

FINGAL COAL REPORT

FOR

GIPPSLAND MINERALS

D. R. BROWN

22 JULY 1971

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MEMORANDUM

TO: Mr. C. P. Barnes,
CHIEF GEOLOGIST.

FROM: D. R. BROWN

SUBJECT: "FINGAL COAL"

INTRODUCTION

Between 23rd June and 1st July, 1971 a geological reconnaissance was made of the coal potential of Gippsland Minerals N.L.'s 350 square mile exploration licence EL 14/71.

Unfortunately, access could not be gained to any now closed coal mines due to cave-ins and the dangerous nature of the mines.

However, an inspection was made of the only working coal mine in the EL, namely the Cornwall Coal Company's underground workings at Fingal.

HISTORY

Coal mining began in the Fingal-St. Marys area in 1886 to supply steaming coal for the local railway. Between 1886 and 1966, total production from this area has been 7,814,060 tons, which comprised approximately 80% of the states total production.

At present, production from the area is approximately 50,000 to 60,000 tons of washed coal per year, from the Cornwall Coal Company's Fingal mine. This coal is used principally as steaming coal on the North coast of Tasmania.

COAL TYPE

The coal measures of the Fingal area are of a Triassic age and are associated with feldspathic sandstone. It can be correlated with the Nymboida coal seams of N.S.W. and the Ipswich stage of Southern Queensland.

The coal is a non coking bituminous variety with a high ash content and an average calorific value of 10,000 Btu/lb. It is principally used as domestic fuel and for steam raising.

GEOLOGY

The rock types of the area are briefly described chronologically below from oldest to youngest.

The basement rock of the area are strongly folded Silurian sediments known as the Mathinna Beds. These sediments consist of sandstones, mudstones, siltstones, slates and phyllites and folded along a general North-South axis. Devonian granites are present within the area but have no bearing on the coal prospects of the area.

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The Silurian is overlain unconformably by Permian sediments. Very broadly, these sediments are predominately freshwater & marine and consist of sandstones, arkoses, siltstones and conglomerates & lss. Within the Fingal area, no complete sections of the Permian have been observed. In 1890, 818 ft. of Permian sediments were observed in the Harefield bore hole. 500 ft. - the Killymoon BH.

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Conformably overlying the Permian are Triassic sediments. The sediments consist of feldspathic sandstones, sandstones, mudstones and carbonaceous mudstones.

The economic coal measures are located within the top 660' of the succession within the Feldspathic Sandstone member. The succession has a measured maximum thickness of 1,055 feet which was revealed in a Mines Department Bore Hole. This thickness is thought to represent the complete sequence of Triassic sedimentation, as Jurassic plant zones have been recognized in specimens from the Fingal area.

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A dolerite sheet of Jurassic age up to 800 or 900 ft. thick in places overlies the Triassic sediments. It is roughly conformable with the sediments and has acted as a vast protective covering for them, preventing their removal by erosion. The contact between the dolerite and underlying sediments was not observed due to more recent talus deposition.

Cainozoic fluviatiles overlie the Triassic within valleys and areas lacking dolerite. Scree is often developed off the dolerite plateau.

STRUCTURE

The Permian sediments rest unconformably on the Silurian. The contact is nearly planar and dips at 1° or less to the south. The Permian-Triassic contact is conformable within the area of interest.

At Yates Mine, Fingal, the Triassic beds dip at approximately -1½° to the East. The general dip of the Triassic within the area of interest is thought to be of the order 1° to 2° to the south-east. However, rolls and faults increase this dip in some areas. The main dolerite sheet shelves to the west with respect to the Triassic beds. At St. Pauls Dome near Avoca, the dolerite is in contact with lower Triassic beds and towards Fingal, the contact remains at this stratigraphic level or lower, i.e. no economic coal measures. Beyond Fingal, the dolerite is in contact with Triassic beds above the economic coal workings.

Overall, the sheet also has a dip to the south-east roughly conformable with the sediments.

Vertical faulting with some tilting was observed within the area on all scales. The Cornwall fault is reported to have a displacement of approximately 500 ft., whereas small faults within the Cornwall Coal Company's mine, Fingal, with displacement of only a few inches were observed. The faulting is possibly of Tertiary age, and is a definite factor to be remembered when planning the extraction of coal.

COAL SEAMS

The character of individual seams, together with their roofs and floors, is variable over quite short distances and correlations between seams is extremely difficult. At the Cornwall Coal Mine (this is the mine, not the company of the same name), which is now closed, there are three seams. Using local seam names,

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 the seams are the Hitit (4'9") with the Fenton (8') approximately 100 feet below it and the Blue (11') approximately 30-40 feet above it. It is not known by the writer which seams have been worked and which have not.

At Duncan and Yates Mines the main seam is 7 feet thick. This seam is present for a known distance of 5000' south of the present workings (Mines Department bore holes), and approximately 2000' to the east in workable widths. Further east it deteriorates into a mudstone coal sequence. However, the presence of a 13 to 16 foot seam has been recorded at Dalmayne approximately 10 miles to the south-east of Duncans Mine.

FUTURE EXPLORATION

The Duncan, Yates, Cornwall, and I believe, the Nicholas coal mines are all covered by mining leases held by the Cornwall Coal Company.

Future coal exploration would therefore most probably, have to begin on a grass-roots level.

Unfortunately, the dolerite layer over the coal measures would make the proving costly, due to the amount of drilling which would need to be done. Also, most of the outcropping coal measures are covered by dolerite talus. Drilling here would be expensive due to the necessity of casing the complete boreholes.

The next stage of exploration should be concerned with accurately mapping the Triassic sediment dolerite boundary with a view to delineating an area of exposed Upper Triassic sediments containing economic coal seams.

A square pattern drilling programme with a maximum of 21 boreholes is proposed, to prove 20,000,000 tons of coal. These holes could be spaced at 1600 feet intervals from each other for a 66 2/3% confidence level. The minimum holes required would be 14 to prove 20,000,000 tons, if the coal thickness is 10 feet or more.

However, it is thought that all consideration should be given to finding a market for the coal before any costly work, i.e. bulldozing, drilling, is started.

A 250 lb. bulk sample was taken from the Duncan Coal Mine operated by the Cornwall Coal Company. This is the only operating mine, and as such, was the only mine where a fresh sample of the coal of the area could be obtained. This sample will be subjected to laboratory tests as soon as possible.

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D. R. BROWN

References:

Threader, V.M.

Interim report of the Geology
 and Coal Resources of the North
 West Coalfields of Tasmania, 1968.

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 Minerals 14/71

Sharp and Howells Pty. Ltd.
 Reg. Office - 47 Yarra Bank Road,
 South Melbourne, Vic. 3205.

3rd August, 1971.

T E S T R E P O R T

Sample of Coal Received 9/7/71
 Lab. No. 71/A/957

<u>Results of Analysis:</u>	<u>Proximate</u>
Moisture	8.3%
Ash	32.9%
Volatile matter	33.9%
Fixed Carbon	25.9%
<u>Ultimate</u>	
Carbon	49.0%
Hydrogen	3.4%
Sulphur	0.59%
Oxygen	Not determined
<u>Ash:</u>	
Silica as SiO ₂	62.2%
Alumina as Al ₂ O ₃	29.0%
Iron as Fe ₂ O ₃	3.0%
Magnesium as MgO	1.2%
Calcium as CaO	2.5%
Potassium as K ₂ O	1.1%
Sodium as Na ₂ O	0.25%
Phosphorus as P ₂ O ₅	0.056%
Sulphur as SO ₃	0.58%
<u>Calorific Value</u>	8280 Btu/lb.

Yours faithfully,
SHARP & HOWELLS PTY. LTD.

(signed) R. W. Scoborio

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