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**DEPARTMENT OF MINES
SOUTH AUSTRALIA**

BRANCH.....GEOLOGICAL SURVEY.....

G.S.51
REPORT No......37/68.....
L.C. 2/54

SUBJECT:— LEIGH CREEK COALFIELD -
CENTRAL AREA - UPPER COAL SERIES
REPORT ON SCOUT DRILLING.

D.M. 728 / 54 **SECURITY FILE**.....

by

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LEIGH CREEK COALFIELD.

CENTRAL AREA - UPPER COAL SERIES

REPORT ON SCOUT DRILLING

- R. K. JOHNS -

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CENTRAL AREA - UPPER COAL SERIES

SUMMARY

In the Triassic coal measures of Telford Basin occurring 1000 + (?) feet stratigraphically above the main (Telford) seam are a number of coal seams - the "Upper coal series" - which further add to the opencut coal reserves at Leigh Creek Coalfield.

Within certain limits, defined elsewhere, 3.58 million tons of coal will be available for open cut mining, having an overall weighted average ash content of 14.61% a sulphur content of 0.47% and calorific value 8,260 B.T.U./lb. (all referred to standard 12% moisture basis).

The coal occurs in a number of seams but possibly only three of these will be amenable to full extraction. Ultimately the thickest sections of several other low-ash seams might be recovered - these have not been included in the above reserves. On the basis of ash content and calorific value the coal is the best discovered in the Telford Basin.

The presence of sand and thick partings and the steep dip of the seams will present problems to the mining authority not previously encountered at Leigh Creek.

INTRODUCTION.

Coal of the upper series was first intersected by boring on the "W" line on the Western margin of Telford Basin but as only thin seams of high ash coal were penetrated no importance was attached to them. The "Y" line of bores, drilled August - November 1950, gave the first indication of the existence of further useful coal in the Basin when an 11ft. seam, and a number of other thinner ones, of low ash content were penetrated.

Scout boring, initiated in 1951 and completed in 1953, traced these seams in the "SM" series of bores round the rim of a closed basin structure. Lines of bores, drilled at approximate 1,000 ft. intervals across the strike of the strata designed to determine the full width of the coal series, the dip of the beds,

INTRODUCTION (Contd.)

and of the quality and thickness of the various seams, indicate that potential open cut sites are restricted to the eastern half of the structure east of a line joining bores S.M. 247 and S.M. 107.

PLANS

1. Telford Basin showing location of scout bores in the Central area (scale 1 inch = 500 feet).
2. Overburden isopachytes at 50 ft. intervals on the top and bottom seams (scale 1 inch = 500 feet).
3. Typical Cross sections showing disposition of the coal seams and ash content of the various seams.
4. Composite section through upper coal series round margin of Central Area.

GEOLOGY1. STRUCTURE

The suboutcrop of the upper coal series outlines a closed basin structure, elongated in a north west -south east direction, in the Southern-central part of Telford Basin. The Westerly pitching synclinal structure of the eastern part of the Area has been long recognised but the structure along the western margin of the basin has been purely conjectural because of the lack of exposures and limited amount of drilling undertaken prior to the present programme.

The beds dip radially towards the structural centre at angles varying between 11° and 35° , though in general there is little departure from a 26° dip over the whole area. Along the northern limb the dip is fairly constant (26° - 30°), with a pronounced flattening at the nose of the eastern closure (pitch 11° - 23°), while the dip along the southern limb varies between 20° and 35° .

Faulting has displaced the Triassic strata along the South Western rim of the structure in the vicinity of S.M.271; elsewhere, faulting is of only minor importance and has resulted in only small localised displacements of the coal seams.

GEOLOGY (Contd.)2. GENERAL

The stratigraphic separation between the main (Telford) seam and the upper coal series has been measured from prepared north-south cross sections. Along the southern margin of the Basin the seams of the Central Area occur some 600 feet stratigraphically above the main seam but along the northern margin this interval is 2,000 feet - the wide discrepancy being due to repetition of strata by faulting in the northern sector or due to elimination of strata by the same cause in the south, or a combination of both.

Fine grained shales with almost a complete absence of sandy beds make up the sedimentary sequence between these major developments of coal; shales, however, give way to a sandy facies in the Central Area. The shale sequence indicates lacustrine deposition under conditions of sluggish drainage and negligible physiographic relief which then gave way to greater stream activity, possibly due to relative uplift of surrounding land, bringing in coarser sediments, sand and sandy shales. During periods of quiescence shales and the coal seams were deposited. Fragments of coal which are almost ubiquitous throughout the upper series possibly represent driftwood.

Reference to accompanying composite columnar section gives an indication of the number and disposition of the coal seams present, and the variations in thickness of these and of the partings which occur throughout the explored area. Three main coal seams (Nos. 1, 2 and 3) may be correlated in the various cross sections, over the whole area, with some degree of certainty while the other thinner ones are more lenticular and only assume importance in isolated areas. Generalised correlation of the sandy beds has been attempted only in the upper part of the section.

The No.1 coal seam, occurring near the base of the upper coal series, is continuous throughout the area and overlies grey shales carrying some fine sand and several thin, apparently discontinuous coal seams. Overlying this near - basal seam and separating it from seam No.2 are a series of grey shales, sandy shales, and sand, and thin lenticular seams of coal. Similar sediments occupy the

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section between coal seams nos. 2 and 3. The upper parting of seam No. 3 and overlying beds consist of sandy shales with developments of fine to coarse quartz sand, and in some places grit. From selected portions of these beds, clean sharp building sand might be readily obtained. Thin coal seams occurring above the No. 3 Seam are thin and lenticular.

3. THE COAL SEAMS

The three main coal seams will be amenable to open cut mining along most of the northern rim of the basin structure and along the eastern part of the southern rim within limits determined by bores S.M.247 and 107. The overall weighted average ash content of these seams over this length is 14.61%.

No. 1 Seam - attains a maximum thickness of 20 ft. in the vicinity of S.M. 224 and thins off gradually towards the arbitrary limits defined above. The coal has a weighted average ash content of 13.03%, a sulphur content of 0.54% and calorific value of 8,497 B.T.U. / lb. (12% moisture basis).

Coal of Seam No. 2. has a weighted average ash content of 15.09%, sulphur content of 0.22% and calorific value 8,625 B.T.U. / lb.

From a seam a little less than 5 ft. thick ^{at} S.M.107 there is a gradual thickening along the strike which attains to 17ft. at S.M.241 and then slowly deteriorates beyond this point.

No. 3 Seam is the main seam of the series. Between S.M. 107 and 224 round the eastern nose of the fold, the seam thickness increases from 16 to 35 feet - parting free - but beyond S.M. 224, though there is an overall increase in coal thickness the seam is split by several partings. A thick lenticular parting of sand, with shale and coal, extends from S.M.224 to S.M.247 while two thinner ones extend westerly from Bore S.M.236. The coal has an overall weighted average ash content of 14.92% with sulphur content 0.44% and calorific value 8,134 B.T.U. / lb.

Sand, loose and unconsolidated except near the surface and carrying water, in the walls of a projected open cut, might present

GEOLOGYCoal Seam No. 3(Contd.)

some difficulty during mining operations. The dip of the coal seam is steeper than any previously mined at Leigh Creek Coalfield and this will involve a revision of techniques currently practiced in mining operations.

RESERVES

Coal reserves have been computed from measurement of areas in various cross sections, multiplication of the means of areas of successive sections by the horizontal interval, and hence the volume. The weight of 1 cub. yd. of coal is conservatively taken as being 1 ton. Below are tabulated the shallow open cut coal reserves for the Central Area:

	<u>DEPTH OBERBURDEN</u> (ft.)	<u>COAL</u> (tons)	<u>COAL</u> (tons) available for extra 10ft overburden depth.
No. 1 Seam	80	580,000	99,000
No. 2 Seam	80	460,000	73,000
No. 3 Seam	110	2,540,000	280,000
<u>TOTAL</u>		<u>3,580,000 tons</u>	<u>452,000 tons.</u>



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19.3.54.

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