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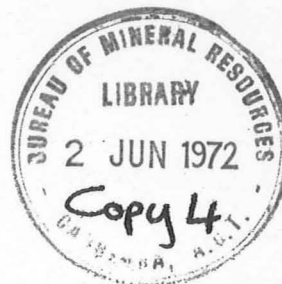
COMMONWEALTH OF AUSTRALIA

DEPARTMENT OF NATIONAL DEVELOPMENT

BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS

053730⁺

Record 1970/82



**SHALLOW STRATIGRAPHIC DRILLING IN THE HOMEBOIN,
ST. GEORGE, DIRRANBANDI, AND EULO 1:250,000 SHEET
AREAS, QUEENSLAND**

by

A. Mond and B.R. Senior

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**BMR
Record
1970/82
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HOMEBOIN, ST GEORGE, DIRRANBANDI, AND EULO 1:250,000 SHEET AREAS, QLD

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Lithological Description of Cores and Cuttings

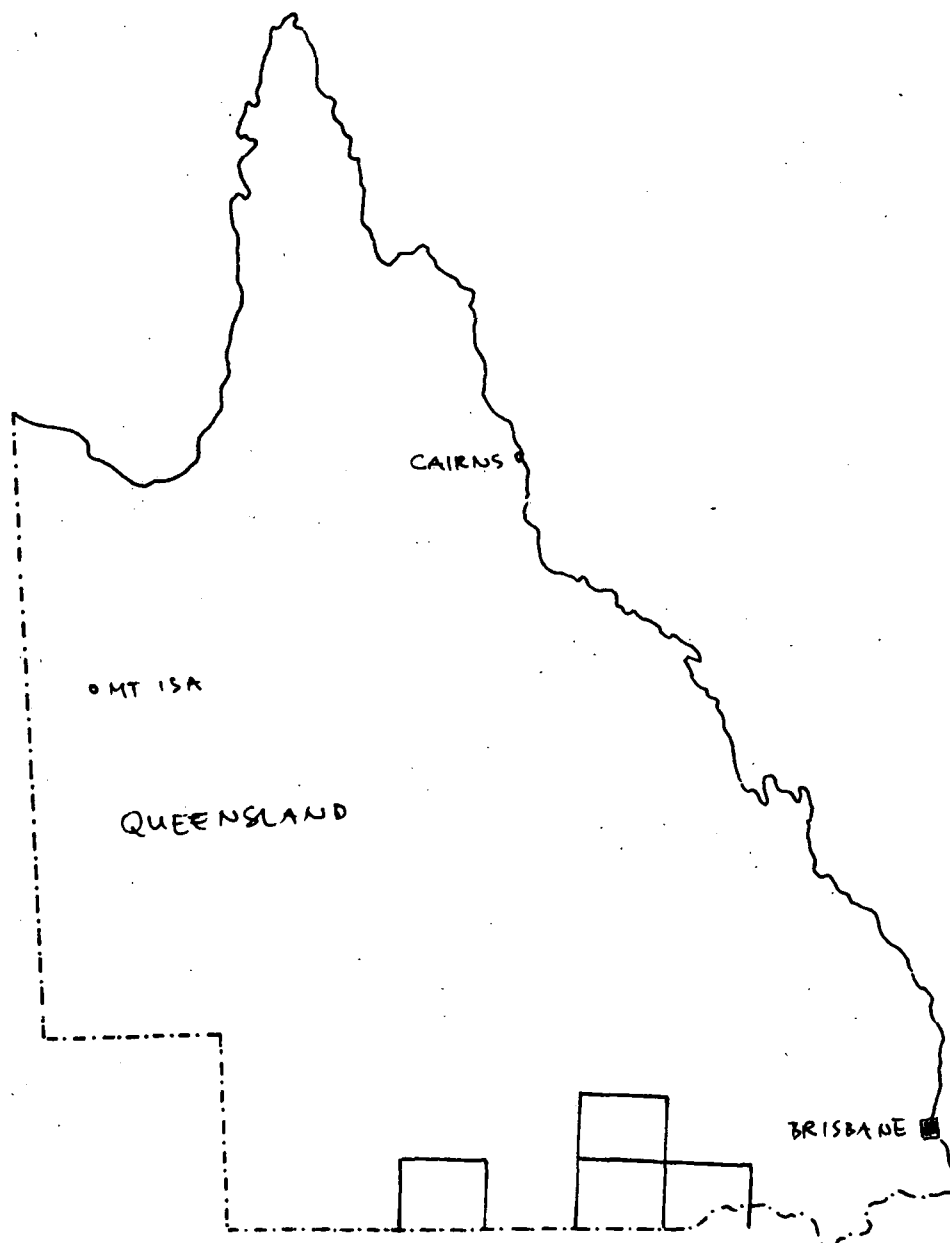
SUMMARY

During 1969 nine shallow stratigraphic holes were drilled in the West Surat Basin area, and three in the Eulo Ridge area of the Eromanga Basin, Queensland. The drilling programme was designed to supplement surface mapping of poorly exposed, chemically differentiated Cretaceous sediments, to give information on the nature of possibly thick Cainozoic cover, and to provide cores of fresh rock for palynological study.

Drill sites in the West Surat Basin were located in the Homebain, Dirranbandi, and St George Sheet areas. These holes were to investigate Cretaceous chemically differentiated rocks, and to provide data on a possible Cainozoic trough fill. In addition one hole was continuously cored through a large portion of the altered Cretaceous sequence to see if they have any potential for precious opal. A sequence lithologically similar to the deeply weathered sediments which form the host rock for opal at Lightning Ridge was penetrated, but no trace of precious opal was found.

Three holes were drilled in the Eulo Sheet area in an area where Cretaceous sediments are gently arched over a basement high known as the Eulo Ridge. Geological mapping in this area indicated depositional thinning of sediments towards granite outliers which outcrop along the Eulo Ridge. These holes gave valuable information of the nature of the sediments and confirmed the identification of nearby outcrops.

(ii)



TOOMPINE	WYANDRA	HOMERDIN	SURAT
ELCO 03 02 04	UNNAHUA	ARRANBANDI 06 04 02 03	ST GEORGE 01 02

FIG.1 - LOCALITY MAP

INTRODUCTION

From 6 October to 1 December 1969 shallow stratigraphic drilling was carried out in the western part of the Surat Basin in conjunction with regional geological mapping (Graham, in press; Senior, B.R., in press; Senior, Daniele, in press) and in the eastern part of the Eromanga Basin, to supplement previous mapping (Senior, et al., 1969).

The main problems in regional mapping in this area are scarcity of exposure and deep weathering of exposed rocks. No cuttings or wireline logs have been obtained from the uppermost 200-250 m of the few petroleum exploration wells that have been drilled in this area; therefore, the shallow stratigraphic drilling was planned

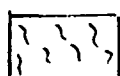
- a) to obtain lithological and wireline log information, and
- b) to collect material for palynological investigation.

Cuttings were collected at intervals of 150 cm while drilling with air; and 300 cm while drilling using water injection techniques, or with water or mud as circulating fluid.

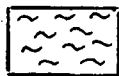
Cores and cuttings were logged in the field, but all the cores and cuttings were later examined in Canberra under a binocular microscope. Results of a preliminary palynological examination by D. Burger (BMR) are included in this Record; results of a full study will be reported separately.

Naming of the holes is serial by 1:250,000 sheets, e.g. BMR Homeboin 2 refers to the second hole drilled by the Bureau of Mineral Resources in the Homeboin 1:250,000 Sheet Area.

A summary of the drilling is given in Table 1. In 52 working days 1 265 m were drilled, including 122 m of coring, and 1 504 km were travelled between individual holes. All cores and cuttings are available for examination at the Bureau of Mineral Resources, Core and Cuttings laboratory, Fyshwick, A.C.T.



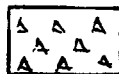
Chemically altered material



Soil



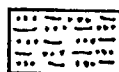
Sand



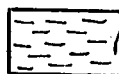
Breccia



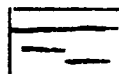
Sandstone



Siltstone



Mudstone



Coal



Cored interval
showing recovery

GR

Gamma ray

P

Self-potential

R

Single point resistivity

STRATIGRAPHICAL NOMENCLATURE
USED IN THIS RECORD

Upper Cretaceous

WINTON FORMATION

Lower Cretaceous

GRIMAN CREEK FORMATION

SURAT SILTSTONE

WALLUMBILLA FORMATION

COREENA MEMBER

DONCASTER MEMBER

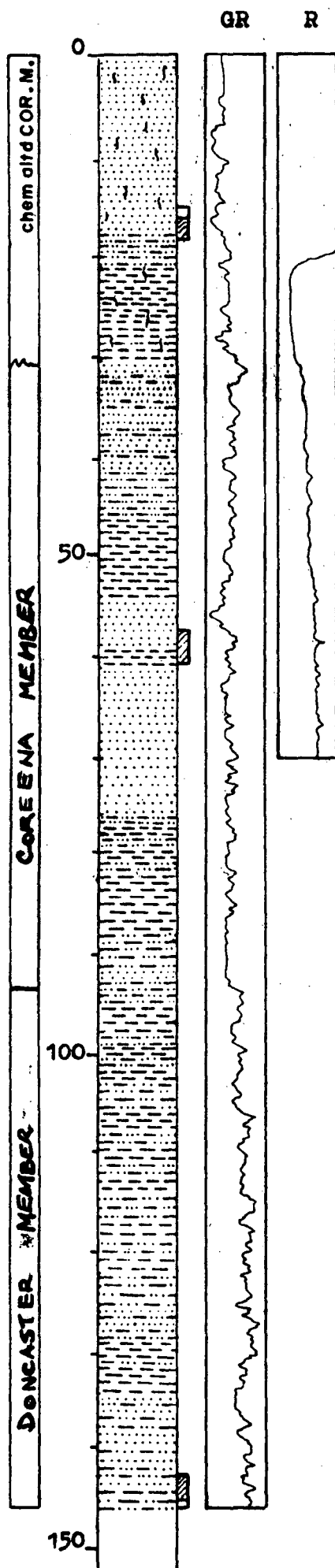
FIG. 2 - LEGEND

ABBREVIATIONS

Above	abv	Mica (ceous)	Mic, mic
Abundant	abd	Moderate	mod
Altered	altd	Mudstone	Mdst
And	/	Olive	olv
Angular	ang	Orange	orng
Black (ish)	blk, (blk)	Pale	pl
Blue (ish)	bl, (bl)	Pink (ish)	pk, (pk)
Brown (ish)	brn, (brn)	Poor	p
Carbonaceous	carb	Purple	purp
Coarse	c	Pyrite	Pyr
Chemically	chem	Quartz	Qz
Dark	dk	Quartzose	qzs
Fair	fr	Rounded	rndd
Feldspar	Fld	Sand (y)	Sd, sd
Fe minerals	Fe	Sandstone	Sst
Ferruginous	fe	Secondary	sec
Fine	f	Siltstone	Sltst
Friable	fri	Soft	sft
Glauconite (ic)	Glau, glau	Soil	Sl
Grained	grnd	Sorted	srt'd
Grey (ish)	gy, (gy)	Subangular	subang
Green (ish)	gn, (gn)	Subrounded	subrndd
Hard	hd	Very	v
Interbedded	intbdd	Weathered	wthrd
Intercalated	intcld	Well	w
Laminated	lamd	White (ish)	wh, (wh)
Light	lt	With	c
Matrix	mtx	Yellow (ish)	yel, (yel)
Medium	m		

B.N.R./ HOMEBOIN No. 1

T.D. 146.00 metres 3 cores



(yel)orng, (yel)brn, lt gy, vf-f grnd,
chem altd Sst.

- dk (yel)orng, chem altd Sltst.

(brn)gy chem altd Mdst.

- lt gy carb Sltst/Sst.

- m gy, (gn)gy Sst/Mdst; Glau, Pyr.

(gn)gy glau Sst.

- dk gy, (gn)gy, glau Mdst/Sltst and some
v f grnd Sst.

GR = 3 secs.

P = 20

R = 25

Position: HOMEBOIN SG55-15, Grid reference 537005, 1.5 km NNW of Tomoo homestead on W side of road to Mungallala and Bonus Downs homestead.

Objectives: To establish if mudstone cropping out nearby and expected at shallow depths in the stratigraphic hole is part of the Doncaster Member or alternatively that the Coreena Member contains a massive mudstone bed.

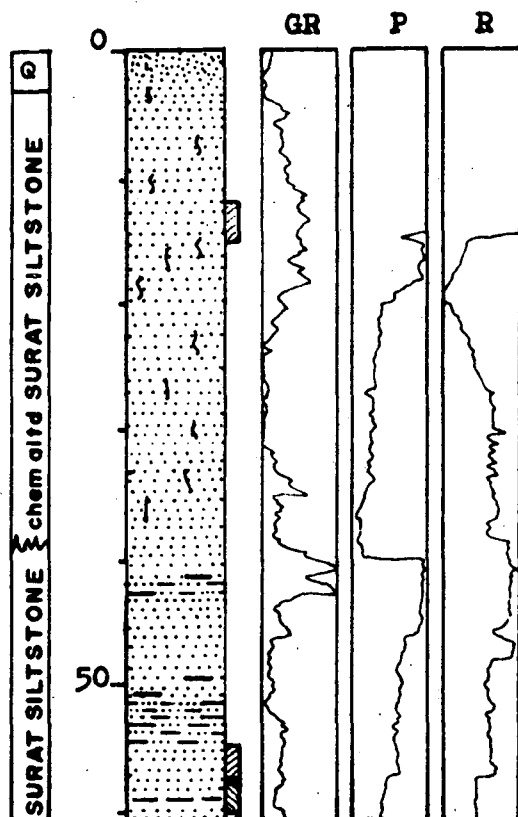
Drilling: TD. 146.00 m. Core No. 1. 15.2-18.3 m recovery 1.98 m
2. 57.9-61.0 m " 3.05 m
3. 143.3-146.0 m " 2.44 m

Results: Mudstone was intersected in the interval 22 m to 31 m overlying labile sandstone, thus showing that it is a thick mudstone bed within the Coreena Member.

Argillaceous sediment becomes dominant below 76 m. The gamma-ray log indicates a change to very fine-grained sediments at 93 m and the Coreena-Doncaster Member boundary is interpreted to occur at this point.

B.M.R. HOMEBOIN No. 2

T.D. 60.96 metres 3 cores.



GR = 5 secs.

P = 20

R = 25

— (yel)orng, (yel)brn, qzs Sd.

(yel)brn, (yel)orng, (gy)brn, lt brn,
chem altd Sst.

— dk (yel)orng, lt brn, fe, chem altd Sst.
pl (yel)brn, v lt gy, chem altd Sst.

— m lt gy, clayey Sst/Sltst; Coal.

— m to dk gy, carb Sst.

— (gn)gy, glau Sst.

— (gn)gy, glau Sst/Sltst/Mdst.

BMR HOMEBOIN 2

Position: HOMEBOIN SG55-15, Grid reference 582956 5.5 km W of Abernethy homestead on S side of road to Loch Lomond homestead.

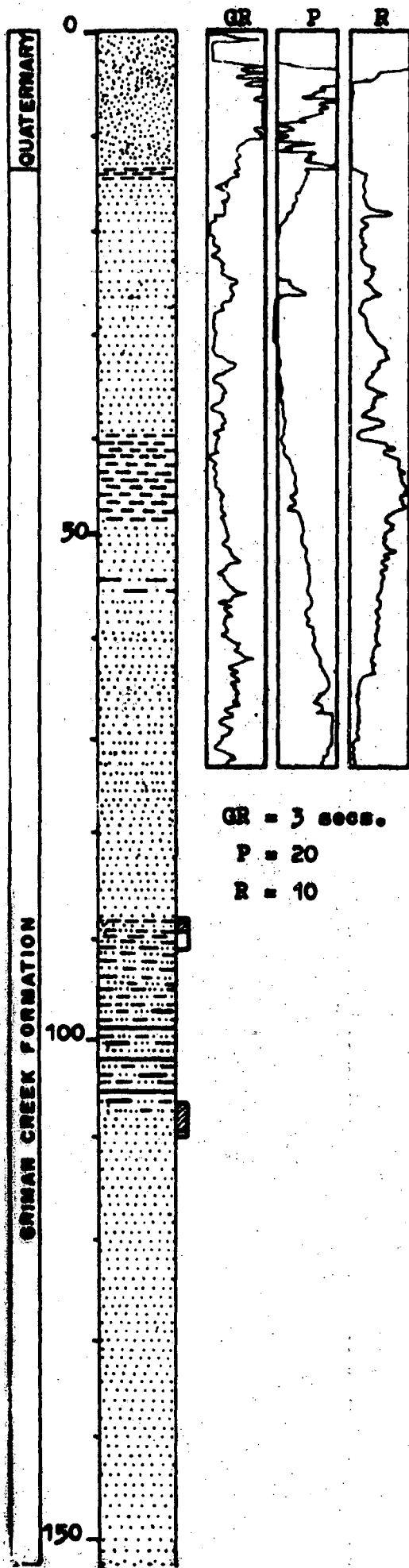
Objectives: To determine lithology of possible Surat Siltstone bed.

Drilling:	TD 60.96 m, Core No. 1.	12.2-15.2 m, recovery	3.02 m
	2.	54.9-58.0 m, "	2.62 m
	3.	58.0-61.0 m, "	2.13 m

Results: This bore spudded into Quaternary sand, and was completed within the Surat Siltstone. A zone of chemical alteration (deep weathering profile) extends from the surface to 38 m. Outcrops of the chemically altered Surat Siltstone in the nearby Neabul Creek channels showed laminar beds dipping between 10° and 18° . Core No. 1 shows horizontal bedding, suggesting that the surface dips are due to small-scale slumping.

The bulk of the sediments penetrated consist of fine to very fine labile sandstone, sandy siltstone, and siltstone. Although the section is more arenaceous than the Surat Siltstone in the type area (Reiser, 1970) correlation with this unit is the best fit and seems to agree with the interpretations made from correlation of wireline logs across the Homeboin Sheet (Senior, in press).

T.D. 152.40 metres 2 cores.



(red)brn, c-m grnd Sd.
as abv, c-v c grnd Sd, lighter colour.

(yel)orng, (gy)orng, v c grnd Sd.
= mod brn, w-c gnd, labile Sst, abd lithics.
= lt (brn)gy, m lt gy, clayey Mdst.

brn, gy, (gy)brn, clayey Sst.

lt gy Mdst.

wh Sst.

GR = 3 secs.
P = 20
R = 10

lt olv gy Mdst/Sltst/Sst.

lt gy Sltst; coal.

lt gy clayey Sst/Sltst; Coal.
= (gn)gy, glau Sst c some Mdst.

(gn)gy, olv gy, glau Sst; Coal.

BMR HOMEBOIN 3

Position: HOMEBOIN SG55-15, grid reference 639948, 0.5 km S of Waterloo homestead, along St George - Mitchell road at turnoff to Waterloo homestead.

Objectives: a) to determine thickness and nature of Cainozoic sediments near the Maranoa River;

b) to obtain a core of coal (possibly Tertiary), the presence of which was indicated by the driller's log of abandoned waterbore No. 6736; and

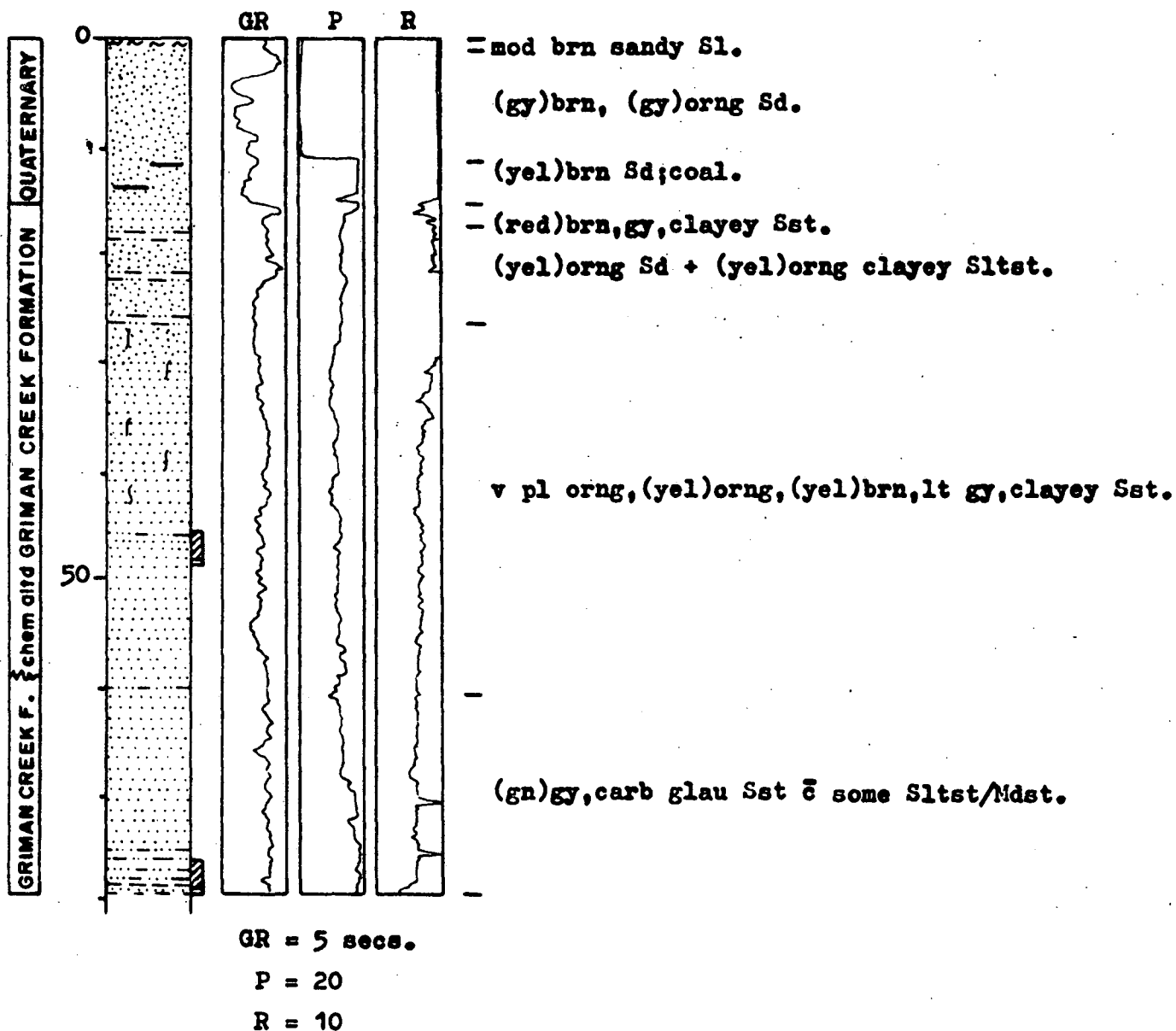
c) to obtain a core of fresh Cretaceous sediments for palynological determination.

Drilling: TD. 152.40 m. Core No. 1.88.4-91.4 m, recovery 1.14 m
2.106.7-109.7m, " 2.87 m

Results: Unfortunately the driller's log of bore No. 6736 proved to be unreliable and Quaternary alluvium was found to be only 12 m thick. Below the sequence is dominated by labile sandstone of the Griman Creek Formation. Coal occurs as very thin beds in the Griman Creek Formation, but none was obtained in the two cores.

B.M.R. ST. GEORGE No. 1

T.D. 79.25 metres 2 cores.



BMR ST GEORGE I

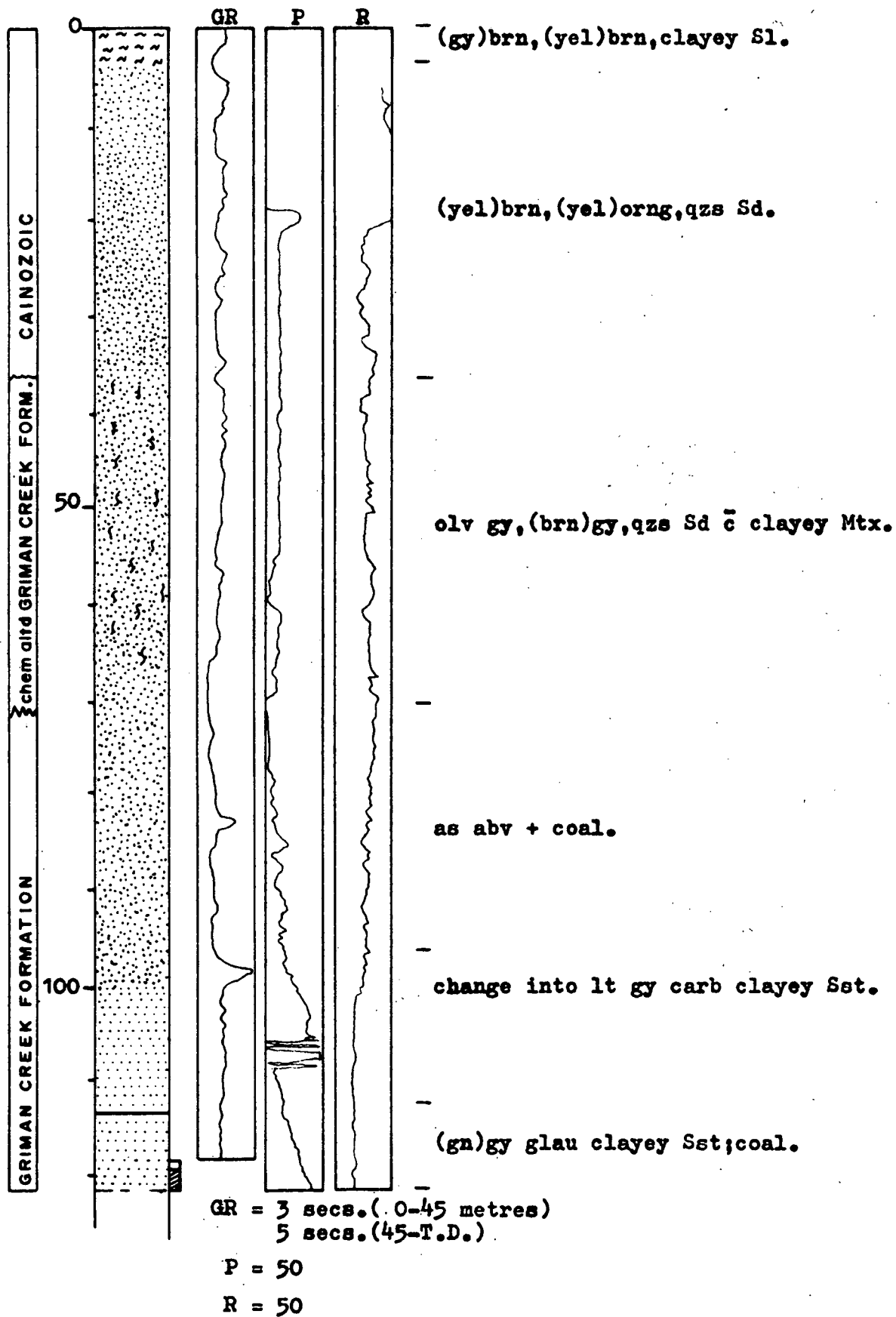
Position: ST GEORGE SH55-4, grid reference 663895, 1.7 km
NNW of Buckinbah homestead.

Objectives: a) to determine thickness of Cainozoic sediments;
b) to identify the Cretaceous formation below the
Cainozoic sediments;
c) to determine thickness of chemically altered
sediments; and
d) to provide a core of unaltered Cretaceous rock
for palynological dating.

Drilling: TD. 79.25 m. Core No. 1.45.7-46.8 m, recovery 2.82 m
2.76.2-79.2 m, " 2.77 m

Results: Quaternary alluvium was found to be only 15 m thick.
The alluvium overlies chemically altered Griman Creek
Formation, with a profile 42 m thick. Palynological
determination of fresh rock from the bottom hole core
gave a questionable K2a age, which is consistent with
previous dating of the Griman Creek Formation.

T.D. 121.92 metres 1 core.



BMR ST GEORGE 2

Position: ST GEORGE SH55-4, grid reference 682832, 1 km N of Thallon on W side of Carnarvon Highway.

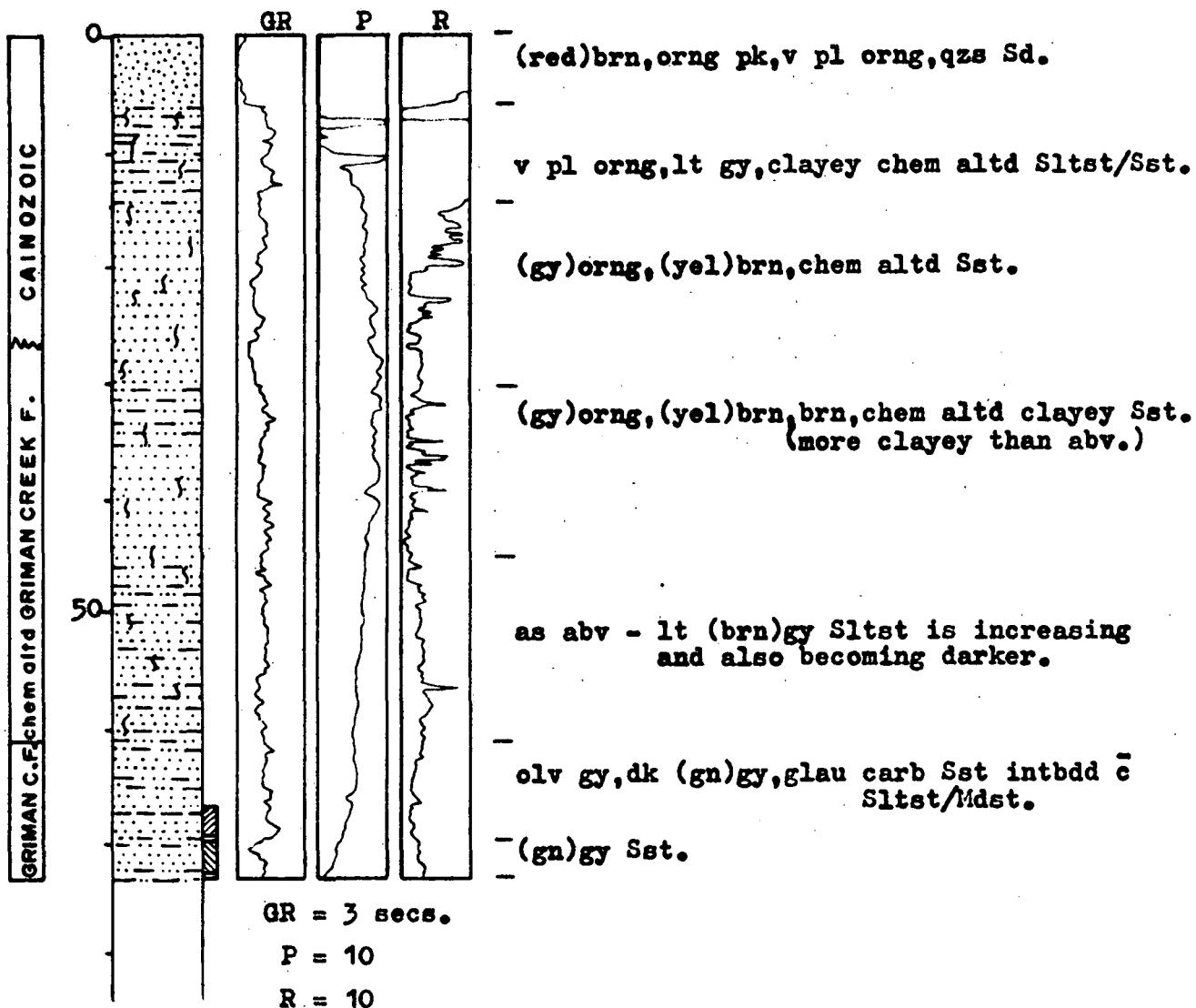
Objectives: a) to determine thickness of Cainozoic sediments;
b) to determine thickness of chemically altered Cretaceous sediments; and
c) to provide a core of unaltered Cretaceous rock for palynological dating.

Drilling: TD. 121.92 m. Core No. 1. 118.9-121.9 m, recovery 2.23 m.

Results: Cainozoic sediments, 35 m thick, consist mainly of sand and overlie 35 m of deeply weathered Griman Creek Formation. The bottom hole core has not yet been palynologically examined.

B.M.R. DIRRANBANDI No. 2

T.D. 73.15 metres 2 cores.



BMR DIRRANBANDI 2

Position: DIRRANBANDI SH55-3, grid reference 639845, 2.3 km
ENE of Yamburgan homestead on E side of road to St
George.

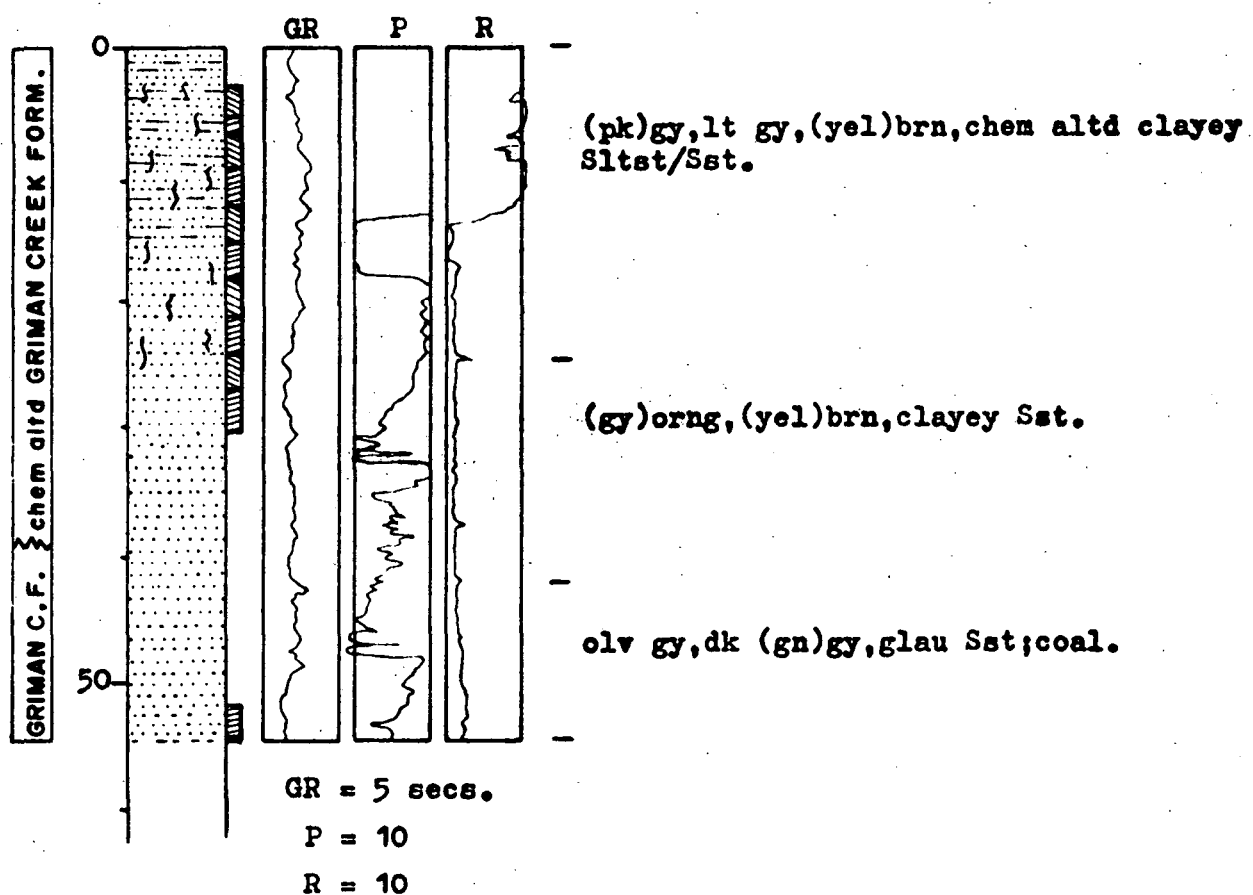
Objectives: To provide fresh samples of the Griman Creek Formation
for palynological dating.

Drilling: TD. 73.15 m. Core No. 1. 67.1-70.1 m, recovery 2.44 m
2. 70.1-73.1 m, " 2.95 m

Results: Cainozoic sediments, consisting mainly of sandy
sediments, were found to be 60 m thick. Fresh cores
of Griman Creek Formation were recovered in two bottom
hole cores, but palynological study has not yet been
undertaken.

B.M.R. DIRRANBANDI No. 3

T.D. 54.86 metres 11 cores.



BMR DIRRANBANDI 3

Position: DIRRANBANDI SH55-3, grid reference 607813, 1.1 km
N of Cavillon homestead on S side of road to Dirranbandi.

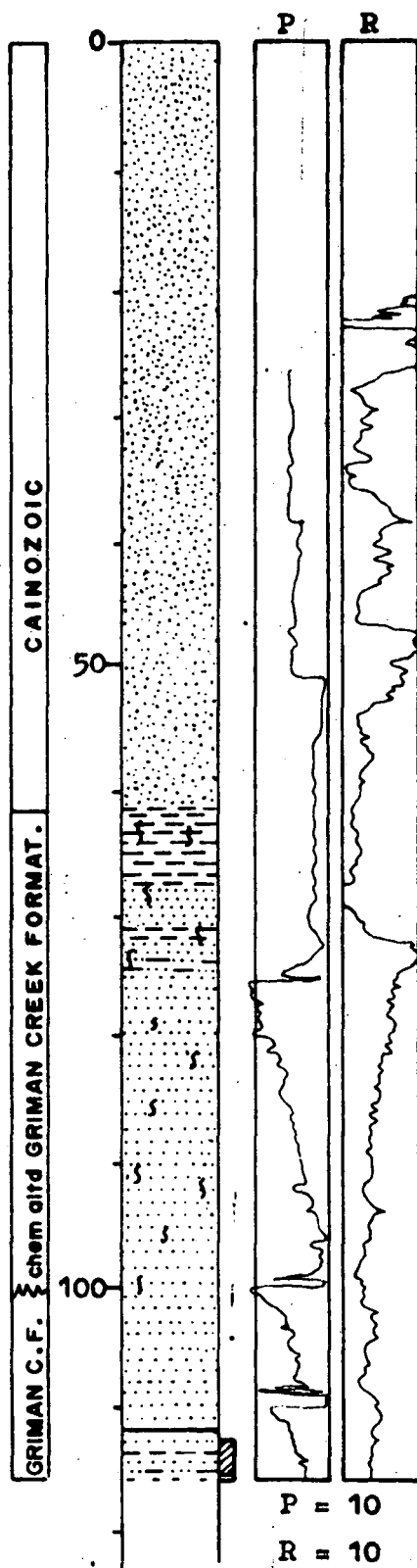
Objectives: a) to provide fresh samples of Griman Creek Formation
for palynological dating; and
b) to obtain continuous core through deeply weathered
Griman Creek Formation in order to assess its
suitability as a host for opalization and to check
for indications of precious opal.

Drilling: TD. 54.86 m. Core No. 1. 3.0-5.7 m, recovery 2.21 m
2. 5.7-6.9 m, " 1.11 m
3. 6.9-9.6 m, " 2.52 m
4. 9.6-12.7 m, " 3.02 m
5. 12.7-15.7 m, " 2.56 m
6. 15.7-18.5 m, " 3.05 m
7. 18.5-21.5 m, " 3.05 m
8. 21.5-24.6 m, " 2.74 m
9. 24.6-27.3 m, " 3.05 m
10. 27.3-30.5 m, " 2.95 m
11. 5.18-54.9 m, " 2.97 m

Results: A continuous core of about 52 m of deeply weathered Griman
Creek Formation was obtained, with 95% recovery. The
sediments are lithologically similar to deeply weathered
Winton Formation, which is the host for precious opal in
most of the Queensland opal fields, and deeply weathered
Lower Cretaceous sediments at Lightning Ridge in New
South Wales, but there are no traces of opal in the cores.
Fresh cores of Griman Creek Formation were collected but
palynological study has not yet been carried out.

B.M.R. DIRRANBANDI No. 4

T.D. 115.82 metres 1 core.



(gy)orng, (yel)brn, (yel)gy, c-v c grnd Sd.

lt olv gy Sltst/Mdst.

wh, v lt gy, clayey chem altd Sst.

v lt gy Mdst/Sst.

(pk)gy, (red)brn, (yel)gy, chem altd Sst.

(yel)gy, lt olv gy, carb Sst.

(gn)gy, glau Sst intbdd c Sltst/Mdst.

BMR DIRRANBANDI 4

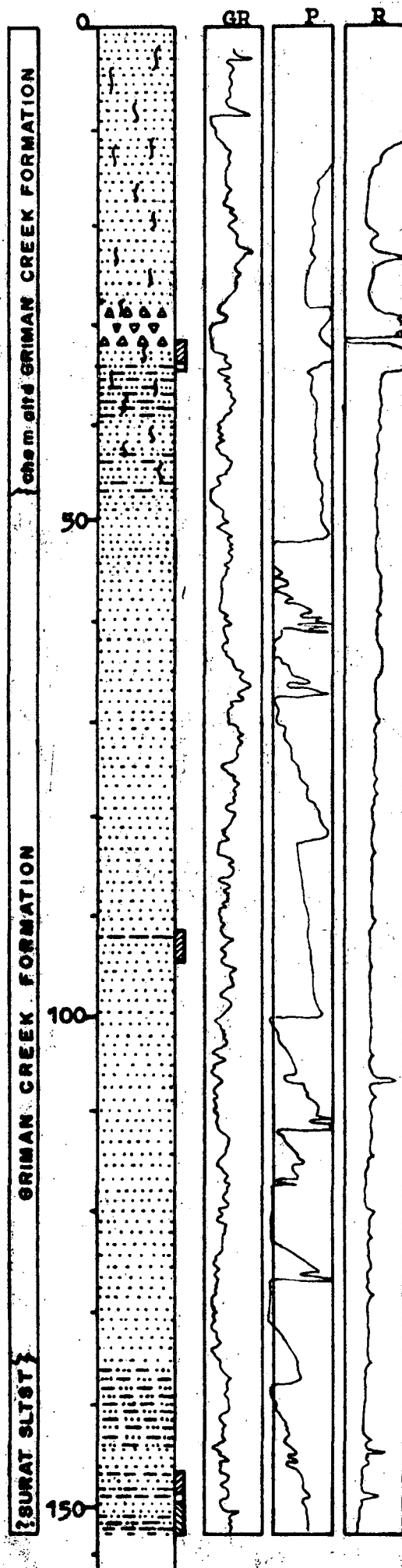
Position: DIRRANBANDI SH55-3, grid reference 613840, 8.8 km WNW of Dirranbandi on S side of road from Dirranbandi to Bollon.

Objectives: To provide data on thickness of Cainozoic in vicinity of probable section line on map.

Drilling: TD. 115.82 m. Core No. 1. 112.8-115.8 m, recovery 2.82 m.

Results: Cainozoic sediments 63 m thick were penetrated. Unconformably below the Cainozoic are chemically altered beds of the Griman Creek Formation. Further investigation by detailed gamma-ray log correlation and isopaching showed that this bore was sited close to the eastern edge of a north-east trending trough which contains up to 220 m of Cainozoic sediment (Senior, 1970).

A bottom hole core of Griman Creek Formation has not yet been studied palynologically.



(gy)orng,(yel)gy,chem altd Sst.

(yel)gy to n gy,clayey Sst.

(yel)gy breccia.

(brn)gy clayey chem altd Sst/Sltst.

n gy,olv gy, clayey Sst/Sltst.

dk dusky gy, clayey carb glau Sst.

dk (gn)gy Mdst.

GR = 3.0000.
P = 10.20,50
R = 10

dk (gn)gy carb Sst.

as abv + lt olv gy/(brn)gy,clayey Sltst.

dk (gn)gy Sltst/Mdst.

dk (gn)gy Sst intbdd Sltst/Mdst.

BMR DIRRANBANDI 5

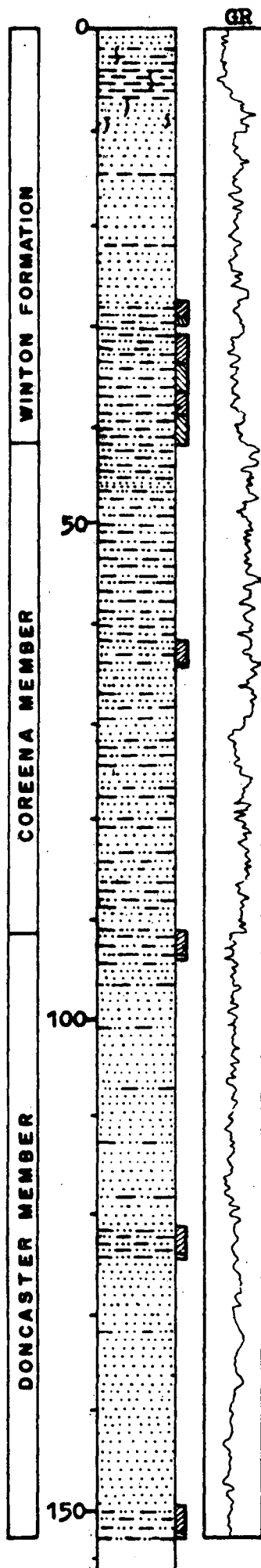
Position: DIRRANBANDI SH55-3, grid reference 525846; 4.5 km
N of Belmore homestead on S side of road from Wyagdon
to Murra Murra homesteads.

Objectives: a) to locate the top of the Surat Siltstone; and
b) to obtain cores of Surat Siltstone for palynological
dating.

Drilling: TD. 152.40 m. Core No. 1. 31.1-34.1 m, recovery 2.26 m
2. 91.4-94.5 m, " 2.95 m
3. 146.3-149.3 m, " 1.90 m
4. 149.3-152.4 m, " 3.05 m

Results: The results of the drilling are inconclusive. A minor
lithological contrast at 138 m, with slightly higher
radioactivity below is tentatively picked as the top of
the Surat Siltstone. Palynology indicates a probable
K2a age, which is consistent with previous determinations
from the Surat Siltstone.

T.D. 152.40 metres 10 cores.



(red)brn chem altd Sst/Sltst and (yel)gy clayey Mdst;gypsum.

(yel)gy,lt gy,chem altd Sst;gypsum.

m dk gy clayey Sst;gypsum.

(gn)gy,clayey mic Sst & dk gy clayey Sltst.

(gn)gy clayey Sltst & bands/pockets of Sst;Glau, Pyr,Gypsum(? caving).

as abv - Sst dominant;Glau,Pyr,Mica.

dk gy/(gy) blk, clayey Sltst gy, (gn) gy, v f-m
grnd glau Sst, Pynte.

GR = 2 secs. (0-122 metres)
3 secs. (122-T.D.)

BMR EULO 2

Position: EULO SH55-1, grid reference 243512, 8.3 km WSW of Bingara homestead, S Eulo to Thargomindah road.

Objectives: a) To determine nature of the Cretaceous sediments in an area of depositional thinning in the vicinity of the Eulo Ridge; and

b) To provide material for lithological and palaeontological study and to establish the presence or absence of Winton Formation sediments.

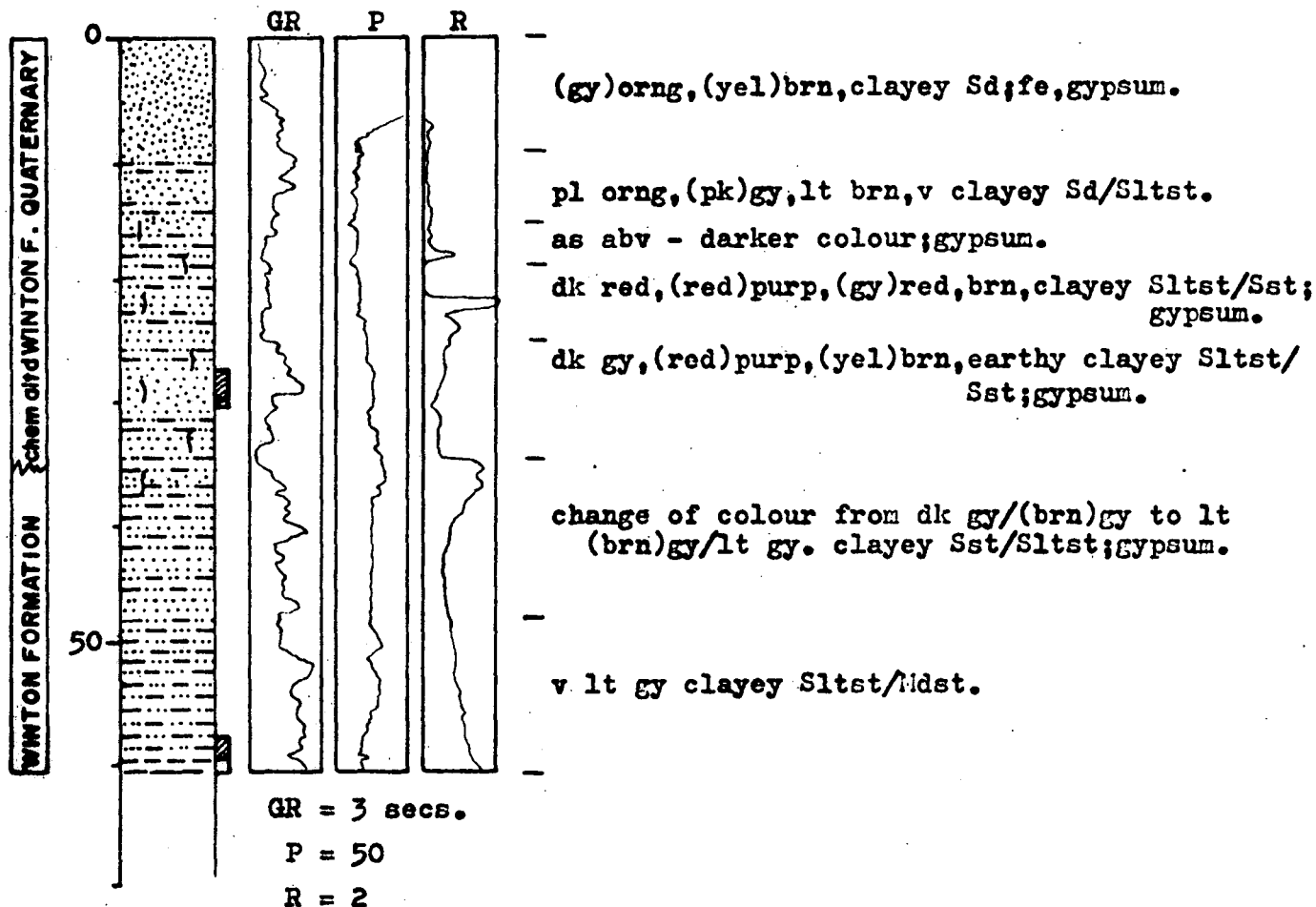
Drilling: TD. 152.40 m. Core No. 1. 27.4-28.9 m, recovery 0.37 m

2. 28.9-29.6 m,	"	0.25 m
3. 30.5-33.3 m,	"	2.56 m
4. 33.3-36.1 m,	"	3.05 m
5. 36.1-38.4 m,	"	2.01 m
6. 38.4-41.4 m,	"	3.05 m
7. 61.0-63.7 m,	"	2.62 m
8. 91.4-94.2 m,	"	2.82 m
9. 121.9-125.0 m,	"	2.74 m
10. 149.3-152.4 m,	"	2.44 m

Results: BMR Eulo 2 was sited in an area of depositional thinning of Cretaceous sediments over the Eulo Ridge. Previous wireline log correlations indicated the non-deposition of some of the Cretaceous units in the ridge area (Senior et al., 1970). Interpretation of this hole suggests that the Winton Formation conformably overlies the Wallumbilla Formation, with non-deposition of intervening sequence (Toolebuc Limestone to Mackunda Formation). The base of the Winton Formation is at the gamma-ray log break at 40m. The boundary between the Doncaster and Coreena Members occurs at 90.2 m. The uniform siltstone and mudstone sequence below this depth, together with the lack of contrast between beds in the gamma-ray logs, tends to confirm this interpretation.

B.M.R. EULO No. 3

T.D. 60.96 metres 2 cores.



BMR EULO 3

Position: EULO SH55-1, grid reference 207517, 7.6 km ESE of Lake House homestead, on S side of Eulo to Thargomindah road.

Objectives: a) To determine lithology and thickness of late Cainozoic lacustrine sediments in the Wynevor Lakes area;
b) To determine if there is silcrete or quartzose sandstone of the Tertiary Glendower Formation below the late Cainozoic sediments; and
c) To provide a core of unaltered Cretaceous sediment for palynological dating.

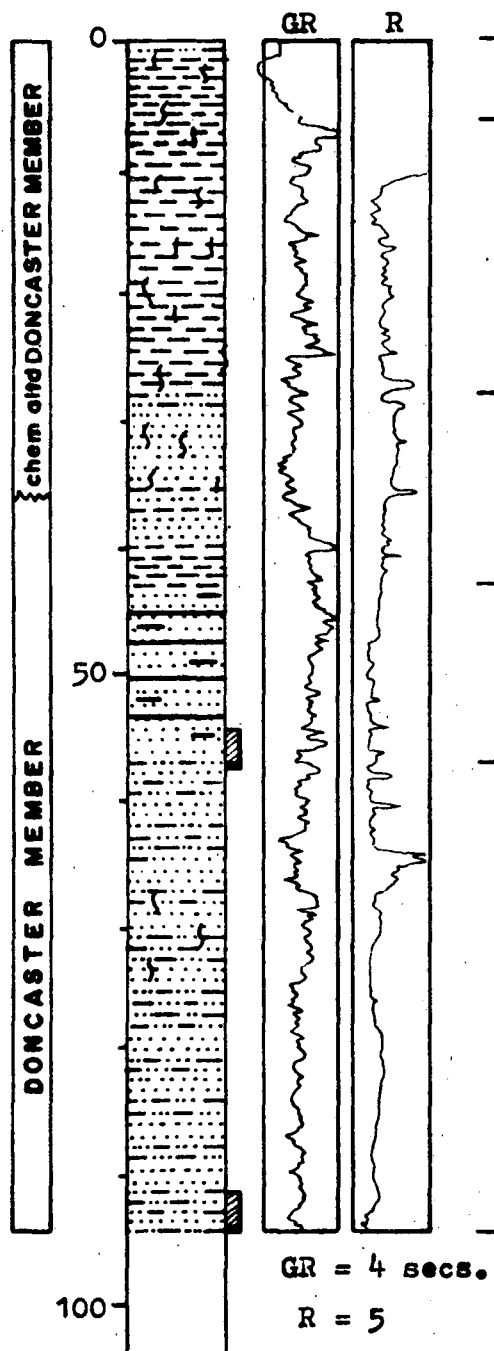
Drilling: TD. 60.96 m. Core No. 1. 27.4-30.5 m, recovery 2.34 m
2. 57.9-60.9 m, " 1.75 m

Results: The results were quite different from the predicted section. Only a thin post-Cretaceous sequence was obtained, indicating that tectonic movements due to faulting east led to erosion of Tertiary sediments in this area.

A bottom hole core was recovered from the relatively unweathered Winton Formation for palynological study.

B.M.R. EULO No. 4

T.D. 94.49 metres 2 cores.



(yel)orng to mod brn, chem altd Mdst.

as abv but softer lt gy,lt (brn)gy Mdst.

(pk)gy,lt (brn)gy,(gy)orng Sltst c̄ some Sst/Mdst.

m gy,m dk gy,f grnd Sst c̄ some lt gy Mdst;
Glau,coal,Mica.

glau Sltst intbdd c̄ Sst.

BMR EULO 4

Position: EULO SH55-1, grid reference 271472, 2.5 km ENE of Turn Turn homestead on W side of road from Turn Turn homestead to Eulo.

Objective: To determine if Doncaster Member mudstone occurs in the area.

Drilling: TD. 94.49 m. Core No. 1. 54.9-57.9 m, recovery 2.89 m
2. 91.4-94.5 m, " 2.77 m

Results: BMR Eulo 4 was sited in an area where good outcrops of mudstone and siltstone were mapped. These outcrops were identified on field evidence and by detailed log correlation as the Doncaster Member of Wallumbilla Formation. A massive section of siltstone and mudstone is present in this hole, which tends to confirm this interpretation. The hole was completed within this unit.

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TABLE 1. SUMMARY OF DRILLING

Hole and Number	Grid reference 1:250,000 * metric + yard	Total depth in metres	Drilling in metres	Coring in metres	Core Numbers	Core recovery (metres)	
						Actual	%
BMR HOMEBOIN 1	537005*	146.00	137.16	8.84	1	1.98	65
					2	3.05	100
					3	2.44	89
BMR HOMEBOIN 2	582956*	60.96	51.82	9.14	1	3.02	99
					2	2.62	86
					3	2.13	70
BMR HOMEBOIN 3	639948*	152.40	146.30	6.10	1	1.14	38
					2	2.87	94
BMR ST GEORGE 1	663895*	79.25	73.15	6.10	1	2.82	93
					2	2.77	91
BMR ST GEORGE 2	682832*	121.92	118.87	3.05	1	2.23	74
BMR DIRRANBANDI 2	639845*	73.15	67.06	6.10	1	2.44	80
					2	2.95	97
BMR DIRRANBANDI 3	607813*	54.86	24.38	30.48	1	2.21	95
					2	1.11	
					3	2.52	
					4	3.02	
					5	2.56	
					6	3.05	
					7	3.05	
					8	2.74	
					9	3.05	
					10	2.95	
					11	2.97	98
BMR DIRRANBANDI 4	613840*	115.82	112.78	3.05	1	2.82	93
BMR DIRRANBANDI 5	525846*	152.40	140.21	12.19	1	2.26	74
					2	2.95	97
					3	1.90	63
					4	3.05	100
BMR EULO 2	243512+	152.40	127.41	24.99	1	0.37	84
					2	0.25	
					3	2.56	
					4	3.05	
					5	2.01	
					6	3.05	
					7	2.62	95
					8	2.82	93
					9	2.74	90
					10	2.44	80
BMR EULO 3	207515+	60.96	55.16	5.79	1	2.34	85
					2	1.75	58
BMR EULO 4	271472+	94.49	88.39	6.10	1	2.89	95
					2	2.77	91
TOTALS		1264.61	1142.69	121.92	43	106.22	87

T.D. 146.00 metres 3 cores

metres

- 0.0 - 3.0 v pl orng, (yel) bn, bn, (gy) red, purp, f-v f grnd chem altd Sst/Sltst.
- 3.0 - 6.1 wh, v lt gy, chem altd Sst $\bar{c}$ (red) brn coating.
- 6.1 - 9.1 wh, lt gy, v f grnd chem altd Sst $\bar{c}$ (red) brn coating.
- 9.1 - 12.2 pl red, dk (yel) orng, v f grnd chem altd Sst.
- 12.2 - 15.2 pl orng, dk (yel) orng, v f-f grnd chem altd Sst.
- 15.2 - 18.3 CORE No. 1
- 16.3 - 16.9 lt brn, v f-f grnd, ang, w srted fe Sst; wthrd, clayey Mtx (Fld).
- 16.9 - 17.5 Upper part is as abv then it becomes finer and gradually into dk (yel) orng Sltst. In the lowermost part is pl (yel) orng/(gy) orng clayey Sltst.
- 17.5 - 18.1 dk (yel) orng clayey Sltst.
- 18.1 - 18.3 (gy) orng, v f grnd clayey Sst/dk (yel) orng clayey Sltst.
- 18.3 - 21.3 lt gy/lt (brn) gy, v f grnd chem altd clayey Sst/Sltst/Mdst.
- 21.3 - 24.4. lt (brn) gy clayey Mdst; in places wthrd to dk (yel) orng, lt brn, mod red.
- 24.4 - 27.4 as abv - lt (brn) gy Mdst is dominant.
- 27.4 - 30.5 (brn) gy, brn, red, v wthrd clayey chem altd Mdst.
- 30.5 - 36.6 lt gy, v f grnd carb Sst/Sltst; Mica, coal.
- 36.6 - 39.6 as abv - m lt gy carb Sltst/v f grnd Sst.
- 39.6 - 42.7 lt olv gy carb Sltst.
- 42.7 - 45.7 as abv - Pyrite.
- 45.7 - 48.8 m gy carb Mdst; Pyrite.
- 48.8 - 54.9 as abv - Glauconite.
- 54.9 - 57.9 (gn) gy glau Sst.
- 57.9 - 61.0 CORE No. 2
- 57.9 - 59.1 dk (gn) gy, v f-f grnd, ang w srted glau Sst; Pyrite.
- 59.1 - 60.3 as abv - dk (gn) gy Mdst increasing, Mdst/Sst intcd, abd Pyr/Glau, carb matter. Sst v f grnd, Mdst lamd.

metres

60.3 - 61.0	dk (gn) gy glau v f-f grnd Sst/Mdst.
61.0 - 76.2	(gn) gy glau Sst.
76.2 - 82.3	(gn) gy, olv gy, microlamd Mdst/Sltst.
82.3 - 88.4	dk gy Mdst.
88.4 - 91.4	dk (gn) gy Sltst.
91.4 - 94.5	as abv + v f grnd Sst.
94.5 - 97.5	dk gy to (gn) blk Mdst.
97.5 - 100.6	dk gy, (gy) blk Mdst/dk (gn) gy Sltst.
100.6 - 103.6	m gy to m dk gy carb Sltst/Mdst.
103.6 - 121.9	m dk gy carb Sltst/Mdst.
121.9 - 125.0	m gy glau Sltst.
125.0 - 128.0	m gy, v f-f grnd Sst/Sltst; Pyrite.
128.0 - 131.1	(gn) gy Sltst/Mdst - Mdst is dominant; small patches of Sltst.
131.1 - 134.1	as abv.
134.1 - 143.3	(gn) gy v f grnd glau Sst/Sltst.
143.3 - 146.0	CORE No. 3
143.3 - 143.9	dk (gn) gy f grnd glau Sst intbdd c̄ Sltst/Mdst.
143.9 - 144.5	as abv - in lower part olv gy Mdst is increasing.
144.5 - 146.0	as abv - m dk Sltst dominant; carbonate mineralization?

B.M.R. HOMEBOIN 2

T.D. 60.96 metres 3 cores

metres

0.0 - 1.5	(yel) orng, f grnd, ang-subang, fr srtd qzs Sd or sd Sl. Some lithics, fe, clayey Mtx.
1.5 - 3.0	pl (yel) brn, f grnd, subang, fr srtd qzs Sd as abv + wh/v pl orng, chem altd Sst.
3.0 - 4.6	wh/v pl orng, ang-subang, w srtd chem altd Sst; v hd sec Qz.
4.6 - 6.1	as abv + coal/chips of pl red-purp (fe) Sst.
6.1 - 7.6	pl red-purp, chem altd Sst; fe, Pyr, lamd. Alternation of wh bands c̄ dusky red purp fe bands.

3.

metres

7.6 - 9.1	as abv - (gy) red purp.
9.1 - 10.7	pl pk/pl red purp - as abv.
10.7 - 12.2	(gn) yel, purp, (red) brn, fe, chem altd Sst $\bar{c}$ mod red coating.
12.2 - 15.2	CORE No. 1
12.2 - 12.5	(gy) orng, pk, mod (red) orng, fe, chem altd Sst; lamd.
12.5 - 14.2	(bl) wh, (gy) orng pk, v f-f grnd, chem altd Sst.
14.2 - 14.8	as abv but v fe; dk (yel) orng-(red) brn/v dk red.
14.8 - 18.3	as abv - (yel) gy, (gy) orng pk.
18.3 - 21.3	mod red/(red) brn, v f grnd, fe, chem altd Sst/Sltst.
21.3 - 24.4	lt brn, subang-subrddd, fr srted, fe, chem altd Sst; v clayey.
24.4 - 27.4	v pl orng/(pk) gy (pl pk), f-m grnd, clayey fe Sst.
27.4 - 30.5	as abv - more fe, fr srted, Mica.
30.5 - 33.5	dk (yel) orng/lt brn, m grnd, p srted. fe. chem altd Sst.
33.5 - 36.6	v pl orng, m grnd, subang-subrddd, w srted qzs Sst.
36.6 - 39.6	pl (yel) brn, p srted, chem altd v wthrd Sst.
39.6 - 42.7	m lt gy, v f grnd, fe, wthrd Sst; coal.
42.7 - 45.7	m lt gy, v f grnd Sst/Sltst; clayey, coal.
45.7 - 48.8	m lt gy, c/v f grnd carb Sst.
48.8 - 51.8	lt olv gy, m-c grnd, subang-subrddd, fr srted porous lithic Sst; coal.
51.8 - 54.9	m dk gy, carb Sltst.
54.9 - 58.0	CORE No. 2
54.9 - 55.5	v fri (gn) gy, f-m grnd, ang-subang w srted glau Sst; mud clasts.
55.5 - 56.1	as abv - carb plant debris replaced by carb matter.
56.1 - 56.7	as abv - m/f grnd ang-subang w srted carb Sst.
56.7 - 57.3	as abv - coarser m-c grnd, abd carb material. Lower 15 cm (gy) blk, earthy carb Mdst in glau Sst.
57.3 - 57.5	(gn) gy Sst $\bar{c}$ abd Sltst/Mdst interbeds and clasts.
58.0 - 61.0	CORE No. 3
58.0 - 59.1	(gn) gy glau Sst $\bar{c}$ carb matter and Sltst/Mdst clasts.
59.1 - 60.0	as abv - f/m grnd, ang-subang w srted. It is v evenly grnd $\bar{c}$ only a few Sltst/Mdst bands/clasts.; lamd 5-10°.

B.M.R. HOMEBOIN 3

T.D. 152.40 metres 2 cores

metres	
0.0 - 3.0	mod (red) brn, c-m grnd, subang-subrddd, fr srted fe qzs Sd.
3.0 - 4.6	as abv; c- v c grnd, lighter colour.
4.6 - 6.1	as abv; dk (yel) orng.
6.1 - 10.7	(gy) orng, v c grnd subang w srted qzs Sd; few lithics.
10.7 - 12.2	(gy) orng, v c grnd, ang-subang, fr srted qzs Sd.
12.2 - 13.7	mod brn, m-c grnd, fr srted fe labile Sst; abd lithics, lamd.
13.7 - 15.2	lt (brn) gy, m-lt gy, clayey Mdst.
15.2 - 18.3	as abv; coarser - v f/f grnd Sst.
18.3 - 21.3	m brn, (red) brn, gy, m-c grnd p srted Sst; Qz, Fld, fe.
21.3 - 24.4	(red) brn, c grnd, fr srted fe qzs Sst; porous, fri.
24.4 - 36.6	mod brn-gy (gy) brn, clayey Sst; fe.
36.6 - 39.6	as abv + m lt gy Mdst.
39.6 - 42.7	lt gy clayey Mdst.
42.7 - 45.7	mod brn/lt gy Mdst + c grnd Sst; Mdst is dominant.
45.7 - 48.8	as abv - fe + wh Sst.
48.8 - 51.8	wh chem altd Sst.
51.8 - 61.0	as abv + (red) brn, brn (fe) chem altd Sst.
61.0 - 64.0	(yel) orng/wh, chem altd Sltst/v f grnd Sst.
64.0 - 73.1	lt gy chem altd Sltst/v f grnd Sst; some pl (yel) orng Sltst.
73.1 - 76.2	as abv - less weathered.
76.2 - 79.2	pl (yel) brn, v c grnd qzs Sst c clayey Mtx.
79.2 - 82.3	lt gy, lt olv gy, v c grnd unsrted Sst c clayey Mtx.
82.3 - 88.4	as abv + gy, lt olv gy, m-f grnd carb Sst; fe, lamd.
88.4 - 91.4	CORE No. 1
88.4 - 88.9	lt olv gy Mdst; in lower part into lt olv gy Sltst.
88.9 - 89.5	In upper part lt olv gy-lt (gn) gy, f grnd, w srted glau Sst, which grades in lower part into lt olv gy Mdst.
91.4 - 94.5	lt gy Sltst.
94.5 - 97.5	m lt gy clayey Sltst c carb matter.

metres

97.5 - 100.6	as abv; coal.
100.6 - 103.6	lt gy/m lt gy, m-f grnd, unsrtd clayey Sst; coal.
103.6 - 106.7	(yel) gy, lt gy Sltst; mic, abd coal.
106.7 - 109.7	CORE No. 2
106.7 - 107.3	(gn) gy, v f grnd glau Sst c̄ Mdst bands in upper part. In lower part v f-m grnd.
107.3 - 107.7	m grnd glau Sst.
107.7 - 108.9	m grnd glau Sst c̄ abd carb matter in bottom 5 cm.
108.9 - 109.5	as abv; abd carb material in top 15 cm and bottom 10 cm.
109.7 - 115.8	dk (gn) gy, v c grnd, ang-subang, fr srtd glau carb Sst.
115.8 - 152.4	as abv + some olv gy, m-f grnd clayey Sst.

B.M.R. ST GEORGE 1

T.D. 79.25 metres 2 cores

metres

0.0 - 1.5	mod brn, c grnd, ang-subang, fr srtd sd S1.
1.5 - 3.0	mod brn to (gy) brn, v c grnd, ang clayey Sd.
3.0 - 6.1	(gy) orng, m-c grnd, ang-subang, fr srtd qzs clayey Sd.
6.1 - 7.6	(gy) orng, m-f grnd clayey Sd; Fe.
7.6 - 9.1	as abv - m-c grnd.
9.1 - 12.2	mod (yel) brn, v c grnd, ang-subang, p srtd qzs Sd; lithics, Fe.
12.2 - 15.2	v c grnd, subang-subfndd, w srtd qzs Sd; Qz, Fe, lithics, coal.
15.2 - 18.3	pl (red) brn, gy, m-f grnd, w srtd clayey Sst.
18.3 - 24.4	dk (yel) orng, v c grnd, ang-subang, fr srtd Sd + dk (yel) orng clayey Sltst.
24.4 - 27.4	as abv - lt brn, fe.
27.4 - 36.6	pk gy (v pl orng), v f grnd, w srtd clayey Sst.
36.6 - 39.6	as abv - v pl orng.
39.6 - 42.7	as abv - v pl orng/(yel) orng, v f grnd clayey Sst c̄ carb matter.
42.7 - 45.7	(gy) orng, v f grnd clayey Sst.
45.7 - 48.8	CORE No. 1
45.7 - 46.3	(gy) orng, pl (yel) orng, v pl orng, f grnd, chem altd Sst.
46.3 - 46.9	as abv; in middle part lt gy olv, (yel) gy, (gy) orng, clayey Sltst.

metres

46.9 - 47.3	as abv - coarser-v f-f grnd clayey Sst.
47.3 - 48.8	(gy) orng, v f-f grnd Sst.
48.8 - 51.8	dk (yel) brn, v f grnd clayey Sst.
51.8 - 54.9	as abv - m-c grnd Sst; fe.
54.9 - 57.9	as abv - gy colour is increasing, coarser, fe.
57.9 - 61.0	as abv + m lt gy carb Sltst/c grnd glau Sst.
61.0 - 70.1	(gn) gy, f-m grnd, w srted carb, glau Sst.
70.1 - 73.1	as abv - clayey dk (gn) gy, mic, f grnd Sst.
73.1 - 76.2	as abv; clayey.
76.2 - 79.2	CORE No. 2
76.2 - 77.4	lt olv gy, (gn) gy, m gy, glau Sltst.
77.4 - 77.7	as abv - becoming coarser-v f grnd Sst.
77.7 - 77.9	(gn) gy glau Sltst.
77.9 - 78.6	15 cm of Sltst then f grnd glau Sst intbdd c Sltst/Mdst.
78.6 - 79.0	as abv - f-m grnd Sst.

B.M.R. ST GEORGE 2

T.D. 21.92 metres 1 core

metres

0.0 - 1.5	(gy) brn, v c-c grnd, ang-subang, clayey qzs Sl; lithics, Fe.
1.5 - 3.0	as abv - dk (yel) brn.
3.0 - 4.6	mod (yel) brn, m-c grnd, w srted fe qzs Sd.
4.6 - 6.1	lt brn, v c grnd, subang, f srted qzs Sd.
6.1 - 9.1	lt olv gy clayey sd Sl.
9.1 - 10.7	olv gy (dk (yel) brn), m-c grnd, ang-subang, w srted qzs Sd.
10.7 - 12.2	dk (yel) brn, v c grnd, qzs Sd - as abv.
12.2 - 18.3	dk (yel) orng, v c grnd, ang-subang, f srted qzs Sd.
18.3 - 27.4	as abv - (yel) brn, p srted Sd.
27.4 - 36.6	as abv + (red) brn fe Sd.
36.6 - 39.6	dk olv gy/(red) brn, v c grnd, w srted qzs Sst/Sd; fe, clayey.

metres

39.6 - 42.7	(pk) gy-lt (brn) gy, c- v c grnd, ang-subang, fr srted qzs Sd; clay Mtx.
42.7 - 45.7	clayey Sd.
45.7 - 48.8	pl (yel) brn, v c grnd Sd c̄ clayey Mtx.
48.8 - 51.8	lt gy-pl purp Sd - as. abv.
51.8 - 54.9	lt gy Sd - as abv.
54.9 - 57.9	(pk) gy, c-v c grnd, ang-subang, fr srted Sd c̄ clayey Mtx.
57.9 - 61.0	as abv - darker, p srted, coarser, fe.
61.0 - 64.0	as abv - pl (yel) brn, v clayey.
64.0 - 67.1	v lt gy- (pk) gy, m-c grnd clayey Sd.
67.1 - 70.1	as abv + purp Sd (fe).
70.1 - 73.1	lt (brn) gy, v c grnd Sd c̄ carb material and clayey Mtx.
73.1 - 79.2	lt gy (pk), c-v c grnd, ang-subang, p srted carb clayey Sd.
79.2 - 97.5	as abv - v c-f. pebbly (4 mm).
97.5 - 100.6	lt (brn) gy, m lt gy, f pebbly grnd, subang, w srted qzs Sd.
100.6 - 106.7	m lt gy, c- v c grnd, ang-subang, p srted carb clayey Sst.
106.7 - 109.7	as abv - m gy.
109.7 - 112.8	as abv - c- v c grnd Qz in m- f grnd clayey Mtx.
112.8 - 118.9	dk (gn) gy, m-c grnd clayey Sst; glau, coal.
118.9 - 121.9	CORE No. 1
119.7 - 120.1	(gn) gy, m grnd, ang-subang, w srted glau Sst; 10° lamd.
120.1 - 120.7	as abv - horizontally lamd, mudclasts.
120.7 - 121.3	as abv - carb bands.
121.3 - 121.9	(gn) gy, v f grnd Sst/Mdst. Last 10 cm m-c grnd Sst.

B.M.R. DIRRANBANDI 2

T.D. 73.15 metres 2 cores

metres

0.0 - 1.5	mod (red) brn, c grnd qzs Sd/m pebbly Sd; fe.
1.5 - 3.0	mod (red) brn, m pebbly. Qz=100%, ang-subang, fe.
3.0 - 4.6	mod orng pk, c grnd, subrddd, Qz pebble + mod orng pk, c-v c grnd, ang, w srted, qzs Sd c̄ clayey Mtx.

metres

4.6 - 7.6	as abv - not so c/fe; wh-v pl orng/pk + v pl orng, chem alt Sltst.
7.6 - 9.1	lt olv gy-v lt gy chem altd Sltst. Pebbly Qz + c grnd, ang, w srted qzs Sd in clayey Mtx.
9.1 - 10.7	as abv - v lt gy; chem altd clayey Sltst dominant.
10.7 - 12.2	(bl) wh-wh clayey chem altd Sltst/v f grnd Sst.
12.2 - 13.7	v lt gy- (pk) gy - as abv.
13.7 - 15.2	as abv - lt (brn) gy.
15.2 - 16.8	(gy) orng pk-(gy) red purp, m-c grnd, chem altd qzs Sst; clayey, fe.
16.8 - 18.3	pl (yel) brn-v dk red - as abv.
18.3 - 19.8	pl (yel) brn, (gy) orng, dk (yel) orng, m grnd, ang, fr srted, fe, chem altd Sst/Mdst.
19.8 - 21.3	(gy) orng pk/(gy) orng chem altd Sst.
21.3 - 24.4	pl (yel) brn, dk (yel) orng, m grnd, ang, w srted Sst c clayey Mtx.
24.4 - 27.4	(gy) orng, m grnd, ang, fr srted, fe, chem altd Sst, clayey Mtx.
27.4 - 30.5	as abv - v pl orng- (gy) orng.
30.5 - 33.5	pl (yel) brn, dk (yel) orng, brn, chem altd clayey Sltst/Sst.
33.5 - 36.6	(gy) orng pk, dk (yel) orng, (gy) orng - as abv.
36.6 - 39.6	lt (brn) gy, dk (yel) orng, clayey chem altd Sst.
39.6 - 42.7	v pl orng, (yel) orng, fe chem altd Sst.
42.7 - 45.7	as abv - v pl orng, (gy) orng, f-v f grnd Sst/Sltst.
45.7 - 51.8	as abv - lt (brn) gy Sltst increasing.
51.8 - 54.9	lt-mod brn, fe Sst/Sltst as abv; dk material increasing.
54.9 - 57.9	as abv - (gy) orng-mod (yel) brn; grey colour is increasing.
57.9 - 61.0	mod (yel) brn-mod brn, c grnd, ang, f srted, fe, chem altd Sst/Sltst; glau..

metres

- 61.0 - 64.0 lt olv gy, glau, carb, v f grnd Sst/Sltst. Still some dk (yel) orng-brn fe Sst.
- 64.0 - 67.1 dk (gn) gy, m grnd, ang-subang, w srtd, glau, carb, Sst intbdd c̄ Sltst.
- 67.1 - 70.1 CORE No. 1
- 67.1 - 67.7 (gn) gy, f-m grnd glau Sst intbdd c̄ dk (gn) gy m grnd Sltst/Mdst. abd plant debris.
- 67.7 - 70.1 Mdst gradually decreasing, dk (gn) gy, m grnd glau Sst dominant.
- 70.1 - 73.1 CORE No. 2
- 70.1 - 70.7 (gn) gy, f-m grnd Sst intbdd c̄ Sltst, as abv.
- 70.7 - 73.0 as abv. - in the middle part Sst becomes coarser m-c grnd.

B.M.R. DIRRANBANDI 3

T.D. 54.86 metres 11 cores

metres

- 0.0 - 1.5 (pk) gy-v lt gy clayey chem altd Sltst intbdd c̄ f-m grnd Sst.
- 1.5 - 3.0 wh chem altd clayey Sltst.
- 3.0 - 5.7 CORE No. 1 (pk) gy clayey chem altd Sst, recrystallized and v difficult to distinguish Sst from Sltst. In lower part lt gy, pl red purp, lt red.
- 5.7 - 6.9 CORE No. 2 as abv.
- 6.9 - 9.6 CORE No. 3 as abv - mod red, (gy) red purp.
- 9.6 - 12.7 CORE No. 4 as abv - (gy) orng pk.
- 12.7 - 15.7 CORE No. 5 pl (yel) brn Sst/Sltst.
- 15.7 - 18.5 CORE No. 6 (gy) orng pk, clayey chem altd Sst.
- 18.5 - 21.5 CORE No. 7 as abv.
- 21.5 - 24.6 CORE No. 8 as abv - in places fe (brn-dk (yel) orng).
- 24.6 - 27.3 CORE No. 9 (gy) orng, v f-f grnd, ang-subang, fr srtd, clayey Sst.

metres

27.3 - 30.5	CORE No. 10 lt-mod brn, f-m grnd, ang-subang, fr srted clayey Sst.
30.5 - 33.5	as abv - (gy) orng, p srted, fe c some plant debris.
33.5 - 39.6	as abv - (gy) orng, pl (yel) brn, v f-f grnd, fr srted Sst.
39.6 - 42.7	as abv - darker.
42.7 - 54.7	olv gy, v f-f grnd, ang-subang, fr srted, carb, glau Sst; coal.
45.7 - 51.8	dk (gn) gy, v f-f grnd, ang-subang, w srted carb, glau Sst; coal.
51.8 - 54.9	CORE No. 11 as abv.

B.M.R. DIRRANBANDI 4

T.D. 115.82 metres 1 core

metres

0.0 - 1.5	m gy, clayey Sl/(brn) gy v c grnd qzs Sd.
1.5 - 3.0	(yel) brn, c grnd, ang-subang, fr srted Sd c clayey Mtx.
3.0 - 4.6	(yel) brn- (yel) orng, m grnd, ang, w srted qzs Sd.
4.6 - 6.1	(yel) brn, m-c grnd, ang, fr srted fe Sd.
6.1 - 7.6	(yel) brn, (gy) orng, m grnd, ang, w srted, fe, qzs Sd.
7.6 - 9.1	(gy) orng, v c grnd to f pebbly ang, fr srted, qzs Sd; Fe.
9.1 - 10.7	as abv - c - v c grnd.
10.7 - 13.7	as abv - c-v f pebbly.
13.7 - 15.2	as abv - c-f pebbly.
15.2 - 18.3	as abv - (gy) orng.
18.3 - 21.3	as abv - c-v c grnd.
21.3 - 24.4	as abv - c-v f pebbly.
24.4 - 36.6	as abv - c-m pebble.
36.6 - 39.6	as abv - pl (yel) brn, c- v c grnd.
39.6 - 42.7	as abv - lt (brn) gy/(yel) gy, c-v c grnd Sd.
42.7 - 57.9	(yel) gy, c-f pebbly, ang, p srted Sd.
57.9 - 61.0	lt olv gy, clayey Sltst c c grnd Sd.
61.0 - 67.1	lt olv gy Mdst.
67.1 - 70.1	wh, v lt gy, pl red purp, v c grnd-pebbly, ang-subang, clayey, fe, chem altd Sst.

metres

70.1 - 73.1	v lt gy Mdst/Sst - as abv.
73.1 - 76.2	(pk) gy, pl pk, chem altd Sst/Sltst c̄ dk (yel) orng, (red) brn, (blk) red patches/coatings (fe).
76.2 - 79.2	(gy) pk, m-c grnd, fr srted, fe, chem altd Sst.
79.2 - 82.3	(red) brn-v dk red, purp, m grnd, fe, chem altd Sst.
82.3 - 85.3	as abv - not so wthrd; already original wh/gy colour.
85.3 - 88.4	(yel) gy/dk (yel) orng, f grnd, chem altd Sst.
88.4 - 100.6	(yel) gy, f grnd, w srted, chem altd Sst.
100.6 - 103.6	(yel) gy, lt olv gy, m-c grnd, ang-subang, fr srted, carb Sst.
103.6 - 106.7	as abv - olv gy.
106.7 - 112.8	dk (gn)gy, m-c grnd, ang-subang, fr srted, glau Sst.
112.8 - 115.8	CORE No. 1
112.8 - 115.6	(gn) gy, f-m grnd, glau Sst c̄ Sltst/Mdst interbeds and clasts; Mica (particularly in Sltst), coal.

B.M.R. DIRRANBANDI 5

T.D. 152.40 metres 4 cores

metres

0.0 - 1.5	mod (red) brn, lt brn, fe, chem altd Sst.
1.5 - 3.0	(gy) orng, (yel) brn, m-c grnd, ang, fr srted, Sst.
3.0 - 4.6	(yel) gy, (gy) orng, (red) brn, m-f grnd, chem altd Sst.
4.6 - 6.1	(yel) gy-lt olv gy, m-c grnd, ang, fr srted, chem altd Sst; in places fe to red/(red) brn.
6.1 - 7.6	(yel) gy, m-c grnd, ang, fr srted, chem altd Sst; fe to v dk red.
7.6 - 9.1	v lt gy-(pk) gy, m-c grnd, ang, w srted, fe, clayey chem altd Sst.
9.1 - 15.2	pl red purp, (gy) pk, m-c grnd, fr srted, fe, chem altd Sst.
15.2 - 18.3	(yel) gy, m-v c grnd, ang-subang, p srted, fe qzs Sst.
18.3 - 21.3	as abv - clayey Mtx increasing; pl (yel) brn, pl red purp.
21.3 - 27.4	m gy, m-c grnd, fe clayey Sst.
27.4 - 30.5	(yel) gy breccia.

metres

30.5 - 31.1	(yel) gy, m-v c grnd, unsorted very hard breccia.
31.1 - 34.1	CORE No. 1
31.1 - 32.2	(yel) gy, lt (bl) gy, qzs breccia - v hard grains up to 2 cm.
32.2 - 32.7	Gradually becoming (pk) gy, lt (brn) gy, fe, clayey.
32.7 - 33.3	v pl orng, lt (brn) gy, clayey chem altd Sst/Sltst.
34.1 - 36.6	lt (brn) gy, v pl orng, clayey, chem altd Sltst.
36.6 - 39.6	as abv - (gy) orng.
39.6 - 42.7	lt (brn) gy, f grnd, clayey, chem altd Sst.
42.7 - 45.7	lt (brn) gy, f grnd, clayey, chem altd Sst/Sltst.
45.7 - 48.8	as abv - olv gy, f grnd, clayey Sst/Sltst.
48.8 - 51.8	m gy-olv gy, f grnd, clayey Sltst, or v f grnd Sst.
51.8 - 54.9	olv gy, v f-f grnd, clayey, carb Sst.
54.9 - 57.9	olv gy-dk (gn) gy, f-m grnd, clayey, carb, glau Sst; ang, fr srttd.
57.9 - 64.0	as abv - dk (gn) gy, v f-v c grnd, ang, Mica.
64.0 - 76.2	m gy, m grnd, ang, w srttd, carb, glau Sst; Mica.
76.2 - 79.2	as abv - m dk gy (more coal).
79.2 - 82.3	as abv - dk (gn) gy, v f-f grnd.
82.3 - 85.3	as abv + lt (bn) gy, f-m grnd Sst.
85.3 - 91.4	as abv - dk (gn) gy.
91.4 - 94.5	CORE No. 2
91.4 - 100.6	dk (gn) gy - 91.4 - 92.7 abd Mdst, then f-m grnd Sst dominant. Carb material abd throughout.
100.6 - 131.1	as abv + lt olv gy/lt (bn) gy, clayey Sltst.
131.1 - 146.3	as abv + lt olv gy-lt (brn) gy, clayey Sltst increasing.
146.3 - 149.3	CORE No. 3
146.3 - 147.0	dk (gn) gy, f-m grnd, glau, carb Sst intbdd c̄ dk (gn) gy Sltst/Mdst.
147.0 - 147.6	Sst is gradually finer and Sltst dominant.
147.6 - 148.2	Almost entirely v dk (gn) gy/dk gy Sltst/Mdst; clayey, earthy.
149.3 - 152.4	CORE No. 4
149.3 - 150.0	dk gy Sst in centre c̄ v dk (gn) gy when wet/vthrd.

metres

150.0 - 150.6	as abv - becoming coarser - f-v f grnd Sst.
150.6 - 151.2	v f-f Sst intbdd c̄ Sltst/Mdst.
151.2 - 151.8	dk (gn) gy, v f grnd Sltst/Mdst; carb plant debris, Pyrite.
151.8 - 152.4	olv blk, v dk (gn) gy, (gn) blk, carb Mdst/Sltst. In places intbdd c̄ v f grnd glau Sst.

B.M.R. EULO 2

T.D. 152.40 metres 10 cores

metres

0.0 - 1.5	(red) brn silicified and chem altd Sst; fe.
1.5 - 3.0	(red) brn, (yel) brn, chem altd Sst/Sltst.
3.0 - 4.6	(pk) gy, (yel) gy, clayey Mdst.
4.6 - 6.1	as abv - gypsum.
6.1 - 7.6	(yel) gy, (pk) gy, (gy) orng, v f-f grnd Sst; gypsum.
7.6 - 9.1	lt gy, f grnd, chem altd Sst c̄ (gy) orng/pl (yel) brn coating; gypsum.
9.1 - 10.7	lt gy, f grnd, chem altd Sst.
10.7 - 12.2	as abv - lt gy/(brn) gy.
12.2 - 15.2	m dk gy, f grnd clayey Sst c̄ clayey bands.
15.2 - 18.3	as abv - v f grnd c̄ dk (yel) orng coating.
18.3 - 21.3	as abv - m gy to m dk gy.
21.3 - 27.4	as abv - gypsum.
27.4 - 28.9	CORE No. 1
27.4 - 27.7	(gn) gy clayey, mic Sst.
28.9 - 29.6	CORE No. 2 as abv.
29.6 - 30.5	Reeming.
30.5 - 33.3	CORE No. 3 dk gy-(gn)gy clayey Sltst.
33.3 - 36.4	CORE No. 4 dk gy-(gn)gy clayey Sltst.
36.1 - 38.4	CORE No. 5 as abv/v f grnd Sst.
38.4 - 41.4	CORE No. 6
38.4 - 39.0	dk gy-(gn)gy clayey Sltst.

metres

39.0 - 39.6	(gn) gy clayey Sltst $\bar{c}$ bands/pockets of Sst; Glauconite.
39.6 - 40.2	(gn)gy-dk gy clayey Sltst.
40.2 - 41.4	earthy, clayey Sltst; gypsum.
41.4 - 45.7	Reeming.
45.7 - 61.0	as abv/dk gy-(gn) dk gy Sst.
61.0 - 63.7	CORE No. 7
61.0 - 61.7	m gy-olv gy clayey Sltst intbdd $\bar{c}$ v f-f grnd Sst;
61.7 - 63.7	as abv - glauconitic clayey Sltst interbeds (or pockets), $\bar{c}$ glauconitic f-m grnd Sst; Pyrite (chalkopyrite), Mica.
63.7 - 67.1	as abv - Sst dominant; Glau, Pyr, Mica.
67.1 - 70.1	as abv - Glau.
70.1 - 73.2	as abv - Glau.
73.2 - 76.2	as abv - m-c grnd glau Sst, Pyrite.
76.2 - 79.2	as abv - Glau.
79.2 - 82.3	as abv - Glau.
82.3 - 85.3	as abv - Glau, carb material, gypsum (caving?).
85.3 - 88.4	as abv - Glau.
88.4 - 91.4	as abv - Glau.
91.4 - 94.2	CORE No. 8
91.4 - 92.0	dk gy/(gy) blk clayey Sltst/v f grnd Sst intbdd $\bar{c}$ v thin bands of m-f grnd glau Sst.
93.3 - 93.9	as abv - Sltst dominant.
93.9 - 94.2	Sltst.
94.2 - 94.5	Reeming.
94.5 - 97.5	gy, (gn)gy, f grnd clayey carb Sst.
97.5 - 112.8	as abv - pyrite.
112.8 - 115.8	as abv - Pyrite, Glauconite.
115.8 - 121.9	as abv - Pyrite, Glauconite.
121.9 - 125.0	CORE No. 9
121.9 - 122.5	dk gy, (gy)blk clayey Sltst/Mdst.
122.5 - 123.1	as abv - Sltst $\bar{c}$ Fe mineralization (concretions).
123.1 - 123.7	as abv - lamd Sltst.
123.7 - 124.4	Sltst $\bar{c}$ Pyrite.

metres

124.4 - 124.7	Sltst c pieces of petrified wood, pockets of glau Sst, mudclasts.
125.0 - 128.0	dk gy-(gn)gy, f grnd Sst; Glau, gypsum (caving?).
128.0 - 131.1	as abv - Glau.
131.1 - 134.1	as abv - Glau.
134.1 - 137.2	as abv - Glau.
137.2 - 140.2	as abv - Glau, Pyrite.
140.2 - 143.3	as abv - Glau.
143.3 - 146.3	as abv - Glau.
146.3 - 149.3	as abv - Glau, Pyrite.
149.3 - 152.4	CORE No. 10
	dk gy clayey Sltst; mudclasts, plant debris, Fe concretions.

B.M.R. EULO 3

T.D. 60.96 metres 2 cores

metres

0.0 - 1.5	lt brn, (red)brn, c-v c grnd, subrndd-rndd, p srted, clayey, fe Sd.
1.5 - 3.0	as abv - (gy) orng, pl (yel) brn, m-c grnd Sd; less Fe than abv, gypsum.
3.0 - 4.6	v pl orng, m-c grnd, subang-subrndd, fr-p srted qzs Sd; abd gypsum.
4.6 - 6.1	as abv - (gy) orng, pl (yel) brn Sd; abd gypsum.
6.1 - 9.1	pl (yel) brn, dk (yel) orng, (gy) orng, clayey Sd (more or less as abv); Fe gypsum.
9.1 - 15.2	v pl orng, (pk) gy, v dusky purp fe/lt brn-mod (yel) brn v clayey Sd/Sltst.
15.2 - 18.3	(brn) gy, (red) purp, clayey Sd/Sltst; gypsum.
18.3 - 21.3	dk gy, v dusky red purp, (gy) red, brn, (yel) brn, fe, clayey Sltst.
21.3 - 24.4	as abv - m dk gy/dusky red purp clayey Sltst or v f grnd Sst; gypsum.

metres

24.4 - 27.4	(brn) gy, red purp, dk (yel) brn, earthy, clayey Sltst/Sst.
27.4 - 30.5	CORE No. 1 (brn) gy earthy, fe Sd. It is very difficult to distinguish individual components; gypsum.
30.5 - 33.5	(brn) gy, red purp, dk (yel) brn, earthy, clayey Sltst/Sst; gypsum.
33.5 - 36.6	pl (yel) brn, pl brn, clayey Sltst/Sd; gypsum. Colour change from dk gy to brn.
36.6 - 39.6	lt gy, lt (brn) gy Sltst; gypsum.
39.6 - 42.7	v lt gy, (pk) gy, clayey Sltst/or v f grnd Sst.
42.7 - 45.7	wh- (pk) gy, clayey Sst/Sltst; gypsum.
45.7 - 48.8	(gy) orng, dk (yel) orng, clayey Sst.
48.8 - 57.8	v lt-lt gy clayey Sltst c̄ (yel) orng patches (fe).
57.9 - 61.0	CORE No. 2 v lt gy clayey Sltst/Mdst. In lower part Mdst dominant.

B.M.R. EULO 4

T.D. 94.49 metres 2 cores

metres

0.0 - 1.5	(yel) gy silicified chem altd Sltst/Mdst c̄ brn coating(fe).
1.5 - 4.6	(pk) gy, v pl orng silicified Mdst.
4.6 - 6.1	as abv - darker, (pk) gy/mod brn (fe).
6.1 - 7.6	as abv - strongly fe - mod (red) brn.
7.6 - 9.1	as abv - not so silicified, softer - wh, (pk) gy, v pl orng, clayey Mdst (fresh) or mod (red) brn - fe and withrd.
9.1 - 10.7	as abv - lt gy/(pk) gy-lt (brn) gy, fe.
10.7 - 12.2	as abv - lt gy.
12.2 - 15.2	as abv - not so fe.
15.2 - 16.8	as abv + fe/silicified, dk (yel) orng Mdst.
16.8 - 21.3	(pk) gy clay (clayey Mdst?).
21.3 - 24.4	as abv - some fe - dk (yel) orng colour.
24.4 - 27.4	(pk) gy, lt (brn) gy, dk (yel) orng, as abv but harder.
27.4 - 30.5	(pk) gy, lt (brn) gy, silicified Sltst c̄ dk (yel) orng coating. Quite hd though not as much as at the top. Some Sst.
30.5 - 33.5	(gy) orng, m grnd, fr-srtd clayey Sst c̄ lt brn coating(fe).

metres

33.5 - 36.6	as abv - dk (yel) orng/red purp (fe).
36.6 - 39.6	fri, (gy) orng, dk (yel) orng clayey Sst/Mdst.
39.6 - 42.7	dk gy or (gy) blk Mdst.
42.7 - 45.7	m gy m dk gy, f grnd Sst; coal.
45.7 - 54.9	dk (gn) gy, f-m grnd, fr-w srted Sst; Glau, Mica, coal.
54.9 - 57.9	CORE No. 1 finer clayey glau Sst c̄ v lt gy Mdst.
54.9 - 56.1	dk (gn) gy, v f-f grnd, fr-w srted, glau Sst; coal, Mica.
56.1 - 57.3	v f-f grnd Sst intbdd c̄ dk (gn) gy, m grnd, w srted, ang-subang, qzs Sst; Glau, coal, Mica.
57.3 - 57.7	Sltst intbdd c̄ Sst (as abv). In places this Sst forms small pockets.
57.9 - 61.0	as abv; clayey Sltst, Glau.
61.0 - 64.0	as abv - glau Sltst.
64.0 - 67.1	as abv - caving of <u>deeply</u> withrd material.
67.1 - 70.1	Sltst/Sst c̄ big grains of Glau; (caving of deeply withrd material).
70.1 - 91.4	as abv - Sltst/v f grnd Sst; Mica.
91.4 - 94.5	CORE No. 2
91.4 - 92.0	lamd Sltst/v f grnd Sst intbdd or c̄ pockets of f-m grnd glau Sst. Sltst is dominant, particularly at the upper part.
92.0 - 94.2	Sltst as abv c̄ occasional pockets of Sst.