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STRATIGRAPHIC DRILLING IN THE BOULIA REGION,
WESTERN QUEENSLAND, 1973

by

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SUMMARY

Three shallow stratigraphic holes were drilled near Boulia during May and June, 1973, in order to obtain stratigraphic information and study material for the palaeontology and palynology of the Lower Cretaceous in the northwestern margin of the Eromanga Basin.

BMR Boulia 2 Stratigraphic Hole penetrated and cored the Longsight Sandstone and the Wallumbilla Formation. BMR Boulia 3 and 3A Stratigraphic Holes penetrated and continuously cored the upper part of the Wallumbilla Formation, the Toolebuc Limestone, and the lower part of the Allaru Mudstone.

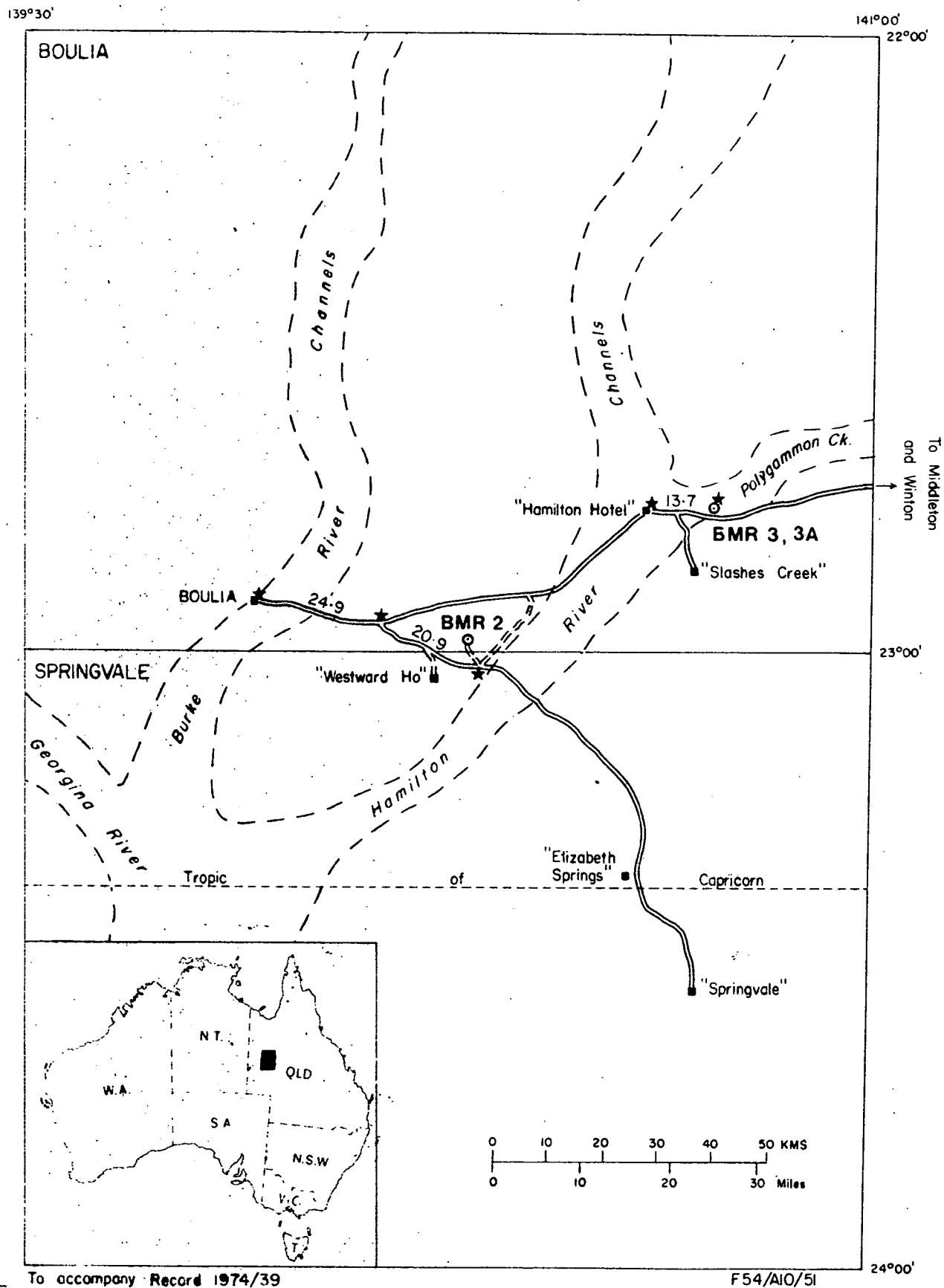


Fig. 1 Location of drilled holes

INTRODUCTION

The Longsight Sandstone crops out in the northwestern Eromanga Basin as a thin, distinct unit overlying basement rocks and conformably overlain by the Wallumbilla Formation. Macrofossils indicating an Aptian age have been collected from the type section of the sandstone in the Boulia 1:250 000 Sheet area (Hill, in Casey, Reynolds, Dow, Pritchard, Vine & Paten, 1960; Reynolds, in Hill & Denmead eds, 1960). The formation contains Aptian plant microfossils in the Springvale 1:250 000 Sheet area, and Aptian and Albian spores and pollen grains farther west, in the Hay River 1:250 000 Sheet area, Northern Territory (Burger & Mond, 1973). Arenaceous sediments, in subsurface farther east in the basin, which were initially unnamed (Jauncey, 1964; Vine, 1964a,b) but are now incorporated in the Longsight Sandstone (Watson, 1973), yielded Upper Jurassic and Lower Cretaceous (Neocomian-Aptian) spores and pollen grains (Burger, 1973; also in Watson, 1973).

The Toolebuc Limestone was drilled and continuously cored in BMR Boulia 3 and 3A Stratigraphic Holes, in order to obtain a representative section of the formation near its type area, and to obtain samples for stratigraphic, palaeontological, and palynological study. The results of this work will be reported separately.

The locations of the holes are shown in Figure 1.

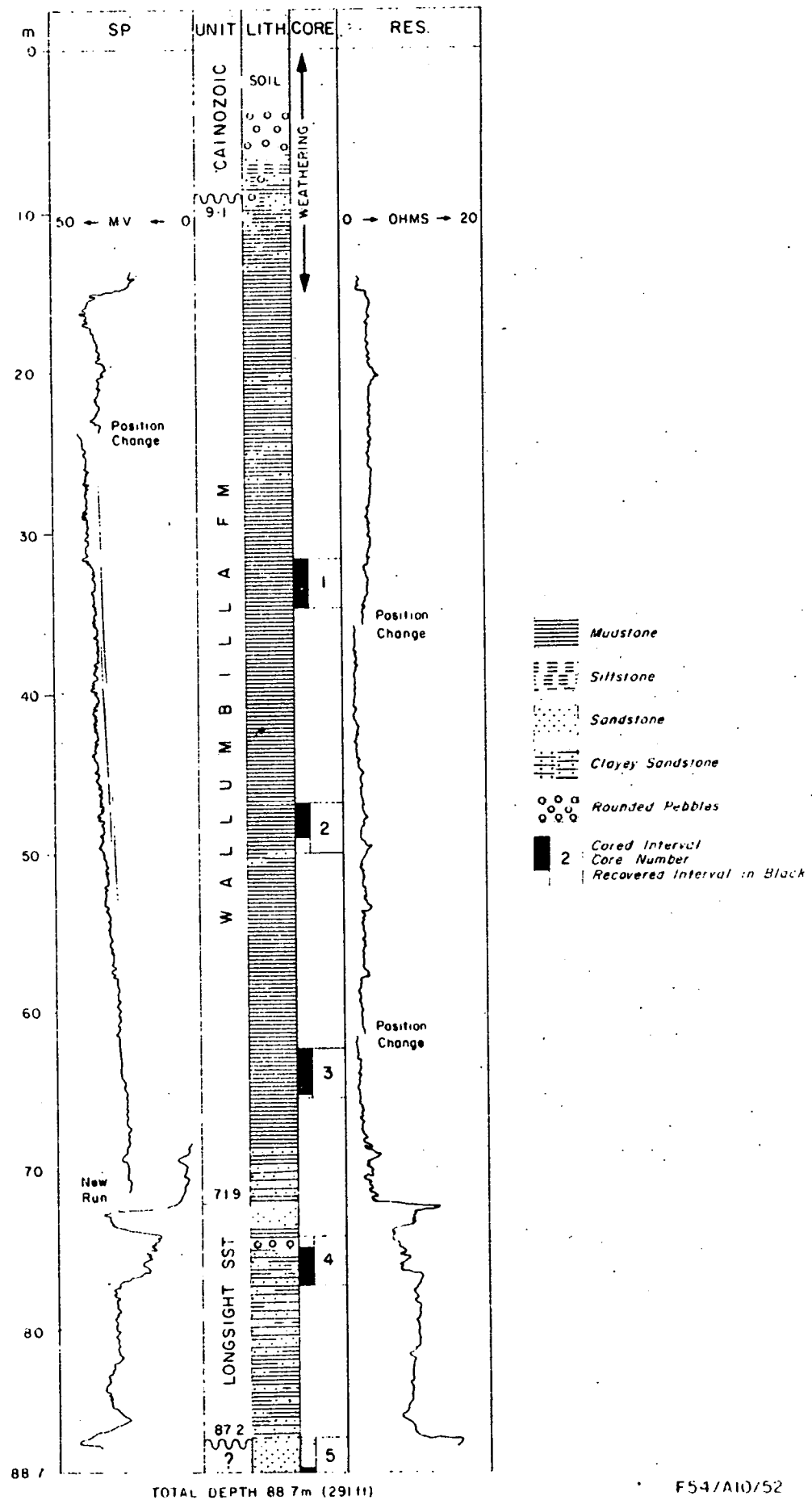
BMR BOULIA 2 STRATIGRAPHIC HOLE

BMR Boulia 2 was drilled near Warenda Creek Bore A, ($22^{\circ}59'45''\text{S}$, $140^{\circ}17'20''\text{E}$) on the property 'Westward Ho', situated about 30 km east of Boulia. The hole reached a total depth of 88.7 m (Fig. 2). The section was logged with a suitcase logger, after casing was set to 14.6 m (48 ft) depth.

Unconsolidated pebble beds, pale yellow to chocolate-coloured soil, sand, and clay were penetrated to 9.1 m depth. The Wallumbilla Formation (9.1 - 71.9 m) consisted of greenish-grey to pale brown mudstone, which at certain levels had a faint bituminous smell, and sandy horizons down to 15 m. Hard slightly calcareous grey to dark grey mudstone was encountered from 15 to about 60 m and soft, dark grey mudstone to about 68 m. The basal part of the unit consisted of soft grey sandy mudstone.

The Longsight Sandstone (71.9-87.2m) in subsurface has a yellowish to pale grey colour; it is clayey and silty, and poorly consolidated. Water flowed from the hole at an estimated rate of 1 litre/sec. The formation consists of fine-grained well-sorted quartzose sandstone with

BMR BOULIA 2 DRILL HOLE



moderately well-rounded grains, including feldspar and rare garnet. It is capped by hard white fine-grained quartzose sandstone approximately 1 m thick, which has also been penetrated in water bores in the region.

From 87.2 m to total depth a white hard calcareous fine-grained quartzose sandstone occurs, topped by a pebble horizon. The sandstone shows steep cross-bedding and is quartz-veined. Initial palynological examination of a sample from 88.7 m has given no indication of its age.

Five cores were cut, spaced at regular intervals. Details are recorded in Table 1.

Table 1: Details of cores in BMR Boulia 2.

CORE	FORMATION	INTERVAL	RECOVERY
1	Wallumbilla	31.7 - 34.7 m	31.7 - 34.7 m
2	Wallumbilla	46.9 - 50.0 m	46.9 - 48.9 m
3	Wallumbilla	62.5 - 65.5 m	62.5 - 65.2 m
4	Longsight	74.1 - 77.1 m	74.8 - 77.1 m
5	Longsight	86.6 - 87.2 m	2 fragments of 2 cm
	Unknown (Palaeozoic?)	87.2 - 88.7 m	1 fragment of 20 cm

BMR BOULIA 3 STRATIGRAPHIC HOLE

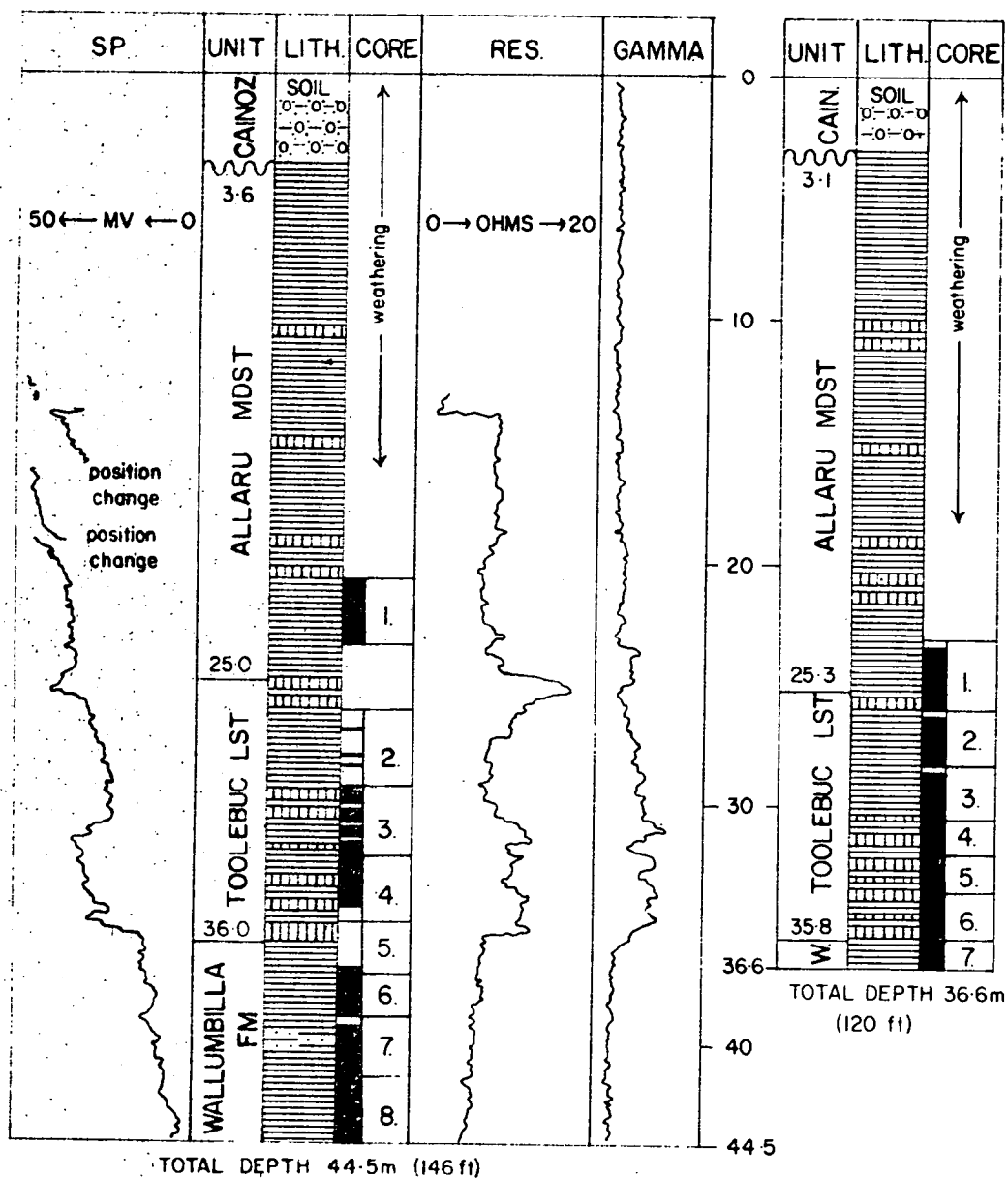
BMR Boulia 3 was drilled 13.7 km east of Hamilton Hotel, about 100 m north of the Boulia-Winton Highway, (22°47'00"S, 140°43'30"E). A total depth of 44.5 m was reached. The hole was cased to 14.6 m (Fig. 3).

Unconsolidated brown ferruginized soil and pebble horizons were penetrated to about 3.6 m depth. The Allaru Mudstone (3.6-25.0 m) consisted of yellow to greenish-grey soft mudstone and siltstone down to 7 m; pale green semi-consolidated mudstone with few thin limestone bands and shell fragments to 20 m; and dark grey mudstone with thin crystalline limestone bands and shell fragments down to 25.0 m.

The Toolebuc Limestone (25.0-36.0 m) consisted of hard grey calcareous mudstone with shell fragments, thin bands of fine-grained clayey sandstone and concretionary limestone down to about 28 m; black, pyritic, soft mudstone

BMR BOULIA 3 DRILL HOLE

BMR BOULIA 3A DRILL HOLE



LEGEND: See Figure 2

Fig. 3 Stratigraphy of BMR Boulia 3 and 3A Stratigraphic Holes

with shell fragments (*Inoceramus*) to about 31 m; black mudstone interbedded with thin crystalline limestone bands to 32 m; and grey to white hard concretionary limestone interbedded with black mudstone to 36.0 m.

The Wallumbilla Formation (36.0-44.5 m) consisted of dark grey soft mudstone with sandy beds at about 40 m depth.

Eight cores were cut; recovery was disappointing as the core barrel was repeatedly blocked by hard limestone concretions. Details are given in Table 2.

Table 2: Details of cores in BMR Boulia 3

CORE	FORMATION	INTERVAL	RECOVERY
1	Allaru	20.7 - 23.2 m	20.7 - 23.2 m
2	Toolebuc	26.2 - 29.3 m	3 fragments, total 0.5 m
3	Toolebuc	29.3 - 32.3 m	29.3-29.5 m; 29.6-31.2 m; 31.3-31.7 m; 31.8-32.3 m
4	Toolebuc	32.3 - 35.4 m	32.3 - 34.9 m
5	Toolebuc/ Wallumbilla	35.4 - 36.9 m	2 cm from top, and 5 cm from bottom of interval
6	Wallumbilla	36.9 - 38.4 m	36.9 - 38.4 m
7	Wallumbilla	38.4 - 41.5 m	38.8 - 41.5 m
8	Wallumbilla	41.5 - 44.5 m	41.5 - 44.5 m

BMR BOULIA 3A STRATIGRAPHIC HOLE

BMR Boulia 3A (Fig. 3) was drilled next to No. 3, in order to recover a more complete core sequence of the Toolebuc Limestone. No logs were run and no casing was inserted.

The Allaru Mudstone (3.1-25.3 m) consisted of greenish to yellow mudstone with a few limestone bands down to 20 m, and dark grey soft mudstone with thin crystalline limestone (aragonite) bands, mainly in the 20-23 m interval, down to 25.3 m.

The Toolebuc Limestone (25.3-35.8 m) consisted of black mudstone with a few thin limestone bands and shell fragments down to about 30.5 m and hard concretionary

limestone and thin crystalline limestone bands interbedded with soft black mudstone down to 35.8 m.

The hole reached total depth at 36.6 m in the uppermost Wallumbilla Formation, which consisted of grey hard mudstone.

Seven cores were taken through the section (Table 3). Recovery was virtually complete; small gaps of 0.1 m are due to compression of the mudstone in the core barrel. The cores provide a suitable reference section of the Toolebuc Limestone.

Table: Details of cores in BMR Boulia 3A

CORE	FORMATION	INTERVAL	RECOVERY
1	Allaru/Toolebuc	22.9 - 25.9 m	23.1 - 25.9 m
2	Toolebuc	25.9 - 28.3 m	26.0-26.1 m; 26.2-28.3 m
3	Toolebuc	28.3 - 30.5 m	28.6 - 30.5 m
4	Toolebuc	30.5 - 32.0 m	30.5 - 32.0 m
5	Toolebuc	32.0 - 33.5 m	32.0 - 33.5 m
6	Toolebuc	33.5 - 35.7 m	33.6 - 35.7 m
7	Toolebuc/ Wallumbilla	35.7 - 36.6 m	35.8 - 36.6 m

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