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SML 537

MOUNT CAERNARVON

PROGRESS REPORTS TO LICENCE EXPIRY / RENEWAL, FOR THE PERIOD 28/1/1971 TO 27/1/1972

Submitted by
South Australian Barytes Ltd
1972

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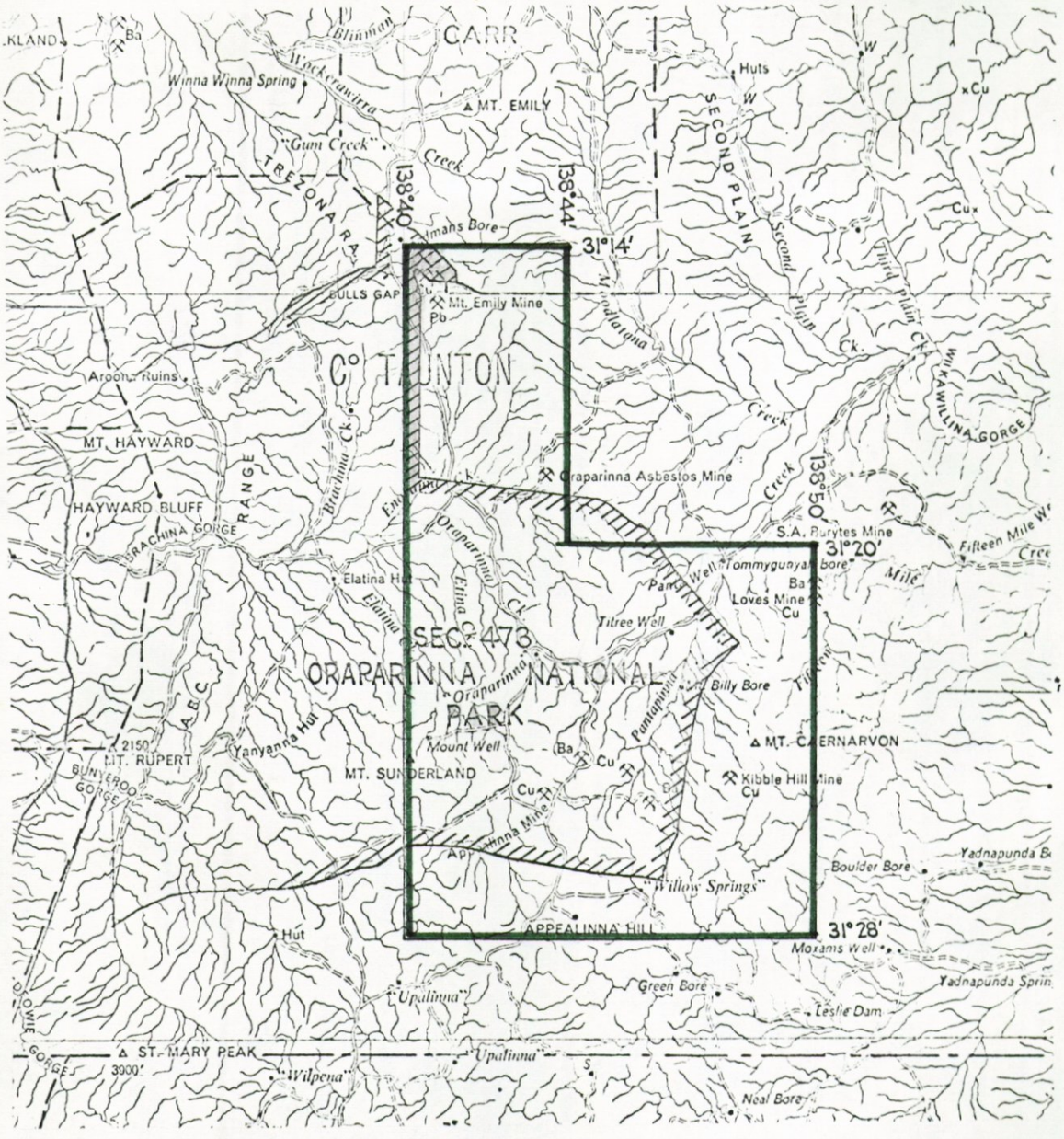
Government of South Australia
Primary Industries and Resources SA



SCALE 1:250000

SOUTH AUSTRALIAN BARYTES LIMITED

DOCKET D.M. 1104/70 AREA 118 SQ MILES

1:250000 PLANS . PARACHILNA

LOCALITY

S.M.L. No. 537 EXPIRY DATE 27.1.72.

CONTENTS ENVELOPE 1578

TENEMENT: S.M.L. 537

TENEMENT HOLDER: S.A. Barytes Ltd.

SOUTH AUSTRALIAN BARYTES LIMITED

TELEPHONE
51 6841 (3 LINES)
SECRETARY: 8 6521

TELEGRAMS
"SABAR"

74 SOUTH TERRACE
ADELAIDE
SOUTH AUSTRALIA 5000

00003

RBR/MAA.

30th April, 1971.

The Director of Mines,
Department of Mines,
Box 38, Rundle Street P.O.,
ADELAIDE, S.A., 5000.

Dear Sir,

S.M.L. 537 - ORAPARINNA DOME.

Report on work for first three months period to April 28, 1971 -

INTRODUCTION.

During 1966 a reconnaissance induced polarization survey of the Oraparinna Dome was made by McPhar Geophysics, on behalf of Metals Exploration. (ENVELOPE 602, S.A. Dept. of Mines). This survey indicated a number of anomalous areas, but no further investigation was made. It is considered that seven of these anomalous areas warrant further investigation.

WORK TO DATE.

1. Gridding.

Seven grids have been surveyed over the selected I.P. anomalies. Each consists of three lines, 400 feet apart, parallel to the reconnaissance I.P. lines, mentioned above. The centre line of each grid is along the reconnaissance I.P. line. Five grids (Nos. 1, 2, 3, 5 and 6) are 2,100 feet long and two (Nos. 4 and 7) are 4,200 feet long.

2. Mapping.

Mapping at a scale of 100 feet to an inch is at present in progress.

3. Induced Polarization.

Preparation for a 300 ft. electrode spacing induced polarization survey, over each grid line, is at present in progress.

expire on ....../2

transferred to ann 1104/70

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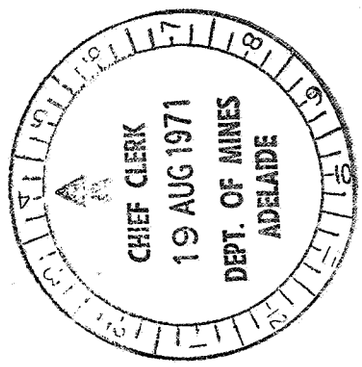
SOUTH AUSTRALIAN BARYTES LIMITED.

S.M.L. 537 - ORAPARINNA DOME.

REPORT ON WORK FOR SECOND THREE MONTHS PERIOD TO 28TH JULY, 1971.



RECONNAISSANCE INDUCED POLARIZATION ANOMALIES.

Gridding and mapping of the reconnaissance I.P. anomalies (see report dated 30th April, 1971) has been completed. These maps are included with this report and a brief description of the geology follows:

Anomaly A1.

This anomaly is in the north east corner of the diapir, parallel to the strike of the "rim rocks", 700 feet to the east. The "rim rocks" here consist of vertically dipping quartzites.

The majority of rocks exposed on the grid area are blocks of steeply dipping dolomite and siltstone. The anomaly covers one such block in which a small pit has been dug in siltstones containing malachite.

Anomaly A2.

Two anomalies are present here, near the centre of the diapir. The majority of the area mapped is covered by river gravel with dolerite ridges forming north-south hills. The river gravels are probably underlain by siltstone breccias which out crop in the river banks in close proximity. No copper mineralization was seen in the area mapped.

Anomaly A3.

This anomaly, near the centre of the diapir, is surrounded mainly by calcareous breccia, containing siltstone and dolerite. No copper mineralization has been seen in the area mapped.

Anomaly A4.

Two anomalies occur here in a distance of 3,000 feet. The southern anomaly is coincident with the down dip continuation of interbedded dolomites and siltstones, similar to those at Blinman. The northern anomaly is in an area of little outcrop, and may be related to hematitic tuffaceous (?) siltstones which outcrop in the creeks. Minor malachite and chalcopyrite is visible in the siliceous and calcareous breccias.

Anomaly A5.

This anomaly is near the northern edge of the Oraparinna Diapir in an area covered mainly by river gravel. Outcrop consists mainly of dolomitic breccia.

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Anomaly A6.

This anomaly is at the southern end of the Enorama Diapir, coincident with dolomites and siltstones, similar to those at Blinman. No mineralization is visible in these rocks, but pods of chalcopyrite, several inches long, are present in the siltstone "rim rocks" that are exposed by a small creek.

Anomaly A7.

This area has not yet been mapped, but is similar to A6.

Anomaly A8.

This area has not yet been mapped, but the anomaly is outside the eastern side of the Oraparinna Diapir and coincides with siltstones and dolomites containing disseminated chalcopyrite and pyrite. This mineralization can be traced two miles to Love's Mine (see Oraparinna 1 mile sheet).

DRILLING OF MALACHITE PROSPECTS.

Mapping of Anomalies A1 and A8 showed the presence of surface copper carbonate mineralization in the Yudnamutana Group sediments on the east side of the Oraparinna Diapir.

One of these deposits has been worked previously at Love's Mine (see Oraparinna 1 mile sheet). Drilling of this prospect has not shown the presence of economic mineralization. (see accompanying report).

The second of these deposits, Balfour Hills, two miles south of Love's Mine, is at present being drilled. Average copper content of surface rock-chip sample is 1.7%. A full report on this prospect will be included in the next three-monthly report.

PROPOSED FUTURE WORK.

1. It is expected to continue the investigation of the reconnaissance I.P. anomalies with a closer electrode spacing I.P. survey over the grids, as mapped.
2. Drilling of the copper carbonate deposit at Balfour Hills is continuing.

R. B. Reid,
Geologist.

5th August, 1971.

00007

HOLE No. S.C 1c 2

COMPANY SOUTH AUSTRALIAN BARYTES LIMITED

AREA BALFOUR HILLS

COLLAR DATA

ELEV _____ CO-ORDS. _____

DIP 60° BEARING East.

FOOTAGE From	FOOTAGE To	FOOTAGE Recovered	COPPER %	ACID * consumed	CORE DESCRIPTION
0	2				Red siltstones. Malachite.
2	4				
4	6				
6	8		2.1	6.4	
8	10		2.0	2.5	
10	12		1.64	5.1	
12	14		1.60	3.8	Yellow siltstones. Malachite.
14	16		1.70	1.3	
16	18		1.95	5.1	
18	20		1.03	5.1	
20	22		0.65	6.4	Pink siltstones. Malachite.
22	24		0.75		
24	26		0.76		
26	28		0.28		Dark brown dolomite.
28	30		0.1		
30	35				Pink siltstone.
35	40				
40	45				Red siltstone.
45	50				Yellow siltstone.
50	55				
55	60				

* Litres 40N H_2SO_4 per ton of rock.

HOLE No. S.C.3.

COMPANY SOUTH AUSTRALIAN BARYTES LIMITED

AREA BALFOUR HILLS

COLLAR DATA

ELEV _____ CO-ORDS. _____

DIP 60° BEARING East.

FOOTAGE From	FOOTAGE To	FOOTAGE Recovered	COPPER %	ACID * consumed	CORE DESCRIPTION	Ave Cor Vein
0	5				Brown dolomite.	
5	10					
10	15					
15	20					
20	25					
25	30					
30	35					
35	40					
40	45				White siltstone.	
45	50					
55	60				Yellow siltstone.	
60	62		< 0.1			
62	64		0.10			
64	66		0.70			
66	68		1.21	19.0	Yellow siltstone and sandstone.	
68	70		1.77	12.7		
70	72		2.3	17.8	Malachite.	
72	74		1.66	11.4		
74	76		1.70	22.9		
76	78		1.91	20.3		
78	80		2.3	22.9		
80	82		1.76	27.9		
82	84		1.95	22.9		
84	86		1.75	25.4		
86	88		1.47	20.3		
88	90		1.31	20.3		
90	92		1.30	19.0		
92	94		0.84			
94	96		0.39		Pink siltstone.	
96	98		0.35			
98	100		0.17		Brown dolomite.	
100	105				Purple siltstone.	

* Litres 40N H_2SO_4 per ton of rock.

00009

HOLE No. S.C.4

COMPANY SOUTH AUSTRALIAN BARYTES LIMITED

AREA BALFOUR HILLS

COLLAR DATA

ELEV _____ CO-ORDS. _____

DIP 60° BEARING East.

FOOTAGE From	FOOTAGE To	FOOTAGE Recovered	COPPER %	ACID * consumed	CORE DESCRIPTION	Au Cu Veins
0	5					
5	10				White siltstone.	
10	15					
15	20					
20	25		< 0.1			
25	30		0.85		Yellow siltstone. Malachite.	
30	35		2.0	27.9		
35	40		1.93	22.9		
40	45		1.81	31.8	White siltstone. Malachite.	
45	50		0.60		Dark brown dolomite.	
50	55		< 0.1		Yellow siltstone.	
55	60		< 0.1			
60	65		< 0.1		Purple siltstone.	
65	70		< 0.1			
70	75		< 0.1		Brown siltstone.	
75	80		< 0.1			
80	85		< 0.1			
85	90		< 0.1		Yellow siltstone.	
90	95		< 0.1		Purple siltstone.	
95	100		< 0.1		Brown siltstone.	
100	105		< 0.1			
105	110		< 0.1			
110	115		< 0.1		Purple siltstone.	
115	120		< 0.1			

* Litres 40N H_2SO_4 per ton of rock.

00010

HOLE No. S.O.5

COMPANY SOUTH AUSTRALIAN BARYTES LIMITED

AREA BALFOUR HILLS

COLLAR DATA

ELEV _____ CO-ORDS. _____

DIP 60° BEARING East.

FOOTAGE From	FOOTAGE To	FOOTAGE Recovered	COPPER %	ACID * consumed	CORE DESCRIPTION
0	5		2.1	24.1	Yellow siltstone. Malachite.
5	10		1.87	21.6	
10	15		1.98	20.3	
15	20		1.26	20.3	
20	25		0.27		Dark brown dolomite.
25	30		< 0.1		
30	35		< 0.1		Purple siltstone.
35	40		< 0.1		
40	45				
45	50				

* Litres 40N H_2SO_4 per ton of rock.

00011

HOLE No. S.C.6.

COMPANY SOUTH AUSTRALIAN BARYTES LIMITED

AREA BALFOUR HILLS

COLLAR DATA

ELEV _____ CO-ORDS. _____

DIP 60° BEARING East.

FOOTAGE From	FOOTAGE To	FOOTAGE Recovered	COPPER %	ACID * consumed	CORE DESCRIPTION	Ave Co Vein
0	5				Brown siltstone.	
5	10					
10	15		< 0.1			
15	20		< 0.1			
20	25		< 0.1			
25	30		< 0.1		Pink siltstone.	
30	35		< 0.1			
35	40		< 0.1			
40	45		0.15		Brown dolomite.	
45	50		1.42	116.8	White siltstone. Malachite.	
50	55		0.64	132.1	Red dolomite.	
55	60		1.04	90.2		
60	65		0.61	207.0	Yellow siltstone.	
65	70		1.51	156.2	Yellow siltstone. Malachite.	
70	75		0.44		Yellow dolomite. Malachite.	
75	80		0.40		White siltstone.	
80	85		0.14			
85	90		0.12		Red dolomite.	
90	95		0.12		Yellow siltstone.	
95	100		0.1			
100	105		0.16			
105	110		1.30	24.1		
110	115		1.52	33.0	Yellow siltstone. Malachite.	
115	120		2.3	24.1		
120	125		1.91	17.8		
125	130		1.35	16.5		
130	135		0.70			
135	140		0.36		Yellow siltstone.	

* Litres 40N H_2SO_4 per ton of rock.

00012

HOLE No. S.C.8

COMPANY SOUTH AUSTRALIAN BARYTES LIMITED

AREA BALFOUR HILLS

COLLAR DATA

ELEV _____ CO-ORDS. _____

DIP 60° BEARING East.

FOOTAGE From	FOOTAGE To	FOOTAGE Recovered	COPPER %/a	ACID * consumed	CORE DESCRIPTION
0	5		< 0.1		Purple siltstone
5	10		< 0.1		
10	15		< 0.1		
15	20		< 0.1		
20	25		< 0.1		
25	30		< 0.1		
30	35		< 0.1		
35	40		< 0.1		
40	45		< 0.1		
45	50		< 0.1		Pink siltstones
50	55		0.33		Pink dolomite
55	60		0.40		Yellow siltstones
60	65		0.82		Pink dolomite Malachite
65	70		0.80		
70	75		1.66		Pink siltstone Malachite
75	80		1.69		
80	85		1.59		
85	90		0.65		
90	95		< 0.1		Grey siltstone
95	100		< 0.1		
100	105		< 0.1		
105	110		< 0.1		Yellow siltstone

* Litres 40N H_2SO_4 per ton of rock.

00013

HOLE No. S.C.

COMPANY SOUTH AUSTRALIAN BARYTES LIMITED

AREA BALFOUR HILLS

COLLAR DATA

ELEV _____ CO-ORDS. _____

DIP 60° BEARING East.

FOOTAGE From	FOOTAGE To	FOOTAGE Recovered	COPPER %	ACID * consumed	CORE DESCRIPTION
0	5		< 0.1		Purple siltstones
5	10		< 0.1		
10	15		< 0.1		Pink dolomite Malachite
15	20		< 0.1		
20	25		0.14		
25	30		< 0.1		Yellow sandstone
30	35		< 0.1		
35	40		< 0.1		
40	45		< 0.1		Yellow siltstone
45	50		< 0.1		
50	55		< 0.1		
55	60		< 0.1		
60	65		< 0.1		White siltstone
65	70		< 0.1		
70	75		< 0.1		
75	80		< 0.1		
80	85		< 0.1		
85	90		< 0.1		
90	95		< 0.1		
95	100		< 0.1		
100	105		< 0.1		
105	110		< 0.1		
110	115		< 0.1		
115	120		< 0.1		
120	125		< 0.1		
125	130		< 0.1		
130	135		< 0.1		
135	140		< 0.1		
140	145		< 0.1		
145	150		< 0.1		

* Litres 40N H_2SO_4 per ton of rock.

00014

HOLE No. S.C.1

COMPANY SOUTH AUSTRALIAN BARYTES LIMITED

AREA BALFOUR HILLS

COLLAR DATA

ELEV _____ CO-ORDS. _____

DIP 60° BEARING East.

FOOTAGE From	FOOTAGE To	FOOTAGE Recovered	COPPER %	ACID * consumed	CORE DESCRIPTION
0	5				Purple siltstone
5	10				
10	15				
15	20				
20	25				
25	30				
30	35				
35	40				
40	45				Red dolomite
45	50				
50	55				Hard purple siltstone
55	60				
60	65				Red dolomite
65	70				
70	75				
75	80				Yellow siltstone
80	85				Red dolomite
85	90				
90	95		0.90		Yellow siltstone Malachite
95	100		0.60		
100	105		0.35		White siltstone
105	110		0.18		
110	115		0.10		
115	120		< 0.1		
120	125		< 0.1		
125	130		< 0.1		
130	135		< 0.1		
135	140		< 0.1		
140	145		< 0.1		
145	150		< 0.1		
150	155		< 0.1		
155	160		< 0.1		

* Litres 40N H_2SO_4 per ton of rock.

00015

HOLE No. S.C.11

COMPANY SOUTH AUSTRALIAN BARYTES LIMITED

AREA BALFOUR HILLS

COLLAR DATA

ELEV _____ CO-ORDS. _____

DIP 60° BEARING East.

FOOTAGE From	FOOTAGE To	FOOTAGE Recovered	COPPER %	ACID * consumed	CORE DESCRIPTION	Av Co Vein
0	10				Grey siltstone	
10	15					
15	20					
20	25					
25	30					
30	35					
35	40					
40	45					
45	50				Brown siltstone	
50	55					
55	60					
60	65					
65	70					
70	75					
75	80					
80	85		< 0.1		Pink siltstone	
85	90		< 0.1			
90	95		< 0.1			
95	100		< 0.1		Red dolomite	
100	105		< 0.1			
105	110		< 0.1			
110	115		< 0.1			
115	120		< 0.1			
120	125		< 0.1			
125	130		< 0.1		Pink siltstone	
130	135		< 0.1		Yellow dolomite	
135	140		< 0.1		Pink siltstone	
140	145		< 0.1		Yellow siltstone	
145	150		0.25			
150	155		0.90			
155	160		1.40	34.2		
160	165		1.40	40.3		
165	170		0.80			
170	175		0.34			
175	180		0.32			
180	185		0.23			
185	190		0.13			

* Litres 40N H_2SO_4 per ton of rock.

00016

HOLE No. S.C.12

COMPANY SOUTH AUSTRALIAN BARYTES LIMITED

AREA BALFOUR HILLS

COLLAR DATA

ELEV _____ CO-ORDS. _____

DIP 60° BEARING East

FOOTAGE From	FOOTAGE To	FOOTAGE Recovered	COPPER %	ACID * consumed	CORE DESCRIPTION	Ave Co Vein
0	5		0.17		Purple siltstone	
5	10		< 0.1		Red dolomite	
10	15		0.18			
15	20		0.60			
20	25		0.21		Pink siltstone	
25	30		0.25			
30	35		0.70		Red dolomite	
35	40		0.27			
40	45		0.18		Yellow siltstone	
45	50		0.32			
50	55		0.40			
55	60		0.38		Yellow dolomite	
60	65		0.16			
65	70		< 0.1		Dark brown siltstone	
70	75		< 0.1			
75	80		< 0.1			
80	85		< 0.1		White siltstone	
85	90		0.60		Yellow siltstone Malachite	
90	95		0.70			
95	100		0.60			

* Litres 40N H_2SO_4 per ton of rock.

00017

HOLE No. S.C.13

COMPANY SOUTH AUSTRALIAN BARYTES LIMITED

AREA BALFOUR HILLS

COLLAR DATA

ELEV _____ CO-ORDS. _____

DIP 60° BEARING East.

FOOTAGE From	FOOTAGE To	FOOTAGE Recovered	COPPER %	ACID * consumed	CORE DESCRIPTION	Ave Cor Vein
0	5				Purple siltstone	
5	10					
10	15					
15	20					
20	25					
25	30					
30	35				Brownsiltstone	
35	40					
40	45					
45	50				Yellow siltstone	
50	55					
55	60					
60	65					
65	70					
70	75					
75	80					
80	85					
85	90				Brown dolomite	
90	95					
95	100		< 0.1			
100	105		< 0.1			
105	110		< 0.1			
110	115		< 0.1		Yellow dolomite	
115	120		0.15		Yellow dolomite Malachite	
120	125		0.22		Yellow siltstone Malachite	
125	130		0.60			
130	135		0.28		Yellow siltstone	
135	140		0.23			
140	145		0.11			
145	150		0.15			

* Litres 40N H_2SO_4 per ton of rock.

00018

HOLE No. S.C.14.

COMPANY SOUTH AUSTRALIAN BARYTES LIMITED

AREA BALFOUR HILLS

COLLAR DATA

ELEV _____ CO-ORDS. _____

DIP 73° BEARING East.

FOOTAGE From	FOOTAGE To	FOOTAGE Recovered	COPPER %	ACID * consumed	CORE DESCRIPTION	Aver Core Vein A
0	5					
5	10				Purple siltstone	
10	15					
15	20					
20	25					
25	30					
30	35					
35	40					
40	45					
45	50					
50	55					
55	60				Hard purple siltstone	
60	65				Purple siltstone	
65	70					
70	75					
75	80				Yellow-brown siltstone	
80	85					
85	90					
90	95					
95	100					
100	105				Red dolomite	
105	110					
110	115		0.13		Yellow siltstone	
115	120		< 0.1		Yellow dolomite	
120	125		< 0.1		Purple siltstone	
125	130		< 0.1		Yellow sandstone	
130	135		0.33			
135	140		1.20	39.1	Yellow sandstone Malachite	
140	145		0.90			
145	150		0.60			
150	155		0.20		White sandstone	
155	160		0.12			
160	165		< 0.1			
165	170		< 0.1		Yellow-brown siltstone	
170	175		< 0.1			
175	180		< 0.1			

* Litres 40N H_2SO_4 per ton of rock.

00019

HOLE No. S.C. 1

COMPANY SOUTH AUSTRALIAN BARYTES LIMITED

AREA BALFOUR HILLS

COLLAR DATA

ELEV _____ CO-ORDS. _____

DIP 60° BEARING East.

FOOTAGE From	FOOTAGE To	FOOTAGE Recovered	COPPER %	ACID * consumed	CORE DESCRIPTION	Av Co Vein
0	2				Pink sandstone	
2	4				White sandstone	
4	6		0.60		Red sandstone Malachite	
6	8		1.00	41.5	Pink sandstone Malachite	
8	10		2.20	13.4	Yellow sandstone Malachite	
10	12		1.50	12.2	Red sandstone Malachite	
12	14		0.60			
14	16		0.60			
16	18				White sandstone	
18	20					
20	22					
22	24					
24	26					
26	28					
28	30				Pink sandstone	
30	32				White sandstone	
32	34					

* Litres 40N H_2SO_4 per ton of rock.

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LOVE'S MINE PROSPECT.

Introduction.

Love's Mine is a small copper carbonate deposit located within S.M.L. 537, five miles south west of the Oraparinna Barytes Mine.

Preliminary geological investigation indicated that a small, high grade copper deposit may be present.

Regional Geology.

Love's Mine is situated in an Upper Proteozoic sequence of siltstones, sandstones and dolomites (the Yudnamutana Sub-Group) on the eastern side of the Oraparinna Diapir. (see Oraparinna 1 mile sheet).

Mine Geology.

Malachite and azurite occur in a green to white sandstone bed, fifteen feet thick, between purple siltstones, dipping 80° east. The copper mineralization is ten feet wide, on the surface and is continuous along strike 400 feet. Rock chip sampling at the surface gave a bulk value of 1.01% Cu.

A shaft sunk early this century reached a depth of 80 feet with little visible variation in the amount of copper present. Sampling across the face (5 feet) at the bottom of this shaft gave a value of 3.4% Cu.

Drilling to test the mineralization at depth showed the sediments to flatten out at a depth of 80 feet (see section B-F). Sampling over five foot intervals, no intersections greater than 1.1% Cu. were encountered and no copper was present at a down dip depth of 150 feet. (LMN.E).

Conclusion.

Apart from the area immediately surrounding the shaft, copper mineralization decreases rapidly with depth. No ore deposit is indicated.

R. B. Reid,
Geologist.

18th June, 1971.

00021

HOLE No. LMNA

COMPANY SOUTH AUSTRALIAN BARYTES LIMITED

AREA S.M.L. 537 LOVES MINE

COLLAR DATA

ELEV _____ CO-ORDS. _____

DIP 80° BEARING East

FOOTAGE From	FOOTAGE To	FOOTAGE Recovered	Cu(ppm)	CORE DESCRIPTION	Average Core to Vein Angle
10	15		500	)	
15	20		100	)	
20	25		40	) Green sandstone with minor malachite	
25	30		40	)	
30	35		40	)	
35	40		80	)	
40	45		60	)	
45	50		60	) Pink siltstone	
50	55		40	)	
55	60		45	)	
60	65		40	Purple siltstone	
65	70		25	Red sandstone	
70	75		40	)	
75	80		40	)	
80	85		10	)	
85	90		20	)	
90	95		20	)	
95	100		30	)	
100	105		70	)	
105	110		30	)	
110	115		55	)	
115	120		20	) Purple siltstone	
120	125		20	)	
125	130		30	)	
130	135		20	)	
135	140		10	)	
140	145		25	)	
145	150		30	)	
150	155		60	Brown dolomite	

Water table at 140 feet.

00022

HOLE No. LMN B

COMPANY SOUTH AUSTRALIAN BARYTES LIMITED

AREA S.M.L. 537 LOVES MINE

COLLAR DATA

ELEV _____ CO-ORDS. _____

DIP 45° BEARING East

FOOTAGE From	FOOTAGE To	FOOTAGE Recovered	Cu(ppm)	CORE DESCRIPTION	Average Core to Vein Angle
40	45		10		
45	50		10		
50	55		10		
55	60		10		
60	65		15		
65	70		20	Purple siltstone	
70	75		30		
75	80		35		
80	85		60		
85	90		45		
90	95		40		
95	100		45		
100	105		50	White sandstone	
105	110		70		
110	115		4,800		
115	120		3,000		
120	125		1,900	White sandstone with malachite	
125	130		1,000		
130	135		340		
135	140		390		
140	145		200		
145	150		210		
150	155		200		
155	160		140		
160	165		160		
165	170		110		
170	175		60		
175	180		60	White siltstone and sandstone	
180	185		95		
185	190		100		
190	195		60		
195	200		45		
200	205		35		
205	210		50		
210	215		50		
215	220		45		
220	225		50		
225	230		55		
230	235		50		
235	240		40		

00023

HOLE No. LMN C

COMPANY SOUTH AUSTRALIAN BARYTES LIMITED

AREA S.M.L. 537 LOVES MINE

COLLAR DATA

ELEV _____ CO-ORDS. _____

DIP 45° BEARING West

FOOTAGE From	FOOTAGE To	FOOTAGE Recovered	Cu(ppm)	CORE DESCRIPTION	Average Core to Vein Angle
35	60			Purple siltstone	
60	65		50	)	
65	70		20	)	
70	75		60	) Green siltstone	
75	80		100	)	
80	85		3,200	)	
85	90		6,000	)	
90	95		1,200	) Green sandstone with malachite and azurite	
95	100		800	)	
100	105		50	)	
105	110		35	) Purple siltstone	
110	115		40	)	
115	120		35	)	

00024

HOLE No. LMN D

COMPANY SOUTH AUSTRALIAN BARYTES LIMITED

AREA S.M.L. 537 LOVES MINE

COLLAR DATA

ELEV _____ CO-ORDS. _____

DIP 57° BEARING West

FOOTAGE From	FOOTAGE To	FOOTAGE Recovered	Cu(ppm)	CORE DESCRIPTION	Average Core to Vein Angle
35	65			Purple siltstone	
65	70		50	)	
70	75		20	)	
75	80		35	) Green siltstone	
80	85		80	)	
85	90		80	)	
90	95		3,000	) Green siltstones plus malachite	
95	100		1,300	)	
100	105		200	)	
105	110		100	)	
110	115		40	) Green sandstone	
115	120		25	)	

HOLE No. LMN E

COMPANY SOUTH AUSTRALIAN BARYTES LIMITED

AREA S.M.L. 537 LOVES MINE

COLLAR DATA

ELEV _____ CO-ORDS. _____

DIP 75° BEARING West

FOOTAGE From	FOOTAGE To	FOOTAGE Recovered	Cu(ppm)	CORE DESCRIPTION	Average Core to Vein Angle
30	80			Purple siltstone	
80	85		30	Purple siltstone	
85	90		15	White siltstone	
90	95		30	Green siltstone	
95	100		100		
100	105		2,400	Green sandstone with malachite and azurite	
105	110		11,000		
110	115		3,600		
115	120		1,000		
120	125		300		
125	130		100	Pink siltstone	
130	135		60	Purple siltstone	
135	140		60		

00026

HOLE No. LMN 1.

COMPANY SOUTH AUSTRALIAN BARYTES LIMITED

AREA S.M.L. 537 LOVES MINE

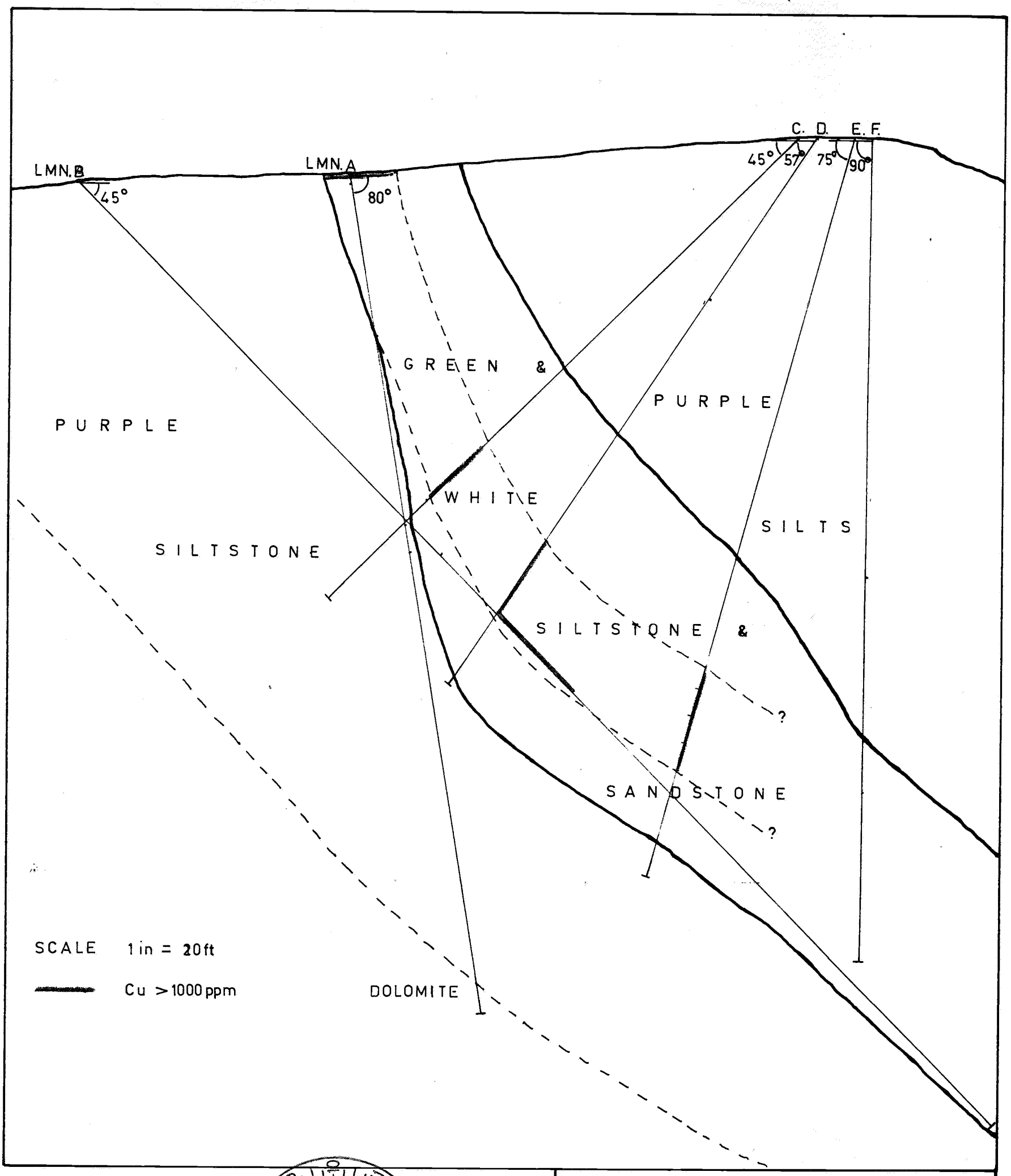
COLLAR DATA

ELEV _____ CO-ORDS. _____

DIP 45° BEARING West.

FOOTAGE From	FOOTAGE To	FOOTAGE Recovered	Cu(ppm)	CORE DESCRIPTION	Average Core to Vein Angle
20	45			Brown siltstone	
45	60			Grey siltstone	
60	65			White siltstone and sandstone	
65	75		2,200	Green sandstone and malachite	
75	90			Green siltstone and sandstone	
90	215			Purple siltstone	
				Water table at 215 feet.	

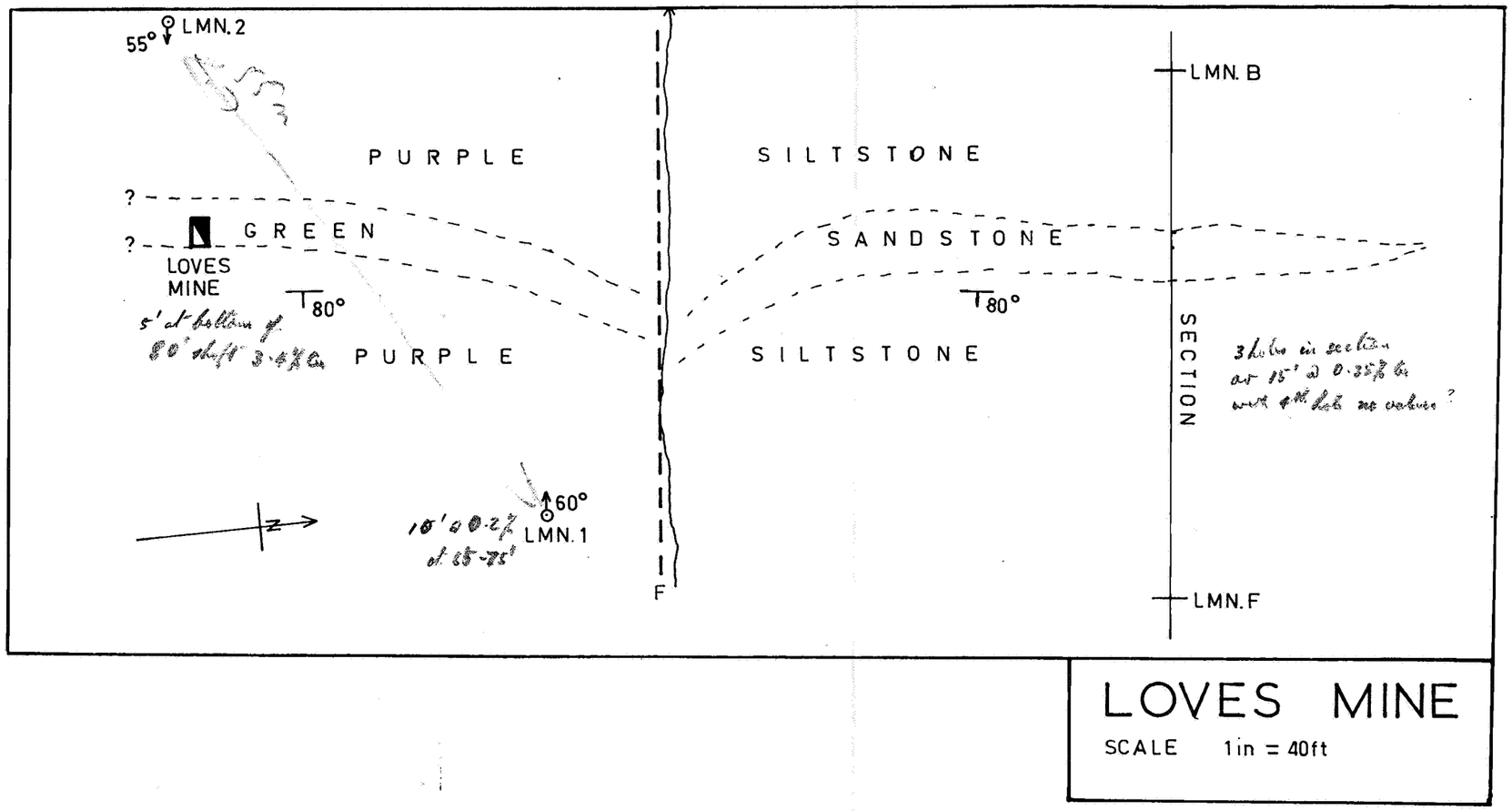
00038

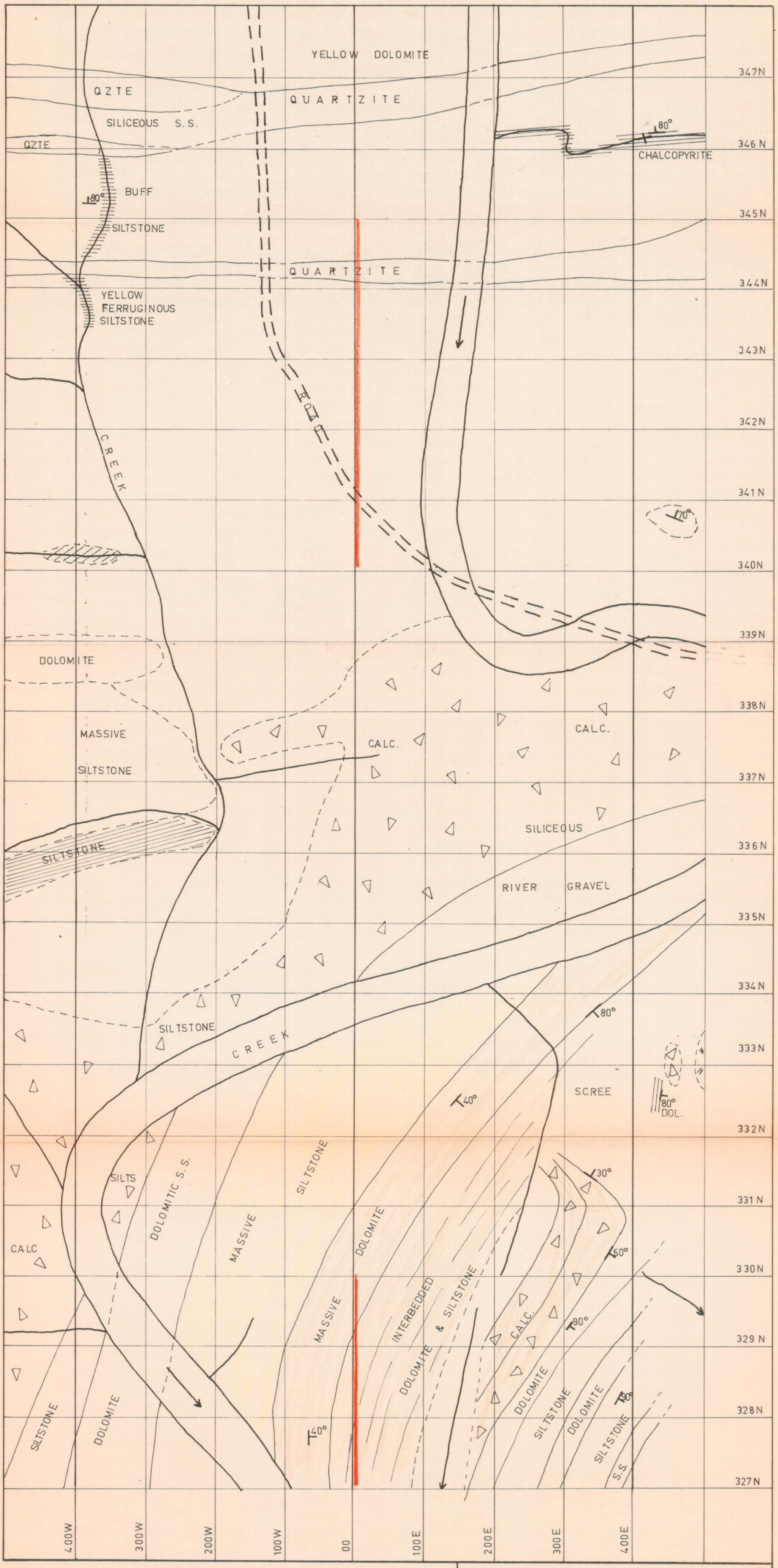


LOVES MINE

SECTION B – F

00039





SOUTH AUSTRALIAN BARYTES LTD.

ORAPARINNA DOME

OUTCROP GEOLOGY GRID A6

SCALE 1in = 100ft

1578-1

CALC.

CALC.

SILTSTONE

SILTS
HEMATITE

CALC.

SILICEOUS

CALC.

SILICEOUS

CREEK

DOLOMITE

CALC.

80°

50°

50°

70°

S.S.

DOLOMITIC
S.S.

MASSIVE
BLACK
HEMATITIC
SILTSTONE

RIVER GRAVEL

PANTAPENNA
CREEK

ROAD

RIVER GRAVEL

450N
449N
448N
447N
446N
445N
444N
443N
442N
441N
440N
439N
438N
437N
436N
435N
434N
433N
432N
431N
430N

400W 300W 200W 100W 00 100E 200E 300E 400E

SOUTH AUSTRALIAN BARYTES LTD.

ORAPARINNA DOME

OUTCROP GEOLOGY GRID A 5

SCALE 1in = 100ft

CALC.

CALC.

CALC.

CALC

PYRITE & MALACHITE

DOLOMITE

80°

HEMATITIC SILTSTONE

SILTSTONE

DOLOMITE

70°

SILTSTONE

DOLOMITE

SILTSTONE

CRYSTALLINE

DOLOMITE

90°

DOLOMITE

SILTSTONE

HEMATITIC S.S. 40°

70°

DOLOMITE

60°

SILTSTONE

MASSIVE DOLOMITE

30°

SILTSTONE

40°

60°

20°

MASSIVE YELLOW SILTSTONE

CALC.

50°

SILTSTONE

SILTSTONE

DOLOMITE

70°

GREY SILTSTONE

CALC

70°

CALC.

SILTS

250 N
249 N
248 N
247 N
246 N
245 N
244 N
243 N
242 N
241 N
240 N
239 N
238 N
237 N
236 N
235 N
234 N
233 N
232 N
231 N
230 N

400W 300W 200W 100W 00 100E 200E 300E 400E

SOUTH AUSTRALIAN BARYTES LTD.

ORAPARINNA DOME

OUTCROP GEOLOGY

SCALE 1in = 100ft

GRID A4

230 N to 251 N

E-78-51

271N
270N
269N
268N
267N
266N
265N
264N
263N
262N
261N
260N
259N
258N
257N
256N
255N
254N
253N
252N
251N

SILTSTONE
MALACHITE
SILTSTONES
90°
40°
30°
CALC.
SILTSTONE
60°
HEMATITIC SILTSTONES
10°
80°
DOLOMITE
70°
SILICEOUS
S.S.
CALC.
DOLOMITE
80°
CALC.
80°
50°
CALC.
SILTSTONE
90°
CHALCOPYRITE
CALC.
50°
SILTSTONE
YELLOW SILTSTONE
50°

400W 300W 200W 100W 00 100E 200E 300E 400E

SOUTH AUSTRALIAN BARYTES LTD.

ORAPARINNA DOME

OUTCROP GEOLOGY

SCALE 1in = 100ft

GRID A4

251N to 272N

DOLERITE

SCREE

DOLERITE

SCREE

RIVER GRAVEL

DOLERITE SCREE

SILTSTONE & QUARTZITE

QUARTZITE & HORNFELS

PANTAPENNA CREEK

RIVER GRAVEL

DOLEITE

SCREE

280 N
279 N
278 N
277 N
276 N
275 N
274 N
273 N
272 N
271 N
270 N
269 N
268 N
267 N
266 N
265 N
264 N
263 N
262 N
261 N
260 N

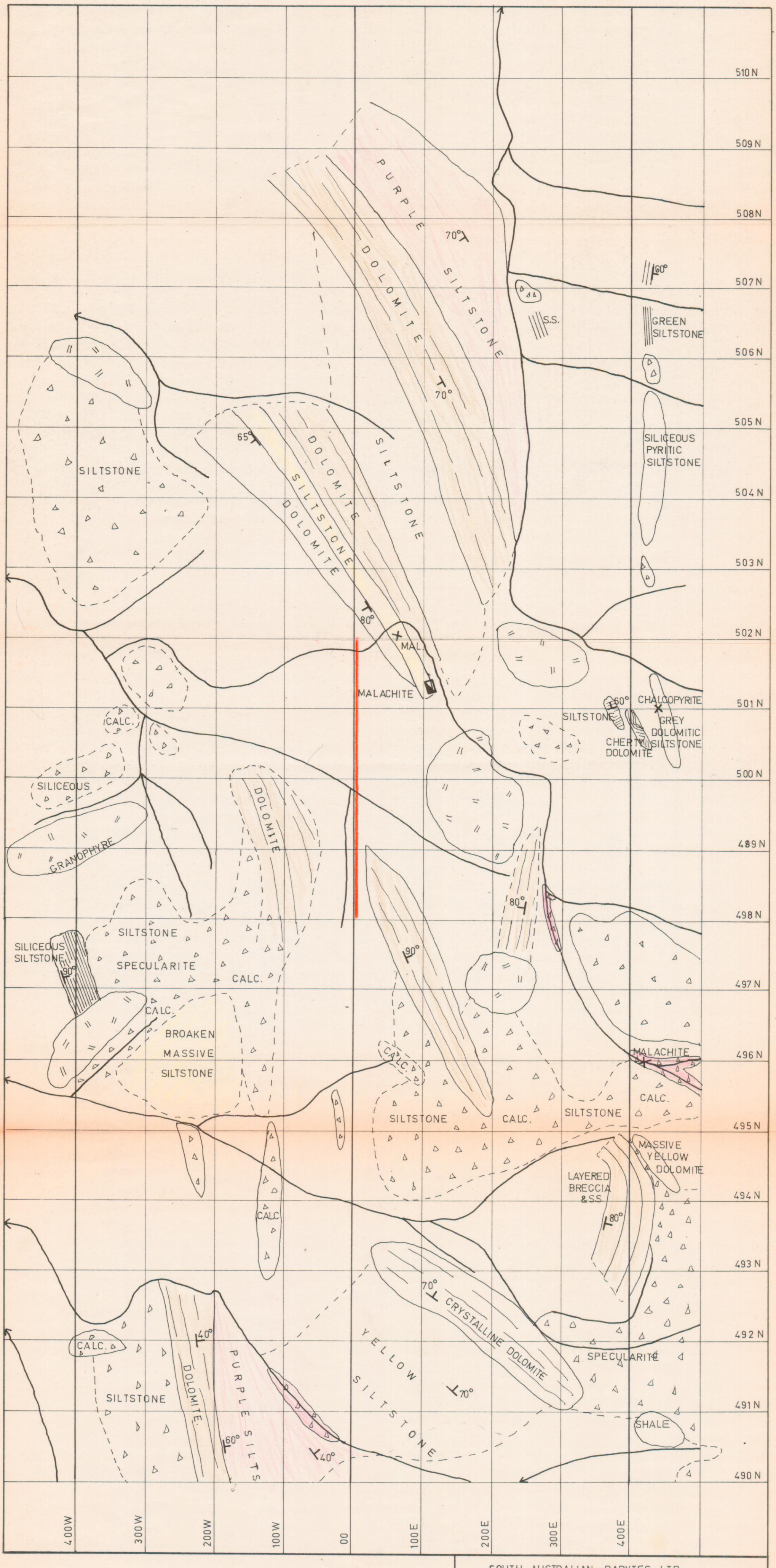
400W 300W 200W 100W 00 100E 200E 300E 400E

SOUTH AUSTRALIAN BARYTES LTD.

ORAPARINNA DOME

OUTCROP GEOLOGY GRID A 2

SCALE 1in = 100ft



SOUTH AUSTRALIAN BARYTES LTD.

ORAPARINNA DOME

OUTCROP GEOLOGY GRID A1

SCALE 1in = 100ft

00027

SOUTH AUSTRALIAN BARYTES LIMITED.

S.M.L. 537 - ORAPARINNA DOME.

REPORT ON WORK FOR THIRD THREE MONTHS' PERIOD TO 28 OCTOBER, 1971.

BALFOUR HILLS.

Introduction.

S.M.L. 537, held by South Australian Barytes Limited for twelve months, commencing January 28, 1971, covers an area of approximately 125 square miles and is situated 120 miles (by road) NNE of Port Augusta.

Preliminary geological investigation and percussion drilling in the east of this area has indicated a potential copper carbonate ore body suitable for acid leaching.

Regional Geology.

S.M.L. 537 covers the Oraparinna "diapir" and surrounding Upper Proterozoic sediments of the Adelaide Geosyncline. (S.A. Mines Dept. Oraparinna 1 mile sheet).

The "diapir" is a strongly faulted area, consisting predominantly of basalts, dolerites, dolomites and hematitic siltstones. Contact between diapiric rocks and surrounding sediments appears to be partially faulted and partially unconformable.

The eastern side of the "diapir" is in contact with the Lower Adelaidean Yudnamutana Group. This sequence includes dolomites, siltstones and tillites containing striated boulders of basalt, similar to that of the "diapir".

Balfour Hills prospect is near the eastern contact between the "diapir" and the Yudnamutana Group.

Local Geology.

Four main areas of copper carbonate mineralization occur within a one mile strike length of the Yudnamutana Group (See Map 1). The copper carbonates are disseminated through siltstones and sandstones in a sequence containing hematitic siltstones, quartz sandstones and dolomites.

STRATIGRAPHY.

The sedimentary sequence is exposed clearly in the creek dividing area 3 into north and south hills. The sequence is as follows:-

Thin bedded, hematitic siltstones and fine grained sandstones containing irregular masses of magnesite. Intraformational folds are present in this sequence.	greater than 30 ft.
Hard dolomitic siltstones.	2 ft.
Red spotted hematitic siltstones and sandstones. (These are represented by purple or brown siltstones in the percussion drill logs).	43 ft.
Pink and yellow dolomite with interbedded siltstones. Some malachite is present in these dolomites.	20 ft.
Yellow quartz sandstone.	8 ft.
Yellow quartz sandstone containing malachite.	12 ft.
White sandstone with narrow dolomitic interbeds.	37 ft.

This sequence is conformably underlain by considerable thicknesses of purple and grey siltstones.

The relation of this conformable sequence to the adjacent sediments is not at this stage clear.

..../2

Structure.

The continuity of strike and length of unbroken outcrop suggests that this area is outside the "diapiric" boundary. The presence of dolerite and apparently out-of-sequence algal dolomites between areas 1 and 3 must, however, be explained.

The Sedimentary sequence in areas 1 and 4 is similar to that (described above) of area 3, but the facing and dip are to the east, whereas in area 3 they are to the west. This suggests the presence of an anticlimal structure striking approximately north-south. In this case the dolerites and algal dolomites, mentioned previously, would be the unconformable basement on which the mineralized sequence was deposited.

Mineralization.

Area 1.

Copper carbonate mineralization has been traced approximately 800 feet in a 10 feet wide bed of quartz sandstone, dipping east at 80°. Average grade of bulk surface samples is 1.2% Cu.

Area 2.

This area consists of a circular hill, approximately 120 feet high. The mineralized sequence here dips east at approximately 20°. Copper carbonates are present in three beds, which outcrop around the hill. More investigation of widths and grade of mineralization are required.

Area 3.

This area consists of two hills with total strike length of 1,000 feet. (See plan and section).

The northern hill is 300 feet long and drilling has shown the mineralized sandstone to dip almost vertically. The average width is 15 feet and average grade 1.8% Cu. Reserves here are 30,000 tons to a depth of 100 ft. The dolomite here is also mineralized, the average grade being 1.1% Cu., also in the form of malachite.

The southern hill has similar grades and widths on the surface, but many facies changes occur, resulting in the reduction of copper values at shallow depths. An estimated 10,000 tons of potential ore is present with average grade of 1.3% Cu. Parts of the dolomites also contain malachite.

Total reserves are therefore 40,000 tons 1.7% Cu.

Area 4.

Grey sandstones containing malachite underly a 30 feet bed of dolomite with interbedded siltstones. This dolomite contains chalcopyrite and the average of random samples has given a value of 0.5% Cu. The cupriferous sandstones are narrow and appear to have limited strike length.

Conclusion.

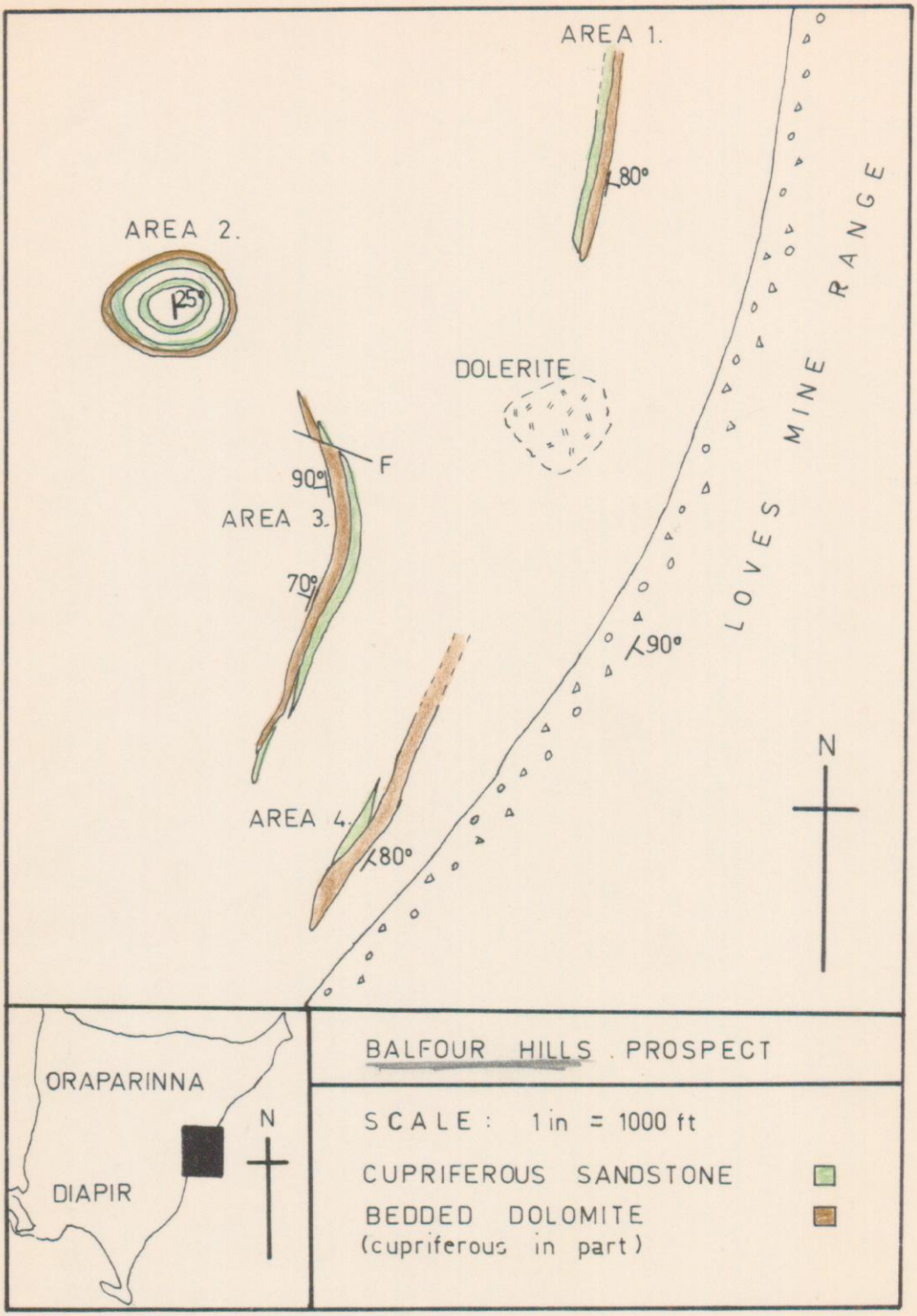
40,000 tons of sandstone containing 1.7% Cu. has been proved. Further reserves of similar grade may be proved with further drilling.

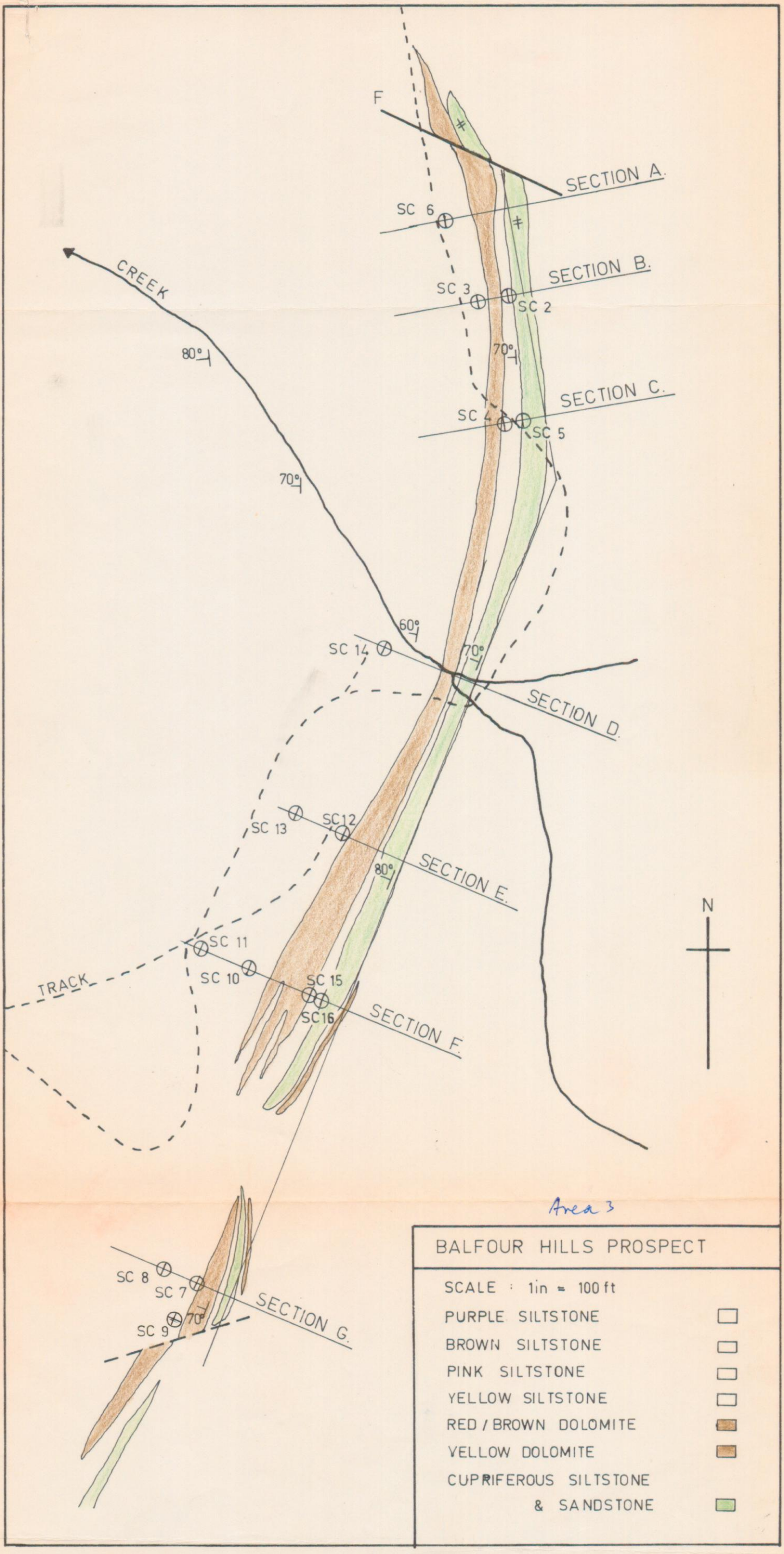
Primary chalcopyrite in the dolomites may indicate the presence of a large, low-grade copper deposit.

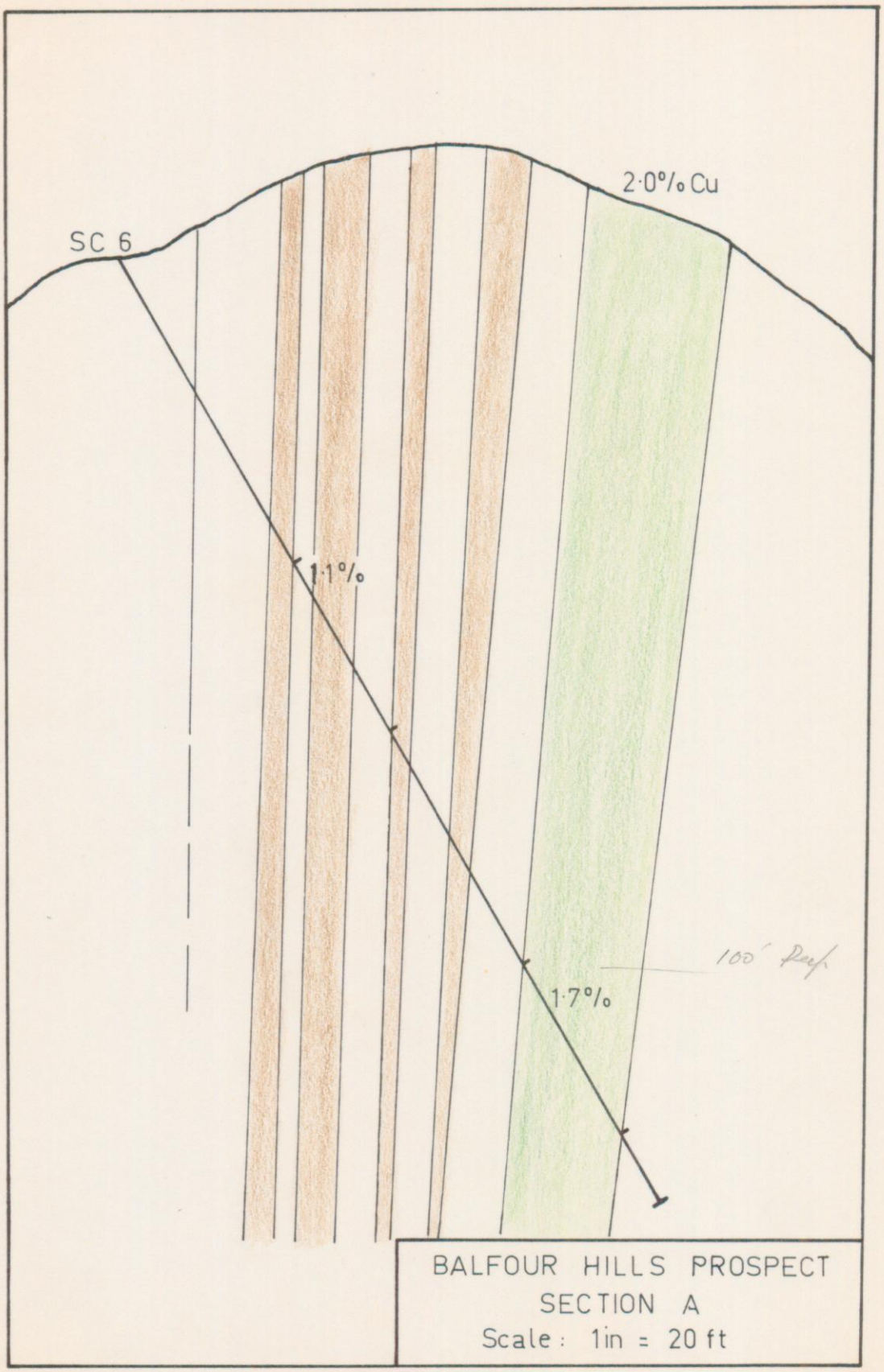
R. B. Reid,
Geologist.

4th October, 1971.

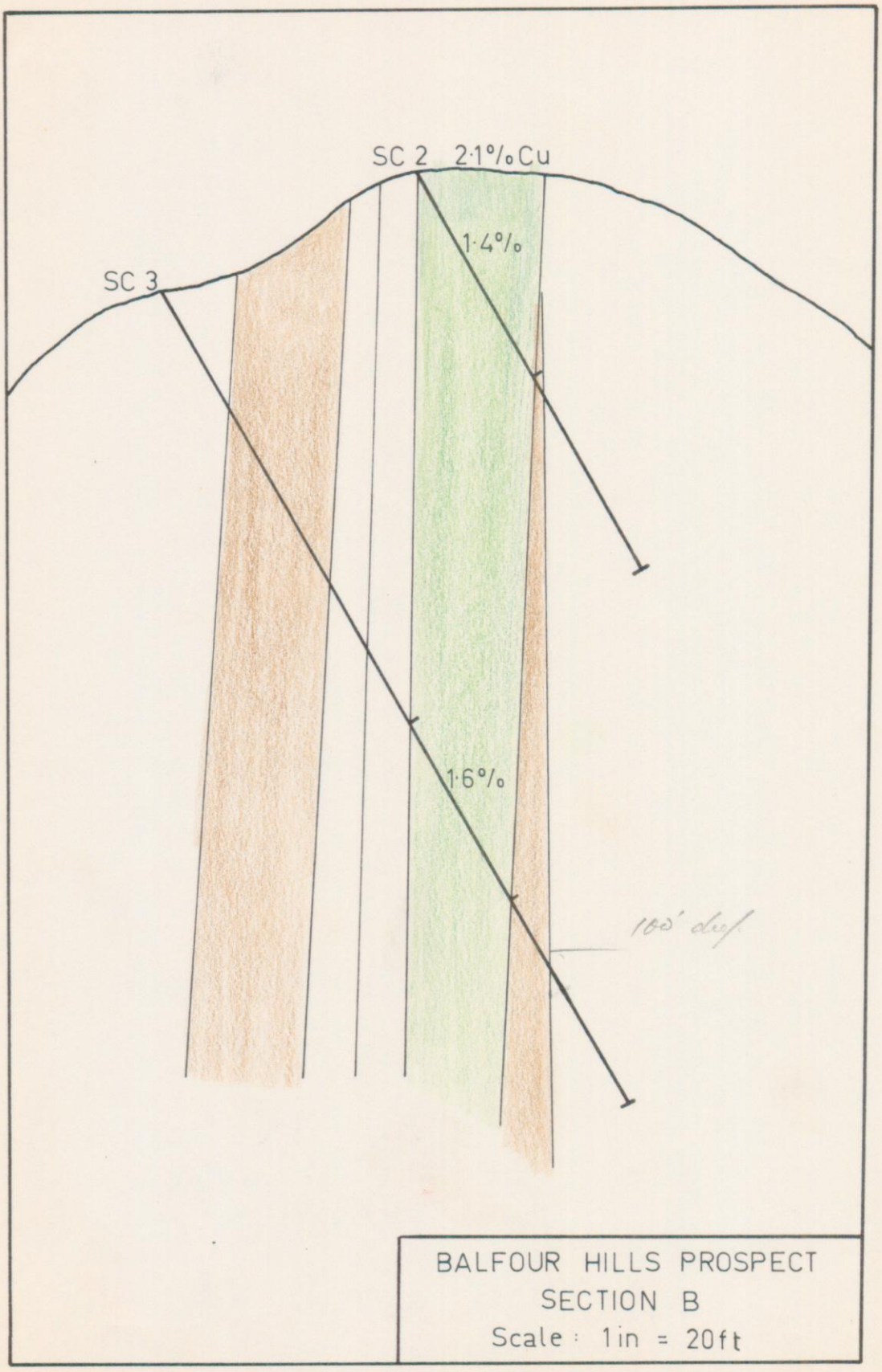
00040


AREA 1.
80°
AREA 2.
25°
DOLERITE
F
90°
AREA 3.
70°
90°
LOVES MINE RANGE
N
AREA 4.
80°
ORAPARINNA
DIAPIR
N
BALFOUR HILLS . PROSPECT
SCALE : 1 in = 1000 ft
CUPRIFEROUS SANDSTONE
BEDDED DOLOMITE
(cupriferous in part)

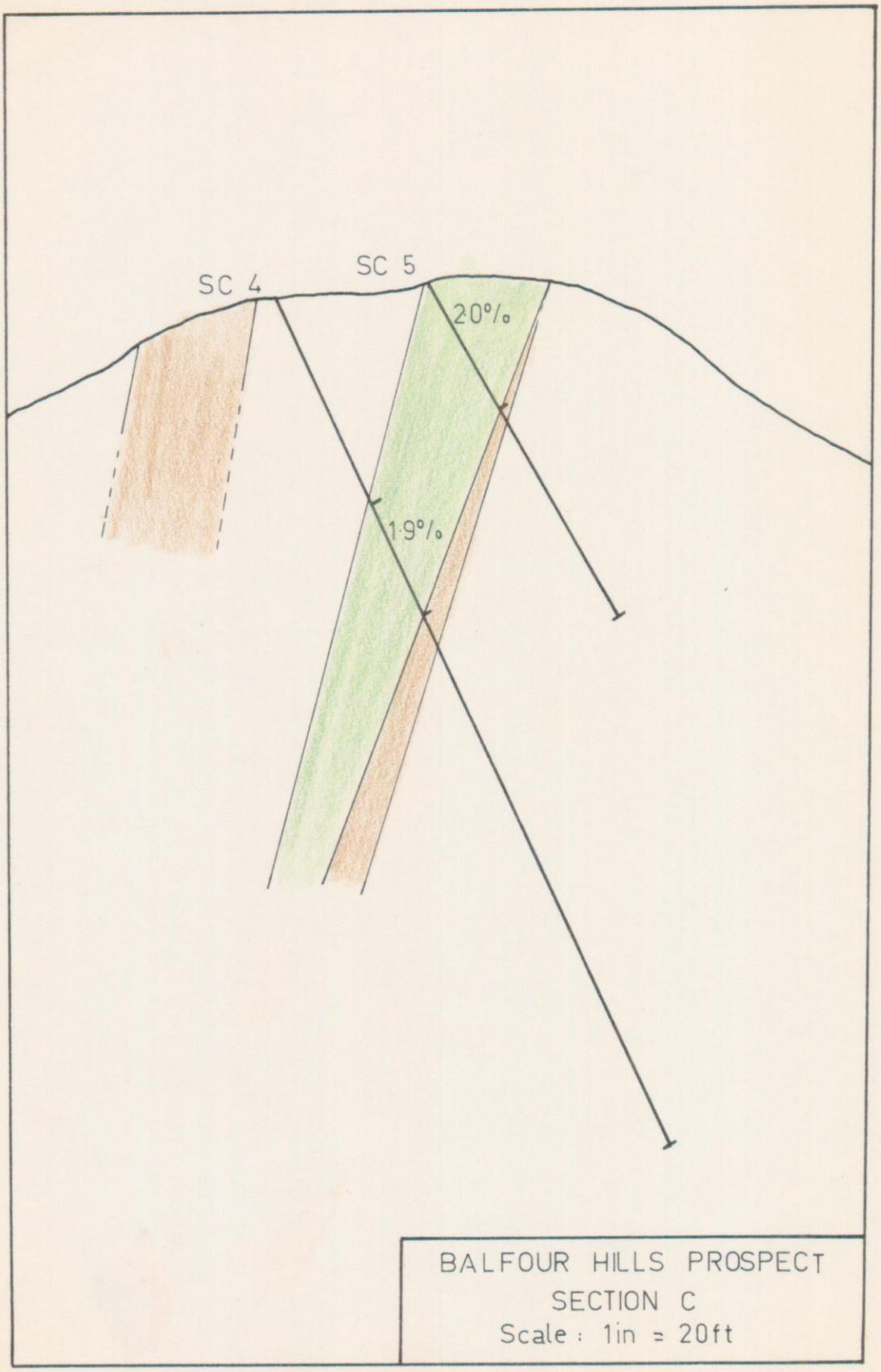

F
SECTION A.
SC 6
SECTION B.
SC 3
SC 2
CREEK
80°
70°
SECTION C.
SC 4
SC 5
70°
60°
SC 14
70°
SECTION D.
SC 13
SC 12
80°
SECTION E.
N
SC 11
SC 10
SC 15
SC16
TRACK
SECTION F.
SC 8
SC 7
SC 9
70°
SECTION G.
Area 3
BALFOUR HILLS PROSPECT
SCALE : 1in = 100 ft
PURPLE SILTSTONE
BROWN SILTSTONE
PINK SILTSTONE
YELLOW SILTSTONE
RED / BROWN DOLOMITE
YELLOW DOLOMITE
CUPRIFEROUS SILTSTONE
& SANDSTONE



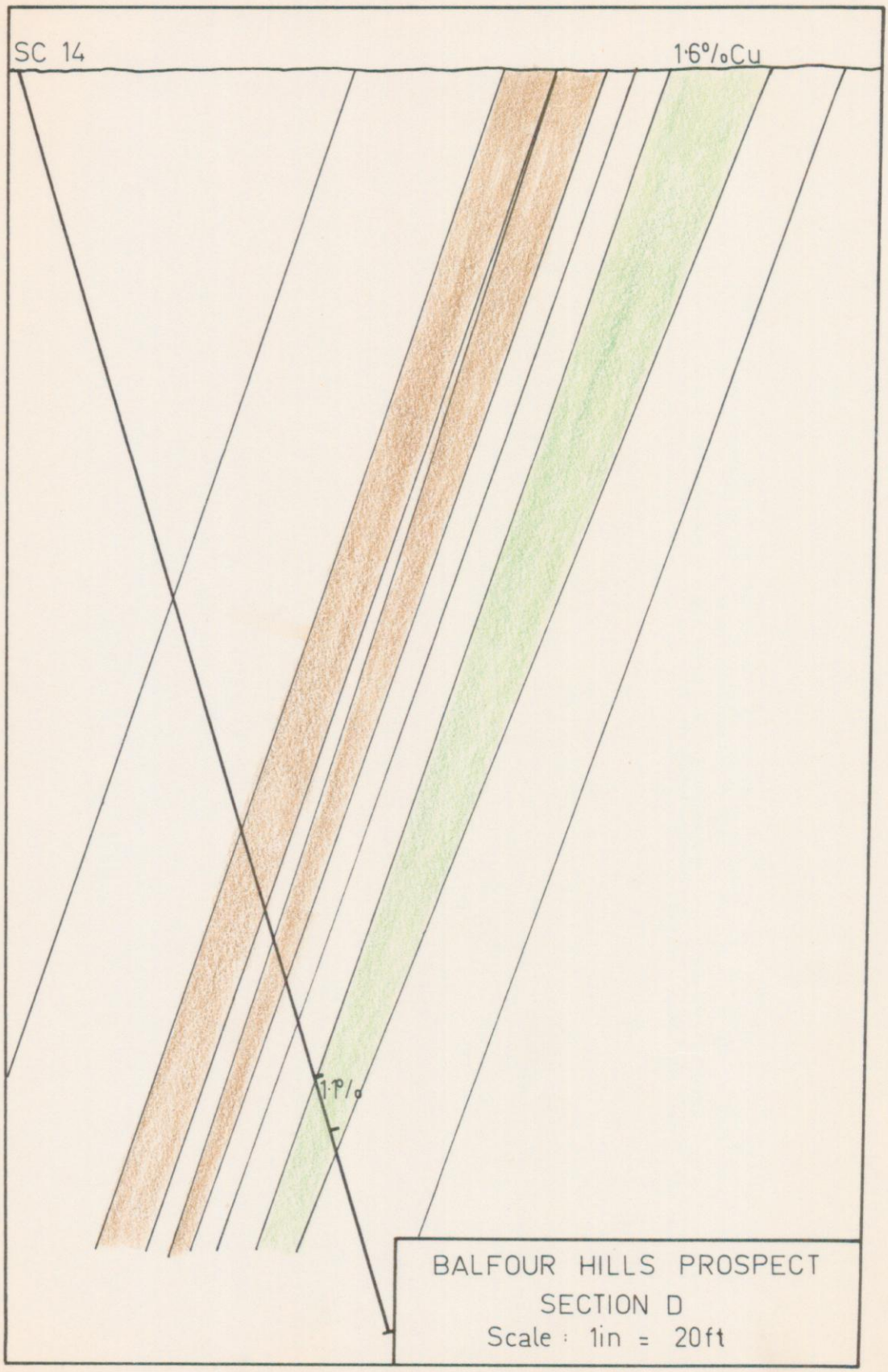
BALFOUR HILLS PROSPECT
SECTION A
Scale: 1in = 20 ft

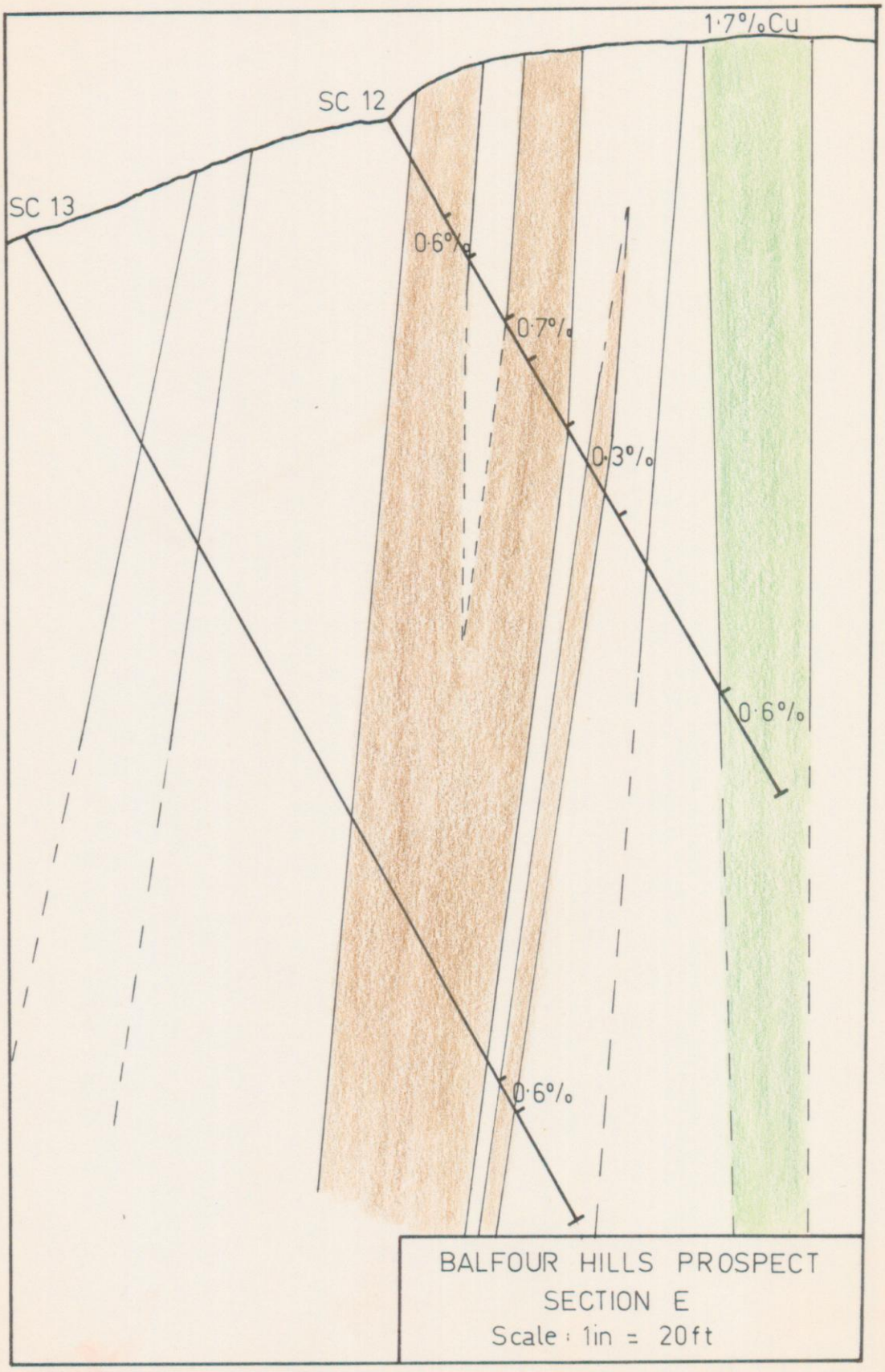


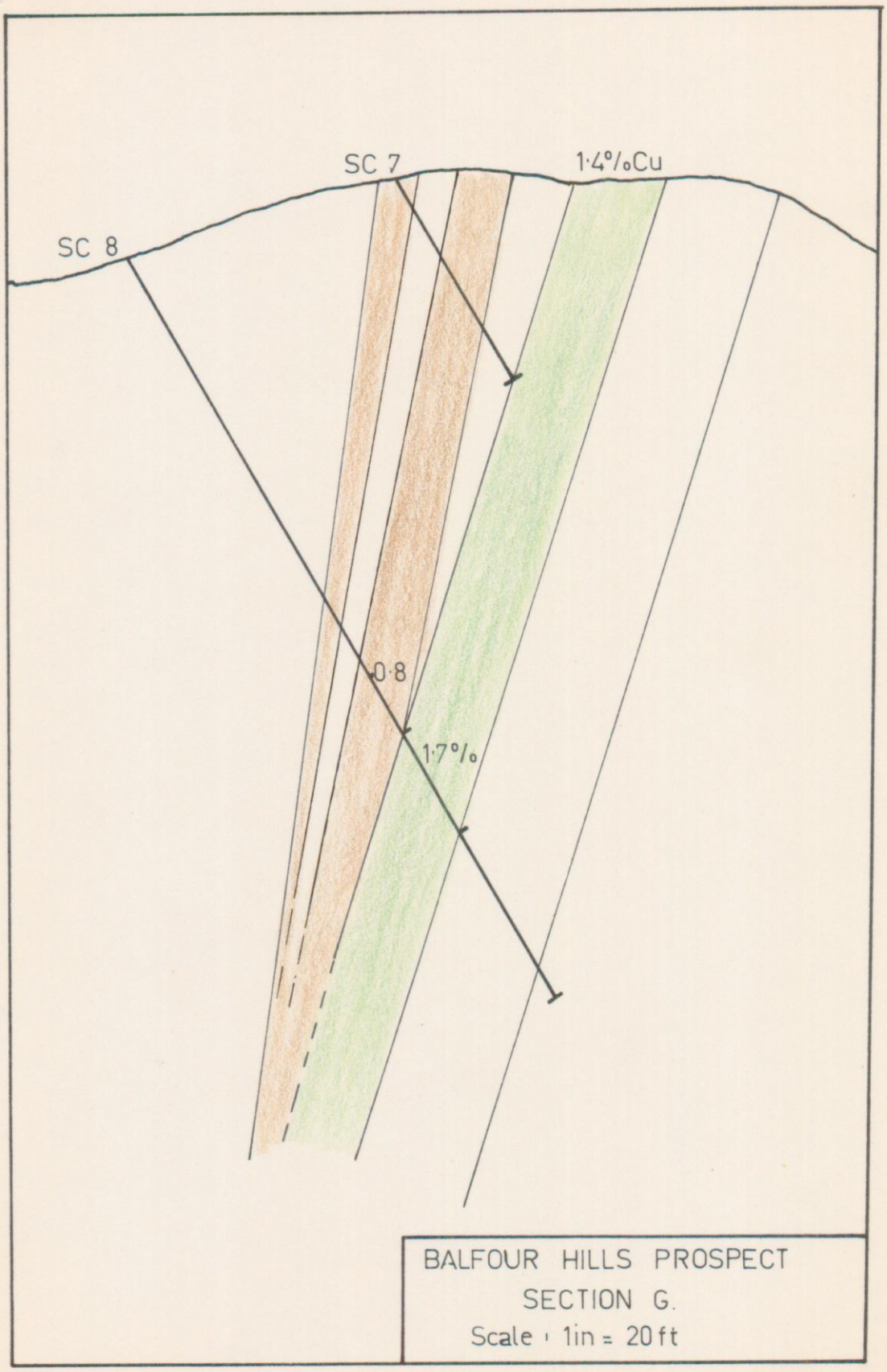
BALFOUR HILLS PROSPECT
SECTION B
Scale : 1 in = 20 ft



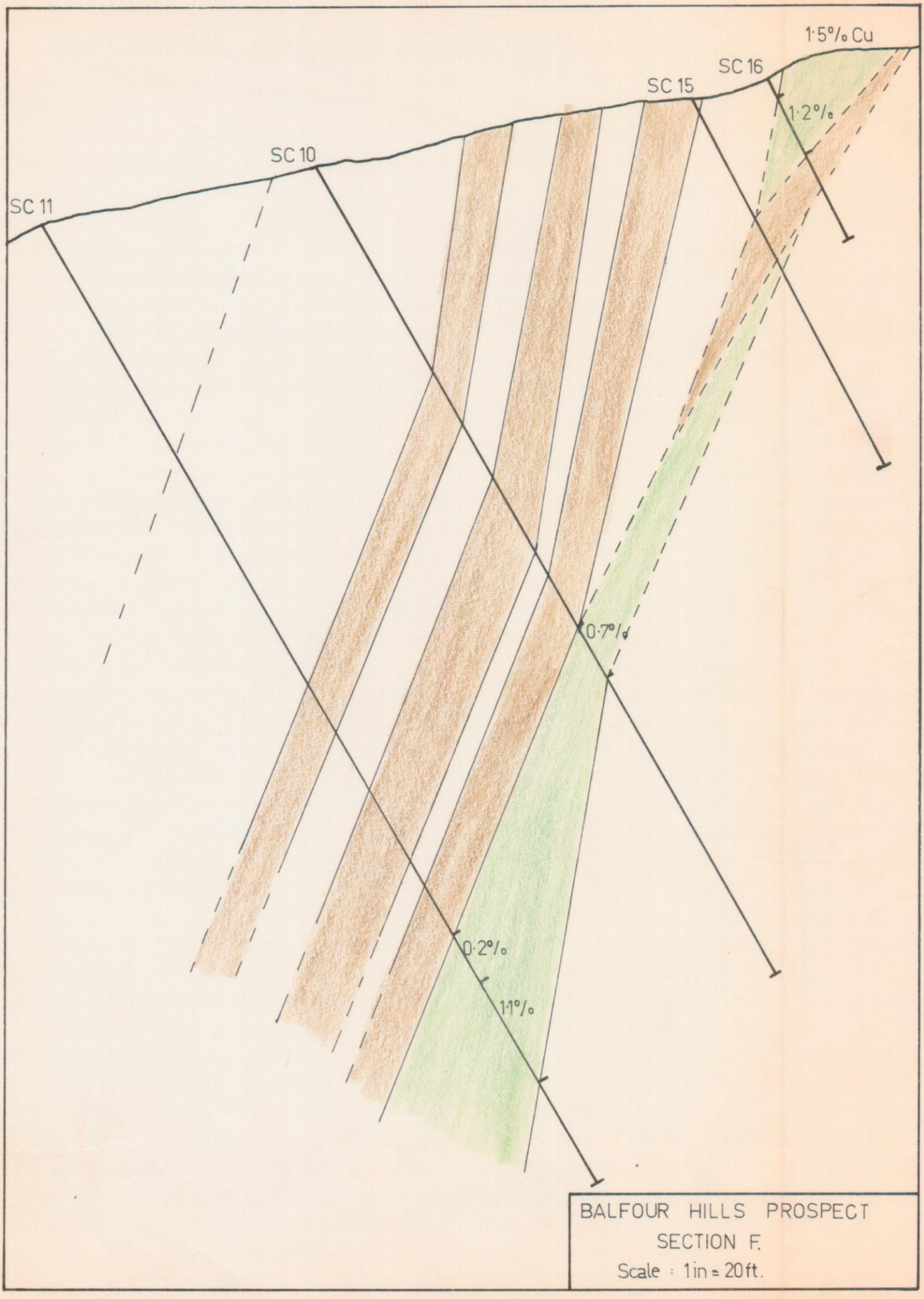
BALFOUR HILLS PROSPECT
SECTION C
Scale : 1in = 20ft


SC 14
1·6%Cu
1·p/o
BALFOUR HILLS PROSPECT
SECTION D
Scale : 1in = 20ft


1·7%Cu
SC 12
SC 13
0·6%
0·7%
0·3%
0·6%
0·6%
BALFOUR HILLS PROSPECT
SECTION E
Scale : 1in = 20ft



BALFOUR HILLS PROSPECT
SECTION G.
Scale : 1in = 20ft



BALFOUR HILLS PROSPECT
SECTION F.
Scale : 1 in = 20 ft.

00030

SOUTH AUSTRALIAN BARYTES LIMITED

ORAPARINNA DOME

FINAL REPORT

R.B. REID
GEOLOGIST

28/1/72

INTRODUCTION

During investigation of reconnaisance Induced Polarization anomalies, located by Metals Exploration (Envelope 587, Mines Dept. S.A.), several areas of copper carbonate mineralization were located at Balfour Hills (report dated October 4, 1971).

Metallurgical Test

Although proven ore reserves are still small, it was decided to investigate possible metallurgical processes to beneficiate the ore before further drilling was begun.

1. Acid Leaching with H_2SO_4

Acid leach tests on the sandstone ore were by AMDEL (Appendix 1). Recovery rates were generally good, but acid consumption by gangue minerals would be one of the major costs of beneficiation.

2. Flotation

To reduce acid consumption it was suggested that flotation followed by acid leaching may be possible. Tests on the sandstone ore by Melinga Mining & Finance Co. P/Ltd (Appendix 2), are at this stage encouraging.

If similar results are obtained from the dolomite ore, it may be possible to treat both sandstone and dolomite ore, thus substantially increasing both proven and indicated ore reserves.

CONCLUSION

At this stage, it is proposed to continue mapping and drilling in the area to increase reserves.

00032

APPENDIX 1

ACID LEACH TESTS ON SANDSTONE ORE

1. INTRODUCTION

Following discussion between Mr R. Reid of South Australian Barytes Ltd and Messrs Goldney and Warburton of Amdel, at our Thebarton laboratories on 18 August 1971, it was agreed that agitation and percolation leach tests be carried out on the sample provided to determine the effect of ore size on leaching efficiency and rate.

2. MATERIAL EXAMINED

The sample submitted for examination was described as "Balfour Mills Prospect, lump ore sample".

3. EXPERIMENTAL PROCEDURE AND RESULTS

3.1 Sample Preparation

Half the sample of lump ore (approximately 20 lb) was crushed to 100% minus ¼ inch. Fractions were riffled out and crushed to 100% minus 8 mesh BSS and 100% minus 22 mesh B.S.S. Samples of the minus ¼ inch, minus 8 mesh BSS and minus 22 mesh BSS ore were submitted for copper assay.

3.2 Agitation Leach Tests

3.2.1 100% minus 8 mesh BSS

500 g of ore was agitated with 750 g of distilled water in a glass beaker (nominal 40% solids slurry density). A.R. grade sulphuric acid, S.G. 1.84 was run in from a burette to maintain a pH of 1.0 in the slurry. The addition of acid caused effervescence which indicated the presence of reasonable amounts of carbonates.

Time Hour	pH	H_2SO_4 Addition lb/1. ton	% Extraction Of Cu
½	1.0	82.4	52.9
1	1.0	97.2	60.6
2	1.0	118.7	69.8
4	1.0	137.9	76.5
7	1.0	153.2	84.3

100% minus 8 mesh B.S.S. Head assay = 2.10% Cu

3.2.2 100% minus 22 mesh BSS

500 g of ore was agitated with 750 g of distilled water in a glass beaker (nominal 40% solids slurry density). A.R. grade sulphuric acid S.G. 1.84 was run in from a burette to maintain a pH of 1.0 in the slurry. The addition of acid once again caused effervescence (possibly a little more than occurred with the 8 mesh material, due to the finer grind size).

Time Hour	pH	H_2SO_4 Addition lb/1. ton	% Extraction Of Cu
½	1.0	136.6	83.5
1	1.0	151.8	90.4
2	1.0	171.5	91.4
4	1.0	177.8	91.3
7	1.0	185.0	91.1

100% minus 22 mesh BSS. Head assay = 2.10% Cu

3.3 Percolation Leach Test

100 g of 100% minus ¼ inch ore was leached by percolation in a one inch I.D. glass column. The same acid/ore ratio as used for the 7-hour minus 22 mesh BSS leach was used (185 lb H_2SO_4/ 1. ton). 146 ml of distilled water and 8.3 g H_2SO_4 were circulated over the ore with an airlift. Once again, effervescence was noticeable and slowed the percolation rate in the early stage, after which a good percolation rate was maintained for several days.

Time Hour	% Extraction of Cu
3	53
6	66
24	79
30	79
46½	79
54	79
72	78

100% minus ¼ inch. Head assay = 2.10% Cu

4. CONCLUSIONS

As expected finer grinding increases the leaching rate and overall recovery of copper. The percolation rate of the ¼ inch material while satisfactory in the small bed depth in the glass column, could be suspect on a larger scale where increased loads could cause the lumps to collapse and blind the bed.

Some improvement in leaching rate and recovery of copper might be achieved using higher acid additions although more gangue might also be attacked. Test work to resolve the above aspects can be carried out at Amdel upon request, if justified by ore reserves.

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APPENDIX 2

FLOTATION TESTS ON SANDSTONE ORE

NOTES ON FLOTATION OF ORAPARINNA "SANDSTONE" ORE :-

A composite sample of drill cores from Oraparinna, Flinders Ranges, was ground to minus 80 mesh and deslimed at 10 microns.

The minus 80 mesh plus 10 micron material was screened on a 150 mesh sieve.

A flotation test was conducted on both fractions.

A sulphide flotation using potassium amylxanthate as collector preceded flotation of oxidised copper minerals by the use of long carbon chain fatty acids.

An emulsion was prepared based on tall oil fatty acids. The cost of the emulsion is approximately 10 cents per pound.

The emulsion was stagewise added and after each addition a concentrate was produced. The rate of fatty acids was in the order of 2 pounds per ton of ore. Test results are shown in Table 1.

Fatty acids would collect the sulphide minerals also and the aim of further experiments would be to produce a low grade copper concentrate with high recovery for leaching. Further test work is recommended.

TABLE 1 RESULTS OF FLOTATION

FRACTION	PRODUCT	WEIGHT %		Cu %		DISTRIBUTION %	
- 150 Mesh + 10 Micron	Sulphide Concentrate	11.1)		8.5)		67.3)	
	Oxide Concentrate 1	3.8)	29.6%	4.6)	4.3%	12.4)	92.1%
	Oxide Concentrate 2	14.7)		1.2)		12.5)	
	Oxide Concentrate 3	5.9		0.46		1.9	
	Rougher Tailing	64.5		0.13		6.0	
	Feed	100.0		1.40		100.0	
- 80 Mesh + 150 Mesh	Sulphide Concentrate	2.2)		18.0)		28.6)	
	Oxide Concentrate 1	2.1)	19.9%	14.0)	5.6%	21.1)	81.4%
	Oxide Concentrate 2	)		)		)	
	Oxide Concentrate 3	15.6)		2.8)		31.7)	
	Rougher Tailing	80.1		0.32		18.6	
	Feed	100.0		1.38		100.0	

We have not tested the "Dolomite" sample.

Results are obviously encouraging, and should your Company still be considering a small mining operation on the Oraparinna copper carbonate ores, we would be interested in carrying out further metallurgical investigations for you.