

UR1984-41

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1984/41. Analysis of coal from the Blue Seam, Blackwood Colliery,
Mount Nicholas.

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A 300 mm x 200 mm channel sample was collected from near the working face of the Blackwood Colliery on 19 April 1981. Proximate, ultimate and petrographic analyses of the coal done by the Joint Coal Board of NSW are given, together with graphic and descriptive sections of the seam. An analysis of the constituents of the dirt bands was made by the Department of Mines.

Location: Cut through No. 38 in C Heading

AMG Grid co-ordinates: 594375 mE, 5399750 mN

Reduced level: 470 m a.s.l.

Depth of cover: 180 m

Seam thickness: 3.25 m

Roof: Lithic sandstone

Floor: Grey mudstone

[18 June 1984]

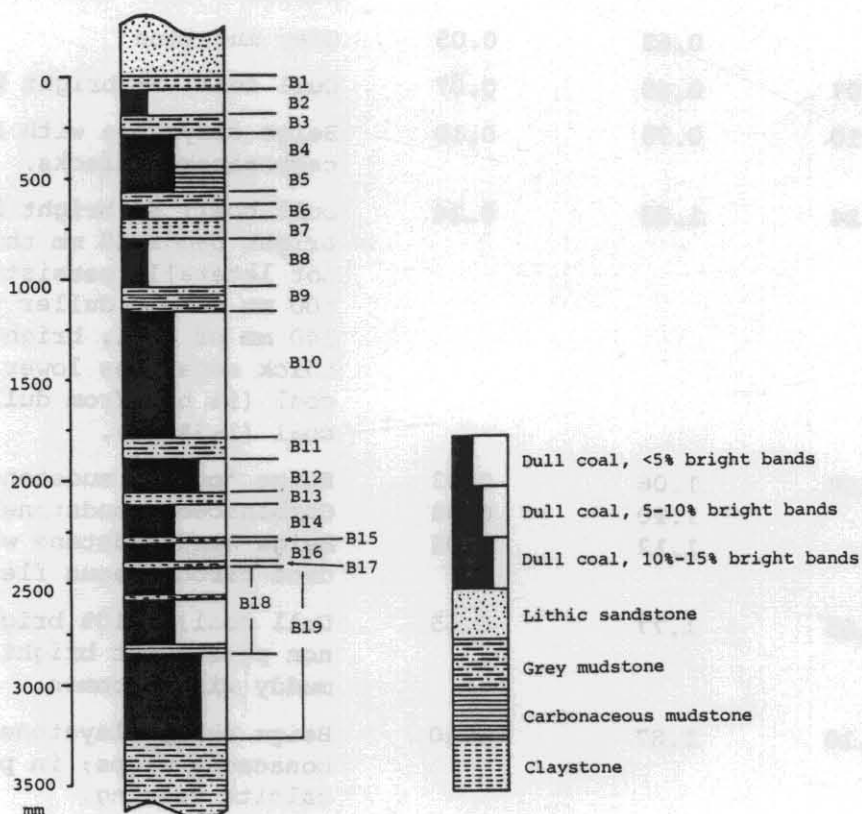


Figure 1. Blue Seam, Blackwood Colliery

Table 1. SEAM DESCRIPTION

SEAM SECTION MEASURED NEAR FACE				
Sample	Sample thickness (m)	Seam cumulative thickness (m)	Ply thickness (m)	Description
				Lithic sandstone roof.
B1	0.07	0.07	0.07	Brown claystone with carbonaceous flecks.
B2	0.12	0.19	0.12	Dull coal; 5% bright bands; occasional slickensides.
B3	0.09	0.23	0.04	Grey mudstone
		0.24	0.01	Beige mudstone
		0.28	0.04	Grey mudstone
B4	0.17	0.31	0.03	Dull coal; 5-10% bright bands
		0.32	0.01	Bright coal band (not persistent 2 m).
		0.44	0.12	Dull coal; 5-10% bright bands
		0.45	0.01	Bright coal band (not persistent 2 m).
B5	0.17	0.57	0.12	Dull coal with abundant mud pellets and slickensides; very dirty; more like a carbonaceous mudstone than dull coal.
		0.62	0.05	Grey mudstone
B6	0.07	0.69	0.07	Dull coal; 5% bright bands
B7	0.10	0.79	0.10	Beige claystone with abundant carbonaceous flecks.
B8	0.24	1.03	0.24	Dull coal; 5% bright bands; some bright bands 10 mm thick, although not laterally persistent; top 100 mm of ply duller than lower 140 mm of coal; bright band 10 mm thick separates lower brighter coal (5% bb) from duller upper coal (1-3% bb).
B9	0.09	1.06	0.03	Beige 'puggy' mudstone
		1.10	0.04	Carbonaceous mudstone
		1.12	0.02	Beige hard mudstone with abundant carbonaceous flecks.
B10	0.65	1.77	0.65	Dull coal; 5-10% bright bands; non persistent bright bands and muddy wisps common.
B11	0.10	1.87	0.10	Beige shaly claystone with carbonaceous wisps; in parts with calcite veining.
B12	0.17	2.04	0.17	Dull coal; abundant bright bands.
B13	0.06	2.10	0.06	Beige hard claystone
B14	0.17	2.27	0.17	Dull coal; 5-10% bright bands

Table 1. (continued)

Sample	Sample thickness (m)	Seam cumulative thickness (m)	Ply thickness (m)	Description
B15	0.02	2.29	0.02	Beige hard claystone with wispy carbonaceous streaks.
B16	0.10	2.39	0.10	Dull stony coal with 5-10% bright bands; bright band 10-20 mm thick in centre of ply.
B17	0.02	2.41	0.02	Beige claystone with abundant wispy carbonaceous streaks and pyrite grains on joints.
B18	0.45	2.86	0.45	Dull coal; 5-10% bright bands; interbedded sequence of dull and brighter coal; minor mudstone flecks.
				Floor of section near face.

SEAM SECTION MEASURED IN SUMP

Sample	Sample thickness (m)	Seam cumulative thickness (m)	Ply thickness (m)	Description
		2.39	0.10	Dull coal
		2.41	0.02	Beige claystone
B19	0.84	2.55	0.14	Dull coal; 15% bright bands, some bands 20-30 mm thick.
		2.56	0.01	Beige claystone
		2.79	0.23	Dull coal; 10-15% bright bands
		2.83	0.04	Grey mudstone
		3.25	0.42	Dull coal; 5-10% bright bands
				Grey mudstone floor

Table 2. PROXIMATE ANALYSES:

Sample	Ply thickness	Description	APPT SG	Air dried moisture	Proximate analysis, dry basis					Specific energy (MJ/kg)	
					Ash	Volatile carbon-aceous material	Fixed carbon	Total Sulphur		Dry basis	Dry ash free
	(m)			(%)	(%)	(%)	(%)	(%)			
B1	0.07	Brown claystone	2.18	2.1	82.1						
B2	0.12	Dull coal	1.64	7.3	43.2	19.3	37.5	0.26	17.74	31.24	
B3	0.09	Grey mudstone	2.13	7.0	81.1						
B4	0.17	Dull coal	1.43	6.6	22.6	25.0	52.4	0.32	25.10	32.42	
B5	0.17	Carbonaceous grey mudstone	2.24	3.6	87.0						
B6	0.07	Dull coal	1.58	5.8	37.8	22.0	40.2	0.24	19.64	31.58	
B7	0.10	Beige claystone	2.22	11.2	91.1						
B8	0.24	Dull coal	1.45	5.6	25.5	26.5	48.0	0.34	24.24	32.54	
B9	0.09	Carbonaceous and grey mudstone	1.89	9.1	71.1						
B10	0.65	Dull coal	1.40	5.8	23.2	30.1	47.7	0.40	24.74	32.22	
B11	0.10	Beige claystone	2.18	7.0	0.5						
B12	0.17	Dull coal	1.34	6.2	17.9	37.5	44.6	0.49	26.88	32.74	
B13	0.06	Beige claystone	2.30	4.7	85.2						
B14	0.17	Dull coal	1.34	5.3	17.5	29.5	53.0	0.37	26.86	32.56	
B15	0.02	Beige claystone	2.06	2.6	73.2						
B16	0.10	Dull coal	1.30	5.2	15.0	33.1	51.9	0.43	27.32	32.14	
B17	0.02	Beige claystone	2.22	3.2	82.6						
B19	0.84	Dull coal	1.35	4.6	20.8	32.6	48.6	0.43	25.70	32.44	

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Table 3. ULTIMATE AND ASH ANALYSES

	B1-B19 Composite	
	Including bands	12.7 mm x 0 Fl.60
<i>Ultimate Analysis</i>		
<i>(Dry ash free %)</i>		
Carbon	78.3	81.6
Hydrogen	5.15	4.93
Nitrogen	1.44	1.49
Sulphur	0.51	0.55
Oxygen	14.6	11.4
CO ₂ AD%	0.82	0.22
<i>Ash Analysis</i>		
SiO ₂	58.9	60.6
Al ₂ O ₃	24.4	20.2
Fe ₂ O ₃	8.9	12.2
CaO	3.50	2.13
MgO	1.19	1.12
TiO ₂	0.96	0.73
Na ₂ O	0.98	0.59
K ₂ O	1.40	0.52
Mn ₃ O ₄	0.009	0.006
P ₂ O ₅	0.160	0.082
SO ₃	1.11	0.97
<i>Ash fusion temperatures (°C)</i>		
Deformation temperature	1060	1100
Softening temperature	1330	1350
Hemisphere temperature	1380	1380
Flow temperature	1480	1430

Table 4. MACERAL ANALYSIS

Sample number:	B2	B4	B6	B8	B10	B12	B14	B16	B19	Composite B1-B19	
										Including bands	F1.6
VITRINITE	11	15	6	16	22	55	21	36	36	31	35
EXINITE	5	8	9	11	11	11	9	6	10	9	10
INERTINITE											
Micrinite	Tr	Tr	-	-	Tr	1	Tr	1	Tr	1	Tr
Macrinite	3	4	5	4	3	2	3	3	3	3	4
Inertodetrinite	20	16	19	17	16	6	14	12	12	11	12
Semifusinite	34	44	39	38	36	17	43	31	26	24	28
Fusinite	5	4	6	5	4	2	4	5	3	3	5
MINERAL MATTER											
Clay	20	7	14	8	6	5	6	5	9	15	6
Carbonate	Tr	2	1	Tr	1	1	Tr	-	Tr	1	Tr
Pyrite	Tr	Tr	-	-	-	-	-	-	-	Tr	-
Quartz	2	Tr	1	1	1	Tr	Tr	1	1	2	Tr
MEAN MAXIMUM REFLECTANCE										0.63	0.63

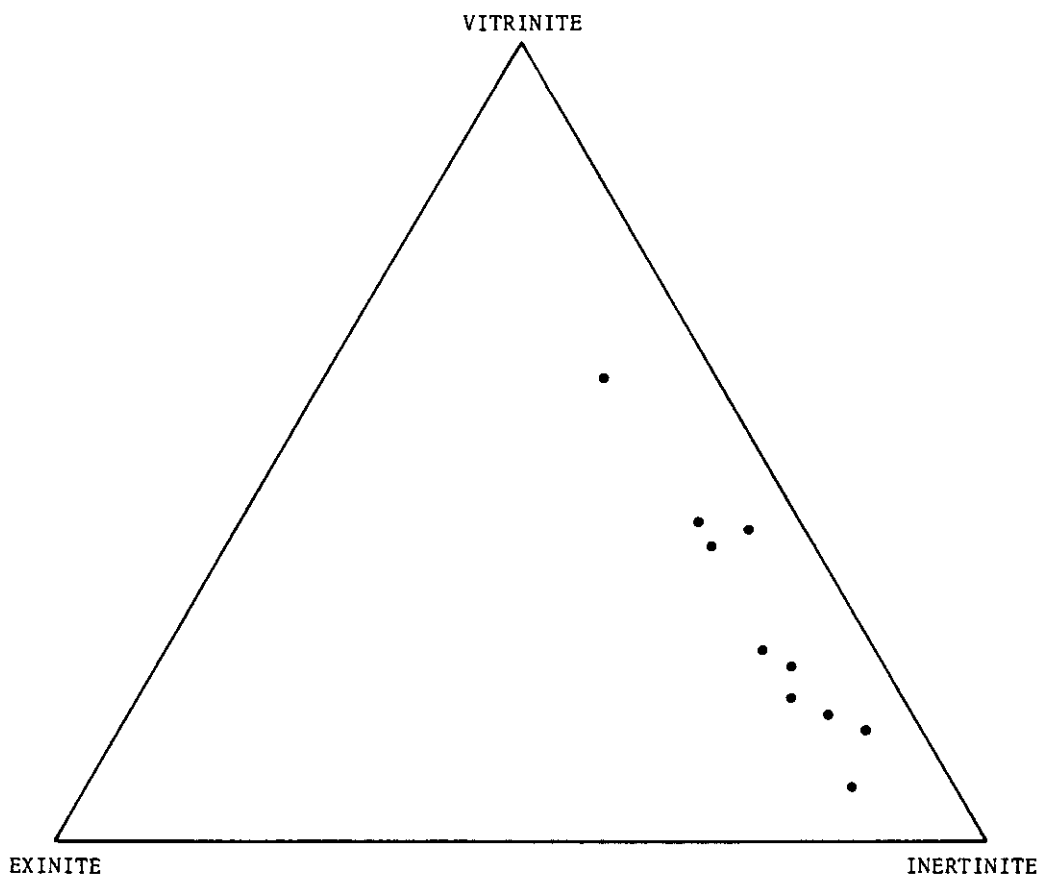


Figure 2. Petrographic composition of the Blue Seam plys

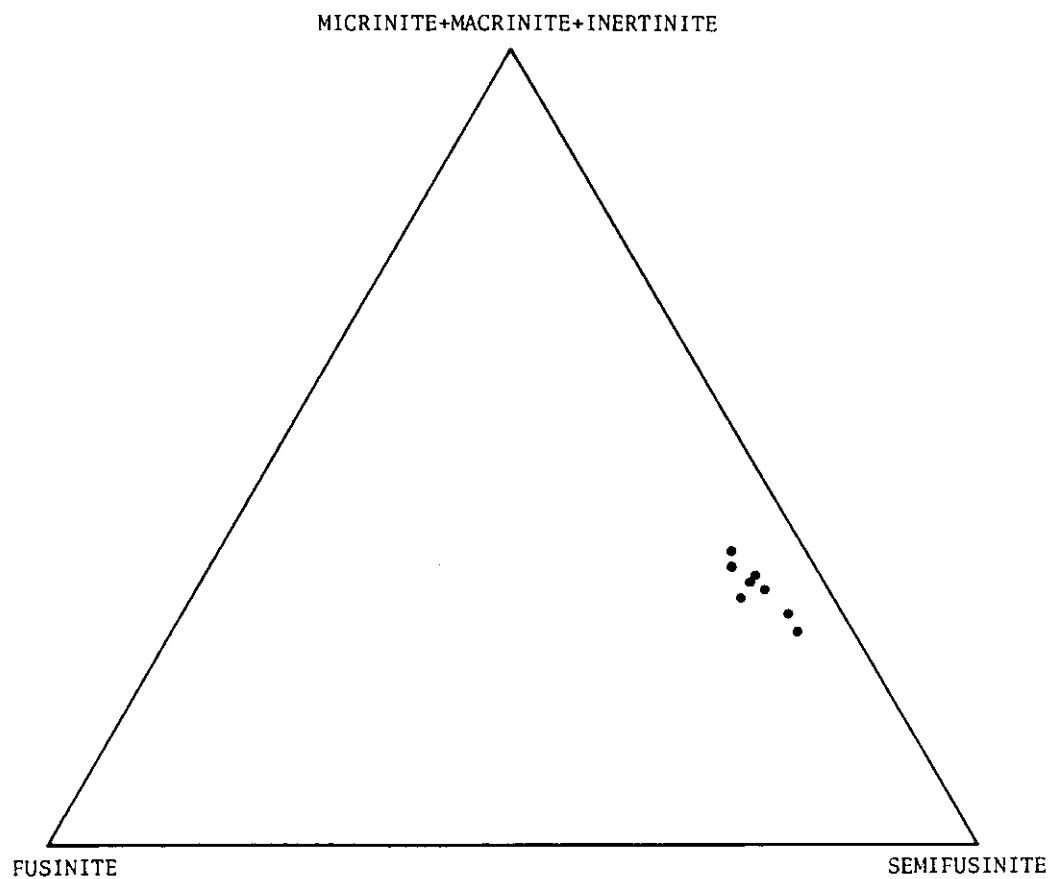


Figure 3. Inertinite composition of the Blue Seam plys

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5 cm

Table 5. *FLOAT-SINK ANALYSIS*

Sample No.	Density of separation		Mass (%)	Ash (%)	Cumulative	
					Mass (%)	Ash (%)
B1-B19	F1.40		30.7	8.8	30.7	8.8
	S1.40	F1.60	29.9	22.4	60.6	15.5
	S1.60	F1.70	4.6	38.1	65.2	17.1
	S1.70	F1.80	2.5	47.0	67.7	18.2
	S1.80		32.3	78.6	100.0	37.7

1. Density analysis carried out on 12.7 mm x 0 material.
2. Ash percentages reported on "air-dried" basis.

Table 6. CLAY COMPONENTS OF THE DIRT BANDS AND COAL PLYS.

COAL PLYS	
Sample No.	Mineralogy (by X-ray diffraction)
2	Quartz (strong), montmorillonite (moderate), kaolinite (weak)
4	Quartz (strong), montmorillonite (weak), calcite (weak), kaolinite (very weak)
6	Quartz (mod.), kaolinite (weak), montmorillonite (very weak)
8	Quartz (mod.), kaolinite (weak), montmorillonite (weak), calcite (very weak)
10	Quartz (mod.), kaolinite (weak), montmorillonite (trace)
12	Montmorillonite (weak), kaolinite (weak), quartz (very weak), calcite (very weak)
14	Quartz (mod.), kaolinite (mod.), montmorillonite (weak), calcite (very weak)
16	Kaolinite (weak), quartz (weak), montmorillonite (very weak)
18	Quartz (mod.), kaolinite (weak), montmorillonite (trace)

MUDSTONE BANDS	
Sample No.	Mineralogy (by X-ray diffraction)
1	Montmorillonite (strong), kaolinite (mod.), quartz (trace)
3	Montmorillonite (mod.), quartz (weak), kaolinite (weak)
5	Quartz (very strong), kaolinite (trace), montmorillonite (trace)
7	Montmorillonite (strong), kaolinite (weak), quartz (very weak)
9	Montmorillonite (mod.), kaolinite (weak), quartz (very weak)
11	Montmorillonite (weak), calcite (weak), kaolinite (weak)
13	Kaolinite (very strong), montmorillonite (weak), quartz (trace)
15	Kaolinite (strong), quartz (very weak), montmorillonite (trace)
17	Kaolinite (mod.), quartz (weak), montmorillonite (very weak)

X-ray diffraction analyses by R.N. Woolley, Department of Mines, Hobart