from the mine adit sample (007W) from Mt. Bischoff, the only sample anomalous in any of the base metals was 029W from the Wynyard EL, with 84 ppb Zn. This value is an order of magnitude higher than the upper limit of the background range and should be followed up with more detailed sampling.

Lead is below saturation with respect to $PbCO_3$ and $PbSO_4$ in all samples and similarly Cu and Zn are below saturation with respect to their sulphates, simple carbonates and malachite.

3.2.8 Iron.

Values range from 0.08 to 1.3 ppm with the exception of the mine adit sample at 14 ppm. The iron is in excess of that expected if it was in equilibrium with ferric hydroxide. It therefore appears that most of the iron detected is in the ferrous state and would be well below saturation with respect to ferrous hydroxide.

There is no relationship between stream flow section or pH and iron content, nor is there any relationship between rock type and Fe/conductivity ratio.

...../10

3.2.9 Fluoride.

Levels ranged from 0.05 ppm to 0.25 ppm in the natural stream water. A value of 1.2 ppm was obtained for the Mt. Bischoff mine adit sample. All values were below CaF_2 saturation by one to three orders of magnitude. No significant difference was noted between the values from the two EL's and no relationship between rock type and F' level was observed.

3.2.10 Arsenic.

Arsenic has been determined on six samples and because the mine adit sample (0.14 ppm) was in excess of the detection limit (0.02 ppm), no further analyses have been carried out until a more sensitive method is devised.

3.2.11 Sulphate.

All values are below detection (0.2 ppm).

Apparently genuine analytical difficulties exist for lowering the detection limits of the latter two species. Normally As can be determined down to 1-2 ppb but for some reason poisoning of an analytical reagent (Zn) seems to be occuring. Barium chloranalate is used to provide a very sensitive technique for SO_4^{2-} determination, however this chemical has not been obtainable in Australia and shipment from overseas is awaited. The classic turbidometric method is limited to about 100-200 ppb SO_4^{2-} detection.

3.3 Water Characterization.

The waters could not be charaterized in relation to rock type. Plots of K, Na-Fe-Mg,Ca ; Na-K-Ca; Fe-K-Ca and Ca-Fe-Mg (figs.5, 6, 7) revealed no meaningful separation of waters sampled from streams containing dominantly sediment and dominantly basalt fragments.

...../11

3.4 Contamination.

A contamination study was made for the trace components. An acid blank was analysed and returned $<$0.001 %Cu, $<$0.01 %Pb, 0.002 % Zn, 0.004 % Fe. Ca, Mg and Na were not detected. Another acidified sample was sent which had been deliberately contaminated by pouring distilled water over human hands and allowing the water to run directly into the sample bottle. This sample returned 0.001 % Cu, $<$ 0.01 % Pb, 0.005 % Zn and 0.008 % Fe. Mg and Ca were less than 0.1 ppm (detection).

3.5 Charge Balance.

A complete charge balance for all major species is given in Table 1. The figures are calculated from the values obtained by Allison Laboratories. No significant SO_4^{2-} species have been detected by the turbidametric method, however the high net positive charge balance suggests the presence of some negative species. An improved analytical technique may show this indeed to be sulphate although the presence of nitrate cannot be ruled out.

4.0 Conclusions.

A real Zn anomaly of 84 ppb exists at sample site 029W in the Wynyard EL and should be followed up. No other anomalous results were obtained and all species with the exception of Fe appear to be at sub saturation levels.

REFERENCES.

1. Environmental Protection Authority (E.P.A.) of Victoria.
1979 : A Guide to the Sampling and Analysis of Water and Wastewater.
Publication 95/79. 42p.

2. Guest, R.L. and Blutstein, H.
1981 : Delivery of Acid Preservative for Trace Metal Determinations
in Waters. Analytical Chemistry 53, 727 - 731.

TABLE 1 :

FILE DESCRIPTION : LABORATORY DETERMINATIONS SURFACE WATER WARATAH/WYNYARD EL's TASMANIA

Sample no.	Fe2+(epm)	Ca2+(epm)	Mg2+(epm)	K+(epm)	Na+(epm)	Cl-(epm)	HCO3-(epm)	F-(epm)	SO4--(epm)	NETT
26	0.01	0.07	0.30	0.02	0.68	0.62	0.15	0.01	0.00	0.30
27	0.02	0.03	0.28	0.02	0.71	0.59	0.05	0.01	0.00	0.41
28	0.05	0.07	0.35	0.03	0.64	0.37	0.49	0.01	0.00	0.27
29	0.01	0.09	0.42	0.03	0.82	0.59	0.33	0.01	0.00	0.44
30	0.02	0.09	0.35	0.03	0.90	0.62	0.40	0.01	0.00	0.35
31	0.01	0.19	0.37	0.03	0.52	0.37	0.45	0.01	0.00	0.30
32	0.02	0.26	0.47	0.02	0.73	0.65	0.39	0.01	0.00	0.45
33	0.02	0.06	0.25	0.01	0.64	0.65	0.05*	0.01	0.00	0.37
34	0.02	0.11	0.31	0.02	0.55	0.45	0.28	0.01	0.00	0.28
35	0.01	0.20	0.40	0.03	0.46	0.34	0.57	0.01	0.00	0.18
36	0.01	0.17	0.40	0.03	0.74	0.54	0.51	0.01	0.00	0.30

* : H^+

\+ : Zn^{2+} + Cu^{2+} included

053

277054

FIG. 1

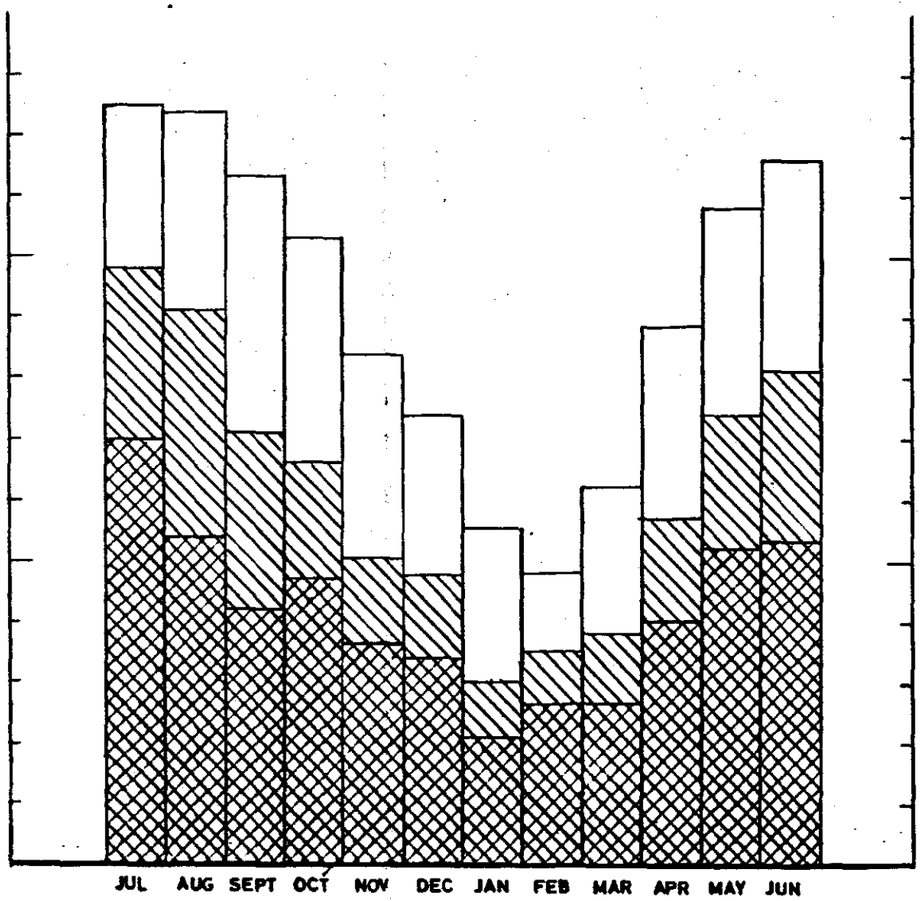
WARATAH 1882 - 1973

YOLLA 1905 - 1979

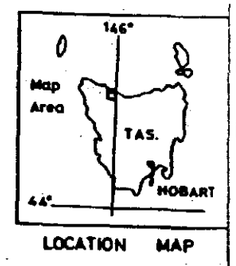
BURNIE 1944 - 1980

Graph of Average Monthly Rainfall

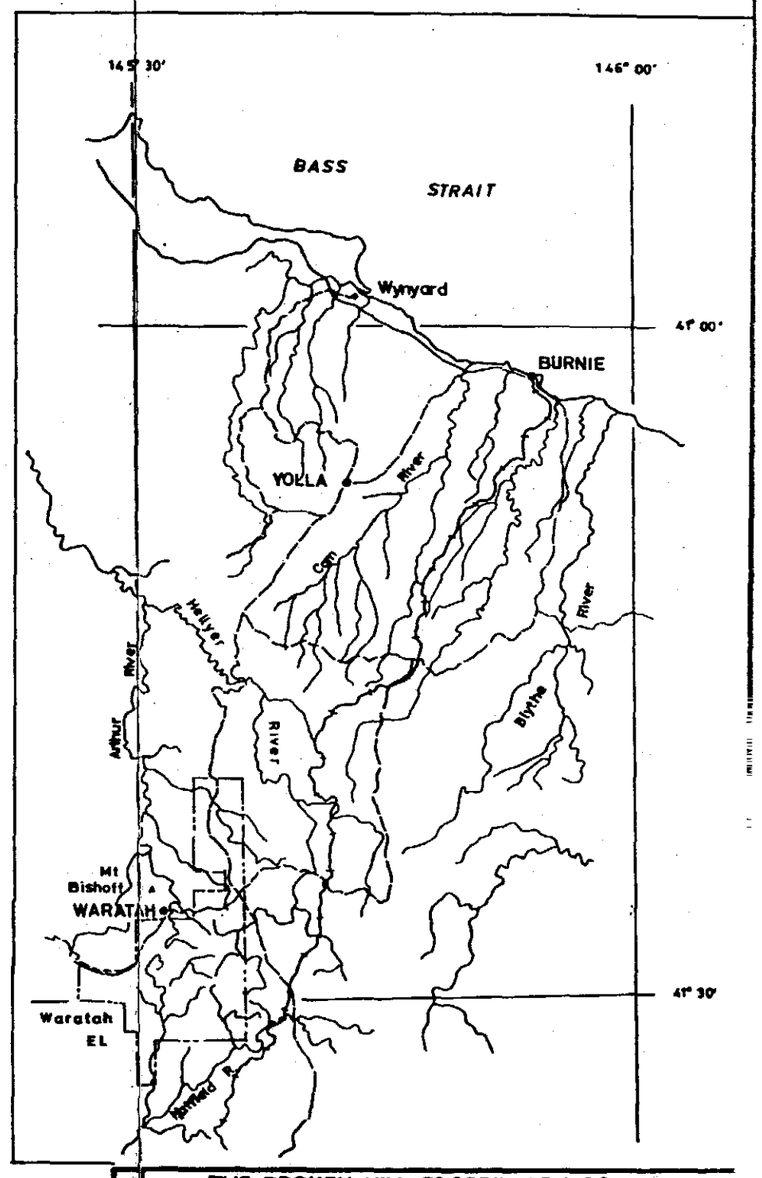
WARATAH - YOLLA - BURNIE DISTRICT



DATA FROM BUREAU OF METEOROLOGY



LOCATION MAP



5 cm

T.N.

ROAD

RAILWAY

RIVER

Map copied from TASMANIA 1:500 000

0 10 20 30 Km

SCALE 1:500 000

THE BROKEN HILL PROPRIETARY CO. LTD.

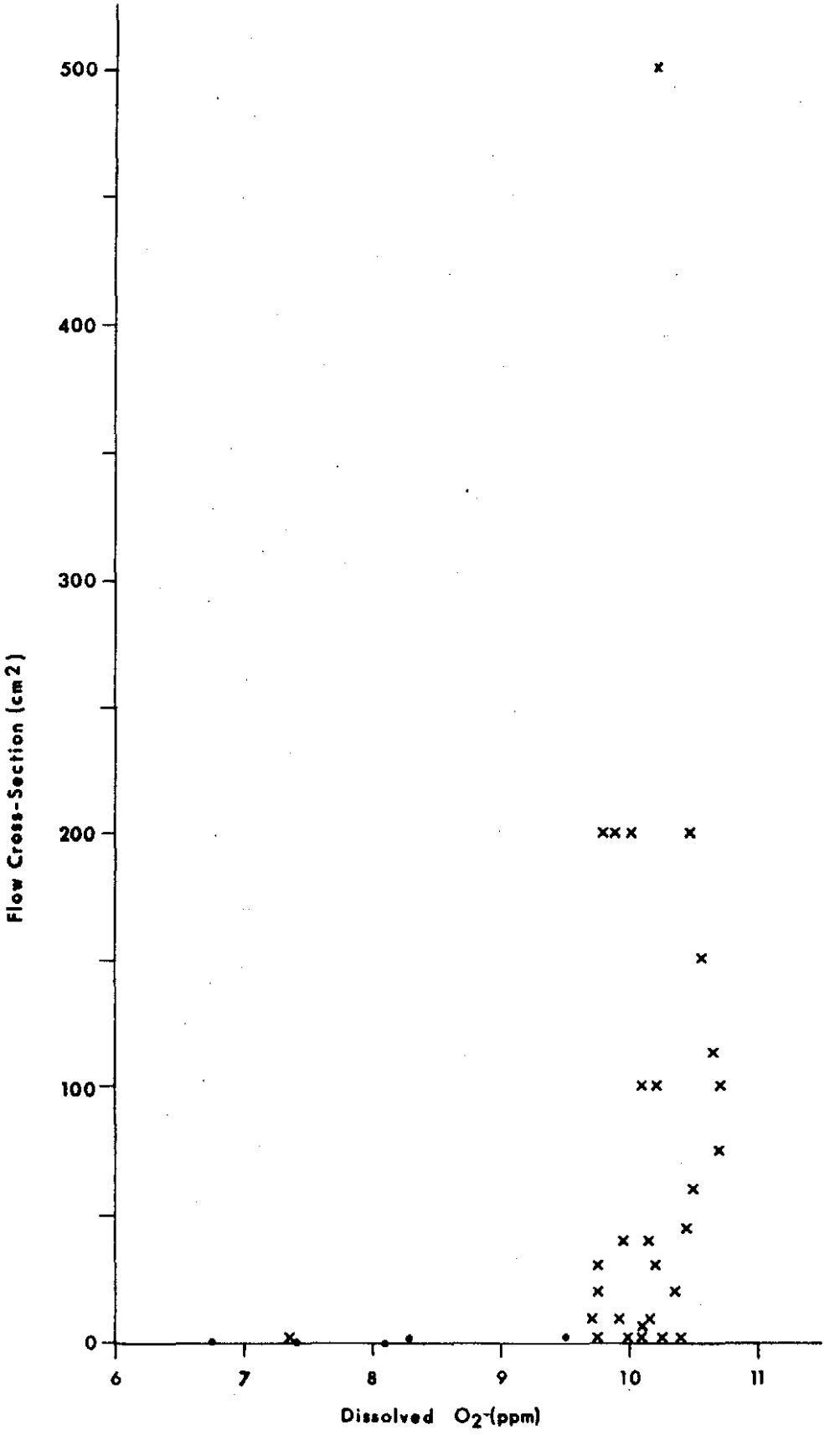
EXPLORATION DEPARTMENT

MONTHLY AVERAGE RAINFALL

N.W. TASMANIA

Revisions:	Prepared by : G. WATHUFF	Centre : SYDNEY
	Date : 25.11.81	Project No.
	Drawn : M. TSIANDARLIS	Drawing No. A3_

277055 FIG. 2



Flow Cross-Section vs Dissolved O_2

• pH < 6·0

× pH > 6·0

Centre: SYDNEY.

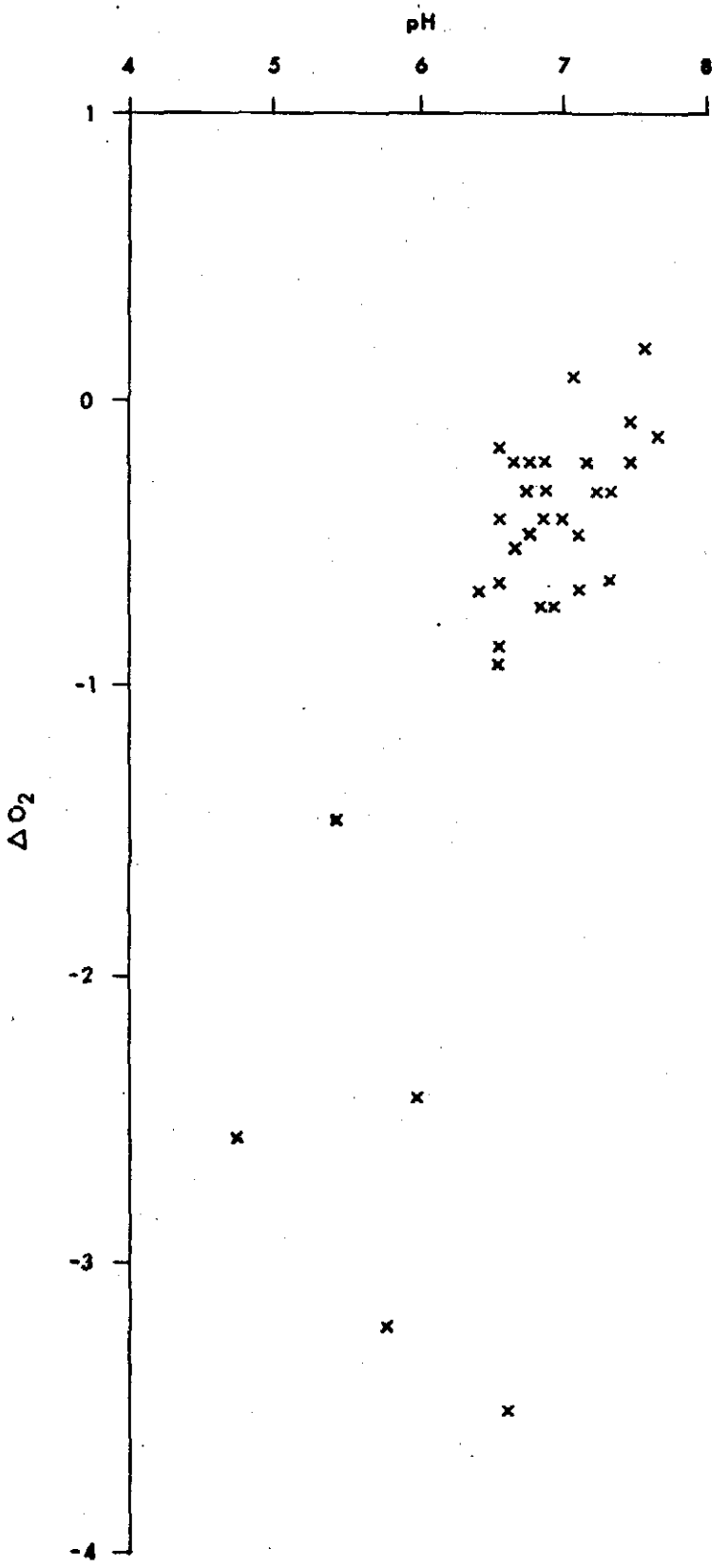
Date: 19-04-1982

THE BROKEN HILL PROPRIETARY CO. LTD.

WARATAH-WYNYARD SPRING WATER

Project No: T650, T640.

Drawing No: A4-



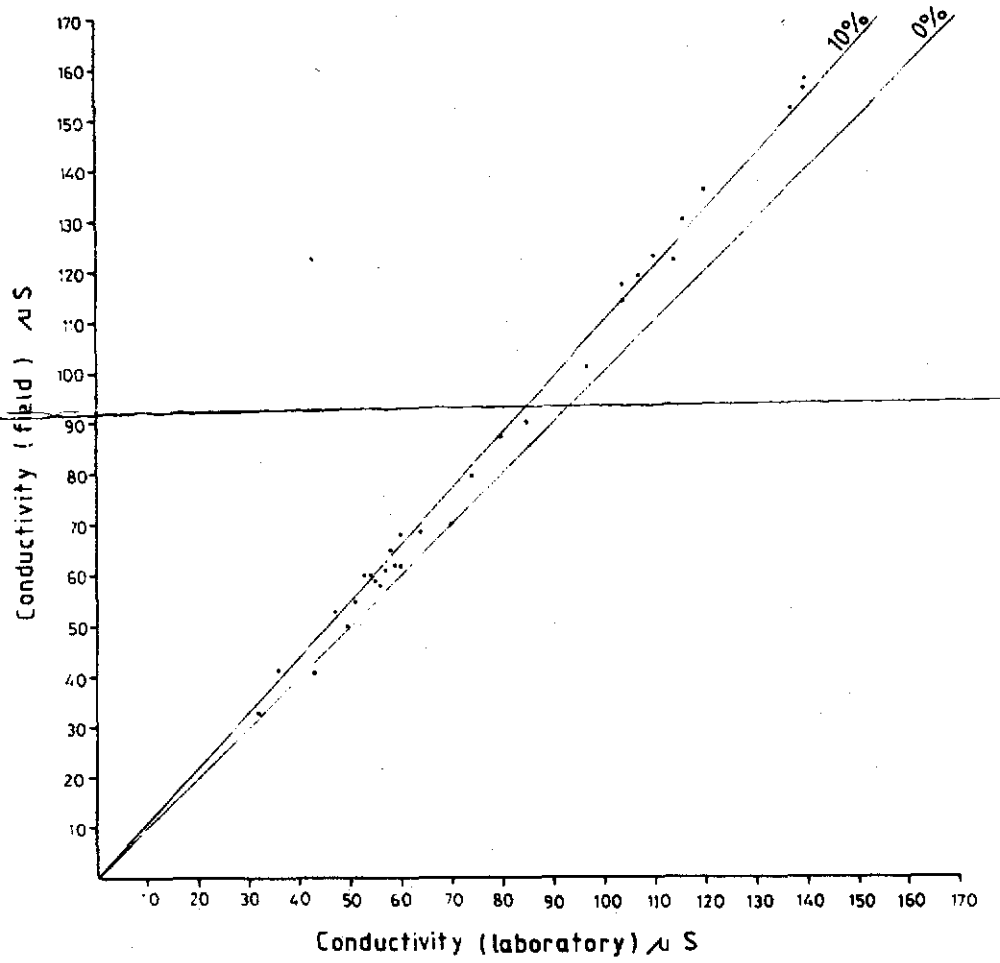
ΔO_2 vs pH

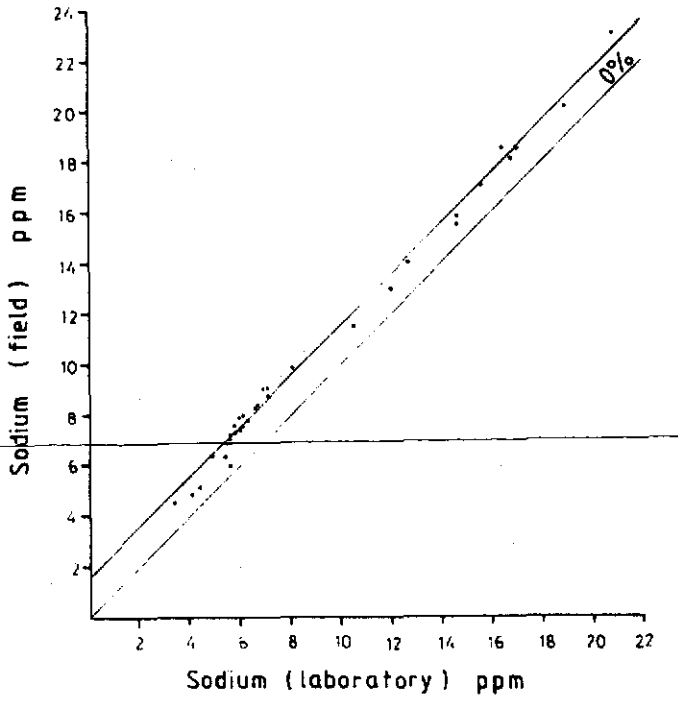
(ΔO_2 = O_2 measured (ppm) — O_2 at saturation (ppm))

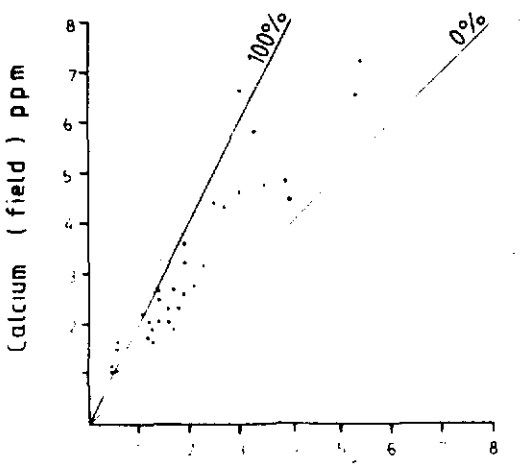
Centre: SYDNEY.	THE BROKEN HILL PROPRIETARY CO. LTD.	Project No: T650. J640.
Date: 19·04·1982.	WARATAH-WYNYARD SPRING WATER	Drawing No: A4-

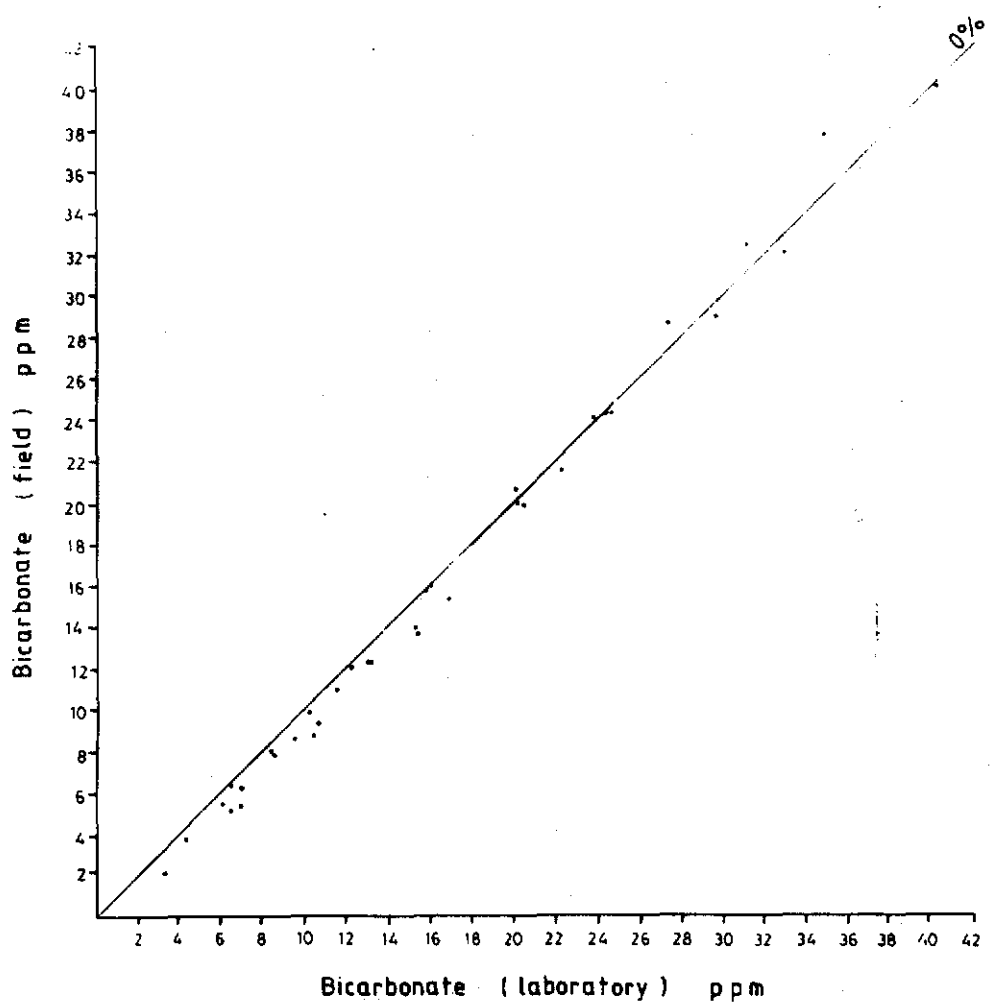
27705?

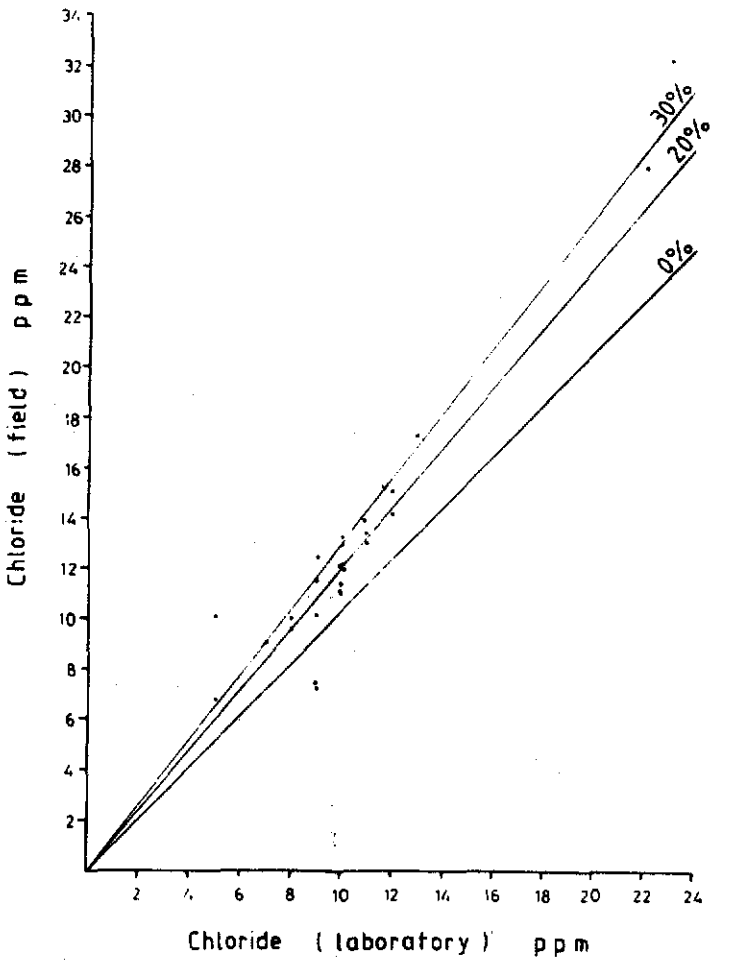
Fig 4











THE BROKEN HILL PROPRIETARY CO. LTD. EXPLORATION DEPARTMENT			
Field vs Laboratory Determinations Conductivity Ca Na HCO_3 Cl			
Revisions:	Drawn: G W	Date: 10 June 82	Centre: SYDNEY
	Traced: D S	Project No.	Drawing No. A2-
	Checked:		

Centre SYD

Date 12/6/82

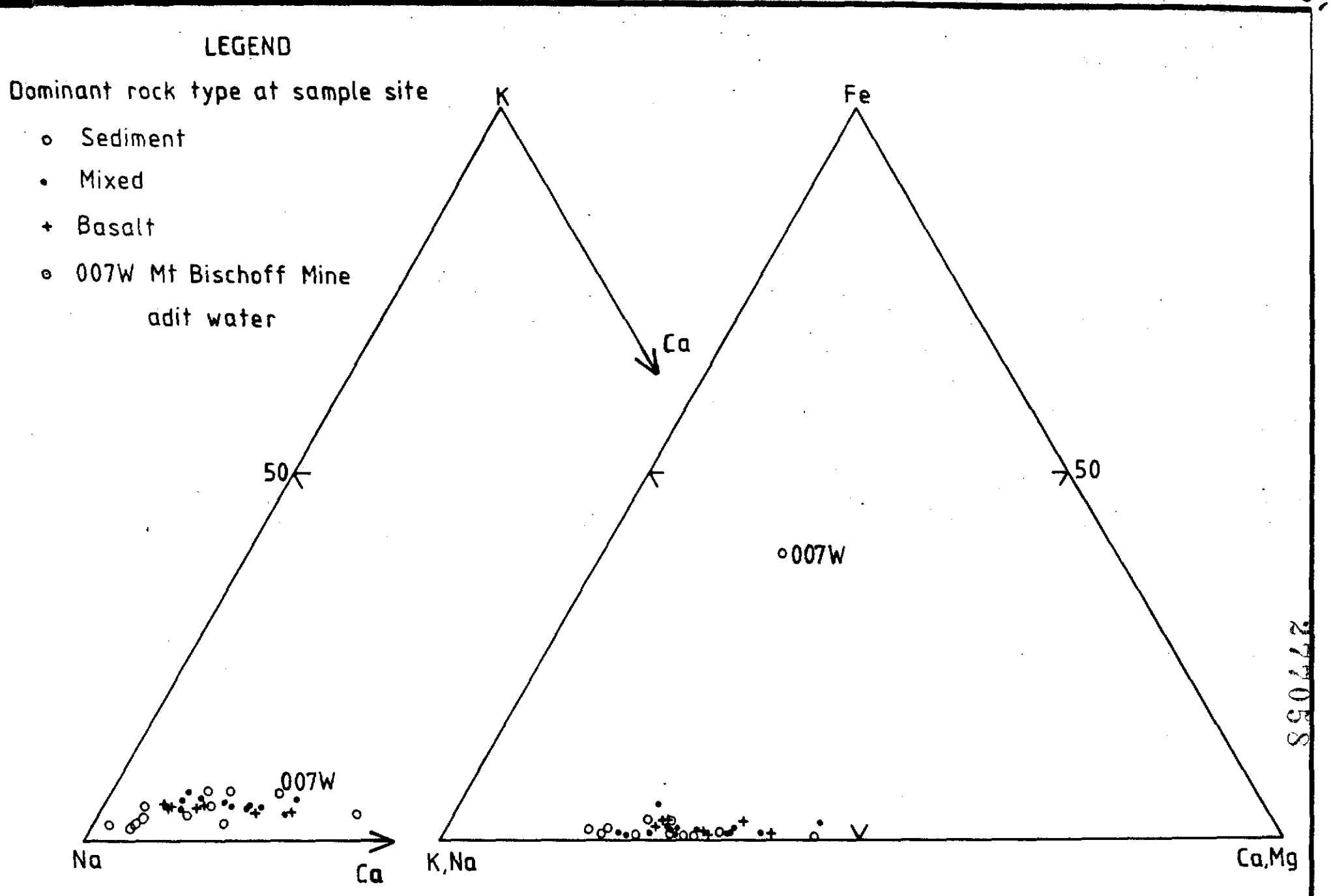
EL 23 and 33/79 WYNYARD and WARATAH

ATOMIC Na-K-Ca and AFM PLOTS FOR WATERS

THE BROKEN HILL PROPRIETARY CO. LTD.

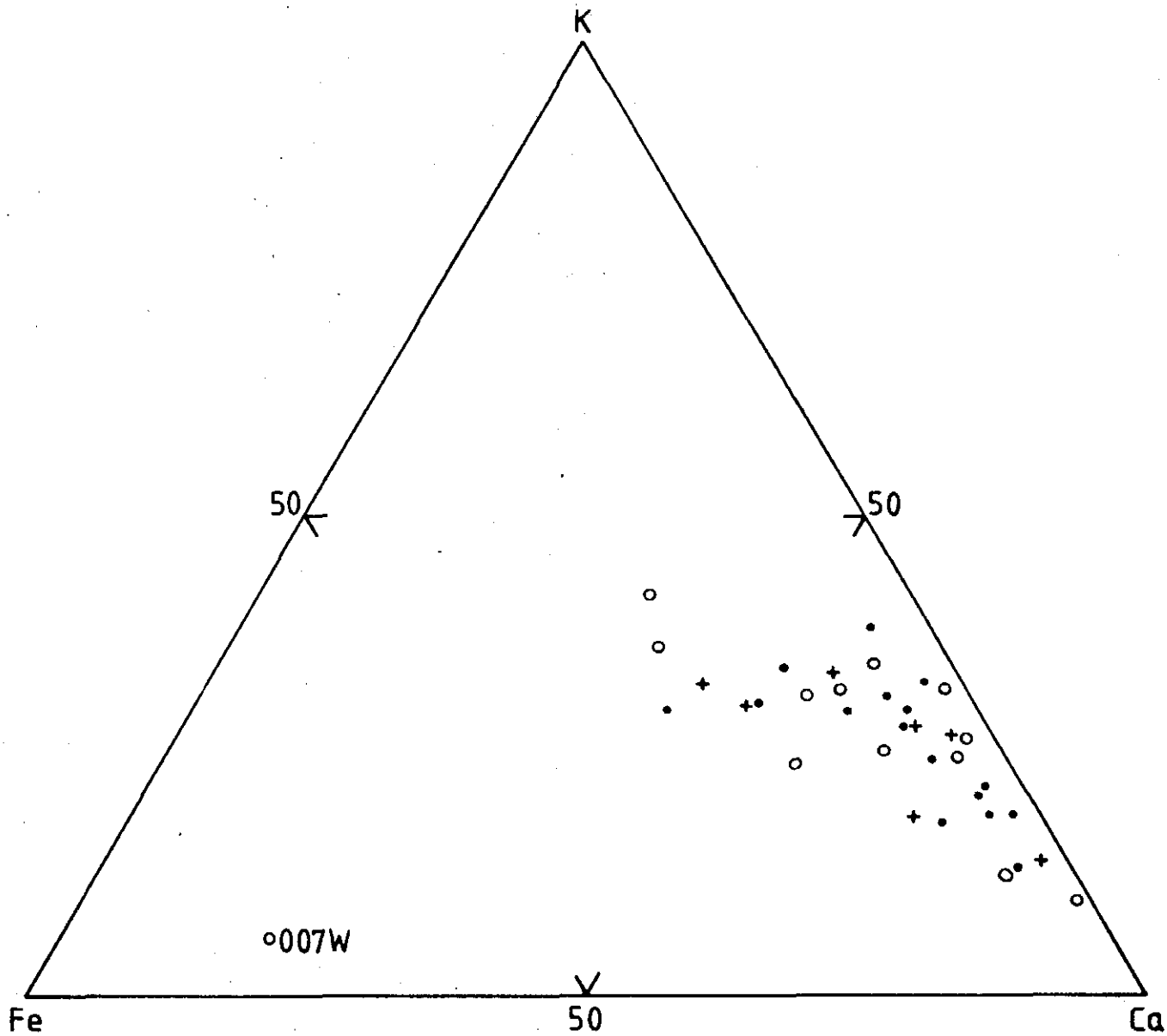
Project No.

Drawing No.



27705S

FIG.



LEGEND

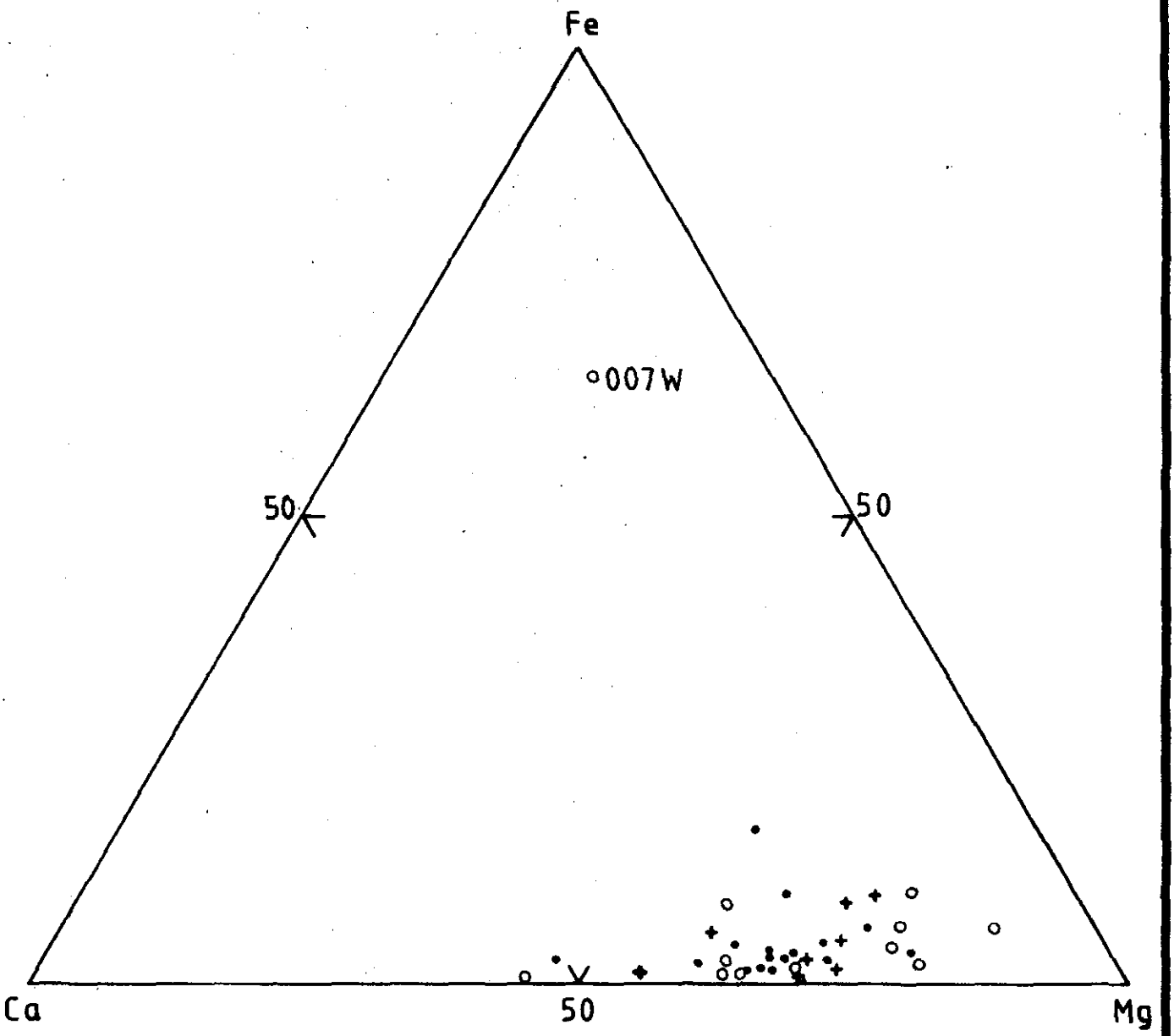
Dominant rock type at sample site

- ○ Sediment
- • Mixed
- \+ Basalt
- ○ 007W Mt Bischoff Mine adit water

Centre SYD	THE BROKEN HILL PROPRIETARY CO. LTD.	Project No.
Date 12/6/82	EL 23/79 and 33/79 WYNYARD and WARATAH ATOMIC Fe-K-Ca PLOT FOR WATER SAMPLES	Drawing No.

059

277060 FIG.7



LEGEND

Dominant rock type at sample site

- ○ Sediment
- • Mixed
- + Basalt
- ○ 007W Mt Bischoff Mine adit water

Centre SYD	THE BROKEN HILL PROPRIETARY CO. LTD.	Project No.
Date 12/6/82.	EL 23/79 and 33/79 WYNYARD and WARATAH ATOMIC Ca-Fe-Mg PLOT FOR WATER SAMPLES	Drawing No.

APPENDIX 1

SAMPLE DESCRIPTIONS.

AREA... W.Y.N.Y.P.A.W. ... WATER SAMPLE ANALYSIS SHEET.

CODE... 7.7.4. ...

277062 061

Sample No	Site	Temp.	pH	Cond.	O_2	Free CO_2	Ca	Cl	Na	Alk	HCO_3'	CO_3''	CO_2 tot	Comments
026W	Field	10	6.5	122	10.15		2.02	27.9	17.0	5.6	106	0		20 x 2 cm flow 6/4/8 c Tree ferns, sassafras Sediment & some basalt fragm Some vein qtz.
	Lab.		6.5_2	114			1.4	22	15.6		9.3			
027W	Field	11	5.4	130	9.5		1.04		18.5	1.1	2.1	0		2 x 1 cm flow 6/4/8 Tree ferns, sassafras Sediment fragments & outcrops
	Lab.		5.8_8	116			0.6	21	16.4		3.3			
028W	Field	12	7.4	119	10.5		2.48	17.3	15.5	24.4	29.0	0		20 x 3cm flow. Sample taken 6/4 just below water fall Sediment outcrops Tree ferns, sassafras, eucalypts
	Lab.		7.1_0	107			1.4	13	14.6		29.6			
029W	Field	12	6.5	156	9.75		2.56		20.1	17.1	20.5	0		30 x 1 cm flow 6/4 Sediment, quartz fragments Tree ferns, eucalypts
	Lab.		6.5_8	140			1.9	21	18.9		20.0			
030W	Field	12	7.05	158	9.95		2.32		23.0	20.6	24.2	0		20 x 2 cm flow (approx) 6/4/ Sediment fragments Tree ferns, sassafras
	Lab.		7.0_3	140			1.8	22	20.8		24.4			
031W	Field	11	7.2	123	10.55		4.85		13.0	23.7	28.7	0		100 x 1.5 cm flow 7/4/ Basalt, sediment fragments Sediment outcrops Tree ferns.
	Lab.		7.2_0	110			3.9	13	12.0		27.3			
032W	Field	11	6.6	170	7.35		6.53		18.1	19.7	24.0	0		3 x 1 cm flow 7/4/8 Sediment outcrops Tree ferns
	Lab.		7.0_0	154			5.3	23	16.7		23.8			
033W	Field	11	4.7	136	8.3		1.74	32.2	15.8	0	0	0		3 x 1 cm flow 7/4/ Quartz, sediment (& quartz) fragm Tree ferns, eucalypts, sassafr
	Lab.		4.2_5	120			1.2	23	14.6	Acidity 10.8				
034W	Field	11	6.8	117.5	10.15		3.16		14.0	12.7	15.3	0		5 x 2 cm flow 7/4/8 Sediment & quartz fragments Phyllitic outcrops
	Lab.		6.6_9	104			2.3	16	12.7		16.8			
035W	Field	12.3	7.5	114	10.7		4.47		11.5	31.1	37.8	0		50 x 2 cm flow 7/4/8 Sediment, basalt, vein qtz fragments. Blackberry, tree fer eucalypts, bracken fern
	Lab.		7.2_6	104			4.0	12	10.5		34.8			
		°C		micro-siemens	ppm		ppm	ppm	ppm	ppm $CaCO_3$	ppm	ppm	ppm	

APPENDIX 2.

LABORATORY ANALYSIS SHEETS.

063

277064

ALLISON LABORATORIES

4 WARWICK STREET, HOBART TASMANIA 7000
TELEPHONE: (002) 34 7681

- APPLIED RESEARCH AND DEVELOPMENT
- INDUSTRIAL AND AGRICULTURAL ANALYSIS
- TANK AND CARGO SURVEYS
- EFFLUENT ANALYSIS

Our ref 29008/19

Dr G Watmuff
BHP Minerals Ltd
20 O'Connell Street
SYDNEY .. NSW .. 2000

ANALYSIS OF WATER SAMPLES

12 water samples contained in 1L (nominal) poly bottles and labelled as shown hereunder were received on 8/4/82. The contents were analysed by methods generally in accord with the APHA "Standard Methods for the Examination of Water and Wastewater" 14th Ed. (1975), details of which are available on request. The results of these analyses were as follows: (except for pH and conductivity, all figures are mgm/L)

	K	Na	Cl^-	pH	Cond µS	HCO_3^-
WO26	0.7	15.6	22	6.5	114	7.6
WO27	0.7	16.4	21	5.8	116	2.7
WO28	1.3	14.6	13	7.1	107	24.3
WO29	1.1	18.9	21	6.5	140	16.4
WO30	1.0	20.8	22	7.0	140	20.0
WO31	1.1	12.0	13	7.2	110	22.4
WO32	0.8	16.7	23	7.0	154	19.5
WO33	0.5	14.6	23	4.2	120	NIL ACIDITY 10.8
WO34	0.9	12.7	16	6.6	104	13.8
WO35	1.1	10.5	12	7.2	104	28.5
WO36	1.2	17.0	19	7.2	137	25.5

G F ALLISON
CHARTERED CHEMIST (AUSTRALIA)

REPORT NO 8877

ISSUED 20 May 1982

064

277065

ALLISON LABORATORIES

4 WARWICK STREET, HOBART TASMANIA 7000
TELEPHONE: (002) 34 7681

- APPLIED RESEARCH AND DEVELOPMENT
- INDUSTRIAL AND AGRICULTURAL ANALYSIS
- TANK AND CARGO SURVEYS
- EFFLUENT ANALYSIS

Our ref 29008/19

Dr G Watmuff
BHP Minerals Ltd
20 O'Connell Street
SYDNEY .. NSW .. 2000

ANALYSIS OF WATER SAMPLES

12 water samples contained in 1L (nominal) poly bottles and labelled as shown hereunder were received on 8/4/82. The contents were analysed by methods generally in accord with the APHA "Standard Methods for the Examination of Water and Wastewater" 14th Ed. (1975), details of which are available on request. The results of these analyses were as follows: (except for pH and conductivity, all figures are mgm/L)

	Cu	Pb	Zn	Fe	Ca	Mg
WO26A	0.001	<0.01	0.005	0.39	1.4	3.7
WO27A	<0.001	<0.01	0.006	0.56	0.6	3.4
WO28A	0.001	<0.01	0.004	1.3	1.4	4.3
WO29A	<0.001	<0.01	0.084	0.32	1.9	5.1
WO30A	<0.001	<0.01	0.004	0.50	1.8	4.2
WO31A	0.001	<0.01	0.003	0.25	3.9	4.5
WO32A	0.001	<0.01	0.004	0.59	5.3	5.7
WO33A	0.001	<0.01	0.005	0.58	1.2	3.1
WO34A	0.001	<0.01	0.002	0.55	2.3	3.8
WO35A	<0.001	<0.01	0.003	0.33	4.0	4.9
WO36A	0.001	<0.01	0.006	0.32	3.5	4.9
WO37A	0.001	<0.01	0.005	0.008	<0.1	<0.1

G F ALLISON
CHARTERED CHEMIST (AUSTRALIA)

REPORT NO 8876

ISSUED 20 May 1982

065

277066

ALLISON LABORATORIES

4 WARWICK STREET, HOBART TASMANIA 7000
TELEPHONE: (002) 34 7681

- APPLIED RESEARCH AND DEVELOPMENT
- INDUSTRIAL AND AGRICULTURAL ANALYSIS
- TANK AND CARGO SURVEYS
- EFFLUENT ANALYSIS

Our refs: 28174/84
28809/22
29008/19

Dr G Watmuff
Senior Geochemist
BHP Minerals Ltd
20 O'Connell Street
SYDNEY

ANALYSIS OF WATER SAMPLES - FLUORIDE

36 water samples contained in 1L poly bottles and labelled as shown hereunder were received 24 March, 2 April and 8 April 1982. The samples were analysed for fluoride by APHA "Standard Methods for the Examination of Water & Wastewater" 14th Ed. (1975), Method 414 C modified in this laboratory.

Results are expressed in mgm/L:

LABEL	F^-
WO26	0.14
027	0.12
028	0.25
029	0.20
030	0.20
031	0.12
032	0.11
033	0.11
034	0.17
035	0.13
036	0.14

G F ALLISON
CHARTERED CHEMIST (AUSTRALIA)

REPORT NO 8981
ISSUED 31 August 1982

NATA

Copy sent to Hobart office

066

277067

ALLISON LABORATORIES

4 WARWICK STREET, HOBART TASMANIA 7000
TELEPHONE: (002) 34 7681

- APPLIED RESEARCH AND DEVELOPMENT
- INDUSTRIAL AND AGRICULTURAL ANALYSIS
- TANK AND CARGO SURVEYS
- EFFLUENT ANALYSIS

Our refs: 28174/84
28809/22
29008/19

Dr G Watmuff
Senior Geochemist
BHP Minerals Ltd
20 O'Connell Street
SYDNEY

ANALYSIS OF WATER SAMPLES - ARSENIC

From the thirtysix water samples labelled 001W to 036W received 24 March, 2 April and 8 April 1982, six were selected which were thought might have detectable arsenic levels. They were analysed in accord with APHA "Standard Methods for the Examination of Water & Wastewater" 14th Ed. (1975), Method 404A with the following results:

Results are expressed in mgm/L

LABEL	ARSENIC
W028	less than 0.02
W032	less than 0.02

G F ALLISON
CHARTERED CHEMIST (AUSTRALIA)

REPORT NO 8982

ISSUED 31 August 1982

Copy sent to Hobart office

EL 23/79 WYNYARD .NW. TAS
GEOLOGY

THE BROKEN HILL PROPRIETARY CO. LTD.
EXPLORATION DEPARTMENT

Revisions:

Drawn:	R.H	Date:	6-2-85
Traced:	J.E.M		
Checked:		Centre:	HOBART
Project No:	T640	Drawing No:	AO-2379-1

277068

1152

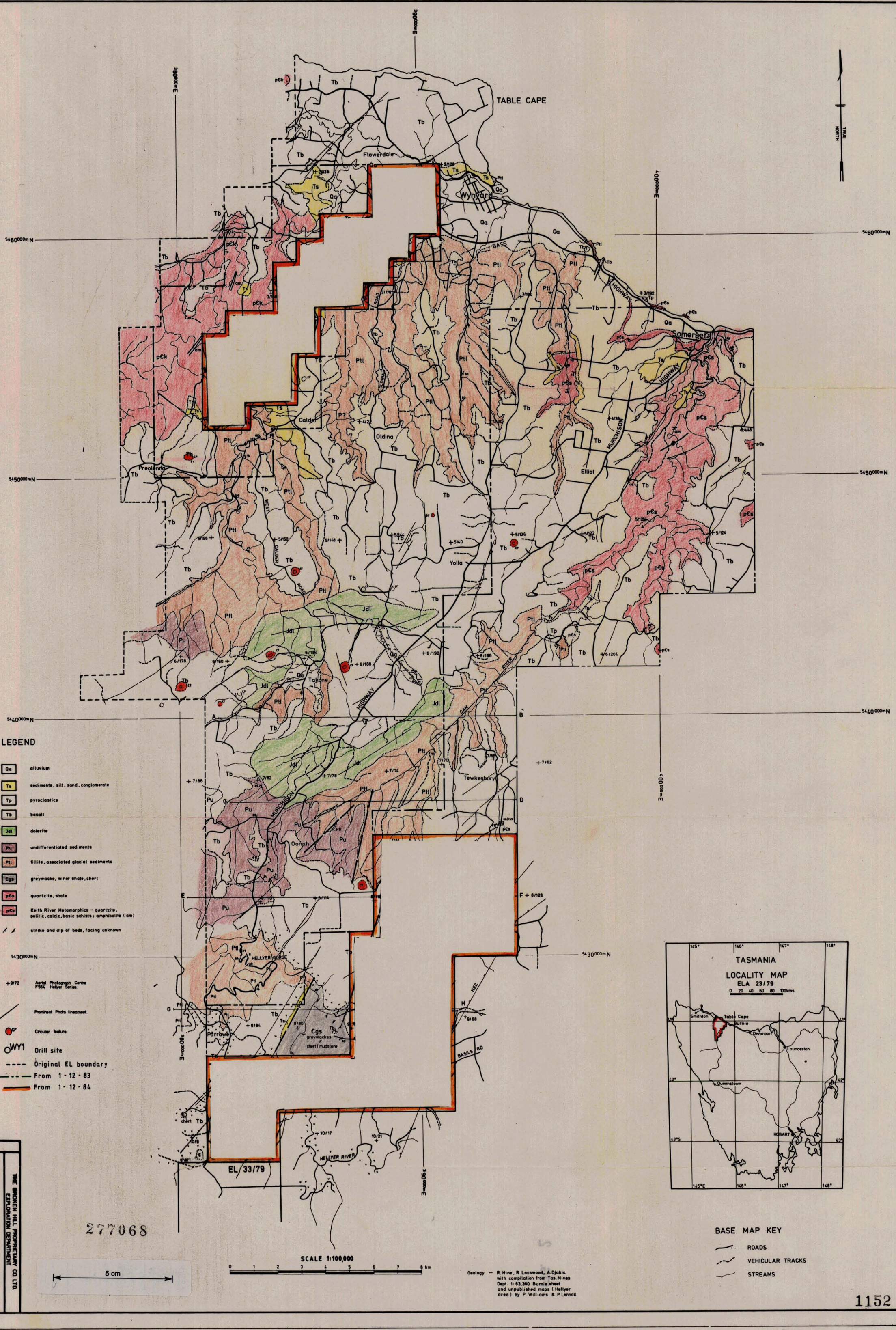


Fig.
FIG. 3

145° 30'E

145° 45'E

41° 00's

41° 15's

EL 23

EL 23/79

RETAINED AREA

RETAINED AREA

5 cm

1:100,000

0 5 10 Km

277069

Fig. No.
To accompany
Dated

THE BROKEN HILL PROPRIETARY CO. LTD.
EXPLORATION DEPARTMENT

EL 23/79, WYNYARD, TASMANIA.
TOTAL MAGNETIC INTENSITY
CONTOURS 1153

Drawn:	Date:	Centre: MELB.
Traced: C/PLOT	Project No.: T64	Drawing No.: G-5261
Checked:		

Revisions:


BASS STRAIT
SOMERSET
Elliott
BASS HIGHWAY
MURCHISON HIGHWAY
FLOWERDALE RIVER
INGLIS RIVER
Jessie River
Calder River
Rattle River
CAM RIVER
Cam River
Seabrook Ck
Guide River
HELLYER RIVER
Parrawe
Parrawe Creek
Emu Creek
Companion Reservoir
41°00′
41°10′
41°20′
5430000 mN
380000 mE
145°40′
145°50′
LEGEND
Original EL boundary
From 1-12-83
From 1-12-84
O WY1 Drill hole
A—A′ Cross section
xCP3 Rock chip and petrology samples
Samples 500 rock chips
Samples 900 petrology
H11 Stream sediment samples
027W Water samples
LOCALITY MAP
EL 23/79
0 20 40 60 80 100 kms
SMITHTON
BURNIE
DEVONPORT
LAUNCESTON
QUEENSTOWN
LEGEND
QUATERNARY Qa alluvium
Ts sediments silt sand conglomerate
TERTIARY Tp pyroclastics
Tb basalt
JURASSIC Jdl dolerite
PERMIAN Pu undifferentiated sediments
Ptl tillite associated glacial sediments
ORDOVICIAN Os quartz sandstone
CAMBRIAN €gs greywacke minor shale chert
PRECAMBRIAN p€s quartzite shale
p€k Keith River Metamorphics-quartzite: pelitic calcic basic schists: amphibolite (am)
Geological boundary
Strike and dip of beds
277070
5 cm
FIG. 4
Scale 1:50 000
0 1 2 3 4 kms
GN
MN
Compiled from: Geology by S. Kerber, R. Hine, R. Lockwood.
Tas.Mines Dept 1:63 360 Burnie sheet and unpub. maps (Hellyer area) by P. Williams and P. Lennox.
THE BROKEN HILL PROPRIETARY CO. LTD.
EXPLORATION DEPARTMENT
EL 23/79 WYNYARD N.W. TASMANIA
STREAM SEDIMENT SAMPLE LOCATIONS
(also rock chips, petrology and water samples)
DRAWN: S P K
TRACED: A H
Checked NJ -1984
DATE:
PROJECT NO T64
CENTRE: HOBART
DRAWING NO 1154

BASS STRAIT
SOMERSET
Elliott
AREA RETAINED
AREA RETAINED
BASS HIGHWAY
MURCHISON HIGHWAY
INGLIS RIVER
FLOWERDALE RIVER
CAM RIVER
HELLYER RIVER
Seabrook Ck
Guide River
Jessie River
Calder River
Rattle River
Parrawe Creek
Emu River
Companion Reservoir
41°00'
41°10'
41°20'
5430000 mN
380000 mE
145°40'
145°50'
Original EL boundary
From 1-12-83
From 1-12-84
LOCALITY MAP
EL 23/79
SMITHTON
BURNIE
DEVONPORT
LAUNCESTON
QUEENSTOWN
LEGEND
QUATERNARY Qa alluvium
Ts sediments silt sand conglomerate
TERTIARY Tp pyroclastics
Tb basalt
JURASSIC Jdl dolerite
PERMIAN Pu undifferentiated sediments
Ptl tillite associated glacial sediments
ORDOVICIAN Os quartz sandstone
CAMBRIAN €gs greywacke minor shale chert
PRECAMBRIAN p€s quartzite shale
p€k Keith River Metamorphics - quartzites pelitic calcic basic schists: amphibolite (am)
geological boundary
drill hole
A A' geological cross section
Sn PPM
(Sn ppm × Wt%) / 100
strike and dip of beds
277071
FIG. 5
Scale 1:50 000
0 1 2 3 4 kms
Compiled from: Geology by S. Kerber, R. Hine, R. Lockwood. Tas. Mines Dept. 1:63 350 Burnie sheet and unpub. maps (Hellyer area) by P. Williams and P. Lennox.
THE BROKEN HILL PROPRIETARY CO. LTD.
EXPLORATION DEPARTMENT
EL 23/79 WYNYARD NW TASMANIA
PAN CONCENTRATE SAMPLE LOCATIONS
AND TIN GEOCHEMISTRY
DRAWN: S.P.K
DATE: APRIL 83
CENTRE: HOBART
TRACED: A.H
PROJECT NO T64
DRAWING NO 1155