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Drilling in the Eastern Eromanga Basin 1966

by

M.C. GALLOWAY and J. INGRAM

BUREAU OF MINERAL RESOURCES GEOLOGY AND GEOPHYSICS DEPARTMENT OF NATIONAL DEVELOPMENT AUSTRALIA

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1967/82

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SUMMARY

During the 1966 field season 16 shallow stratigraphic holes were drilled in the Barcaldine-Alpha-Tambo area of Queensland (between 23°00' to 25°30' and 145° to 147° E). Units drilled range in age from Carboniferous to Cainozoic.

The depth of the holes ranged from 104 to 413 feet and averaged 248 feet. The total footage drilled was 4472 feet, including 1129 feet of coring. An average of 12½% of coring was carried out in each hole. Core recovery per hole ranged from 28-99% and averaged 84%.

Drilling took place between June 20 and October 12 over 73 days, at an average rate of 4½ days per hole.

As a result of the drilling, some of the mapping of the Jurassic units in the Jericho Sheet area has been modified; the mapping of the Cretaceous units was substantiated. The sandstones at the base of the Marine Cretaceous sequence in the Tambo district were found to be discontinuous and no equivalent of the Minmi Member of the Blythesdale Formation was found. Thinning of the Hooray Sandstone over the Birkhead Anticline north of Tambo was proved.

Cores of coal for quality evaluation were cut in the Cretaceous Winton Formation. Cores for palynological examination were cut in the Joe Joe Formation, Colinlea and Dunda Sandstones, the topmost Moolayember Formation and Black Alley Shale. The Joe Joe Formation was found to underlie the extensive area of Cainozoic sediments surrounding the Alpha township.

INTRODUCTION

The 1966 drilling programme was planned to provide lithological and palynological control to supplement surface mapping undertaken during 1964 and 1965 by the Great Artesian Basin party. The area mapped during 1964 (Vine, Jauncey, Casey and Galloway, 1965) and to a lesser extent in 1965 (Exon, Galloway and Kirkegaard and Casey, 1966) was one in which there was little outcrop or only deeply weathered exposure in the Jurassic sequence. Thus many formation determinations were questionable.

Additionally some holes were planned to obtain fresh samples of coal for quality evaluation.

Drilling was carried out by the Petroleum Technology Section; Mineral Resources Branch of B.M.R.,during two periods, the first from June 20th to July 31st, the second from September 12 to October 12 - a total of 73 days. During this time 16 holes were drilled to an average depth of 248 feet of which 12½% was coring (re-drilled holes excluded in both cases). Details of the drilling are summarised in Table 1.

Two holes were drilled at certain sites, the first hole being drilled to obtain wire line logs from which the coring programme was drawn up, and the second hole, cored at the selected intervals, thus minimising the amount of coring necessary.

Geological supervision of the drilling was provided by Galloway who also carried out a preliminary examination of the samples. Ingram carried out a systematic re-examination of the cores and cuttings in Canberra and compiled figures 2- 17. The final interpretation was by Galloway.

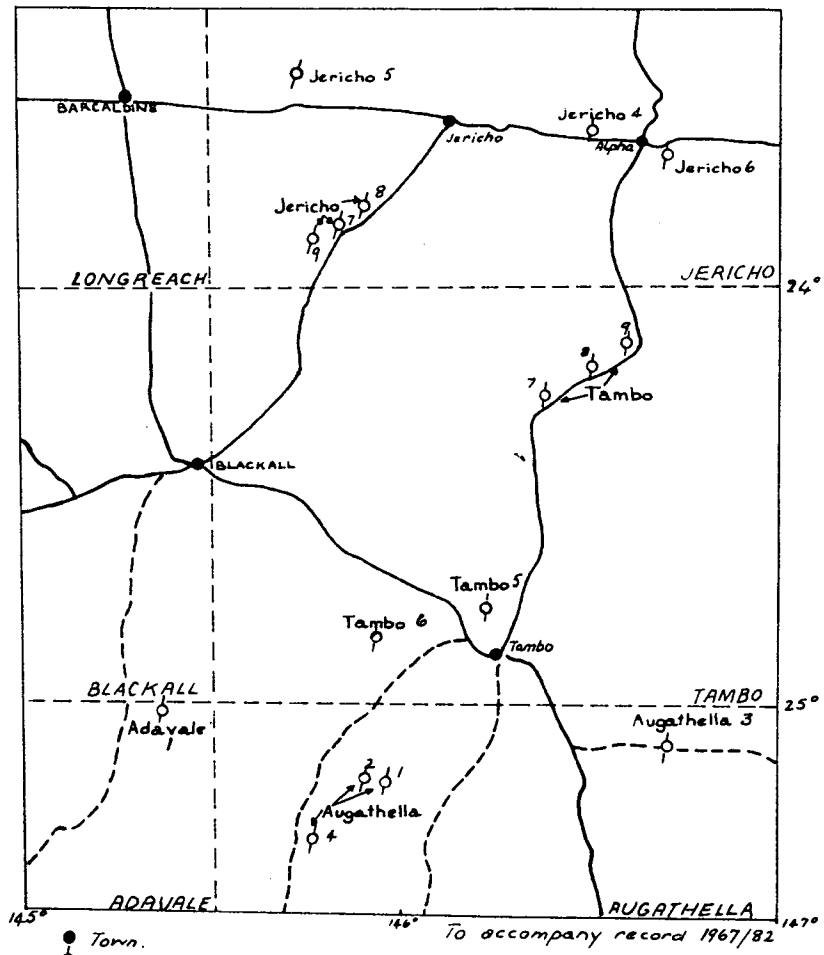
Nomenclature of arenites follows Crook (1960). "Siltstone" is used for grains 1/16 - 1/25 m.m. and the term "mudstone", for non-fissile sediments of the clay size class, and "shale" for fissile mudstones. Grade sizes used are those of Wentworth (1922).

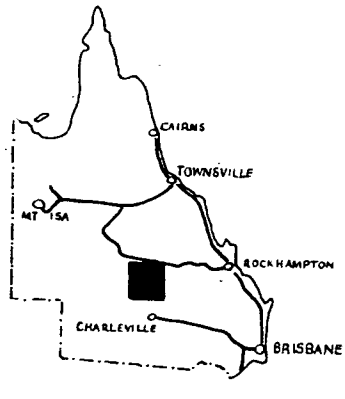
Figure 1 shows the localities of the holes drilled, and drilling statistics are set out in Table 1.

The data obtained from the drilling of the sixteen holes follows

Fig.1.

SCOUT HOLE LOCALITIES





Q/A113

TABLE 1

D R I L L I N G S T A T I S T I C S

Well Name and Number	TD	Footage Cored	Footage Rec	%Rec	Spudded	Completed	Drilling	Rest	Travelling setting up camp	Breakdowns etc.
CAREY RIG										
Jericho 4	223' 6"	10' 6"	9' 4"	89%	27/6	29/6	3	2	1½	5
5	289' 6"	93' 0"	64' 9½"	70%	1/7	14/7	4½	4	1	7
Augathella 1	104	23' 6"	22' 2½"	95%	18/7	20/7	1½	-	1	-
2	153	60' 0"	59' 3"	99%	20/7	22/7	2½	1½	-	½
Tambo 5	278' 6"	76' 6"	63' 7½"	83%	25/7	29/7	5	½	-	-
5a	75	25'11"	25' 2"	97%	30/7	30/7	½	-	-	-
MAYHEW 1000	Rig									
Adavale 1 (1)	240	-	-	-	14/9	14/9				
(2)	174' 4"	67' 7	63'11"	95%	14/9	15/9	2	-	2	-
Tambo 6 (1)	210	-	-	-	16/9	16/9				
(2)	150	30' 0"	28' 3½"	94%	16/9	19/9	1½	1	½	1
Augathella 3	387	133' 0"	105' 7"	93%	21/9	24/9	3½	1½	1	1
Tambo 7	251' 6"	19' 6"	17' 6"	90%	27/9	27/9	½	-	½	-
8	217'	20' 0"	7'2"	36%	28/9	28/9	1	-	-	-
9	172'	15' 0"	4' 3"	28%	29/9	29/9	3/4	-	¼	-
Jericho 6	310' 0"	20' 0"	17' 6"	88%	30/9	1/10	1¼	-	¼	½
7	413' 3"	40' 1"	34' 3"	85%	4/10	5/10	2	1½	½	-
8	140'	-	-	-	6/10	6/10	¼	-	¼	-
9	402	57' 6"	54' 3"	94%	6/10	8/10	2¼	1	¼	-
Augathella 4 (1)	177	-	-	-	12/10	12/10	-	-	-	-
(2)	104' 6"	19' 0"	13'11"	73%	12/10	12/10	½	2	1½	-

(1) (2) See introduction for explanation

B.M.R. JERICHO 4 (map ref 45620557 Jericho)

Object: To collect samples for palynological examination from a unit, thought to be the Lower Permian Colinlea Sandstone.

Results: 0-90 Colinlea Sandstone, mainly quartzose sandstone
90-223'6" Joe Joe Formation, mudstone, siltstone, fine grained labile sandstone, pebble conglomerate.

Comments: Presence of quartzose sandstone (0-100') confirmed the surface lithology, so the unit was probably Colinlea Sandstone. This interval, which was weathered throughout, contained no mudstone or siltstone; the sandstone was quartzose and sub-labile so no suitable material for palynology was encountered.

The presence, below 100 feet, of siltstone and mudstone, labile sandstone and pebble conglomerate indicates the presence of the Joe Joe Formation.

The hole was dry, and the lower half had collapsed before logging could be attempted. The results of palynological examination of cores is included in appendix 4:-

Cores:

Core 1, 213' - 213'6", Length 6" , recovered 6".
Core 2, 213'6" - 223'6", Length 10'0" , recovered 8'10".

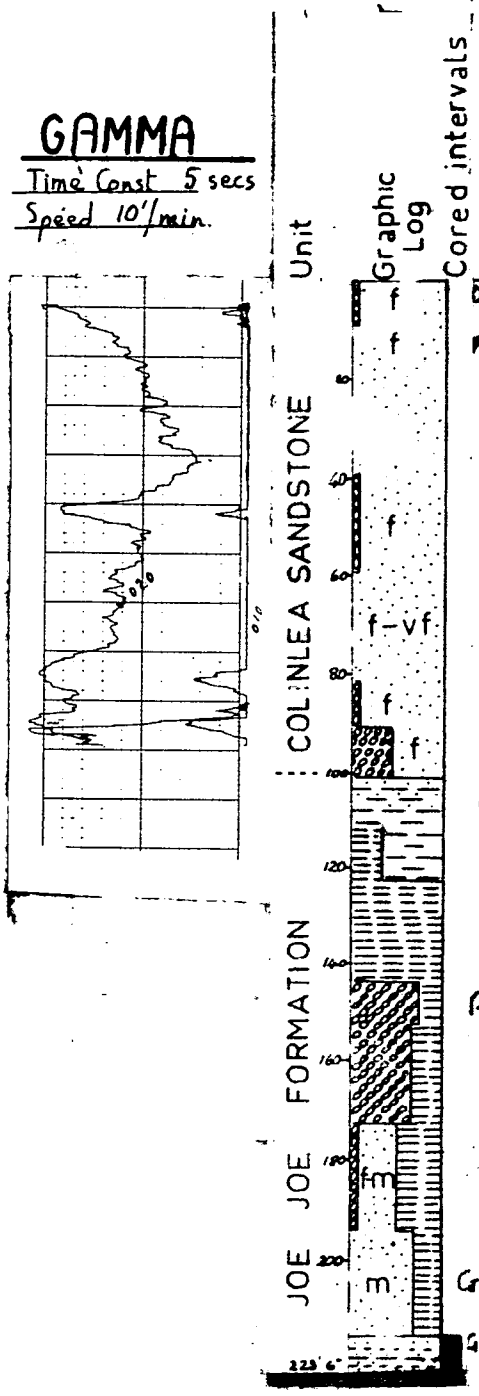
B.M.R. JERICHO 5 (map ref 37140758 Jericho)

Object: To drill in an area where the Ronlow Beds (regarded as including the whole Jurassic sequence) were thought to be thin. It was intended to core the whole sequence for a detailed palynological and lithological study in order to see whether correlates of the differentiated Jurassic sequence (Hutton to Hooray Sandstone) could be recognised.

Results: 0-289'6" Ronlow Beds, mainly sandstone, extensively weathered throughout, unsuitable for palynology.

Comments: Well-weathered sandstone did not justify abundant coring. Hole could not be completed as rig incapable of recovering stuck drill pipe (fish recovered later by Mayhew). As a result of extensive weathering, the hole did not achieve its objective of providing material suitable for palynological study. Subsequently, gamma ray logging of a water bore about twelve miles to the west resulted in a re-interpretation of the surface geology. It now appears that Jericho 5 was drilled in that part of the Ronlow Beds which correlates with the Hutton Sandstone.

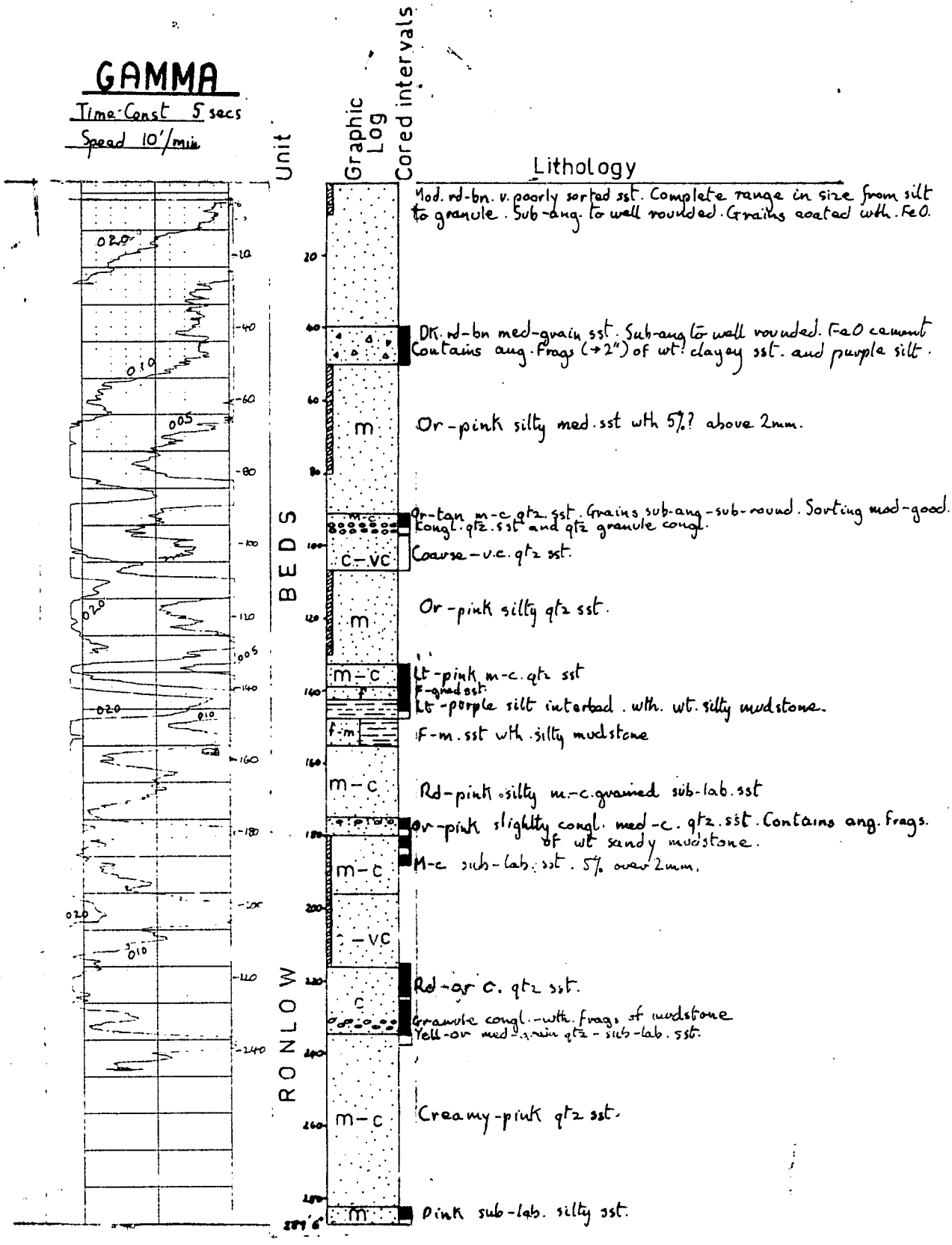
B.M.R JERICHO No. 4.



To accompany record 1967/82
F55/A14/2

Fig. 3.

B.M.R. JERICHO No. 5

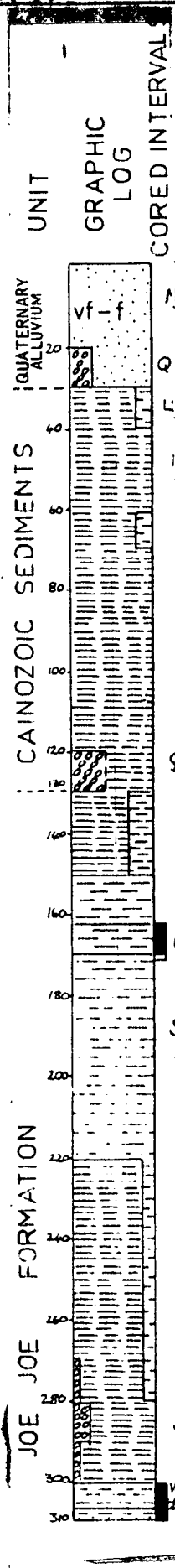


To accompany record 1967/82

F 55/A14/3

Fig. 4.

BMR JERICHO No. 6



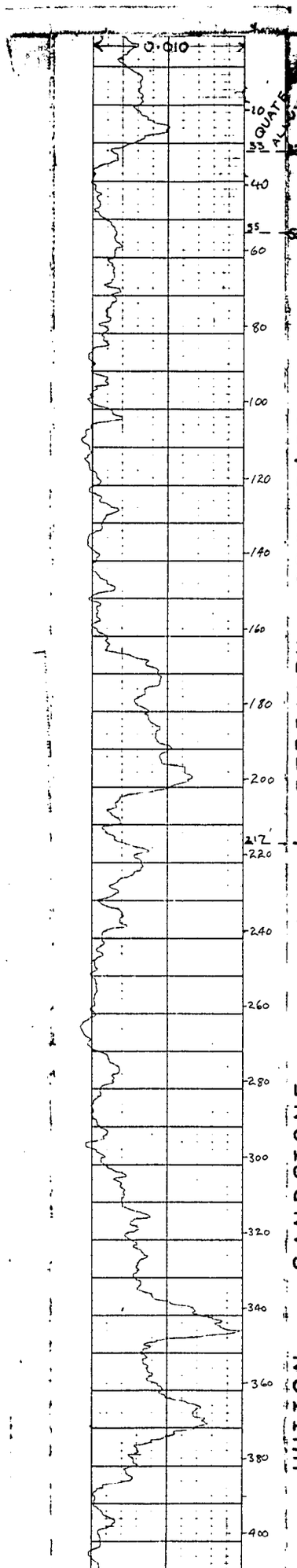
To accompany record 1967/82

F55/A14/4

Fig. 5

B.M.R. JERICHO No. 7.

GAMMA
Time Const 5 secs



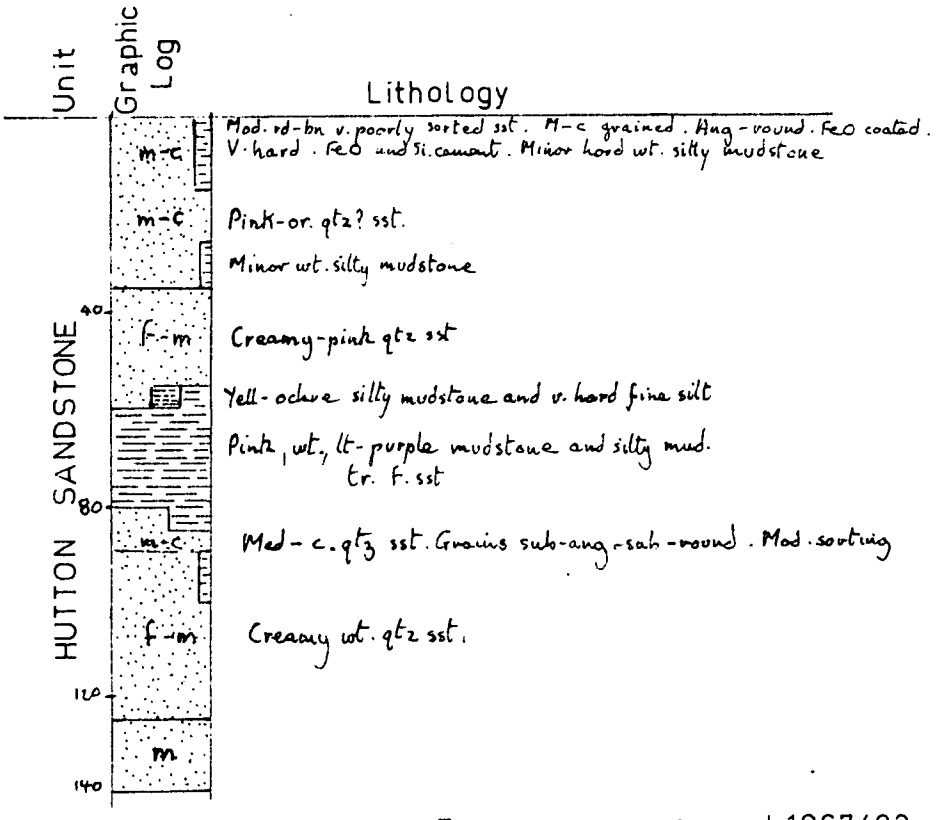
Unit	Graphic Log	Cored interval	Lithology	Drilling results
QUATERNARY ALLUVIUM	m		Gry-or. to wt. m.-grained qtz sst. with 1-2% granules.	Air drilling
SILCRETE	f-m		Gry-or. to wt. qtz sst with hard rd-bn. ferrug. sst.	
	f		Contains frags of v. hard red-black silicif. sst. Ang. qtz in rd-bn. glassy matrix. Also frags of rd-bn. sub-vitreous amorphous silica?, and yellow-ochre v. hard silty sst.	33'–55' Very hard drilling
	pb		Qtz pebble congl. (60-70% qtz and chert chips)	
	m		DK-yell-or. qtz. sst. Sorting mod.	
	f-m		Rd-bn. silty sst and hard yell. silty sst. with some red-black silicif. sst.	65'–75' Hard drilling
	m		Gry-or. med-grain qtz. sst. Moderate sorting. Grains sub-ang-sub-round. FeO cement.	85' changed to mud drilling
	pb		Sandy pebble congl.	
	gr		Sandy granule congl.	
	m		Gry-or. qtz-sub-lab. sst. 1-2% above 2mm. Tr. carb. wood frags.	
TERTIARY SEDIMENTS	gr-v.c		Granule congl.	
	m		Sandy granule congl.	
	wf		15%? pebbles 85%?. creamy wt. silt and clay	
	wf		Creamy wt. wt. qtz. sst. and siltst.	
	pb		Rd, pink, and yell. congl. qtz. sst. Abund. wt. ang. frags of clay and silty clay (1mm-6")	
212'				
	f-m		Gry-or. very silty qtz. sst. with tr.-10% material above 2mm. tr.-5% carb. wood and plant frags	
	m		Gry-Or. m. grain. qtz. sst	
HUTTON SANDSTONE	f-m		Gry-or. m. grain qtz-sub-lab. sst. In part silty.	
	f-m		DK. or.-tan. f-m. qtz? sst. Some alteration along joints to v. hard. red-black sst.	
	f		Creamy-wt. silt and clay with f. sand. with 2-15% qtz and liths above 2mm	
	f-m		Creamy-pink silty sst.	
	f		Creamy-pink silty f. qtz? sst.	
	m-c		Or.-tan m-c. grain qtz. sst. In part conglomeratic.	

To accompany Record 1967/82

F55/A14/5

Fig.6.

B.M.R. JERICHO No.8



To accompany record 1967/82

F55/A14/6

Core Number	Interval	Length Cored	Length Recovered
1	39 - 49	10' 0"	9' 6"
2	81 - 91	10' 0"	10' 0"
3	91 - 96	5' 0"	3' 6"
4	96 - 106	10' 0"	6"
5	123 - 133	10' 0"	-
6	133 - 133'6"	6"	6"
7	133'6" - 137'6"	4' 0"	2' 6"
8	137'6" - 147'6"	10' 0"	10' 0"
9	175'6" - 186'	10' 6"	4' 6"
10	217'6" - 227'6"	10' 0"	9' 9½"
11	228' - 238	10' 0"	7' 9"
12	282'6" - 289'6"	7' 0"	6' 3"

B.M.R. JERICHO 6 (map ref 47830540 Jericho)

Object: To determine what underlies the Cainozoic sediments immediately east of Alpha.

Results: 0 - 30 Quaternary alluvium, very fine to fine grained yellow brown sandstone, with quartz pebble conglomerate at the base.

30 -130 Cainozoic sediments, clayey silt and minor silty mudstone. Silty quartz granule conglomerate at base.

130-310 Joe Joe Formation, hard siliceous (?) mudstone, hard white, pink and green siltstone, carbonaceous mudstone with abundant plant fragments, silty pebble conglomerate, pink and green fine labile sandstone, some carbonaceous beds.

Comments: Good cores for lithological and palynological study were obtained; for palynological results see appendix 4.

Cores:

Core Number	Interval	Length Cored	Length Recovered
1	162 - 172	10' 0"	8' 6"
2	300 - 310	10' 0"	9' 0"

B.M.R. JERICHO 7, 8 and 9

These holes were drilled to examine the Jurassic sequence, in particular the Injune Creek Group. BMR Jericho 7 apparently drilled a thick sequence of Tertiary sediments before bottoming in Hutton Sandstone. Having not achieved its objective, BMR Jericho 8 was sited east of Jericho 7 where no Tertiary sediments were known to occur and where it was thought that the Injune Creek Group would be found at shallow depth. This hole appears to have been drilled entirely in the Hutton Sandstone. Having still not drilled the Injune Creek Group, BMR Jericho 9 was sited at, or just below, the base of the Marine Cretaceous sequence, and penetrated the Hooray Sandstone, Westbourne Formation and was terminated in the Adori Sandstone.

B.M.R. JERICHO 7 (map ref 38310293 Jericho)

Object: To examine the Jurassic sequence, in particular the Injune Creek Group.

Results:
0 - 33 Quaternary alluvium,medium grained poorly sorted quartz sandstone.
33 -217 Tertiary Sediments
33 - 55 Silcrete, silicified quartz sandstone and quartz pebble conglomerate
55 -190 Medium grained quartz sandstone with common sandy pebble and granule conglomerate.
190 -217 Very fine sandstone and siltstone with quartz pebble conglomerate
217 -413'3" Hutton Sandstone, fine to medium grained greyish orange quartzose and sub labile sandstone.

Comments: Weathered throughout and may not be suitable for palynology. The Tertiary Hutton Sandstone boundary is difficult to pick. Evidently no Injune Creek Group Sediments were drilled. This is thought to be due to pre-Tertiary erosion of the Injune Creek Group followed by infill with Tertiary sediments. As the Injune Creek Group was not intersected, Jericho 8 was planned.

Cores:

Core Number	Interval	Length Cored	Length Recovered
1	207 - 216'6"	9' 6"	4' 9"
2	252 - 262	10' 0"	8'11"
3	328 - 338'4"	10' 4"	10' 4"
4	403 - 413'3"	10' 3"	10' 3"

Fig. 7.

B.M.R. JERICHO No. 9.

E LOG

S.P. | Resistivity

GAMMA

Time Const. 5 secs.

Palynological Log | Graphic Log | Cored intervals | Lithology

Unit

CAINOZOIC SEDIMENTS

HOORAY SANDSTONE

WESTBOURNE FORMATION

ADORI SANDSTONE

Varicoloured. Dk. rd-bn pebbles of hard silicif. sst. and lt-bn. silty sst. in a dk. yell. silty sst.

Mod. rd-bn. very hard. v. poorly sorted sst. FeO coats grains. Gns ang.-round with. hard wt. silt and silty sst.

Rd-pink & poorly sorted sst. (sub-lab) 5%? granola size with. wt. silt and v. silty sst.

Orange-tan p. sorted sub-lab. sst. (Litho mostly rd, hard, v.f.grad, rounded.) The silt contains coal frags.

Or-tan v. silty f-grad sst.

Wt., purple, pink silt and claystone minor sst. with. few pebbles.

Labile sst. P. sorting. Felsp. and wt. clay frags. make 30%?

Uncon. labile sst. Rapid changes in grain size. In part congl. Contains 'rafts' (±2") of hard wt claystone and abundant smaller clay frags.

Lt-bn. lab. sst.

Wt. clayey silt with minor sst (as above)

Lt-bn., gry-gn. f-grad lab. sst. (abund. coal laths) Few thin carb. laminae.

Lt-med. gry-gn. lab. sst. (10%+? of liths are coal) P. sorting.

Gry-gn lab. sst. P. sorting. Large frags (→ 4") of silty mudstone (Disrupted bedding)

Lignite
Carb. mudstone
Lignite

J5

Lt-med. gry. lab. sst. and clayey silt with up to 15%? coal and carb. plant frags

J5

Fgrain lab. sst. interbed. with dk. gry. carb., mic., silt.
Mgrain lab. sst. Porous. Sorting moderate.

J5

Ltgry-gn. F.-med grained, lab. sst. Mod. sorting.

Lt-gry. gn. labile silty sst with frags of yell.-or. clay. and some coal and plant frags., and traces of wt. F-grain clayey qtz. sst.
Also throughout as small prop. are med-coarse clean qtz grains

Coarse-v. coarse qtz sst. Porous. Mod. sorting. Grains sub-ang., With thin gravelly beds.

To accompany Record 1967/82

E55/A14/7

B.M.R. JERICHO 8 (map ref 39170332 Jericho)

Object: Follow up to BMR Jericho 7 to examine the Injune Creek Group on the eastern side of the possible Tertiary valley.

Results: 0 - 140 Hutton Sandstone, varicoloured fine to medium quartz sandstone, some coarse sandstone, some mudstone and silty mudstone.

Comments: The well was evidently sited just below the base of the Injune Creek Group. It is possible that Tertiary sandstones occur in the upper part of the hole but it is not possible to pick a boundary from the cuttings. The absence of conglomerates and very coarse sandstones which commonly occur in the Tertiary sequence suggests that no Tertiary sediments occur in this hole. As the Injune Creek Group had still not been penetrated, Jericho 9 was planned. The outcrops previously regarded as Injune Creek Group in the Belleview - Narbethong area are evidently Tertiary.

B.M.R. JERICHO 9 (map ref 37620277 Jericho)

Object: Follow up to Jericho 7 and 8 to examine the Injune Creek Group. This well was sited near the base of the Wallumbilla Formation so as to drill through the Hooray Sandstone to the Injune Creek Group.

Results:

0 - 33 Cainozoic sediments

33 - 198 Hooray Sandstone, light brown and red fine and medium sub labile and labile sandstone.

198 - 331 Westbourne Formation of Injune Creek Group. Fine grained labile sandstone, siltstone and mudstone.

331 - 402 Adori Sandstone of Injune Creek Group. Coarse and very coarse quartz sandstone.

Comments: The boundary between the Tertiary sequence and the Hooray Sandstone is difficult to pick. It is possible that no Tertiary sediments were drilled and that the uppermost part of the hole is deeply weathered Hooray sandstone.

The Westbourne Formation interval was picked by the lithological change and confirmed by the Gamma Ray Log and palynological work. The thickness of the Hooray Sandstone, compared with that indicated by gamma ray logs of nearby water bores, is anomalously high. This suggests that a channel may have existed, at the locality of Jericho 9, at the time of deposition of the Hooray Sandstone, but there is doubt as to the position of the top of the Hooray Sandstone.

Arenaceous foraminifera (see Appendix 2) probably indicating a brackish or shallow water marine environment occur at 230-240 feet. Their absence in the remaining cuttings and cores indicate that these conditions were short lived and local.

The results of palynological examination are included in Appendix 3.

Core analyses (see Appendix 5) show that the highest permeability is from core 6 (2,500 - 5,500 millidarcys) while cores 1, 3 and 5 recorded from 250 to 750 millidarcys. Cores 3 and 4 generally recorded less than 100 millidarcys.

Cores:

Core Number	Interval	Length Cored	Recovery
1	65 - 73	8' 0"	7' 1"
2	132 -142	10' 0"	9' 7"
3	192 -201' 6"	9' 6"	8' 8"
4	252 -262	10' 0"	9' 8"
5	315 -325	10' 0"	10' 0"
6	392 -402	10' 0"	9' 3"

B.M.R. TAMBO 5 (5a) (map ref 42539194 Tambo)

Object: (1) To examine the base of the Marine Cretaceous sequence and to determine whether an arenaceous unit, similar to the Minmi Member of the Blythesdale Formation could be recognised.

(2) To examine the upper and lower parts of the Hooray Sandstone

(3) To examine the Westbourne Formation.

Results: 0 - 73' 6" Doncaster Member of the Wallumbilla Formation; the basal part is not arenaceous and no equivalent of the Minmi Member of the Blythesdale Formation was found.

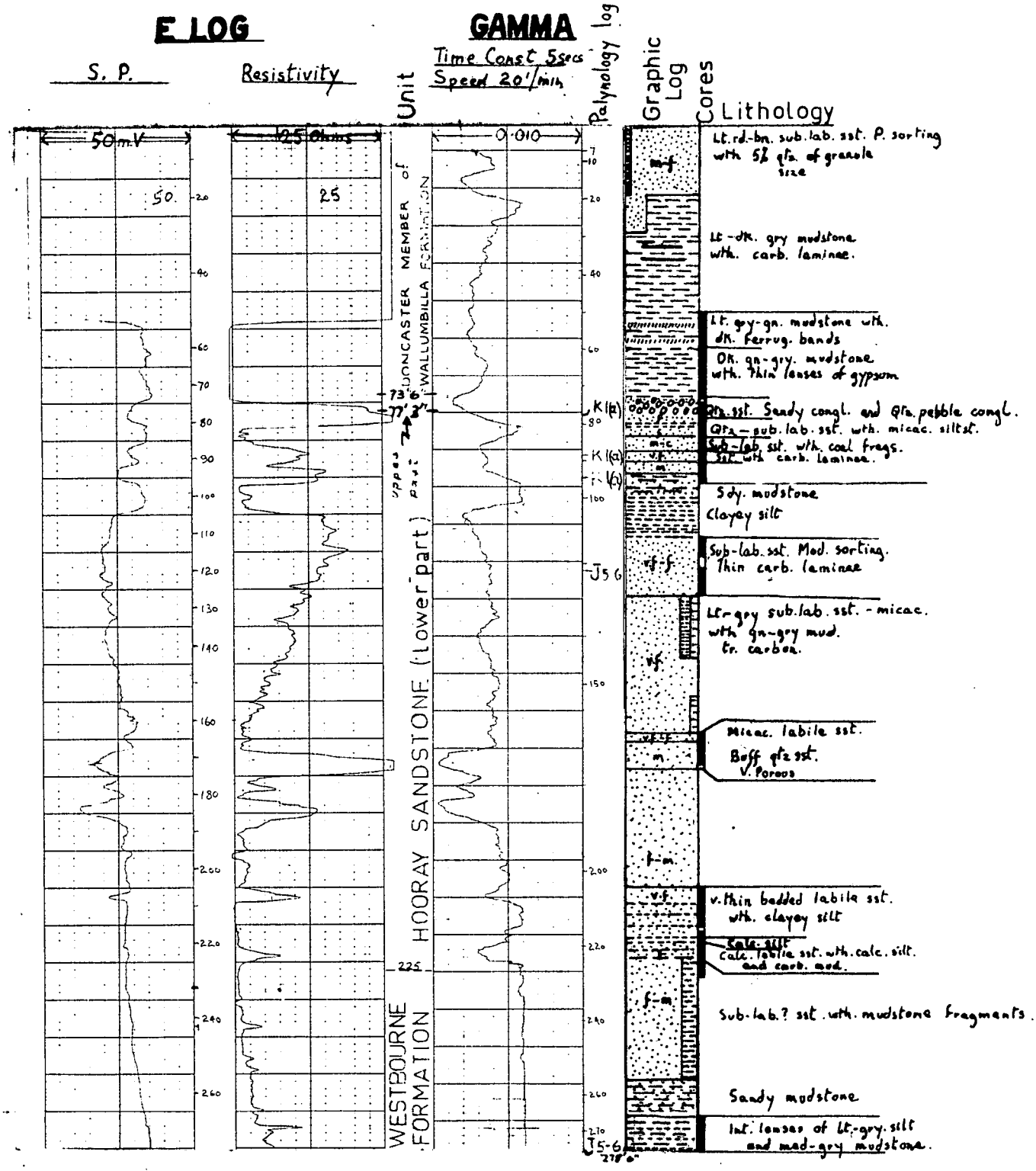
73' 6" - 225' Hooray Sandstone, 73'6"-77'3" upper part, quartzose very coarse sandstone, pebble conglomerate, sandy conglomerate. 77'3"-225' lower part, sub-labile and labile sandstones, very fine and fine grained, some medium grained, some mudstone and siltstone.

Comments: The well penetrated all targets sought. Tambo 5a was drilled to core the interval above Core I in Tambo 5. The thickness of the upper part of the Hooray Sandstone, 3 feet 9 inches, is in contrast with the 100 feet in the type section, 12 miles east of Tambo 5.

The total thickness of the Hooray Sandstone in Tambo 5 was 151'6" while in the type section it was 250 feet. Tambo 5 was drilled on the crest of the Birkhead Anticline whereas the type section of the Hooray Sandstone is in the syncline east of the Birkhead Anticline. The thinning of the unit appears to have been entirely in the upper part.

Fig.8.

B. M. R. TAMBO No. 5 (5A)



To accompany record 1967/82

G55/A2/20

Whilst the basal part of the Doncaster Member was not arenaceous in this hole, it was arenaceous in cores 1 and 2 of Tambo 3, sited about half a mile west of Tambo 5. This confirms that the arenaceous basal part of the Tambo Formation is discontinuous.

Core analyses (see Appendix 5) shows that core 4 had the best permeability, which ranged from 2110 to 2590 millidarcys; cores 5 and 6 had a vertical permeability of approximately 50 millidarcys and a horizontal permeability of 180-500 millidarcys. Porosity and permeability tests on cores 7 and 8 were unsuitable for testing or were very low.

The results of palynological examination are included in Appendix 2.

Cores:

Core Number	Interval	Length Cored	Length Recovered
Tambo 5			
1	75 - 80	5' 0"	3' 0"
2	80 - 90	10' 0"	8' 0"
3	90 - 97	7' 0"	6' 9½"
4	112 -122	10' 0"	4' 4"
5	122 -126' 6"	4' 6"	4' 3"
6	164' 6" -174' 6"	10' 0"	8'10"
7	206' 6" -216' 6"	10' 0"	8'10"
8	216' 6" -227'	10' 6"	10' 6"
9	269 -278' 6"	9' 6"	9' 1"
Tambo 5a			
1	49 - 59' 7"	10' 7"	10' 8"
2	59' 7" - 65' 7"	6' 0"	6' 0"
3	65' 7" - 75'	9' 4"	8' 6"

B.M.R. TAMBO 6 (map ref 39449115 Tambo)

Object: To core the interval of the Gamma Ray anomaly which was thought to coincide with the Toolebuc Limestone.

Results: 0 - 162 Allaru Mudstone

162 - 210 Coreena Member of Wallumbilla Formation

Comments: The gamma ray tool produced an abnormal log as compared with the logs of nearby water bores; the tool later failed to function. The greatest gamma ray anomaly was 130-135 feet, though high readings occur from 127-162 feet; below 162 feet the readings are still much higher than those above 127 feet. The zone of greatest gamma ray anomaly was cored but the lithology was not typical of the Toolebuc Limestone.

However palynological work (see Appendix 3) revealed that the interval 120-150 feet had a low spore content which Burger regards (pers.comm.) as typical of the Toolebuc Limestone. Micropaleontological work (see Appendix 2) has revealed a swarm of Hedbergella (Globigerina) in the interval 120-150 feet and a minor concentration in the interval 50-60 feet. Crespin (1963 p.19) states that Globigerina is typical of the Toolebuc Limestone and does not list it as being present in either the overlying or underlying units.

It is therefore evident that the absence of the Toolebuc Limestone is not erosional but due to facies change.

Cores:

Core Number	Interval	Length Cored	Recovery
1	120 - 130	10' 0"	9' 1½"
2	130 - 140	10' 0"	10' 0"
3	140 - 150	10' 0"	9' 2"

B.M.R. TAMBO 7 (map ref 44609792 Tambo)

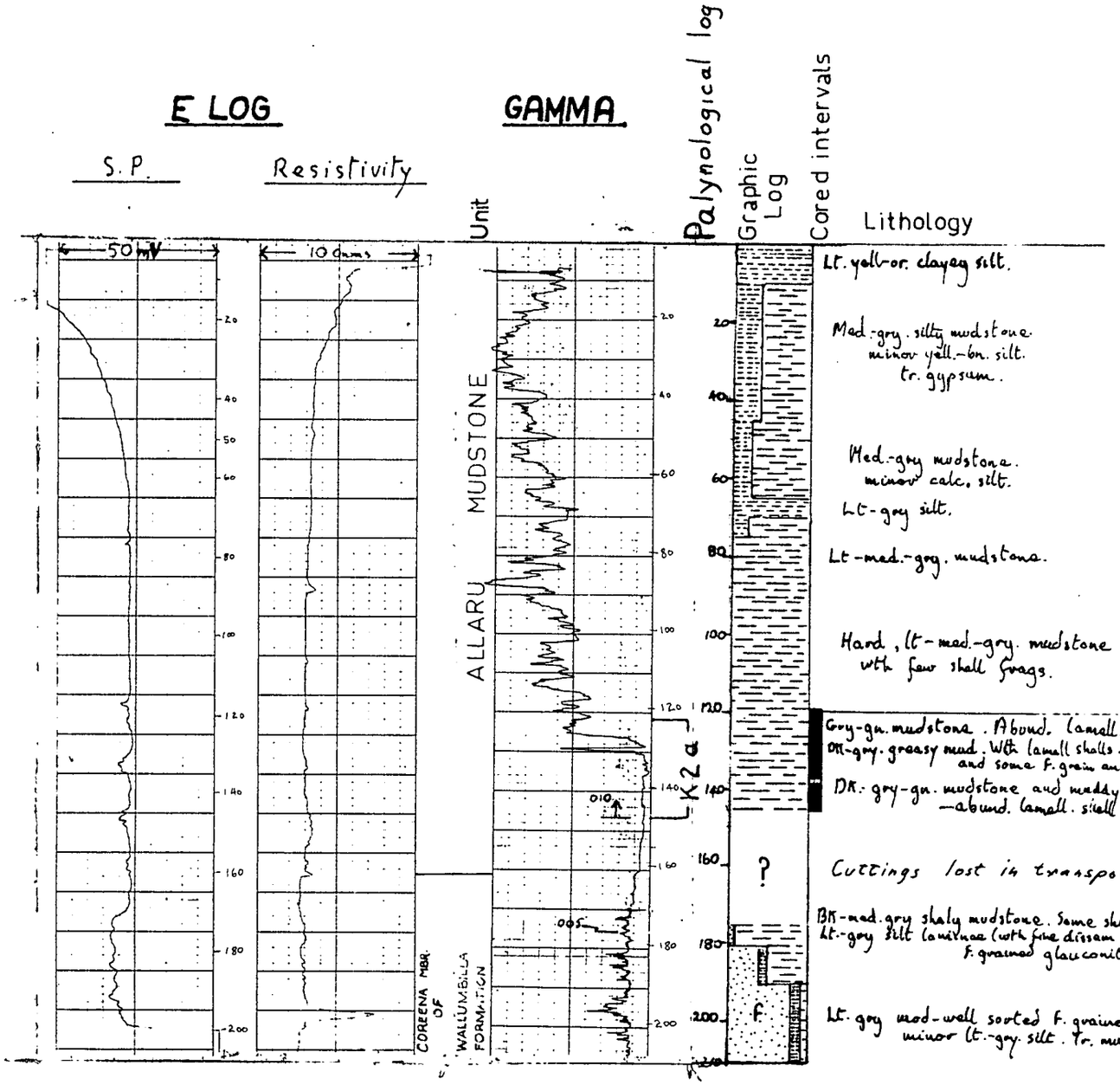
Object: Evans (1966) refers to the conflicting information as to the age of the Moolayember Formation in the Southern Jericho and Northern Tambo Sheet areas. Samples collected from what was thought to be the top of this unit had produced anomalous J 1 spores. This information was based on outcrop samples from an area of poor outcrop, seismic shot hole samples from an area of sand cover, and cuttings from South Pacific Limited Birkhead No 1. To resolve this problem a hole was drilled in an area of relatively good outcrop to obtain samples from what was almost certainly the topmost Moolayember Formation for further palynological work.

Results: 0 - 36 Precipice Sandstone

36 -251'6" Moolayember Formation

Fig. 9.

B. M. R. TAMBO No. 6

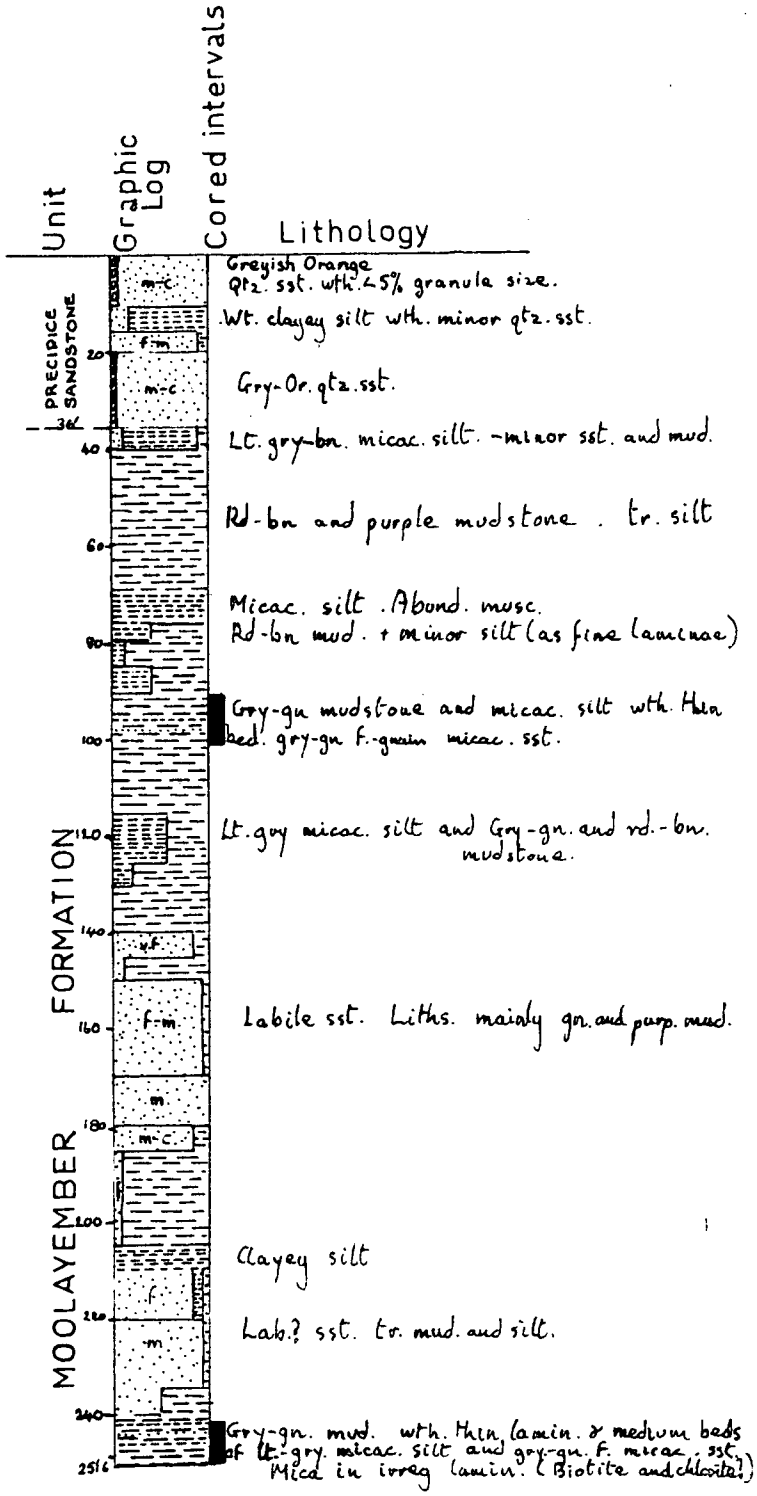


To accompany record 1967/82

G55/A 2/21

Fig.10.

B.M.R. TAMBO No. 7

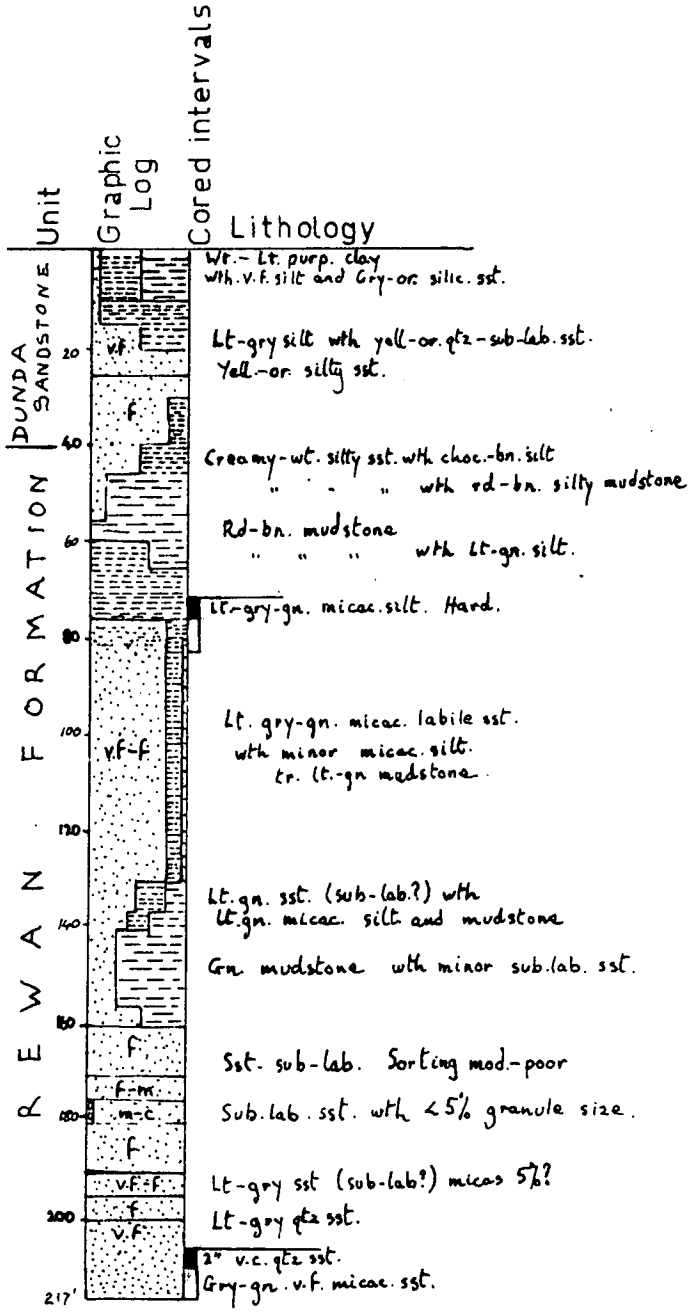


To accompany record 1967/82

G55/A2/22

Fig.11.

B.M.R. TAMBO No.8



To accompany record 1967/82

G55/A2/23

Comments: Core 1 was cut at 92 feet (92-102') as above this depth the unit was weathered. No spores could be recovered from the cores (see Appendix 4).

Core analyses (see Appendix 5) showed that the cores either had no permeability or were unsuitable for testing.

Cores:

Core 1	92 - 102,	cut 10'0" recovered 9' 2"
2	242 - 251'6"	cut 9'6" recovered 8' 4"

B.M.R. TAMBO 8 (map ref 46019872 Tambo)

Object: Evans (1966) suggests that the base of the Dunda Sandstone is time transgressive. Additional information was sought through Tambo 8 which was planned to core the topmost Rewan Formation by drilling through the Dunda Sandstone.

Results: 0 - 40 Dunda Sandstone

40 -217 Rewan Formation

Comments: The hole was sited at the boundary between the Dunda Sandstone and Rewan Formation. The lithology below 40 feet is typical of the Rewan Formation with both red and green mudstones being present. Core I was cut as soon as fresh material was encountered; neither core 1 nor core 2 produced spores (see Appendix 4).

Core analyses (see Appendix 5) showed that the cores either had no permeability or were unsuitable for testing.

Cores:

Core 1	72	- 82	cored 10'0" recovered 3'8"
2	207	- 217	cored 10'0" recovered 3'6"

B.M.R. TAMBO 9 (map ref 46889941 Tambo)

Objects: To core the Black Alley shale for palynological samples. These to be used to determine whether the acritarchs, common in this unit in BMR Tambo 1, (Evans, pers.comm.) persist in the Tambo area.

Results: 0 - 48 Blackwater Group

48 - 120 Black Alley Shale

120 - 172 Peawaddy Formation

Comments: The results of the palynological work appear in Appendix 4.

Core analyses (see Appendix 5) showed that the cores either had no permeability or were unsuitable for testing.

Cores:

Core 1	92 - 97	cut 5' 0", recovered 2' 7"
2	162 - 172	cut 10'0", recovered 1' 6"

B.M.R. AUGATHELLA 1 (map ref 39138683 Augathella)

Object: To provide a series of cores for porosity-permeability measurements to check aquifer characteristics of a nearby poorly exposed quartzose sandstone in the Mackunda Formation. Klm

Results: Core analyses (see Appendix 5) showed that core 1 had a moderate vertical permeability (680, 970 millidarcys); horizontal permeability tests could not be carried out. Core 2 was unsuitable for testing.

Cores:

Core Number	Interval	Cored Length	Recovery
1	80' 6" - 88' 6"	8' 0"	7' 5"
2	88' 6" - 98' 6"	10' 0"	9' 3½"
3	98' 6" - 104'	5' 6"	5' 6"

B.M.R. AUGATHELLA 2 (map ref 39678677 Augathella) Kw

Object: To core coal horizons in the Winton Formation for quality evaluation.

Results: A number of carbonaceous horizons were cored, the lowermost cores were black and lignitic coal. Though they seem to be very extensive their quality is such that they have no economic value in the forseeable future.

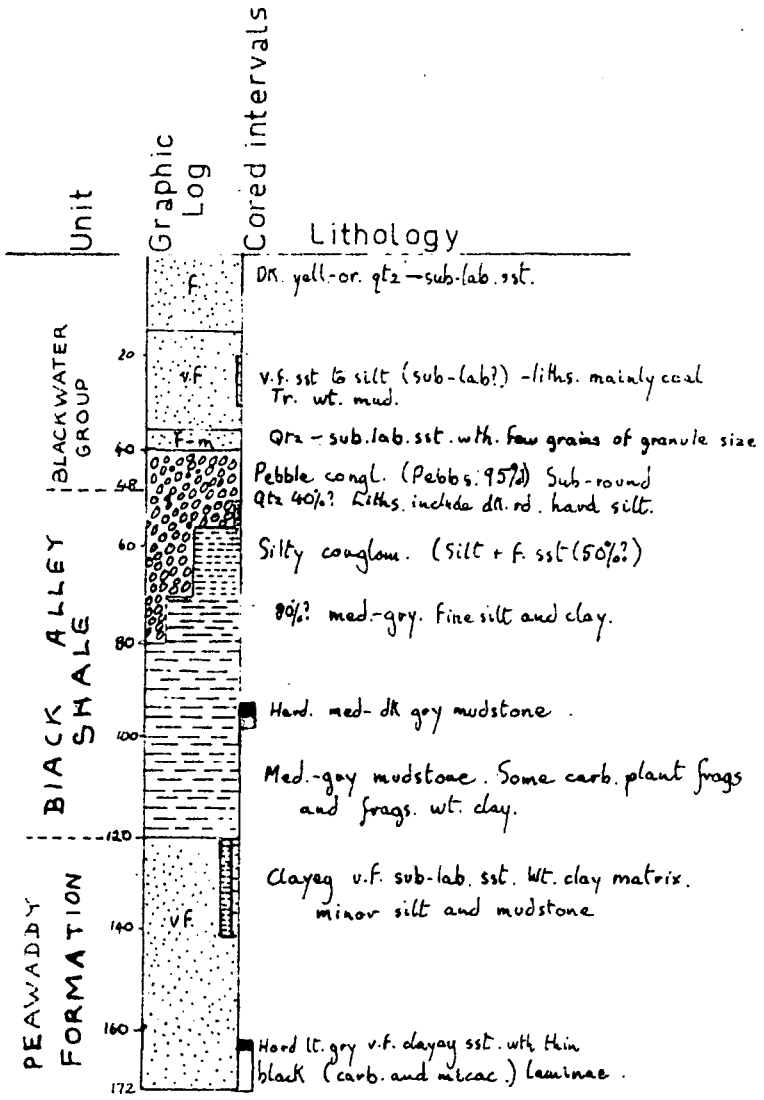
Details of the coal analyses are included in Appendix 1. Porosity-permeability core analyses (see Appendix 5) showed that the permeabilities were either low (70 millidarcys) or unsuitable for testing.

Cores:

Core Number	Interval	Length Cored	Recovery
1	28 - 38	10' 0"	10' 0"
2	51 - 61	10' 0"	10' 0"
3	81 - 91	10' 0"	9'11½"
4	91 - 101	10' 0"	10' 0"
5	133 - 143	10' 0"	9' 3½"
6	143 - 153	10' 0"	10' 0"

Fig.12.

B.M.R. TAMBO No. 9

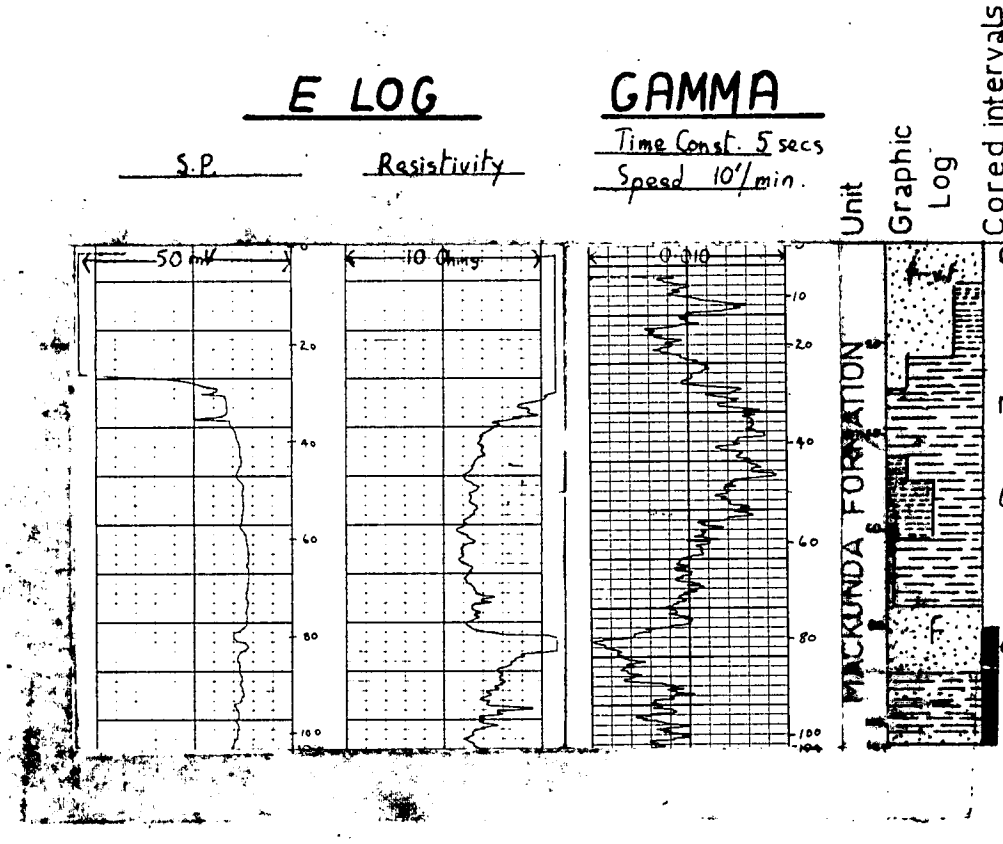


To accompany record 1967/82

G55/A 2/24

Fig. 13.

B.M.R. AUGATHELLA No. 1.

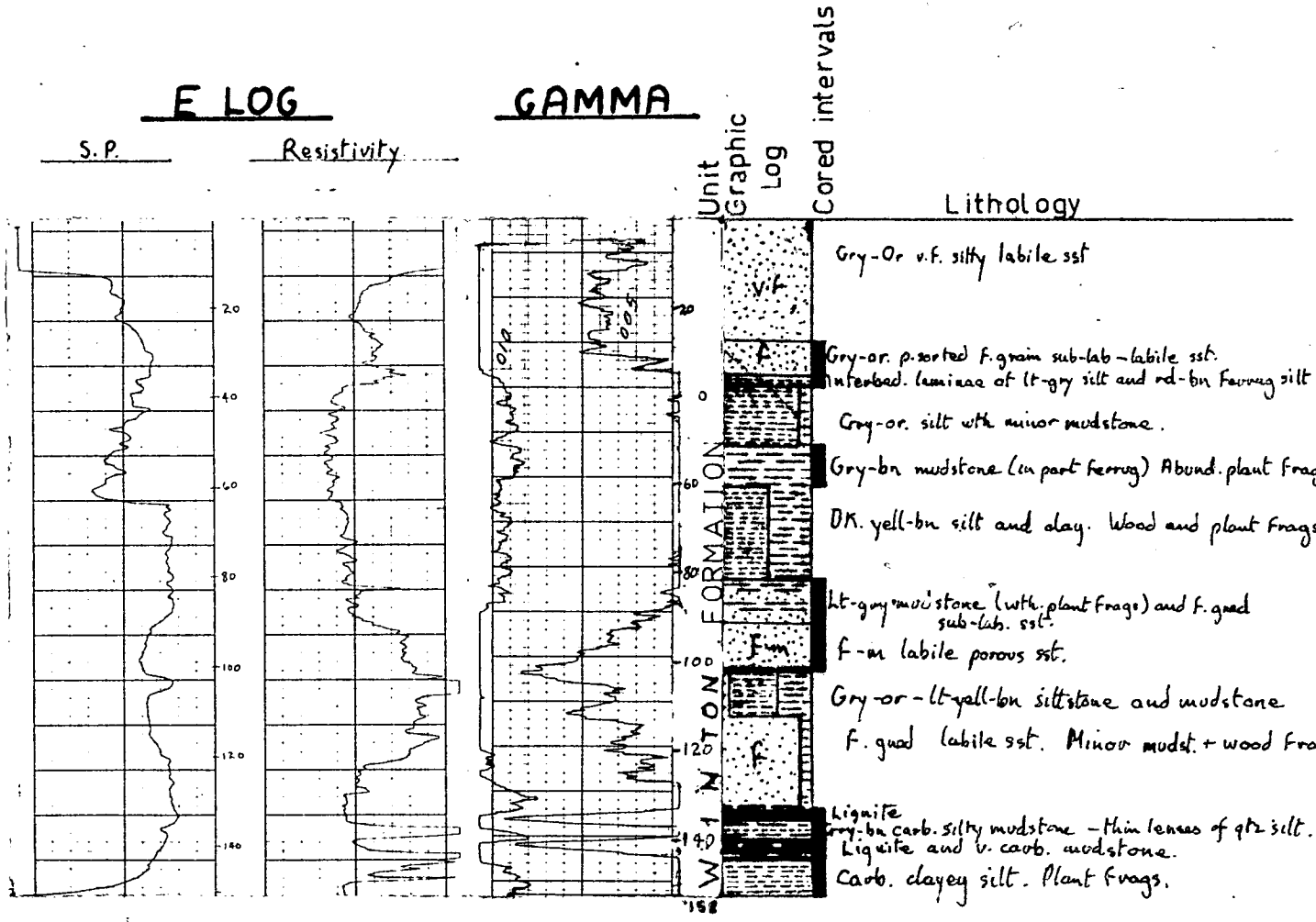


To accompany record 1967/82

G 55/A 6/2

Fig. 14.

B.M.R. AUGATHELLA No. 2



To accompany record 1967/82

G55/A6/3

B.M.R. AUGATHELLA 3 (map ref 48808775 Augathella)

Objects: To check:

(1) The interpretation that here the sand plain is underlain by the Doncaster Member of the Wallumbilla Formation.

(2) If the upper and lower parts of the Hooray Sandstone can be recognised in this area.

(3) The thickness of the upper part of the Hooray Sandstone.

Results: 0 - 20 Quaternary sand

20 - 72 Doncaster Member of the Wallumbilla Formation

72 - 128 Upper part of the Hooray Sandstone characterised by the presence of sandy pebble conglomerate and quartzose sandstone.

128 - 320 Lower part of the Hooray Sandstone, characterised by the presence of labile sandstone and almost total lack of conglomerate.

320 - 387 Hooray Sandstone or uppermost Westbourne Formations consisting of fine and very fine grained thinly interlaminated labile sandstone and coaly labile sandstone with some cross bedding.

Comments: The well confirmed that the sand plain is underlain by the Doncaster Member of the Wallumbilla Formation. It confirmed that the upper part of the Hooray Sandstone is thicker in this area (56 feet) than on the Birkhead Anticline (3 feet 9 inches in Tambo 5, 5a).

The interval 320 - 387 feet may be regarded as either uppermost Westbourne Formation or lowermost Hooray Sandstone depending upon the criteria used in determining the boundary between the two formations. The type section of the Westbourne Formation in Amoseas Westbourne No.1 (Exon 1966) consists almost entirely of shale and siltstone, with sandstone confined to thin beds in the basal part. However in outcrop, Exon, Galloway,Casey and Kirkegaard (1966) recognise a sandy upper part of the Westbourne Formation but this description seems to conflict with the description of the type section. This upper sandy part of the Westbourne Formation appears to be similar to the sandy interval between 320 and 387 feet in B.M.R. Augathella 3.

The lower part of the Hooray Sandstone in the type section (Exon 1966) is predominantly fine grained sandstone and thus also appears to be similar to the sandy interval between 320 and 387 feet in B.M.R. Augathella 3.

In the type section the Westbourne Formation has electrical log characteristics typical of a shale sequence, and is further characterised by high gamma ray counts. Electrical logs of the problematical interval in Augathella No. 3 are similar to those of the Westbourne Formation type section, but unfortunately no gamma-ray log of the interval could be obtained due to caved hole.

However a gamma ray log of water bore 6398 about 6 miles SE of Augathella 3 shows the Westbourne type anomaly clearly and establishes that in the water bore the Hooray Sandstone is over 400 feet thick. This is nearly twice the thickness in Augathella No. 3 if the interval 320 to 387 feet represents the Westbourne Formation. In the absence of any obvious structural or environmental reason for such a variation, this difference in thickness is unlikely.

Palynological determinations (Appendix 3) from cores in the problematical interval indicate a J5 age of deposition. Unfortunately determinations elsewhere show that both the uppermost Westbourne Formation and the lower part of the Hooray Sandstone were deposited during this period of time.

In the opinion of the senior author the balance of evidence favours the interpretation that the problematical interval should be referred to the lower part of the Hooray Sandstone, and that there is thus no evidence for major variations in thickness of the lower part of the formation.

Porosity-permeability determinations (see Appendix 5) showed that cores 4,5,6,7, 10 and 12 had permeability factors generally from 500 to 2000 millidarcys. Cores 2 and 11 had horizontal permeabilities of around 340 millidarcys, the remainder were from 60-150 millidarcys, very low to non permeable or not determined due to unsuitability of core for testing.

Cores:

Core Number	Interval	Length Cored	Recovery
1	62 - 71	9	7' 3"
2	71 - 78	7	5'11"
3	78 - 87' 6"	9' 6"	9' 5½"
4	88 - 97' 6"	9' 6"	6' 9"
5	97'6"- 106	9' 6"	1' 6"
6	106 - 115	9	5' 9"
7	115 - 125	10	9'11½"
8	125 - 135	10	9'11"
9	135 - 145	10	1' 6"
10	167 - 177' 6"	10' 6"	9' 5"
11	210 - 220	10	9' 7"
12	220 - 230	10	9' 6"
13	330 - 340	10	9' 7"
14	377 - 387	10	9' 0"

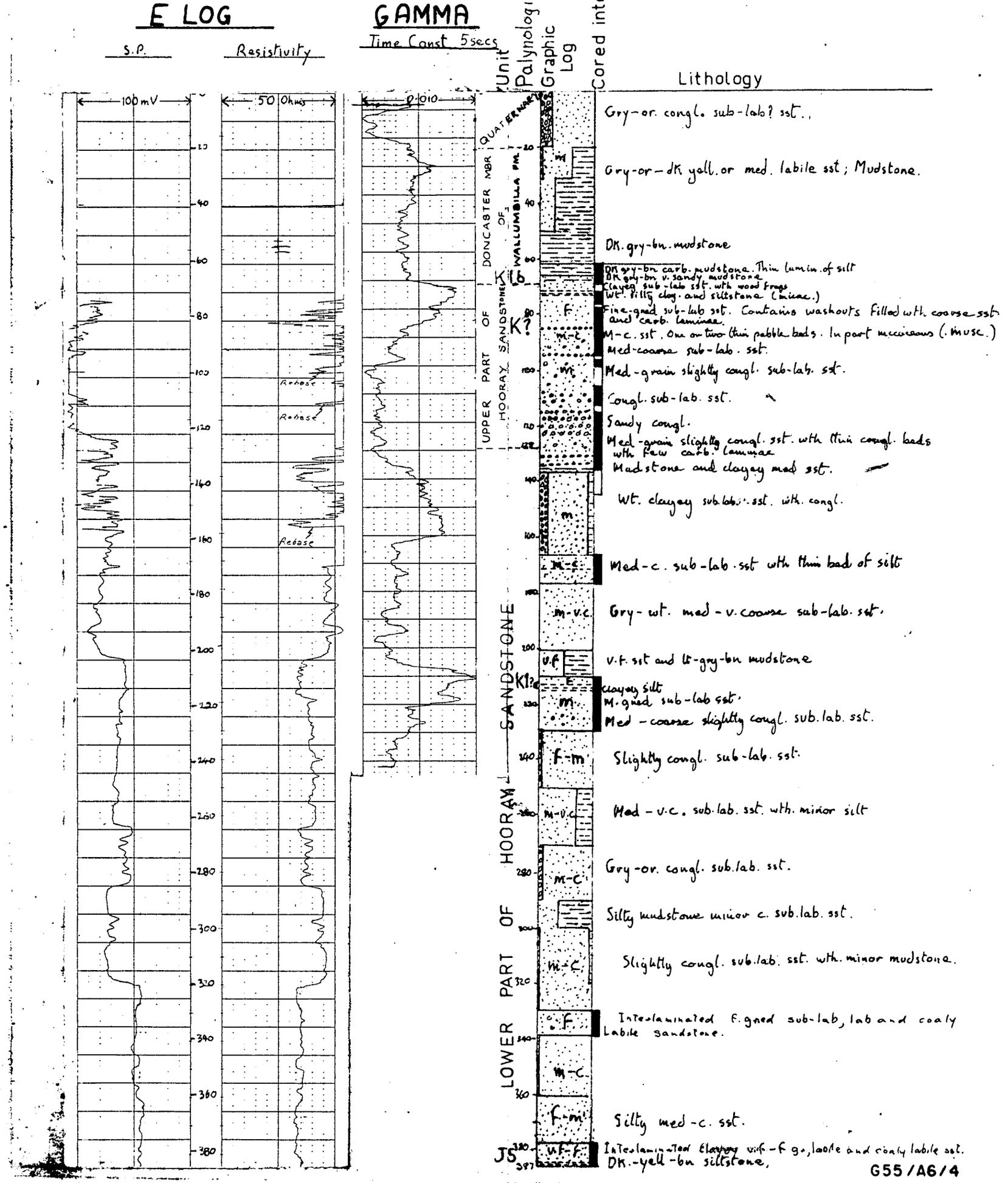
B.M.R. AUGATHELLA 4 (map ref 37838514 Augathella)

Objects: To core coal horizons in the Winton Formation for quality evaluation.

Results: Core 1 (85-94'6") recovered bright, semi-bright and dull coal. Details of analyses of this coal are included in Appendix I. It is unlikely that the coal will be of economic value in the foreseeable future.

BMR. AUGATHELLA No 3

Fig. 15

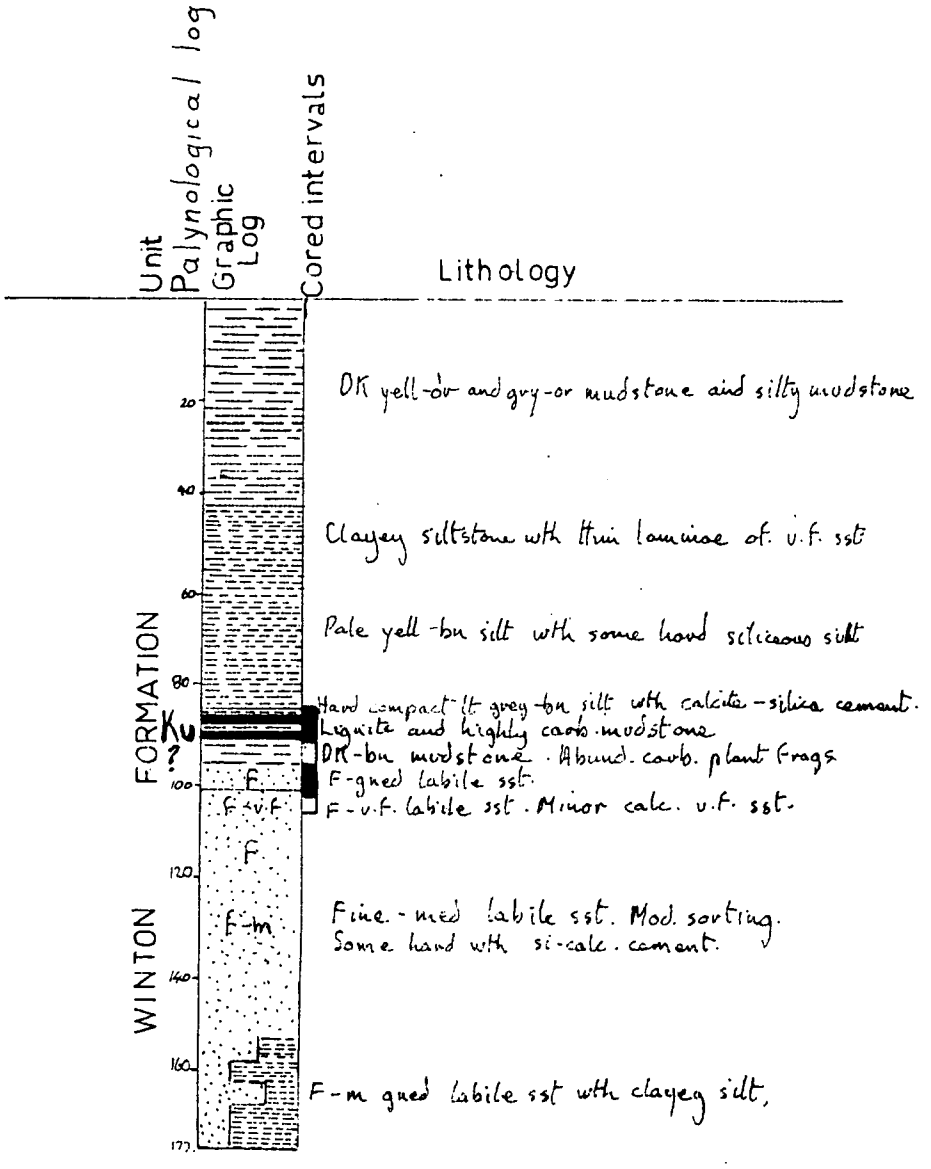


To accompany Record 1967/82

G55/A6/4

Fig.16.

B.M.R. AUGATHELLA No. 4



To accompany record 1967/82

G 55/A6/5

Cores:

Core 1, 85 - 94'6", cored 9'6", recovered 6'9"

2, 95 - 104'6", cored 9'6", recovered 7'2"

B.M.R. ADAVALE 1 (map ref 33008902 Adavale)

Objects: To core coal for quality evaluation.

Results: Cores 1 (50-60'3"), 3 (97-107), 4 (107-117) and 7 (165'2"-174'4") recovered bright, semi bright and dull coal. Details of analyses are included in Appendix I. It is unlikely that the coal will be of economic value in the foreseeable future.

Porosity-permeability analyses (see Appendix 5) showed that the cores either have no permeability or were unsuitable for testing.

A plug from core 4 (113'6"-114'1") has an average apparent grain density, including non interconnected voids, of 3.05 gm/cc. It is a fine silt size carbonate rock, with only a few detrital grains. It is made up of laminae of brownish grey material with thin lenticular interlaminae of white milky material.

A positive phosphate test was obtained using ammonium molybdate; however the shapiro test indicates that the rock contains less than 5% phosphate and probably less than 1%. Thin section showed that the rock was very fine grained silt size and composed of carbonate minerals, about 1% quartz and a trace of plagioclase feldspar. When acid etched the rock was only weakly stained by Alazarin Red S indicating that only a minor proportion of the carbonate was calcite. The milky white material was identified by x-ray diffraction as mainly calcite with some siderite, and the brownish grey material as mainly siderite with some calcite (C.D.Branch,BMR, pers.comm.).

The specific gravity of siderite is 3.8 which accounts for the high specific gravity of the rock. The total thickness of the sideritic bed was 4½ inches (113 feet 11 inches to 114 feet 3½ inches). Re-examination of the non coaly parts of the cores suggested that siderite, in addition to being common in certain horizons was disseminated to a varying degree throughout the rest of the cored intervals, being most common in the mudstone laminae. This was proved by x-ray diffraction (C.D.Branch, BMR, pers.comm.).

These results are of particular interest as they may well be the clue to the apparently random positioning of the ironstone beds in the weathered profile of the Rolling Downs Group. Siderite on weathering would loose carbonate ions into solution and have iron oxide deposited in its place. It could be suggested that the location of the iron stone is controlled by the presence of calcareous layers. However the source of the Fe ions is still unexplained. If the iron were to be supplied by the enclosing beds then greater iron leaching close to the ironstone body and progressively less leaching away from them would be expected, but this does not occur.

With siderite as the host mineral, only the carbonate ions have to be removed with simultaneous oxidation of the Fe ions.

Cores:

Core Number	Interval	Length Cored	Recovery
1	50 - 60' 3"	10' 3"	10' 3"
2	90 - 97	7' 0"	7' 0"
3	97 - 107	10' 0"	10' 0"
4	107 - 117	10' 0"	7' 6"
5	145 - 155	10' 0"	9' 6"
6	155 - 165' 2"	10' 2"	10' 2"
7	165'2"- 174' 4"	10' 2"	9' 6"

CONCLUSIONS

The drilling is a useful and necessary adjunct to the field mapping. It is necessary for confirming and supplementing of field information. This is especially so in areas of poor outcrop, thinning and facies variation. It is essential for the recovery of fresh samples for palynology, coal analysis, porosity and permeability determination and petrology.

Most of the targets in the drilling programme were achieved.

The area dominated by sand plain between the outcrop of the Hutton Sandstone and the Rolling Downs Group was found to be mostly underlain by Tertiary sediments and not the Injune Creek Group (Jericho 7,8,9). It is probable that a Tertiary valley was scoured through this country to form a tributary to the Alice River.

The Cretaceous mapping was confirmed by Tambo 5,6, Augathella 1,2,3,4 and Adavale 1.

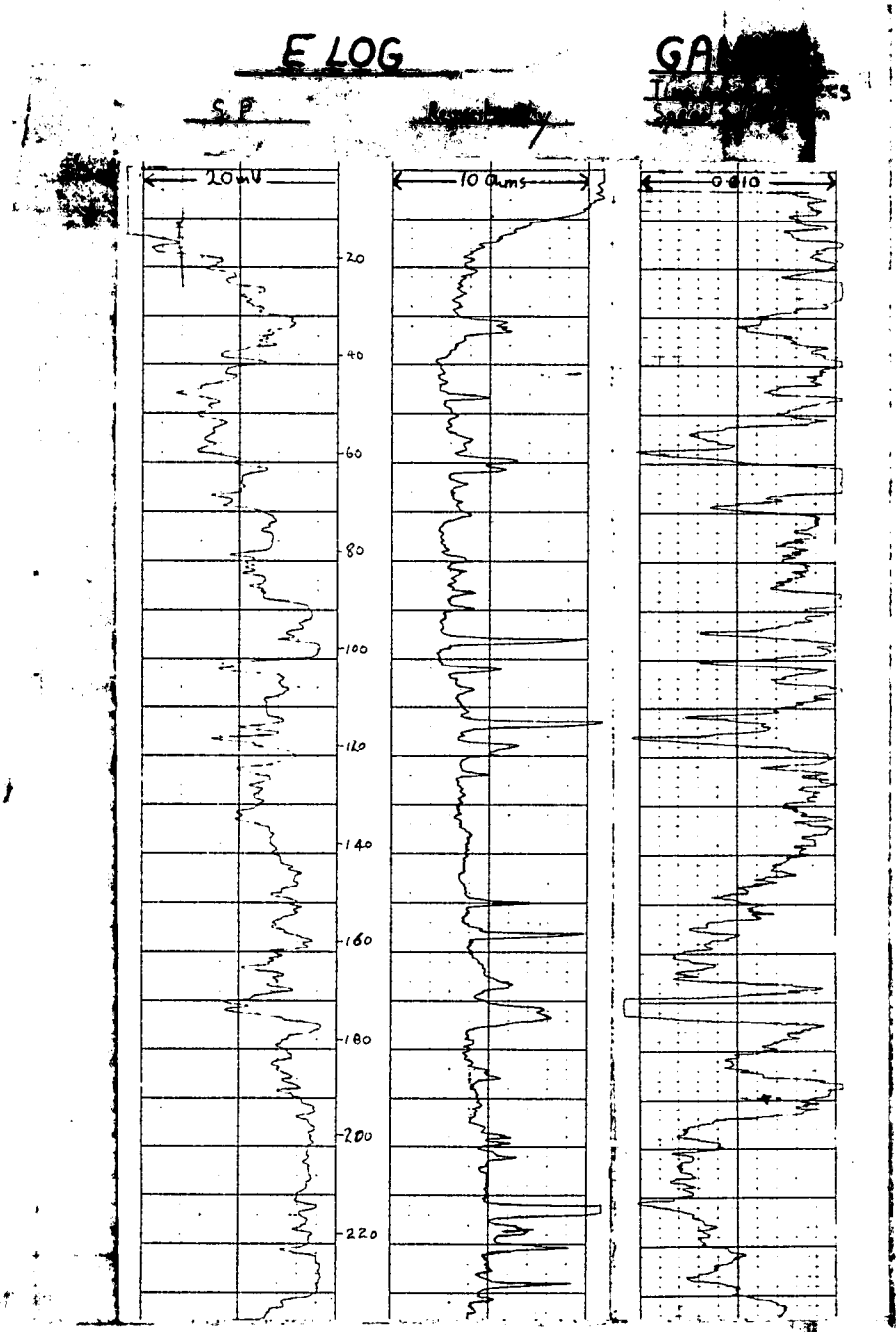
The basal glauconitic sandstones of the Doncaster Member of the Wallumbilla Formation were proved to be discontinuous (Tambo 5,5a). The thinning of the units over the Birkhead Anticline was also proved.

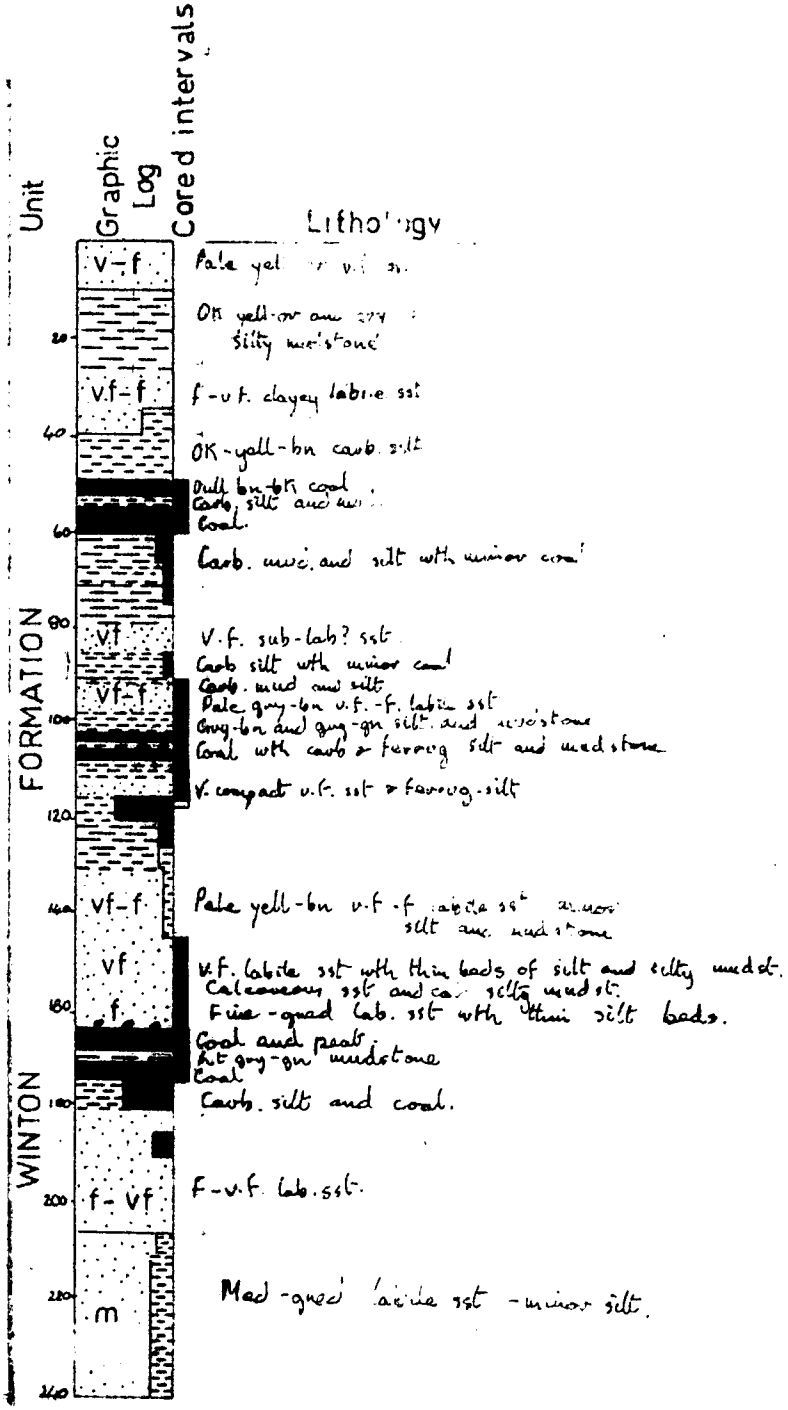
Further information regarding the lithology, thickness and distribution of the Doncaster Member of the Wallumbilla Formation as well as the upper and lower parts of the Hooray Sandstone was obtained (Tambo 5, 5a, Augathella 3).

Cores of Cretaceous coal for analysis were successfully obtained (Augathella 2,4, Adavale 1), the details of the analyses are included in Appendix 1. The coal was found to be of no economic value in the foreseeable future.

Fig. 17.

B.M.R. ADAVALE No. 1





To accompany record 1967/82

G 55/A5/3

Samples sought for palynological examination were also obtained (Jericho 4, and 6, Tambo 7, 8 and 9); the results of this work are included in appendices 3 and 4.

The Carey rig was totally unsuitable for Geological Branch work because of its inability to attain target depths deeper than 50 feet in the Bowen Basin and 150 feet in the Eromanga Basin.

ACKNOWLEDGMENTS

The authors would like to thank Dr P.R. Evans for writing appendix 4. This was based on work done while he was with the Bureau of Mineral Resources but entirely written up after leaving this organisation.

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APPENDIX I

RESULTS OF COAL ANALYSES CARRIED OUT BE GEOLOGICAL SURVEY OF QUEENSLAND

B.M.R. Augathella & Adavale Scout Bores

Coals from boreholes at Adavale and Augathella were received from the Bureau of Mineral Resources for examination and analysis. The coal sections were logged and certain portions were then selected for analysis (Proximate Analysis, Sulphur, Calorific Value, Specific Gravity and Coking Tests). Portions were also selected for petrographic examination and Ultimate and Proximate Analysis. Results of analyses are shown on the attached tables. A report on the petrographic examination is appended, together with typed descriptions of the seams and graphic logs of the sections sampled.

The chemical, physical and petrographic data indicate that these coals are of low rank and are non-coking.

Petrographic Studies of Adavale No.1 and Augathella Nos. 2 and 4 Vitrains

Lenses of vitrain representing compressed coalified fragments of wood up to about 1½ inches in length occurred in the coal seams found in the Adavale No. 1 and Augathella No. 2 boreholes. This material was very similar in appearance to jet found in the Lias of Yorkshire, England.

In order to assess the rank of the coals in Adavale No. 1 some of these lenses were removed from two of the seams for chemical analysis and reflectance determinations, the results of which appear in the table.

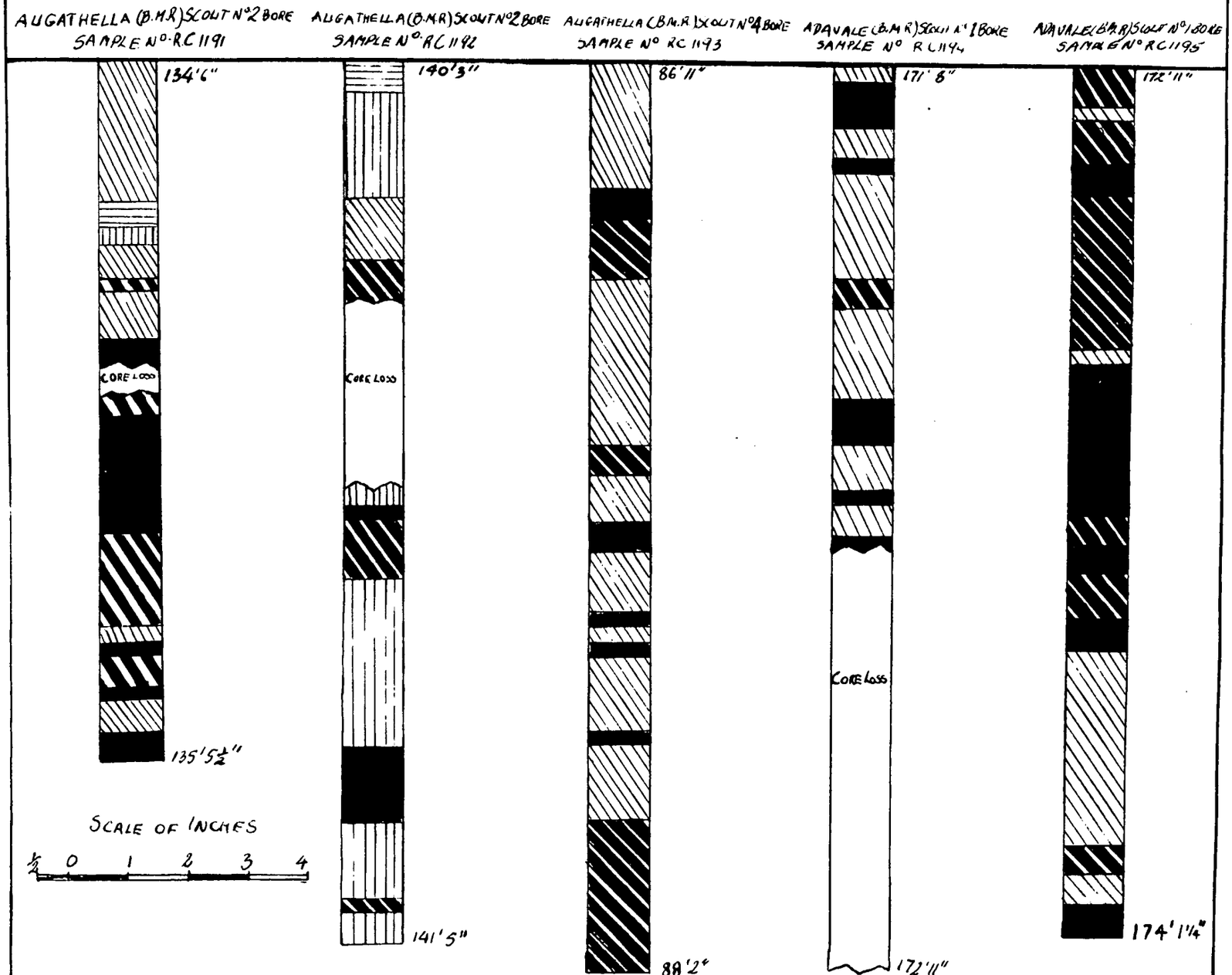
The extremely high moisture contents of these samples made preparation for reflectance determinations difficult. Alternative absorption of moisture and drying out during and following the preparation technique tended to crack the polished blocks and impart an uneven surface. Even though determinations were made directly following preparation, the uneveness which developed would certainly have introduced some error into the results and would have been responsible in part for the fairly large variation in readings. However, most of this variation is attributed to the marked heterogeneity of the samples which showed a cryptic arrangement of cell walls and fillings under the microscope. The highest readings, for example, were obtained on material which could have been phlobaphenite. Due to the small size of most occurrences of each entity and to the complexity of the structure, selection of any one type of material for reflectance determinations was impossible. The average of the readings, therefore, represents the whole of the material in the vitrain and, as such, is more properly related to the chemical analysis of the material than a series of readings on a certain entity.

Errors resulting from uneven surfaces and the inherent variation due to the heterogeneity of samples, both referred to above, could have given rise to falsely high bireflectance values for such low rank coals. For this reason only maximum reflectance determinations were made.

Both reflectance determinations and chemical analysis indicate an extremely low rank for these samples. Although they should be classified as lignites on the basis of their reflectances and carbon contents, their hydrogen contents are unusually low even for sub-hydrous lignites so that these samples would lie well apart from Seyler's coal band. However, coals with such an anomolous carbon-hydrogen relationship have been previously recorded in Queensland.

B.M.R. ALGATHELLA N°2, 4 & ADAVALE N°1
(SCOUT BORES)
COAL SECTIONS SAMPLED
GRAPHIC LOGS

Fig 1A



LEGEND

BRIGHT COAL (& SEMI BRIGHT) ■ MAINLY BRIGHT COAL (BRIGHT > DULL) ▤ INTERBANDED DULL & BRIGHT COAL ▨ MAINLY DULL COAL (DULL > BRIGHT) ▥ DULL COAL (& SEMI DULL) ▨

To accompany record 1967/82 Appendix 1.

Q/A115

TABLE 1

Intervals analysed from Augathella Nos. 2 and 4 & Adavale No. 1 Scout Bores

Borehole	Sample Number	Interval	
		From	To
Augathella No. 2	1191	134 - 6	135 - 5½
Augathella No. 2	1192	140 - 3	141 - 5½
Augathella No. 4	1193	86 - 11	88 - 2
Adavale No. 1	1194	171 - 8	172 - 11
Adavale No. 1	1195	172 - 11	174 - 1½

TABLE 2

Results of Analyses

Sample Number	1191	1192	1193	1194	1195
Moisture %	26.7	21.4	27.2	23.2	25.7
Volatile material %	26.7	30.4	36.7	29.1	29.4
Fixed carbon %	30.8	37.6	29.1	35.4	32.9
Ash %	15.8	10.6	7	12.3	12
	100. 0	100.0	100.0	100.0	100.0
BTU/lb.	6690	7850	7610	7730	7460
Sulphur %	0.39	0.50	0.68	0.49	0.41
COKING TESTS					
Classification	NN	NN	NN	NN	NN
Swelling Index	0	0	0	0	0
Specific Gravity	1.406	1.406	1.333	1.397	1.377

TABLE 3

Reflectance Data and Chemical Analyses of Vitrains from Adavale No. 1 borehole

Depth from		57' 4"	173' 6¼"
Depth to		58' 0"	174' 0"
Maximum Reflectance at 5390A	Air	5.96	6.62
	Oil RI = 1.515	0.217	0.357
Dry ash free	Carbon	73.4	74.4
	Hydrogen	2.7	4.1
	Nitrogen	0.9	0.9
	Sulphur	0.7	0.8
	Oxygen (diff)	22.3	19.8
	Carbonates	0.55	0.53
Air dried	Moisture	27.5	29.1
	Ash	4.8	5.3
	Volatile Matter	36.5	32.9
	Fixed Carbon	31.2	32.7
Dry ash free	Volatile Matter	53.9	50.2

Augathella No. 2

Analysis sample R.C. 1191 — **134'6"-135'5½"**

134'6" - 134'11½" (0'5½") — Rec. 0'5½"

1½" dull coal c numerous flattened rods of vitrain.
¾" dull coal, occas. flattened rods vitrain.
½" mainly bright coal.
¼" mainly dull coal.
½" dull coal.
¼" dull & bright coal.
¾" dull coal.
½" bright coal.
½" b.c.

134'11½" - 135'5½" (0'6½") — Rec. 0'6"

¼" interbedded dull & bright coal.
1¼" semi bright coal.
¾" bright coal, some fine dull coal lam.
1" dull & bright coal, interbedded, dull > bright.
½" bright & dull coal, interbedded, bright > dull.
¼" dull coal (fusain)
¼" semi bright coal.
½" dull & bright coal interbedded.
¼" semi bright coal.
½" dull coal c fine bright laminae.
½" fairly bright coal

(No analyses undertaken)

136' 1" - 136'7½" (0'6½") — Rec. 0'6½"

½" semi bright coal.
¾" mainly dull coal with few bright lam.
½" mainly bright coal.
¾" dull coal, some fine bright lam.
¼" dull coal → carb. shale.
¾" interbedded dull & bright coal.
¼" mainly dull coal.
¼" bright → semi bright coal.
¾" dull coal with thin bright coal laminae; some slickensiding.
¼" bright coal.
½" mainly dull coal with bright coal lam. & blebs.
¼" semi bright & dull coal interbedded; bright dull.
¾" semi bright coal.

136'7½" - 137'2½" — Rec. 0'7"

7" med. brown, sl.carbonaceous shale. numerous plant fossils throughout, all fragmentary, many small slickensides.

Analysis sample R.C. 1192 140'3" - 141'5½"

140'3" - 140'10" (0'7") Rec. 0'4"

½" mainly semi bright coal, some dull coal.
1¾" mainly dull coal with semi bright coal laminae & blebs. Top ½" semi bright coal, blebs very small & finely interspersed in the dull coal.
1" dull coal, fusain with fine laminae of semi bright coal. Several larger fragments of semi-bright coal at top.
¾" semi bright & dull coal, coarsely interbedded.
b.c. - larger fragments are coarsely interbedded dull & semi bright coal, and
3" loss dull coal with fine semi bright coal blebs. (1½"). The smaller fragments were a mixture of semi bright coal and fusain fragments. (¼").

140'10" - 141'5½" (0'7½") Rec. 0'7½"

¼" mainly dull coal, fine blebs & laminae of semi bright coal.
¼" semi bright coal.
1" dull & semi bright coal coarsely interbedded.
¾" mainly dull coal c̄ fine blebs of semi bright coal.
1¼" mainly dull coal c̄ coarser lam & blebs of semi bright coal.
¾" mainly dull coal with fine blebs of semi bright coal.
1¼" semi bright coal with fine lam. dull coal; yellow encrustation on outer surface of core. ($?S_8$)
1¼" mainly dull coal c̄ coarser & numerous blebs of semi bright coal.
¼" dull & semi bright coal, finely interbedded.
½" mainly dull coal with numerous fine blebs of semi bright coal.
slickensiding throughout.

(No analyses undertaken)

141'10" - 142'3½" (0'5½") Rec. 0'5½"

¼" semi bright coal.
2¼" medium brown, sl.carbonaceous shale with bottom ½" mainly dull coal & coarse laminae of semi bright coal. Fine laminae of semi bright coal throughout.
½" dull coal to carb. shale with numerous fine laminae of semi bright coal, & several coarse blebs.
¼" semi bright coal.
¼" dull coal.
¾" semi bright coal, some dull coal (minor)
1¼" medium to dk.brown shale with several coarse & numerous fine lam. of semi bright coal (carb.sh.).
slickensiding in coal.

143'5½" - 144'2" (0'8") Rec. 0'8½"

3¾" med. brown carb.sh.; numerous plant fossils (fragmentary).

¼" semi bright coal lam. @ 1¾". Many small semi bright coal lam.; some slickensiding.
½" semi bright coal c̄ fine laminae of carb. shale
¾" carb.sh. with fine laminae of semi bright coal. A thick semi bright coal bleb at bottom.
¾" semi bright coal with few thin interbedded dull coal laminae.
½" mainly dull coal c̄ interbedded semi bright coal laminae.
2" dull (fusain) coal with numerous fine semi bright coal blebs. Several semi bright coal laminae (< ⅛") @ ¼". Some carb. shale fragments.
¼" semi bright coal.

Augathella No. 4

Analyses sample R.C. 1193 86'11" - 88'2"

86'11" - 87'7"
(0'8")

Rec. 0'8"

¾" dull coal c̄ some semi bright coal blebs & laminae.
1¼" dull coal with numerous fine semi bright coal blebs & laminae.
½" semi bright coal.
1" dull & semi bright coal, finely interbedded
¾" dull coal c̄ some fine semi bright coal blebs
¾" dull coal with fine laminae of semi bright coal & some large blebs.
1¼" dull coal, occasional semi bright coal blebs & lam. FeS_2 nodule (⅜" diam.) at base.
½" dull & semi bright coal, coarsely interbedded.
¾" dull coal.
½" semi bright coal.

87'7" - 88'2"
(0'7")

Rec. 0'7"

1" dull coal with semi bright coal blebs.
¼" semi bright coal.
¼" dull coal, with fine semi bright laminae.
¼" semi bright & dull coal very finely interbedded (semi bright > dull).
1¼" dull coal with semi bright coal blebs & laminae.
¼" semi bright coal.
1¼" dull coal with semi bright coal laminae & blebs.
2½" dull & semi bright coal interbedded.

(No analyses undertaken)

88'10" - 89'4"
(0'6")

Rec. 0'6"

6" med.→dk. brown carbonaceous shale with numerous plant fossils (fragmentary); some slickensides; some semi bright coal lam. in top 1¾".

89'11" - 90'7"
(0'8")

Rec. 0'8"

8" dk. brown carbonaceous shale, numerous fragmentary plant fossils; some slickensiding. some semi bright coal laminae, b.c.

91'1" - 91'9"
(0'8")

Rec. 0'8"

1" dull coal with semi bright coal blebs & laminae.
¼" semi bright coal.
¾" dull coal with large (¼") semi bright blebs & laminae. (1/16").
¾" semi bright coal with very minor dull coal laminae.
½" dull coal (fusain?) with fine semi bright blebs & lam.
¼" semi bright coal.
¾" b.c.coal.
¼" semi bright coal with minor finely interbedded dull coal.
⅛" dull coal, some fine semi bright coal blebs.
⅛" semi bright coal.
¾" dull coal, semi bright coal laminae.
¼" semi bright coal.
1½" dull coal with numerous ⅛" blebs & laminae of semi bright coal.
¼" semi bright coal.
½" b.c.

95' 0½" - 95'6"
(0'5½")

Rec. 0'5½"

5½" med→dk. brown carb. shale with fragmentary plant fossils; some slickensiding.

Adavale No. 1

50'6" - 51'0"
(0'6")

Rec. 0'6"

6" dk. brown carb. shale with numerous plant fossils & slickensides.
½" dull coal with fine semi bright coal blebs at 5".

51' 0" - 51'7"
(0'7")

Rec. 0'7"

7" dk. brown carb. shale with numerous plant fossils (fragmentary) and some fusainous fragments; some thin laminae of coaly shale.

Numerous slickensides; some occur around a bleb of semi bright coal. (? due to compaction or drilling)

55'8" - 56'3" (0'7")

Rec. 0'7"

½" semi bright coal; some slickensiding on upper surface, ribbed stem.
6½" dk. brown carb.sh. with some (⅛") lenses of semi bright coal (compressed branches), slickensiding throughout.

56'3" - 56' 9" (0'6")

Rec. 0'6"

1½" dk. brown carb. shale with some ⅛" laminae of semi bright coal.
½" semi bright coal, one compressed branch; slickensided lower surface.
4" dk. brown carb. shale with some ⅛" laminae of semi bright coal; slickensiding throughout. Quite a few woody fragments in bottom 1".

Reflectance data and chemical analyses of vitrains carried out on interval 57'4"-58'0"

57'4" - 58'0" (0'8")

Rec. 0'8"

Core broken, with approx. 2½" of core intact at top.
¾" dull coal with semi bright coal blebs.
¼" semi bright coal.
1¾" dull coal with fine & coarse semi bright coal blebs; $FeCO_3$ band.
The remaining fragments are of similar composition. Some large partially compressed branches. All core is greatly slickensided.

58'0" - 58' 6" (0'6")

Rec. 0'6"

Core broken & slickensided.
6" dk. br. carb. shale, some fragmentary plant fossils. some thin (⅛" & < ⅛") lenses of semi bright coal. Slightly coaly horizon (½") at top.

59'1" - 59'8" (0'7")

Rec. 0'7"

¼" dull coal.
¼" semi bright coal.
½" dull coal with few semi bright coal blebs.
¼" dull coal with numerous semi bright coal blebs & laminae.
¼" dull coal.
½" semi bright & dull coal coarsely interbedded.
½" dull coal & few semi bright coal blebs.
¾" dull & semi bright coal, finely interbedded.
1" semi bright coal with ⅛" dull coal laminae, at ½".
¾" dull coal, few semi bright coal blebs.
2" dull & semi bright coal laminae interbedded.
All dull coal has very high content of fusain.

59'8" - 60'3"
(0'7")

Rec. 0'7"

Core broken, approx. 3" of intact core only remains probably from the top section.

1" semi bright & dull coal, finely interbedded.
¼" dull coal.
½" semi bright coal with one fine ?canneloid coal lamina.
½" semi dull coal.
½" semi bright coal.
¼" semi dull coal.
½" semi bright coal.
½" semi bright & semi dull coal coarsely interbedded.

Note: "semi dull" erected here to describe coal between dull & semi bright. This would probably fall into "semi bright" coal category if the rank was slightly high. The rank of these coals in the higher sections are distinctly lower in rank, showing less compaction, etc. Some slickensiding.

102'3½" - 102'10"
(0'6½")

Rec. 0'6½"

¼" semi bright coal, minor dull coal.
½" dull coal, some semi bright coal blebs.
¼" semi bright coal.
1" dull coal, semi bright coal blebs & laminae.
¼" semi bright coal.
1½" dull coal with very fine semi bright coal blebs & some large (⅛") blebs & laminae.
⅛" semi bright coal with dull coal laminae.
¾" semi bright coal c one ⅛" dull coal lamina at ¼".
1¼" dull coal with fine semi bright coal. lam. & blebs.
¼" semi bright coal.

163'9" - 164'3"
(0'6")

Rec. 0'6"

Core entirely broken.
dk. brown carb. shale, some plant fossils (fragmentary), some slickensides. Several semi bright coal fragments, one being 1" thick. Other thin laminae of semi bright coal throughout.

164'3" - 164'8"
(0'5")

Rec. 0'5"

Core entirely broken.
dk. brown carb. shale, to coaly carb. shale; some thin laminae & blebs of semi bright coal throughout; closely slickensided.

165'2" - 165'9½"
(0'7½")

Rec. 0'7"

7½" med. to dk. gy. brown shale with numerous fragmentary plant stem fossils. Many thin semi bright coal laminae throughout; slickensided.

166'10" - 167'5"
(0'7")

Rec. 0'5½"

¼" dull coal.
½" dull coal with semi bright coal blebs.
¼" semi bright coal.
¼" dull coal, few semi bright coal blebs.
1" dull coal with coarsely interbedded semi bright coal blebs & laminae. ⅛" semi bright at top.
½" semi bright coal.
¼" dull coal with semi bright coal laminae & blebs.
½" semi bright coal with some dull coal lam.
¼" semi bright coal.
¾" dull coal coarsely interbedded with semi bright coal laminae.
1" dk. brown carb. shale.

Analysis sample R.C. 1194 171'8" - 172'11"

171' 8" - 172' 4"
(0'8")

Rec. 0'7¾"

¼" dull coal.
¾" semi bright coal with minor lam. of dull coal.
½" dull coal with semi bright coal (fine) blebs & laminae.
¼" semi bright coal with very fine dull coal lam.
1¾" dull coal with semi bright coal, blebs & lam.
½" dull & semi bright coal coarsely interbedded.
1½" dull coal with fine semi bright coal lam. & blebs; several large (⅛") semi bright coal blebs.
¾" semi bright coal with dull coal laminae.
¾" dull coal with semi bright coal blebs & lam.
¼" semi bright coal with fine dull coal lam.
½" dull coal with semi bright coal blebs.
¼" semi bright coal.
slickensiding.

172'4" - 172'11"
(0'7")

Rec. 0'7"

Core entirely broken. The larger fragments consisted of dull coal with occasional fine laminae of semi bright coal.

Analysis sample R.C. 1195 172'11" - 174'1½"

172'11" - 173'6¼"
(0'7¼")

Rec. 0'7¼"

½" dull & semi bright coal, coarsely interbedded
¼" dull coal, some fine semi bright coal lam.
¾" dull & semi bright coal, coarsely interbedded.
½" semi bright coal with fine laminae of dull coal.
1¼" dull & semi bright coal coarsely interbedded.
1¼" semi bright coal finely interbedded with dull coal, several ⅛" blebs of semi bright coal.
¼" dull coal (fusain)
1¾" semi bright coal with finely interbedded dull coal.
¾" semi bright coal.

Reflectance data and chemical analyses of vitrains carried out on interval 173'6¼" - 174' 0"

173'6¼" - 174'11¼"
(0'6")

Rec. 0'7"

¼" semi bright & dull coal, coarsely interbedded.
¼" semi bright & dull coal finely interbedded.
½" semi bright coal, with some finely interbedded dull coal.
¾" dull & semi bright coal, finely interbedded. Bottom ⅛"-¼" more fusain.
¼" semi bright coal.
¾" dull coal with numerous coarse & fine semi bright coal laminae & blebs.
1" dull coal & carb. shale with large blebs of semi bright coal.
1" dull coal with finely interbedded semi bright coal blebs & laminae.
½" dull coal with some fine semi bright coal blebs; some carb. shale. (br.)
½" dull & semi bright coal coarsely interbedded.
½" dull coal, c̄ few very fine semi bright coal laminae.
½" semi bright coal with some minor dull coal.
½" dull coal, c̄ few very fine semi bright coal laminae.

Note: Augathella No. 2 core split when wet. Perhpas this was because they had been in perforated tubing and had dried out.

APPENDIX 2

MICROPALAEONTOLOGICAL EXAMINATION OF B.M.R. JERICHO 9, TAMBO 5, 6, AUGATHELLA 1, 2, 3, and ADAVALE 1.

by

G.R.J. Terpstra

INTRODUCTION

Core and cutting samples have been examined from the B.M.R. Scout Bores Jericho 9, Tambo 5, 6, Augathella 1, 2, 3, and Adavale 1, Queensland. The results of the examination are given below.

OBSERVATIONS

Jericho 9

Cutting samples have been examined from 180 - 350 feet. A few indeterminate arenaceous foraminifera were observed in the cuttings 230 - 240 feet, which may indicate a brackish water or very shallow marine environment of deposition.

The lithology of the washed residues in general is:-

180 - 210 feet sandstone

210 - 350 feet sand, shale, lignite and some pyrites.

Tambo 5

Cutting samples have been examined from 0 - 278 feet. No microfossils occur and there is no indication of marine deposition. The lithology of the washed residues in general is:

0 - 101 feet weathered shale and sand with occasional gypsum

101 - 278 feet sand and shale with lignite and some pyrites.

Tambo 6

Cutting samples have been examined at regular intervals of five feet from 0 - 135 feet and from 175 - 210 feet; cores were examined from 120 - 150 feet. The forms listed are rare or uncommon except where otherwise noted.

0 - 10 feet	no microfossils	
10 - 50 feet	*Inoceramus* prisms, Radiolaria sp.	
50 - 60 feet	*Hedbergella infracretacea* (Glaessner)	
	Trochammina sp.	
	Radiolaria sp.	
	Inoceramus prisms	
60 - 125 feet	Radiolaria sp. including *Dictyomitra* sp.	
	Inoceramus prisms	
	Megaspores	

Core 1 120' - 122' 11½"

Hedbergella infracretacea (Glaessner)

(Common occurrence)

Inoceramus prisms

Radiolaria sp.

Core 2 130' - 140'

Hedbergella infracretacea (Glaessner)

(Common occurrence)

Inoceramus prisms

Radiolaria sp.

Fish Teeth

Core 3 140' - 149' 2"

Hedbergella infracretacea (Glaessner)

(Common occurrence)

Inoceramus prisms

Radiolaria

Shell fragments

125 - 135 feet

Hedbergella infracretacea (Glaessner)

(Common occurrence)

Radiolaria sp.

Inoceramus prisms

175 - 210 feet

Trochamminoides coronus Loeblich and Tappan 1946

Radiolaria sp.

Inoceramus prisms

Megaspores

The microfossils observed indicate a Lower Cretaceous (Albian) age and marine deposition for the strata examined.

Hedbergella infracretacea (Glaessner) N. Ludbrook 1966, includes such species as:-

Globigerina infracretacea Glaessner 1937

Globigerina cretacea Crespin 1953

Globigerina planispira Crespin (not Tappan) 1953

Specimens identified as Trochamminoides coronus Loeblich & Tappan by Crespin (1963) have recently been re-identified as: Haplophragmoides perturbans Ludbrook, 1966.

The lithology of the washed residues in general is:

0 - 40 feet weathered shale with some lignite

40 - 135 feet mainly grey shale, some sand and lignite

175 - 210 feet grey shale, sand, lignite, pyrites and some glauconite.

Augathella 1

Cutting samples have been examined from 17 - 80 feet and a core sample from 88'6" - 98'6".

No microfossils occur and there is no indication of marine deposition. The lithology of the washed residues in general is:

17' - 59' shale and sand with siderite

59' - 98' sand, shale and lignite

Augathella 2

Cutting samples have been examined from 0 - 133 feet. No microfossils occur and there is no indication of marine deposition.
The lithology of the washed residues in general is:

0 - 38 feet sand and weathered shale

38 - 133 feet sand, shale and lignite

Augathella 3

Cutting samples have been examined from 0 - 60 feet.

No microfossils occur and there is no indication of marine deposition.
The lithology of the washed residues in general is:

0 - 60 feet sand and shale and some lignite at 30 feet.

Adavale 1

Cutting samples, taken at regular intervals of five feet, have been examined from 15-240 feet. No foraminifera have been encountered but megaspores occur fairly frequently between 40 and 195 feet.
The lithology of the washed residues in general is:

15 - 35 feet weathered shale

40 - 195 feet some shale and sand and much lignite

195 - 240 feet much sand, some shale and some lignite

There is no indication of marine deposition.

The megaspores indicate a Lower Cretaceous age.

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APPENDIX 3

PRELIMINARY REPORT ON THE PALYNOLOGY OF SHALLOW HOLES IN THE CENTRAL QUEENSLAND AREA

by

D. Burger

Cores from shallow holes, drilled in the TAMBO - AUGATHELLA - JERICHO 1:250,000 sheet areas were examined for spores, pollen grains and microplankton. Comparison of stratigraphic position of the samples with palynological age is given in Table 1.

TABLE 1.

Bore	Core	Depths	MFP No.	Formation	Unit	Age	
Augathella No. 4	1	89'10"	4412	Winton Fm.	Ku?	U.Cretac?	L
	2	97	4386	" "	"	"	
Tambo No. 6	1	123' 5"	4379	Toolebuc?	K2a?	Albian	M
	2	133 4	4380	"	"	"	LM3
	3	149	4381	"	"	"	LM
Augathella No. 3	1	63' 4"	4382	Marine Cretac.	K1	Aptian	LM1
	1	67 9	4383	" "	K1b	"	M1
	3	81 10	4384	Hooray Sst. (UP)	K?	?	L
	11	214 4	4385	" " (Lr)	K1(?a)	Neocomian	
	14	378	4387	" " "	J5	U.Jurassic	
Tambo No. 5	1	78'	4181	Hooray Sst. (Lr)	K1(?a)	Neocomian	
	2	88	4182	" " "	"	"	M
	3	95	4183	" " "	"	"	L
	5	122	4209	" " "	J5-6	U.Jurassic	L
	9	275' 5"	4211	Westbourne Fm.	"	"	L
Jericho No. 9	3	199' 6"	4423	Hooray Sst.	J5	U.Jurassic	
	4	255 6	4424	Westbourne Fm.	"	" "	
	5	325	4426	" "	"	" "	

L Low spore recovery
M Microplankton: 3 Odontochitina operculata Dinoflagellate Zone
1 Dingodinium cerviculum " "
MFP = B.M.R. registered sample preparation number prefix.

DISCUSSION.

Spore units J5-6

Microfloras belonging to units J5-6 are known from the upper Birkhead Formation, Westbourne Formation and Hooray Sandstone in the eastern Eromanga Basin (Evans 1966b,d). Recent palynological information from the Surat Basin has led to a subdivision in the interval of these units and a redefinition of unit J6 (Burger 1968). The vertical range of the unit includes the upper part of the Gubberamunda Sandstone and the Orallo Formation.

Undifferentiated J5-6 microfloras were recognized in Tambo 5 from the Hooray Sandstone (core 5) and the Westbourne Formation (core 9). Poor spore recovery, due to unfavourable fossilization conditions prevents the positive identification of J6.

Unit J5 was recognized in the Westbourne Formation of Jericho No. 9 (cores 4, 5) and the basal Hooray Sandstone of Jericho No. 9 (core 3) and Augathella No. 3 (core 14).

Spore units K1a-b

The earliest K1a microfloras are recorded from the uppermost Orallo Formation in the Surat Basin (Burger 1968) unit K1a extends upwards as high as the base of the marine section of the Blythesdale Formation. Basal K1 microfloras are recorded from the Hooray Sandstone in the eastern Eromanga Basin (Evans 1966-b).

Undifferentiated K1a-b microfloras are identified from the Hooray Sandstone and overlying Marine Cretaceous in Tambo No. 5 and Augathella No. 3. Again, insufficient spore recovery prevents the positive recognition of unit K1a. Unit K1b however is recognized in the basal Marine Cretaceous from Augathella No. 3 (core 1, sample 4383). The associated microplankton assemblage indicates the Dingodinium cerviculum Dinoflagellate Zone. The presence of Crybelosporites stylosus in this microflora, together with some microplankton species (Canningia n. sp. Evans 1966-e, p. 19; possibly also of Micrhystridium sp.) forms a combination which is known only from the marine Minmi Member of the Blythesdale Formation (Evans 1966-e; Burger 1968).

Spore units K2

The spore zonation in the K2 units, beginning with the first appearance of Coptospora paradoxa (Evans 1966-d) is at the present time being studied in more detail in the light of recent spore information obtained from the central and northern Eromanga Basin.

Although C. paradoxa was not encountered in the samples from Tambo No. 6, its earliest occurrence coincided approximately with the base of the Odontochitina operculata Zone (Evans 1966-e), and as such the K2 units are thought to be represented in the microfloras of Tambo No. 6. Rare spores described by Dettmann (1963) from her Paradoxa Assemblage and recovered from core 1 (sample 4379), together with O. operculata, strongly suggests a basal K2 age for the microflora of this sample.

Tambo No. 6 cores 1 and 2 are tentatively attributed to the Toolebuc Limestone, but certain characteristics of the microplankton succession, also observed by Evans in the Julia Creek sheet area (Evans 1962) and later recognised in other parts of the Eromanga Basin, might also point to the lowermost Allaru Mudstone.

Augathella No. 4 core 2 contains, besides Coptospora paradoxa, various types of angiospermous pollen grains in quantities unknown from lower Winton and older formations (Burger, in prep.). Identical microfloras were also recovered from the Winton Formation in W.O.L. Warbreccan Nos. 1 and 2 wells and provisionally attributed to the Upper Cretaceous (Cenomanian? See Evans 1966-c).

CONCLUSIONS.

Based on combined spore and microplankton criteria mentioned above an upper and lower age limit can be given to the boundaries of the Hooray Sandstone, at least in the eastern part of the Eromanga Basin. Correlation with the Upper Jurassic to Lower Cretaceous formations in the Surat Basin appears to result in the picture shown in Table 2. Palynological studies in the LONGREACH - TAMBO- TAROOM sheet areas (Evans 1966-b) resulted in an almost identical correlational scheme.

There are indications, based on vertical spore distribution, that the contact between the lower and upper Hooray Sandstone should be correlated with some level in the upper part of the Blythesdale Formation.

At the present time palynological criteria for the identification of the Upper Cretaceous in Australia are neither clearly defined, nor supported by any other means of dating. Upper Cretaceous palynology is being studied in detail at the University of Queensland by Drs. G. Playford and M.E. Dettmann.

Palynological reports of a great upsurge of Angiosperms in lowermost Upper Cretaceous microfloras throughout the world might prove to be valuable in subdividing the Cretaceous in Australia on the basis of the fraction of Angiospermous pollen grains in the microfloras.

TABLE 2

<table>
<tr><th>SPORE UNITS</th><th>TAMBO-AUGATHELLA AREA</th><th colspan="2">ROMA AREA</th></tr>
<tr><td>K 1b</td><td rowspan="2">WALLUMBILLA FORMATION
(Lower part)</td><td colspan="2">WALLUMBILLA FORMATION
(Lower part)</td></tr>
<tr><td rowspan="2">K 1a</td><td rowspan="3">BLYTHES-
DALE
FORMATION</td><td>Minmi Member</td></tr>
<tr><td rowspan="3">HOORAY SANDSTONE</td><td></td></tr>
<tr><td>J 6</td><td colspan="2">ORALLO FORMATION</td></tr>
<tr><td></td><td colspan="2">GUBBERAMUNDA SANDSTONE</td></tr>
<tr><td>J 5</td><td colspan="3">W E S T B O U R N E F O R M A T I O N</td></tr>
</table>

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APPENDIX 4

PALYNOLOGY OF SOME SHALLOW DRILL CORE SAMPLES FROM THE TAMBO AND JERICHO 1:250,000 SHEET AREAS

by

P.R. Evans

BMR TAMBO 7:-

Commenced in Precipice Sandstone and entered Moolayember Formation. Examined to test the suggestion that rocks associated with Jurassic palynological unit J1 developed the character of the Moolayember Formation in TAMBO (Evans, 1966). Samples from the cores and depths given below failed to yield any palynomorphs and the question remains unresolved.

Core No.	Interval	M.F.P. No.
1	92' 0" - 92'10"	4282
1	94'10" - 95' 6"	4283
2	242' 0" - 242' 7"	4284
2	243' 6"	4298
2	244' 2"	4299
2	245'10" - 246' 5"	4285

BMR TAMBO 8:-

Commenced in Triassic Dunda Beds and entered the Rewan Formation. Little of the two cores from the hole was suitable for examination. All samples examined were unfossiliferous.

BMR TAMBO 9:-

Commenced in Permian Black Alley Shale and entered the Peawaddy Formation. Two samples were examined:

Core 1, 93 ft 6 in. - 94 ft Black Alley Shale.

An abundant yield of spores, pollen and occasional algae (see appended list). Spinose acritarchs were not observed. The variety of spores relative to pollen is suggestive of a P3d rather than P4 age, in keeping with the regional age of the Black Alley Shale. However, the lack of acritarchs precludes firm identification of this zone. The lack of acritarchs contrasts strongly with the Black Alley Shale intersected by the nearby B.M.R. Tambo No. 1 CH which in core 3, at 161 ft 10 in. contained abundant Veryhachium sp. 3, the diagnostic component of unit P3d.

Core 2, 163 ft 2 in. Peawaddy Formation.

Spores and pollen were relatively common but diluted with abundant micrinitic material. No acritarchs could be seen. The spores (listed below) confirm a Stage 5 (P3b-4) age for the Peawaddy Formation on TAMBO.

BMR JERICHO 4:-

Commenced in Colinlea and entered Joe Joe Formation. Samples were taken from the Joe Joe Formation at:

MFP 4605 Core 1, 213 ft.
MFP 4606 Core 2, 221 ft.

The microflora in both samples was relatively abundant and characteristic of stage 2 (see appendix).

BMR JERICHO 6:-

Passed from Quaternary into Joe Joe Formation. One sample was examined MFP 4613 Core 1 162 ft 0-6 in. Only a moderate yield of spores was obtained which could fit into Stage 1. Further examination for more definitive species is warranted. The core was remarkable for its content of well preserved Rhacopterid pinnule fragments with cuticle intact which await further examination.

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31st December 1967.

P.R. EVANS.
Geologist.

MICROFLORAL LISTS

B.M.R. TAMBO No. 9	MFP 4274 core 1, 93'6"-94'	MFP 4275 core 2, 163'2"
Phyllothecotriletes nigritellus	+	+
Deltoidospora directa	+	+
Conbaculatisporites sp.	+	+
Baculatisporites sp.	+	
Granulatisporites micronodosus	+	+
Lacinitriletes trisinus	+	+
Lophotriletes tereteangulatus	+	+
Didecitriletes ericianus	+	+
D. uncinatus	+	
D. aff. dentatus	+	
Microreticulatisporites bitriangularis	+	
Indospora sp.	+	
Lycopodiumsporites sp.	+	
Kraueselisporites spp.	+	+
Dulhuntyispora parvithola	+	
Striatopodocarpidites cancellatus	+	+
Protohaploxypinus amplus/sewardi	+	+
Vesicaspora ovata	+	+
Striatoabietites multistriatus	+	+
Alisporites sp.	+	
Gnetaceaepollenites sinuosus	+	
Peltacyrtia sp.	+	
Circulisporites sp.	+	
Schizosporis calculus	+	
Welwitschiapites?		+
Marsupipollenites triradiatus	+	+
Barakarites rotatus		+
Parasaccites spp.		+
Bascanisporites undosus		+

B.M.R. JERICHO No. 4 & 6.

	Jericho 4		Jericho 6
	MFP 4605 core 1 213'	MFP 4606 core 2 221'	MFP 4613 core 1 162'
Punctatisporites	+	+	
Punctatisporites gretensis	+		+
Phyllothecotriletes nigritellus	+	+	+
Punctatisporites sp. 7	+	+	+
Anaplanisporites sp. 8	+	+	
Kraeuselisporites sp. 35		+	+
Erdtmania elongatus		+	
Parasaccites korbaensis		+	+
Punctatisporites sp. 58		+	
Cycadopites cymbatus		+	
Protohaploxypinus goraiensis		+	
Potonieisporites neglectus		+	+
Anapiculatisporites sp. 17			+
Parasaccites triangularis			+

APPENDIX 5

CORE ANALYSIS RESULTS - B.M.R. DRILLING, 1966, EROMANGA BASIN, QUEENSLAND

by

P. G. Duff

Cores from nine wells drilled in the Eromanga Basin during 1966 were submitted for petrophysical testing in the Petroleum Technology laboratory. The results of testing are incorporated in the accompanying tables.

Fluid saturation determinations were made only if the freshly broken core segments exhibited fluorescence or if a positive acetone test was obtained from the finely divided material.

All samples were subjected to a simple phosphate test using an acid ammonium molybdate solution. Only one sample gave a positive reaction viz. Adavale Scout No. 1, core 4, 113'6" - 114'1".

In some cases the core segments were found to consist of small fragments from which regular shapes for permeability determinations could not be cut; these are recorded in the table as "N.D." (not determined).

Petroleum Technology Laboratory, Bureau of Mineral Resources, Geology and Geophysics, Canberra

CORE ANALYSIS RESULTS

NOTE:- (i) Unless otherwise stated, the porosities and permeabilities were determined on two small plugs (V&H) cut at right angles from the core. Ruska porosimeter and permeameter were used with, air at 30 p.s.i.g. and dry nitrogen , respectively, as the saturating and flowing media. (ii) Residual oil and water saturations were determined using soxhlet type apparatus. (iii) Acetone test precipitates are recorded as nil, trace, fair, strong or very strong.

WELL NAME AND NO. JERICHO B.M.R. SCOUT NO. 9 DATE OF TEST. 5TH JANUARY 1968

Core No.	Depth From:- To:-	Lithology	Average Effective Porosity from two plugs (% Bulk Vol.)	Absolute Permeability (Millidarcy)		Average Density (gm./cc.)		Fluid Saturation (% of pore space)		Acetone Test	Core Water Salinity (P.P.M. NaCl)	Solubility in 15% HCl (% Bulk vol.)	Fluorescence of freshly broken core.
				V	H	Dry Bulk	Apparent Grain	Water	Oil				
1	65'0" 65'6"	Sandstone, argillaceous	46*	N.D.	713	1.52	2.82	N.D.	N.D.	Neg.	N.D.	N.D.	Nil
1	68'0" 68'5"	As above	41*	323	561	1.64	2.78	"	"	"	"	"	"
1	69'0" 69'8"	As above	45	N.D.	501	1.53	2.77	"	"	"	"	"	"
2	134'0" 134'8"	Siltstone &sandstone	43*	"	1257	1.66	2.91	"	"	"	"	"	"
2	137'4" 137'10"	As above	43*	"	657	1.70	3.07	"	"	"	"	"	"
3	194'4" 194'9"	Sandstone &siltstone	31	45	47	1.94	2.78	"	"	"	"	"	"
3	197'1" 197'5"	As above	31	21	N.D.	1.99	2.88	"	"	"	"	"	"

Remarks:- * Drying cracks occurred; results unreliable.

General File No. 62/399.
Well File No.

Petroleum Technology Laboratory, Bureau of Mineral Resources, Geology and Geophysics, Canberra

CORE ANALYSIS RESULTS

NOTE:- (i) Unless otherwise stated, the porosities and permeabilities were determined on two small plugs (V&H) cut at right angles from the core. Ruska porosimeter and permeameter were used with, air at 30 p.s.i.g. and dry nitrogen , respectively, as the saturating and flowing media. (ii) Residual oil and water saturations were determined using soxhlet type apparatus. (iii) Acetone test precipitates are recorded as nil, trace, fair, strong or very strong.

WELL NAME AND NO. JERICHO B.M.R. SCOUT NO. 9 DATE OF TEST. 5TH JANUARY 1968

Core No.	Depth From:- To:-	Lithology	Average Effective Porosity from two plugs (% Bulk Vol.)	Absolute Permeability (Millidarcy)		Average Density (gm./cc.)		Fluid Saturation (% of pore space)		Acetone Test	Core Water Salinity (P.P.M. NaCl)	Solubility in 15% HCl (% Bulk vol.)	Fluorescence of freshly broken core.
				V	H	Dry Bulk	Apparent Grain	Water	Oil				
1	65'0" 65'6"	Sandstone, argillaceous	46*	N.D.	713	1.52	2.82	N.D.	N.D.	Neg.	N.D.	N.D.	Nil
1	68'0" 68'5"	As above	41*	323	561	1.64	2.78	"	"	"	"	"	"
1	69'0" 69'8"	As above	45	N.D.	501	1.53	2.77	"	"	"	"	"	"
2	134'0" 134'8"	Siltstone &sandstone	43*	"	1257	1.66	2.91	"	"	"	"	"	"
2	137'4" 137'10"	As above	43*	"	657	1.70	3.07	"	"	"	"	"	"
3	194'4" 194'9"	Sandstone &siltstone	31	45	47	1.94	2.78	"	"	"	"	"	"
3	197'1" 197'5"	As above	31	21	N.D.	1.99	2.88	"	"	"	"	"	"

Remarks:- * Drying cracks occurred; results unreliable.

General File No. 62/399.
Well File No.

Petroleum Technology Laboratory, Bureau of Mineral Resources, Geology and Geophysics, Canberra

CORE ANALYSIS RESULTS

NOTE:- (i) Unless otherwise stated, the porosities and permeabilities were determined on two small plugs (V&H) cut at right angles from the core. Ruska porosimeter and permeameter were used with, air at 30 p.s.i.g. and dry nitrogen, respectively, as the saturating and flowing media. (ii) Residual oil and water saturations were determined using soxhlet type apparatus. (iii) Acetone test precipitates are recorded as nil, trace, fair, strong or very strong.

WELL NAME AND NO. JERICHO B.M.R. SCOUT NO. 9 DATE OF TEST. 5TH JANUARY 1968

Core No.	Depth From:- To:-	Lithology	Average Effective Porosity from two plugs (% Bulk Vol.)	Absolute Permeability (Millidarcy)		Average Density (gm./cc.)		Fluid Saturation (% of pore space)		Acetone Test	Core Water Salinity (P.P.M. NaCl)	Solubility in 15% HCl (% Bulk vol.)	Fluorescence of freshly broken core.
				V	H	Dry Bulk	Apparent Grain	Water	Oil				
4	256'0" 256'7"	Sandstone	31	36	48	1.88	2.69	N.D.	N.D.	Neg.	N.D.	N.D.	Nil
4	258'5" 259'1"	"	32	75	109	1.86	2.72	"	"	"	"	"	"
5	317'4" 318'0"	"	32	265	N.D.	1.82	2.67	"	"	"	"	"	"
5	321'8" 322'3"	"	32	529	658	1.79	2.64	"	"	"	"	"	"
6	392'0" 392'8"	"	33	2,500	3,100	1.81	2.70	"	"	"	"	"	"
6	395'11" 396'5"	"	33	N.D.	5.500	1.79	2.67	"	"	"	"	"	"

Remarks:-

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Well File No.

4.

Petroleum Technology Laboratory, Bureau of Mineral Resources, Geology and Geophysics, Canberra

CORE ANALYSIS RESULTS

NOTE:- (i) Unless otherwise stated, the porosities and permeabilities were determined on two small plugs (V&H) cut at right angles from the core. Ruska porosimeter and permeameter were used with, air at 30 p.s.i.g. and dry nitrogen, respectively, as the saturating and flowing media. (ii) Residual oil and water saturations were determined using soxhlet type apparatus. (iii) Acetone test precipitates are recorded as nil, trace, fair, strong or very strong.

WELL NAME AND NO. JERICHO B.M.R. SCOUT NO. 9 DATE OF TEST. 5TH JANUARY 1968

Core No.	Depth From:- To:-	Lithology	Average Effective Porosity from two plugs (% Bulk Vol.)	Absolute Permeability (Millidarcy)		Average Density (gm./cc.)		Fluid Saturation (% of pore space)		Acetone Test	Core Water Salinity (P.P.M. NaCl)	Solubility in 15% HCl (% Bulk vol.)	Fluorescence of freshly broken core.
				V	H	Dry Bulk	Apparent Grain	Water	Oil				
4	256'0" 256'7"	Sandstone	31	36	48	1.88	2.69	N.D.	N.D.	Neg.	N.D.	N.D.	Nil
4	258'5" 259'1"	"	32	75	109	1.86	2.72	"	"	"	"	"	"
5	317'4" 318'0"	"	32	265	N.D.	1.82	2.67	"	"	"	"	"	"
5	321'8" 322'3"	"	32	529	658	1.79	2.64	"	"	"	"	"	"
6	392'0" 392'8"	"	33	2,500	3,100	1.81	2.70	"	"	"	"	"	"
6	395'11" 396'5"	"	33	N.D.	5.500	1.79	2.67	"	"	"	"	"	"

Remarks:-

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Well File No.

Petroleum Technology Laboratory, Bureau of Mineral Resources, Geology and Geophysics, Canberra

CORE ANALYSIS RESULTS

NOTE:- (i) Unless otherwise stated, the porosities and permeabilities were determined on two small plugs (V&H) cut at right angles from the core. Ruska porosimeter and permeameter were used with, air at 30 p.s.i.g. and dry nitrogen, respectively, as the saturating and flowing media. (ii) Residual oil and water saturations were determined using soxhlet type apparatus. (iii) Acetone test precipitates are recorded as nil, trace, fair, strong or very strong.

WELL NAME AND NO. TAMBO B.M.R. SCOUT NO. 5 DATE OF TEST. 28TH DECEMBER 1967

Core No.	Depth From:- To:-	Lithology	Average Effective Porosity from two plugs (% Bulk Vol.)	Absolute Permeability (Millidarcy)		Average Density (gm./cc.)		Fluid Saturation (% of pore space)		Acetone Test	Core Water Salinity (P.P.M. NaCl)	Solubility in 15% HCl (% Bulk vol.)	Fluorescence of freshly broken core.
				V	H	Dry Bulk	Apparent Grain	Water	Oil				
4	112'0" 112'8"	Sandstone	35	2,110	2,590	1.73	2.65	N.D.	N.D.	Neg.	N.D.	N.D.	Nil
5	123'3" 123'8"	"	32	54	508	1.81	2.66	"	"	"	"	"	"
5	124'10" 125'6"	"	32	50	386	1.82	2.67	"	"	"	"	"	"
6	165'2" 165'8"	"	32	45	184	1.85	2.72	"	"	"	"	"	"
6	170'3" 170'9"	"	30	N.D.	N.D.	1.88	2.67	"	"	"	"	"	"
7	207'2" 207'10"	Siltstone	33	2	N.D.	1.87	2.79	"	"	"	"	"	"
8	216'6" 217'1"	"	29	Nil	N.D.	2.01	2.83	"	"	"	"	"	"

Remarks:- Cores Nos. 1, 2, 3; no samples available.

General File No. 62/399.
Well File No.

Petroleum Technology Laboratory, Bureau of Mineral Resources, Geology and Geophysics, Canberra

CORE ANALYSIS RESULTS

NOTE:- (i) Unless otherwise stated, the porosities and permeabilities were determined on two small plugs (V&H) cut at right angles from the core. Ruska porosimeter and permeameter were used with, air at 30 p.s.i.g. and dry nitrogen, respectively, as the saturating and flowing media. (ii) Residual oil and water saturations were determined using soxhlet type apparatus. (iii) Acetone test precipitates are recorded as nil, trace, fair, strong or very strong.

WELL NAME AND NO. TAMBO B.M.R. SCOUT NO. 5 DATE OF TEST. 28TH DECEMBER 1967

Core No.	Depth From:- To:-	Lithology	Average Effective Porosity from two plugs (% Bulk Vol.)	Absolute Permeability (Millidarcy)		Average Density (gm./cc.)		Fluid Saturation (% of pore space)		Acetone Test	Core Water Salinity (P.P.M. NaCl)	Solubility in 15% HCl (% Bulk vol.)	Fluorescence of freshly broken core.
				V	H	Dry Bulk	Apparent Grain	Water	Oil				
4	112'0" 112'8"	Sandstone	35	2,110	2,590	1.73	2.65	N.D.	N.D.	Neg.	N.D.	N.D.	Nil
5	123'3" 123'8"	"	32	54	508	1.81	2.66	"	"	"	"	"	"
5	124'10" 125'6"	"	32	50	386	1.82	2.67	"	"	"	"	"	"
6	165'2" 165'8"	"	32	45	184	1.85	2.72	"	"	"	"	"	"
6	170'3" 170'9"	"	30	N.D.	N.D.	1.88	2.67	"	"	"	"	"	"
7	207'2" 207'10"	Siltstone	33	2	N.D.	1.87	2.79	"	"	"	"	"	"
8	216'6" 217'1"	"	29	Nil	N.D.	2.01	2.83	"	"	"	"	"	"

Remarks:- Cores Nos. 1, 2, 3; no samples available.

General File No. 62/399.
Well File No.

Petroleum Technology Laboratory, Bureau of Mineral Resources, Geology and Geophysics, Canberra

CORE ANALYSIS RESULTS

NOTE:- (i) Unless otherwise stated, the porosities and permeabilities were determined on two small plugs (V&H) cut at right angles from the core. Ruska porosimeter and permeameter were used with, air at 30 p.s.i.g. and dry nitrogen, respectively, as the saturating and flowing media. (ii) Residual oil and water saturations were determined using soxhlet type apparatus. (iii) Acetone test precipitates are recorded as nil, trace, fair, strong or very strong.

WELL NAME AND NO. TAMBO B.M.R. SCOUT NO. 7 DATE OF TEST. 26TH JANUARY 1968

Core No.	Depth From:- To:-	Lithology	Average Effective Porosity from two plugs (% Bulk Vol.)	Absolute Permeability (Millidarcy)		Average Density (gm./cc.)		Fluid Saturation (% of pore space)		Acetone Test	Core Water Salinity (P.P.M. NaCl)	Solubility in 15% HCl (% Bulk vol.)	Fluorescence of freshly broken core.
				V	H	Dry Bulk	Apparent Grain	Water	Oil				
1	93'9" 94'3"	Siltstone	26	Nil	N.D.	2.17	2.94	N.D.	N.D.	Neg.	N.D.	N.D.	Nil
1	97'2" 97'9"	Siltstone& Sandstone	24	N.D.	"	2.16	2.84	"	"	"	"	"	"
1	100'8" 101'2"	Sandstone, ferruginous	25	"	"	2.19	2.92	"	"	"	"	"	"
2	243'3" 244'2"	Siltstone	19	Nil	Nil	2.20	2.74	"	"	"	"	"	"
2	246'11" 247'5"	Shale, ferruginous	20	N.D.	N.D.	2.28	2.85	"	"	"	"	"	"
2	248'9" 249'4"	Shale, calcareous	20	"	"	2.15	2.69	"	"	"	"	"	"

Remarks:-

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Well File No.

Petroleum Technology Laboratory, Bureau of Mineral Resources, Geology and Geophysics, Canberra

CORE ANALYSIS RESULTS

NOTE:- (i) Unless otherwise stated, the porosities and permeabilities were determined on two small plugs (V&H) cut at right angles from the core. Ruska porosimeter and permeameter were used with, air at 30 p.s.i.g. and dry nitrogen, respectively, as the saturating and flowing media. (ii) Residual oil and water saturations were determined using soxhlet type apparatus. (iii) Acetone test precipitates are recorded as nil, trace, fair, strong or very strong.

WELL NAME AND NO. TAMBO B.M.R. SCOUT NO. 7 DATE OF TEST. 26TH JANUARY 1968

Core No.	Depth From:- To:-	Lithology	Average Effective Porosity from two plugs (% Bulk Vol.)	Absolute Permeability (Millidarcy)		Average Density (gm./cc.)		Fluid Saturation (% of pore space)		Acetone Test	Core Water Salinity (P.P.M. NaCl)	Solubility in 15% HCl (% Bulk vol.)	Fluorescence of freshly broken core.
				V	H	Dry Bulk	Apparent Grain	Water	Oil				
1	93'9" 94'3"	Siltstone	26	Nil	N.D.	2.17	2.94	N.D.	N.D.	Neg.	N.D.	N.D.	Nil
1	97'2" 97'9"	Siltstone& Sandstone	24	N.D.	"	2.16	2.84	"	"	"	"	"	"
1	100'8" 101'2"	Sandstone, ferruginous	25	"	"	2.19	2.92	"	"	"	"	"	"
2	243'3" 244'2"	Siltstone	19	Nil	Nil	2.20	2.74	"	"	"	"	"	"
2	246'11" 247'5"	Shale, ferruginous	20	N.D.	N.D.	2.28	2.85	"	"	"	"	"	"
2	248'9" 249'4"	Shale, calcareous	20	"	"	2.15	2.69	"	"	"	"	"	"

Remarks:-

General File No. 62/399.
Well File No.

Petroleum Technology Laboratory, Bureau of Mineral Resources, Geology and Geophysics, Canberra

CORE ANALYSIS RESULTS

NOTE:- (i) Unless otherwise stated, the porosities and permeabilities were determined on two small plugs (V&H) cut at right angles from the core. Ruska porosimeter and permeameter were used with, air at 30 p.s.i.g. and dry nitrogen, respectively, as the saturating and flowing media. (ii) Residual oil and water saturations were determined using soxhlet type apparatus. (iii) Acetone test precipitates are recorded as nil, trace, fair, strong or very strong.

WELL NAME AND NO. TAMBO, B.M.R. SCOUT NO. 8 DATE OF TEST. 26TH JANUARY 1968

Core No.	Depth From:- To:-	Lithology	Average Effective Porosity from two plugs (% Bulk Vol.)	Absolute Permeability (Millidarcy)		Average Density (gm./cc.)		Fluid Saturation (% of pore space)		Acetone Test	Core Water Salinity (P.P.M. NaCl)	Solubility in 15% HCl (% Bulk vol.)	Fluorescence of freshly broken core.
				V	H	Dry Bulk	Apparent Grain	Water	Oil				
1	73'7" 74'3"	Siltstone Sandstone	27	Nil	2	2.10	2.89*	N.D.	N.D.	Neg.	N.D.	N.D.	Nil
1	74'11" 75'6"	As above	26	Nil	1	2.12	2.81	"	"	"	"	"	"
2	207'0" 207'8"	Siltstone	30	N.D.	N.D.	1.96	2.81	"	"	"	"	"	"
2	209'11" 210'6"	Sandstone	26	N.D.	15	1.99	2.70	"	"	"	"	"	"

* Small ferruginous bands present.

Remarks:-

General File No. 62/399.
Well File No.

Petroleum Technology Laboratory, Bureau of Mineral Resources, Geology and Geophysics, Canberra

CORE ANALYSIS RESULTS

NOTE:- (i) Unless otherwise stated, the porosities and permeabilities were determined on two small plugs (V&H) cut at right angles from the core. Ruska porosimeter and permeameter were used with, air at 30 p.s.i.g. and dry nitrogen , respectively, as the saturating and flowing media. (ii) Residual oil and water saturations were determined using soxhlet type apparatus. (iii) Acetone test precipitates are recorded as nil, trace, fair, strong or very strong.

WELL NAME AND NO. TAMBO, B.M.R. SCOUT NO. 8 DATE OF TEST. 26TH JANUARY 1968

Core No.	Depth From:- To:-	Lithology	Average Effective Porosity from two plugs (% Bulk Vol.)	Absolute Permeability (Millidarcy)		Average Density (gm./cc.)		Fluid Saturation (% of pore space)		Acetone Test	Core Water Salinity (P.P.M. NaCl)	Solubility in 15% HCl (% Bulk vol.)	Fluorescence of freshly broken core.
				V	H	Dry Bulk	Apparent Grain	Water	Oil				
1	73'7" 74'3"	Siltstone Sandstone	27	Nil	2	2.10	2.89*	N.D.	N.D.	Neg.	N.D.	N.D.	Nil
1	74'11" 75'6"	As above	26	Nil	1	2.12	2.81	"	"	"	"	"	"
2	207'0" 207'8"	Siltstone	30	N.D.	N.D.	1.96	2.81	"	"	"	"	"	"
2	209'11" 210'6"	Sandstone	26	N.D.	15	1.99	2.70	"	"	"	"	"	"

* Small ferruginous bands present.

Remarks:-

General File No. 62/399.
Well File No.

Petroleum Technology Laboratory, Bureau of Mineral Resources, Geology and Geophysics, Canberra

CORE ANALYSIS RESULTS

NOTE:- (i) Unless otherwise stated, the porosities and permeabilities were determined on two small plugs (V&H) cut at right angles from the core. Ruska porosimeter and permeameter were used with, air at 30 p.s.i.g. and dry nitrogen, respectively, as the saturating and flowing media. (ii) Residual oil and water saturations were determined using soxhlet type apparatus. (iii) Acetone test precipitates are recorded as nil, trace, fair, strong or very strong.

WELL NAME AND NO. TAMBO B.M.R. SCOUT NO. 9 DATE OF TEST. 26TH JANUARY 1968

Core No.	Depth From:- To:-	Lithology	Average Effective Porosity from two plugs (% Bulk Vol.)	Absolute Permeability (Millidarcy)		Average Density (gm./cc.)		Fluid Saturation (% of pore space)		Acetone Test	Core Water Salinity (P.P.M. NaCl)	Solubility in 15% HCl (% Bulk vol.)	Fluorescence of freshly broken core.
				V	H	Dry Bulk	Apparent Grain	Water	Oil				
1	93'0" 93'6"	Shale	29	N.D.	N.D.	2.15	3.03	N.D.	N.D.	Neg.	N.D.	N.D.	Nil
1	95'1" 95'7"	Shale & Siltstone	26	N.D.	N.D.	2.21	2.98	"	"	"	"	"	"
2	162'7" 163'2"	Sandstone	21	Nil	8	2.16	2.72	"	"	"	"	"	"

Remarks:-

General File No. 62/399.
Well File No.

Petroleum Technology Laboratory, Bureau of Mineral Resources, Geology and Geophysics, Canberra

CORE ANALYSIS RESULTS

NOTE:- (i) Unless otherwise stated, the porosities and permeabilities were determined on two small plugs (V&H) cut at right angles from the core. Ruska porosimeter and permeameter were used with, air at 30 p.s.i.g. and dry nitrogen, respectively, as the saturating and flowing media. (ii) Residual oil and water saturations were determined using soxhlet type apparatus. (iii) Acetone test precipitates are recorded as nil, trace, fair, strong or very strong.

WELL NAME AND NO. TAMBO B.M.R. SCOUT NO. 9 DATE OF TEST. 26TH JANUARY 1968

Core No.	Depth From:- To:-	Lithology	Average Effective Porosity from two plugs (% Bulk Vol.)	Absolute Permeability (Millidarcy)		Average Density (gm./cc.)		Fluid Saturation (% of pore space)		Acetone Test	Core Water Salinity (P.P.M. NaCl)	Solubility in 15% HCl (% Bulk vol.)	Fluorescence of freshly broken core.
				V	H	Dry Bulk	Apparent Grain	Water	Oil				
1	93'0" 93'6"	Shale	29	N.D.	N.D.	2.15	3.03	N.D.	N.D.	Neg.	N.D.	N.D.	Nil
1	95'1" 95'7"	Shale & Siltstone	26	N.D.	N.D.	2.21	2.98	"	"	"	"	"	"
2	162'7" 163'2"	Sandstone	21	Nil	8	2.16	2.72	"	"	"	"	"	"

Remarks:-

General File No. 27399.
Well File No.

Petroleum Technology Laboratory, Bureau of Mineral Resources, Geology and Geophysics, Canberra

CORE ANALYSIS RESULTS

NOTE:- (i) Unless otherwise stated, the porosities and permeabilities were determined on two small plugs (V&H) cut at right angles from the core. Ruska porosimeter and permeameter were used with, air at 30 p.s.i.g. and dry nitrogen, respectively, as the saturating and flowing media. (ii) Residual oil and water saturations were determined using soxhlet type apparatus. (iii) Acetone test precipitates are recorded as nil, trace, fair, strong or very strong.

WELL NAME AND NO. AUGATHELLA B.M.R. SCOUT NO. 1

DATE OF TEST.

Core No.	Depth From:- To:-	Lithology	Average Effective Porosity from two plugs (% Bulk Vol.)	Absolute Permeability (Millidarcy)		Average Density (gm./cc.)		Fluid Saturation (% of pore space)		Acetone Test	Core Water Salinity (P.P.M. NaCl)	Solubility in 15% HCl (% Bulk vol.)	Fluorescence of freshly broken core.
				V	H	Dry Bulk	Apparent Grain	Water	Oil				
1	80'6" 80'11"	Sandstone, friable	40	680	N.D.	1.64	2.73	N.D.	N.D.	Neg.	N.D.	N.D.	Nil
1	87'3" 87'11"	"	45	970	"	1.53	2.79	"	"	"	"	"	"
2	90'9" 91'5"	"	43	N.D.	"	1.64	2.87	"	"	"	"	"	"

Remarks:-

General File No. 62/399.
Well File No.

Petroleum Technology Laboratory, Bureau of Mineral Resources, Geology and Geophysics, Canberra

CORE ANALYSIS RESULTS

NOTE:- (i) Unless otherwise stated, the porosities and permeabilities were determined on two small plugs (V&H) cut at right angles from the core. Ruska porosimeter and permeameter were used with, air at 30 p.s.i.g. and dry nitrogen, respectively, as the saturating and flowing media. (ii) Residual oil and water saturations were determined using soxhlet type apparatus. (iii) Acetone test precipitates are recorded as nil, trace, fair, strong or very strong.

WELL NAME AND NO. AUGATHELLA B.M.R. SCOUT NO. 1 DATE OF TEST.

Core No.	Depth From:- To:-	Lithology	Average Effective Porosity from two plugs (% Bulk Vol.)	Absolute Permeability (Millidarcy)		Average Density (gm./cc.)		Fluid Saturation (% of pore space)		Acetone Test	Core Water Salinity (P.P.M. NaCl)	Solubility in 15% HCl (% Bulk vol.)	Fluorescence of freshly broken core.
				V	H	Dry Bulk	Apparent Grain	Water	Oil				
1	80'6" 80'11"	Sandstone, friable	40	680	N.D.	1.64	2.73	N.D.	N.D.	Neg.	N.D.	N.D.	Nil
1	87'3" 87'11"	"	45	970	"	1.53	2.79	"	"	"	"	"	"
2	90'9" 91'5"	"	43	N.D.	"	1.64	2.87	"	"	"	"	"	"

Remarks:-

General File No. 62/399.
Well File No.

Petroleum Technology Laboratory, Bureau of Mineral Resources, Geology and Geophysics, Canberra

CORE ANALYSIS RESULTS

NOTE:- (i) Unless otherwise stated, the porosities and permeabilities were determined on two small plugs (V&H) cut at right angles from the core. Ruska porosimeter and permeameter were used with, air at 30 p.s.i.g. and dry nitrogen, respectively, as the saturating and flowing media. (ii) Residual oil and water saturations were determined using soxhlet type apparatus. (iii) Acetone test precipitates are recorded as nil, trace, fair, strong or very strong.

WELL NAME AND NO. AUGATHELLA B.M.R. SCOUT NO. 2 DATE OF TEST.

Core No.	Depth From:- To:-	Lithology	Average Effective Porosity from two plugs (% Bulk Vol.)	Absolute Permeability (Millidarcy)		Average Density (gm./cc.)		Fluid Saturation (% of pore space)		Acetone Test	Core Water Salinity (P.P.M. NaCl)	Solubility in 15% HCl (% Bulk vol.)	Fluorescence of freshly broken core.
				V	H	Dry Bulk	Apparent Grain	Water	Oil				
2	59'2" 59'7"	Claystone	CRACKS OCCURRED ON DRYING. UNSUITABLE FOR ANALYSIS										
3	83'3" 83'9"	Sandstone & siltstone, friable	41	70	N.D.	1.73	2.93	N.D.	N.D.	Neg.	N.D.	N.D.	Nil
3	85'10" 86'6"	Siltstone	CRACKS OCCURRED ON DRYING. UNSUITABLE FOR ANALYSIS										
4	91'0" 91'9"	Sandstone, friable	39	N.D.	N.D.	1.81	2.97	N.D.	N.D.	Neg.	N.D.	N.D.	Nil
4	96'4" 97'0"	"	41	"	"	1.61	2.73	"	"	"	"	"	"
4	97'5" 97'11"	"	41	"	"	1.60	2.72	"	"	"	"	"	"
5	133'0" 133'7"	Claystone	40	"	"	1.78	2.97	"	"	"	"	"	"

Remarks:-
Core No. 1; no sample available.

General File No. 62/399.
Well File No.

Petroleum Technology Laboratory, Bureau of Mineral Resources, Geology and Geophysics, Canberra

CORE ANALYSIS RESULTS

NOTE:- (i) Unless otherwise stated, the porosities and permeabilities were determined on two small plugs (V&H) cut at right angles from the core. Ruska porosimeter and permeameter were used with, air at 30 p.s.i.g. and dry nitrogen, respectively, as the saturating and flowing media. (ii) Residual oil and water saturations were determined using soxhlet type apparatus. (iii) Acetone test precipitates are recorded as nil, trace, fair, strong or very strong.

WELL NAME AND NO. AUGATHELLA B.M.R. SCOUT NO. 2 DATE OF TEST.

Core No.	Depth From:- To:-	Lithology	Average Effective Porosity from two plugs (% Bulk Vol.)	Absolute Permeability (Millidarcy)		Average Density (gm./cc.)		Fluid Saturation (% of pore space)		Acetone Test	Core Water Salinity (P.P.M. NaCl)	Solubility in 15% HCl (% Bulk vol.)	Fluorescence of freshly broken core.
				V	H	Dry Bulk	Apparent Grain	Water	Oil				
2	59'2" 59'7"	Claystone	CRACKS OCCURRED ON DRYING. UNSUITABLE FOR ANALYSIS										
3	83'3" 83'9"	Sandstone & siltstone, ~~friable~~	41	70	N.D.	1.73	2.93	N.D.	N.D.	Neg.	N.D.	N.D.	Nil
3	85'10" 86'6"	Siltstone	CRACKS OCCURRED ON DRYING. UNSUITABLE FOR ANALYSIS										
4	91'0" 91'9"	Sandstone, friable	39	N.D.	N.D.	1.81	2.97	N.D.	N.D.	Neg.	N.D.	N.D.	Nil
4	96'4" 97'0"	"	41	"	"	1.61	2.73	"	"	"	"	"	"
4	97'5" 97'11"	"	41	"	"	1.60	2.72	"	"	"	"	"	"
5	133'0" 133'7"	Claystone	40	"	"	1.78	2.97	"	"	"	"	"	"

Remarks:-
Core No. 1; no sample available.

General File No. ~~62~~/399.
Well File No.

Petroleum Technology Laboratory, Bureau of Mineral Resources, Geology and Geophysics, Canberra

CORE ANALYSIS RESULTS

NOTE:- (i) Unless otherwise stated, the porosities and permeabilities were determined on two small plugs (V&H) cut at right angles from the core. Ruska porosimeter and permeameter were used with, air at 30 p.s.i.g. and dry nitrogen, respectively, as the saturating and flowing media. (ii) Residual oil and water saturations were determined using soxhlet type apparatus. (iii) Acetone test precipitates are recorded as nil, trace, fair, strong or very strong.

WELL NAME AND NO. AUGATHELLA B.M.R. SCOUT NO. 3 DATE OF TEST. 22ND JANUARY 1968

Core No.	Depth From:- To:-	Lithology	Average Effective Porosity from two plugs (% Bulk Vol.)	Absolute Permeability (Millidarcy)		Average Density (gm./cc.)		Fluid Saturation (% of pore space)		Acetone Test	Core Water Salinity (P.P.M. NaCl)	Solubility in 15% HCl (% Bulk vol.)	Fluorescence of freshly broken core.
				V	H	Dry Bulk	Apparent Grain	Water	Oil				
1	67'9" 68'3"	Siltstone & carb.shale	37	N.D.	N.D.	1.69	2.69	11	Nil	Strong*	N.D.	N.D.	Nil
2	73'0" 73'7"	Sandstone	28	64	122	1.93	2.68	4	Nil	Trace			
2	76'0" 76'6"	"	29	N.D.	363	1.89	2.68	N.D.	N.D.	Nil	"	"	"
3	80'6" 81'2"	"	30	96	144	1.89	2.68	N.D.	N.D.	Nil	"	"	"
3	86'3" 86'10"	"	28	62	283	1.90	2.66	2	Nil	Trace	"	"	"
4	89'4" 89'11"	"	31	2967	697	1.85	2.66	N.D.	N.D.	Nil	"	"	"
4	94'0" 98'9"	"	32	527	805	1.81	2.67	N.D.	N.D.	Nil	"	"	"

Remarks:- * Hydrocarbon indications derived from coaly material in shale.

General File No. 62/399.
Well File No.

Petroleum Technology Laboratory, Bureau of Mineral Resources, Geology and Geophysics, Canberra

CORE ANALYSIS RESULTS

NOTE:- (i) Unless otherwise stated, the porosities and permeabilities were determined on two small plugs (V&H) cut at right angles from the core. Ruska porosimeter and permeameter were used with, air at 30 p.s.i.g. and dry nitrogen, respectively, as the saturating and flowing media. (ii) Residual oil and water saturations were determined using soxhlet type apparatus. (iii) Acetone test precipitates are recorded as nil, trace, fair, strong or very strong.

WELL NAME AND NO. AUGATHELLA B.M.R. SCOUT NO. 3 DATE OF TEST. 22ND JANUARY 1968

Core No.	Depth From:- To:-	Lithology	Average Effective Porosity from two plugs (% Bulk Vol.)	Absolute Permeability (Millidarcy)		Average Density (gm./cc.)		Fluid Saturation (% of pore space)		Acetone Test	Core Water Salinity (P.P.M. NaCl)	Solubility in 15% HCl (% Bulk vol.)	Fluorescence of freshly broken core.
				V	H	Dry Bulk	Apparent Grain	Water	Oil				
1	67'9" 68'3"	Siltstone & carb. shale	37	N.D.	N.D.	1.69	2.69	14	Nil	Strong*	N.D.	N.D.	Nil
2	73'0" 73'7"	Sandstone	28	64	122	1.93	2.68	4	Nil	Trace	"	"	"
2	76'0" 76'6"	"	29	N.D.	363	1.89	2.68	N.D.	N.D.	Nil	"	"	"
3	80'6" 81'2"	"	30	96	144	1.89	2.68	N.D.	N.D.	Nil	"	"	"
3	86'3" 86'10"	"	28	62	283	1.90	2.66	2	Nil	Trace	"	"	"
4	89'4" 89'11"	"	31	2967	697	1.85	2.66	N.D.	N.D.	Nil	"	"	"
4	94'0" 98'9"	"	32	527	805	1.81	2.67	N.D.	N.D.	Nil	"	"	"

Remarks:- * Hydrocarbon indications derived from coaly material in shale.

General File No. 62/399.
Well File No.

Petroleum Technology Laboratory, Bureau of Mineral Resources, Geology and Geophysics, Canberra

CORE ANALYSIS RESULTS

NOTE:- (i) Unless otherwise stated, the porosities and permeabilities were determined on two small plugs (V&H) cut at right angles from the core. Ruska porosimeter and permeameter were used with, air at 30 p.s.i.g. and dry nitrogen , respectively, as the saturating and flowing media. (ii) Residual oil and water saturations were determined using soxhlet type apparatus. (iii) Acetone test precipitates are recorded as nil, trace, fair, strong or very strong.

WELL NAME AND NO. AUGATHELLA B.M.R. SCOUT No. 3 DATE OF TEST. 22ND JANUARY 1968

Core No.	Depth From:- To:-	Lithology	Average Effective Porosity from two plugs (% Bulk Vol.)	Absolute Permeability (Millidarcy)		Average Density (gm./cc.)		Fluid Saturation (% of pore space)		Acetone Test	Core Water Salinity (P.P.M. NaCl)	Solubility in 15% HCl (% Bulk vol.)	Fluorescence of freshly broken core.
				V	H	Dry Bulk	Apparent Grain	Water	Oil				
5	97'6" 106'0"	Sandstone	32	N.D.	1244	1.83	2.69	N.D.	N.D.	Neg.	N.D.	N.D.	Nil
6	106'6" 106'11"	"	31	1960	N.D.	1.84	2.65	"	"	"	"	"	"
6	109'8" 110'2"	"	28	109	559	1.92	2.66	"	"	"	"	"	"
7	116'4" 116'11"	"	27	242	406	1.94	2.66	"	"	"	"	"	"
7	122'11" 123'5"	"	32	1388	1253	1.83	2.66	"	"	"	"	"	"
8	126'10" 127'8"	"	21	1	3	2.12	2.68	"	"	"	"	"	"
8	133'3" 134'0"	"	22	N.D.	35	2.09	2.67	"	"	"	"	"	"

Remarks:-

General File No. 62/399.
Well File No.

Petroleum Technology Laboratory, Bureau of Mineral Resources, Geology and Geophysics, Canberra

CORE ANALYSIS RESULTS

NOTE:- (i) Unless otherwise stated, the porosities and permeabilities were determined on two small plugs (V&H) cut at right angles from the core. Ruska porosimeter and permeameter were used with, air at 30 p.s.i.g. and dry nitrogen , respectively, as the saturating and flowing media. (ii) Residual oil and water saturations were determined using soxhlet type apparatus. (iii) Acetone test precipitates are recorded as nil, trace, fair, strong or very strong.

WELL NAME AND NO. AUGATHELLA B.M.R. SCOUT No. 3 DATE OF TEST. 22ND JANUARY 1968

Core No.	Depth From:- To:-	Lithology	Average Effective Porosity from two plugs (% Bulk Vol.)	Absolute Permeability (Millidarcy)		Average Density (gm./cc.)		Fluid Saturation (% of pore space)		Acetone Test	Core Water Salinity (P.P.M. NaCl)	Solubility in 15% HCl (% Bulk vol.)	Fluorescence of freshly broken core.
				V	H	Dry Bulk	Apparent Grain	Water	Oil				
5	97'6" 106'0"	Sandstone	32	N.D.	1244	1.83	2.69	N.D.	N.D.	Neg.	N.D.	N.D.	Nil
6	106'6" 106'11"	"	31	1960	N.D.	1.84	2.65	"	"	"	"	"	"
6	109'8" 110'2"	"	28	109	559	1.92	2.66	"	"	"	"	"	"
7	116'4" 116'11"	"	27	242	406	1.94	2.66	"	"	"	"	"	"
7	122'11" 123'5"	"	32	1388	1253	1.83	2.66	"	"	"	"	"	"
8	126'10" 127'8"	"	21	1	3	2.12	2.68	"	"	"	"	"	"
8	133'3" 134'0"	"	22	N.D.	35	2.09	2.67	"	"	"	"	"	"

Remarks:-

General File No. 62/399.
Well File No.

Petroleum Technology Laboratory, Bureau of Mineral Resources, Geology and Geophysics, Canberra

CORE ANALYSIS RESULTS

NOTE:- (i) Unless otherwise stated, the porosities and permeabilities were determined on two small plugs (V&H) cut at right angles from the core. Ruska porosimeter and permeameter were used with, air at 30 p.s.i.g. and dry nitrogen , respectively, as the saturating and flowing media. (ii) Residual oil and water saturations were determined using soxhlet type apparatus. (iii) Acetone test precipitates are recorded as nil, trace, fair, strong or very strong.

WELL NAME AND NO. AUGATHELLA B.M.R. SCOUT NO. 3 DATE OF TEST. 22ND JANUARY 1968

Core No.	Depth From:- To:-	Lithology	Average Effective Porosity from two plugs (% Bulk Vol.)	Absolute Permeability (Millidarcy)		Average Density (gm./cc.)		Fluid Saturation (% of pore space)		Acetone Test	Core Water Salinity (P.P.M. NaCl)	Solubility in 15% HCl (% Bulk vol.)	Fluorescence of freshly broken core.
				V	H	Dry Bulk	Apparent Grain	Water	Oil				
9	136'2" 136'6"	Sandstone	26	N.D.	107	1.98	2.69	N.D.	N.D.	Neg.	N.D.	N.D.	Nil
10	169'0" 169'9"	"	34	1905	2059	1.78	2.66	"	"	"	"	"	"
10	173'9" 174'5"	"	35	N.D.	2306	1.74	2.69	"	"	"	"	"	"
11	210'0" 210'10"	Sandstone &siltstone	34	11	N.D.	1.94	2.94	"	"	"	"	"	"
11	215'8" 216'4"	Sandstone	35	111	333	1.81	2.77	"	"	"	"	"	"
12	223'8" 224'4"	"	34	N.D.	106	1.82	2.77	"	"	"	"	"	"
12	227'8" 228'1"	"	34	N.D.	922	1.78	2.72	"	"	"	"	"	"

Remarks:-

General File No. 62/399.
Well File No.

Petroleum Technology Laboratory, Bureau of Mineral Resources, Geology and Geophysics, Canberra

CORE ANALYSIS RESULTS

NOTE:- (i) Unless otherwise stated, the porosities and permeabilities were determined on two small plugs (V&H) cut at right angles from the core. Ruska porosimeter and permeameter were used with, air at 30 p.s.i.g. and dry nitrogen , respectively, as the saturating and flowing media. (ii) Residual oil and water saturations were determined using soxhlet type apparatus. (iii) Acetone test precipitates are recorded as nil, trace, fair, strong or very strong.

WELL NAME AND NO. AUGATHELLA B.M.R. SCOUT NO. 3 DATE OF TEST. 22ND JANUARY 1968

Core No.	Depth From:- To:-	Lithology	Average Effective Porosity from two plugs (% Bulk Vol.)	Absolute Permeability (Millidarcy)		Average Density (gm./cc.)		Fluid Saturation (% of pore space)		Acetone Test	Core Water Salinity (P.P.M. NaCl)	Solubility in 15% HCl (% Bulk vol.)	Fluorescence of freshly broken core.
				V	H	Dry Bulk	Apparent Grain	Water	Oil				
9	136'2" 136'6"	Sandstone	26	N.D.	107	1.98	2.69	N.D.	N.D.	Neg.	N.D.	N.D.	Nil
10	169'0" 169'9"	"	34	1905	2059	1.78	2.66	"	"	"	"	"	"
10	173'9" 174'5"	"	35	N.D.	2306	1.74	2.69	"	"	"	"	"	"
11	210'0" 210'10"	Sandstone &siltstone	34	11	N.D.	1.94	2.94	"	"	"	"	"	"
11	215'8" 216'4"	Sandstone	35	111	333	1.81	2.77	"	"	"	"	"	"
12	223'8" 224'4"	"	34	N.D.	106	1.82	2.77	"	"	"	"	"	"
12	227'8" 228'1"	"	34	N.D.	922	1.78	2.72	"	"	"	"	"	"

Remarks:-

General File No. 62/399.
Well File No.

Petroleum Technology Laboratory, Bureau of Mineral Resources, Geology and Geophysics, Canberra

CORE ANALYSIS RESULTS

NOTE:- (i) Unless otherwise stated, the porosities and permeabilities were determined on two small plugs (V&H) cut at right angles from the core. Ruska porosimeter and permeameter were used with, air at 30 p.s.i.g. and dry nitrogen , respectively, as the saturating and flowing media. (ii) Residual oil and water saturations were determined using soxhlet type apparatus. (iii) Acetone test precipitates are recorded as nil, trace, fair, strong or very strong.

WELL NAME AND NO. AUGATHELLA B.M.R. SCOUT NO. 3 DATE OF TEST. 22ND JANUARY 1968

Core No.	Depth From:- To:-	Lithology	Average Effective Porosity from two plugs (% Bulk Vol.)	Absolute Permeability (Millidarcy)		Average Density (gm./cc.)		Fluid Saturation (% of pore space)		Acetone Test	Core Water Salinity (P.P.M. NaCl)	Solubility in 15% HCl (% Bulk vol.)	Fluorescence of freshly broken core.
				V	H	Dry Bulk	Apparent Grain	Water	Oil				
13	334'0" 334'7"	Sandstone	31	12	21	1.90	2.76	N.D.	N.D.	Neg.	N.D.	N.D.	Nil
13	336'0" 336'5"	"	32	20	15	1.88	2.76	"	"	"	"	"	"
14	381'8" 382'4"	"	34	N.D.	73	1.77	2.70	"	"	"	"	"	"
14	383'6" 384'1"	"	33	34	38	1.81	2.69	"	"	"	"	"	"

Remarks:-

General File No. 62/399.
Well File No.

Petroleum Technology Laboratory, Bureau of Mineral Resources, Geology and Geophysics, Canberra

CORE ANALYSIS RESULTS

NOTE:- (i) Unless otherwise stated, the porosities and permeabilities were determined on two small plugs (V&H) cut at right angles from the core. Ruska porosimeter and permeameter were used with, air at 30 p.s.i.g. and dry nitrogen , respectively, as the saturating and flowing media. (ii) Residual oil and water saturations were determined using soxhlet type apparatus. (iii) Acetone test precipitates are recorded as nil, trace, fair, strong or very strong.

WELL NAME AND NO. AUGATHELLA B.M.R. SCOUT NO. 3 DATE OF TEST 22ND JANUARY 1968

Core No.	Depth From:- To:-	Lithology	Average Effective Porosity from two plugs (% Bulk Vol.)	Absolute Permeability (Millidarcy)		Average Density (gm./cc.)		Fluid Saturation (% of pore space)		Acetone Test	Core Water Salinity (P.P.M. NaCl)	Solubility in 15% HCl (% Bulk vol.)	Fluorescence of freshly broken core.
				V	H	Dry Bulk	Apparent Grain	Water	Oil				
13	334'0" 334'7"	Sandstone	31	12	21	1.90	2.76	N.D.	N.D.	Neg.	N.D.	N.D.	Nil
13	336'0" 336'5"	"	32	20	15	1.88	2.76	"	"	"	"	"	"
14	381'8" 382'4"	"	34	N.D.	73	1.77	2.70	"	"	"	"	"	"
14	383'6" 384'1"	"	33	34	38	1.81	2.69	"	"	"	"	"	"

Remarks:-

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Well File No.

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WELL NAME AND NO. ADAVALE B.M.R. SCOUT NO. 1 DATE OF TEST. 10TH MAY 1967

Core No.	Depth From:- To:-	Lithology	Average Effective Porosity from two plugs (% Bulk Vol.)	Absolute Permeability (Millidarcy)		Average Density (gm./cc.)		Fluid Saturation (% of pore space)		Acetone Test	Core Water Salinity (P.P.M. NaCl)	Solubility in 15% HCl (% Bulk vol.)	Fluorescence of freshly broken core.
				V	H	Dry Bulk	Apparent Grain	Water	Oil				
1	52'9" 53'4"	Siltstone	29	97	13	1.91	2.69	27	Nil	Nil	N.D.	N.D.	Nil
2	92'5" 93'0"	Siltstone	38	N.D.	18	1.82	2.93	42	Nil	"	"	"	"
3	104'3" 105'0"	Siltstone &Sandstone	33	N.D.	N.D.	1.85	2.75	N.D.	N.D.	N.D.	"	"	"
4	113'6" 114'1"	*Dolomite?	14	Nil	Nil	2.65	3.05*	N.D.	N.D.	"	"	"	"
5	152'1" 152'10"	Siltstone	36	N.D.	N.D.	1.72	2.69	30	Nil	Nil	"	"	"
6	156'1" 156'9"	Sandstone	37	100	N.D.	1.77	2.77	52	Nil	"	"	"	"

Remarks:- * Strongly positive phosphate test using ammonium molybdate.

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CORE ANALYSIS RESULTS

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