GEOLOGICAL SURVEY
OF
SOUTH AUSTRALIA

DEPARTMENT OF MINES,
ADELAIDE

REPORT No. 30-112

REPORT ON THE REVIEW OF THE BROWN COAL PROSPECTS IN THE STRATHALBYN-HARTLEY-MONARTO DISTRICT.

BY

D. J. McGARRY - ASSISTANT GEOLOGIST.

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I. Introduction

Following inspections of two bores in Hd. Freeling which were reported to have traversed coal, a regional geological investigation of the district was undertaken.

1. Location.

The area occupies a southern part of Co. Sturt and an eastern part of Co. Hindmarsh, and includes Hd. Freeling and portions of the Hds. of Monarto, Mobilong, Bremer, Brinkley and Strathalbyn.

2. Previous Work.

Prof. R. Tate palaeontologically logged the material from Knight's Bore, Hd. Brinkley, whilst Mr. R. Segnit conducted several underground water property investigations in the Hds. of Freeling and Strathalbyn.

Mr. R.K. Johns conducted a geological survey in the Rocky Gully area, Hd. Mobilong.

The field work for this report was conducted during the latter portion of 1950 under the supervision of Mr. L.W. Parkin and Mr. R.C. Sprigg.

II. General Topography

Two distinct cycles of erosion result in youthful features being superimposed upon a former mature land surface.

The latter is represented by the topography in the region to the west of Hartley and in the northern central regions where faulting has resulted in the uplifting of the old surface as a horst block. This old surface did not suffer complete peneplanation, remnants of Tertiary marine beds, occurring as cappings on the much older basement rocks.

The Bremer River, which flows in a southerly direction, and the Rocky Gully Creek, which flows in an easterly direction are antecedent streams, which were able to hold their courses during the diastrophic period.

All other streams in the area are subsequent of no great length and mostly have shallow channels.

In the southern and eastern regions there are lowlying

plains, originally debouch areas for the streams of the uplifted blocks.

In part, the plains are now covered by leached siliceous sand dunes or by thin lagoonal deposits.

The former are also superimposed upon much of the uplifted basement rocks and Tertiary marine strata.

III. Geology.

The area is largely covered by Recent and Pleistocene aeolian sands and river alluvium, which partly mask the underlying beds.

Where observed the "basement" consists of quartzites, schists and granites inconformably overlain in certain areas by Marine Tertiary strata.

In the Monarto-Gifford Hill area a horst has been formed between the Palmer and Bremer faults.

The uplifted block is pivoted, transversely in a region north-east of Langhorne's Creek and is also tilted down to the west-ward due to the much larger throw of the Palmer Fault.

Tertiary strata are found outcropping at widely distributed points as shown on the accompanying geological plan. Unconformities between the Tertiary and the "basement" rocks are also evident at several places.

With the assistance of bore and well information an understanding of the Tertiary succession can be obtained.

It is evident that considerable overlapping of the beds occuts towards the old Tertiary basin margin, which probably existed in the northwestern districts.

Knight's Bore Hd. Brinkley and a bore on Sect. 3572 Hd. Freeling encountered a fossiliferous sandy bed some 30' in thickness with some coaly fragments at depths of 270' and 330' respectively.

This horizon is believed to be equivalent to that of the limestone, which overlies the coal at Moorlands and which had earlier been given a Janjukian age by Chapman.

Because of the lack of deep bores the limits of this bed cannot be determined, but it is certainly not present in the marginal and horst areas.

Above this fossiliferous horizon are found black, brown, dark grey and blue clays, with hematite nodules. These beds thin to the west and north and are considered to be equivalent to the carbonaceous clays which overlie the Janjukian limestones at Moorlands.

The uppermost blue and grey clay beds extend to the west and to some extent to the north (See Sections) and have been cut in bores and wells in the horst region.

Hematite nodules and gravelly iron wad beds exist at the base of the Tertiary at the Cross Bridge, Hartley, in the banks of the River Bremer; and elsewhere along the Bremer, as well as in a railway cutting approximately 1 mile east of Monarto. These very thin beds are considered to be equivalent to, or portion of, the blue and grey clay beds.

A yellow highly fossiliferous limestone stratigraphically overlies these beds and is found outcropping throughout the area covered by Tertiary deposits. In the northern and western regions the fossils are of a fragmentary nature and the limestone is exceed ingly porous.

The effect of the movements along the Palmer and Bremer faults has been, essentially, to elevate Tertiary units in the horst region as illustrated in the cross sections.

The "coaly" material reported from the bore in Secs. 282 Hd Freeling, was, in fact a dark blue-grey clay and traverses between 65' and 108'.

The geological evidence shows that this same dark clay would probably be present as a much thinner bed at approximately 40'-50' in the bore on Sect. W. Hd. Freeling.

The presence of water-worn gravel in the old sludge of this bore indicates that the drilling pierced the base of the Tertiary beds, and it is therefore considered that the material in this bore referred to by Mr. Harvey, was in fact a dark blue-grey clay.

Conclusions.

1. Marginal Tertiary sediments occur in the Strathalbyn-Hartley-Monarto area.

2. The beds are elevated, in part, by a block uplift formed between the Palmer and Bremer Faults.

3. The sediments form an overlapping sequence and are all stratigraphically younger than economic coal-bearing strata known to exist in the vicinity e.g. Moorlands.

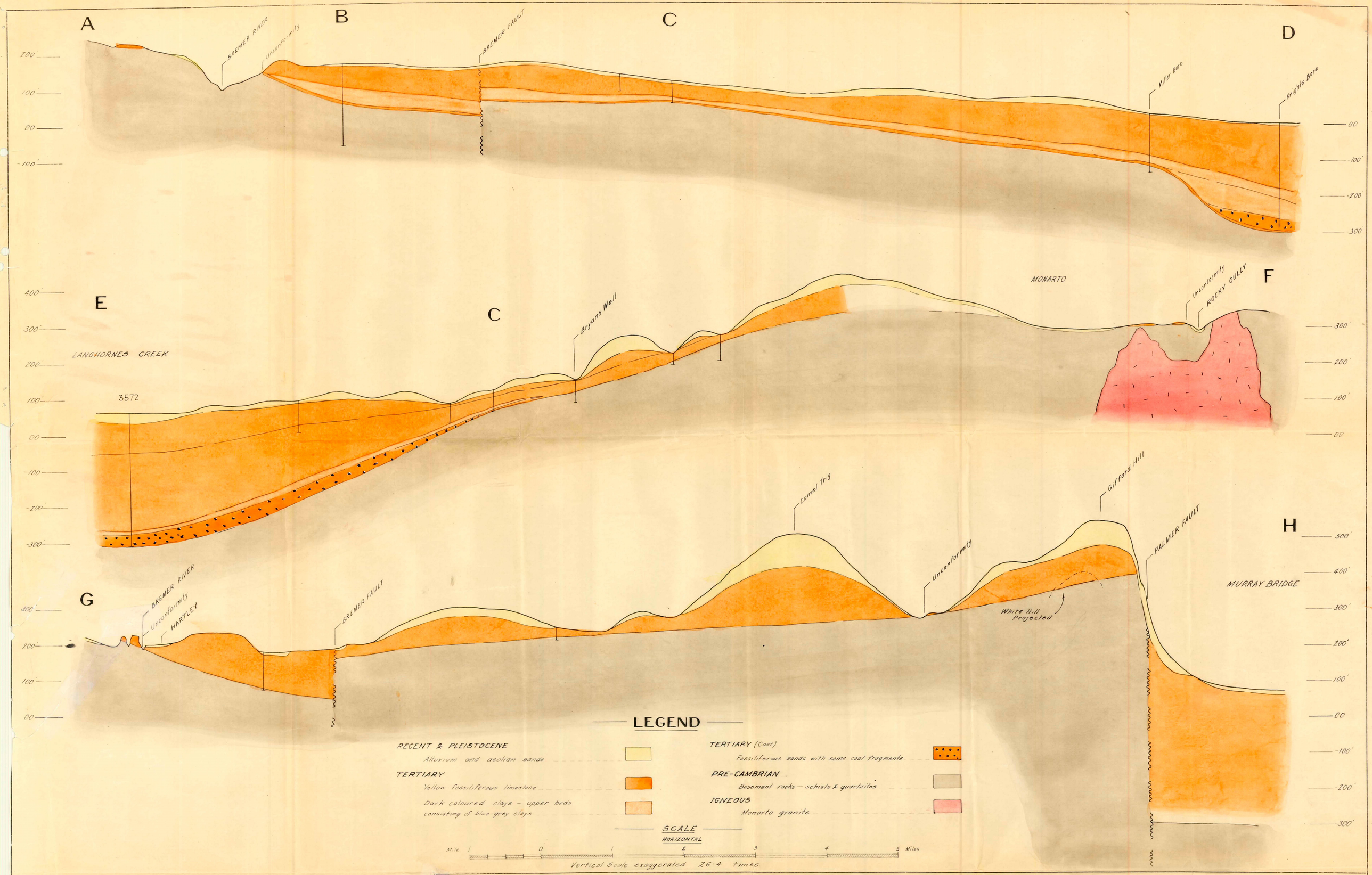
4. Dark coloured clays which in the vicinity may in part contain coal fragments and which are comparable to the carbonaceous beds overlying the so-called Janjukian limestones at Moorlands, are represented by a dark grey-blue clay which lenses out towards the margin of the Tertiary basin.

5. This dark-blue-grey clay has been confused in this area at times, with coaly beds.

6. It is therefore considered highly improbable that coal-bearing strata exists in the Tertiary sediments of this region.

(D.J. McGarry),
ASSISTANT GEOLOGIST

DJMcG:SK
7.6.51.



LEGEND

RECENT & PLEISTOCENE
Alluvium and aeolian sands

TERTIARY
Yellow fossiliferous limestone
Dark coloured clays – upper beds consisting of blue grey clays

TERTIARY (Cont)
Fossiliferous sands with some coal fragments

PRE-CAMBRIAN
Basement rocks – schists & quartzites

IGNEOUS
Monarto granite

SCALE
HORIZONTAL

Mile 1 0 1 2 3 4 5 Miles

Vertical Scale exaggerated 26·4 times.

S. A. DEPT. OF MINES

PTNS. MOBILONG ALEXANDRINA M. S.

GEOLOGICAL SECTIONS

Req. No.
D.M.
Compiled from Sketch by D. McGARRY.

Associated Drawing No. | No. | Amendment | Init. | Date

Approved: Director of Mines
Passed: C.P.

Drn. M.B.L.
Tcd.
Ckd. R.R.
Exd.

Scale Hor 2"=1mile Vert 1"=100feet

51-170

Date 8-6-51 HJ

Callington
Run 3
Mt Barker Creek
Run 4
Monarto South
UNCONFORMITY
Murray Bridge
PALMER FAULT
GIFFORD HILL
BREMER FAULT
Hartley
Run 5
Run 6
Section 282
HARRIOT HILL
Sect W
Strathalbyn
Run 1
Langhorne Creek
Sect 3572
Mosquito Creek
Run 2
Angas Plains
Lake Plains
Tolderol Stn.
Run 4
MOSQUITO POINT
TOLDEROL POINT

LAKE ALEXANDRINA

LEGEND

RECENT & PLEISTOCENE. — River alluvium, swamp deposits, & aeolian sands.

TERTIARY. — Yellow fossiliferous limestone.

Definite subsurface yellow fossiliferous limestone.

PRE-CAMBRIAN — Schists, quartzites & greywacke.

IGNEOUS — Monarto granite.

S.A. DEPT. OF MINES

WESTERN PORTIONS

MOBILONG & ALEXANDRINA

GEOLOGICAL PLAN

Approved	Compiled from uncontrolled Vertical Aerial Photographs Flown by R.A.A.F. Nov. 1945	SCALE 2 Inches to 1 Mile
for Director of Mines	Drawn by J.L.P. Photog. Section; Passed Chief Draughtsman	L51-32 H.J.
		DATE 7-6-51