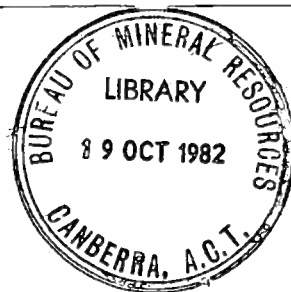


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STRATIGRAPHIC DRILLING IN THE CRETACEOUS TOOLEBUC FORMATION
IN THE SOUTHERN EROMANGA BASIN, 1981 - A CONTRIBUTION TO
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SUMMARY

Six shallow stratigraphic holes were drilled during November-December 1981 in the Southern Eromanga Basin, as part of the BMR/CSIRO Oil Shale Methodology Project. The holes were drilled to obtain stratigraphic, structural, petrophysical, geophysical, and geochemical information about the Toolebuc Formation and its oil shale. The formation was intercepted, and fully cored, in three holes.

Since the time of drilling, Ozimic (1982) has given the name "Urisino Beds" to that part of the Toolebuc intercepted by these holes. These beds consist of interbedded siltstones and sandstones, with a few thin limestone units, and contain no oil shale. They are time-equivalent of the Kerogenous Toolebuc Formation to the north (Burger, 1981).

The holes were drilled by a contractor, whose equipment failures led to the abandonment of two holes. A third hole failed to reach target depth owing to water circulation problems. A two-man crew from BMR wire-line logged the holes.

The thickness of "Urisino Beds" encountered varied between one and fifteen metres. Lithological and wire-line logs are given in Appendices 1 to 5.

DRILLING

Drilling was by Rockdril Contractors Pty Ltd, Brisbane, using a Foxmobile truck-mounted rig. For open-hole drilling, a standard blade-bit was used. Coring was by a HQ triple tube core barrel 3.0 m long, with a split steel inner tube.

The contractor failed to provide percussion drilling equipment, which led to the abandonment of holes BMR Eulo 5 and 6.

In the program a total of 421 metres of drilling was carried out, of which 137 metres consisted of coring. Core recovery was excellent, being estimated at 99%. Cuttings were taken at 2-metre intervals, 132 out of 142 being considered satisfactory, giving a recovery rate of 93%. In general, water circulation problems were responsible for the 10 unsatisfactory samples.

Wire-line logging was done by a BMR crew led by G. Jennings, using a 43 mm diameter Gamma and Neutron tool.

The drilling programme commenced on 19/11/81, and was completed on 6/12/81.

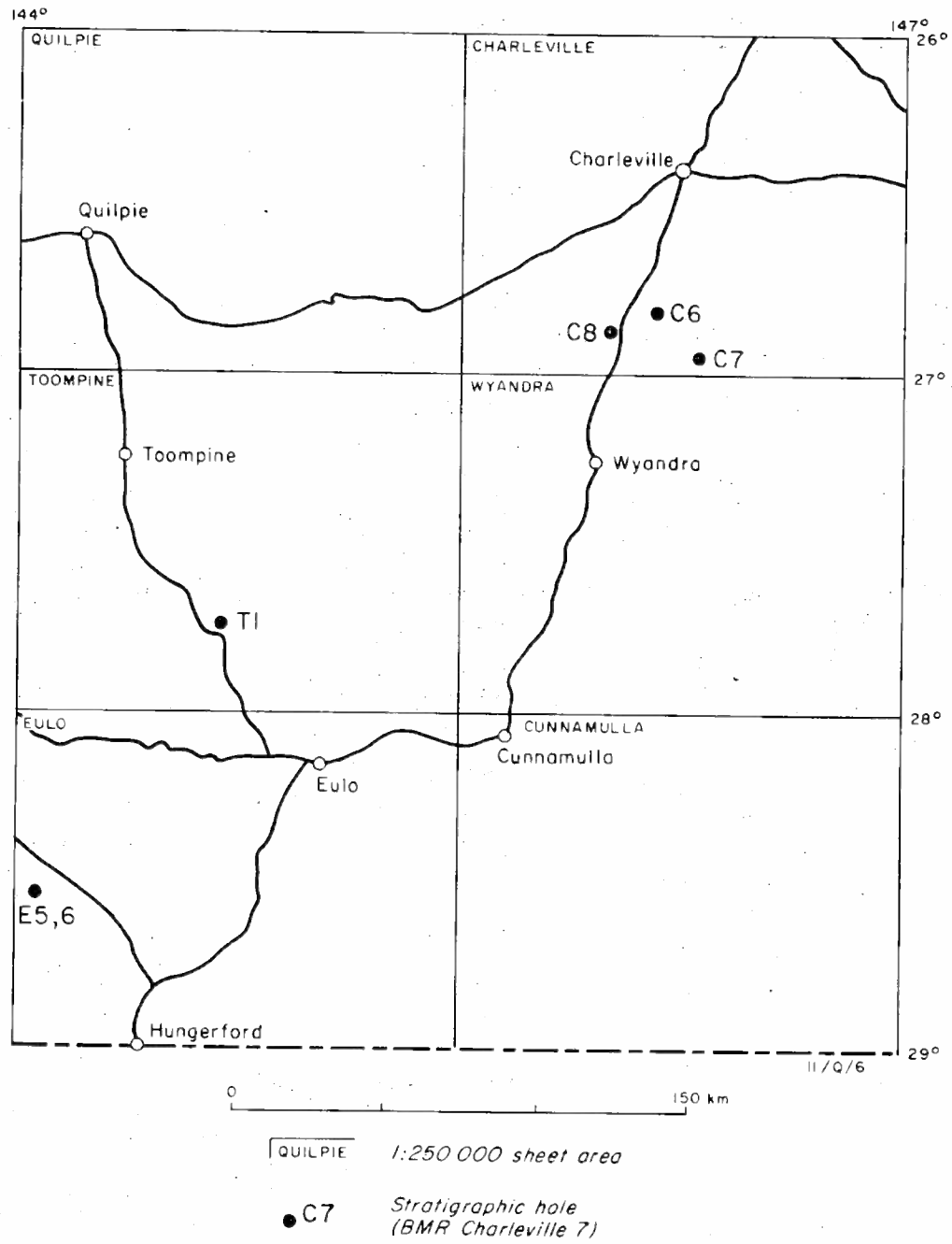


Fig.1 Location map, stratigraphic holes drilled in S.W. Queensland

GEOLOGICAL SETTING:

The Toolebuc Formation and its equivalents occur over a wide area of the Mesozoic Eromanga Basin. Ozimic (1982) recognizes two facies of the Toolebuc Formation (kerogenous facies A and kerogenous facies B) which grade into the laterally time-equivalent Woodridge Limestone Member and the 'Urisino beds' (fig. 2). These units have been assigned a late Albian age, and to the Rolling Downs Group.

This drilling program intersected the "Urisino beds" in three holes. Ozimic (1982) described the beds as siltstones with glauconite-bearing sandstone and a few thin beds of non-fossiliferous limestone. They are underlain by the Coreena Member of the Wallumbilla Formation and overlain by the Allara Mudstone. Unlike the Toolebuc Formation, the Urisino beds do not contain oil shale. Intersected sections are described in the Appendices.

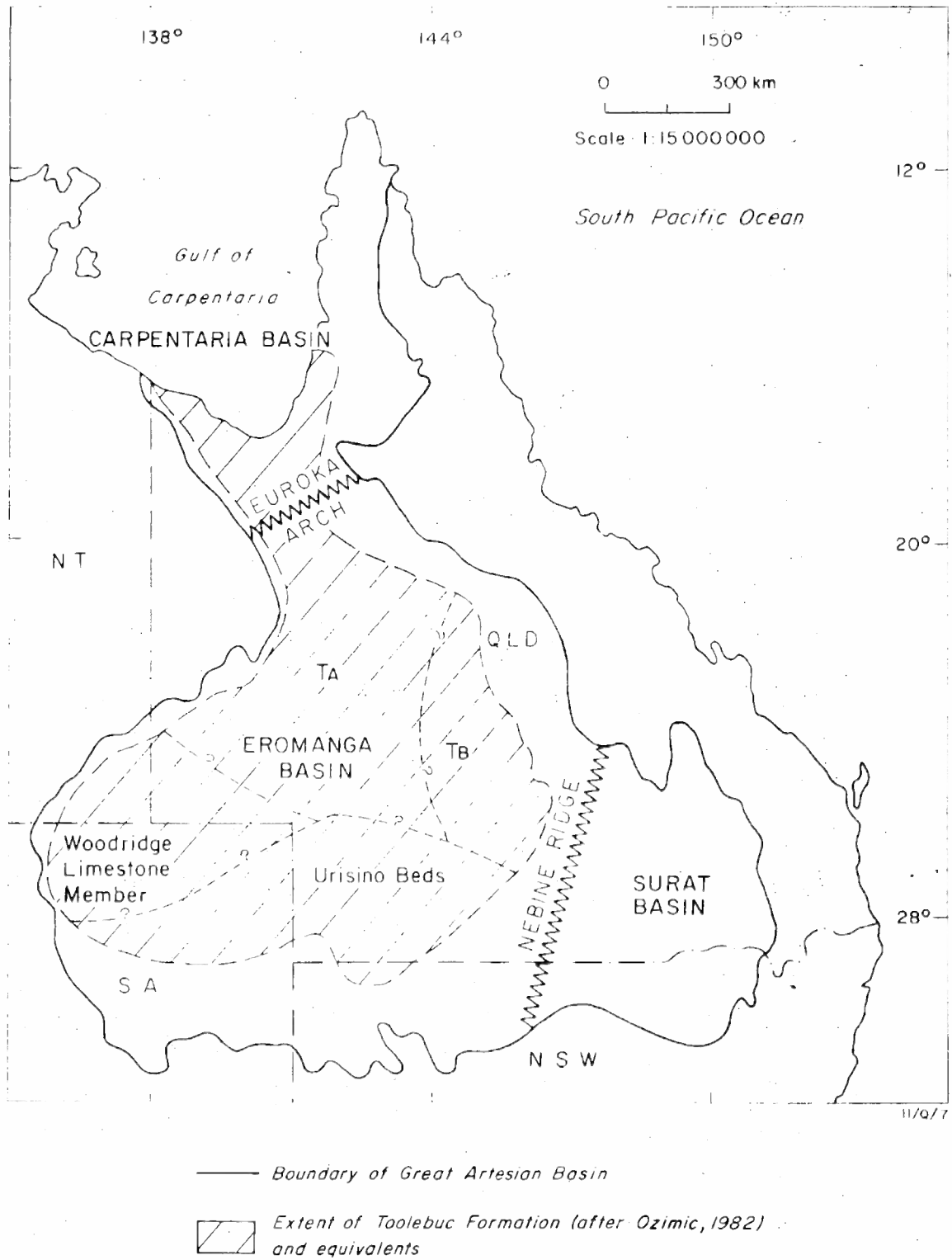


Fig.2 Extent of Toolebuc Formation

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APPENDIX 1 : B.M.R. CHARLEVILLE 6

GENERAL DATA : B.M.R. CHARLEVILLE 6

SHEET AREA CHARLEVILLE 1:250,000
 GENERAL LOCATION 2 km SSE OF "KENMORE" HOMESTEAD,
 NEAR BORE R4000
 LATITUDE 26°50'S
 LONGITUDE 146°09"E
 COMMENCED DRILLING 19/11/81
 COMPLETED DRILLING 22/11/81
 DRILLED BY ROCKDRIL CONTRACTORS PTY LTD,
 BRISBANE, Q.
 TOTAL DEPTH 85.2 m
 SURFACE ELEVATION 275 m (estimate only)
 WIRE-LINE LOGS

- GAMMA-RAY SURFACE TO 81.7 m
 - NEUTRON SURFACE TO 82.3 m

LOGGED DOWN DRILL STEM - HOLE NOT STABLE

CUTTINGS SURFACE TO 47.0 m
 CORES (14 CORES) 47.0 m TO 85.2 m

STRATIGRAPHY

The rock units penetrated in Charleville No. 6, and their thicknesses are listed below.

<u>ROCK UNIT</u>	<u>INTERVAL (m)</u>	<u>THICKNESS (m)</u>
SUPERFICIAL SAND & SILCRETE	SURFACE TO 14.0	14.0
CAINOZOIC CLAYS	14.0 TO 49.4	35.4
ALLARU MUDSTONE	49.4 TO 64.9	13.5
URISINO BEDS	64.9 TO 80.4	15.5
COREENA MEMBER	80.4 TO 85.2	4.8 +

The lithological units penetrated are described and correlated with the wire-line logs, in Figure 3.

The Urisino beds in this hole consists of very thinly interbedded sandstone and shale, with occasional breccia beds. There is abundant organic material in the form of plant remains, with occasional thin bands of coal. The boundary with the overlying Allaru Mudstone shows signs of reworking.

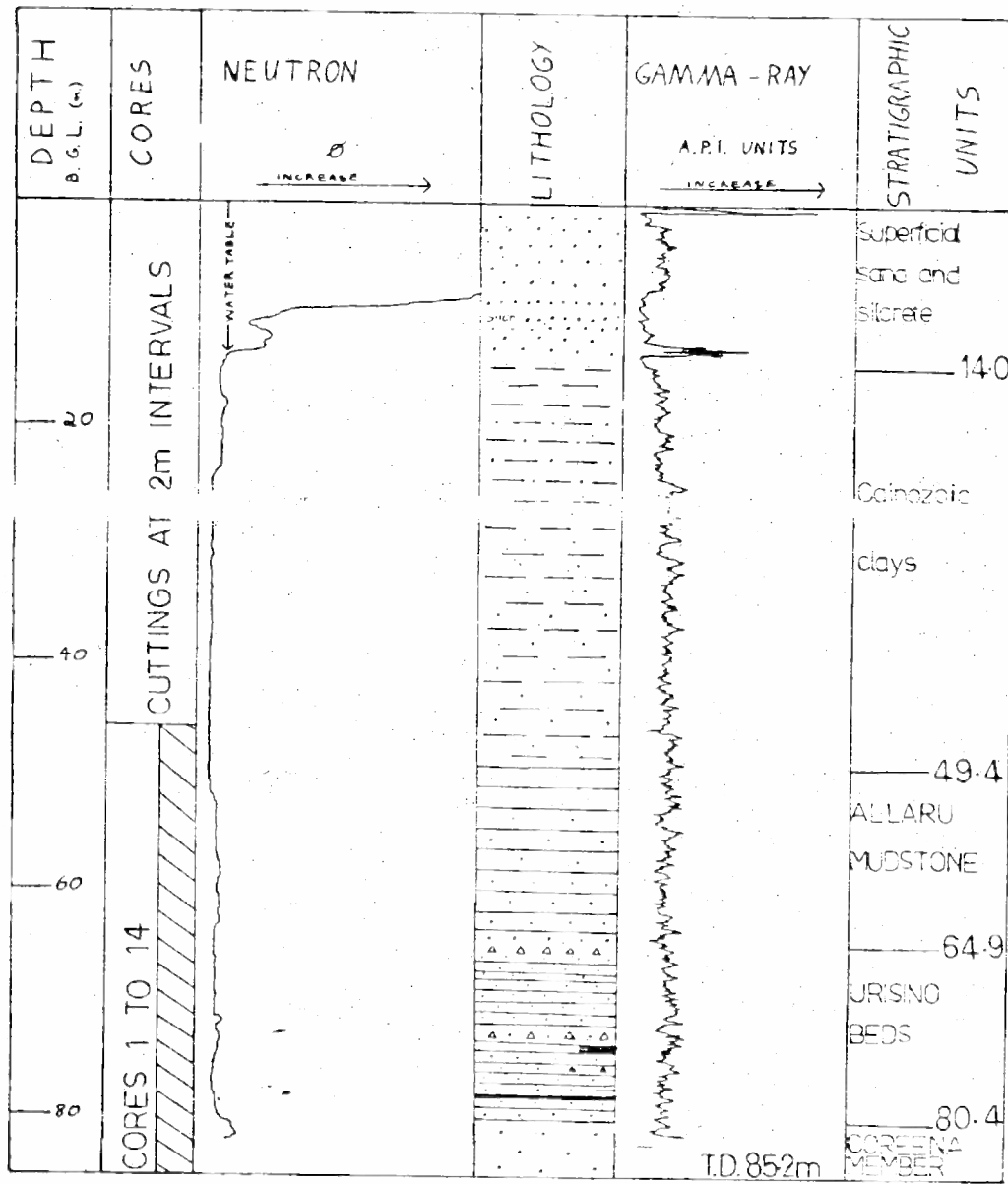


Fig. 3 Stratigraphic hole, BMR Charleville 6.

APPENDIX 2 : B.M.R. CHARLEVILLE 7

GENERAL DATA : B.M.R. CHARLEVILLE 7

SHEET AREA	CHARLEVILLE 1:250,000
GENERAL LOCATION	12 KM ENE OF "BARRAMORNIE"
	HOMESTEAD, NEAR "BARRAMORNIE" BORE
LATITUDE	26°50'S
LONGITUDE	146°09'E
COMMENCED DRILLING	2/12/81
COMPLETED DRILLING	5/12/81
DRILLED BY	ROCKDRIL CONTRACTORS PTY LTD, BRISBANE, Q.
TOTAL DEPTH	151.8 m
SURFACE ELEVATION	274 m
WIRE-LINE LOGS	
- GAMMA-RAY	SURFACE TO 151.2 m
- NEUTRON	SURFACE TO 151.8 m

LOGGED DOWN DRILL STEM - HOLE NOT STABLE

CUTTINGS	SURFACE TO 100.2 m
CORES	(18 CORES) 100.2 m to 151.8 m

STRATIGRAPHY

The rock units penetrated in Charleville No. 7, and their thicknesses, are listed below.

<u>ROCK UNIT</u>	<u>INTERVAL (m)</u>	<u>THICKNESS (m)</u>
SUPERFICIAL SAND & GRAVEL	SURFACE TO 10.0	10
CAINOZOIC CLAYS	10.0 TO 48.0	38
WEATHERED ROCK (?ALLARU)		
- TRANSITIONAL ZONE	48.0 TO 72.0	24
ALLARU MUDSTONE	72.0 TO 130.5	58.5
URISINO BEDS	130.5 TO 140.2	9.7
COREENA MEMBER	140.2 TO 151.8	10.6 +

The lithological units penetrated are described and correlated with the wire-line logs in Figure 4.

The Urisino beds in this hole consist of thin shale and sand interbeds, with organic remains throughout. The base of the unit is very sandy, and may consist largely of reworked Coreena Sandstone Member; the boundary with the overlying Allaru Mudstone is abrupt, but with no signs of disconformity.

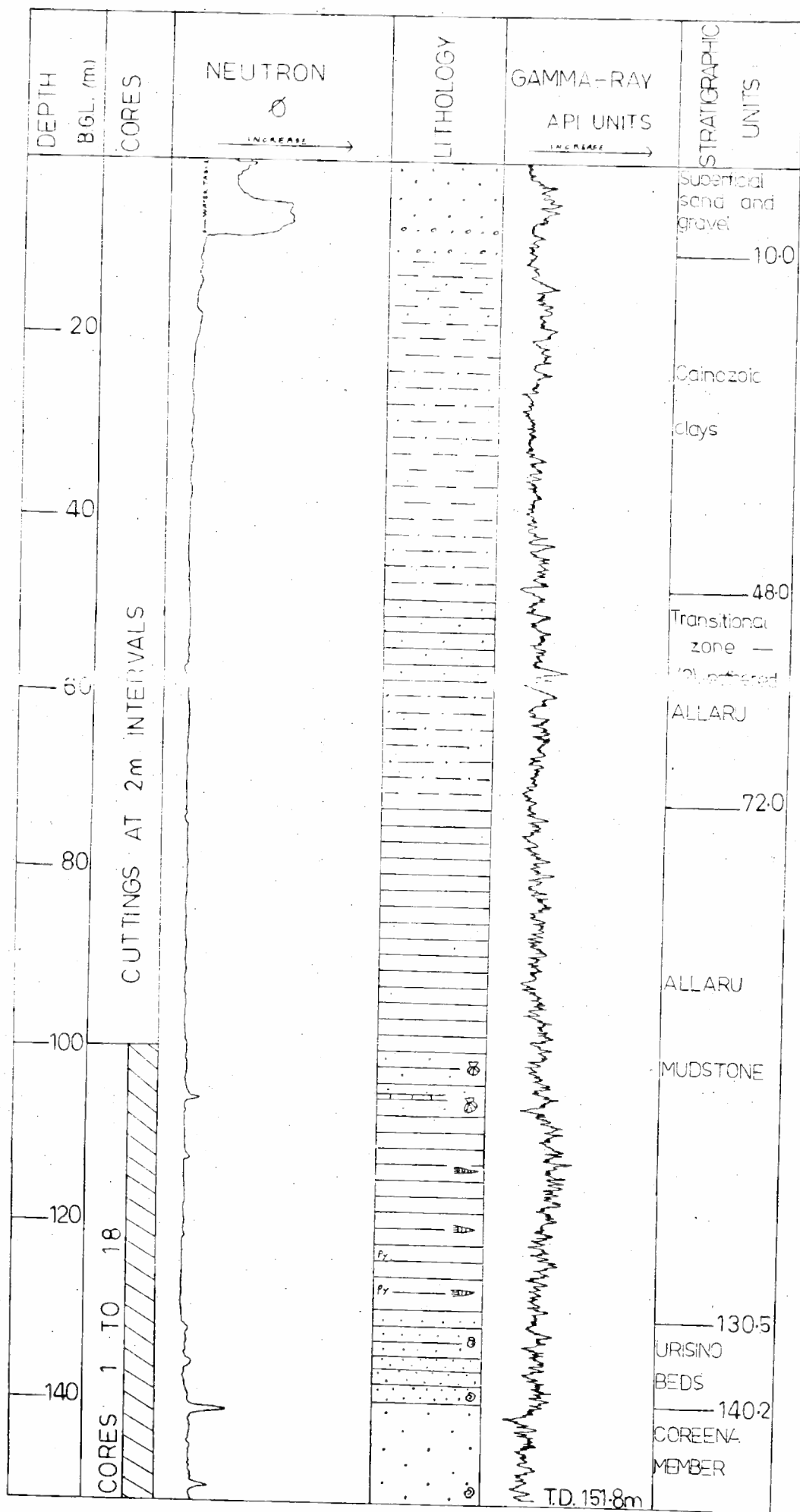


Fig. 4 Stratigraphic hole, BMR Charleville 7.

APPENDIX 3 : B.M.R. CHARLEVILLE 8

GENERAL DATA : B.M.R. CHARLEVILLE 8

SHEET AREA	CHARLEVILLE 1:250 000
GENERAL LOCATION	0.5 KM W of DILLALAH RAILWAY SIDING
LATITUDE	26°52'S
LONGITUDE	146°03'E
COMMENCED DRILLING	5/12/81
COMPLETED DRILLING	5/12/81
DRILLED BY	ROCKDRIL CONTRACTORS PTY LTD, BRISBANE, Q.
TOTAL DEPTH	68.0 m
SURFACE ELEVATION	263 m
WIRE-LINE LOGS	

- GAMMA-RAY SURFACE TO 58.8 m
 LOGGED DOWN DRILL STEM - HOLE VERY UNSTABLE

CUTTINGS	SURFACE TO 64.0 m (NO RECOVERY 64.0 m to 68.0 m)
CORES	NIL

STRATIGRAPHY

This hole struck an ancient channel of the Warrego River, and was abandoned due to water circulation problems before reaching target depth. The entire sequence intersected consisted of Cainozoic river sands and gravels.

APPENDIX 4 : B.M.R. TOOMPINE 1

GENERAL DATA : B.M.R. TOOMPINE 1

SHEET AREA	TOOMPINE 1:250 000
GENERAL LOCATION	0.3 KM E of "ALROY" HOMESTEAD
LATITUDE	27°48'S
LONGITUDE	144°42'E
COMMENCED DRILLING	23/11/81
COMPLETED DRILLING	26/11/81
DRILLED BY	ROCKDRIL CONTRACTORS PTY LTD, BRISBANE, Q.
TOTAL DEPTH	105.1 m
SURFACE ELEVATION	UNKNOWN
WIRE LINE-LOGS	
- GAMMA RAY	103.6 m
- NEUTRON	104.2 m

THE HOLE WAS FIRST LOGGED DOWN THE DRILL STEM, ON THE SECOND RUN, THE DRILL STEM WAS LIFTED TO 75.0 m B.G.L. AND THE INTERVAL FROM 61.0 m to 104.2 m RE-LOGGED.

CUTTINGS	SURFACE TO 10.0 m
	12.0 m to 40.6 m
	45.0 m to 71.0 m
CORES	(1 CORE) 10.0 m to 12.0 m
	(2 CORES) 40.6 m to 45.0 m
	(13 CORES) 71.0 m to 105.1 m

STRATIGRAPHY

The rock units penetrated in Toompine No. 1, and their thicknesses, are listed below.

<u>ROCK UNIT</u>	<u>INTERVAL (m)</u>	<u>THICKNESS (m)</u>
SURFICIAL SAND, IRONSTONE AND SILCRETE	SURFACE TO 14.0	14.0
CAINOZOIC CLAYS	14.0 to 64.0	50.0
ALLARU MUDSTONE	64.0 to 101.2	37.2
URISINO BEDS	101.2 to 102.2	1.0
COREENA MEMBER	102.2 to 105.1	2.9+

The lithological units penetrated are described and correlated with the wire-line logs in Figure 5. The thin unit which has been correlated with Toolebuc Formation in this hole is a black, crumbly

sandy shale; distinct from the more massive Allaru Mudstone, and overlying a Coreena Member sandstone with a breccia band near the top. It has been referred to the Urisino beds, although the interbedded shale/sandstone texture of the beds in BMR Charleville 6 and 7 is not present in this hole.

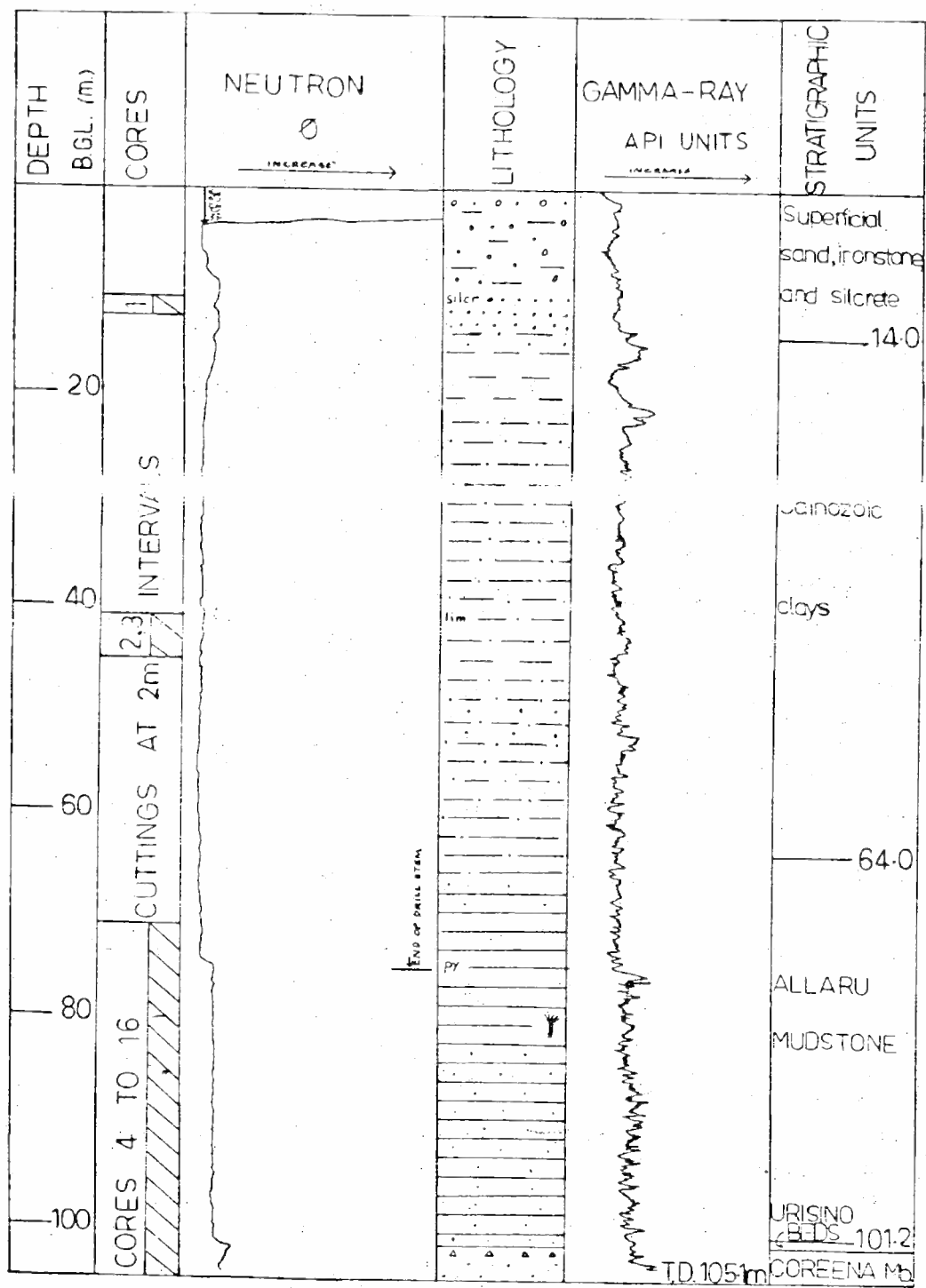


Fig. 5 Stratigraphic hole, BMR Toompine 1.

APPENDIX 5 : B.M.R. EULO 5, 6

GENERAL DATA : B.M.R. EUO 5, 6






SHEET AREA	EULO 1:250 000
GENERAL LOCATION	NEAR "WANDY LADY" BORE, "BOODGHEERE" STATION
LATITUDE	28°33'S
LONGITUDE	144°03'E
COMMENCED DRILLING	27/11/81
COMPLETED DRILLING	28/11/81
DRILLED BY	ROCKDRIL CONTRACTORS PTY LTD, BRISBANE, Q.
TOTAL DEPTH	EULO 5 7.9 m EULO 6 6.9 m
SURFACE ELEVATION	168 ± 2 m.
WIRE-LINE LOGS	NIL
CUTTINGS	EULO 5 SURFACE to 4.0 m EULO 6 SURFACE to 4.0 m
CORES	EULO 5 (4 CORES) 4.0 to 7.9 m EULO 6 (1 CORE) 4.0 to 6.9 m

STRATIGRAPHY

These holes were drilled 10 m apart, and were abandoned in each case when the driller found he did not have the correct equipment to penetrate a very hard silcrete layer, as below.

<u>ROCK UNIT</u>	<u>INTERVAL (m)</u>	<u>THICKNESS (m)</u>
SUPERFICIAL SAND	SURFACE TO 4.0	4.0
SILCRETE	4.0 TO 7.9	3.9+

APPENDIX 6: EXPLANATION OF SYMBOLS USED ON LOGS

○ ○ ○ ○	GRAVEL
• • • • •	SAND
— . — . — .	SILT
— . — . — .	SANDY CLAY
— — — — —	CLAY
— . — . — .	SANDY SHALE
— — — — —	SHALE
— — — — —	LIMESTONE
△ △ △ △	BRECCIA
	COAL
Py	PYRITE
lim	LIMONITE
sil/cr	SILCRETE
	UNIDENTIFIED MACROFOSSIL
	PELECYPOD
	BELEMNITE
	CRINOID STEM