

## Abstract

This coalfield, in the Middle Derwent Valley, is of limited lateral extent. The coal-bearing ground is confined to a small fault block, and part of the prospective ground is overlain by Tertiary basalt. A dolerite sill forms a floor to the fault block. Three seams, each 1.0-1.5 m thick, occur in a stratigraphic interval of 4.5-6.0 m. The top two seams were mined together in underground workings known as the Langloh Colliery from 1938-1963. A measured reserve of four million tonnes of *in situ* black coal suitable for extraction by open-cut mining has recently been defined. The coal is similar in quality and petrographic character to other Tasmanian Triassic black coals.

## LOCATION AND ACCESS

The coalfield is situated in the middle reaches of the Derwent Valley, on the eastern side of the River Derwent between the townships of Hamilton and Ouse. Access is by sealed road from Hobart, a distance of 85 km. Many secondary unsealed roads service the area.

## GENERAL GEOLOGY

The coal-bearing ground in the Langloh coalfield is part of a dominantly lithic sandstone sequence interbedded with minor mudstone and coal seams. The sequence is of fluviatile origin and is part of the lithic sandstone sequence of the Upper Parmeener Super-Group. Examination of the microflora from mudstone associated with the coal seams suggests that the sequence belongs to the *Craterisporites rotundus* zone and hence is Karnian in age (S.M. Forsyth, pers. comm.).

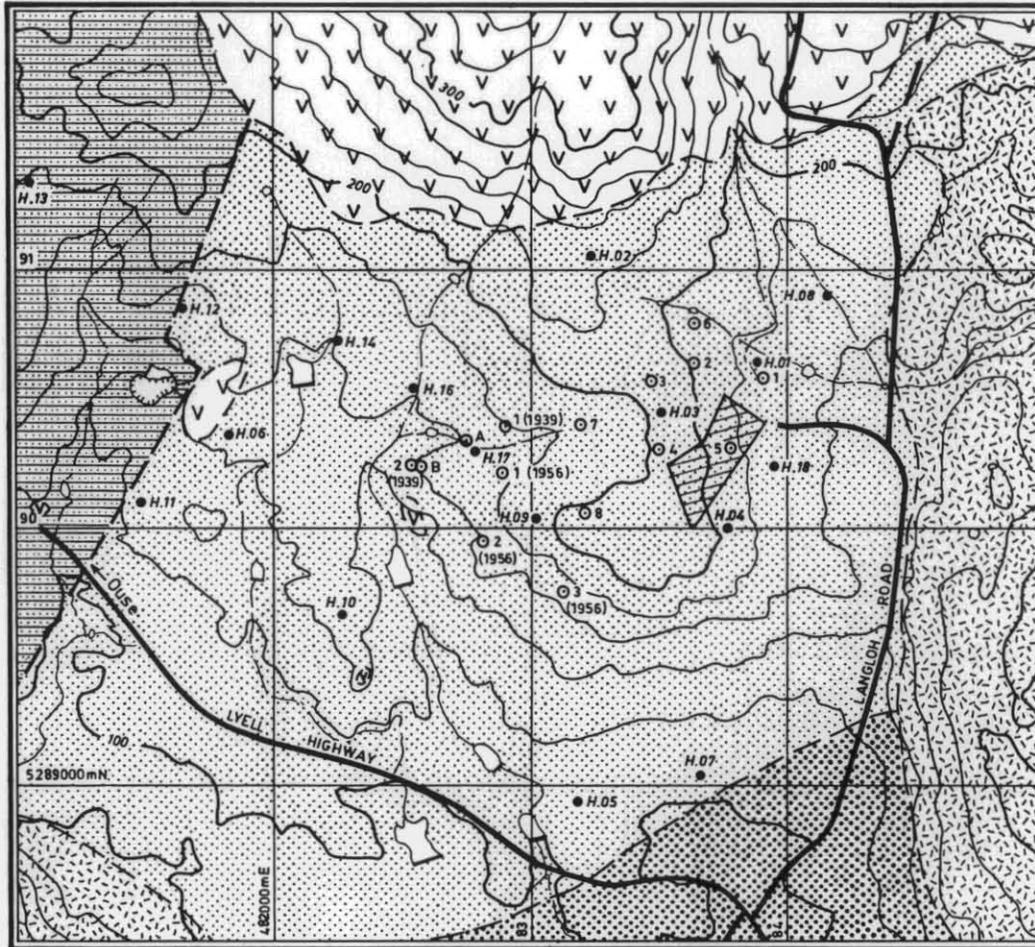
The lithic sandstone sequence is underlain by a quartzose sandstone sequence which is devoid of coal. The sandstones are confined to a wedge-shaped fault block, bounded on the west by a Tertiary graben and to the east and south by Jurassic dolerite. The geology of the area is shown in Figure 1.

Jurassic dolerite has intruded the sandstone sequence and now forms a 'floor' to the fault block, as drill holes in the coalfield have encountered dolerite at depth. The underlying dolerite sill which forms this 'floor' dips at 4° towards the west. Tertiary basalt flows cover the lithic sandstone sequence to the north and a basalt neck occurs on the western margin of the coalfield. This basalt neck or plug is related to a system of faults, the largest of which defines the eastern edge of the Tertiary graben (Morrison and Bacon, 1984).

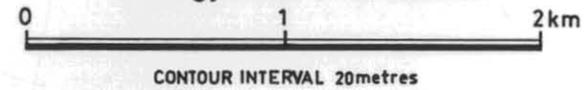
## COAL GEOLOGY

Three coal seams exist in the coalfield. The seams are 1.0-1.5 m thick and usually show abrupt, non-erosional roof and floor contacts, although in some intersections the upper seam (A) has an erosional top marked by a mud-pebble conglomerate which filled scours in the underlying peat. The three seams are separated by grey silty mudstone units. The mudstone between seams A and B is typically 200 mm thick while the mudstone between seams B and C is usually 1.0-1.5 m thick (Morrison and Bacon, 1980). The top two seams were worked together with the intervening mudstone band

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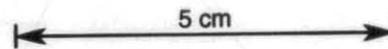
Geologist C.A. BACON  
 Geology after K.C. Morrison



- TERTIARY**  
 Clay, sand, ferricrete  
 Basalt
- JURASSIC**  
 Dolerite
- TRIASSIC**  
 Lithic sandstone  
 Quartz sandstone
- Inferred fault  
 Capricorn Mining drill hole  
 Department of Mines drill hole  
 Area of underground mining

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Figure 1.



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in the old Langloh Colliery.

### PREVIOUS INVESTIGATIONS

Selwyn (1855) inspected a 0.3 m thick outcrop of coal 11 km above New Norfolk (near Plenty) and commented that a seam of coal 2.5 m thick was known to crop out near Hamilton. The coal in the area was rediscovered when a well was sunk through sandstone for water near the Langloh Park homestead, and some small scale mining activity followed. Thureau (1883) recorded that the well was sunk "years ago" and whilst no mining was in progress at the time of his visit, miners who had some years previously extracted small quantities of coal for domestic and other purposes supplied the information that the seam was 1.07 m thick and 12.2 m below the ground surface. Thureau recommended that the area be drilled to determine the quality and quantity of coal available.

In 1891 the well (or shaft) was enlarged, and a quantity of coal raised and sent for analysis and practical testing by various consumers of coal, such as the railways. Four holes were drilled in the coalfield in 1892. The logs are given in Montgomery (1894) and again in Hills et al. (1922).

By 1922 the prospecting activity in the area consisted of two shafts. One was the old enlarged well, and the second a shaft which had been sunk near the Kimbolton homestead.

Mining was commenced in 1938 by the Langloh Coal Mining Company. The initial attempt to open a mine was by development from the shallow shafts, but this approach was quickly abandoned in favour of driving a dip tunnel into the seam. The leases, held by H.E. Brock for the Langloh Coal Mining Company, were transferred to M.E. Gorringer for the Hamilton Coal Company in December 1942. Mining was continued by the latter company until 1963.

Two diamond-drill holes were drilled in the coalfield in 1939, eight between the years 1944 and 1946, and three in the period 1955-1956 as an aid to mine planning. Analyses from these drilling programmes are given in Appendix 2.

Mining was by the bord and pillar method and the coal was used in local industry, by the railways, and as a domestic fuel.

The mine employed between four and twelve men and produced between 2000-8000 tonnes of coal per year. As the workings were fairly shallow, percolating water from the ground surface was a continual problem. The mudstone (montmorillonite-rich) roof and floor of the seam reacted with water to produce difficult mining conditions for most of the life of the mine.

### COAL QUALITY

The Langloh coal is similar in quality to Triassic coals found elsewhere in Tasmania. Analyses from a variety of historical sources are listed in Appendix 2. Montgomery (1894) recorded details of various tests made on the Langloh coal and commented favourably on the results of trials of the coal in steam-raising purposes for industrial use. A recent (1985) analysis of a bulk (unwashed) coal sample from the coalfield is given below:-

Moisture (%)	4.8
Ash (%)	20.3
Volatile matter (%)	24.5
Fixed carbon (%)	50.4
Total sulphur (%)	0.3
Chlorine (%)	0.02
Phosphorous (%)	0.003
Specific energy (MJ/kg)	23.6

Tests on core from the 1939 drilling showed a yield of 2.8 gallons (12.7 litres) of crude oil per ton of coal from a sample from DDH 1 (1939) Seam No 1 (2.3 m thick). Fusibility of the ash of the coal was also determined on the 1939 core samples and found to be from 1250°C to above 1350°C.

Petrographic analysis of coal from this area shows that the environment of peat deposition was similar to that of other Tasmanian Triassic black coals. The coal is rich in inertinite with minor vitrinite and cutinite. In some parts of the coalfield the coal has been heat-affected by intrusive Jurassic dolerite and the rank of the coal raised slightly. Mean maximum vitrinite reflectance of the coal varies from 0.6-3.6% as a result of this heating. Fingal coal has a mean maximum vitrinite reflectance in the order of 0.55-0.60% (Morrison and Bacon, 1984).

#### RECENT EXPLORATION

An exploration programme was conducted over the coalfield from 1979 to 1984 to determine the quality and quantity of coal in the area. Over part of the coalfield a measured reserve of four million tonnes of coal suitable for extraction by open-cut mining has been determined. Additional reserves suitable for underground extraction exist in the coalfield but as yet have not been brought up to measured reserve status.

#### FUTURE POTENTIAL

Although of limited areal extent the coalfield has the potential to support a small scale mining operation. The measured and indicated *in situ* reserves of the coalfield are in the order of ten million tonnes. The coal is similar in quality to other Tasmanian Triassic black coals and the seam is remarkably free of dirt bands. This coalfield has considerable potential for further development.

#### REFERENCES

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MORRISON, K.C.; BACON, C.A. 1984. Comparison between the Fingal and Langloh coalfields, Tasmania Basin. *Abstracts 18th Annual Newcastle Symposium on Advances in the Study of the Sydney Basin.*

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APPENDIX 1

AMG references of drill holes and adits in the Langloh (Lawrenny) coalfield

1894 Drilling (Department of Mines)

- A DN82759033
- B DN82579023
- C -
- D -

1939 Drilling (Department of Mines)

- 1 DN82909038
- 2 DN82579023

1944-1946 Drilling (Department of Mines)

- 1 DN83909057
- 2 DN83649064
- 3 DN83499056
- 4 DN83509030
- 5 DN83799030
- 6 DN83649079
- 7 DN83209039
- 8 DN83229006

1956 Drilling (Department of Mines)

- 1 DN82909022
- 2 DN82828995
- 3 DN83148975

APPENDIX 2

Coal analyses from the Langlooh coalfield

Sample number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Moisture at 100°C (%)	3.02	4.0	4.7	4.1	5.3	3.5	2.11	2.94	2.04	2.30	1.8	1.91	1.96	2.36	5.2	2.64	2.04
Volatile matter (%)	24.02	23.5	18.0	20.5	21.2	9.9	24.32	24.36	24.90	24.78	26.65	24.86	25.76	24.94	23.2	17.26	19.1
Fixed carbon (%)	63.40	66.3	55.9	62.4	42.5	52.6	54.51	42.10	54.92	53.34	57.73	53.59	54.28	45.04	56.1	59.86	58.46
Ash (%)	9.63	6.2	21.4	13.0	31.0	34.0	19.06	30.60	18.14	19.58	13.82	19.64	18.00	27.66	15.5	20.24	20.40
Total sulphur (%)	0.61	-	-	-	-	-	0.38	0.59	0.35	0.33	0.35	0.32	0.23	0.33		0.37	0.34
Specific energy (MJ/kg)	-	-	-	-	-	-	25.9	21.4	26.6	25.8	27.9	26.0	26.3	22.9		25.7	25.5

1. Analysis of coal from shaft by W.F. Ward, Hobart, 1891 (Montgomery, 1894).
2. Analysis of coal from shaft (Montgomery, 1894).
3. Analysis of coal from No. 2 Bore, whole seam sample, Seam No. 1.
4. Analysis of coal from No. 2 Bore, whole seam sample, Seam No. 2.
5. Analysis of coal from No. 2 Bore, whole seam sample, Seam No. 3.
6. Analysis of coal from No. 2 Bore, whole seam sample, Seam No. 5.
- 7-14. Fly samples from various parts of the mine, collected in 1943 (DOM plan 621B).
15. Sample from the Main Heading (not whole seam) collected in 1959.
16. DDH 1 (1939), Seam No. 2 (1.37 m thick).
17. DDH 2 (1939), Seam No. 2 (1.29 m thick).