82-1769.
Pt 1.

768001

FOURTH SIX MONTHLY REPORT

ON

EXPLORATION LICENCE 6/79
(CATAMARAN)

FOR PERIOD 16.11.81 TO 15.05.82

by
N.T. Perkins.

Distribution:

1. Department of Mines, Hobart.
2. Marathon Petroleum Australia, Ltd.
3. Field Copy.

083

768002

CONTENTS

1.0 INTRODUCTION

2.0 EXPLORATION

3.0 FUTURE WORK

FIGURES

Figure 1 Drillhole Graphics Legend.

Figure 2 Drillhole Location Map.

APPENDICES

Appendix I Drillhole Graphics and Geophysical Logs 1:500

Appendix II Geophysical Logs Originals

Appendix III Lithological Logs

Appendix IV Petrographic Report

1.0 INTRODUCTION

Exploration Licence 6/79 (Catamaran) covers an area of 136 square kilometres in the vicinity of Recherche Bay, south-eastern Tasmania. It was granted to Marathon Petroleum Australia, Ltd. on May 16, 1980 for a period of six (6) months and renewed on November 16, 1980, May 16, 1981 and November 16, 1981.

2.0 EXPLORATION

Work for the period November 16, 1981 to May 1[illegible], 1982 included:-

a. a 1665.8m stratigraphic drilling programme which was carried out in two phases. The first from November 14, 1981 to December 14, 1981 included 5 holes, 221.28m of chip drilling and 260.42m of core drilling. The second phase from February 4, 1982 to May 13, 1982 included 7 holes, 289.75m of chip and 702.40m of core.

A summary of the holes is as follows:

Drillhole	Total Depth (m)	Comments
CA 101	42	Basalt; abandoned due to drilling problem.
CA 102	170	Triassic Coal Measures; 0.6m coal seam at 45m.
CA 103	29	Dolerite scree; abandoned due to excess water and caving.
CA 104	39	Dolerite Scree; abandoned due to drilling problems.
CA 105	79	Triassic Coal Measures/Dolerite; 3m coal interval intersected 61m.

CA 106	234.16	Basalt 0-72m; Triassic Coal Measures 72m to 225m; Dolerite 225m to TD. 3m of coal at 132m.
CA 107	57.46	Dolerite Scree; abandoned due to drilling problems
CA 108	39.43	Triassic sediments 0 to 20.21m; dolerite 20.21 to TD. Hole abandoned due to drilling conditions.
CA 109	300.36	Triassic sediment 0 to 295.36, Dolerite 295.36 to TD. 1.0m of coal at 261m and 1.0m of coal at 287m.
CA 110 (chiphole)	304.00	Triassic sediment throughout hole except for dolerite from 95m to 115m.
CA 111	171.50	Triassic sediments from 0 to 34m and 48m to 156m with dolerite from 34 to 48m and 156 to TD. 1.4m of coal at 79m and 3.9m of coal between 149 and 156m.
CA 112 (chiphole)	108.40	Triassic sediment from 0 to 22m and 37 to 105m with Dolerite from 22 to 37m and 105m to TD.

Drillhole graphics and geophysical logs at 1:500 scale are enclosed as Appendix I as well as copies of the original BPB geophysical logs as Appendix II and Marathon computer printout lithological logs as Appendix III. Drillholes CA101, CA103, CA104 and CA107 were not geophysically logged due to bad hole conditions. Details of samples taken are listed below:

Drillhole	Depths Samples taken (m)	Type of sample
CA 101	No samples taken.	
CA 102	14.85 - 15.47	Coal
	51.84 - 52.28	Coal
	59.24 - 59.59	Coal
	74.10 - 74.63	Coal
	87.64 - 87.95	Coal

CA 103	No samples taken.	
CA 104	No samples taken.	
CA 105	60.81 - 61.31	Coal
	61.31 - 61.53	Coal
	61.53 - 61.77	Coal
	61.77 - 62.21	Non-coal
	62.21 - 62.94	Coal
	62.94 - 63.42	Coal
CA 106	132.62 - 132.68	Coal
	132.68 - 132.79	Non Coal
	132.79 - 133.47	Coal
	133.47 - 134.01	Coal & Non Coal
	134.01 - 135.05	Coal
CA 107	No samples taken.	
CA 108	No samples taken.	
CA 109	261.31 - 262.27	Coal
	287.24 - 287.94	Coal
	287.94 - 288.47	Coal
CA 110	14.0 - 16.0	Chip samples
	28.0 - 29.0	" "
	29.0 - 30.0	" "
	30.0 - 31.0	" "
	73.0 - 74.0	" "
	74.0 - 75.0	" "
	75.0 - 76.0	" "
	76.0 - 77.0	" "
	77.0 - 78.0	" "
	91.0 - 92.0	" "
	92.0 - 93.0	" "
	93.0 - 94.0	" "
CA 111	78.62 - 79.31	Coal
	79.31 - 79.52	Non Coal
	79.52 - 80.65	Coal
CA 112	No samples taken.	

No results have as yet been received for these samples.

b. Four samples were sent to Pontifex & Associates Pty. Ltd. who cut thin sections and described the samples petrographically this report is attached as AppendixIV.

c. Preliminary correlations have been carried out but due to the structurally complex nature of the area and the spacing of the holes more infill drilling will have to be carried out.

3.0 FUTURE WORK

Work to be undertaken in the future includes:-

(a) Construction of access and clearing of approved sites for the next drilling programme.

(b) A 6,500m chip and 50m core drilling programme with geophysical logs to be carried out when weather permits.

(c) Testing for magnetic susceptability and accurate density measurements of the different rock types.

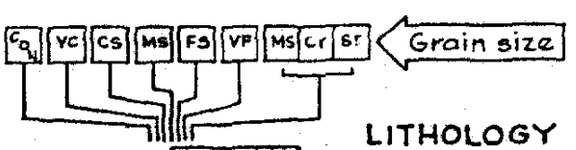
(d) Re-evaluation of previous geophysical work using more accurate information as derived from (c).

Figure 1

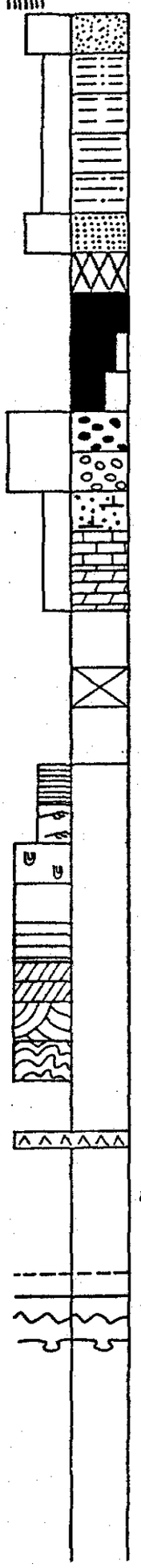
Drillhole Graphics Legend.

089

768008



CON - CONGLOMERATE, VC - VERY COARSE, CS - COARSE GRAINED, MS - MEDIUM GRAINED, FS - FINE GRAINED, VF - VERY FINE, MS - MUDSTONE, CY - CLAYSTONE, ST - SILTSTONE.



LITHOLOGY

SA - SAND

CL - CLAY

MS, CY - MUDSTONE, CLAYSTONE

CS - CARBONACEOUS SHALE

ST - SILTSTONE

SS - SANDSTONE

CG - INFERIOR COAL

CB - COAL MID LUSTROUS TO BRIGHT

CI - COAL MID LUSTROUS

CD - COAL MID LUSTROUS TO DULL

INTRAFORMATIONAL } CONGLOMERATE
EXTRAFORMATIONAL }

CALCAREOUS SANDSTONE

LIMESTONE

DOLOMITE

CORE LOSS

STRUCTURES

LAMINATION

CROSS LAMINATION

BURROWING

MASSIVE

FLAT BEDDING

TABULAR PLANAR } CROSS BEDDING
TROUGH }

DISTURBED BEDDING

ROOTLET BEDS

PLANT FOSSILS

BED BASE TYPES

TRANSITIONAL

ABRUPT

EROSIONAL

DEFORMED

OTHER FEATURES

SD - SIDERITE

FG - IRONSTONE

LS - LIMESTONE

SI - SILICEOUS

PV - SWELLING

2° - DIPS

MARATHON

SEDIMENTARY CORE LOGGING LEGEND

Figure 2

Drillhole Location Map.

Appendix I

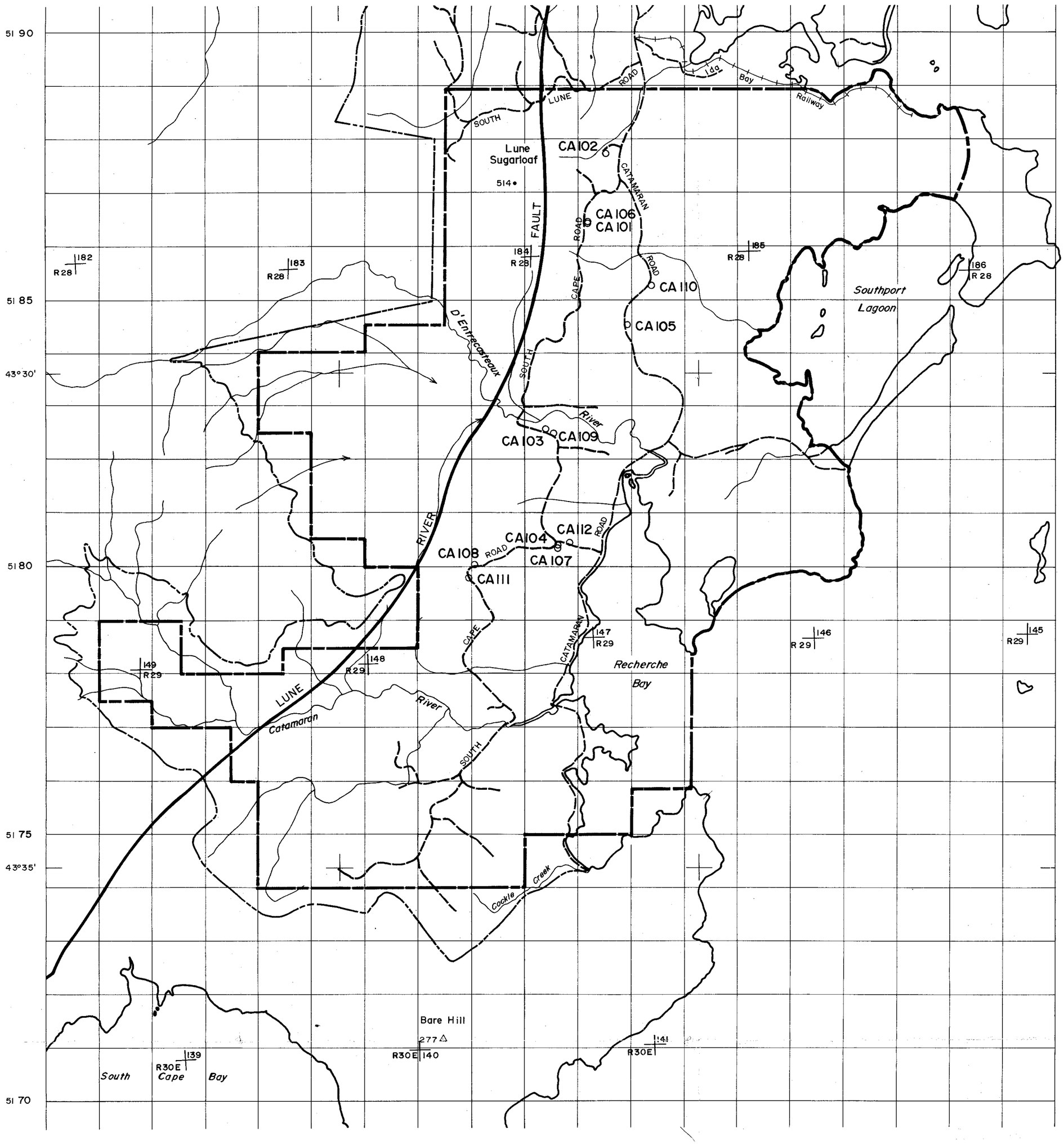
Drillhole Graphics and Geophysical Logs

1:500

091

485 146°50' 490 146°55' 495 147°00' 500

51 90 51 85 43°30' 51 80 51 75 43°35' 51 70



5cm

TOPOGRAPHIC LEGEND

- Sealed Road
- Unsealed Road
- E.L. Boundary
- S.W.A.C. Boundary
- R29 | 146 — Photo Centre
- o CM 112 — Drillhole location & number

SCALE 1 : 50 000

1000 0 1000 2000 3000 4000 5000

Metres

768011

Marathon Petroleum Australia, Ltd
Brisbane Australia

South East Cape (Sh. 8210) Tasmania

E.L. 6/79 Catamaran — Tasmania Project

Plan Showing

DRILL HOLE LOCATION MAP

DRAWN BY J. Andrews	DATE Jun. '82	MAP No. C.M. 016 FILE ORDER	PLATE 88
ORIGINAL DATA	DATE May '82	REVISED BY	DATE

82-1769

CA101/103/104

099

Depth in Metres

CA 101

0

20

40

T.D. 42·18 m

CA 103

0

20

Schree

T.D. 28·50 m

CA 104

0

20

Schree

40

T.D. 39·0m

SEAM LOG

HOLE No's 101, 103, 104

5 cm

SCALE 1 :500

768012

Marathon Petroleum Australia, Ltd.
BRISBANE AUSTRALIA

E.L. 679 CATAMARAN

Plan Showing

DRILL HOLE SECTION
HOLE Nos. CA 101, 103, 104

Mapped by _____
Drawn by B.A.W. Date JUNE, 1982.

Plan No CIA3T5-5

82-1769

b921-28

CA102

Depth in Metres

0 API 200

6000 SDU 0

7" 3"

LOW HIGH

0
20
40
60
80
100
120
140
160

T.D. 170·0m.

GAMMA RAY | SEAM LOG | L.S. DENSITY | CALIPER | RESISTIVITY

HOLE No. CA 102

5 cm

SCALE 1: 500

Marathon Petroleum Australia, Ltd.

E.L. 679 CATAMARAN

DRILL HOLE SECTION
HOLE No. CA 102

Mapped by

Drawn by J. Andrews Date May 1982

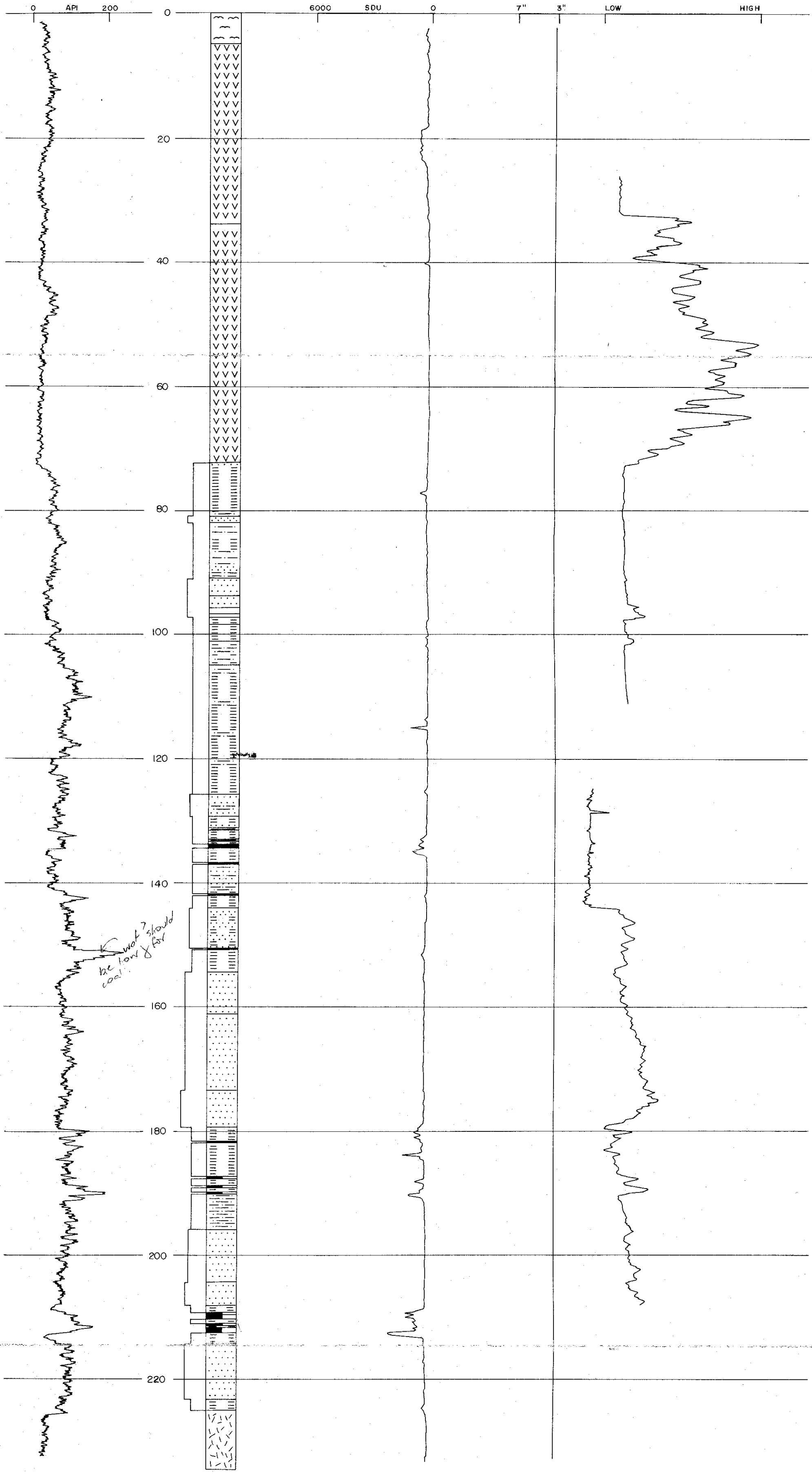
Plan No CIA3 T5-3

768013

100

Depth in Metres

0 API 200 | 0 | 6000 SDU 0 | 7" 3" LOW HIGH



GAMMA RAY | SEAM LOG | L.S. DENSITY | CALIPER | RESISTIVITY

HOLE No. CA 106

100

768014

5 cm

SCALE 1:500

Marathon Petroleum Australia, Ltd.
BRISBANE AUSTRALIA
Hobart SK 55-8 Tasmania

E.L. 679 CATAMARAN

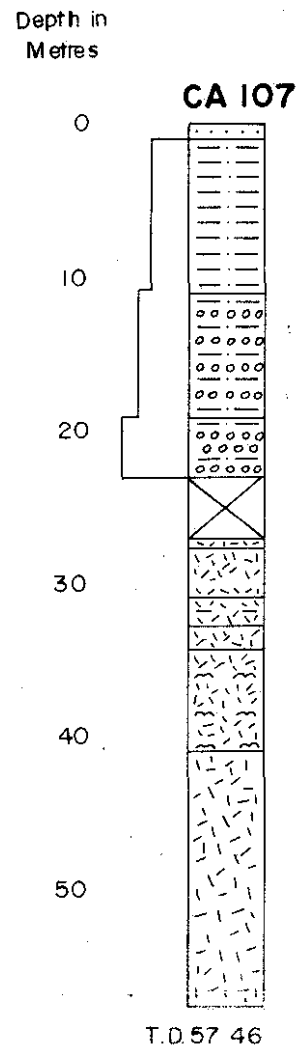
Plan Showing

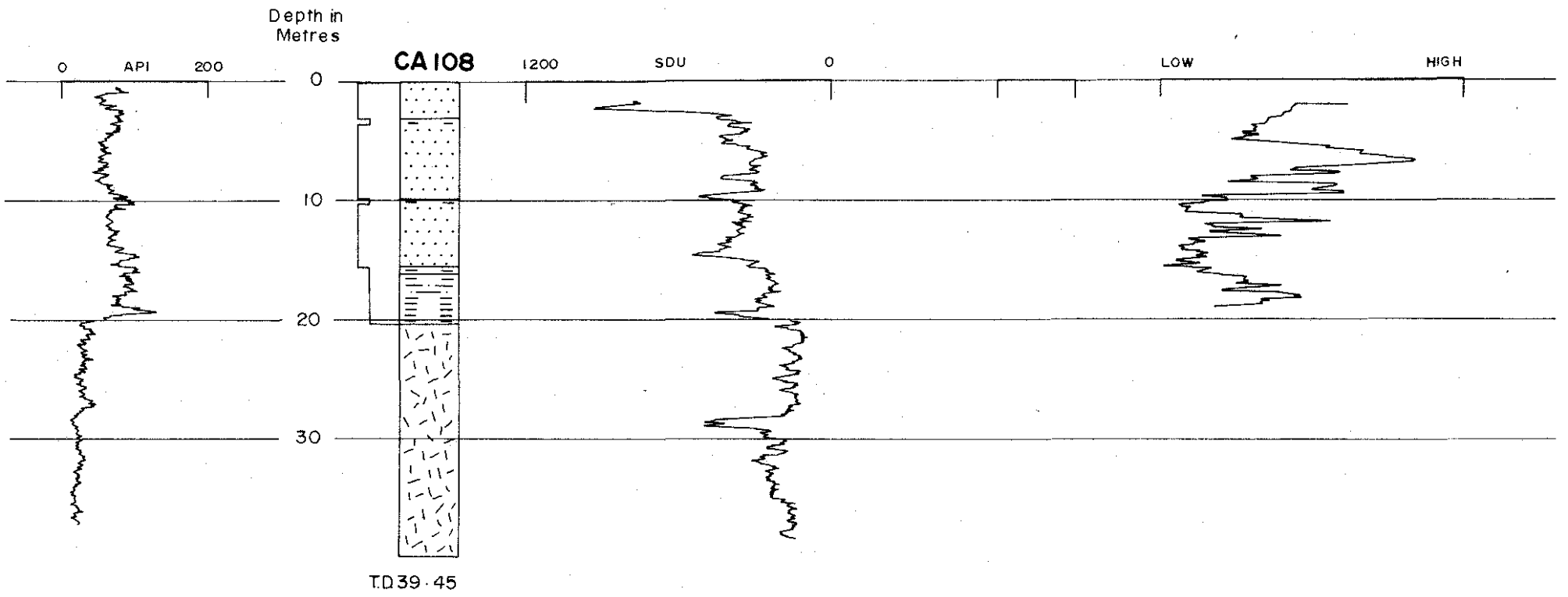
DRILL HOLE SECTION
HOLE No. CA 106

Mapped by Plan No. CM018
Drawn by J.A. Date Jun. '82

82-1769

096





GAMMA RAY SEAM LOG L.S. DENSITY CALIPER RESISTIVITY

HOLE No. CA107 & CA108

768015

5 cm

SCALE 1:500

Marathon Petroleum Australia, Ltd.
BRISBANE AUSTRALIA

Hobart SK 55-8 Tasmania

E.L. 679 CATAMARAN

Plan Showing

DRILL HOLE SECTION

HOLE No. CA107 & CA108

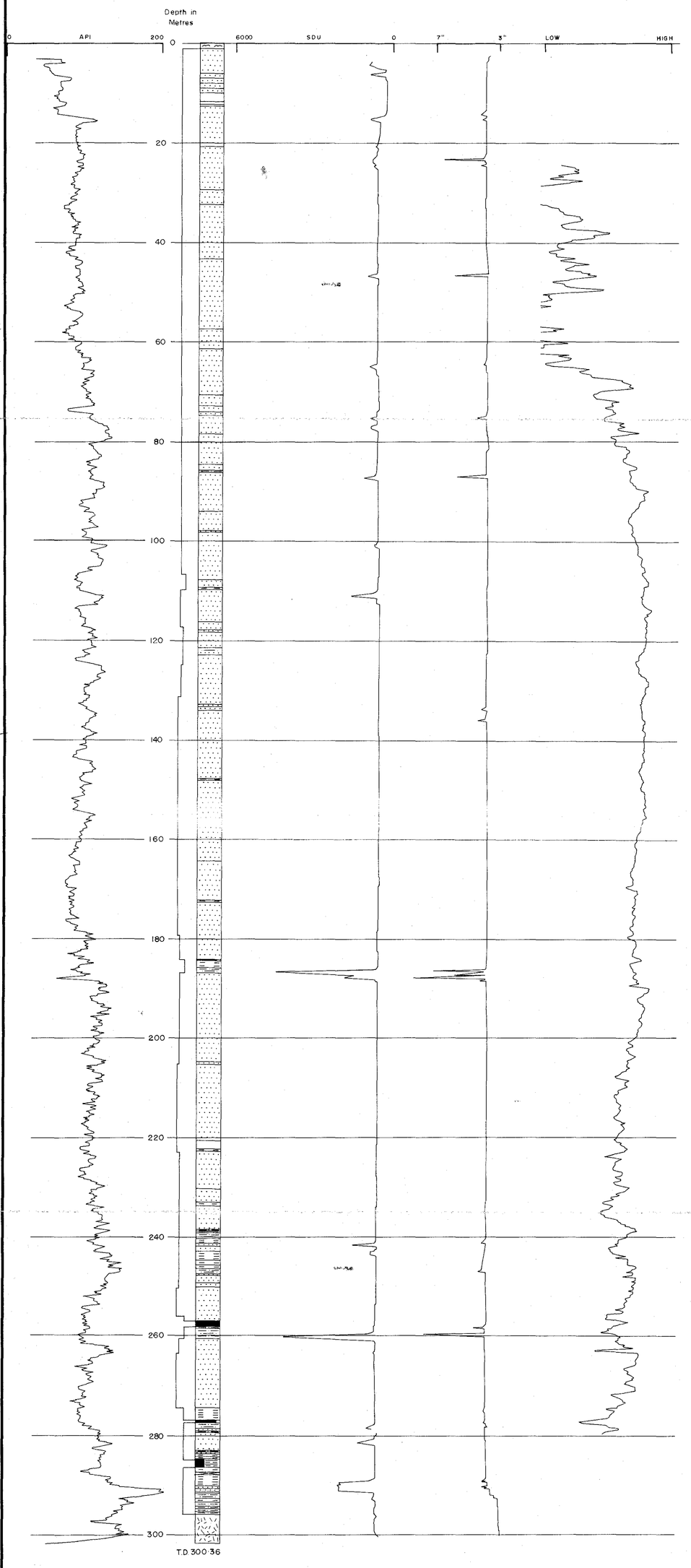
Mapped by

Drawn by J. Andrews Date June '82

Plan No CIA 3T5-4

094

CA109



HOLE No. CA 109

094

160

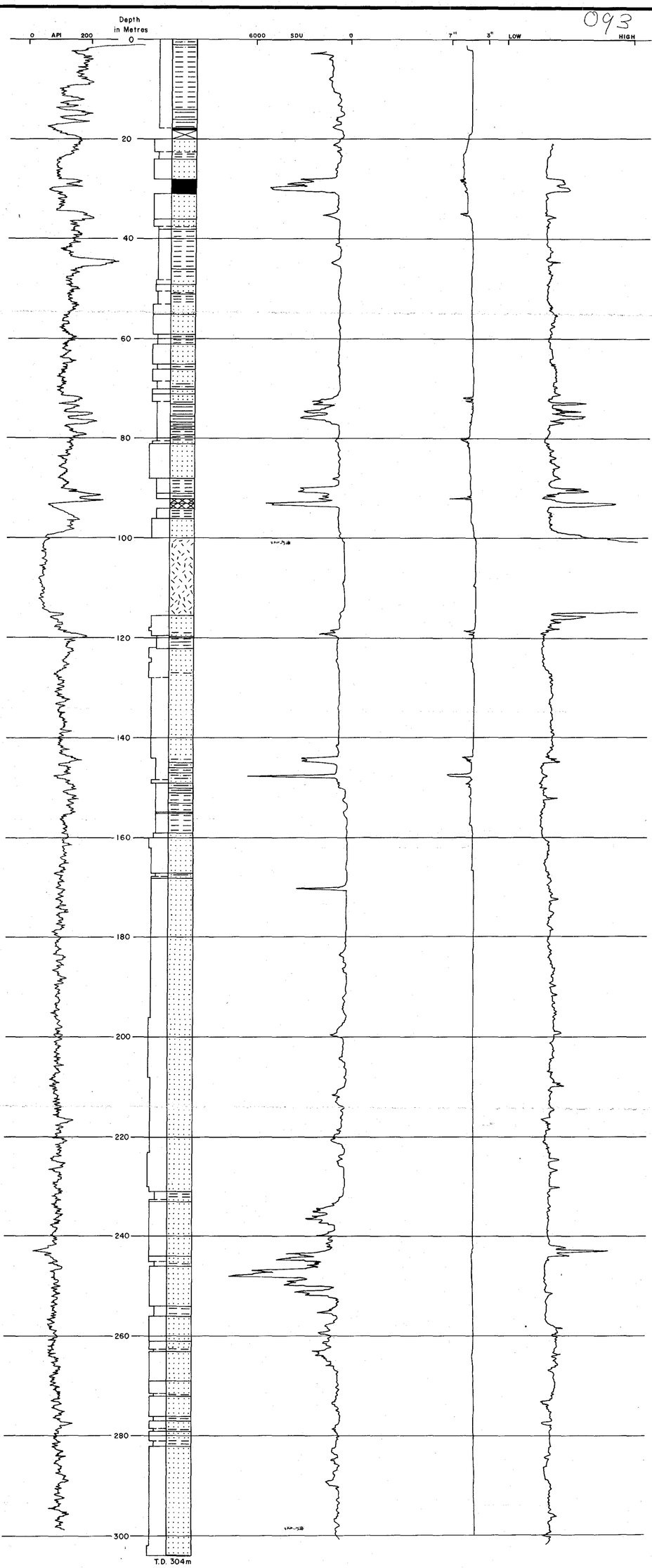
768016

5 cm

SCALE 1: 500

Marathon Petroleum Australia, Ltd.
BRISBANE AUSTRALIA
Hobart SK 55-8 Tasmania
E.L. 679 CATAMARAN
Plan Showing
DRILL HOLE SECTION
HOLE No. CA 109
Mapped by
Drawn by J.A. Date Jun '82
Plan No. CM 019

82-1769



093

HOLE No. CA110

660

768017

82-1769

5 cm

SCALE 1:500

Marathon Petroleum Australia, Ltd.
BRISBANE AUSTRALIA

E.L. 679 CATAMARAN

Plan Showing

DRILL HOLE SECTION

HOLE No. CA 110

Mapped by
Drawn by B.A.W Date JUNE, 1982. Plan No. CM 020

098

Depth in Metres

0 API 200

4200 SDU 0

LOW HIGH

0
20
40
60
80
100
120
140
160

T.D. 171·50 m

GAMMA RAY

SEAM LOG

L.S. DENSITY

RESISTIVITY

5 cm

SCALE 1: 500

NOTE: Gamma Ray and L.S. Density were logged through NQ RODS from T.D. to 1m and HQ CASING from 111·65m to 1m.

768018

HOLE No. CA III

Marathon Petroleum Australia, Ltd.
BRISBANE AUSTRALIA

E.L. 679 CATAMARAN

Plan Showing

DRILL HOLE SECTION
HOLE No. CA III

Mapped by _____
Drawn by B. A. W. Date JUNE, 1982

Plan No CIA 3T5-6

82-1769

695

Depth in Metres

0 API 200

1200 SDU 0

0
20
40
60
80
100

T.D. 108.4m.

GAMMA RAY

SEAM LOG

L. S. DENSITY

5 cm

SCALE 1:500

HOLE No. CA 112

768019

Marathon Petroleum Australia, Ltd.
BRISBANE AUSTRALIA

E.L. 679 CATAMARAN

Plan Showing

DRILL HOLE SECTION

HOLE No. CA 112

Plan No CIA3T5-7

Mapped by

Drawn by B. A. W. Date JUNE, 1982.

768020

82-1769

5 cm

BOREHOLE CA101

CLIENT MARATHON

AREA CATAMARAN

COUNTRY AUSTRALIA

DATE LOGGED 16.11.81

DEPTH SCALE 200:1

1 OF 2 LOGS

COAL LITHOLOGY LOG

SONDE TYPE
COAL COMBINATION SONDE

LOG SUITE
GAMMA RAY
L S DENSITY
CALIPER

BOREHOLE DATA

PERMANENT DATUM	Ground Level		
ELEVATION OF PD		BPB	DRILLER
MEASUREMENTS FROM	GL	GL	
DEPTH REACHED	36.81m	37m	
CASING SHOE	Nil		
BIT SIZES 1	4" TO TD	2	TO
3	TO	4	TO
CASING SIZES 1	TO	2	TO

FLUID DATA

NATURE	Air/water
SG	1.00 gm/cc
LEVEL	4.1m
VISCOSITY	
Rm at meas temp	
BHT	

OPERATION DATA

FIRST READING	36m
LAST READING	1m
INTERVAL LOGGED	35m
UNIT-TRUCK No	#26/V309
ENGINEER	W.Penrose
WITNESS	

EQUIPMENT AND RECORDING DATA

COAL COMBINATION SONDE 1638

LOG	EQUIPMENT			TAPING			PANEL			CAL COEFF	DEPTHS			SEAM LOG RUN
	SONDE	SOURCE	CALIBRATOR	LOG TAPED	RECORD SPEED	DIRECT or REPLAY	SPEED	T.C SECS	NORM		FROM	TO	INTERVAL	
GAMMA RAY	1638 SIDEWALL POSITION													
L S DENSITY		5854	393	Y	9	D	9	1	1.6		35	1	34	N
CALIPER			water	"	"	"	"	1/3	6.01		36	1	35	"
			-	"	"	"	"	1	-		35	1	34	"

COAL QUALITY/SEAM THICKNESS LOG INTERVALS (Refer to relevant log)

FROM	No Details	INTERVAL TOTAL
TO		
INTERVAL		= Nil

ADDITIONAL SONDES RUN

SONDE	LOG	GENERAL SCALE LOG	DETAIL SCALE LOG
R	RES.	Y	N

REFER TO ADDITIONAL HEADINGS

REMARKS

CALIBRATION DATA

JIG No. 393 VALUE 553 @ 2" DIAM

JIG MARK SHOWN AT ABOVE VALUE -

JIG CAL DATE 15.11.81 JIG VALUE 10300 SDU @ 1.1 g/cm³

JIG No water SPAN NORM SDU/CPS = 6.01

3 ins 598 cps

7 ins 936 cps

GAMMA RAY	DEPTH	COAL BULK DENSITY g/cm³	CALIPER INCHES

HOLE SIZE CORRECTION DATA

2" 4" 6" 8" 120 125 130 135 14 145 15 155 16 17 18 19 20 22 24 30

CA 01

7" 5" 3"

0 API 200

6000 SDU 0

water level

20

40

0 200

6000 0

7" 5" 3"

BOREHOLE CA 01 AREA CATAMARAN

CLIENT MARATHON PETROLEUM COUNTRY AUSTRALIA

COAL LITHOLOGY LOG

MY 88002R

114 768021

82-1769

GENERAL LOG
RESISTIVITY

5cm

BOREHOLE CA01
CLIENT MARATHON

AREA CATAMARAN
COUNTRY AUSTRALIA
DATE LOGGED 15.11.81

2 OF 2 LOGS

DEPTH SCALE 200ft

BOREHOLE DATA — REFER TO Lithology LOG

OPERATION DATA — REFER TO Lithology LOG

EQUIPMENT AND RECORDING DATA

	LOG	TAPING				PANEL	
	LOG	TAPE NO.	RECORD SPEED	DIRECTION REPLAY	SPEED	T.C. SECS	CAL COEFF
RES.	Y	9	D	9	1/3	NORM	-

REMARKS

SONDE NO	R	SOURCE NO	-

DEPTH

CA 01

Resistivity

LOW HIGH

water level

20

40

LOW HIGH

DEPTH

BOREHOLE CA 01
CLIENT MARATHON PETROLEUM

AREA CATAMARAN
COUNTRY AUSTRALIA

MY A584,52R

768022

82-1769

5 cm

COAL LITHOLOGY LOG

←

BOREHOLE CA/02
CLIENT MARATHON PETROLEUM

AREA CATAMARAN
COUNTRY AUSTRALIA
DATE LOGGED 1.12.81

DEPTH SCALE 200:1

1 OF 2 LOGS

SONDE TYPE
COAL
COMBINATION
SONDE

LOG SUITE
GAMMA RAY
L S DENSITY
CALIPER

BOREHOLE DATA

PERMANENT DATUM	Ground Level			
ELEVATION OF P D				
	B P B		DRILLER	
MEASUREMENTS FROM	GL		GL	
DEPTH REACHED	168.41m		170m	
CASING SHOE	-			
BIT SIZES	1	5" TO 36m	2	3 3/4 TO TD
	3	TO	4	TO
CASING SIZES	1	TO	2	TO

FLUID DATA

NATURE	Air/Water
S G	1.00 gm/cc
LEVEL	7.0m
VISCOSITY	
Rm at meas temp	
B H T	

OPERATION DATA

FIRST READING	168m
LAST READING	1m
INTERVAL LOGGED	167m
UNIT-TRUCK No	#39/V309
ENGINEER	W.Penrose
WITNESS	W.Barbour

EQUIPMENT AND RECORDING DATA

COAL COMBINATION SONDE 1638

LOG	EQUIPMENT			TAPING			PANEL			CAL COEFF	DEPTHS			SEAM LOG RUN
	SONDE	SOURCE	CALIBRATOR	LOG TAPED	RECORD SPEED	DIRECT or REPLAY	SPEED	T C SECS	NORM		FROM	TO	INTERVAL	
GAMMA RAY	1638		393	Y	9	D	9	1	1.62		167	6	161	N
L S DENSITY		5854	water	"	"	"	"	1/3	5.99		168	1	167	"
CALIPER	SIDEWALL POSITION		-	"	"	"	"	1	-		168	1	167	"

COAL QUALITY / SEAM THICKNESS LOG INTERVALS (Refer to relevant log)

FROM	Details Not Required.	INTERVAL TOTAL
TO		
INTERVAL		

ADDITIONAL SONDES RUN

SONDE	LOG	GENERAL SCALE LOG	DETAIL SCALE LOG
R.	RES.	Y	N

REFER TO ADDITIONAL HEADINGS

REMARKS

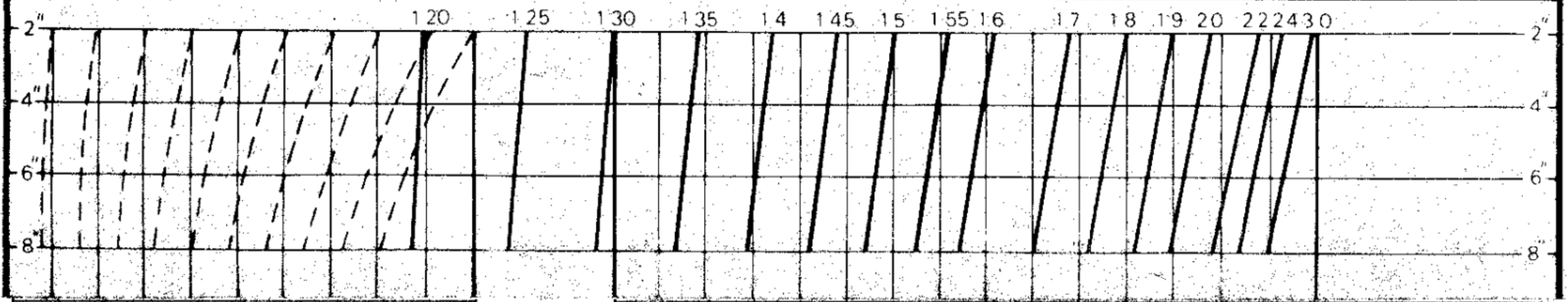
B P B COAL LITHOLOGY LOG

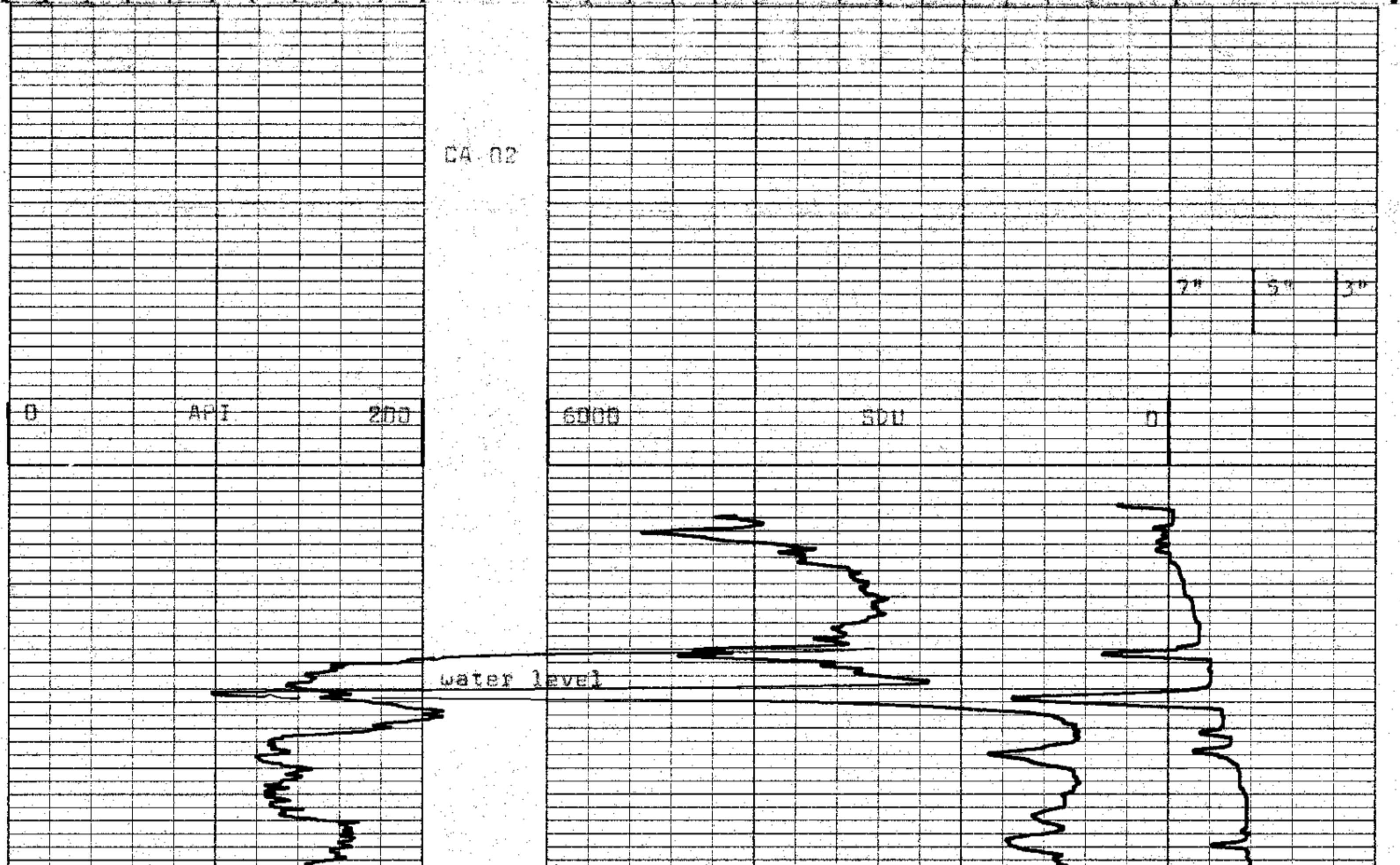
CALIBRATION DATA

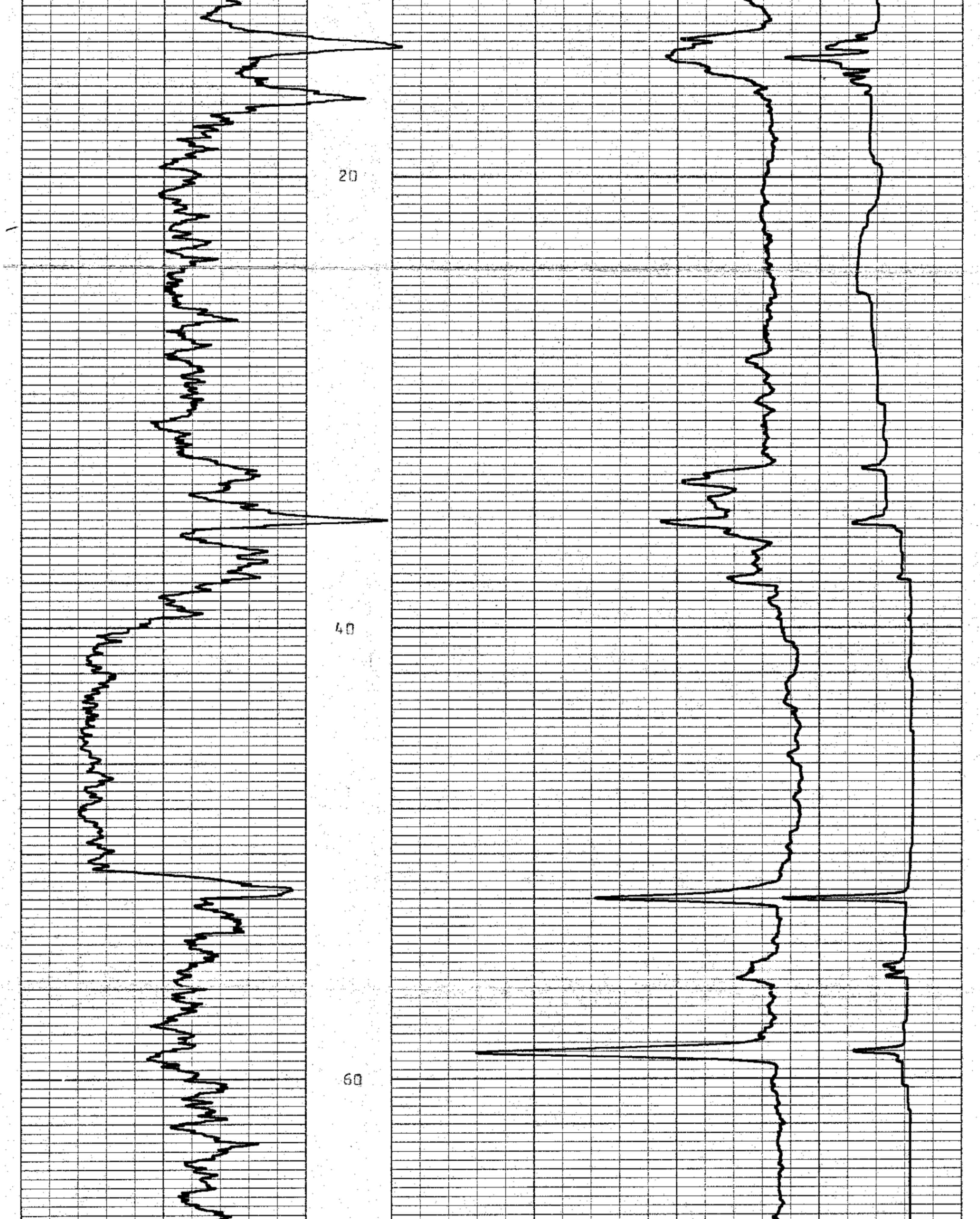
JIG No. 393 VALUE 553 @ 2" DIAM. JIG MARK SHOWN AT ABOVE VALUE =	JIG CAL DATE 29.11.81 JIG VALUE 10308 SDU @ 1.1 g/cm³ JIG No. water SPAN NORM $\frac{SDU}{CPS}$ = 5.99	7 ins 798 cps 3 ins 566 cps

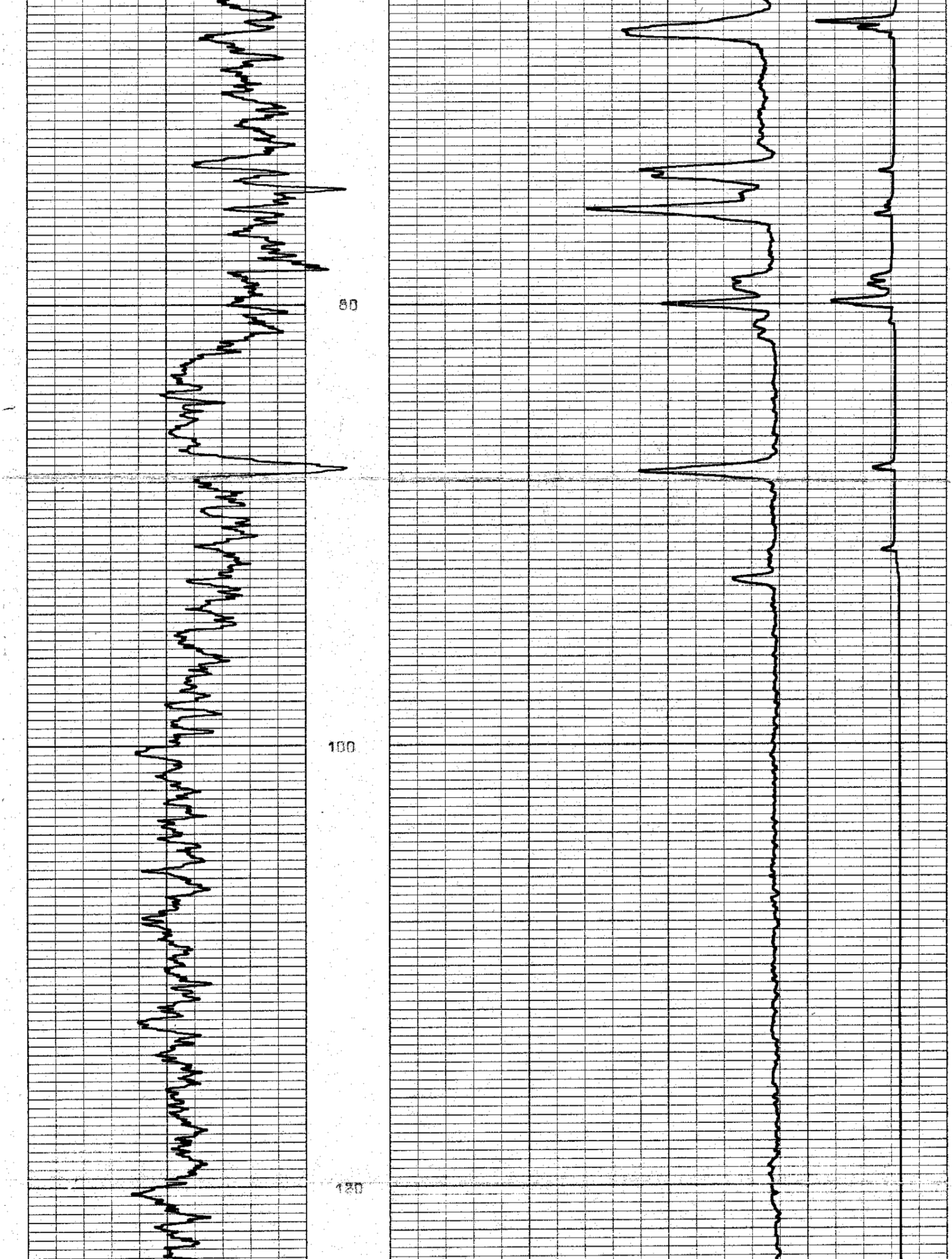
GAMMA RAY	DEPTH	COAL BULK DENSITY g/cm³	CALIPER INCHES

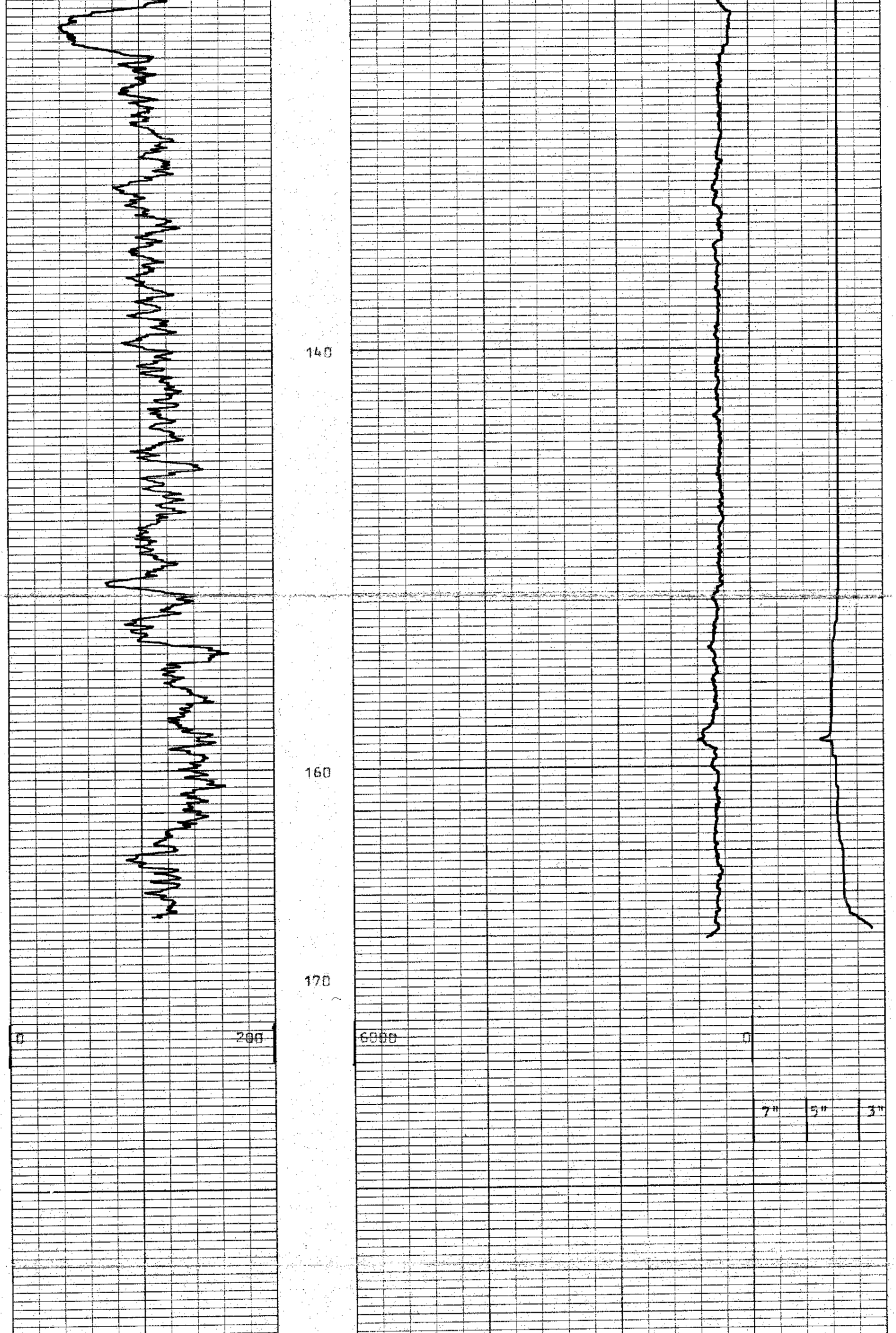
HOLE SIZE CORRECTION DATA











82-1769

5 cm

GENERAL LOG
RESISTIVITY

BOREHOLE CA/02
CLIENT MARATHON PETROLEUM

AREA CATAMARAN (TAS.)
COUNTRY AUSTRALIA
DATE LOGGED 1.12.81

DEPTH SCALE 200:1

2 OF 2 LOGS

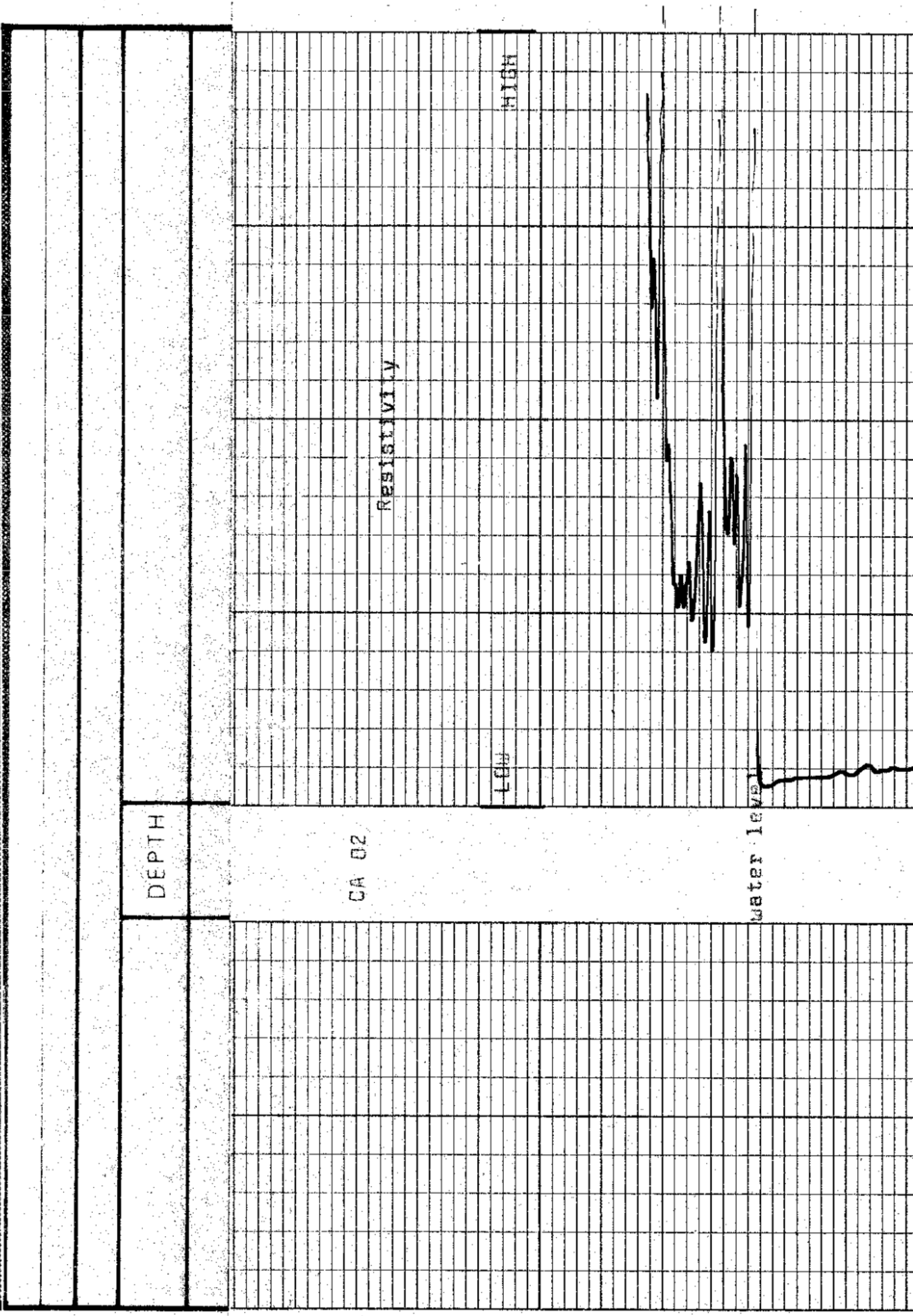
BOREHOLE DATA	REFER TO Lithology LOG
OPERATION DATA	REFER TO Lithology LOG

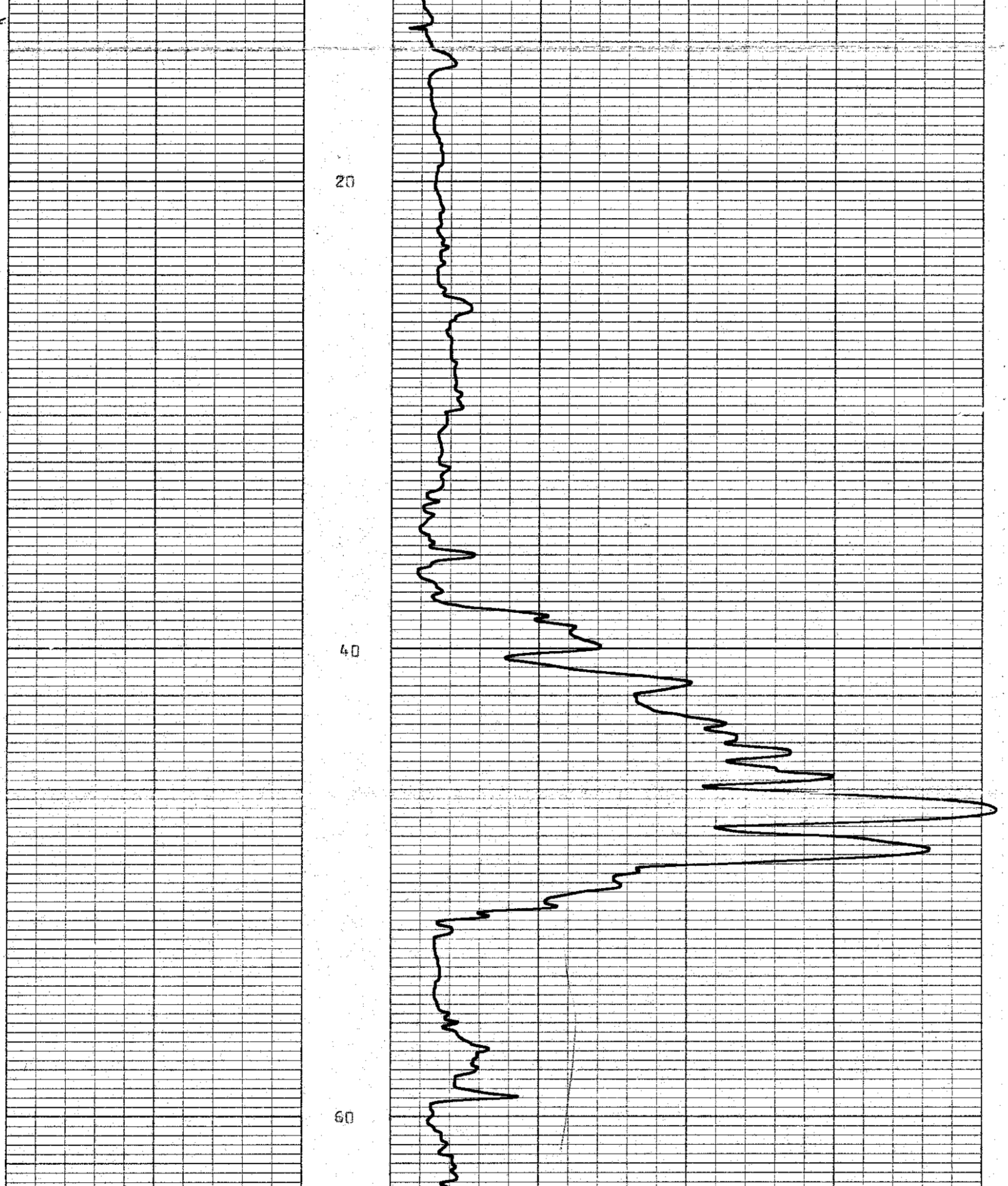
EQUIPMENT AND RECORDING DATA

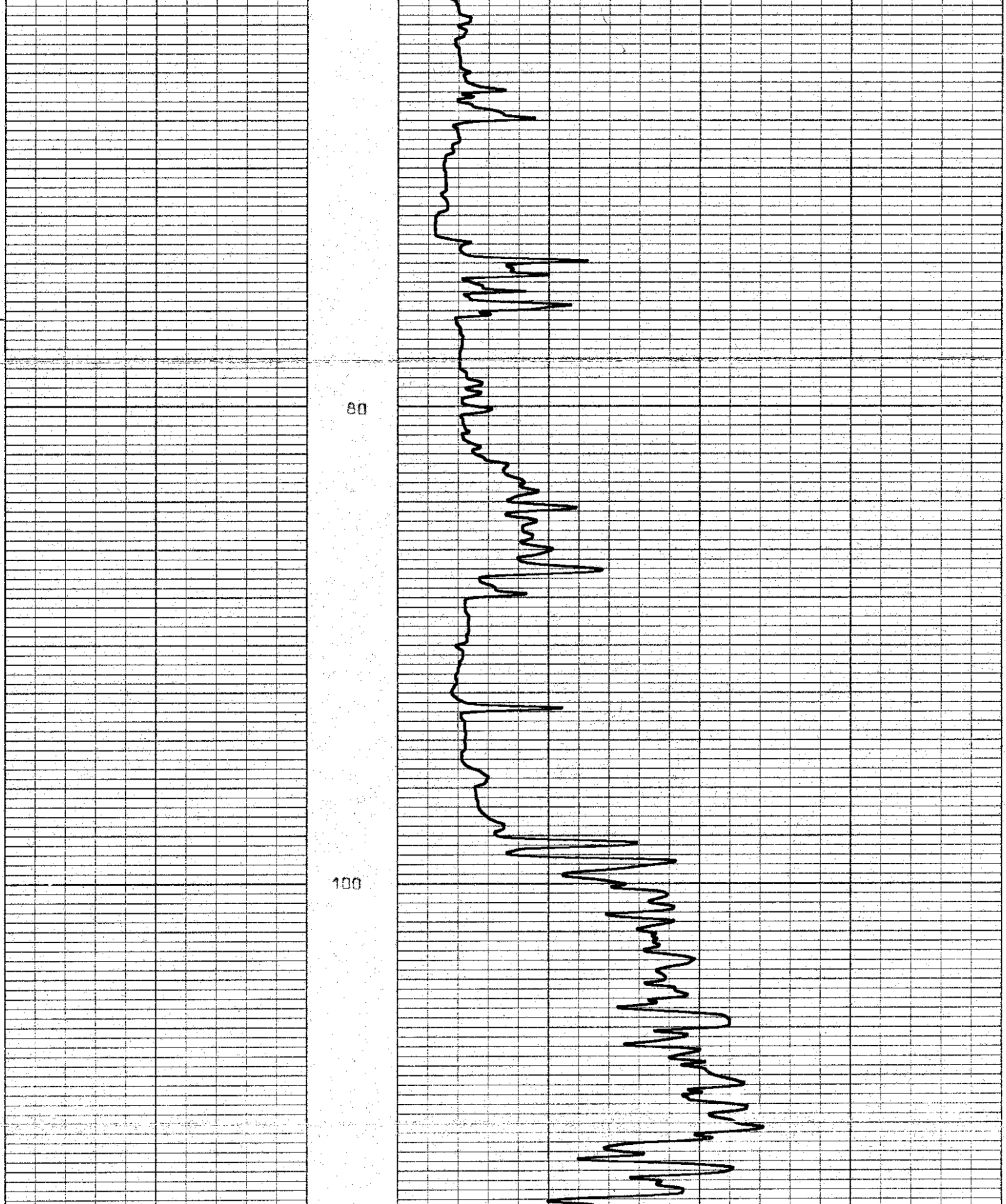
LOG	TAPING			PANEL			CAL COEFF
	LOG TAPED	RECORD SPEED	DIRECT or REPLAY	SPEED	T.C. SECS	NORM	
RES.	Y	9	D	9	1/3	-	
	SONDE NO	[illegible]	SOURCE NO	-			

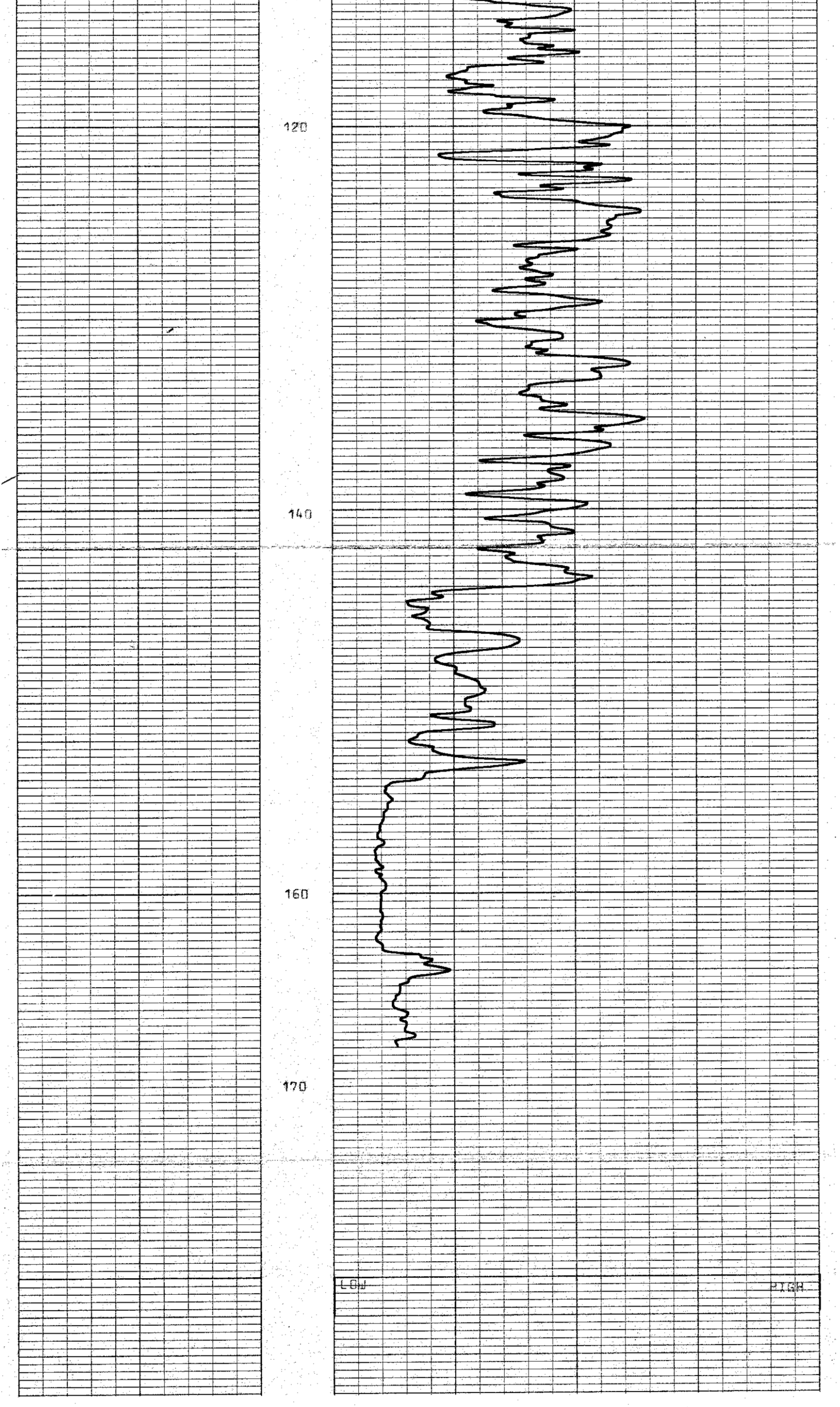
REMARKS

Interval logged - 168m
to 3m
165m









768024

82-1769

5 cm

BPB

BOREHOLE	CA 106
CLIENT	MARATHON

AREA	CATAMARAN
COUNTRY	AUSTRALIA
DATE LOGGED	26.2.82

DEPTH SCALE 200:1

1 OF 4 LOGS

←

COAL LITHOLOGY LOG

BOREHOLE DATA

PERMANENT DATUM	gl			
ELEVATION OF P D				
	B P B		DRILLER	
MEASUREMENTS FROM	gl		gl	
DEPTH REACHED	208.59m		234.16m	
CASING SHOE	144m			
BIT SIZES	1	HQ TO 144	2	NQ TO TD
	3	TO	4	TO
CASING SIZES	1	5" TO 33	2	HQ TO 144

FLUID DATA

NATURE	water
S G	1.00 gm/cc
LEVEL	Topped
VISCOSITY	
Rm at meas temp	
B H T	

SONDE TYPE

COAL
COMBINATION
SONDE

LOG SUITE

GAMMA RAY
L S DENSITY
CALIPER

OPERATION DATA

FIRST READING	208m
LAST READING	1m
INTERVAL LOGGED	207m
UNIT-TRUCK No	V309/#39
ENGINEER	W.Penrose
WITNESS	

EQUIPMENT AND RECORDING DATA

COAL COMBINATION SONDE 1638

LOG	EQUIPMENT			TAPING			PANEL			CAL COEFF	DEPTHS			SEAM LOG RUN
	SONDE	SOURCE	CALIBRATOR	LOG TAPED	RECORD SPEED	DIRECT or REPLAY	SPEED	T C SECS	NORM		FROM	TO	INTERVAL	
GAMMA RAY	1638		393	Y	9.2	D	9.2	1.5	1.59		207	1	206	Y
L S DENSITY	SIDEWALL POSITION	5054	water	"	"	"	"	1/3,1	6.24		208	2	206	"
CALIPER			-	"	"	"	"	1	-		208	1	207	"

COAL QUALITY/SEAM THICKNESS LOG INTERVALS (Refer to relevant log)

FROM	192m	136m	INTERVAL TOTAL
TO	182m	130m	
INTERVAL	10m	6m	

ADDITIONAL SONDES RUN

SONDE	LOG	GENERAL SCALE LOG	DETAIL SCALE LOG
R	RES.	Y	N

REFER TO ADDITIONAL HEADINGS

REMARKS

Run one - logged 12/2/82

Run two - logged 26/2/82 through HQ casing.

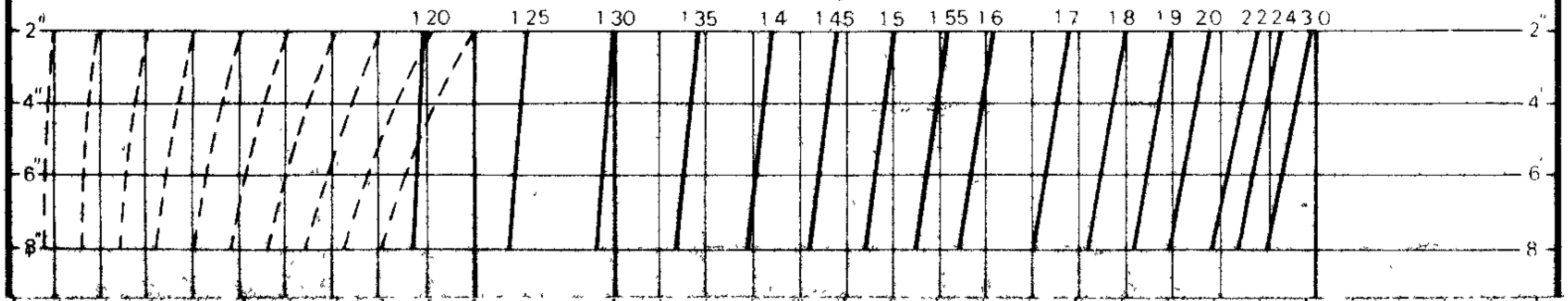
B P B COAL LITHOLOGY LOG

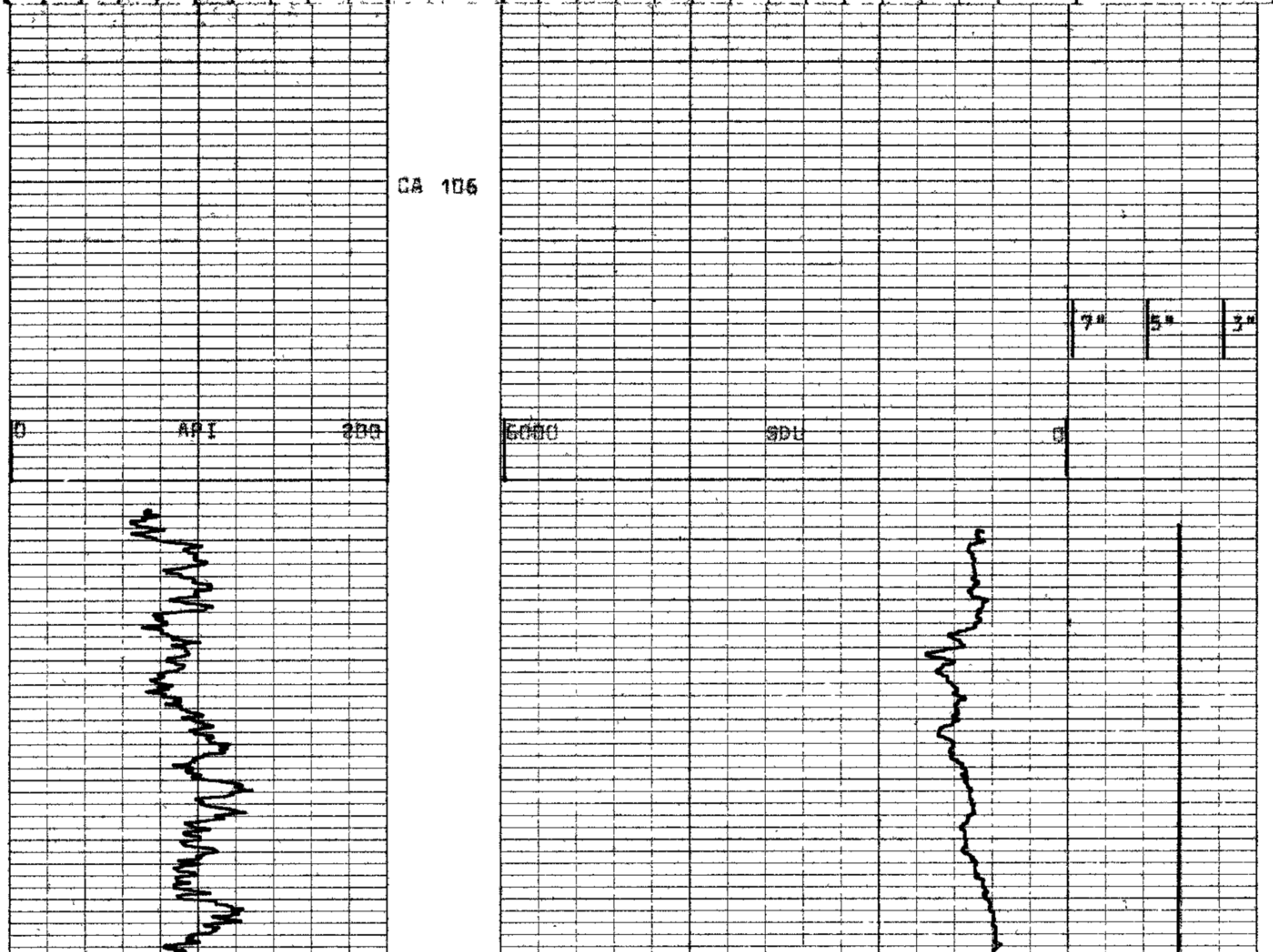
CALIBRATION DATA

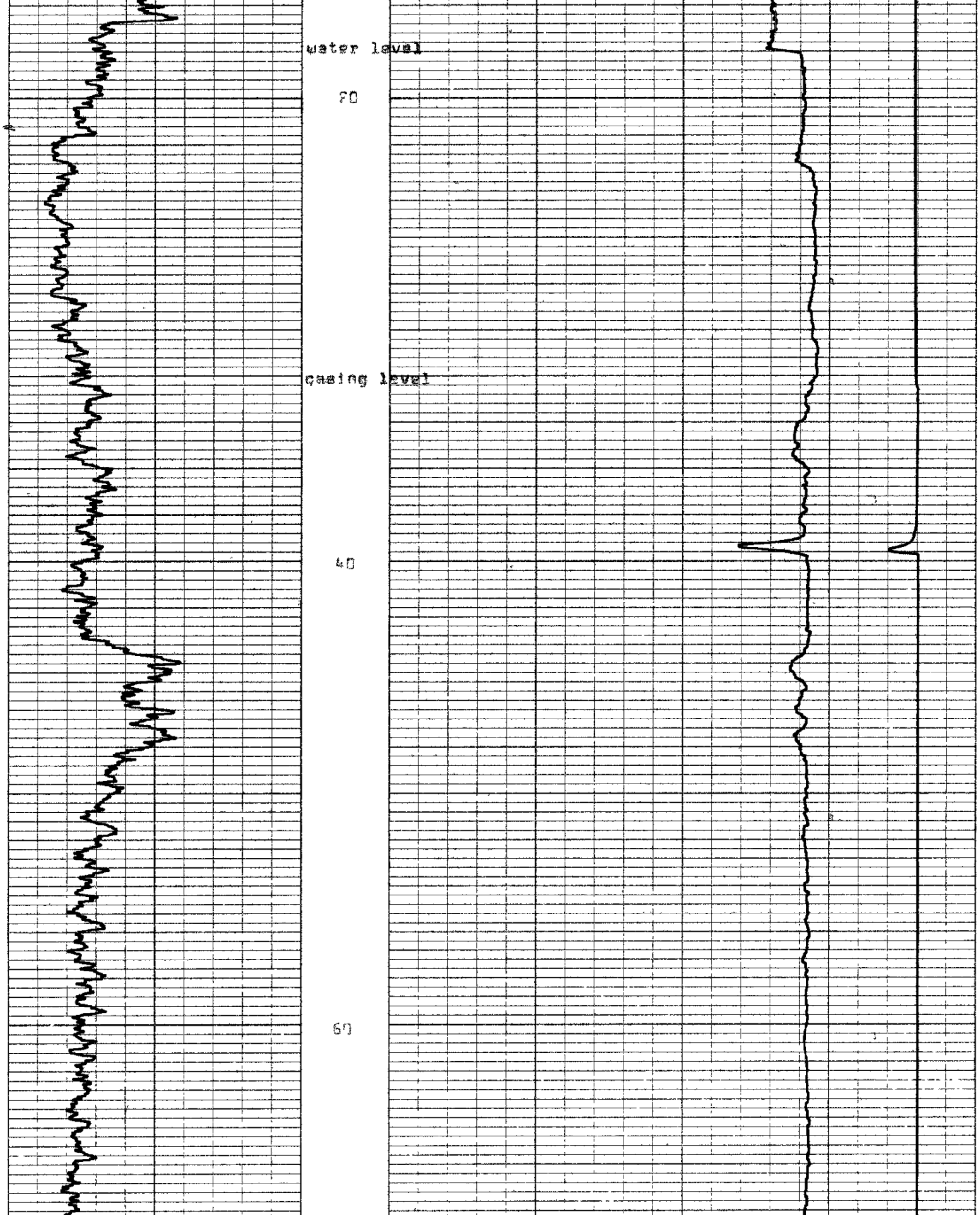
JIG No 393 VALUE 553 @ 2" DIAM		JIG CAL DATE 21.2.82 JIG VALUE 10300 SDU @ 1.1 g/cm^3	7 ins 791 cps
JIG MARK SHOWN AT ABOVE VALUE –		JIG No water SPAN NORM $\frac{SDU}{CPS}$ = 5.98	3 ins 569 cps

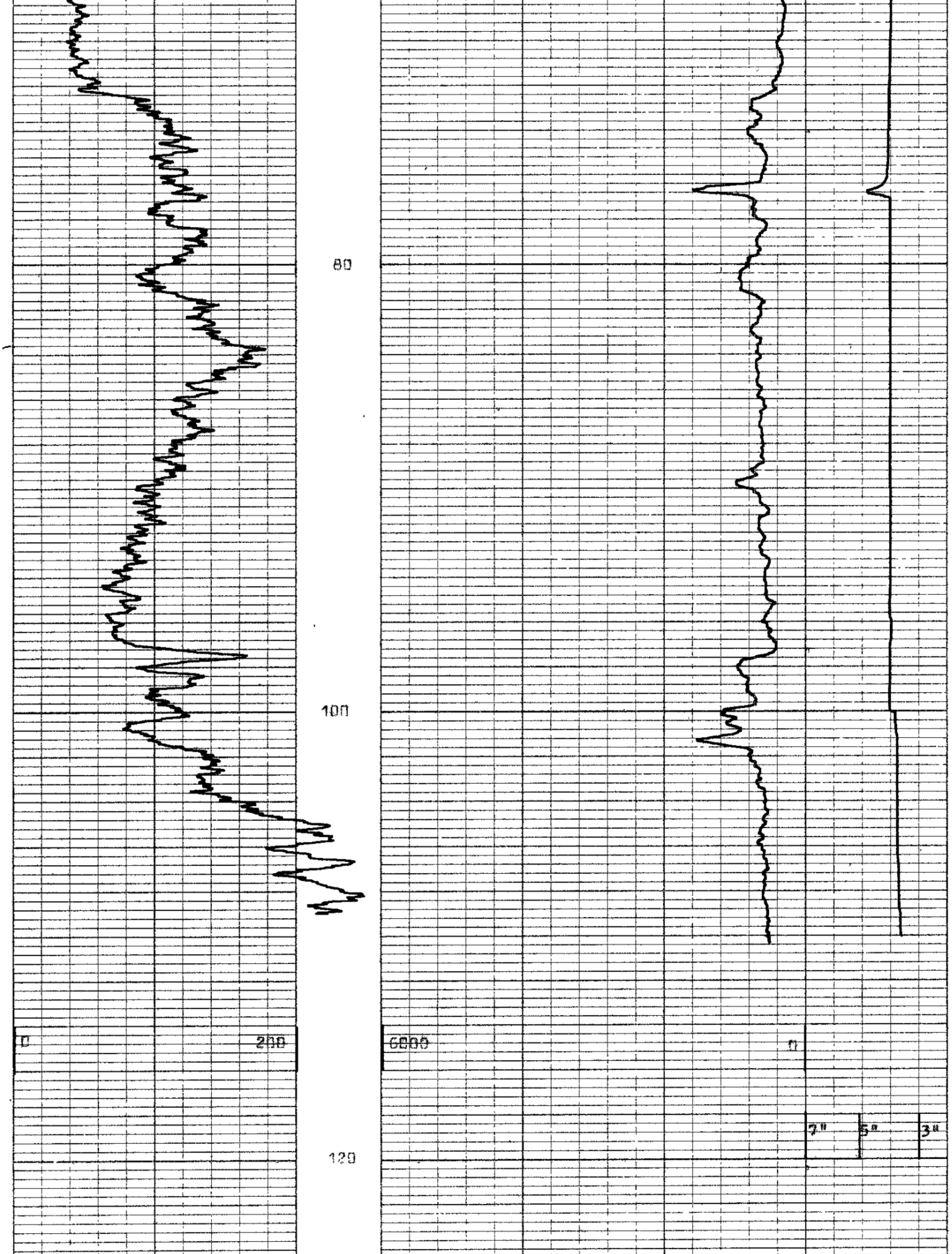
GAMMA RAY	DEPTH	COAL BULK DENSITY g/cm^3	CALIPER INCHES

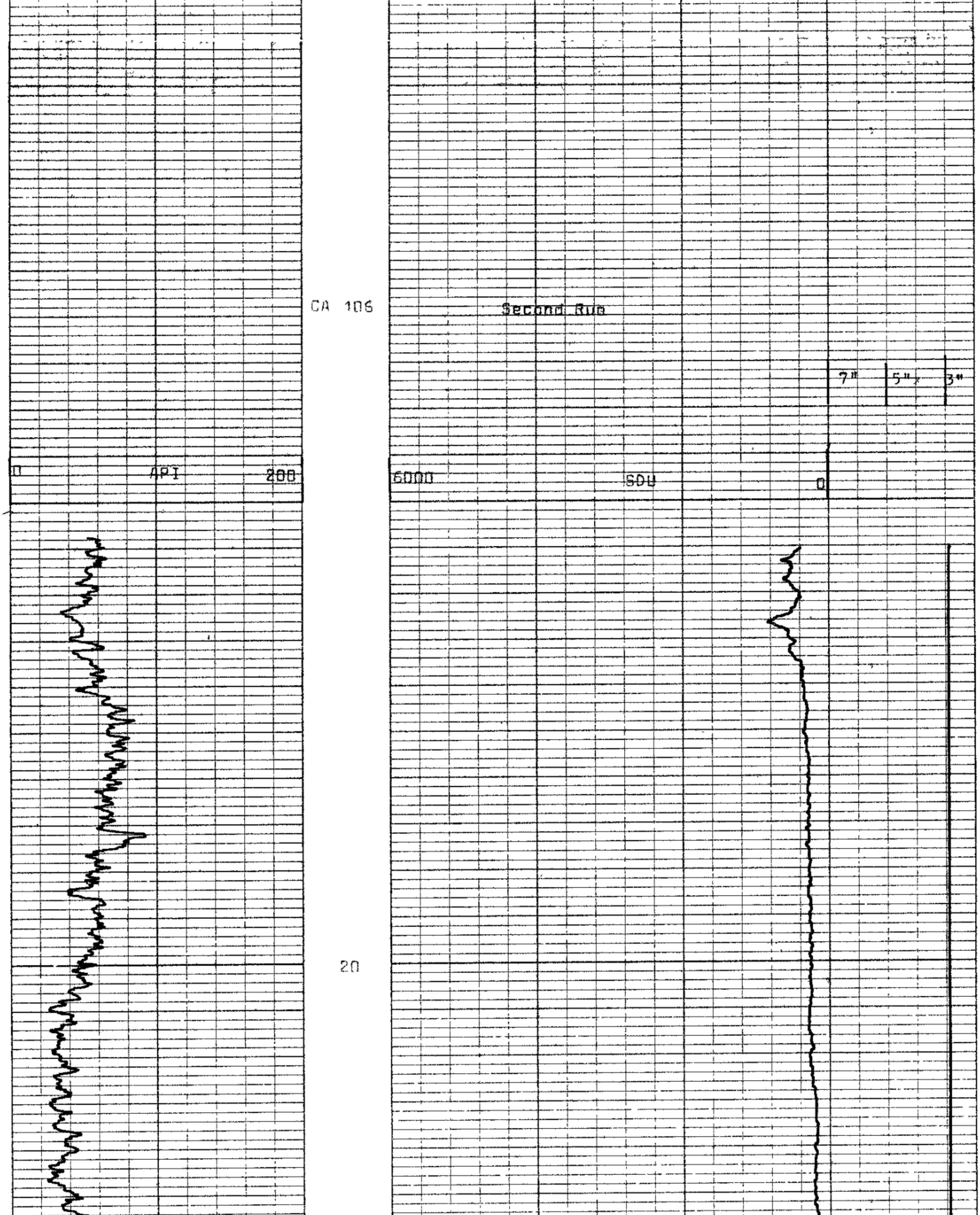
HOLE SIZE CORRECTION DATA

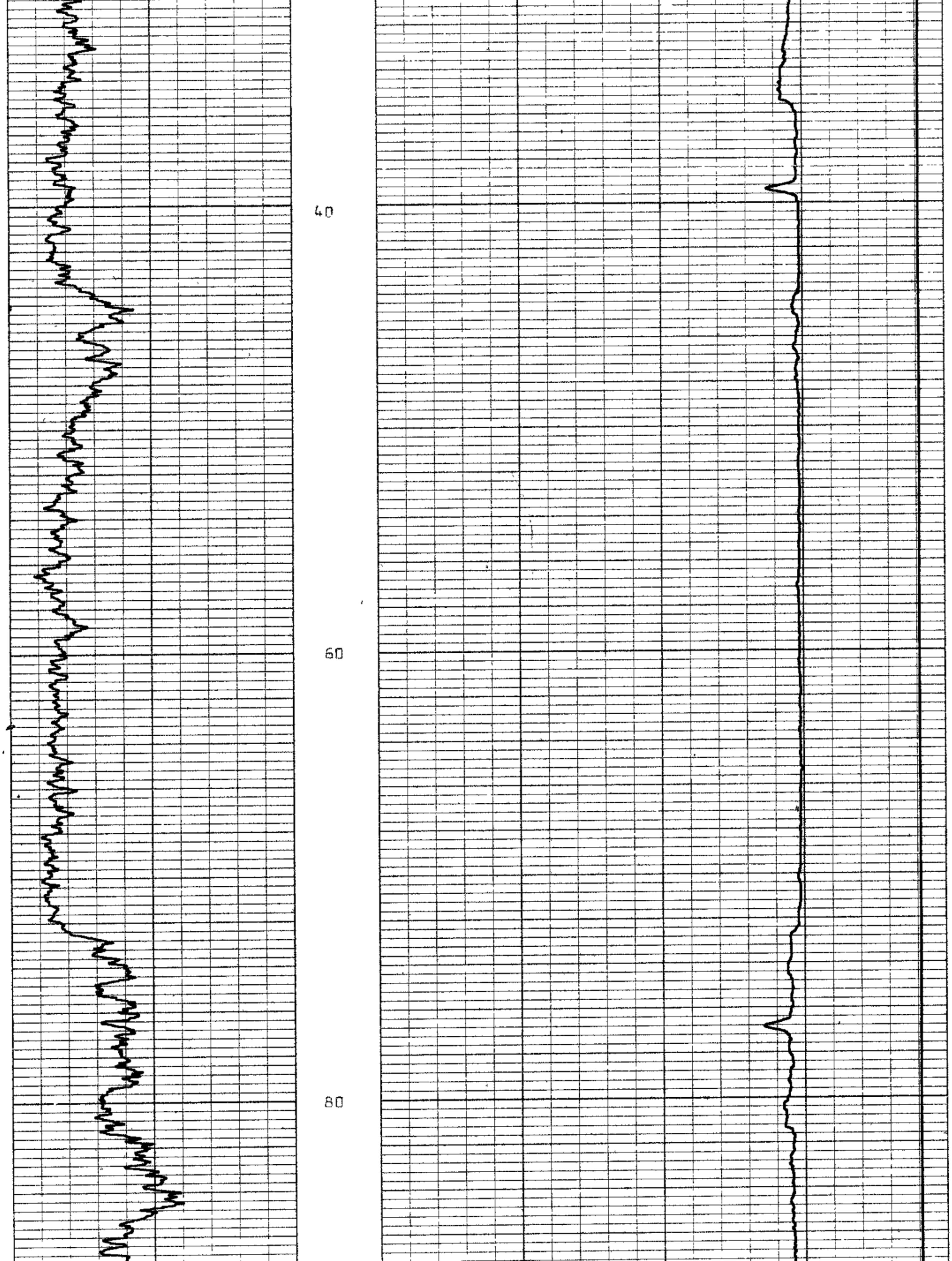


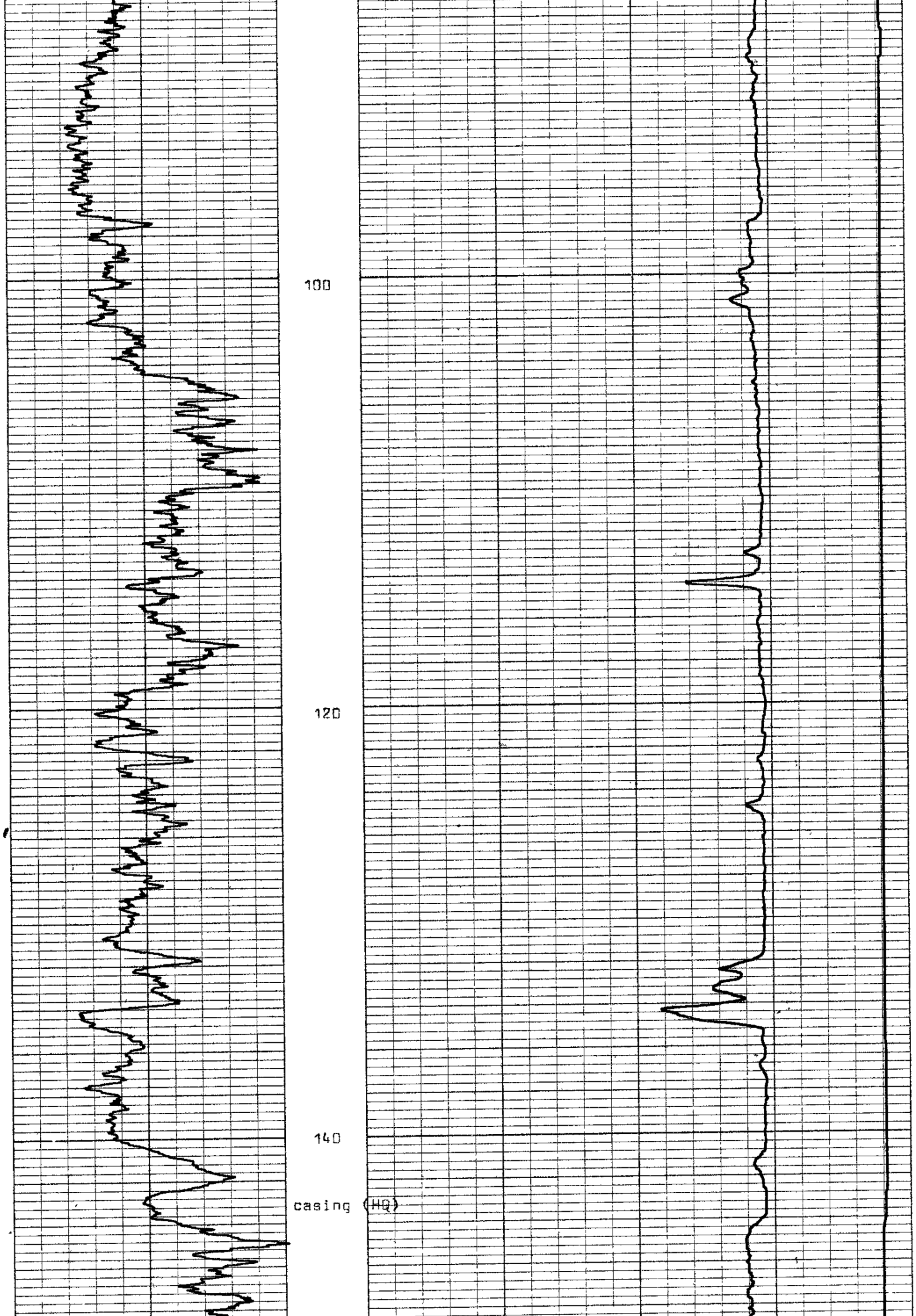


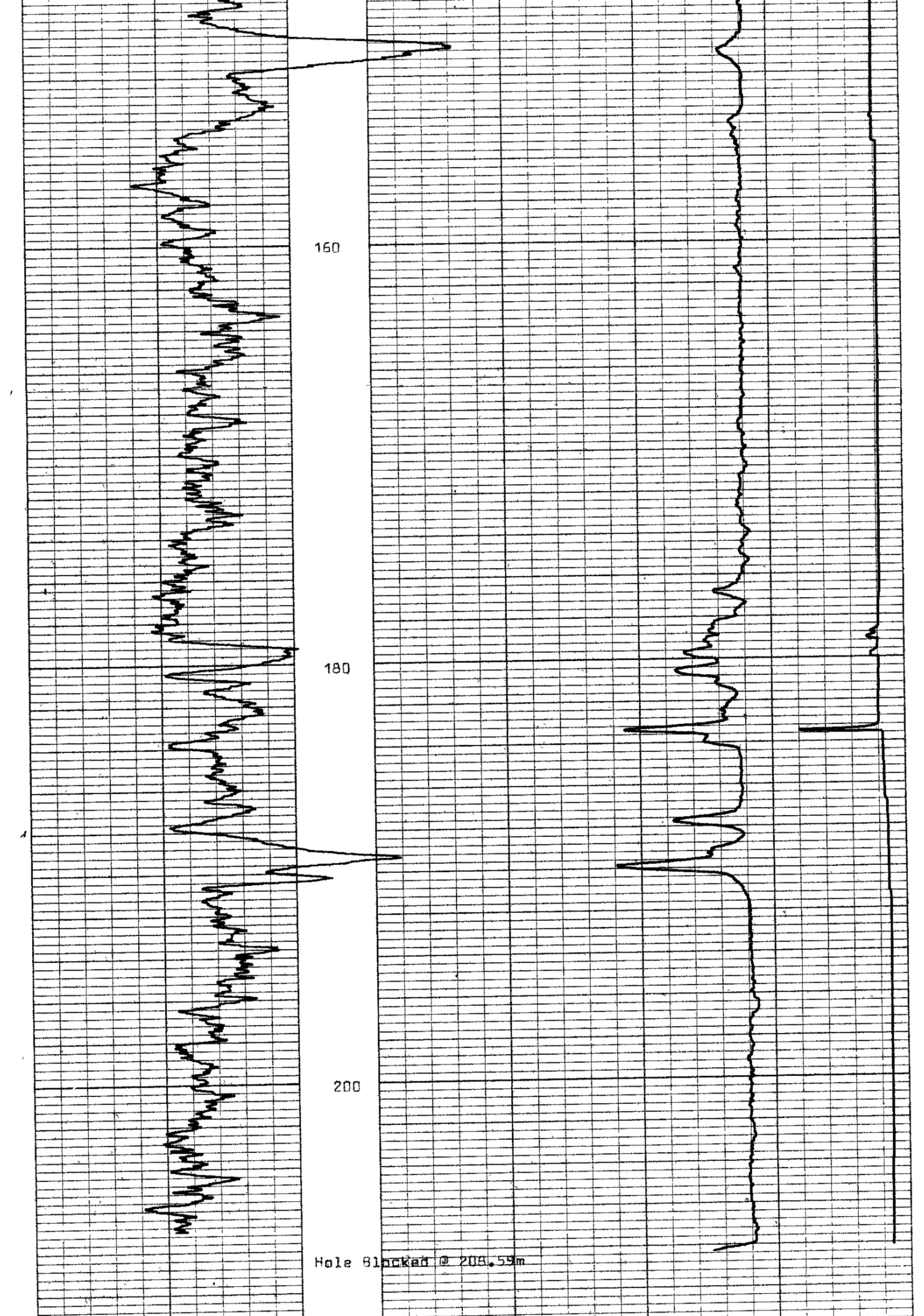




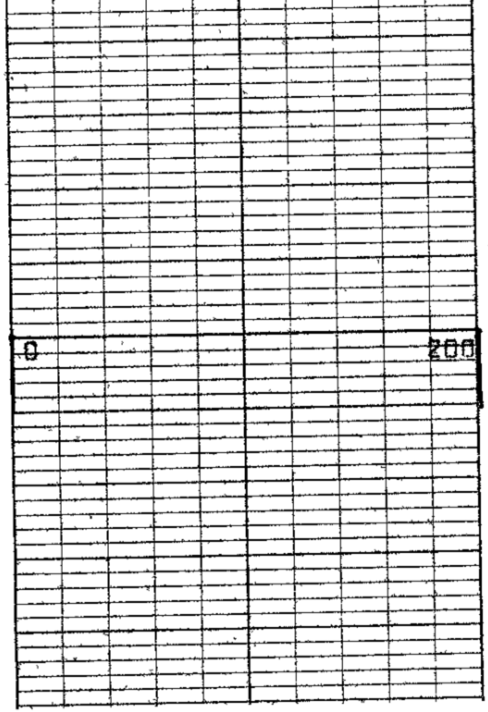


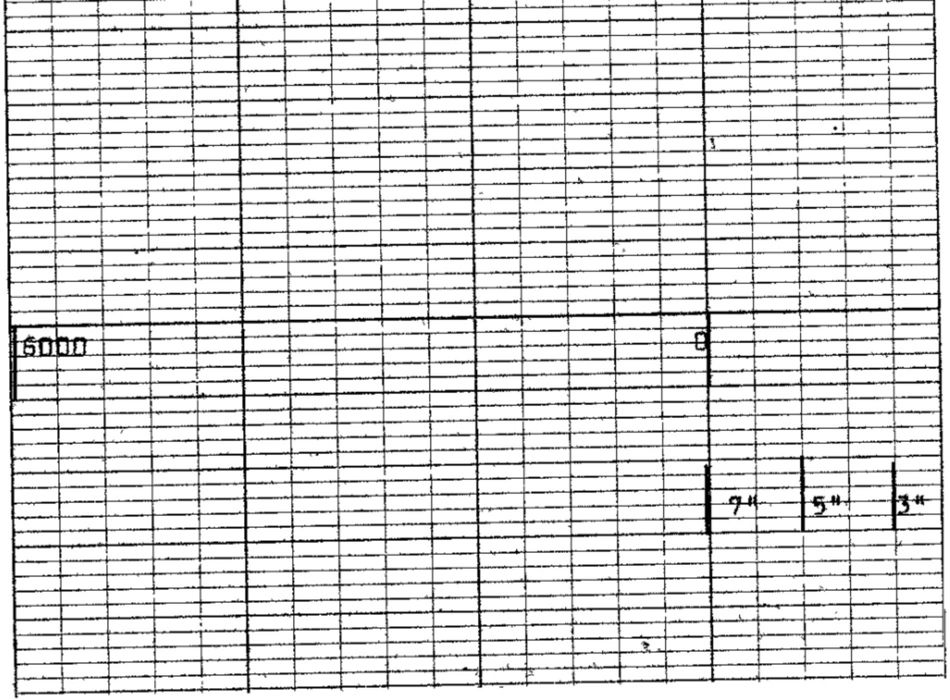






Hole Blocked @ 208.59m





117

768025

82-1769

5 cm

BPB

COAL QUALITY LOG

BOREHOLE	CA 106
CLIENT	MARATHON

AREA	CATAMARAN
COUNTRY	AUSTRALIA
DATE LOGGED	26.2.82

DEPTH SCALE
200:1

2 OF 4 LOGS

BOREHOLE DATA	REFER TO LITHOLOGY LOG
OPERATION DATA	REFER TO LITHOLOGY LOG

EQUIPMENT AND RECORDING DATA

COAL COMBINATION SONDE 1638

SIDEWALL POSITION

LOG	TAPING			PANEL			CAL COEFF
	LOG TAPED	RECORD SPEED	DIRECT or REPLAY	SPEED	T C SECS	NORM	
GAMMA RAY	Y	Z	R	3	1	1.59	
LS DENSITY	"	"	"	"	"	5.96	

SOURCE SONDE AND CALIBRATION

REFER TO LITHOLOGY LOG

COAL QUALITY LOG INTERVALS

FROM	192m	136m
TO	182m	130m
INTERVAL	10m	6m

FROM		INTER-VAL TOTAL
TO		
INTERVAL		= 16m

REMARKS

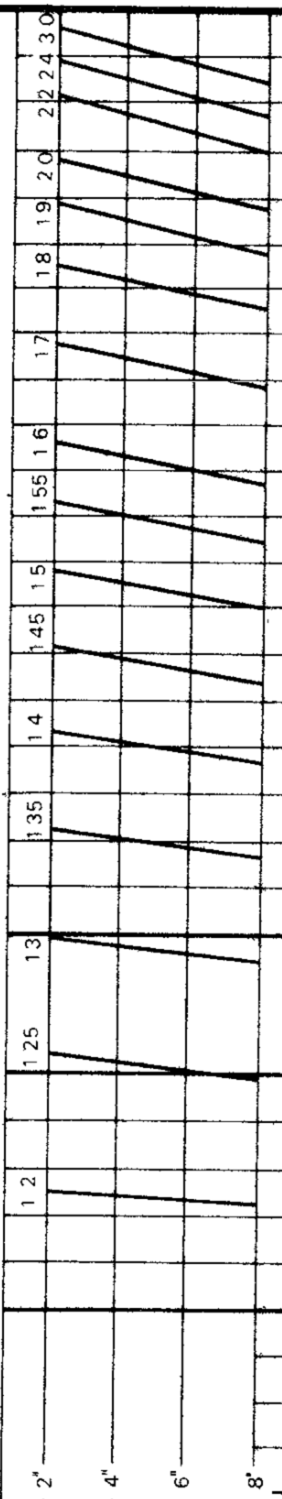
SONDE TYPE
COAL
COMBINATION
SONDE

LOG SUITE
GAMMA RAY
L S DENSITY

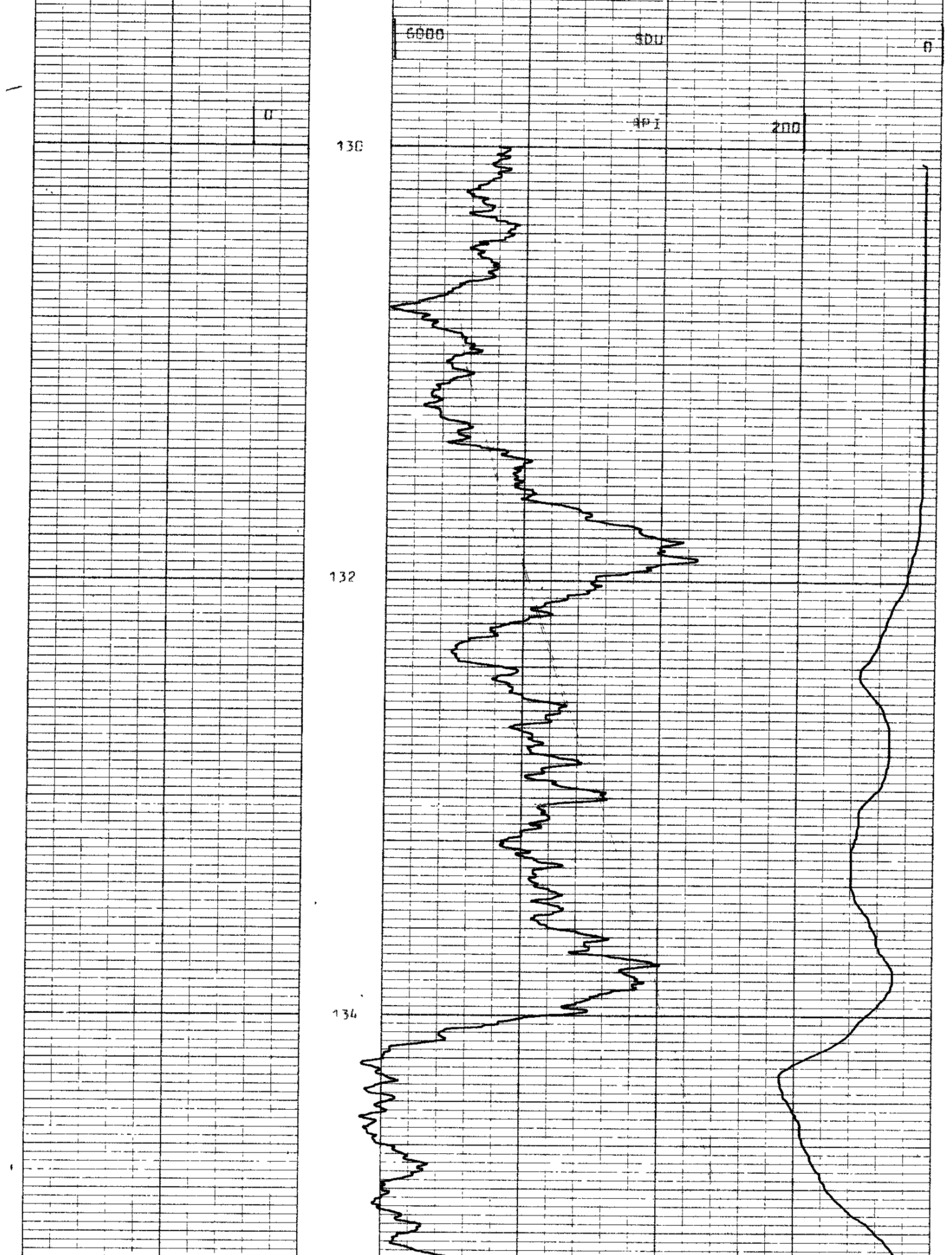
BPB COAL QUALITY LOG

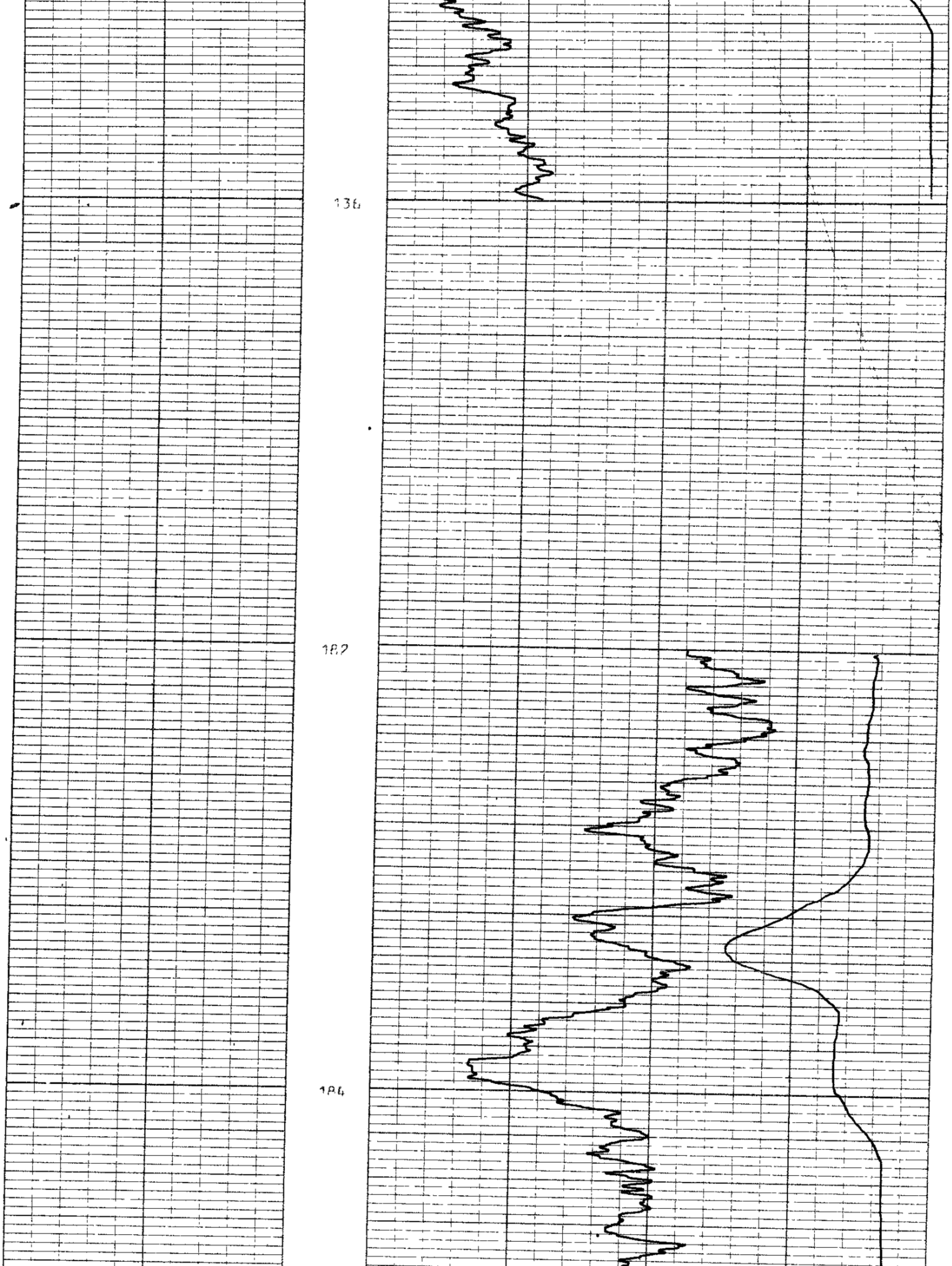
	DEPTH	GAMMA RAY
		COAL BULK DENSITY g/cm3

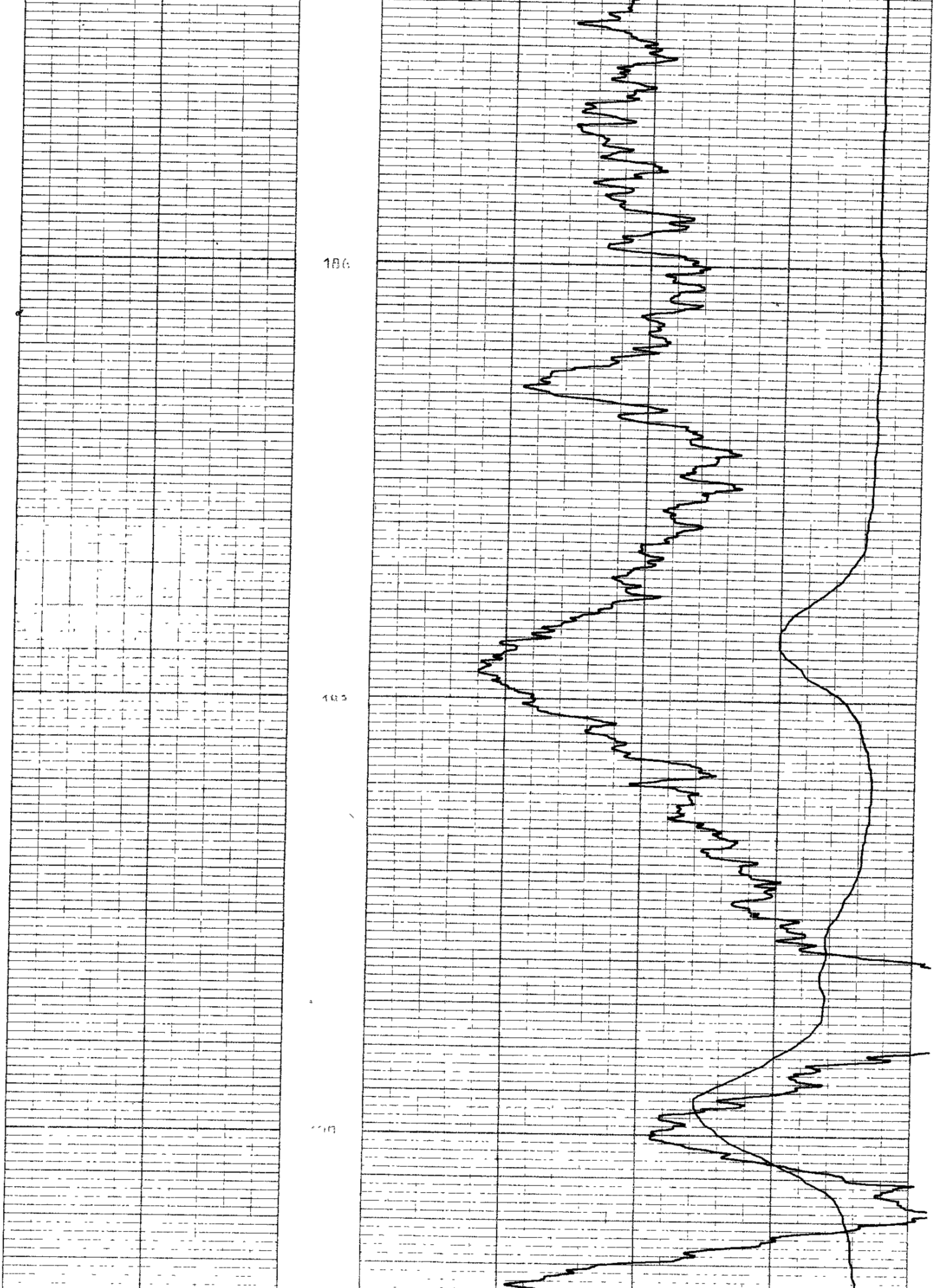
HOLE SIZE CORRECTION DATA

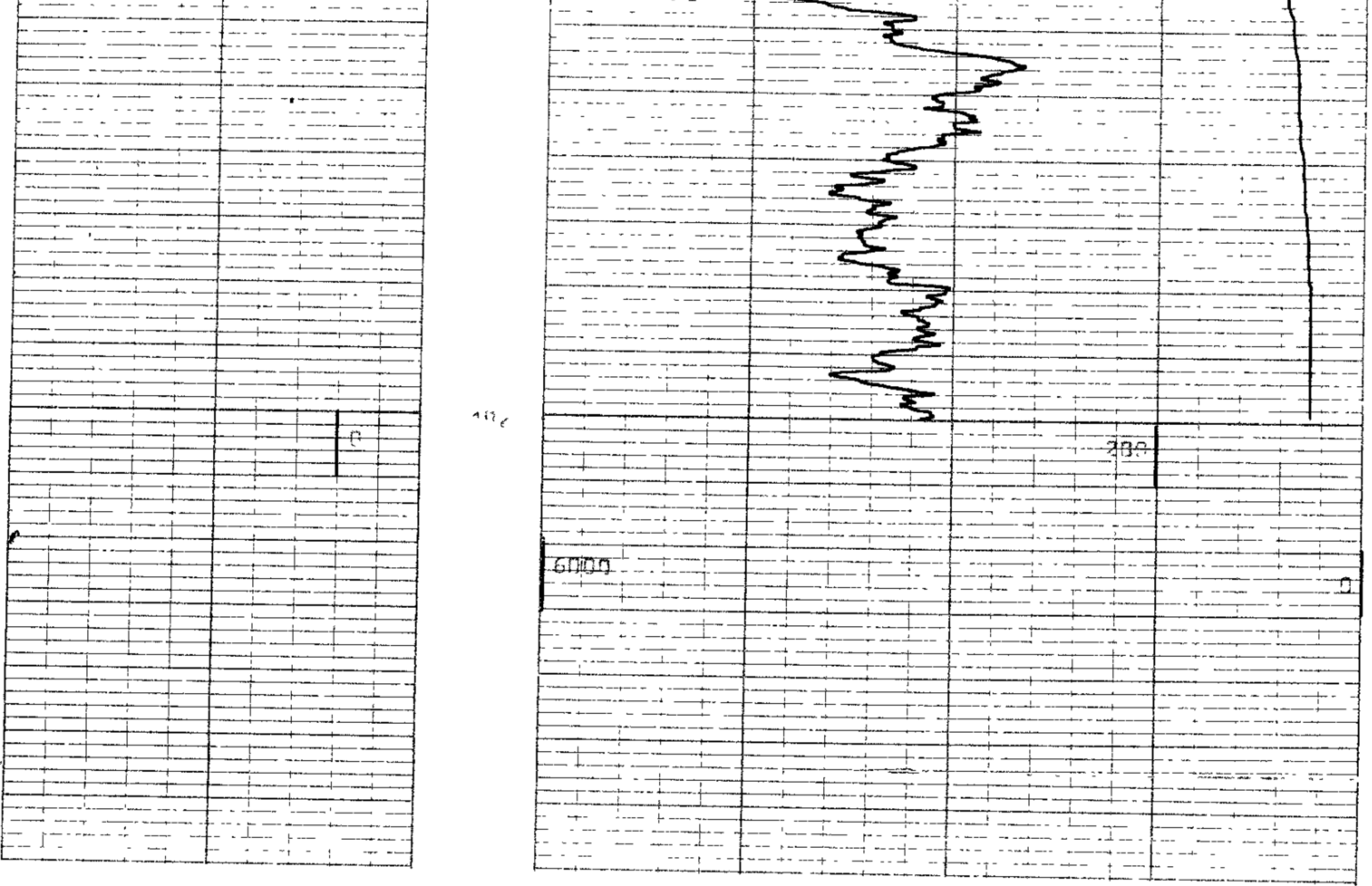


CA 1[illegible]









768026

82-1769

5 cm

SEAM THICKNESS LOG

BOREHOLE CA 106
CLIENT MARATHON

AREA CATAMARAN
COUNTRY AUSTRALIA
DATE LOGGED 26.2.82

DEPTH SCALE

3 OF 4 LOGS

SONDE TYPE
COAL
COMBINATION
SONDE

LOG SUITE
CALIPER
B R DENSITY

BOREHOLE DATA	REFER TO LITHOLOGY LOG
OPERATION DATA	REFER TO LITHOLOGY LOG

EQUIPMENT AND RECORDING DATA

COAL COMBINATION SONDE 1538
SIDEWALL POSITION

LOG	TAPING			PANEL			CAL COEFF
	LOG TAPED	RECORD SPEED	DIRECT or REPLAY	SPEED	TC SECS	NORM	
CALIPER	Y	2	R	3	1	-	
B R DENSITY	"	"	"	"	1/3	5.26	

SOURCE SONDE AND CALIBRATION
REFER TO LITHOLOGY LOG

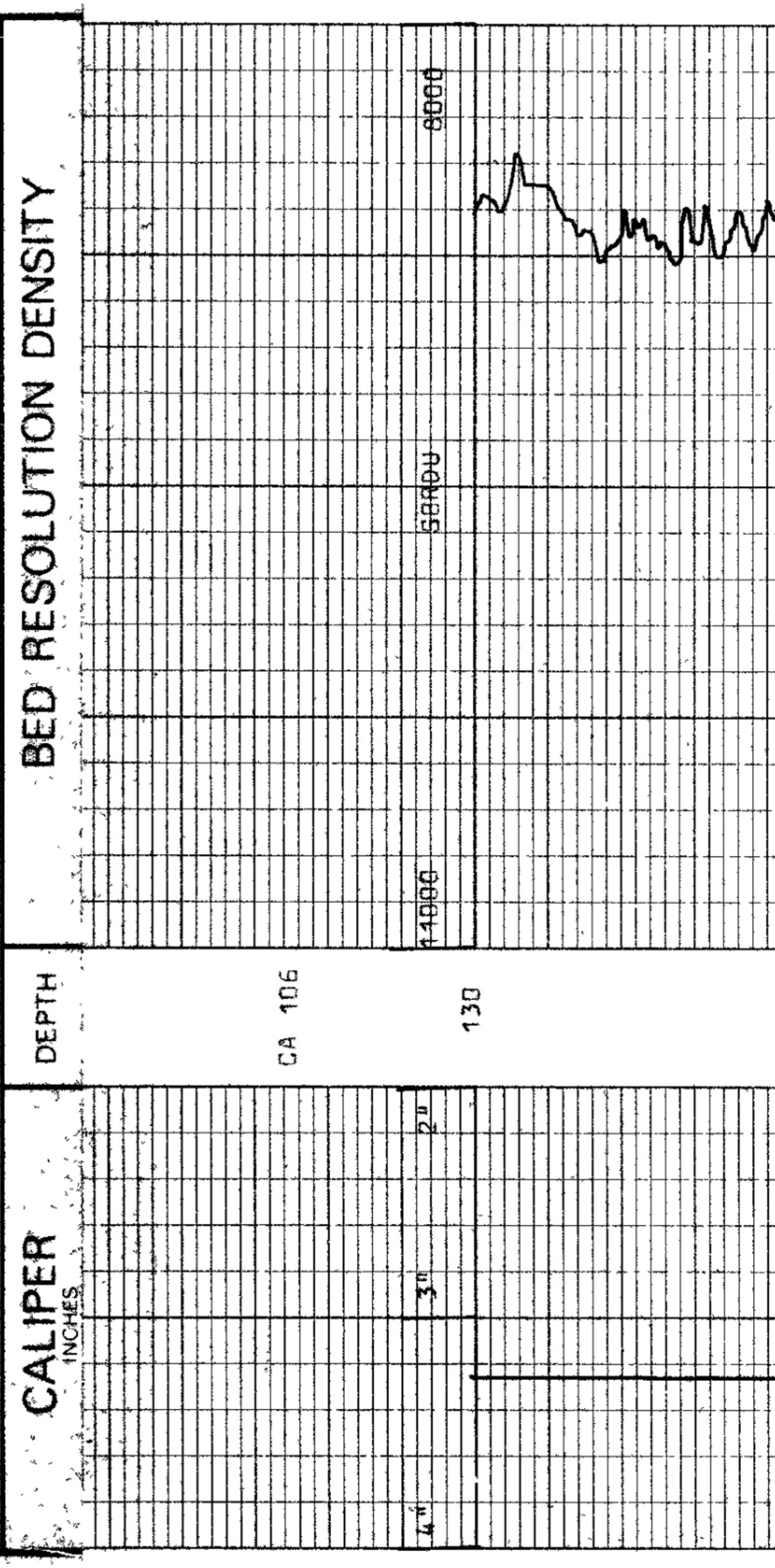
SEAM THICKNESS LOG INTERVALS

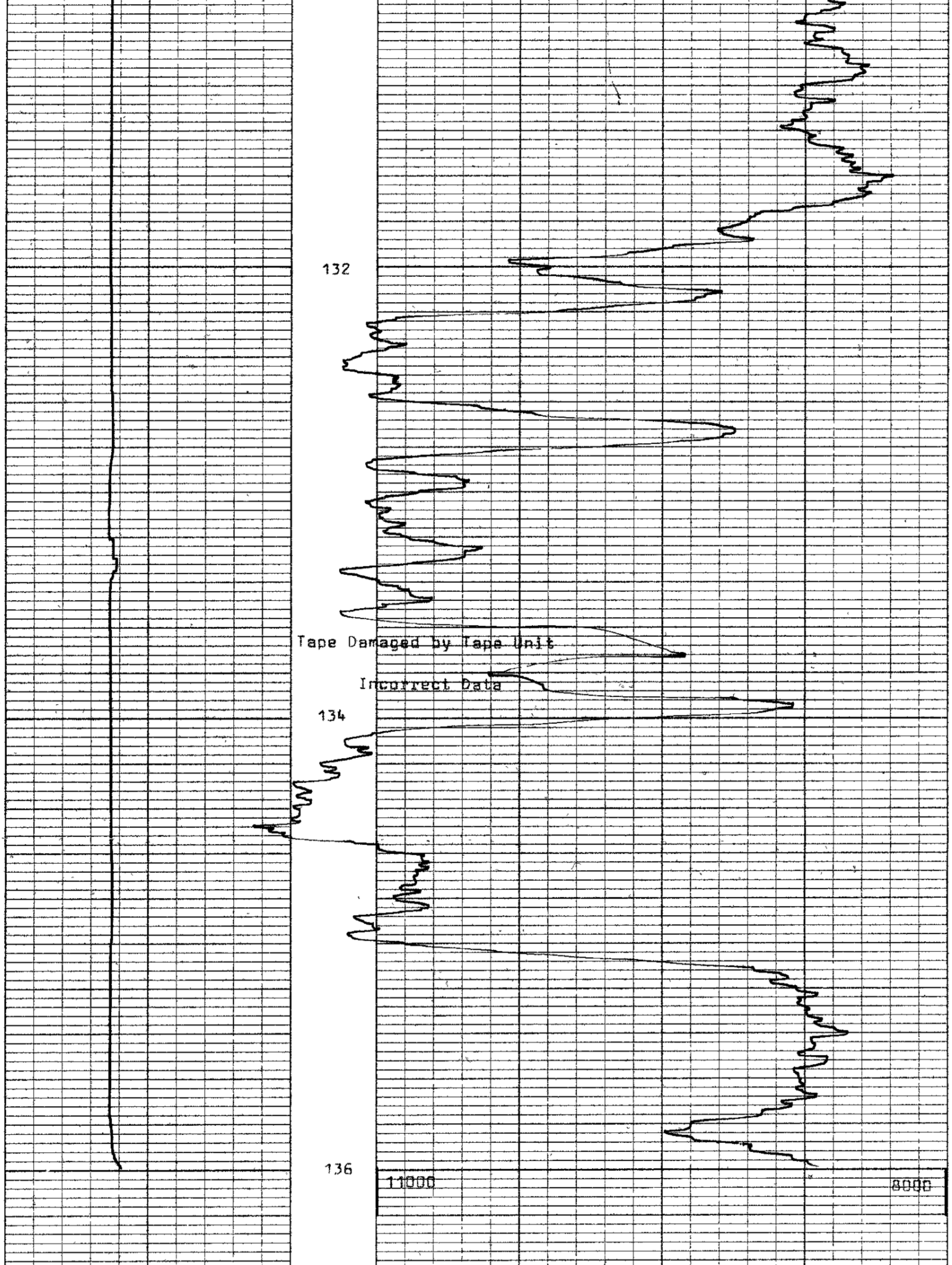
FROM	192m	136m	
TO	182m	130m	
INTERVAL	10m	6m	
FROM			INTERVAL
TO			TOTAL
INTERVAL			=

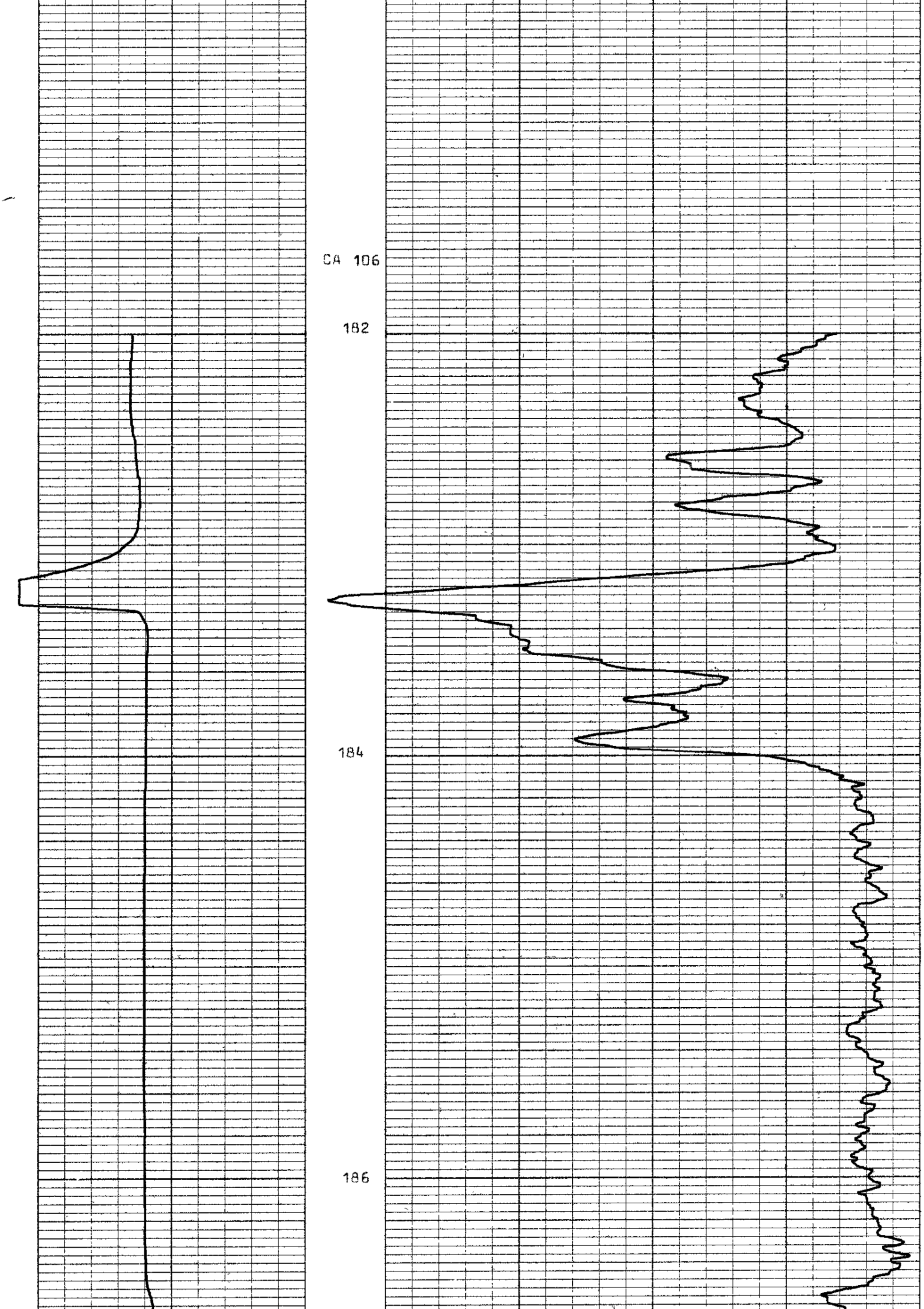
REMARKS

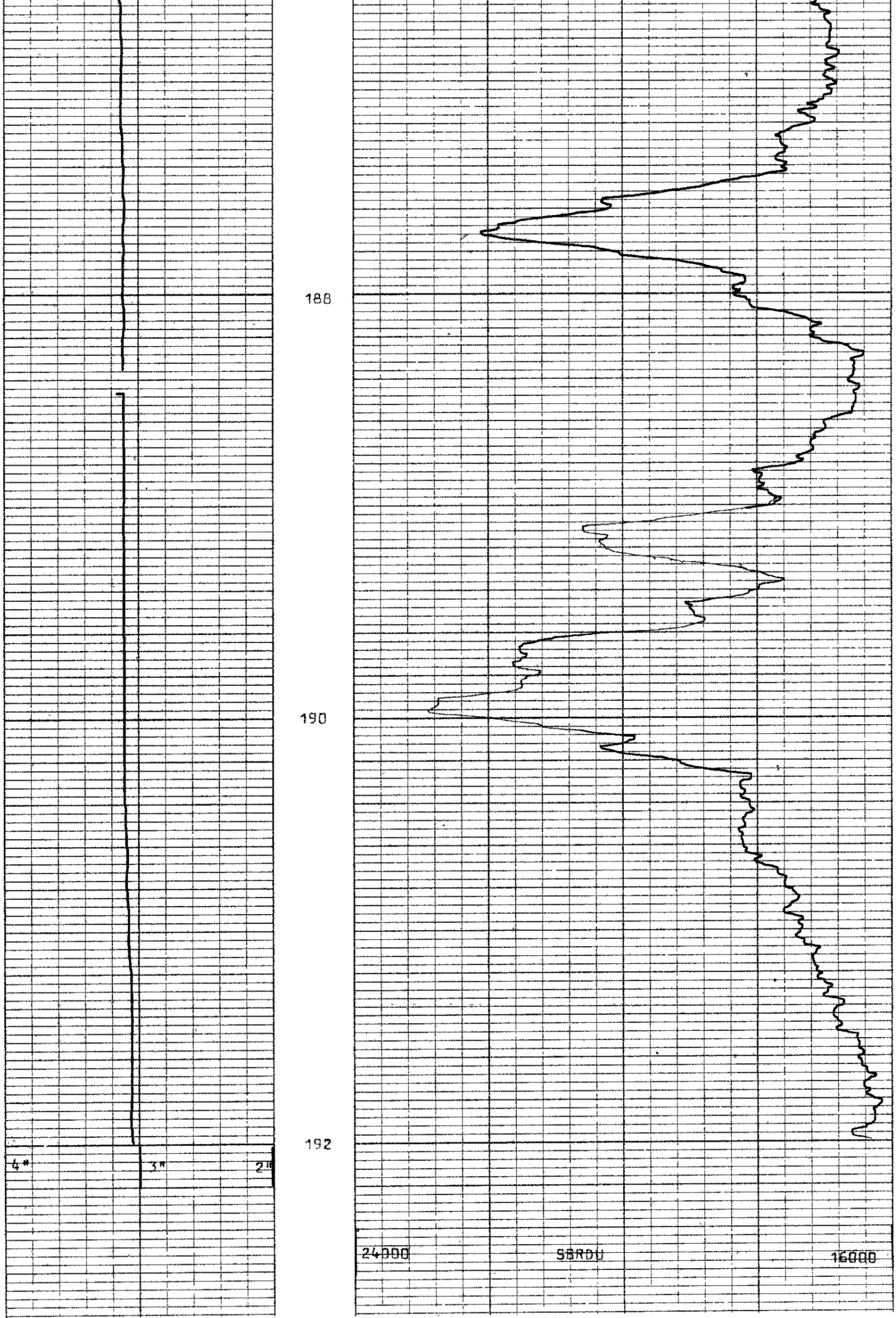
Top seam logged through
HQ casing.

B P B SEAM THICKNESS LOG









76802

5 cm

82-1769

GENERAL LOG
RESISTIVITY

BOREHOLE CA 106
CLIENT MARATHON

AREA CATAMARAN
COUNTRY AUSTRALIA
DATE LOGGED 26.2.82

DEPTH SCALE 200:1

4 OF 4 LOGS

BOREHOLE DATA	REFER TO Lithology LOG	
OPERATION DATA	REFER TO Lithology LOG	

EQUIPMENT AND RECORDING DATA

LOG	TAPING			PANEL			CAL COEFF
	LOG TAPED	RECORD SPEED	DIRECT or REPLAY	SPEED	T C SECS	NORM	
RES.	Y	9	D	9	1	-	
	SONDE NO	R	SOURCE NO	-			

REMARKS

Interval logged 208m
1m
207m

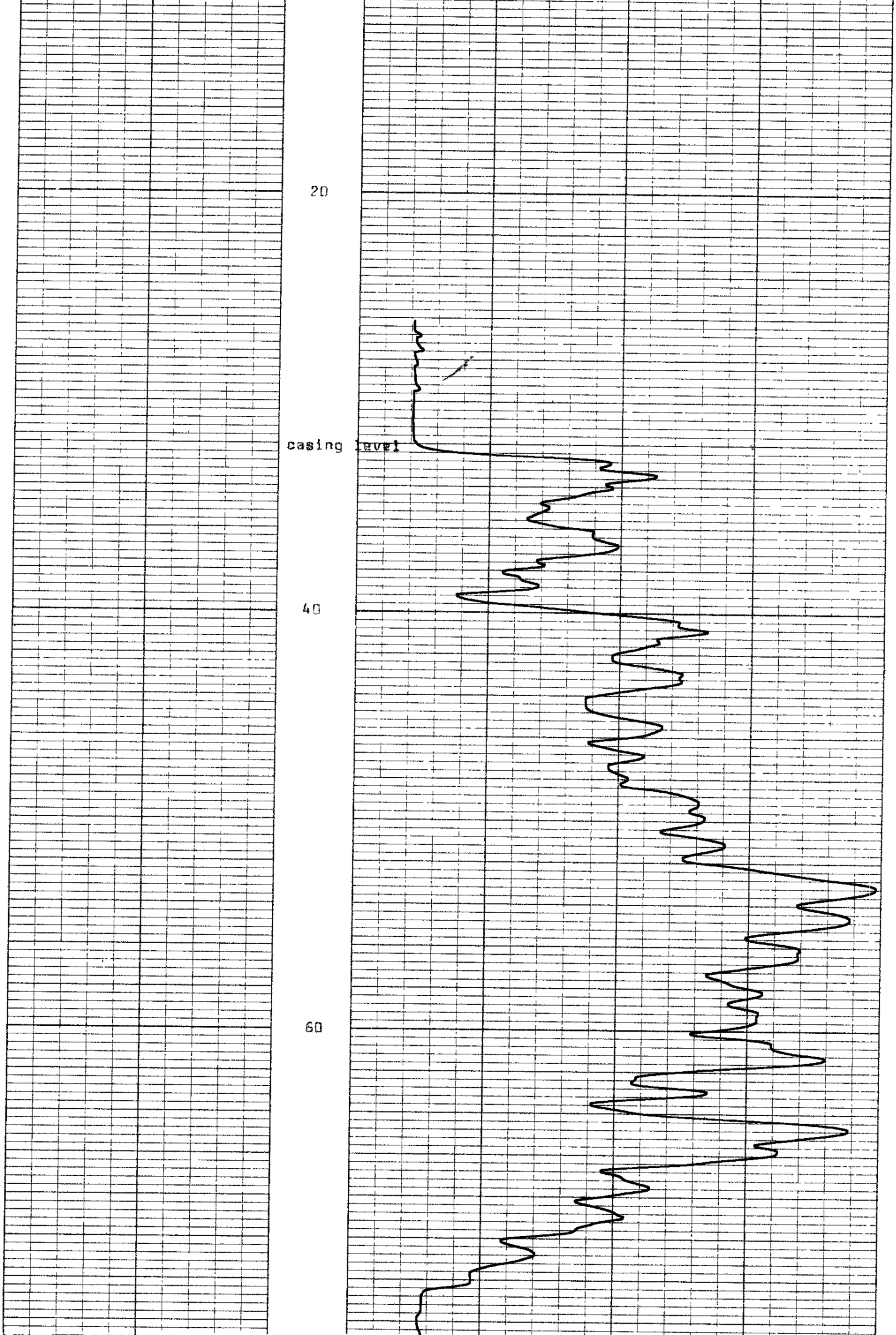
DEPTH

CA 106

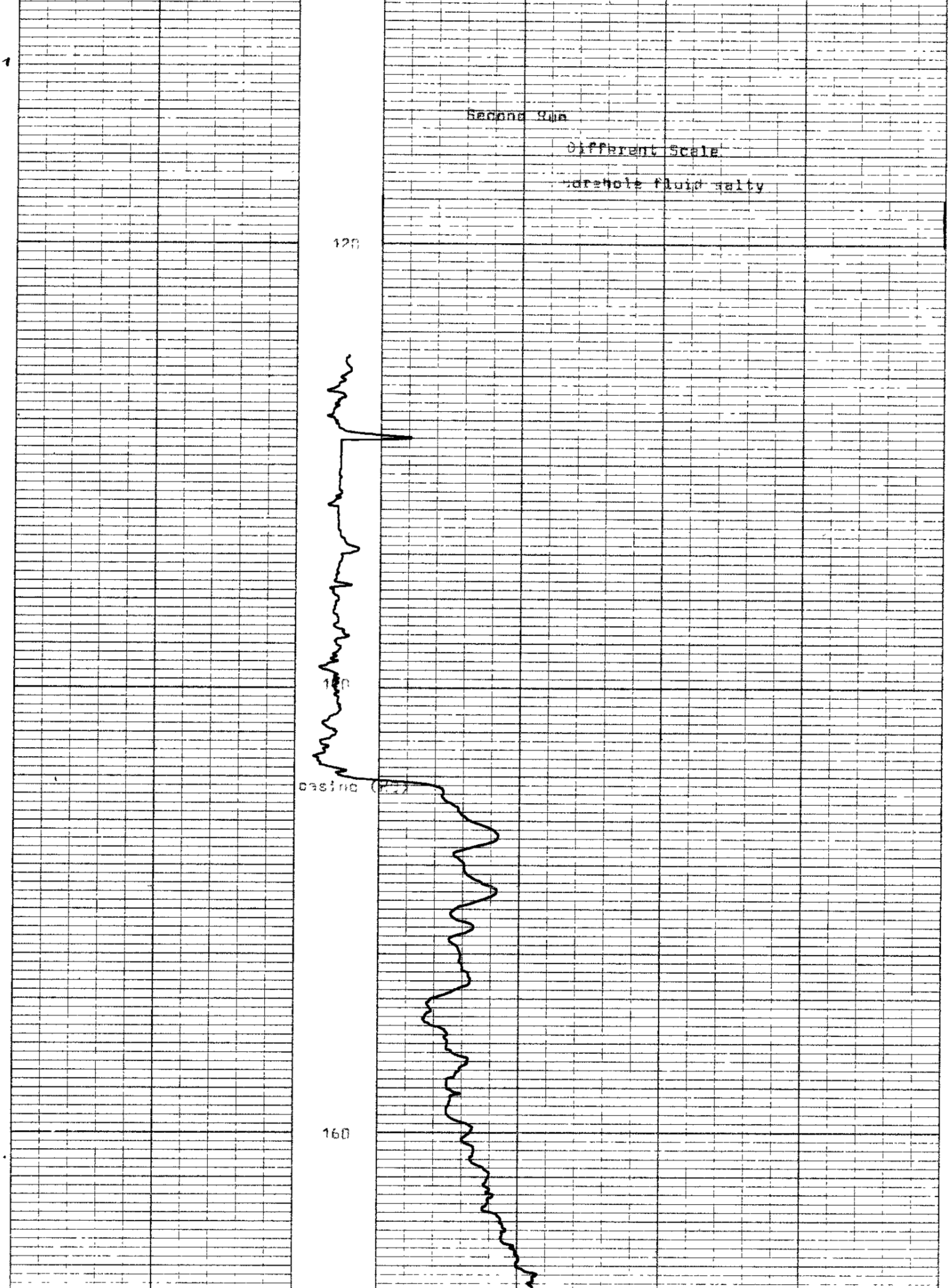
Resistivity

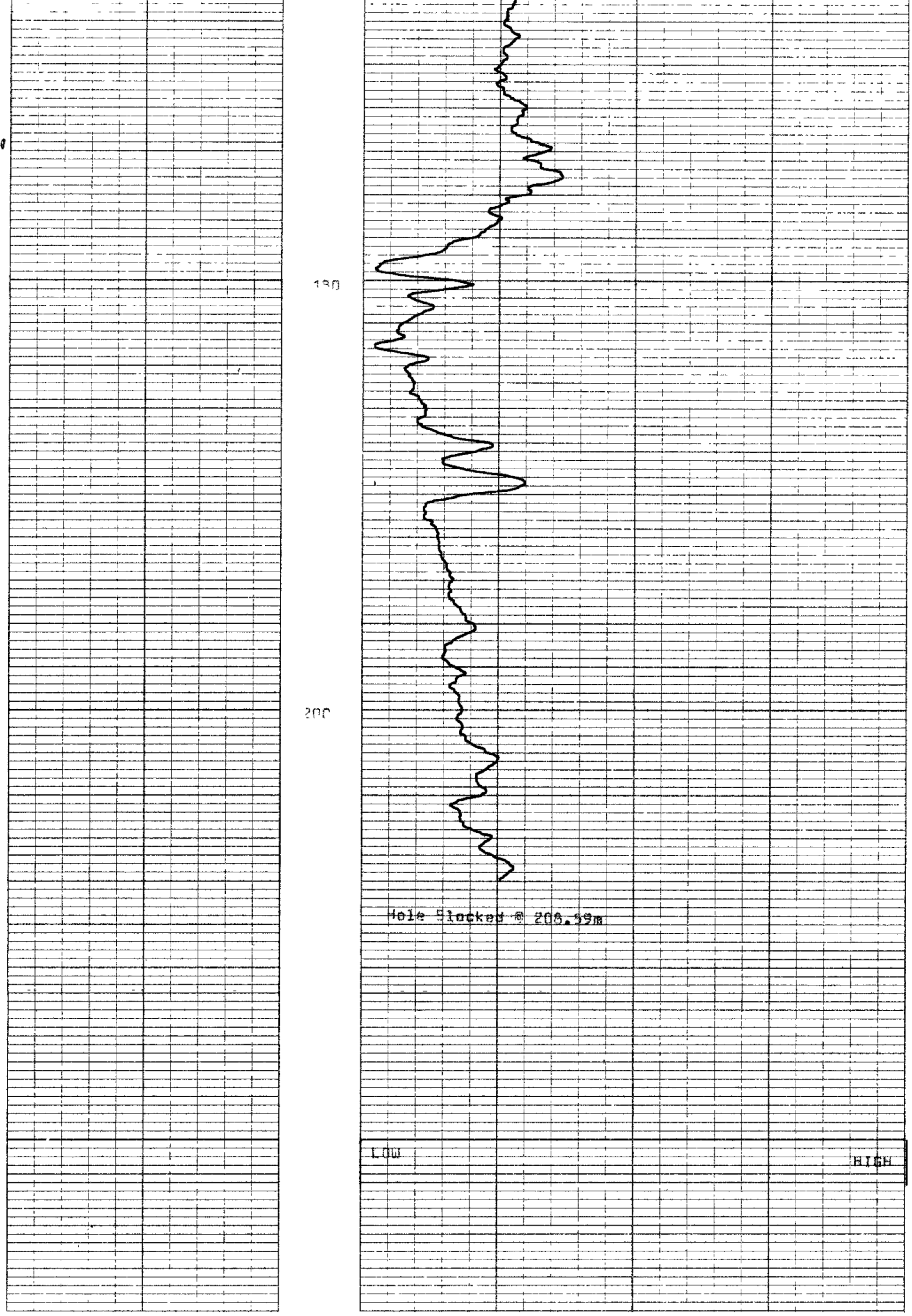
LOW

HIGH



1





768028

82-1769

B

COAL LITHOLOGY LOG

SONDE TYPE
COAL COMBINATION SONDE

LOG SUITE
GAMMA RAY
L S DENSITY
CALIPER

BOREHOLE GA 108
CLIENT MARATHON PETROLEUM
AREA GATAMARAN
COUNTRY AUSTRALIA
DATE LOGGED 17.3.82
DEPTH SCALE 1:200
1 OF 3 LOGS

BOREHOLE DATA

PERMANENT DATUM	Ground Level		
ELEVATION OF PD		BPB	DRILLER
MEASUREMENTS FROM		G.L.	G.L.
DEPTH REACHED	39.21m		39.43m
CASING SHOE			
BIT SIZES 1	6" TO 20m	2	HQ TO T.D.
3	TO	4	TO
CASING SIZES 1	HW TO 20m	2	TO

FLUID DATA

NATURE	Mud
S G	1.3
LEVEL	2.3m
VISCOSITY	
Rm at meas temp	
B H T	

OPERATION DATA

FIRST READING	38m
LAST READING	0m
INTERVAL LOGGED	38m
UNIT - TRUCK No	V309/39
ENGINEER	A.Redding
WITNESS	

EQUIPMENT AND RECORDING DATA

COAL COMBINATION SONDE

LOG	EQUIPMENT			TAPING			PANEL			CAL COEFF	DEPTHS			SEAM LOG RUN
	SONDE	SOURCE	CALIBRATOR	LOG TAPED	RECORD SPEED	DIRECT or REPLAY	SPEED	T C SECS	NORM		FROM	TO	INTERVAL	
GAMMA RAY	1635 SIDEWALL POSITION		393	Y	9	D	9	1	1.67					
L S DENSITY		3854	water	"	"	"	"	1/3	6.07			"		
CALIPER				"	"	NR								

COAL QUALITY/SEAM THICKNESS LOG INTERVALS (Refer to relevant log)

FROM		INTERVAL TOTAL
TO		
INTERVAL		

ADDITIONAL SONDES RUN

SONDE	LOG	GENERAL SCALE LOG	DETAIL SCALE LOG

REFER TO ADDITIONAL HEADINGS

REMARKS

Run one: T.D. to 20m thro' HQ rods
Run two: 20m to G.L. thro' HW casing

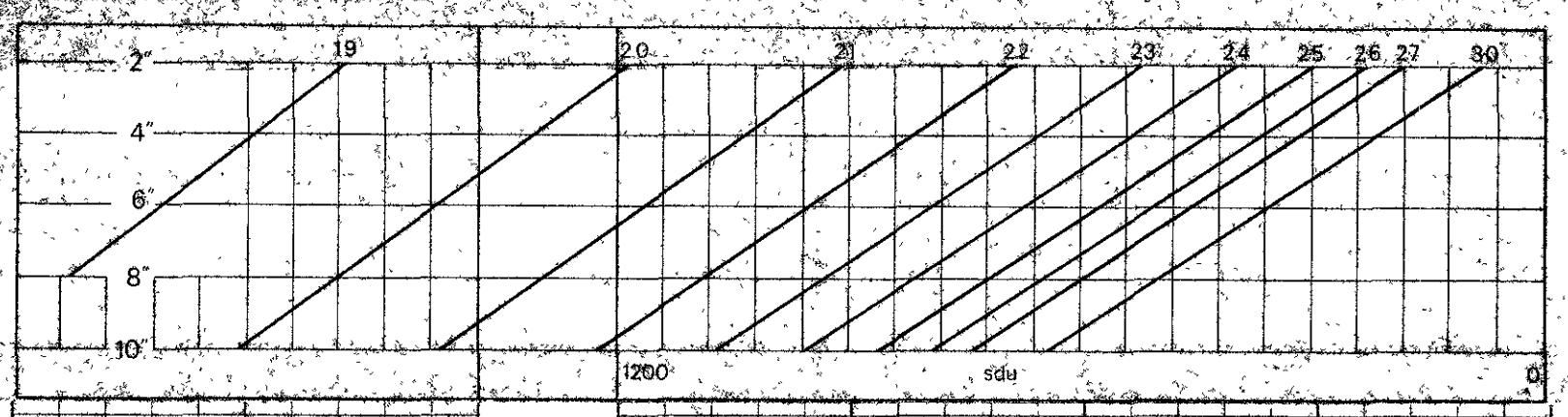
B PB COAL LITHOLOGY LOG

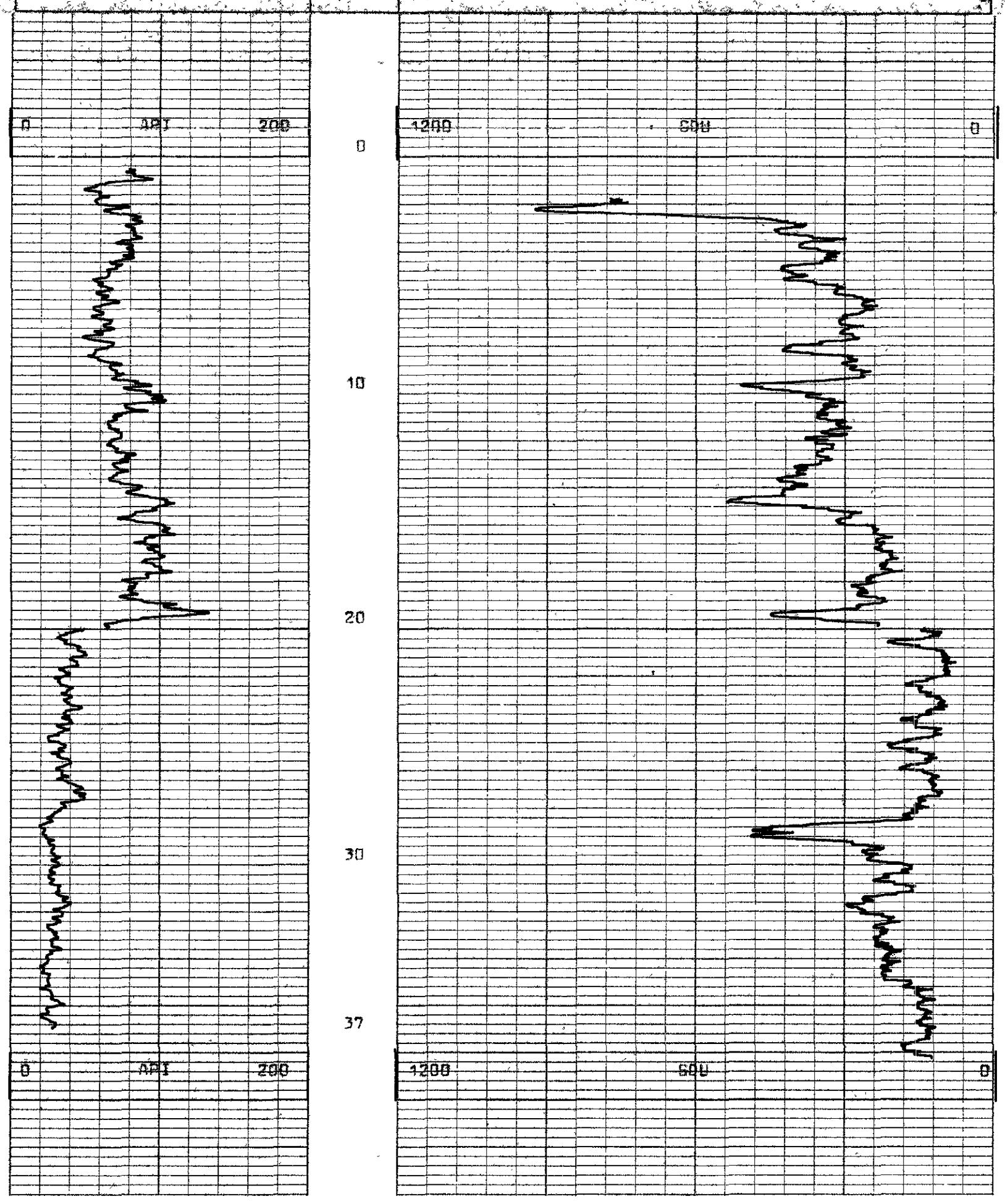
CALIBRATION DATA

JIG No 393 VALUE 551 @ 2" DIAM
JIG MARK SHOWN AT ABOVE VALUE –
JIG CAL DATE 14.3.82 JIG VALUE 10300 SDU @ 1.1 g/cm³ — 8 ins 844 cps
JIG No water SPAN NORM SDU/CPS = 6.07 — 4 ins 616 cps

GAMMA RAY	DEPTH metres	COAL BULK DENSITY g/cm³	CALIPER INCHES

HOLE SIZE CORRECTION DATA





768029

82-1769

5 cm

RESISTANCE LOG

BOREHOLE CA 108

CLIENT MARATHON PETROLEUM

AREA CATAMARAN

COUNTRY AUSTRALIA

DATE LOGGED 17.3.82

DEPTH SCALE 1:200

2 OF 3 LOGS

BOREHOLE DATA — REFER TO Lithology LOG

OPERATION DATA — REFER TO Lithology LOG

EQUIPMENT AND RECORDING DATA

LOG	TAPING			PANEL			CAL COEFF
	LOG TAPED	RECORD SPEED	DIRECT or REPLAY	SPEED	T C SECS	NORM	
RES	Y	9	D	9	1/3		

SONDE NO

SOURCE NO

REMARKS

Logged open hole available after rods pulled

RESISTANCE

DEPTH metres

HIGH LOW

0 10 19

601

768030

82-1769

5 cm

RESISTIVITY LOG. 112

BOREHOLE CA 109

CLIENT MARATHON

AREA CATAMARAN(TAS)

COUNTRY AUSTRALIA

DATE LOGGED 8/4/82

DEPTH SCALE 1:200

1 OF 4 LOGS

BOREHOLE DATA	REFER TO Lithology LOG
OPERATION DATA	REFER TO Lithology LOG

EQUIPMENT AND RECORDING DATA

LOG	TAPING			PANEL			CAL COEFF
	LOG TAPED	RECORD SPEED	DIRECT or REPLAY	SPEED	T.C. SECS	NORM	
RES	Y	12	D	12	1/3		

SONDE NO

SOURCE NO

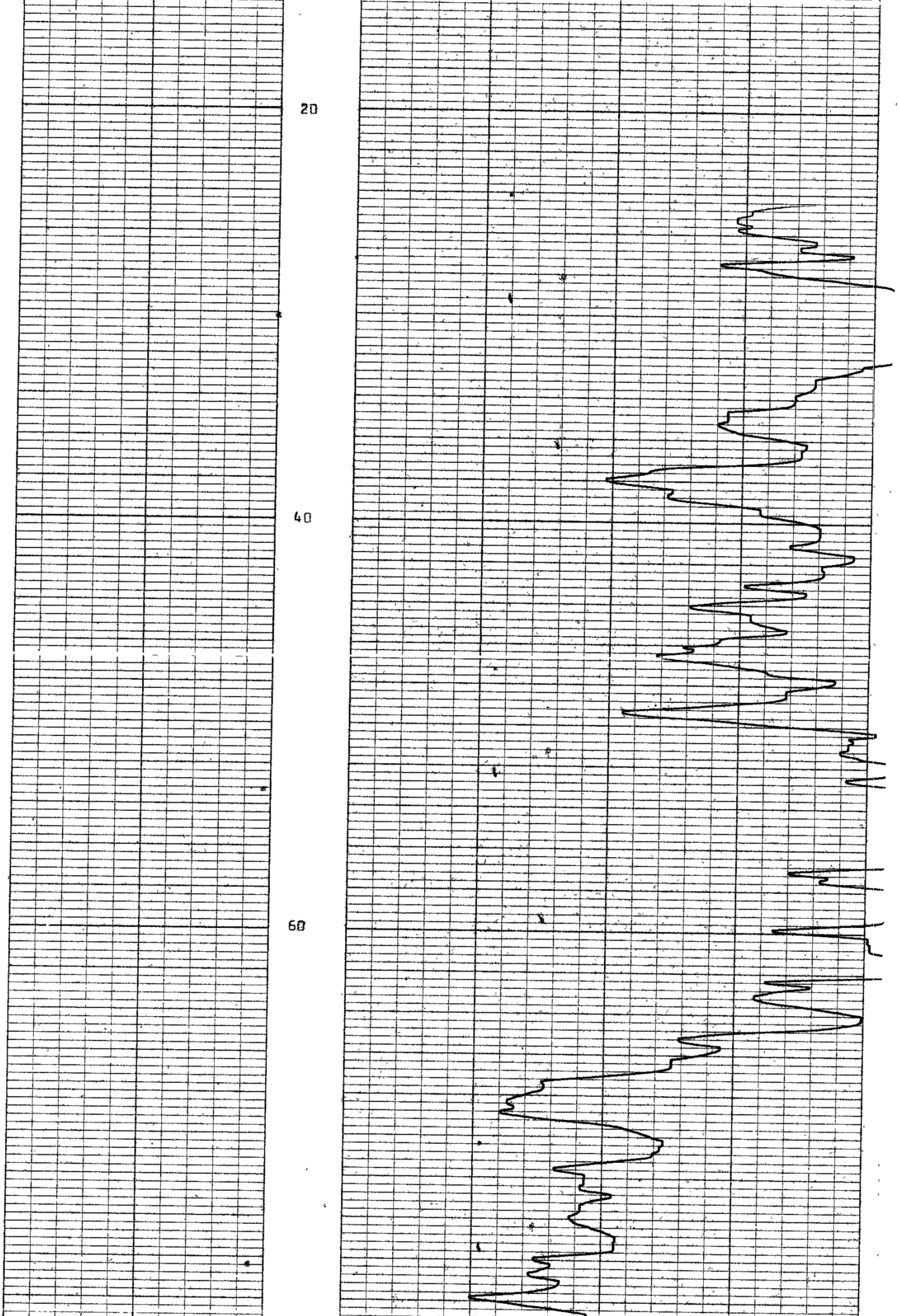
REMARKS

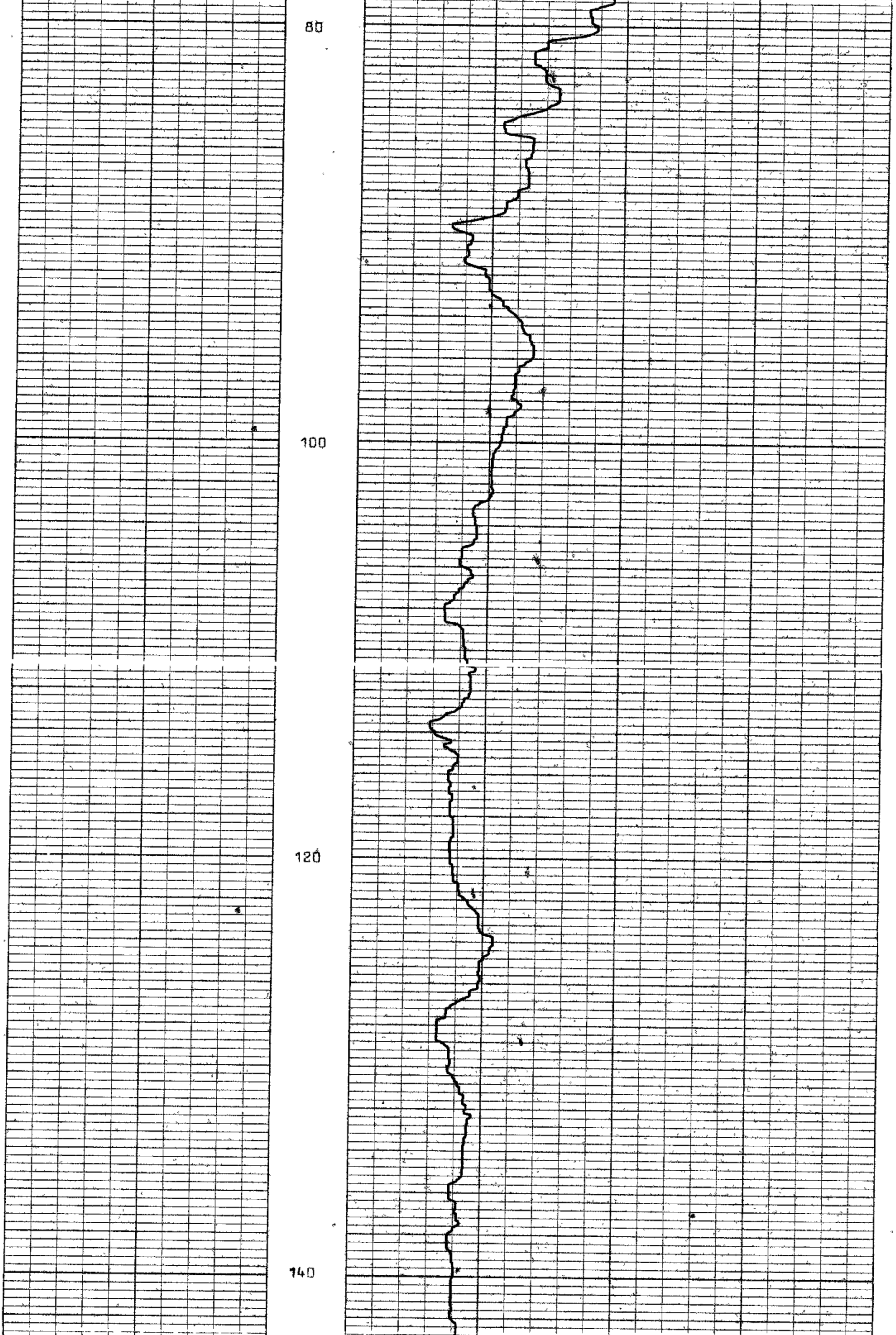
DEPTH

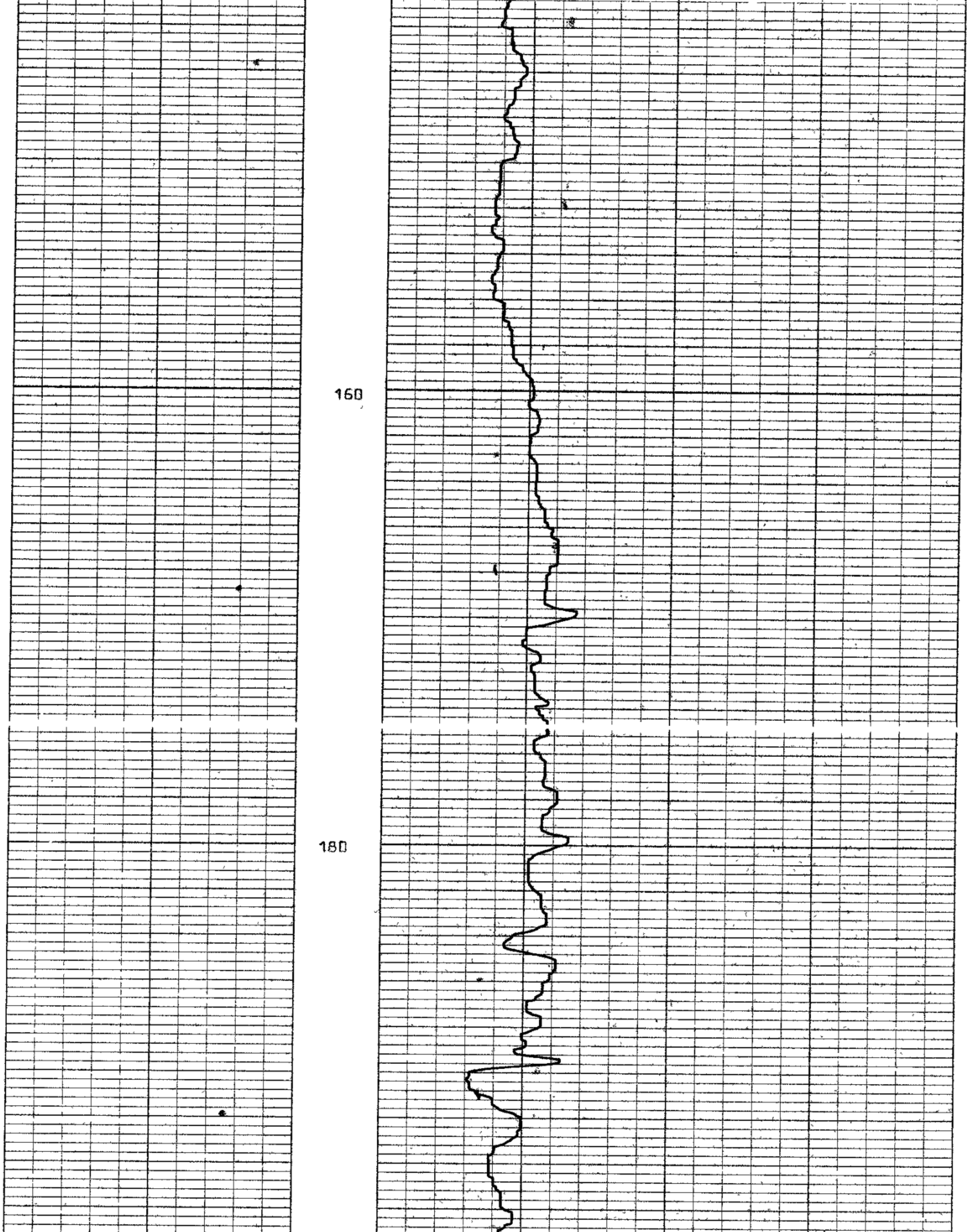
HIGH

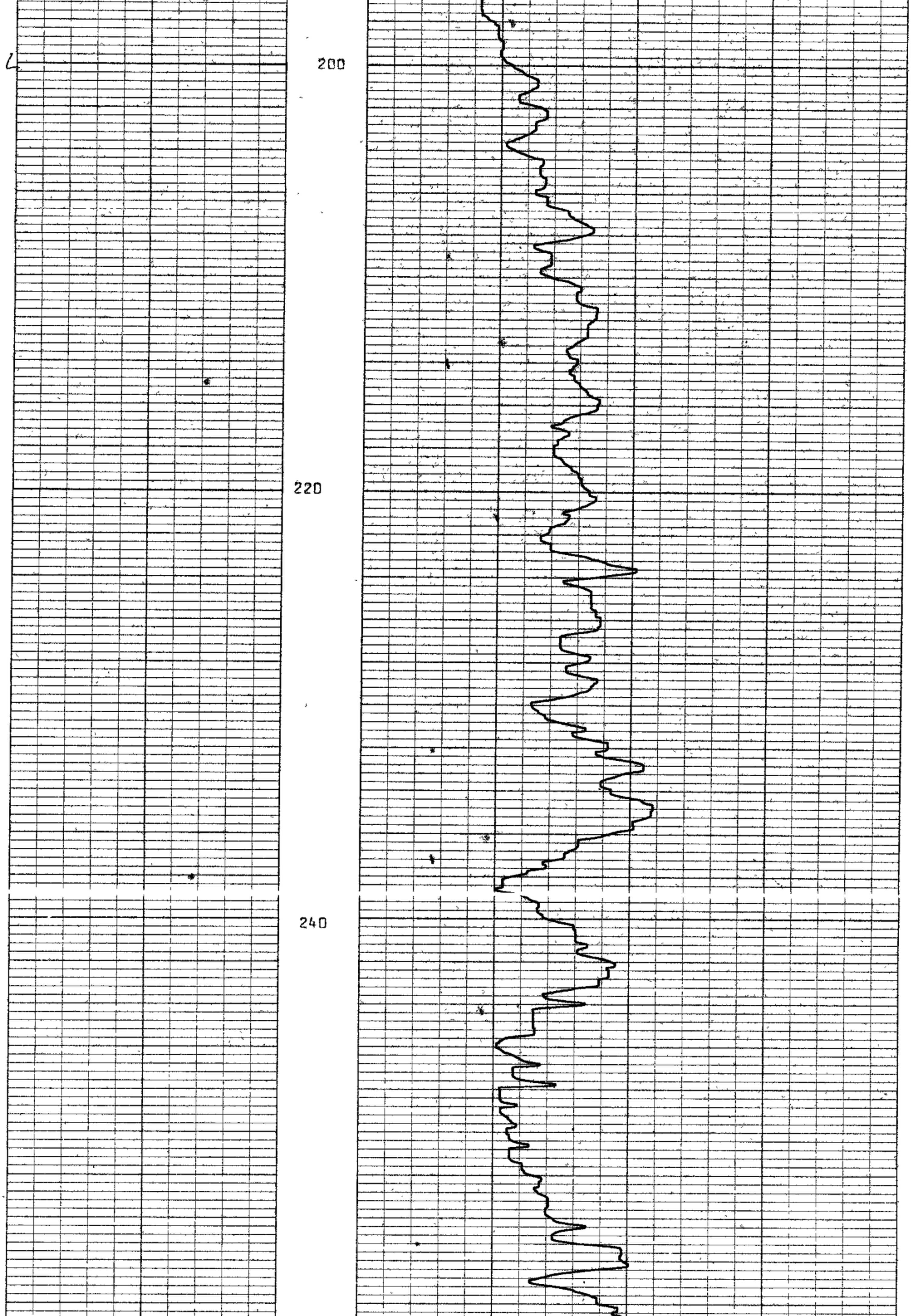
LOW

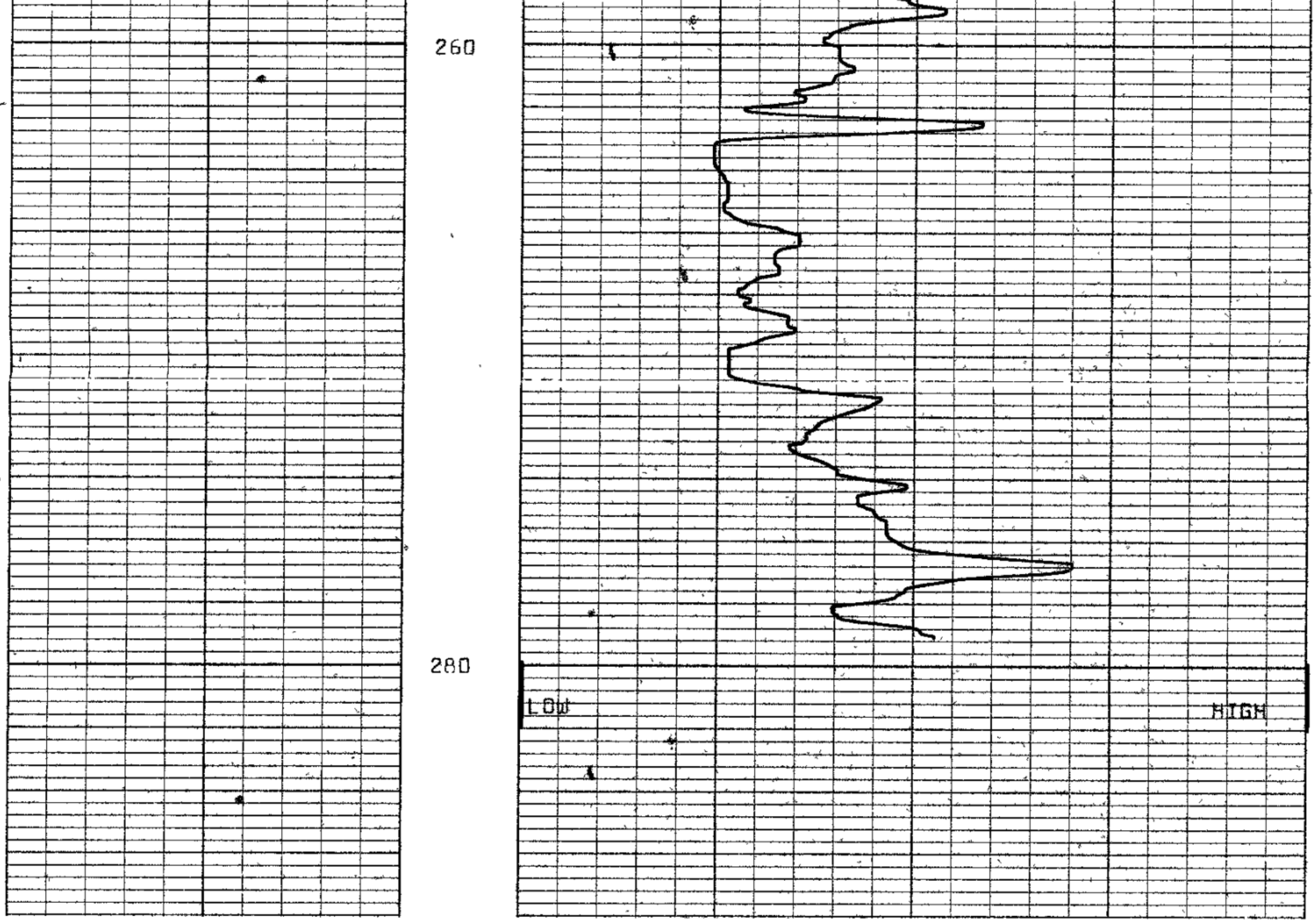
0











76802

82-1769

COAL LITHOLOGY LOG

5 cm

BOREHOLE CA 109
CLIENT MARATHON
AREA CATAMARAN
COUNTRY AUSTRALIA (TAS)
DATE LOGGED 8/4/82

DEPTH SCALE 1:200

2 OF 4 LOGS

SONDE TYPE
COAL COMBINATION SONDE

LOG SUITE
GAMMA RAY
L S DENSITY
CALIPER

BOREHOLE DATA

PERMANENT DATUM	Ground Level			
ELEVATION OF P D				
	BPB		DRILLER	
MEASUREMENTS FROM	300			
DEPTH REACHED	300.14		300.36	
CASING SHOE				
BIT SIZES	1	TO	2	TO
	3	TO	4	TO
CASING SIZES	1	TO	2	TO

FLUID DATA

NATURE	Air/Water
S G	
LEVEL	1.0
VISCOSITY	
Rm at meas temp	
B H T	

OPERATION DATA

FIRST READING	300
LAST READING	1
INTERVAL LOGGED	299
UNIT-TRUCK No	V309/39
ENGINEER	M. Andrews
WITNESS	

EQUIPMENT AND RECORDING DATA

COAL COMBINATION SONDE

LOG	EQUIPMENT			TAPING			PANEL			CAL COEFF	DEPTHS			SEAM LOG RUN
	SONDE	SOURCE	CALIBRATOR	LOG TAPED	RECORD SPEED	DIRECT or REPLAY	SPEED	T C SECS	NORM		FROM	TO	INTERVAL	
GAMMA RAY	1938		393	Y	9,3	D	9,3	1,3		1.38	300	1	299	v
L S DENSITY	SIDEWALL POSITION	5854	Water	Y	"	"	"	1/3, 1.5.07			"	"	"	"
CALIPER			-	"	"	"	"	1/3			"	"	"	"

COAL QUALITY/SEAM THICKNESS LOG INTERVALS (Refer to relevant log)

FROM	291	265	246	192	INTERVAL TOTAL
TO	286	258	242	188	
INTERVAL	5	7	4	4	= 20

ADDITIONAL SONDES RUN

SONDE	LOG	GENERAL SCALE LOG	DETAIL SCALE LOG	
213	SSN/N	1:200		REFER TO ADDITIONAL HEADINGS

REMARKS

The hole was logged below the steel casing, from 300m to 280m. Then from 280m to 0m following the cementing of the lower seam and removal of all but 5m of casing.

B P B COAL LITHOLOGY LOG

CALIBRATION DATA

JIG No 393 VALUE 553@ 2" DIAM

JIG MARK SHOWN AT ABOVE VALUE – 200

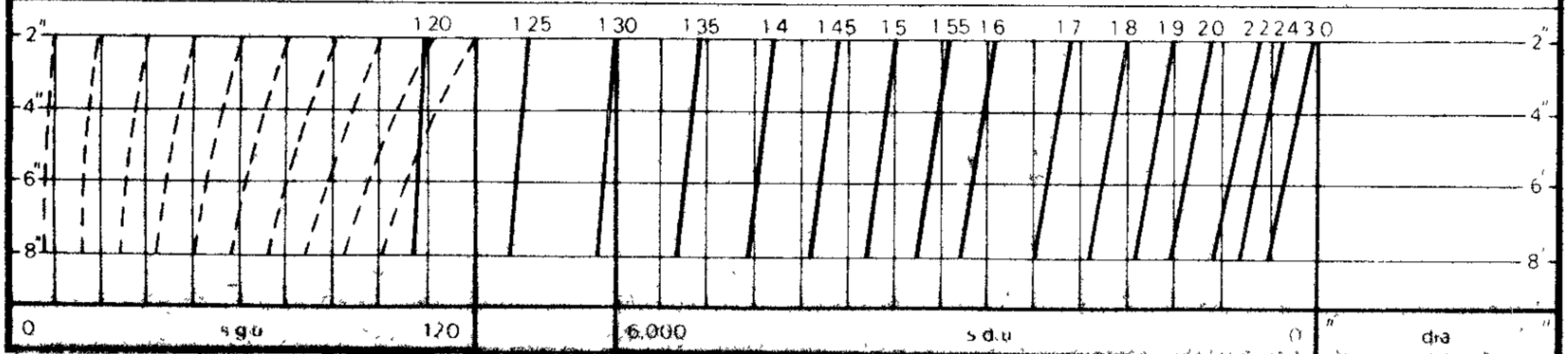
JIG CAL DATE 6/4/82 JIG VALUE 10K3 SDU@ 1.1 g/cm^3

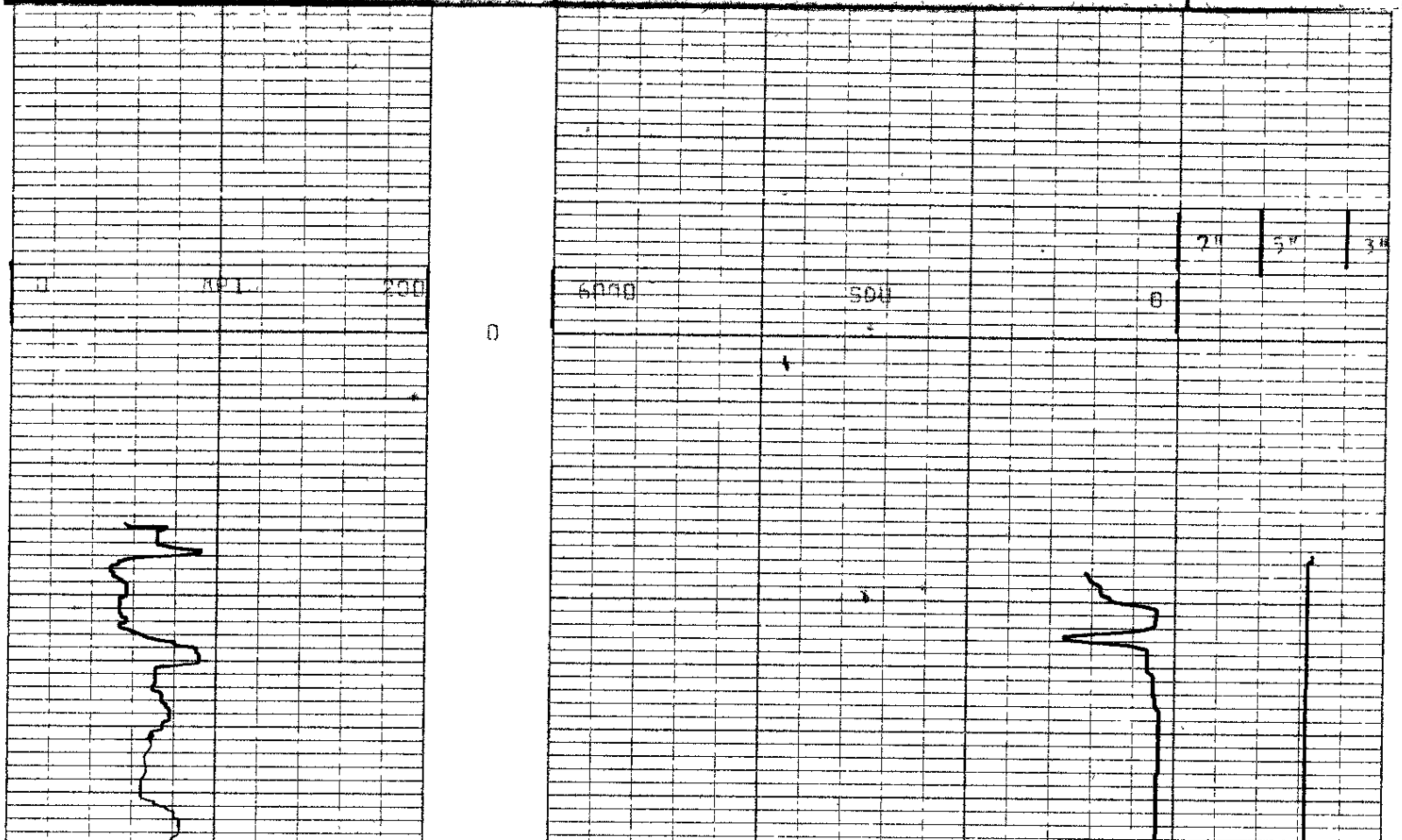
JIG No Water SPAN 6000–0 NORM $\frac{SDU}{CPS}$ = 5.07

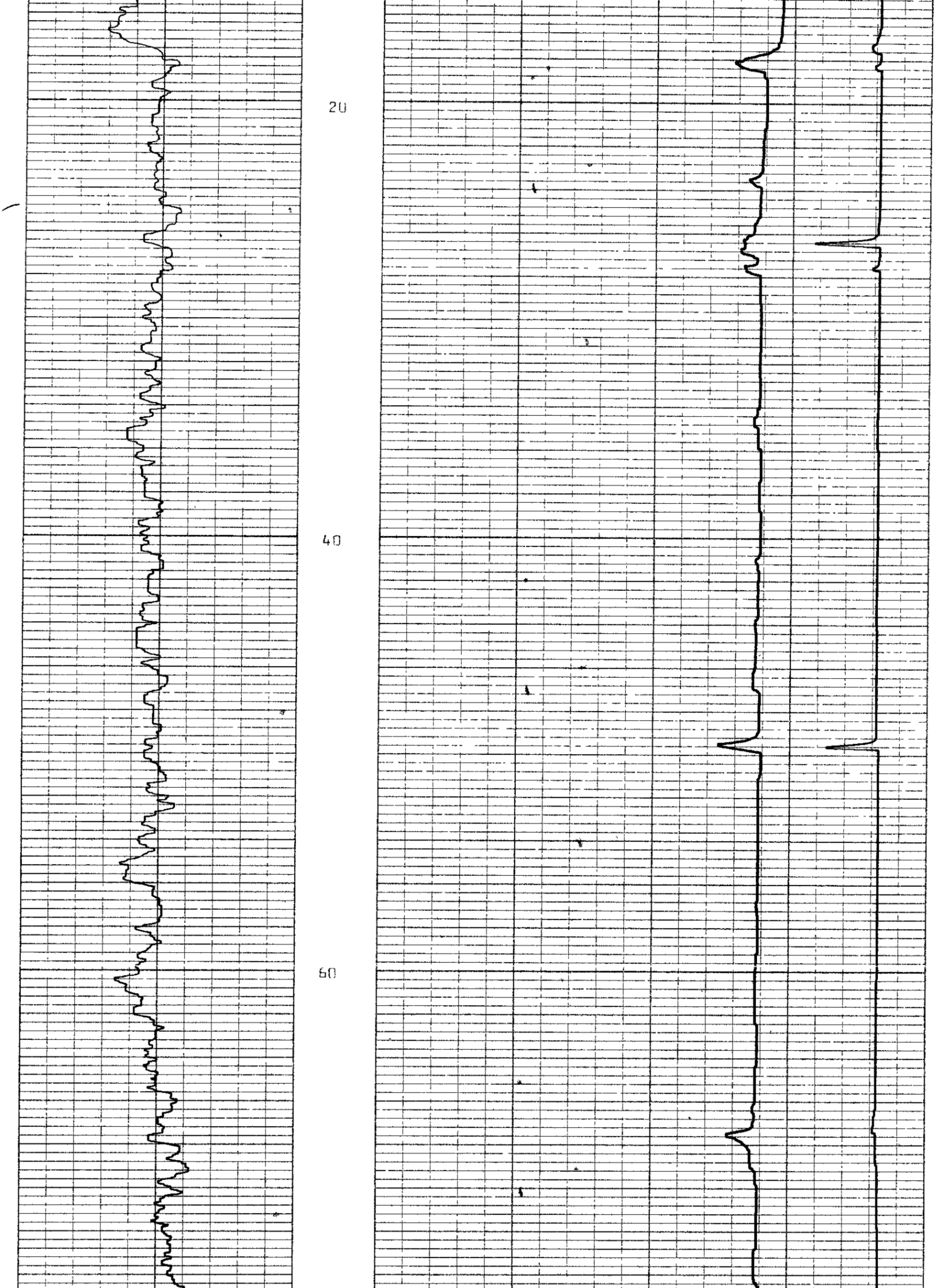
7	ins	897 cps
3	ins	560 cps

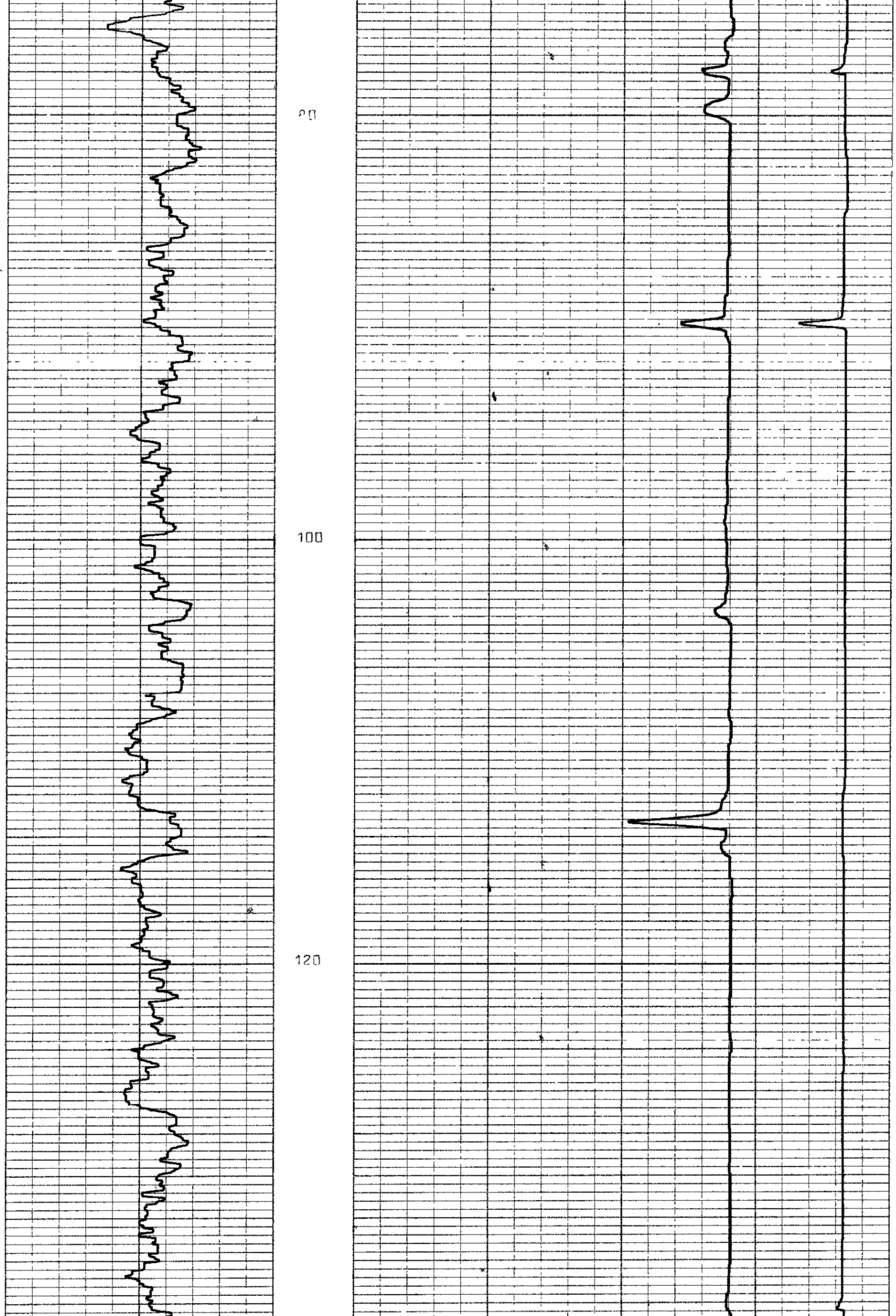
GAMMA RAY	DEPTH	COAL BULK DENSITY g/km3	CALIPER INCHES

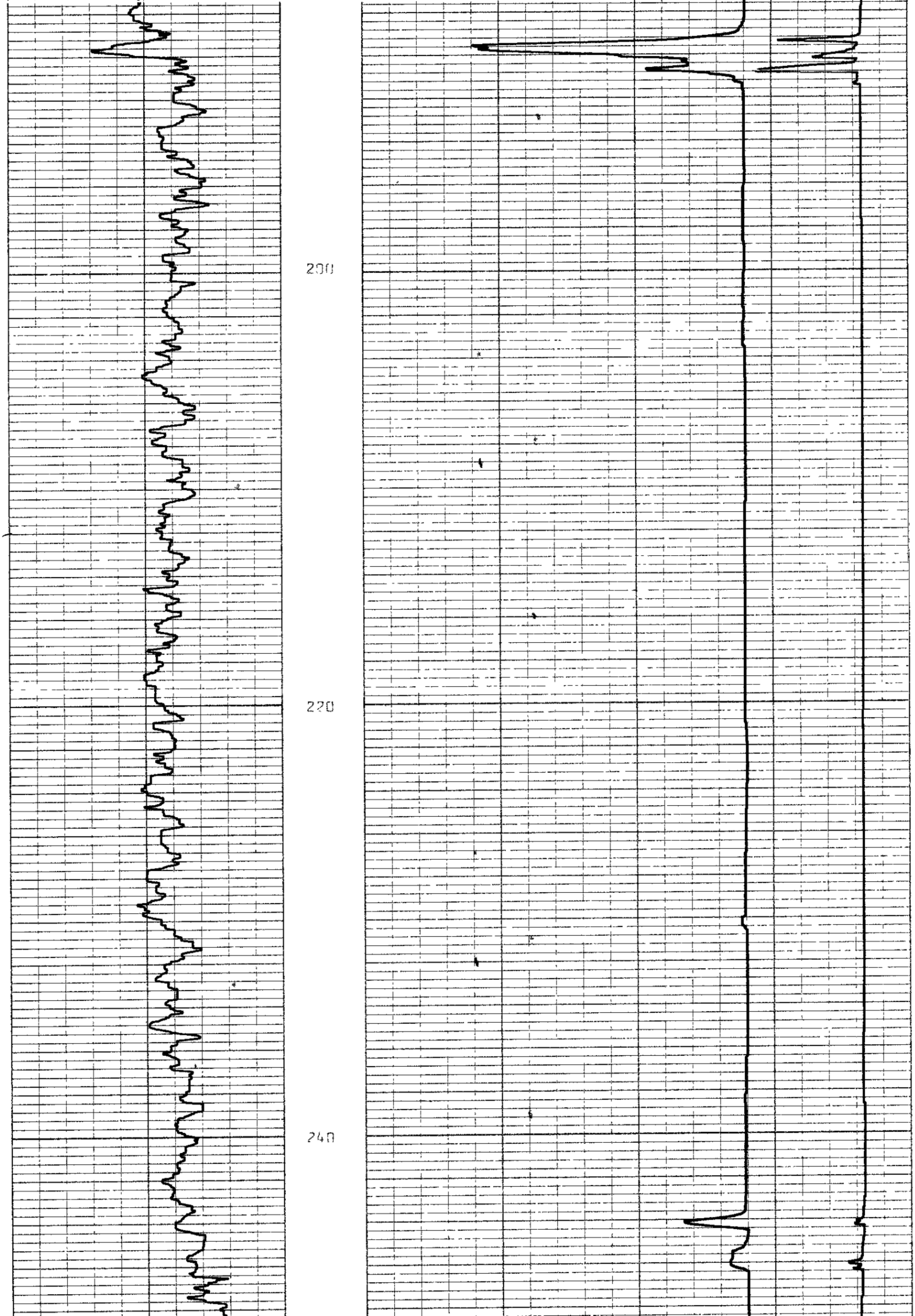
HOLE SIZE CORRECTION DATA

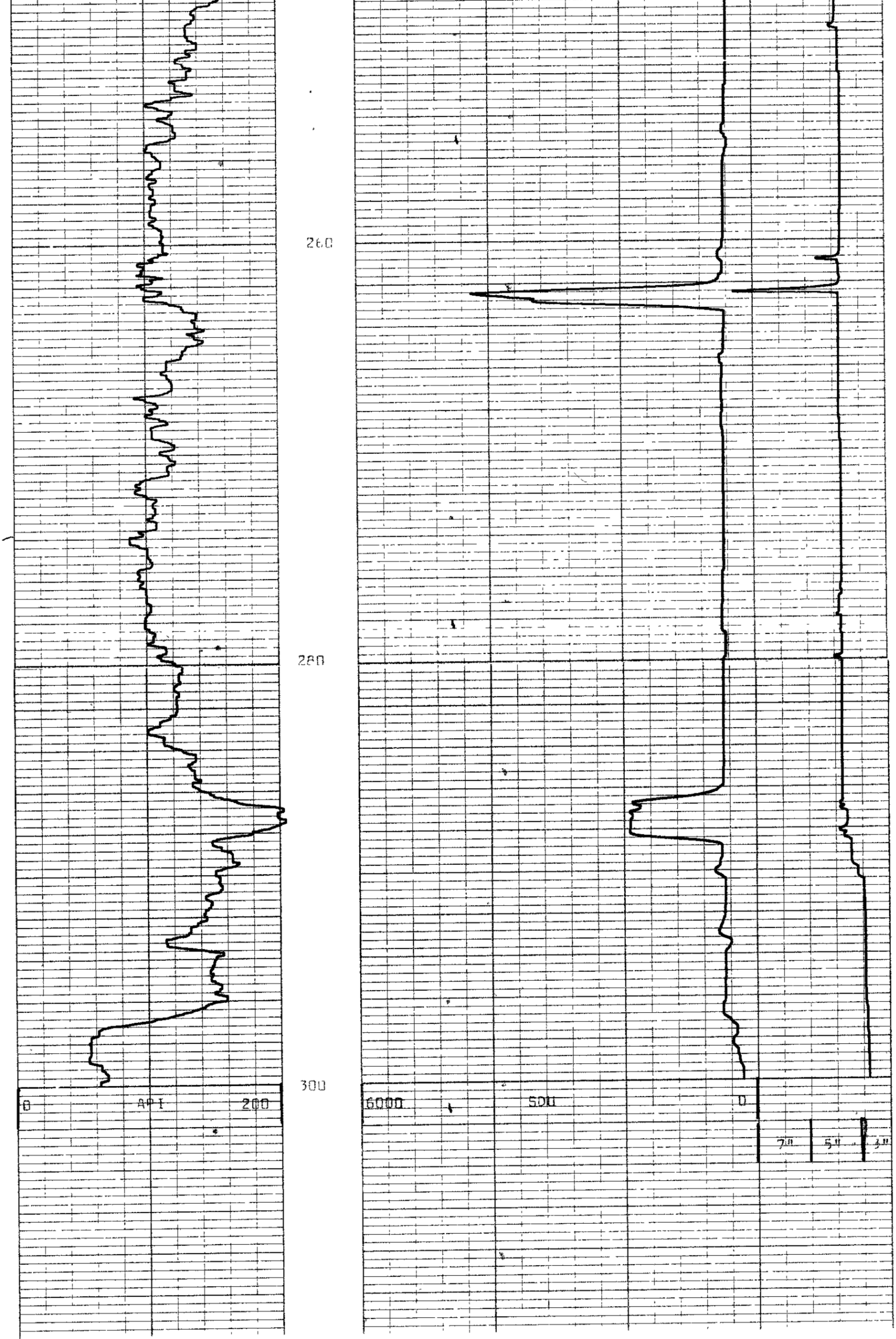












68032

82-1769

5 cm

BOREHOLE CA 105

CLIENT MARATHON

AREA CATAMARAN

COUNTRY AUSTRALIA (TAS)

DATE LOGGED 8/4/82

DEPTH SCALE 1:200

3 OF 4 LOGS

SEAM THICKNESS LOG

SONDE TYPE
COAL
COMBINATION
SONDE

LOG SUITE
CALIPER
B R DENSITY

BOREHOLE DATA	REFER TO LITHOLOGY LOG
OPERATION DATA	REFER TO LITHOLOGY LOG

EQUIPMENT AND RECORDING DATA

COAL COMBINATION SONDE

SIDEWALL POSITION

LOG	TAPING			PANEL			CAL COEFF
	LOG TAPED	RECORD SPEED	DIRECT or REPLAY	SPEED	TC SECS	NORM	
CALIPER	Y	2	R	3	1/3		
B R DENSITY	"	"	"	"	"	6.23	

SOURCE SONDE AND CALIBRATION

REFER TO LITHOLOGY LOG

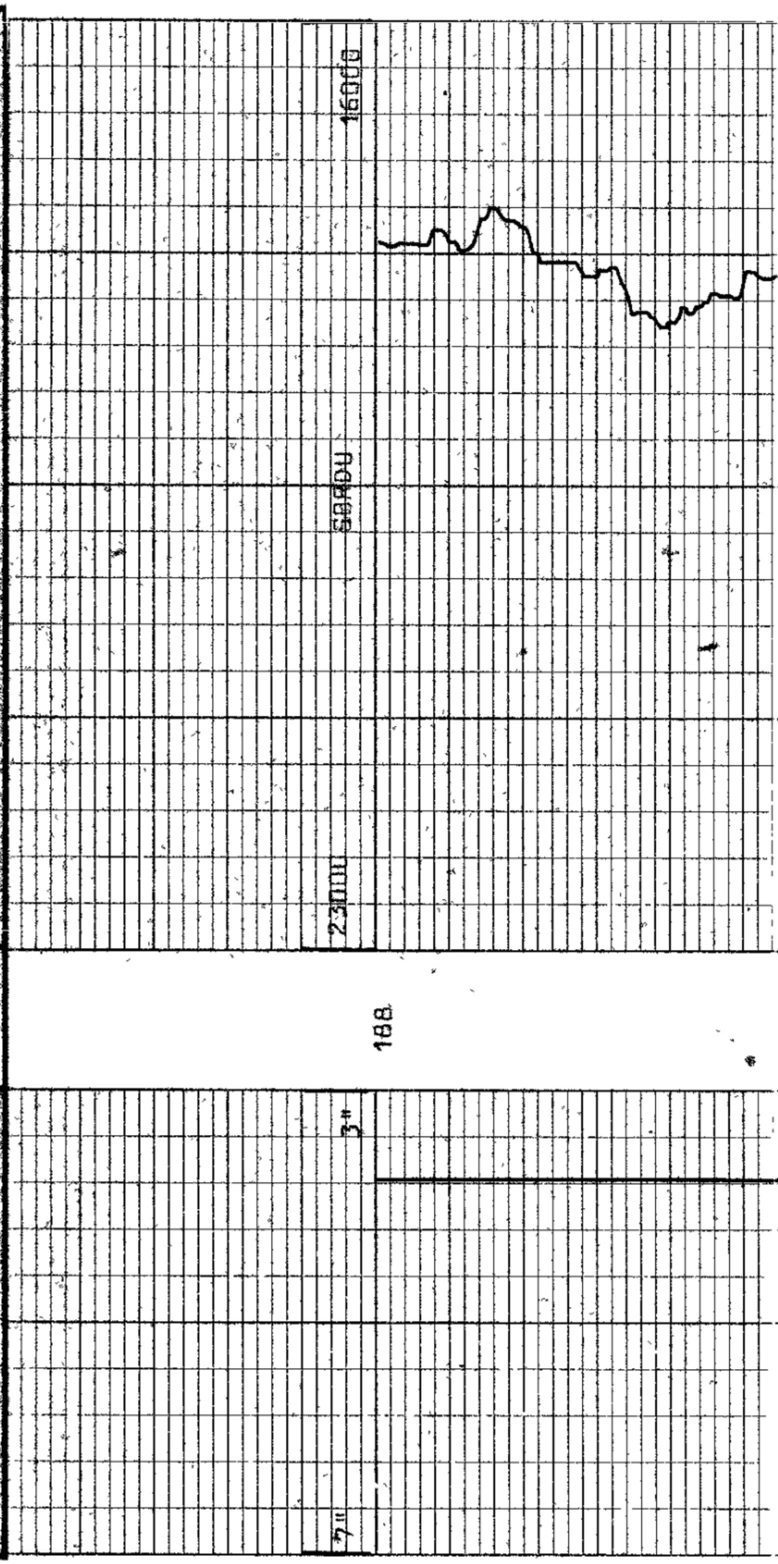
SEAM THICKNESS LOG INTERVALS

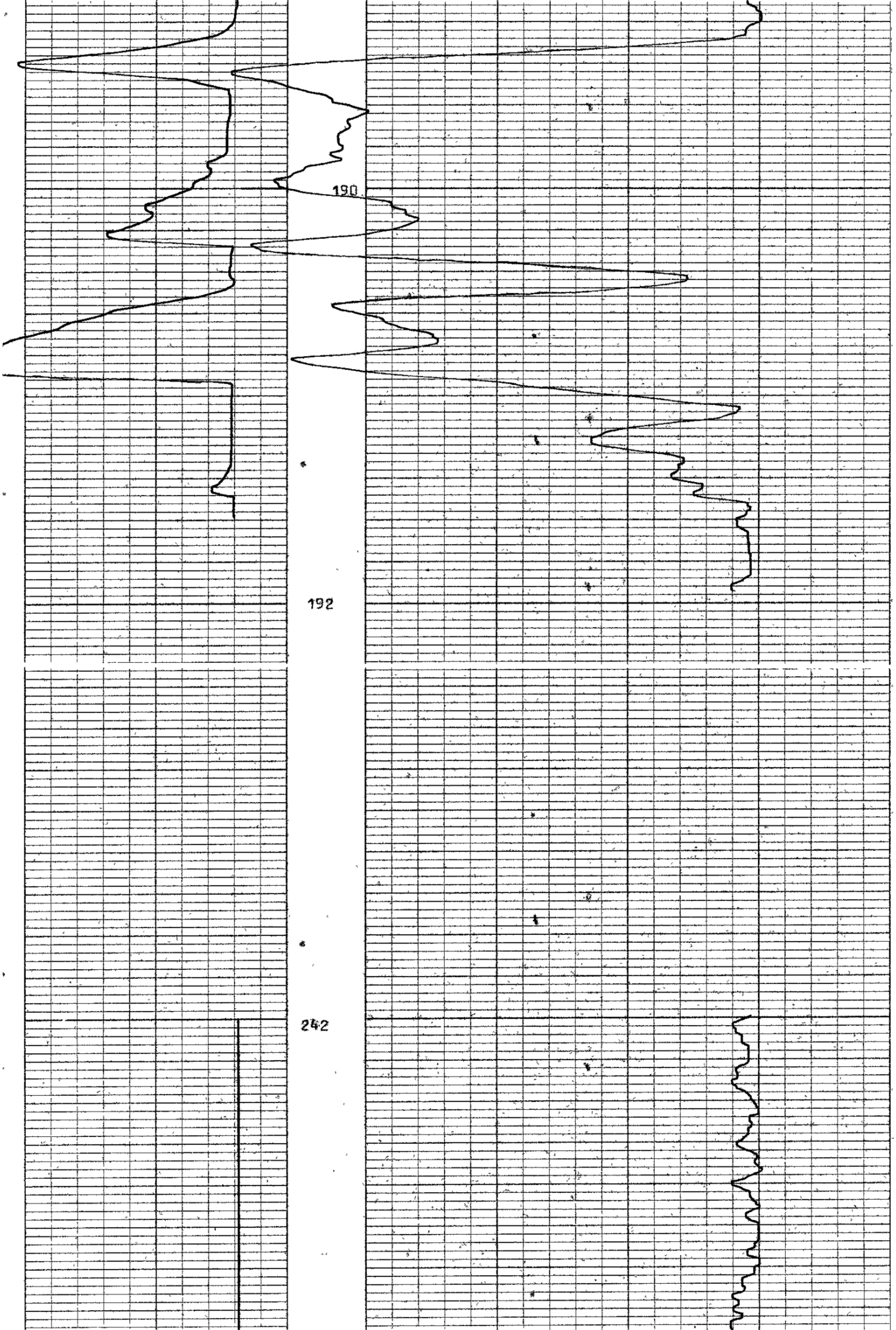
FROM	291	246	
TO	286	242	
INTERVAL	5	4	
FROM	265	192	INTERVAL
TO	258	188	TOTAL
INTERVAL	7	4	= 20

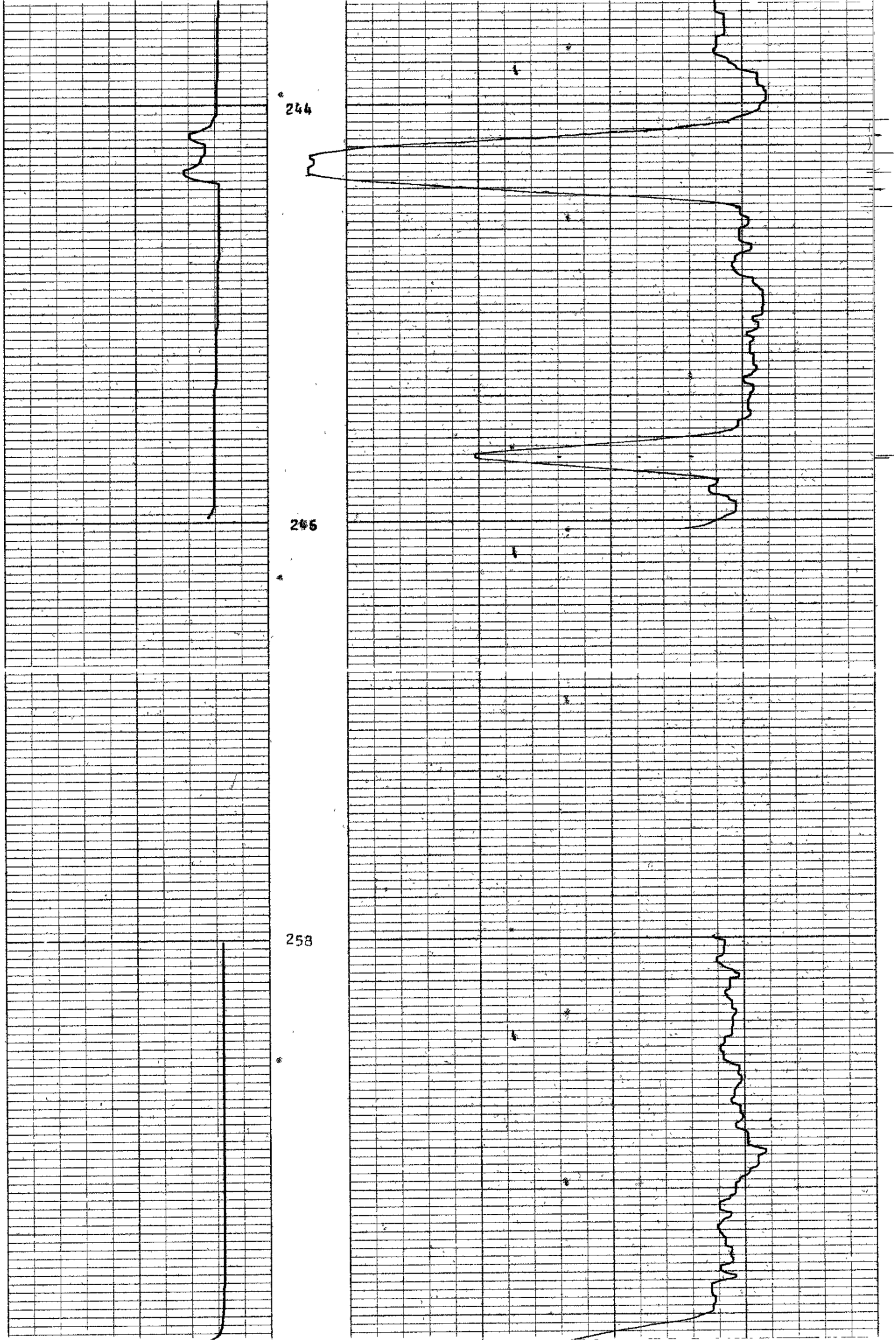
REMARKS

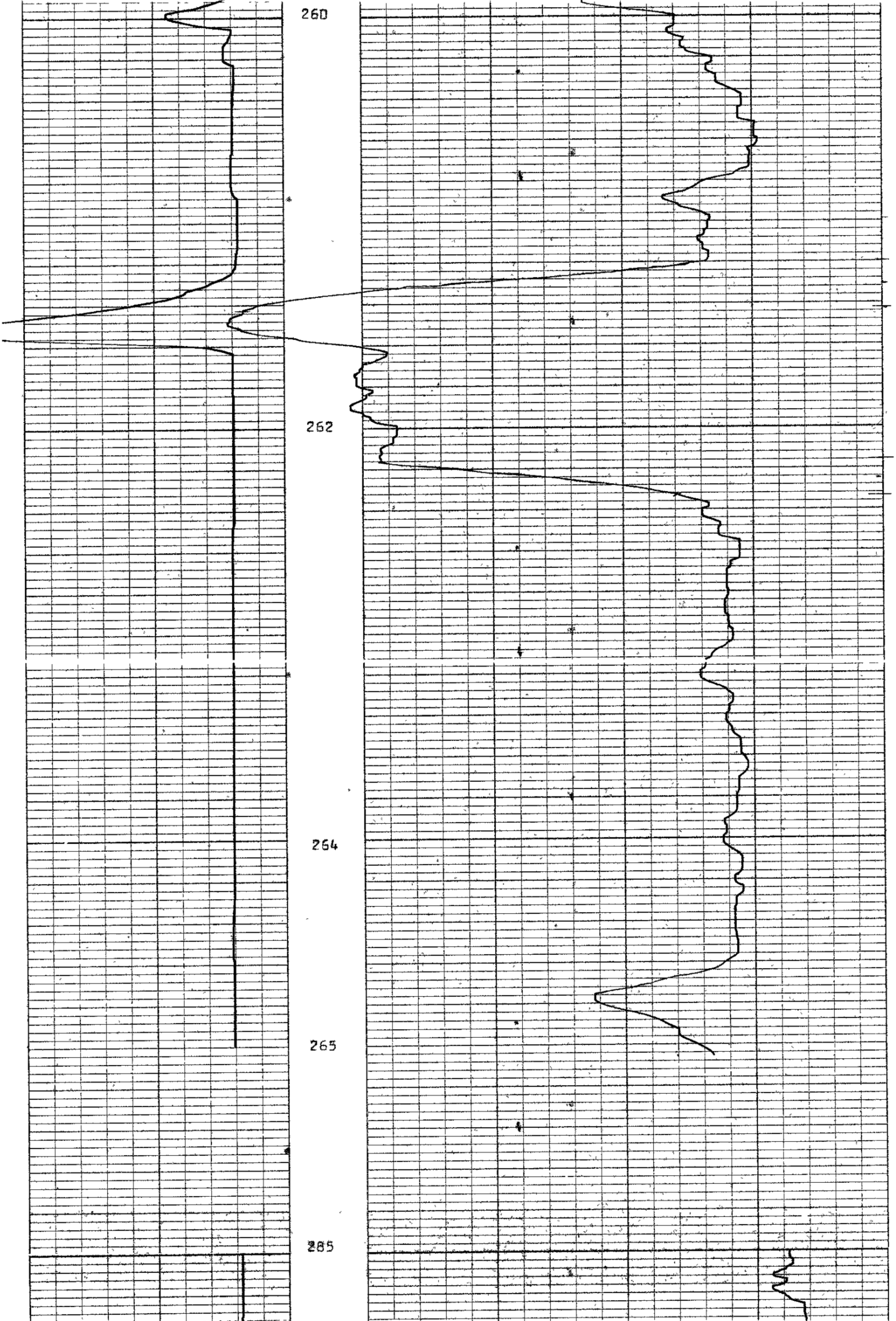
B P B SEAM THICKNESS LOG

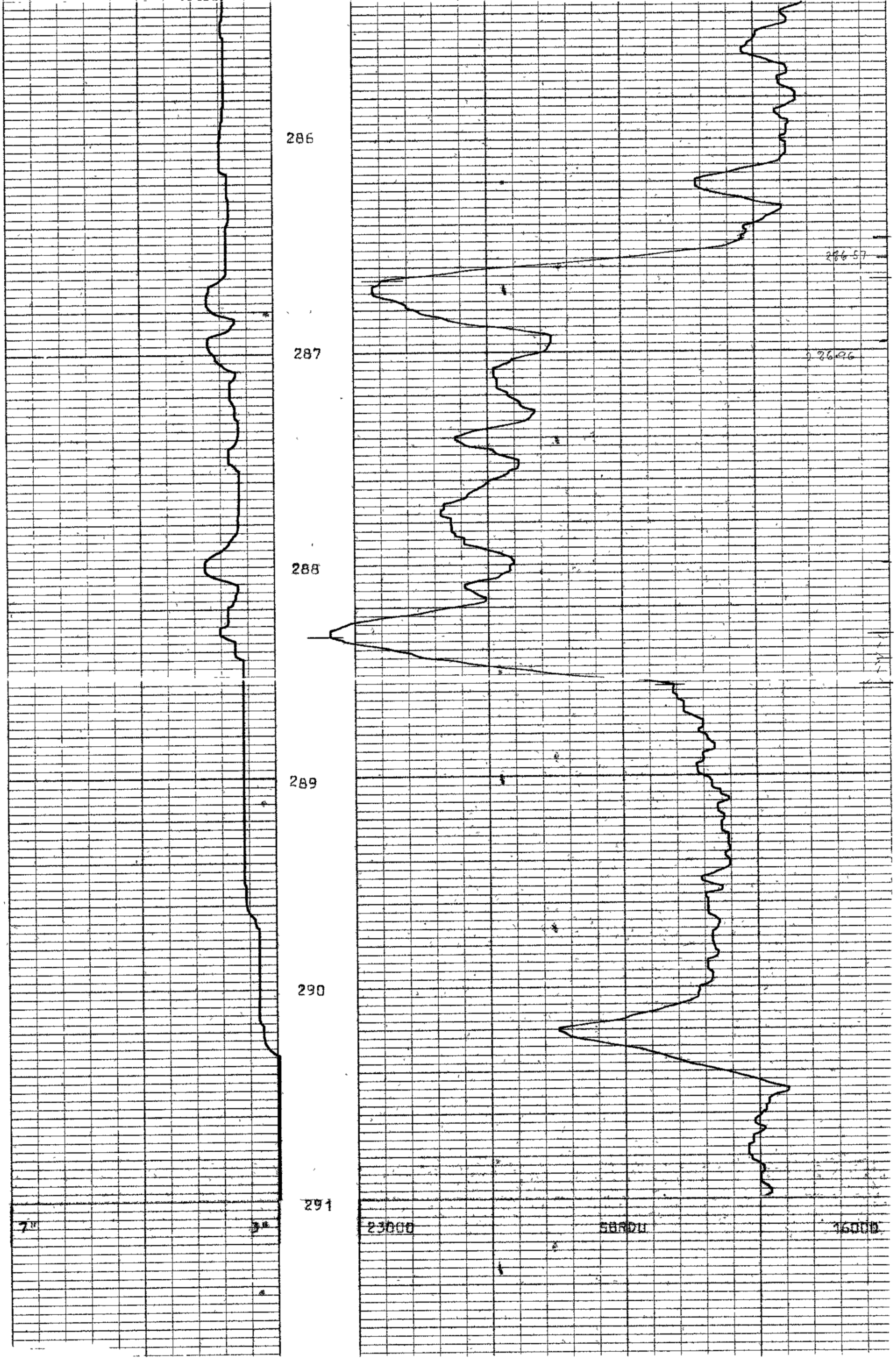
CALIPER INCHES	DEPTH	BED RESOLUTION DENSITY
dia		c.p.s

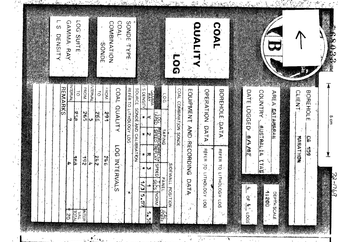











COAL QUALITY LOG
BPB COAL QUALITY LOG
DEPTH
GAMMA RAY
COAL BULK DENSITY
HOLE SIZE CORRECTION DATA

26805

S2-1769

5 cm

BOREHOLE CA 110
CLIENT MARATHON

AREA CATAMARAN
COUNTRY Australia
DATE LOGGED 17/4/82

DEPTH SCALE
1:200

1 OF 4 LOGS

←

COAL LITHOLOGY LOG

SONDE TYPE
COAL COMBINATION SONDE

LOG SUITE
GAMMA RAY
L S DENSITY
CALIPER

BOREHOLE DATA

PERMANENT DATUM	Ground Level		
ELEVATION OF P D			
	BPB		DRILLER
MEASUREMENTS - FROM	G.L.		G.L.
DEPTH REACHED	302.5 m		304 m
CASING SHOE	20 m		
BIT SIZES 1	6" TO 4¾"	2	TO
3	TO	4	TO
CASING SIZES 1	6" TO 2 m	2	5" TO 20 m

FLUID DATA

NATURE	Air/Water
S G	
LEVEL	3 m
VISCOSITY	
Rm at meas temp	
B H T	

OPERATION DATA

FIRST READING	299m
LAST READING	1m
INTERVAL LOGGED	298 m
UNIT - TRUCK No	39/309
ENGINEER	P.J.C.Palmer
WITNESS	

EQUIPMENT AND RECORDING DATA

COAL COMBINATION SONDE

LOG	EQUIPMENT			TAPING			PANEL			CAL COEFF	DEPTHS			SEAM LOG RUN
	SONDE	SOURCE	CALIBRATOR	LOG TAPED	RECORD SPEED	DIRECT or REPLAY	SPEED	T C SECS	NORM		FROM	TO	INTERVAL	
GAMMA RAY	193 8		jig393	Y	9,2	D	9,2	1,5	1:53 1:66		~~148~~ 299	~~1~~ 148	~~147~~ 151m	Y
L S DENSITY	163 8	5854	Water	Y	9,2	D	9,2	1/3 1,2	1.53 5.89		"	"	"	Y
CALIPER	SIDEWALL POSITION		std jig	Y	9,2	D	9,2	1/3			"	"	"	Y

COAL QUALITY/SEAM THICKNESS LOG INTERVALS (Refer to relevant log)

FROM	96	78	32	INTERVAL TOTAL
TO	88	70	26	
INTERVAL	8m	8m	6m	22m

ADDITIONAL SONDES RUN

SONDE	LOG	GENERAL SCALE LOG	DETAIL SCALE LOG
RES	RES	1:200	

REFER TO ADDITIONAL HEADINGS

REMARKS

B P B COAL LITHOLOGY LOG

CALIBRATION DATA

JIG No 393 VALUE 553 @ 2" DIAM

JIG MARK SHOWN AT ABOVE VALUE –

JIG CAL DATE 15/4/82 JIG VALUE 10300 SDU @ 1.1 g/cm³

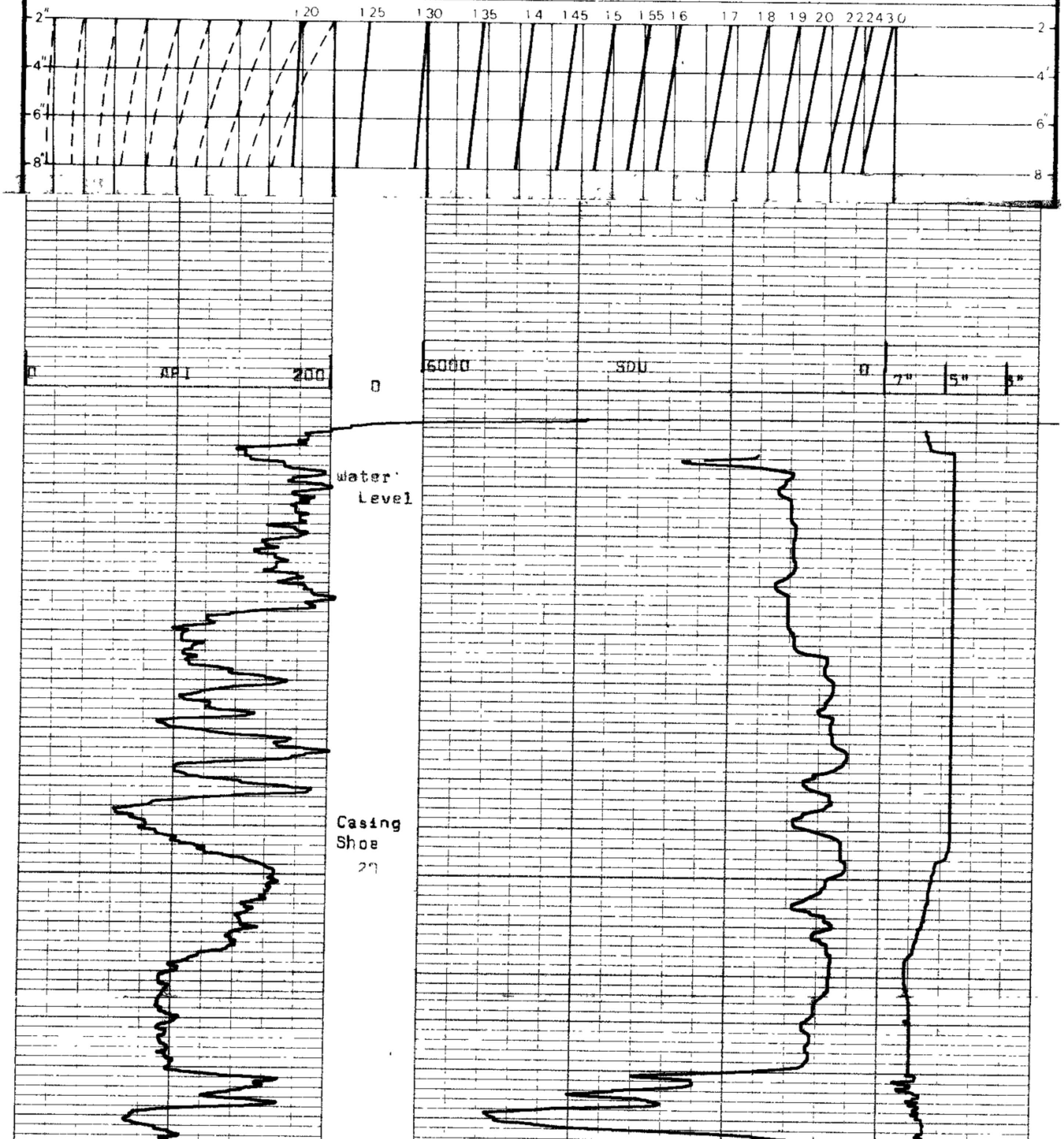
JIG No Water SPAN NORM $\frac{SDU}{CPS}$ = 5.37/75.89

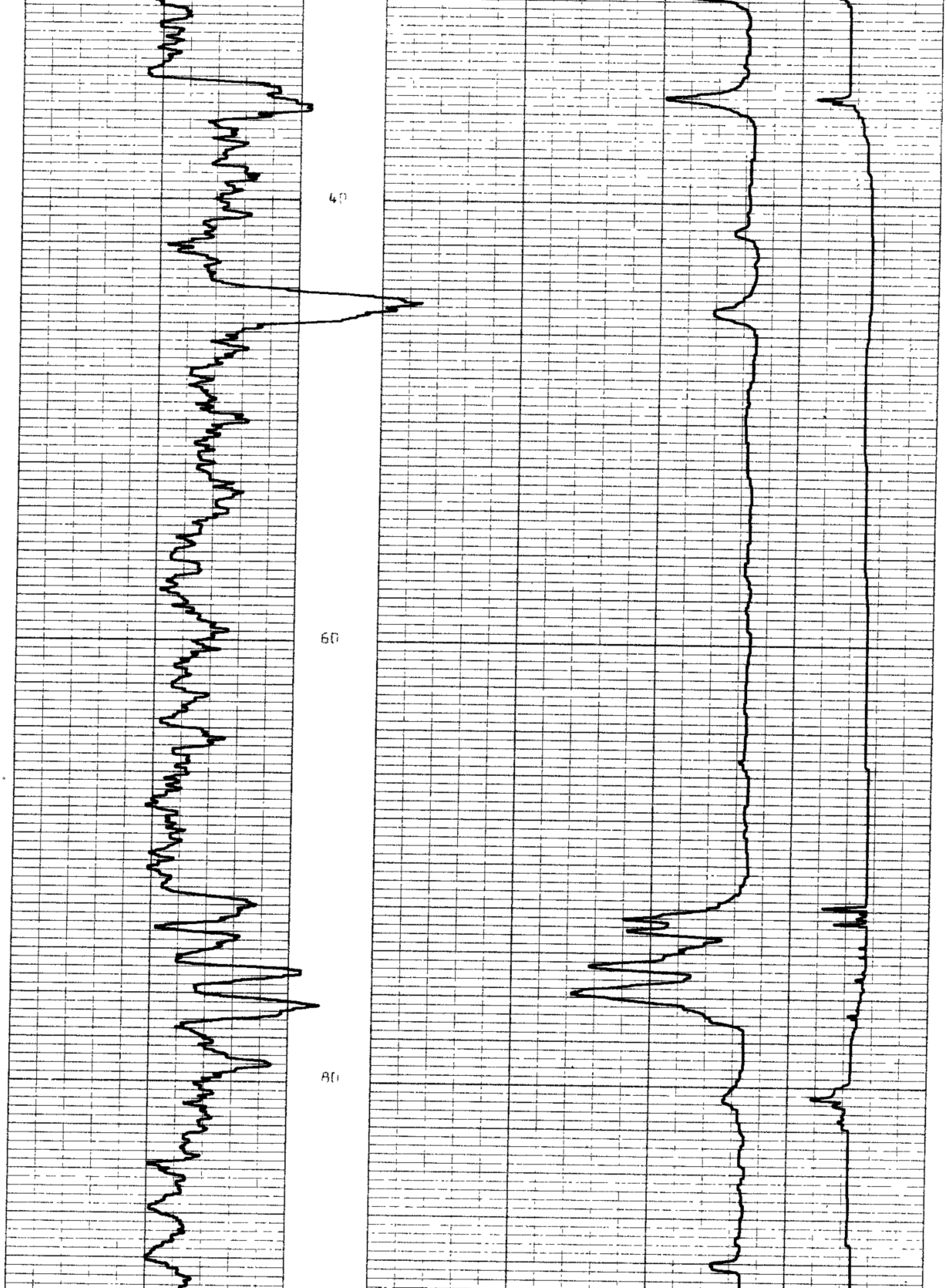
7 ins 925 798 cps

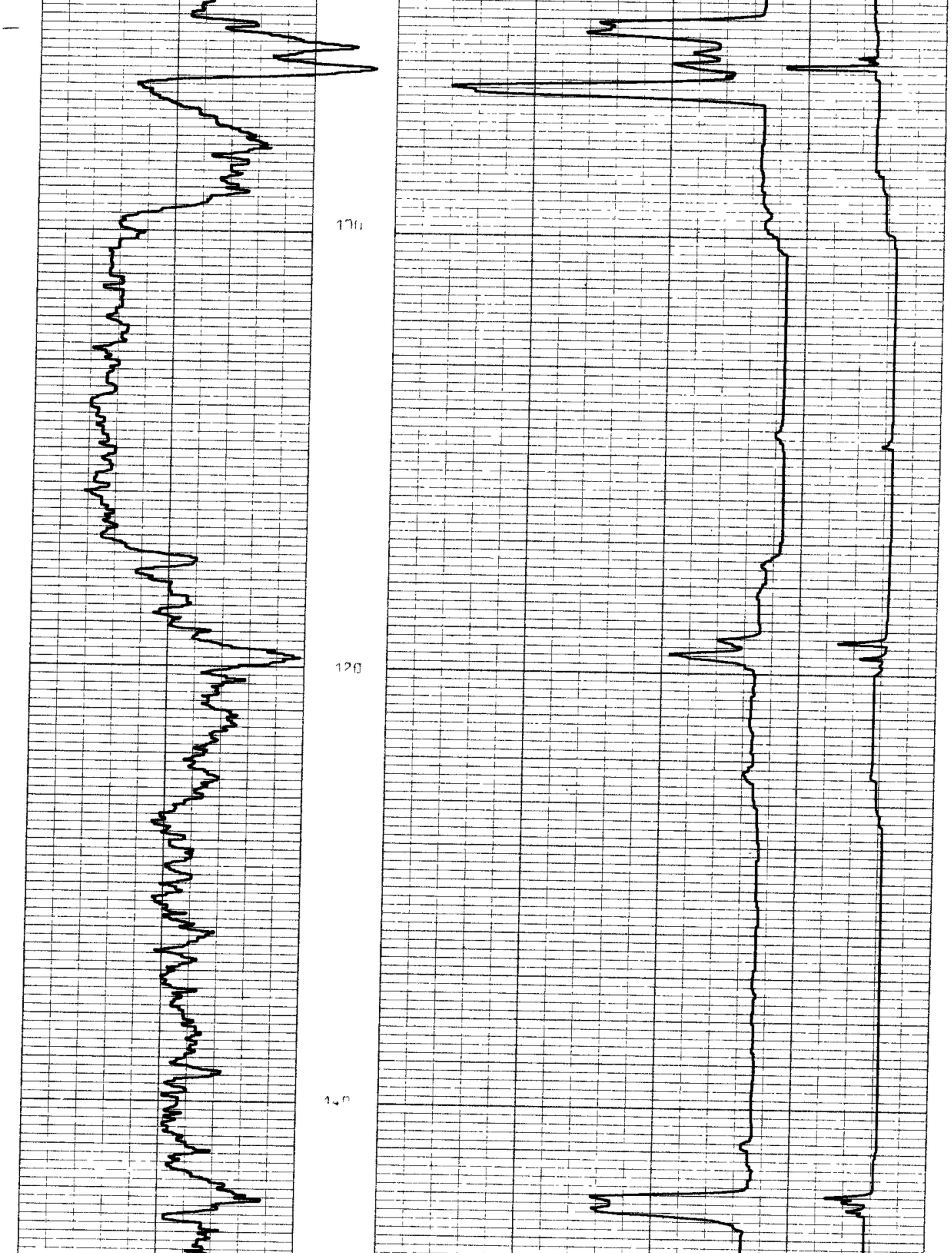
3 ins 558 567 cps

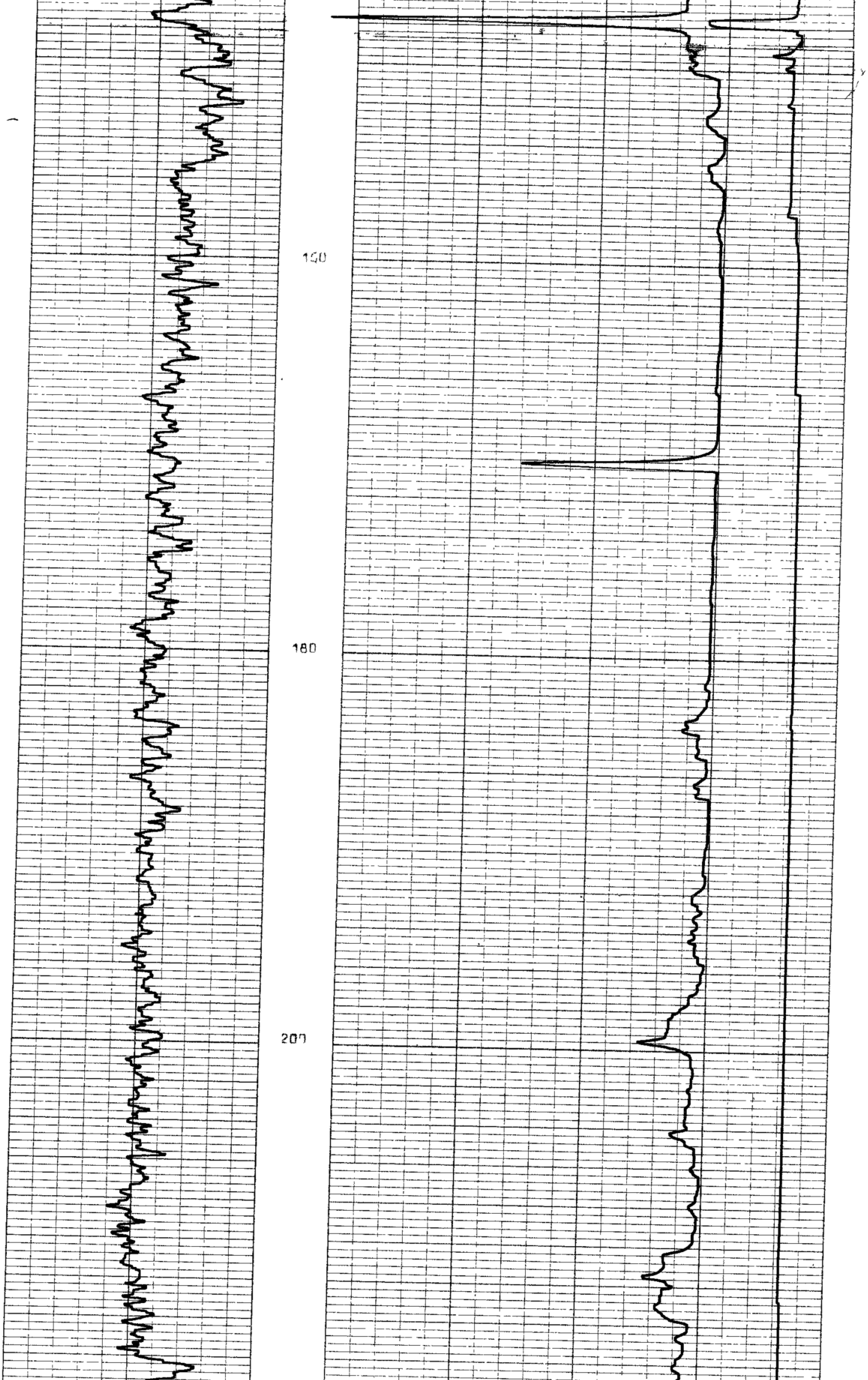
GAMMA RAY	DEPTH	COAL BULK DENSITY g/cm³	CALIPER INCHES

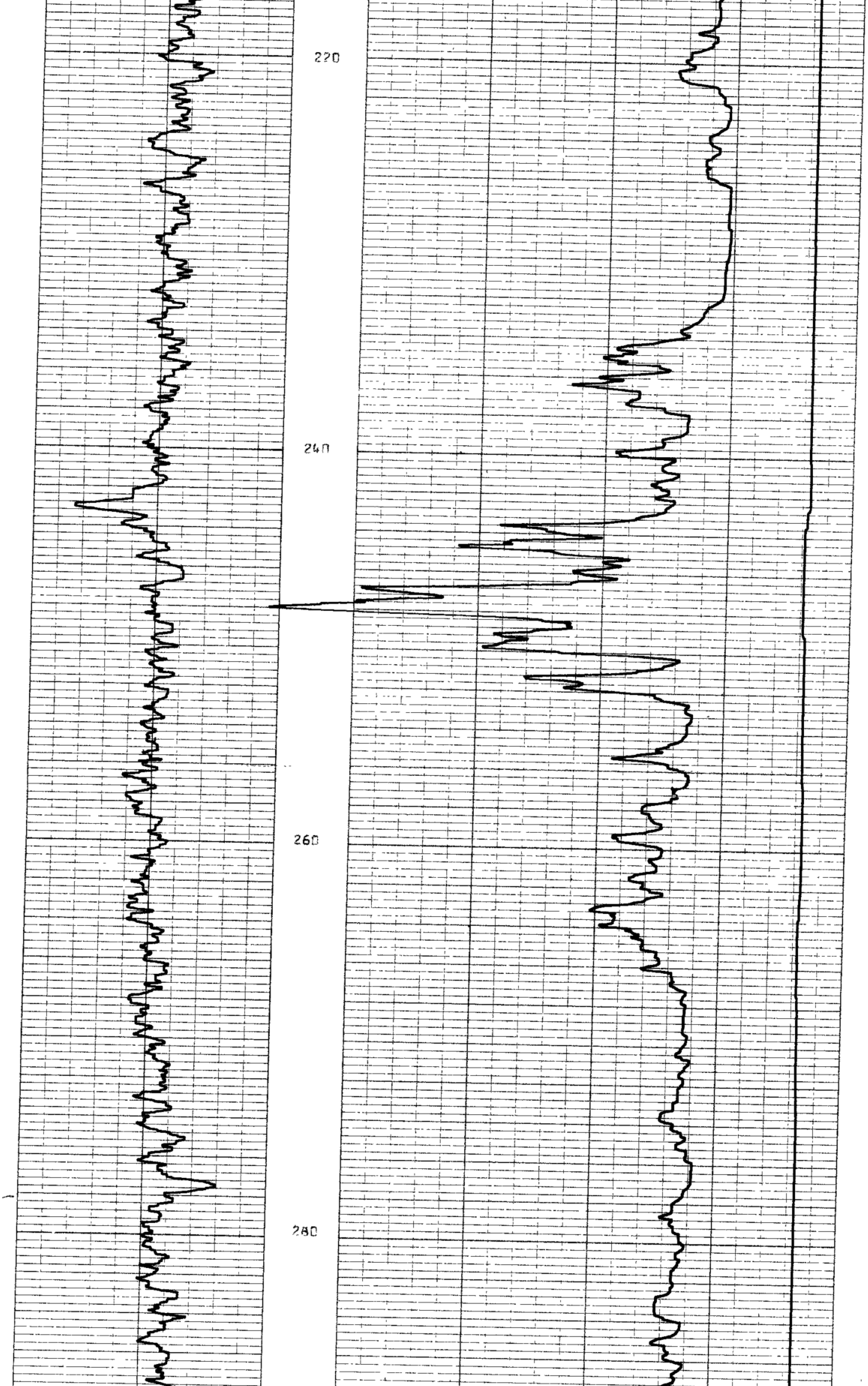
HOLE SIZE CORRECTION DATA

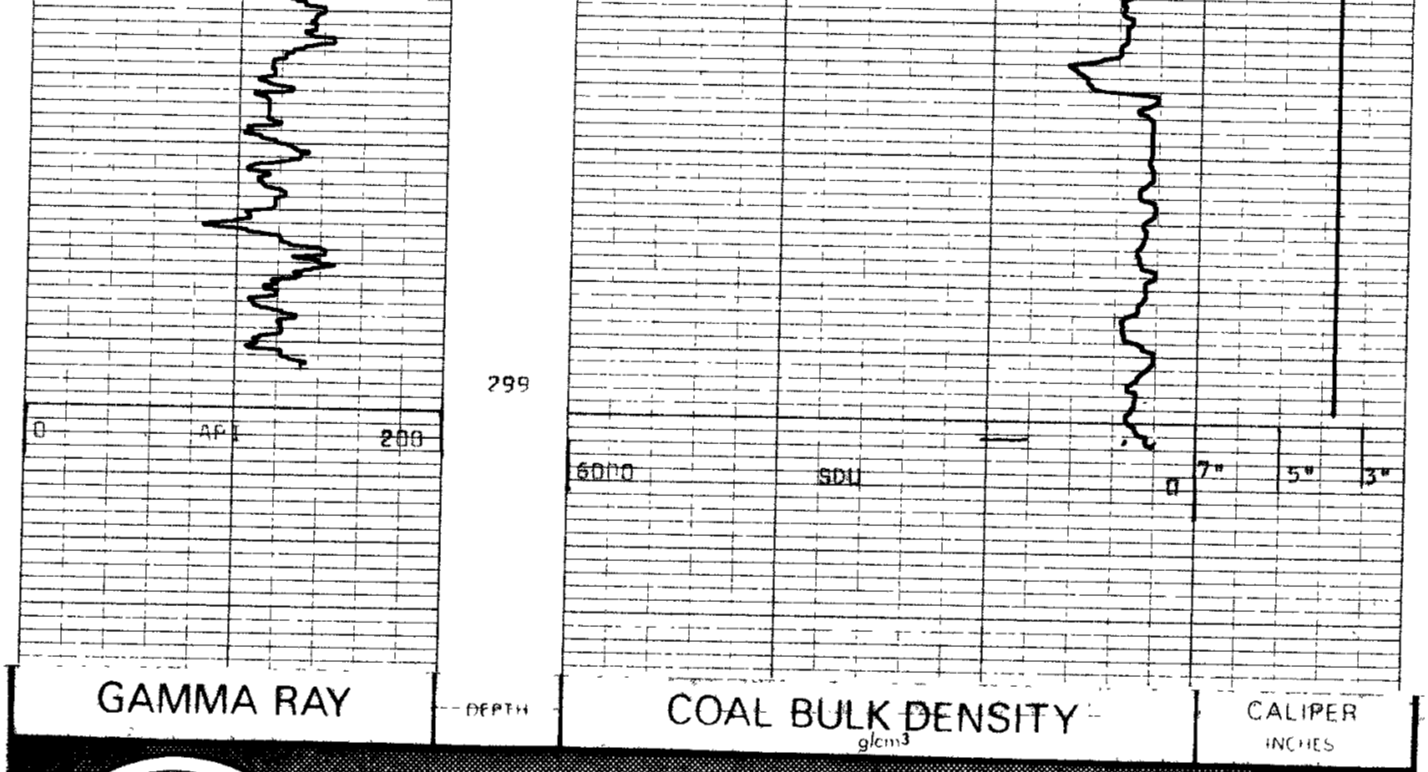












BOREHOLE CA 110

AREA CATAMARAN

CLIENT MARATHON

COUNTRY Australia

COAL LITHOLOGY LOG

MY 88002 R

105

82-1769 768035

5 cm

Resistance Log.

BOREHOLE GA 110
CLIENT MARATHON

AREA CATAMARAN
COUNTRY Australia
DATE LOGGED 16/4/82

DEPTH SCALE 1:200

2 OF 4 LOGS

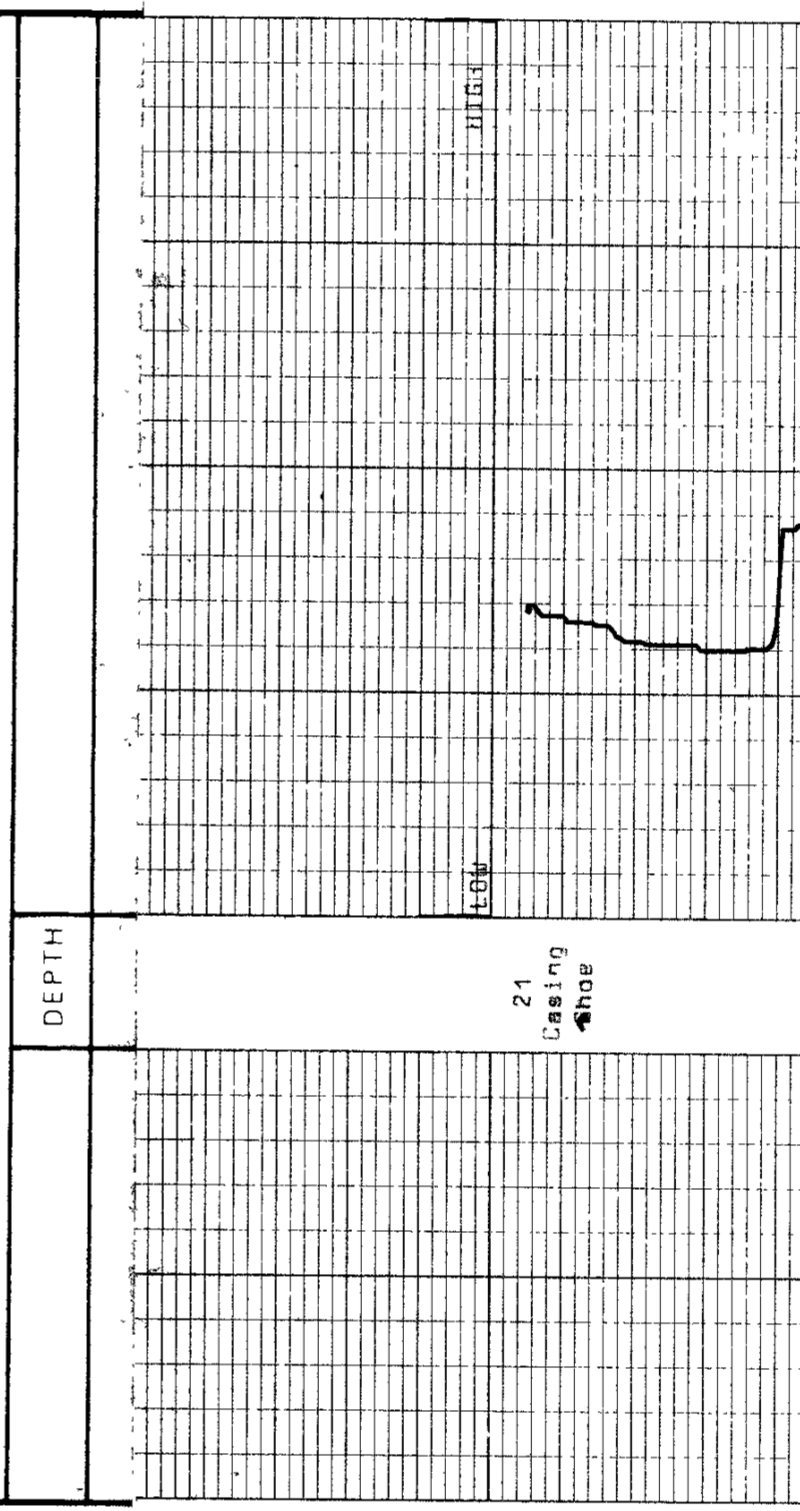
BOREHOLE DATA REFER TO Lithology LOG
OPERATION DATA REFER TO Lithology LOG

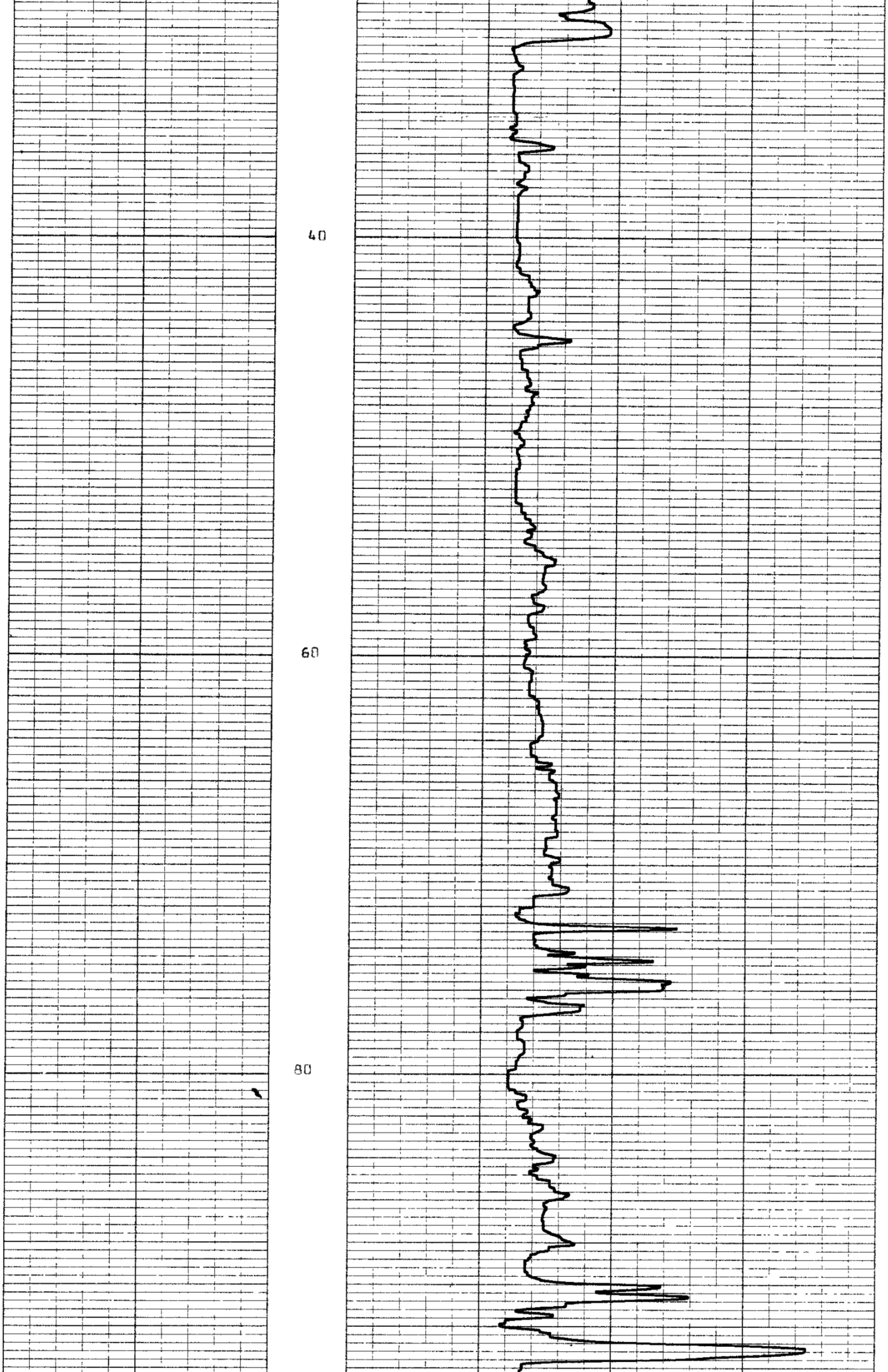
EQUIPMENT AND RECORDING DATA

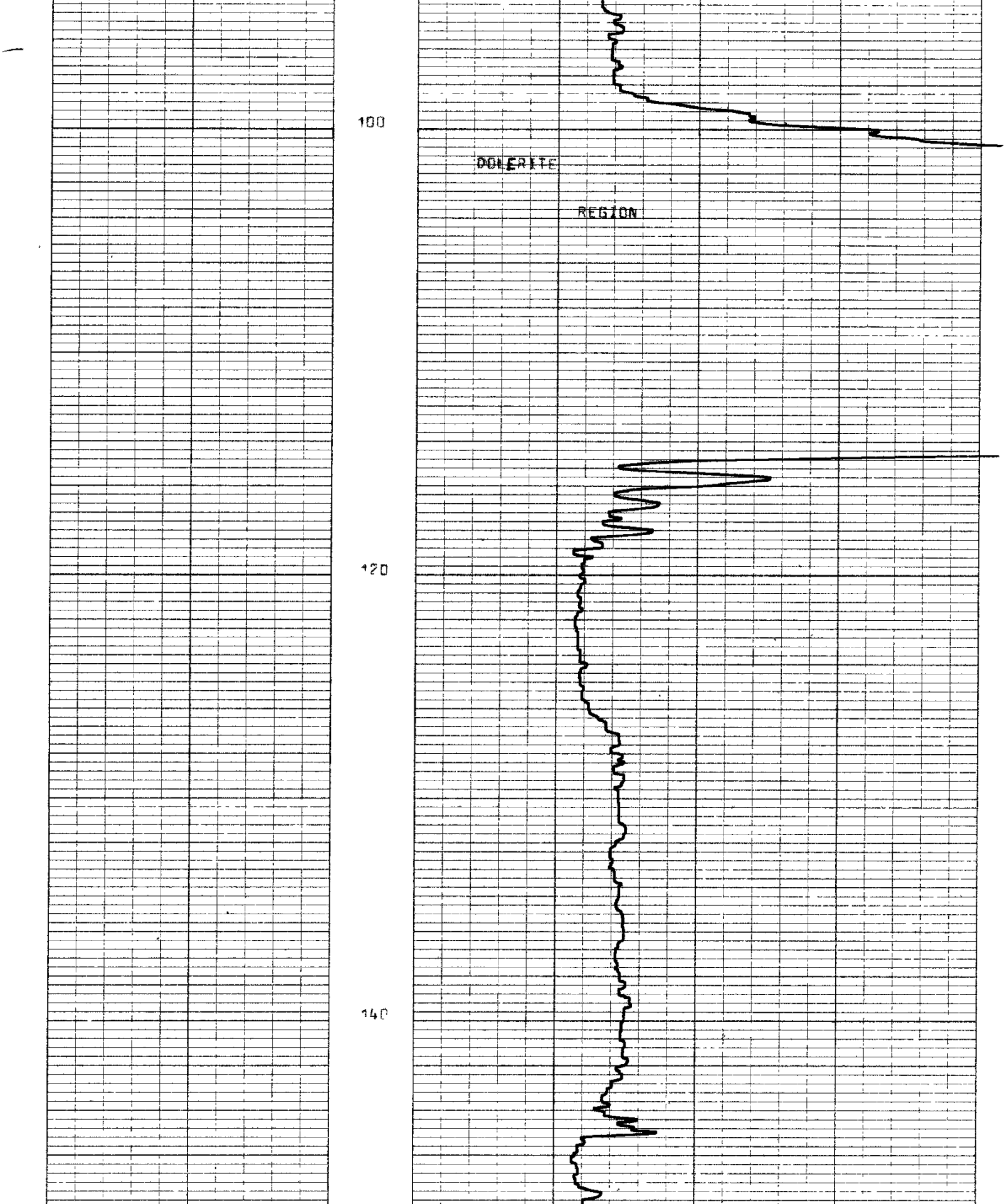
LOG	TAPING			PANEL			CAL COEFF
	LOG TAPED	RECORD SPEED	DIRECT or REPLAY	SPEED	T C SECS	NORM	
Res	Y	9	D	9	1/3		

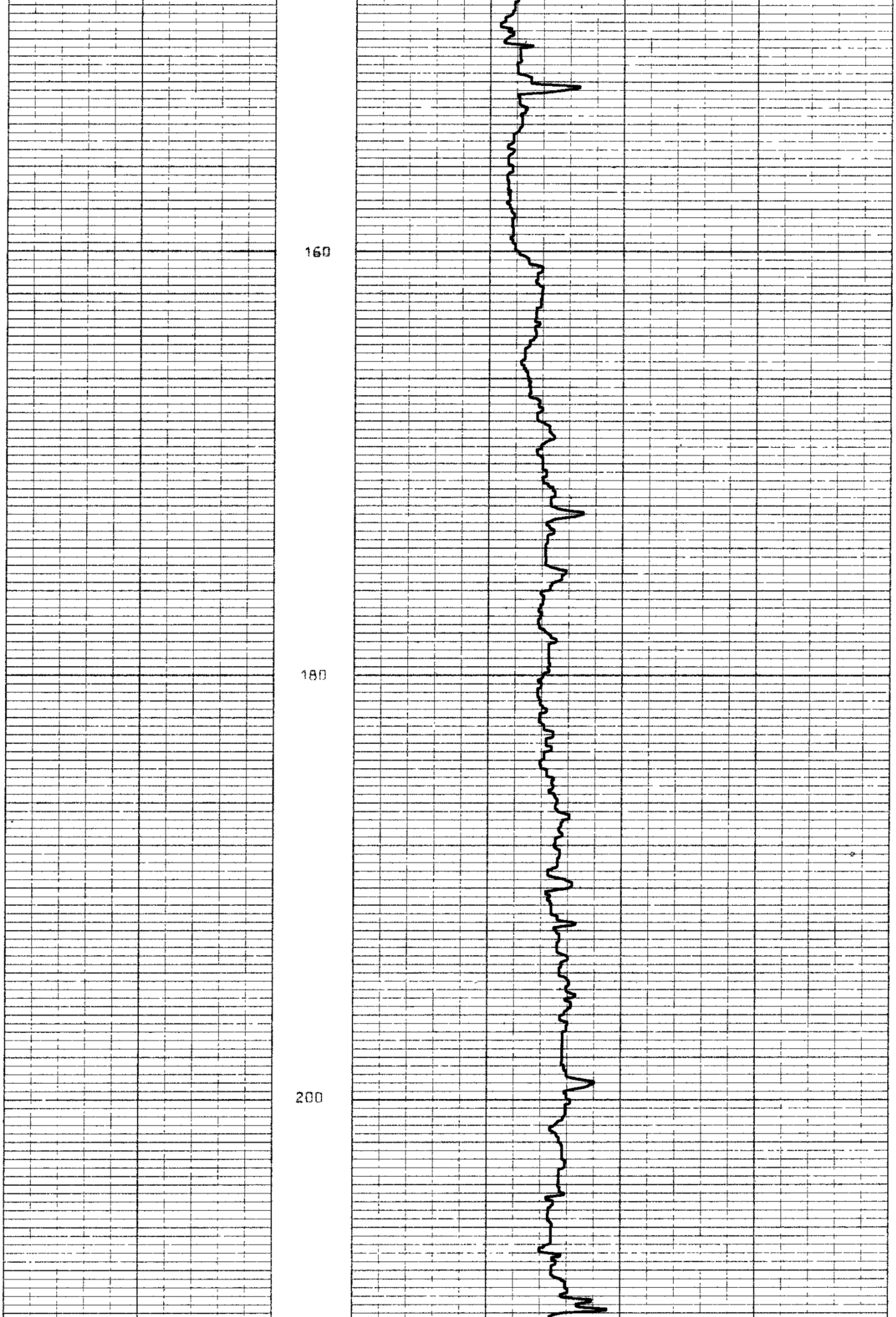
SONDE NO
SOURCE NO

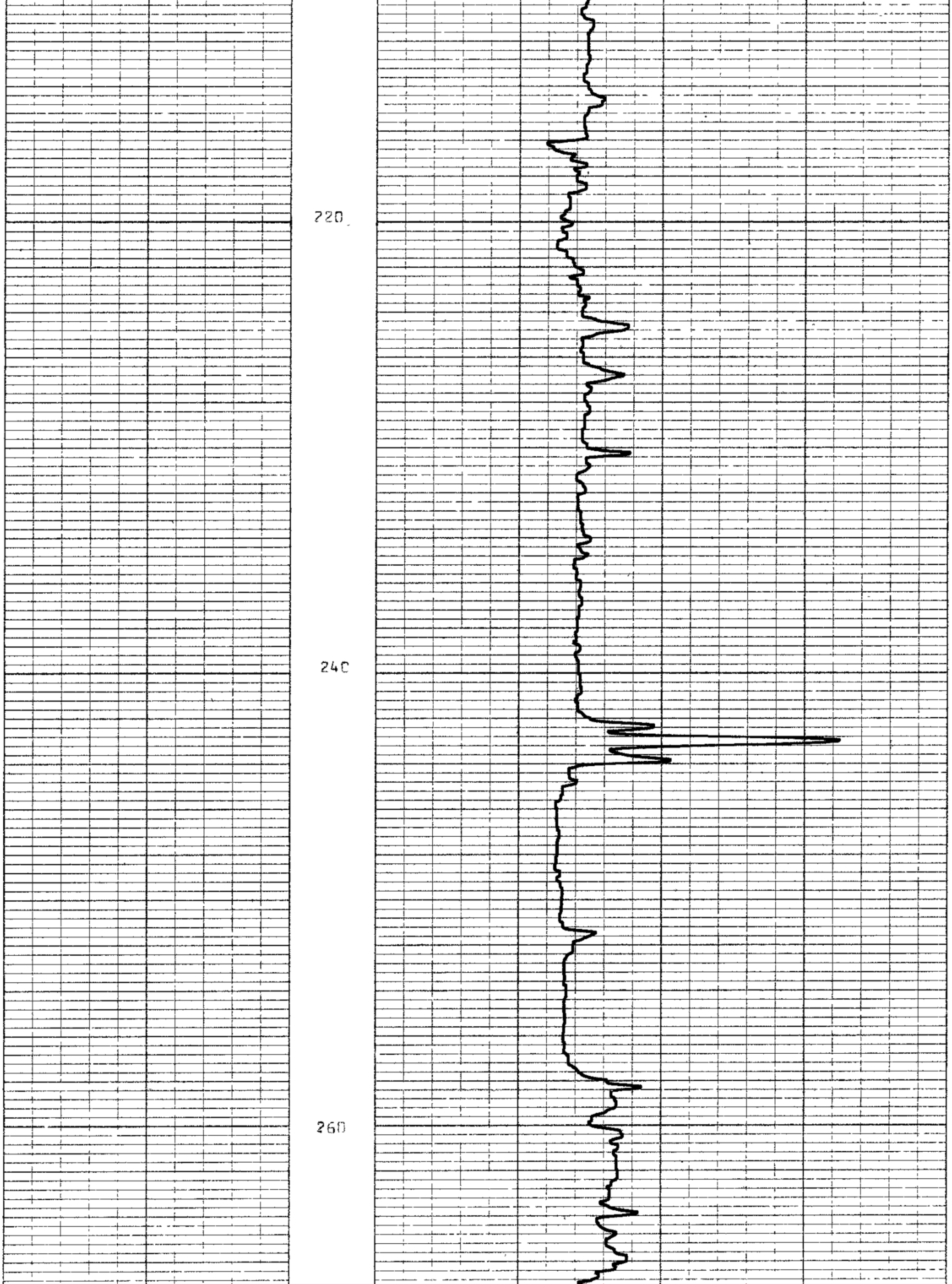
REMARKS

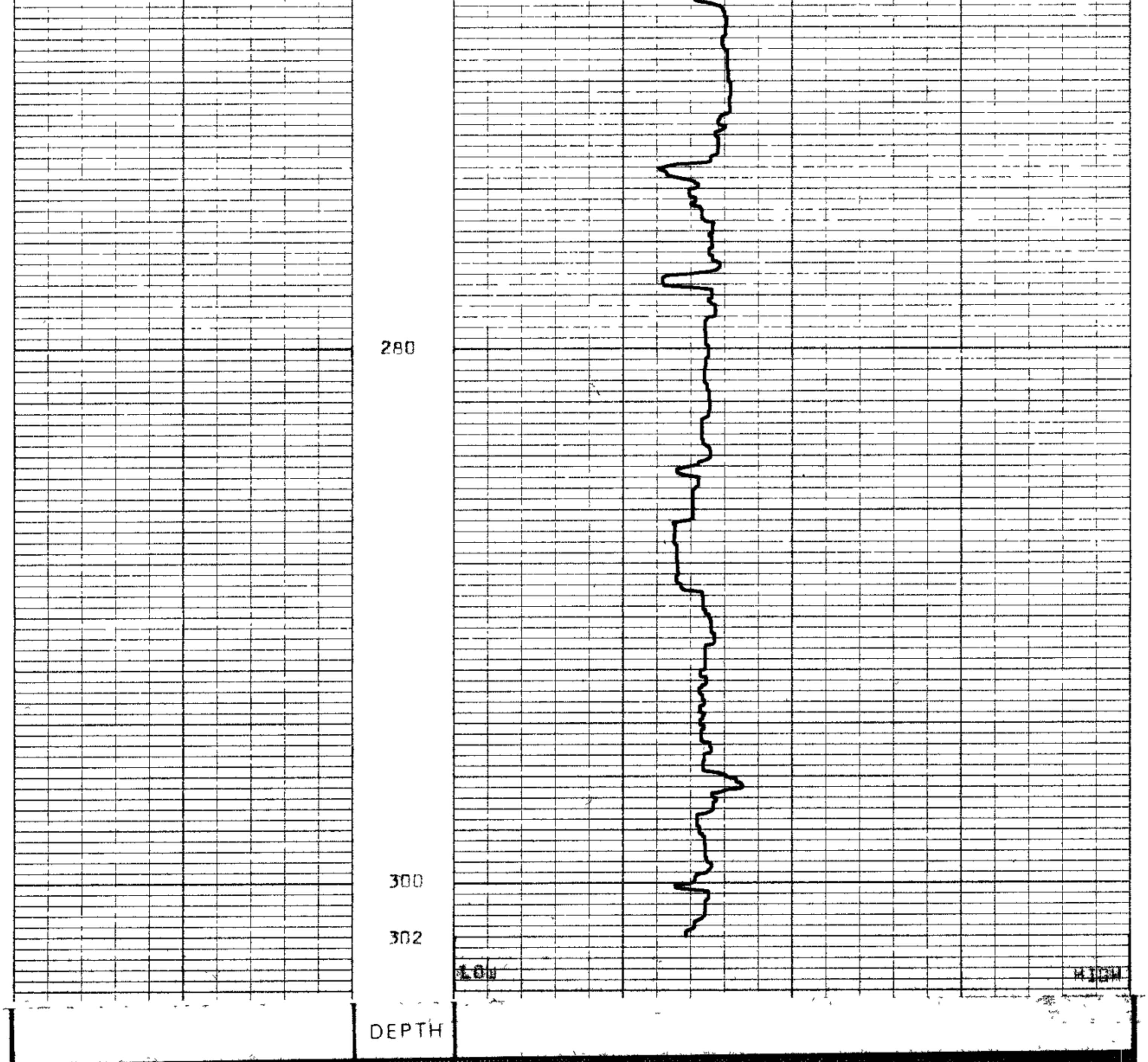












BPB

BOREHOLE CA 118

CLIENT MARATHON

AREA CATAMARAN

COUNTRY Australia

MYA58452R

94

82-1769

5 cm

BOREHOLE CA 110
CLIENT MARATHON

AREA CATAMARAN
COUNTRY Australia
DATE LOGGED 17/4/82

DEPTH SCALE
1:20

3 OF 4 LOGS

COAL QUALITY LOG

BOREHOLE DATA	REFER TO LITHOLOGY LOG
OPERATION DATA	REFER TO LITHOLOGY LOG

EQUIPMENT AND RECORDING DATA

COAL COMBINATION SONDE

SIDEWALL POSITION

LOG	TAPING			PANEL			CAL COEFF
	LOG TAPED	RECORD SPEED	DIRECT or REPLAY	SPEED	T C SECS	NORM	
GAMMA RAY	Y	2	R	3	1	1.53	
LS DENSITY	Y	2	R	3	1	5.37	

SOURCE SONDE AND CALIBRATION

REFER TO LITHOLOGY LOG

SONDE TYPE
COAL
COMBINATION
SONDE

COAL QUALITY LOG INTERVALS

FROM	96	78	32 m	
TO	88	71	26 m	
INTERVAL	8	6	6 m	
FROM				INTER-VAL TOTAL
TO				
INTERVAL				±20m

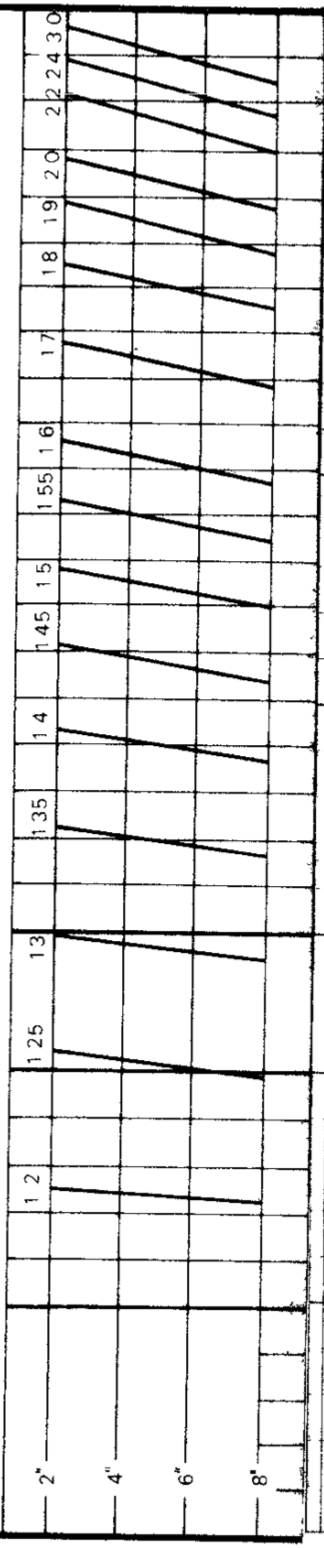
LOG SUITE
GAMMA RAY
L S DENSITY

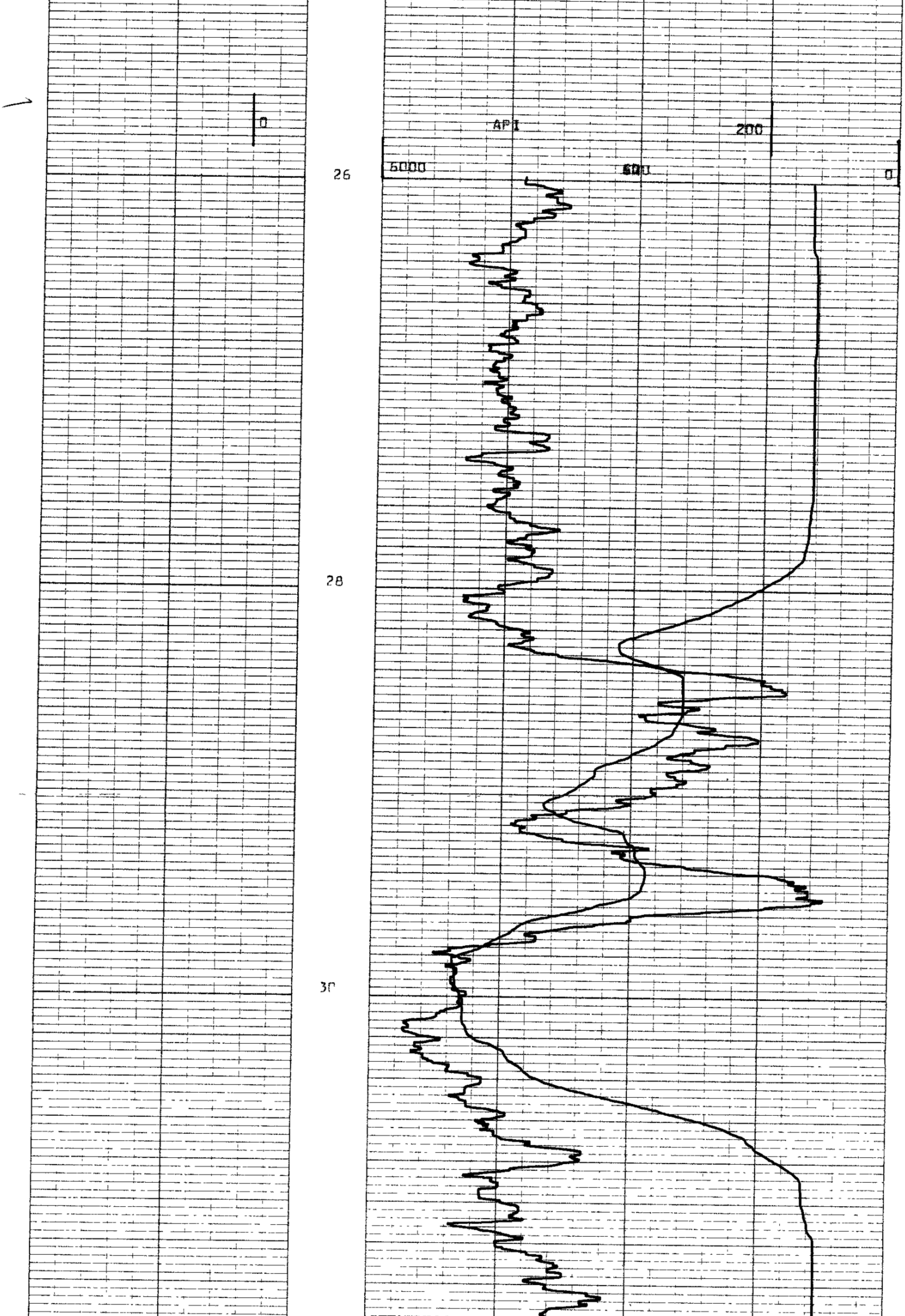
REMARKS

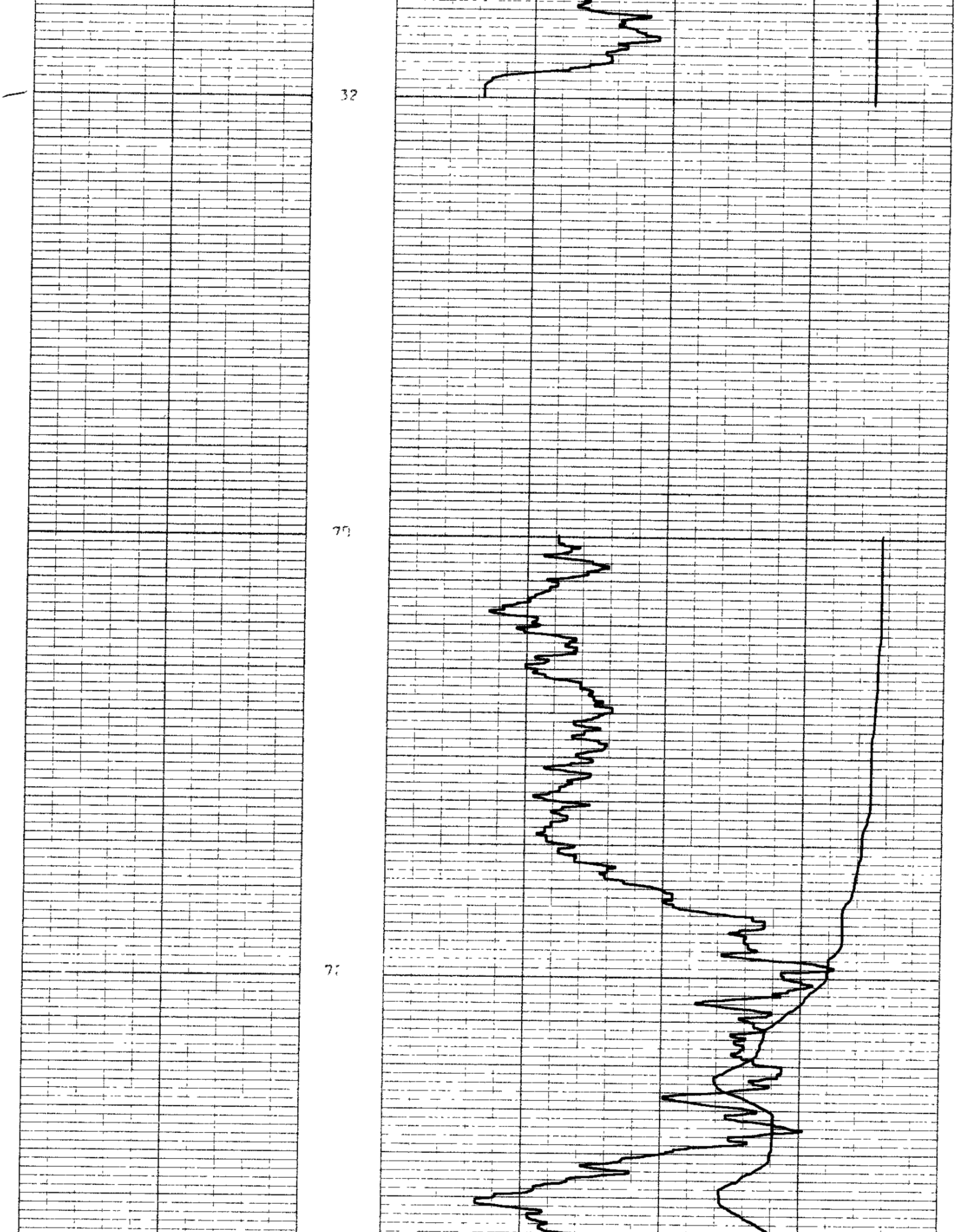
BPB COAL QUALITY LOG

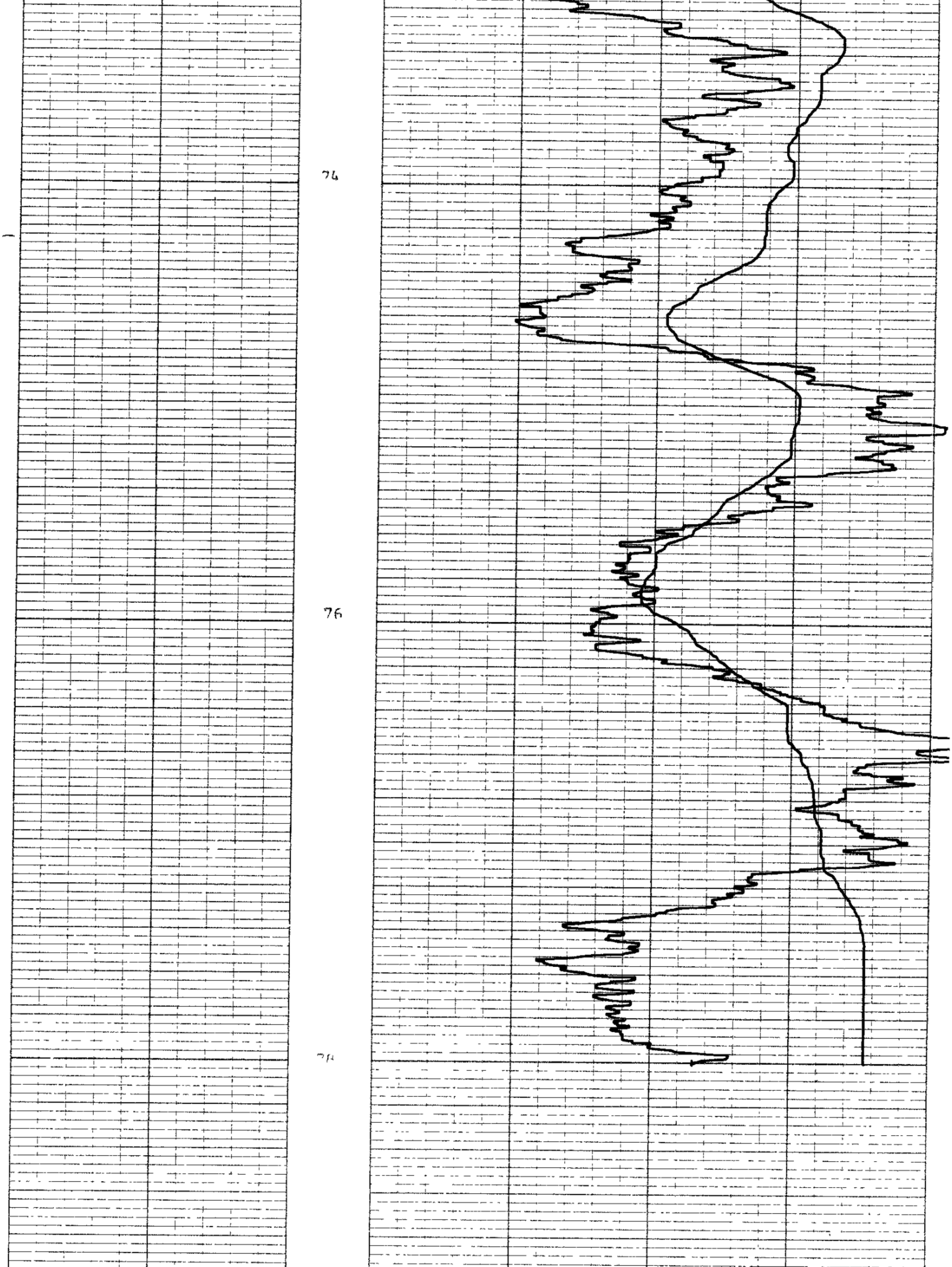
	DEPTH	GAMMA RAY
		COAL BULK DENSITY g/cm³

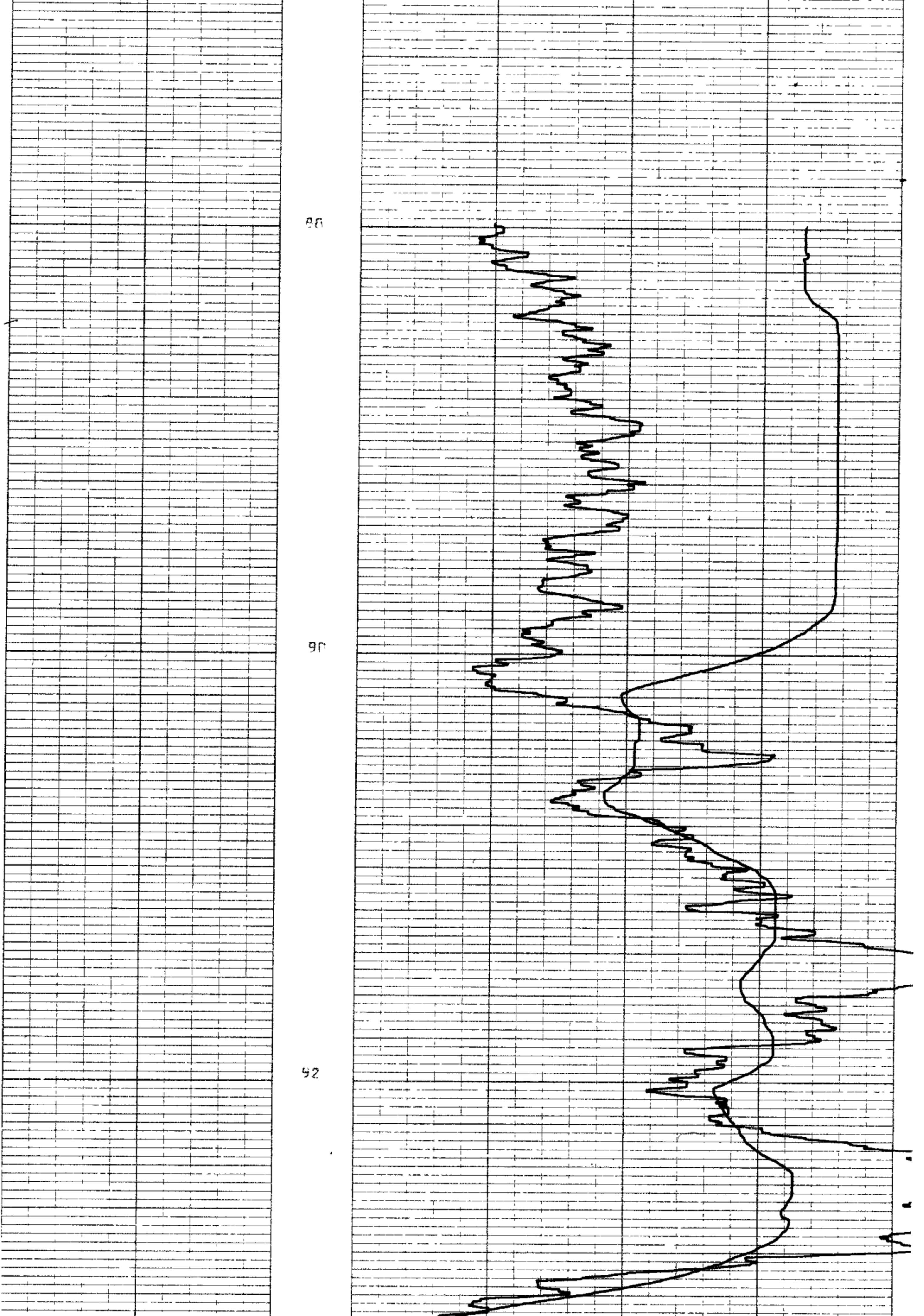
HOLE SIZE CORRECTION DATA

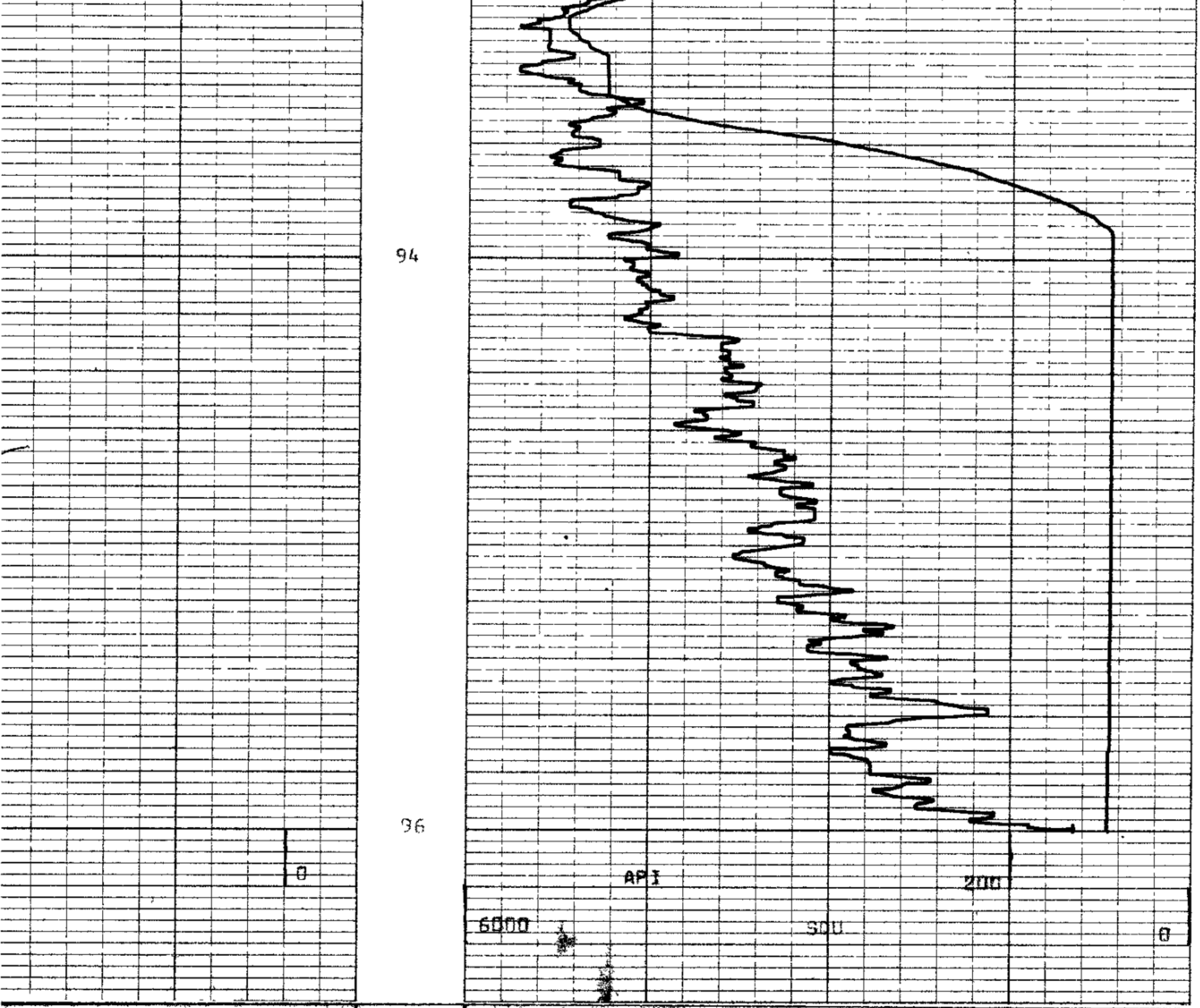












COAL BULK DENSITY
g/cm3

DEPTH

GAMMA RAY

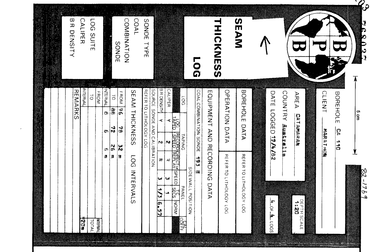
BOREHOLE CA 110

AREA CATAMARAN

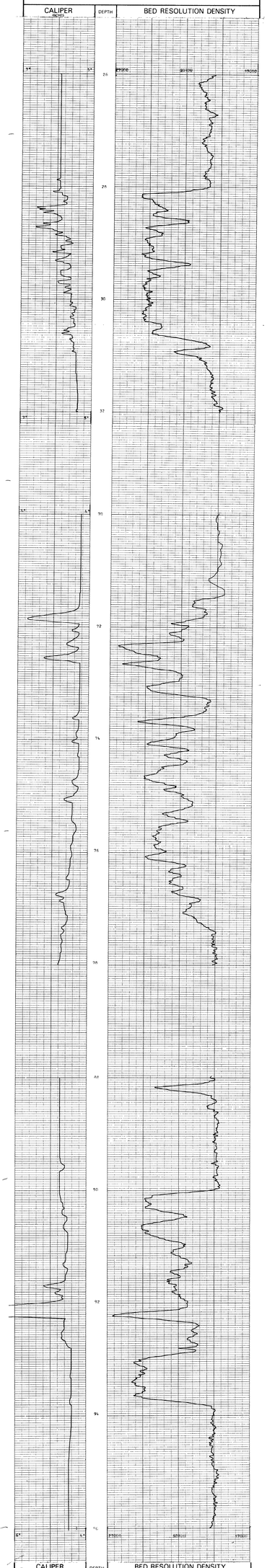
CLIENT MARATHON

COUNTRY Australia

COAL QUALITY LOG



B P B SEAM THICKNESS LOG



CALIPER
INCHES
DEPTH
BED RESOLUTION DENSITY

BPB

BOREHOLE GA 145 | AREA CATOMBUWA

CLIENT MARATHON | COUNTRY Australia

SEAM THICKNESS LOG

82-1749

5 cm

RESISTIVITY LOG. 768038

BOREHOLE CA 111

CLIENT MARATHON

AREA CATAMARAN

COUNTRY AUSTRALIA(TAS)

DATE LOGGED 8/5/82

DEPTH SCALE 1:200

1 OF 5 LOGS

BOREHOLE DATA	REFER TO Lithology LOG
OPERATION DATA	REFER TO Lithology LOG

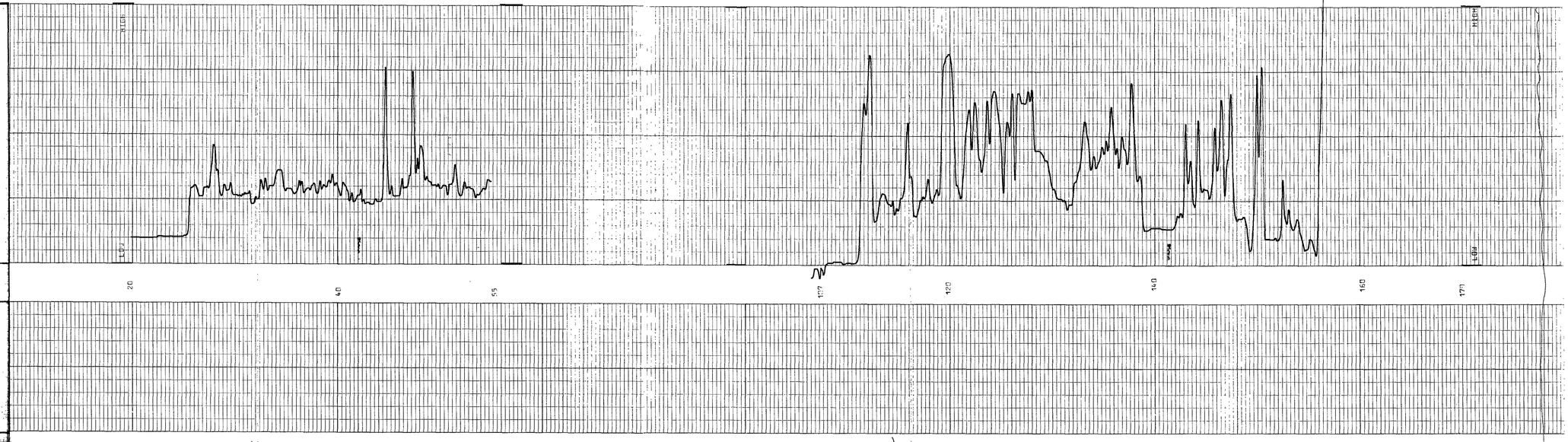
EQUIPMENT AND RECORDING DATA

LOG	TAPING			PANEL			CAL COEFF
	LOG TAPE ID	RECORD SPEED	DIRECT/ REPLAY	SPEED	T.P. SLS	NORM	
RES	Y	12	D	12	-	-	-

CABLE NO RES — SHOT NO -

REMARKS Due to unstable borehole conditions, a RES log was only possible from 170-107m and from 55-20m. The Res log is of no value through steel rods or casing.

DEPTH



COAL LITHOLOGY LOG

5 cm

BOREHOLE CA 111

CLIENT MARATHON 768039

82-1769

AREA CATAMARAN

COUNTRY AUSTRALIA(TAS)

DATE LOGGED 8/5/82

DEPTH SCALE 1:200

2 OF 6 LOGS

SONDE TYPE
COAL
COMBINATION
SONDE

LOG SUITE
GAMMA RAY
L S DENSITY
CALIPER

BOREHOLE DATA

PERMANENT DATUM	GROUND LEVEL			
ELEVATION OF PD				
	BPB		DRILLER	
MEASUREMENTS FROM	159			
DEPTH REACHED	159.36		171.50	
CASING SHOE				
BIT SIZES	1	HQ TO 111.65	2	NQ TO 171.50
	3	TO	4	TO
CASING SIZES	1	HQ TO 11[illegible]	2	NQ TO 171.[illegible]

FLUID DATA

NATURE	Air/water
SG	
LEVEL	1.0
VISCOSITY	
Rm at meas temp	
BHT	

OPERATION DATA

FIRST READING	169
LAST READING	1
INTERVAL LOGGED	168
UNIT-TRUCK No	U309/39
ENGINEER	M.Andrews
W TNESS	

EQUIPMENT AND RECORDING DATA

COAL COMBINATION SONDE

LOG	EQUIPMENT			TAPING			PANEL			CAL COEFF	DEPTHS			SEAM LOG RUN
	SONDE	SOURCE	CALIBRATOR	LOG TAPED	RECORD SPEED	DIRECT or REPLAY	SPEED	T C SECS	NORM		FROM	TO	INTERVAL	
GAMMA RAY	1798		393	Y	9,3	D	9,3	1,3		1.84	169	1	168	Y
L S DENSITY	SIDEWALL POSITION	5854	Water	"	"	"	"	1/3,	1 5.97	-	"	"	"	"
CALIPER			-	"	"	"	"	1/3	-	-	"	"	"	"

COAL QUALITY/SEAM THICKNESS LOG INTERVALS (Refer to relevant log)

				INTERVAL TOTAL
FROM	159	(refer	54	
TO	147	to 100	70	
INTERVAL	12	3of6)	14	26

ADDITIONAL SONDES RUN

SONDE	LOG	GENERAL SCALE LOG	DETAIL SCALE LOG	
RES	RES	1:200	-	REFER TO ADDITIONAL HEADINGS

REMARKS

Hole was logged through NQ rods from TD-1, and HQ casing from 111.65 ~1m.

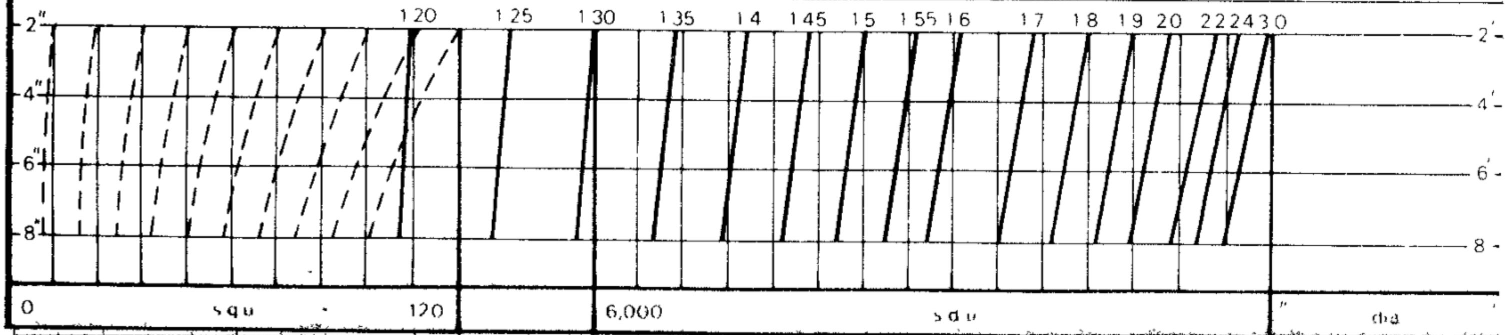
B P B COAL LITHOLOGY LOG

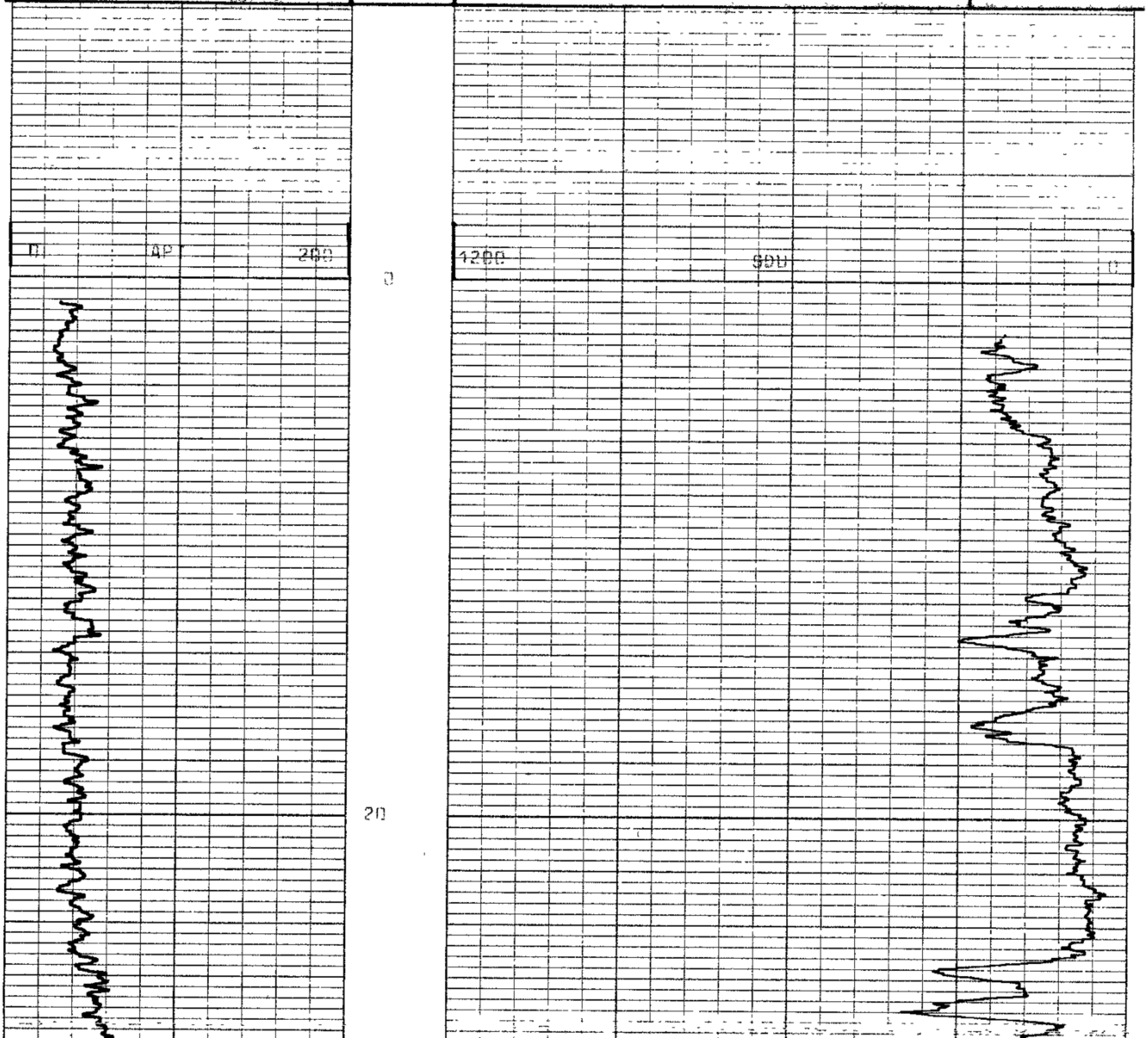
CALIBRATION DATA

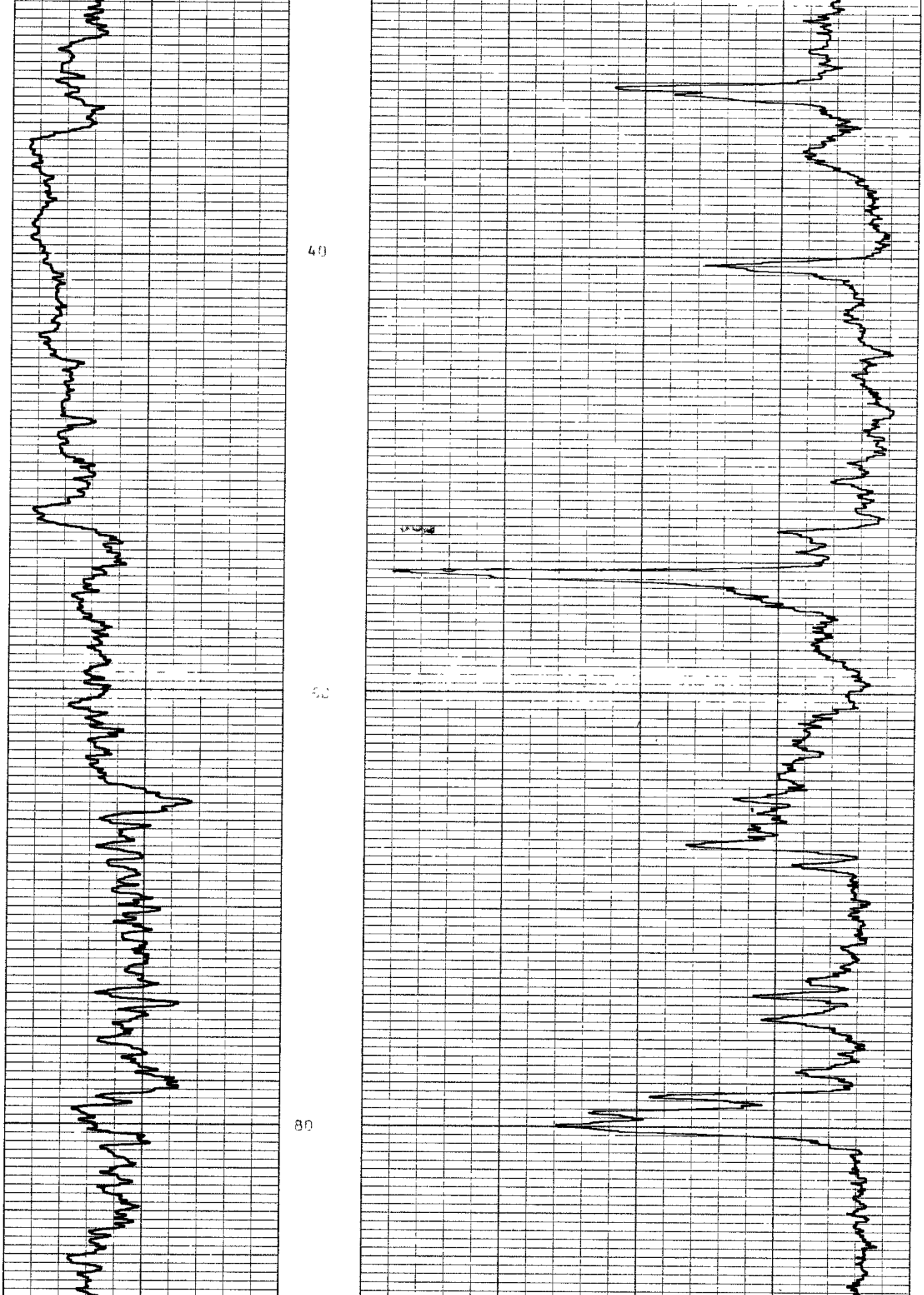
JIG No 393 VALUE 553@ 2" DIAM	JIG CAL DATE 1/5/82 JIG VALUE 1043 SDU@1.1 g/cm³	ins	cps
JIG MARK SHOWN AT ABOVE VALUE 200	JIG No Water SPAN 1200-0 NORM $\frac{SDU}{CPS}$ = 5.97	ins	cps

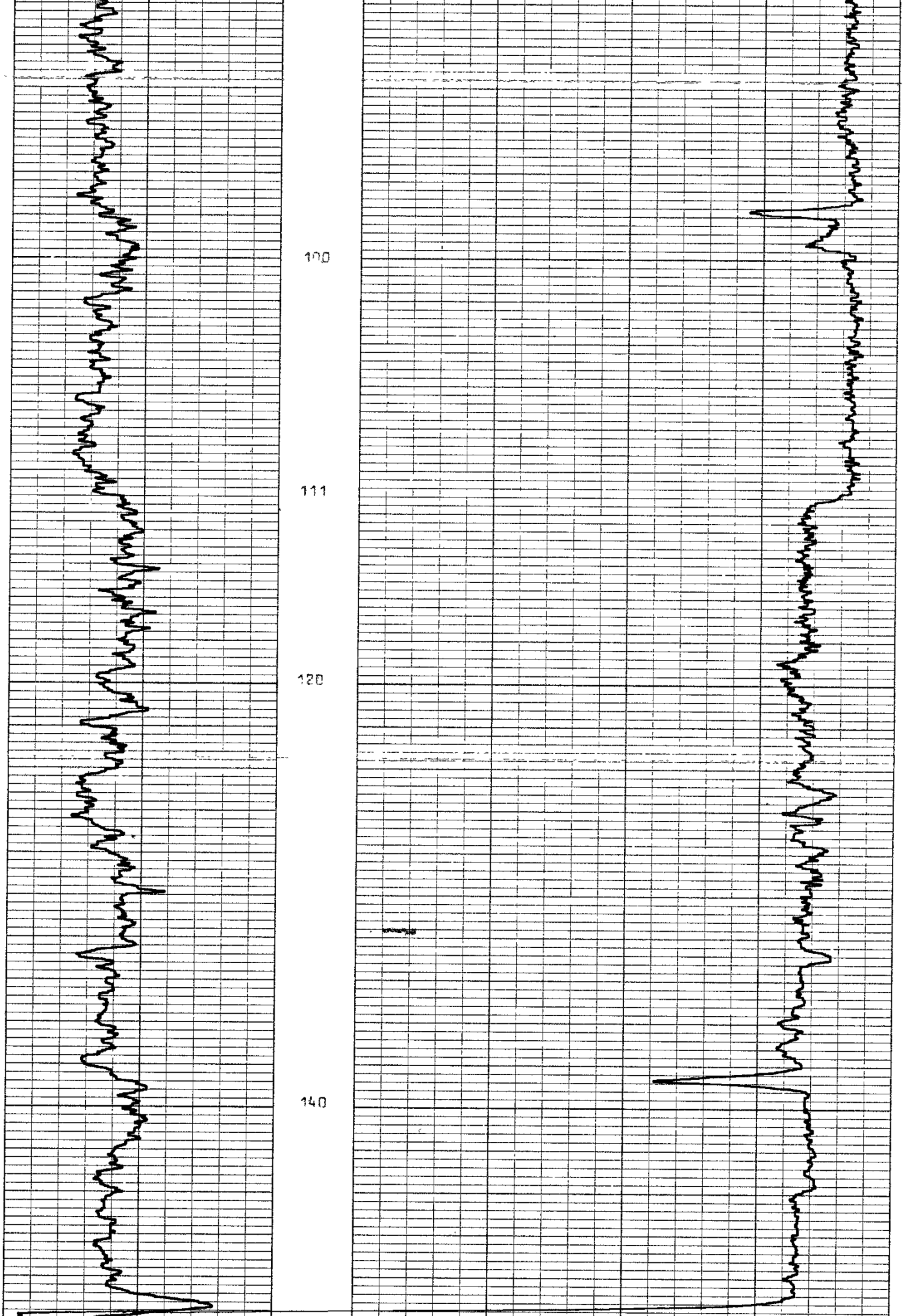
GAMMA RAY	DEPTH	COAL BULK DENSITY g/cm³	CALIPER INCHES

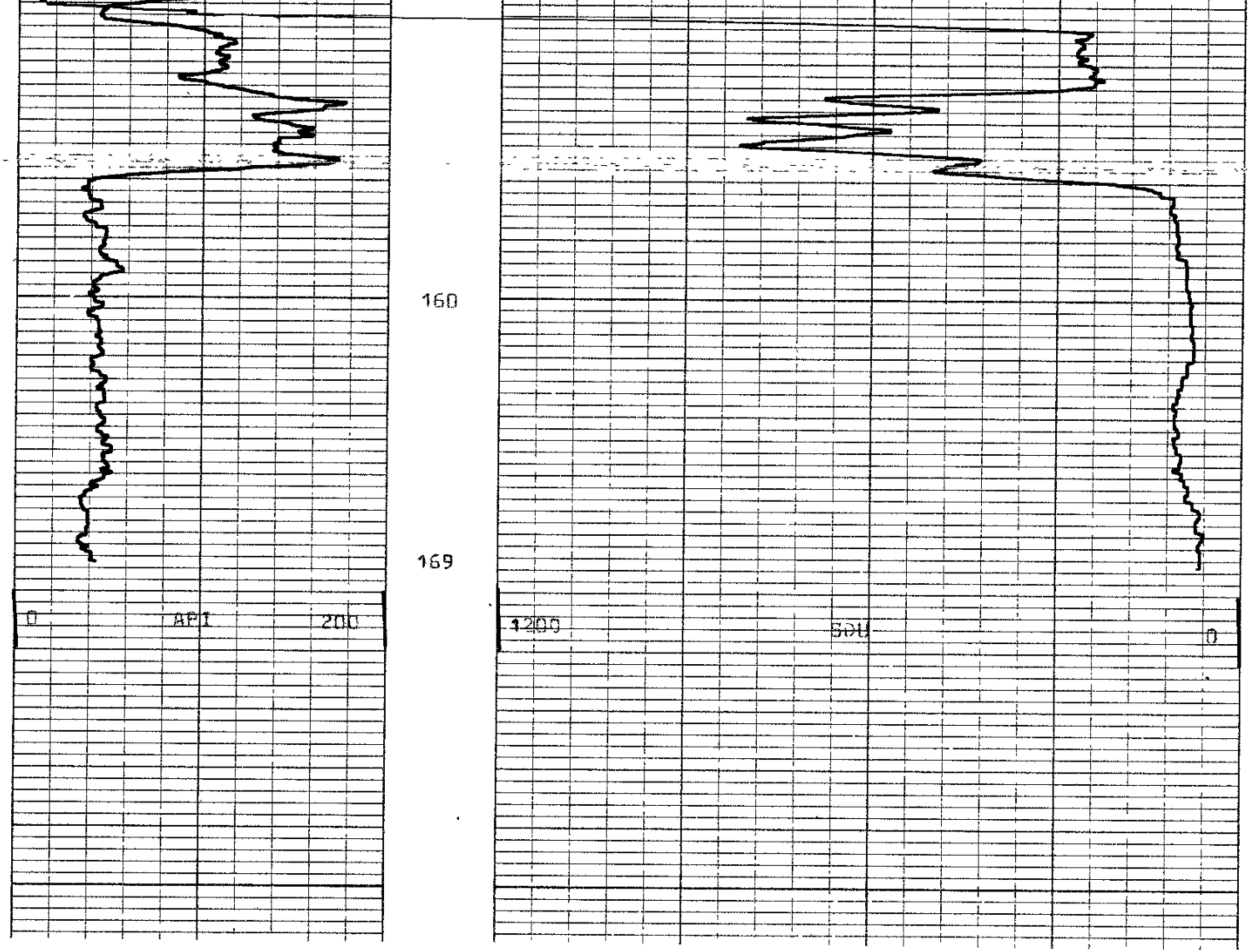
HOLE SIZE CORRECTION DATA











82-1769

5 cm

BPB

COAL QUALITY LOG

←

BOREHOLE CA 111 768040

CLIENT MARATHON

AREA CATAMARAN

COUNTRY AUSTRALIA(TAS)

DATE LOGGED 8/5/82

DEPTH SCALE 1:20

4 OF 6 LOGS

BOREHOLE DATA	REFER TO LITHOLOGY LOG
OPERATION DATA	REFER TO LITHOLOGY LOG

EQUIPMENT AND RECORDING DATA

COAL COMBINATION SONDE

SIDEWALL POSITION

LOG	TAPING			PANEL			CAL COEFF
	LOG TAPED	RECORD SPEED	DIRECT or REPLAY	SPEED	T C SECS	NORM	
GAMMA RAY	Y	3	R	2.3	1		1.84
L S DENSITY	"	"	"	"	1/3	5.97	

SOURCE SONDE AND CALIBRATION

REFER TO LITHOLOGY LOG

COAL QUALITY LOG INTERVALS

FROM	159	
TO	147	
INTERVAL	12	
FROM	84	INTER VAL TOTAL
TO	70	
INTERVAL	14	26

REMARKS

Seam from 159-147m was logged through the uncased hole.However the eam from 84-70m was logged through HC steel casing

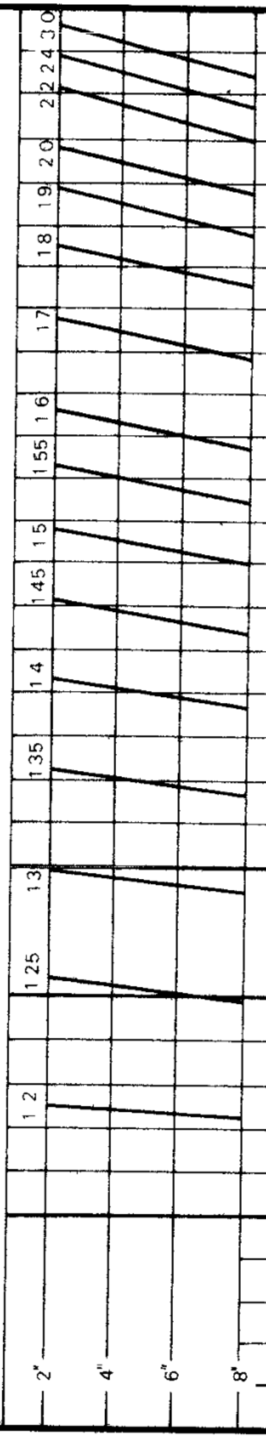
SONDE TYPE
COAL
COMBINATION
SONDE

LOG SUITE
GAMMA RAY
L S DENSITY

BPB COAL QUALITY LOG

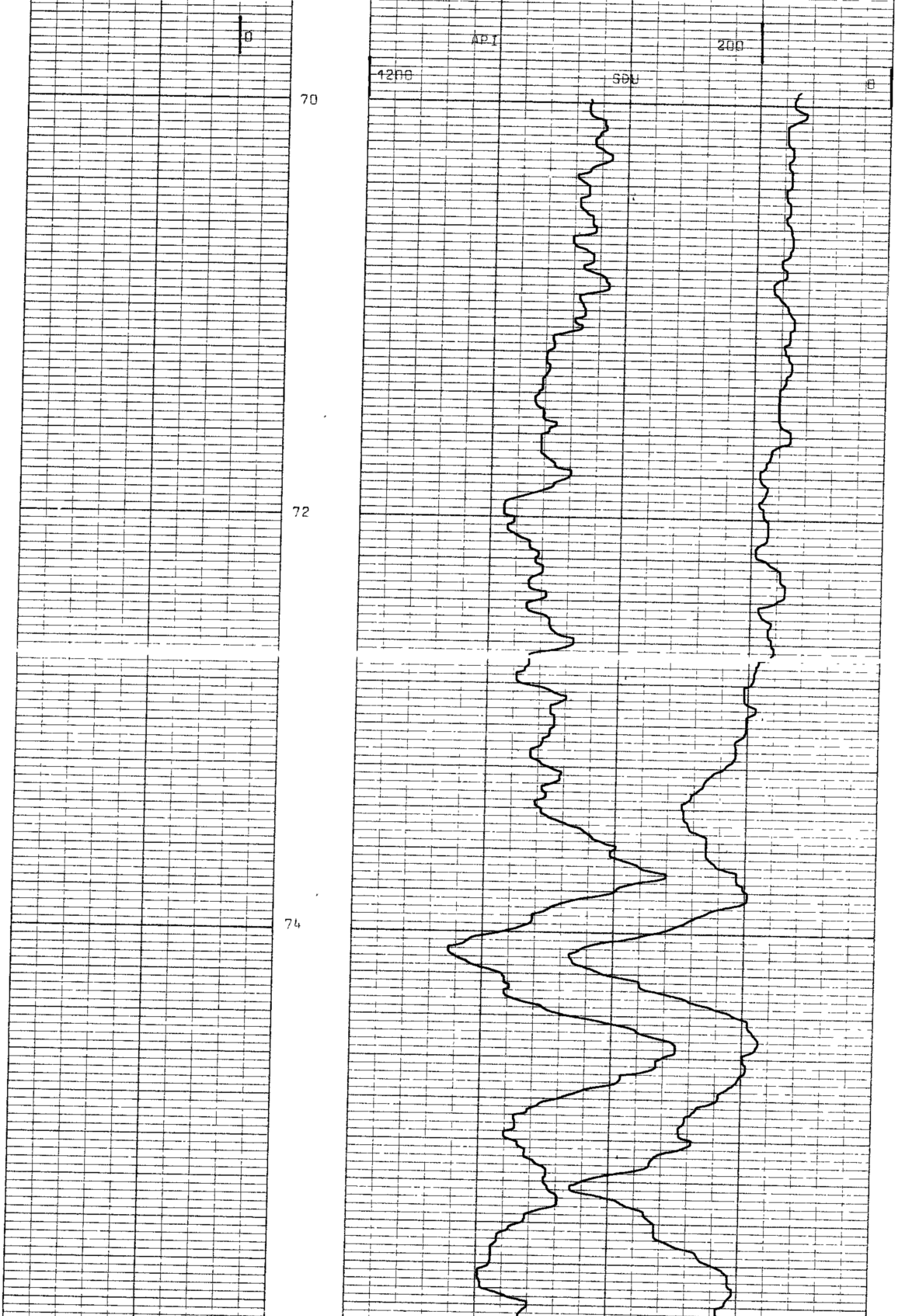
DEPTH	GAMMA RAY
	COAL BULK DENSITY g/cm^3

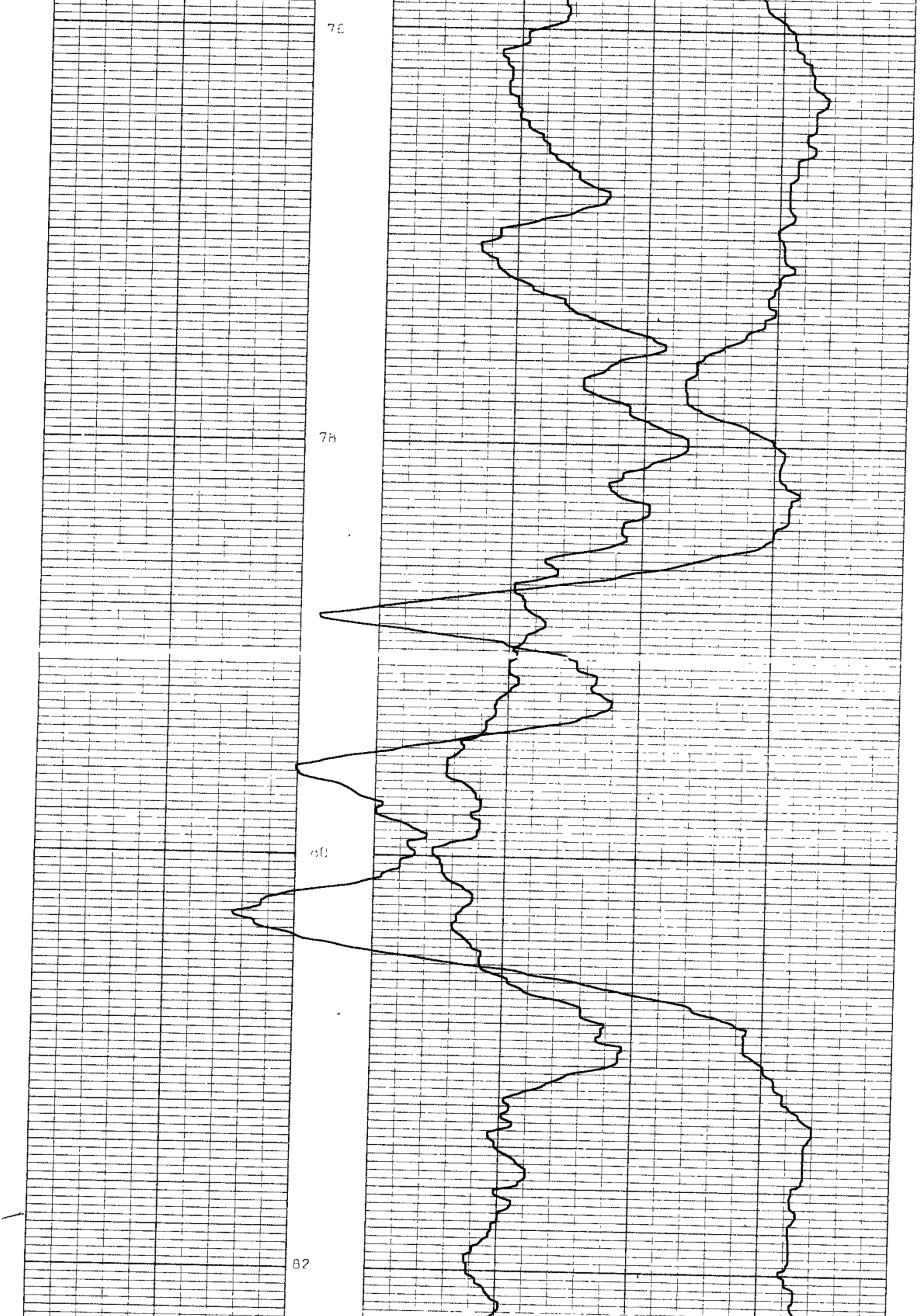
HOLE SIZE CORRECTION DATA

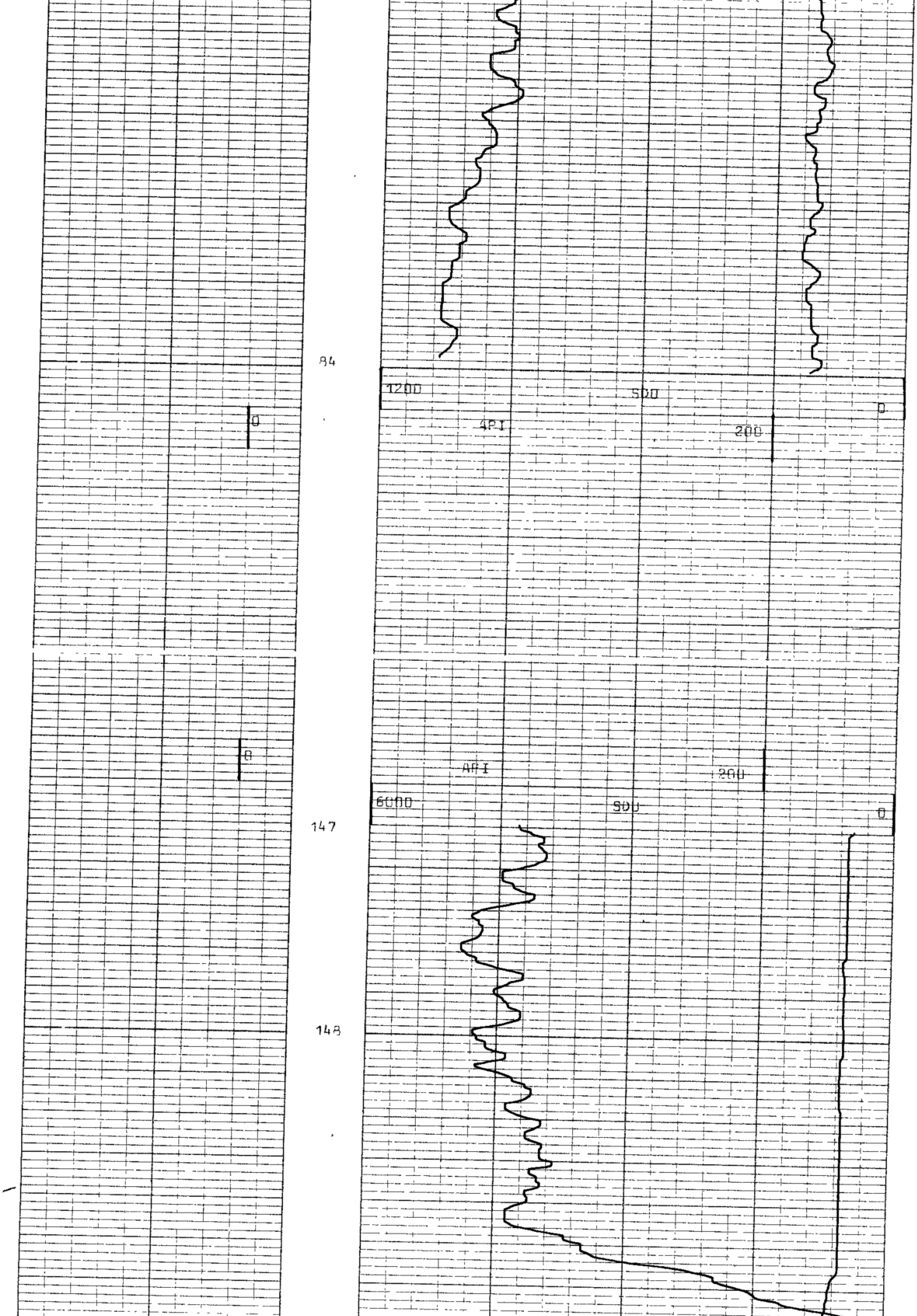


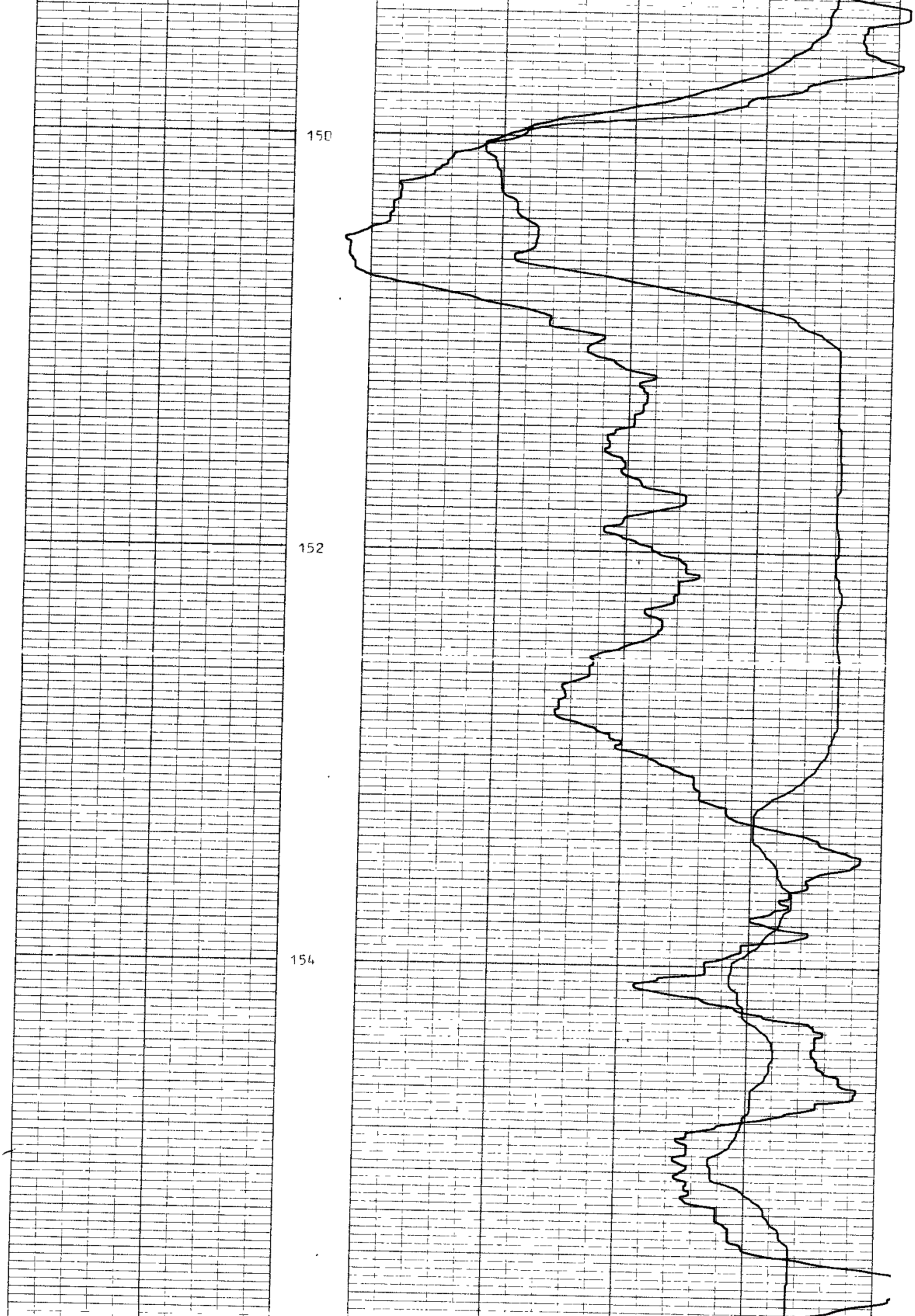
120 s g u 0

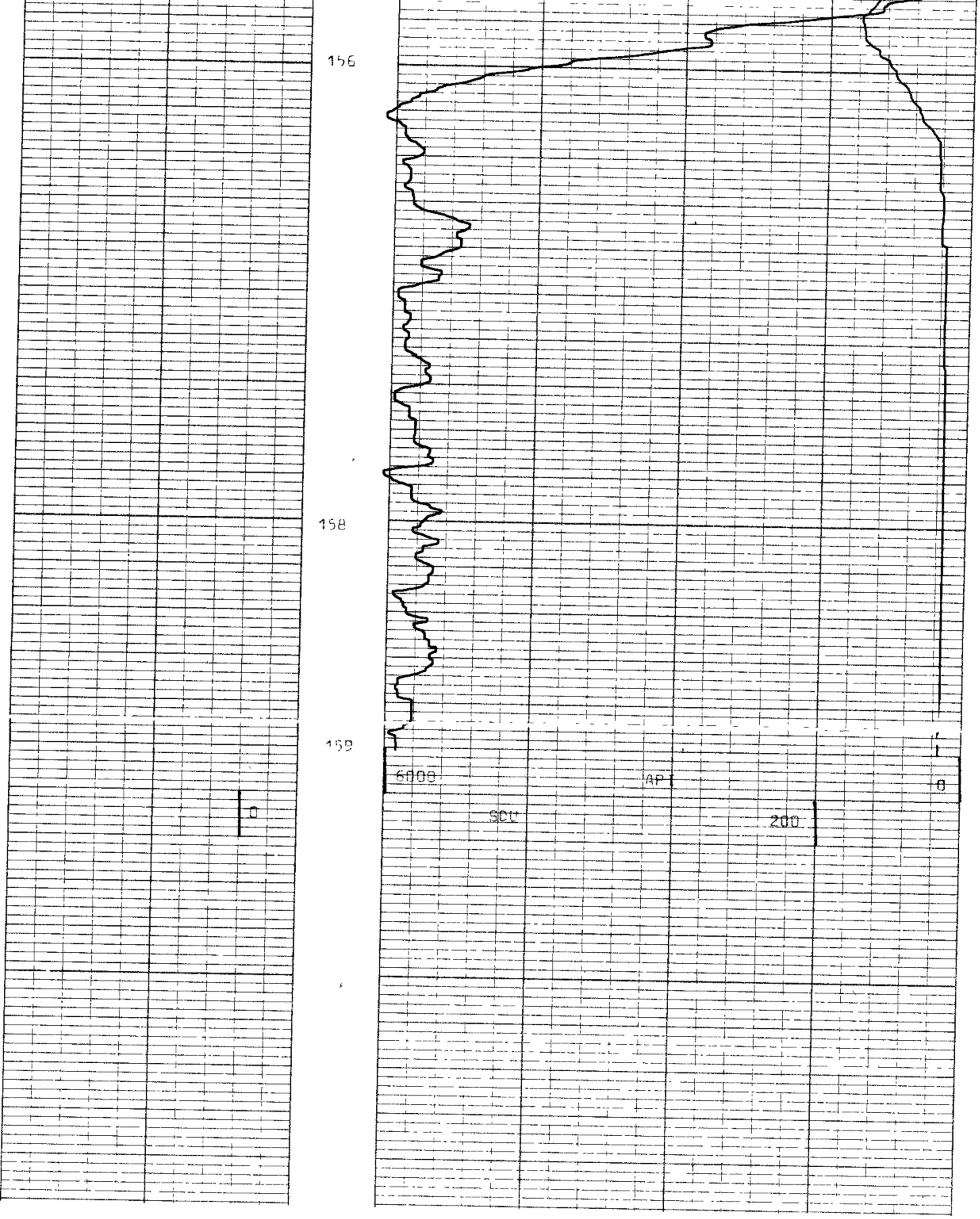
6 000 s d u 0











82-1769

5 cm

BOREHOLE CA 111
CLIENT MARATHON 768041

AREA CATAMARAN
COUNTRY AUSTRALIA(TAS)
DATE LOGGED 8/5/82

DEPTH SCALE 1:20

5 OF 6 LOGS

SEAM THICKNESS LOG

BOREHOLE DATA	REFER TO LITHOLOGY LOG
OPERATION DATA	REFER TO LITHOLOGY LOG

EQUIPMENT AND RECORDING DATA

COAL COMBINATION SONDE

SIDEWALL POSITION

LOG	TAPING			PANEL			CAL COEFF
	LOG TAPED	RECORD SPEED	DIRECT or REPLAY	SPEED	T C SECS	NORM	
CALIPER	√	3	P	2.5	1/3	-	-
B R DENSITY	"	"	"	"	"	6.34	-

SOURCE SONDE AND CALIBRATION

REFER TO LITHOLOGY LOG

SEAM THICKNESS LOG INTERVALS

FROM	159	
TO	147	
INTERVAL	12	
FROM	84	INTERVAL
TO	70	TOTAL
INTERVAL	14	= 26

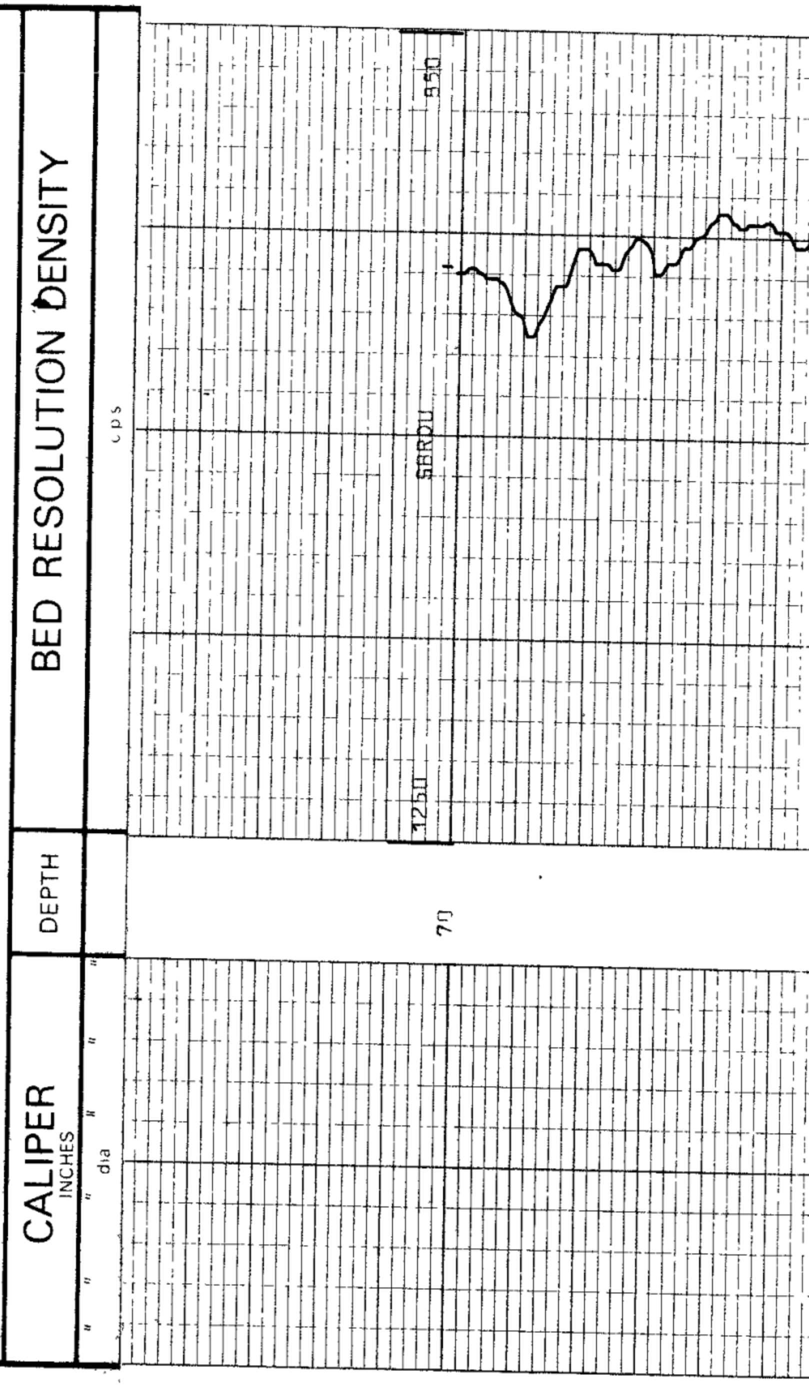
REMARKS

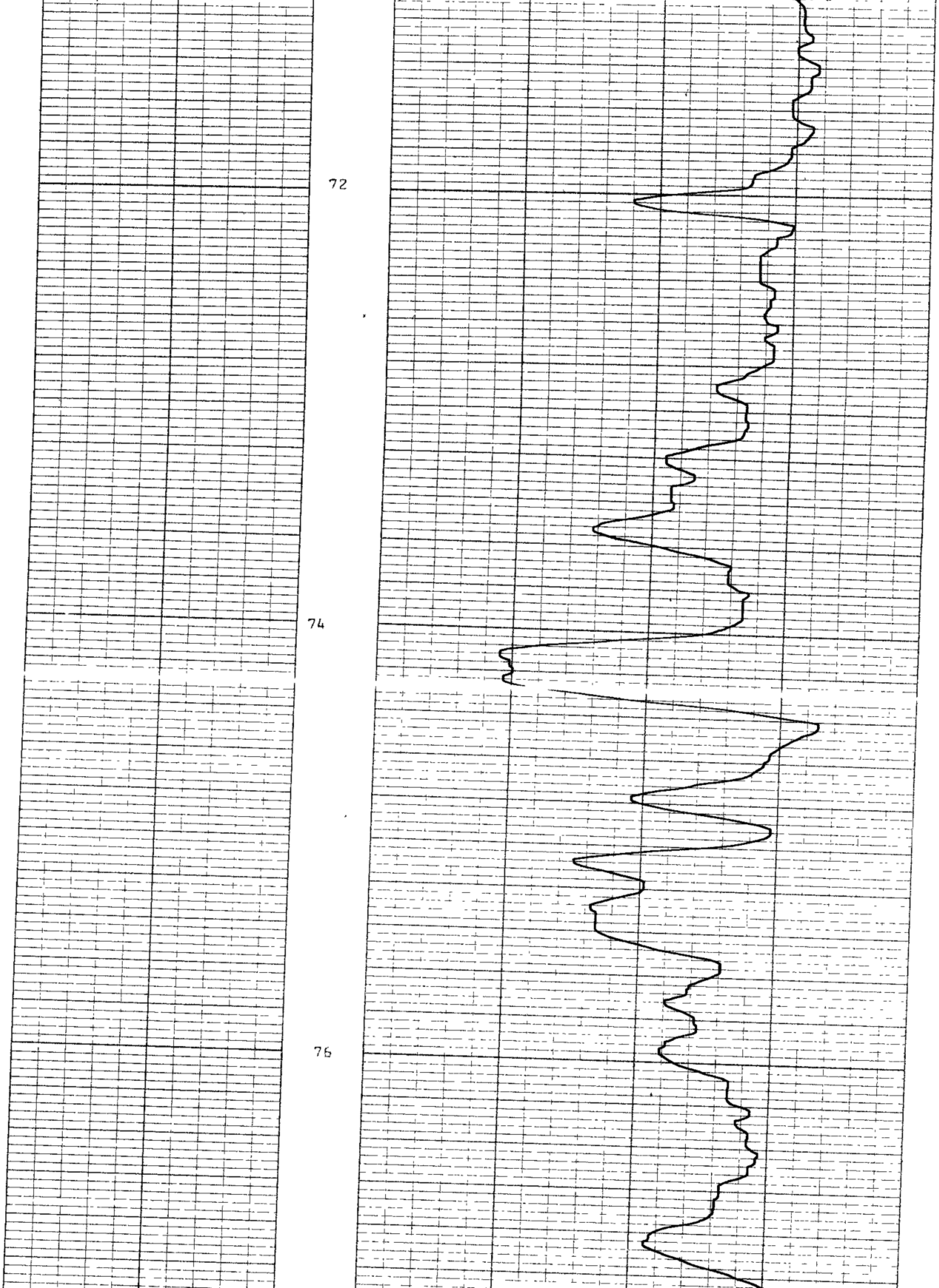
refer to log 4of6.

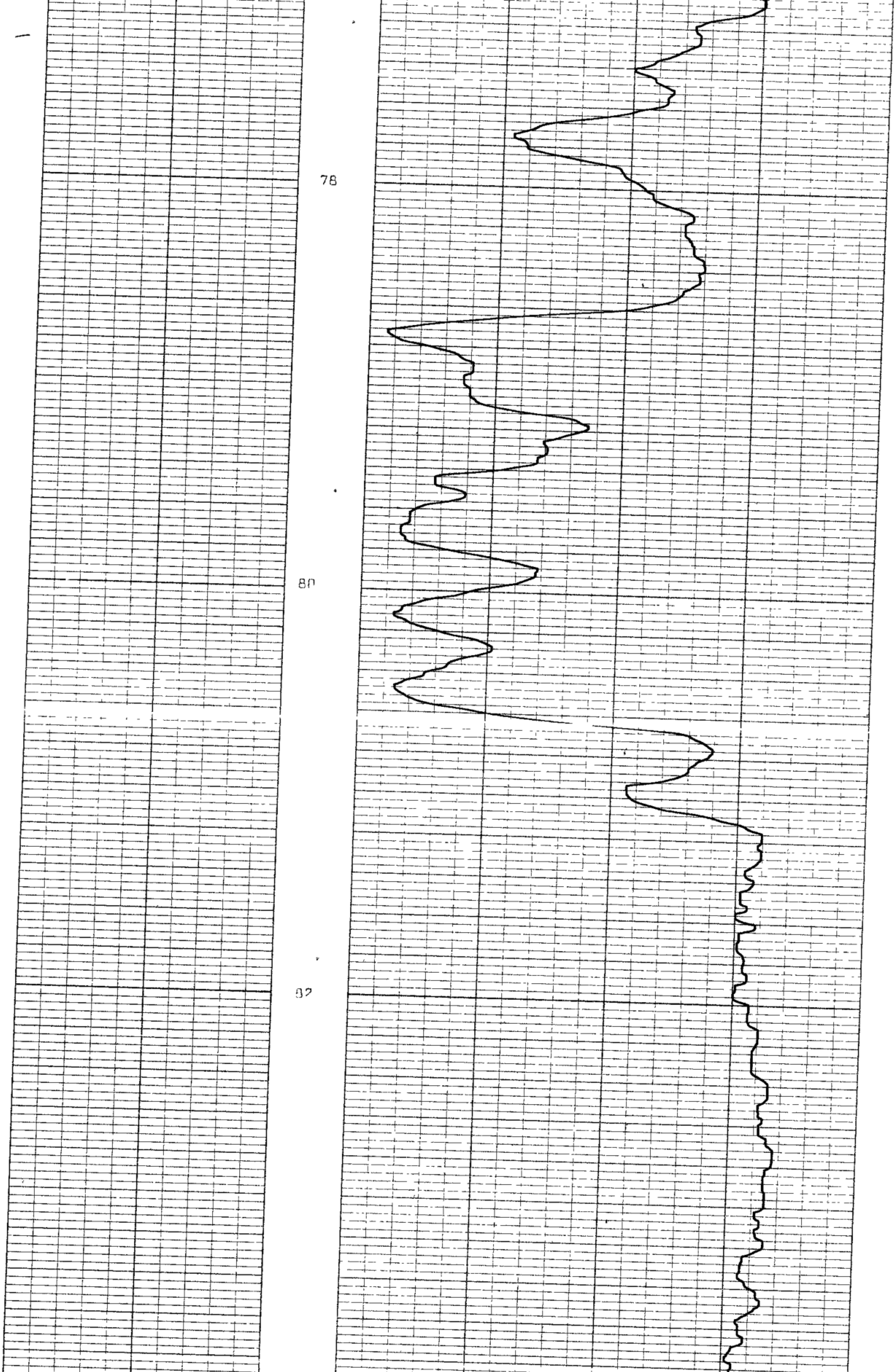
SONDE TYPE
COAL
COMBINATION
SONDE

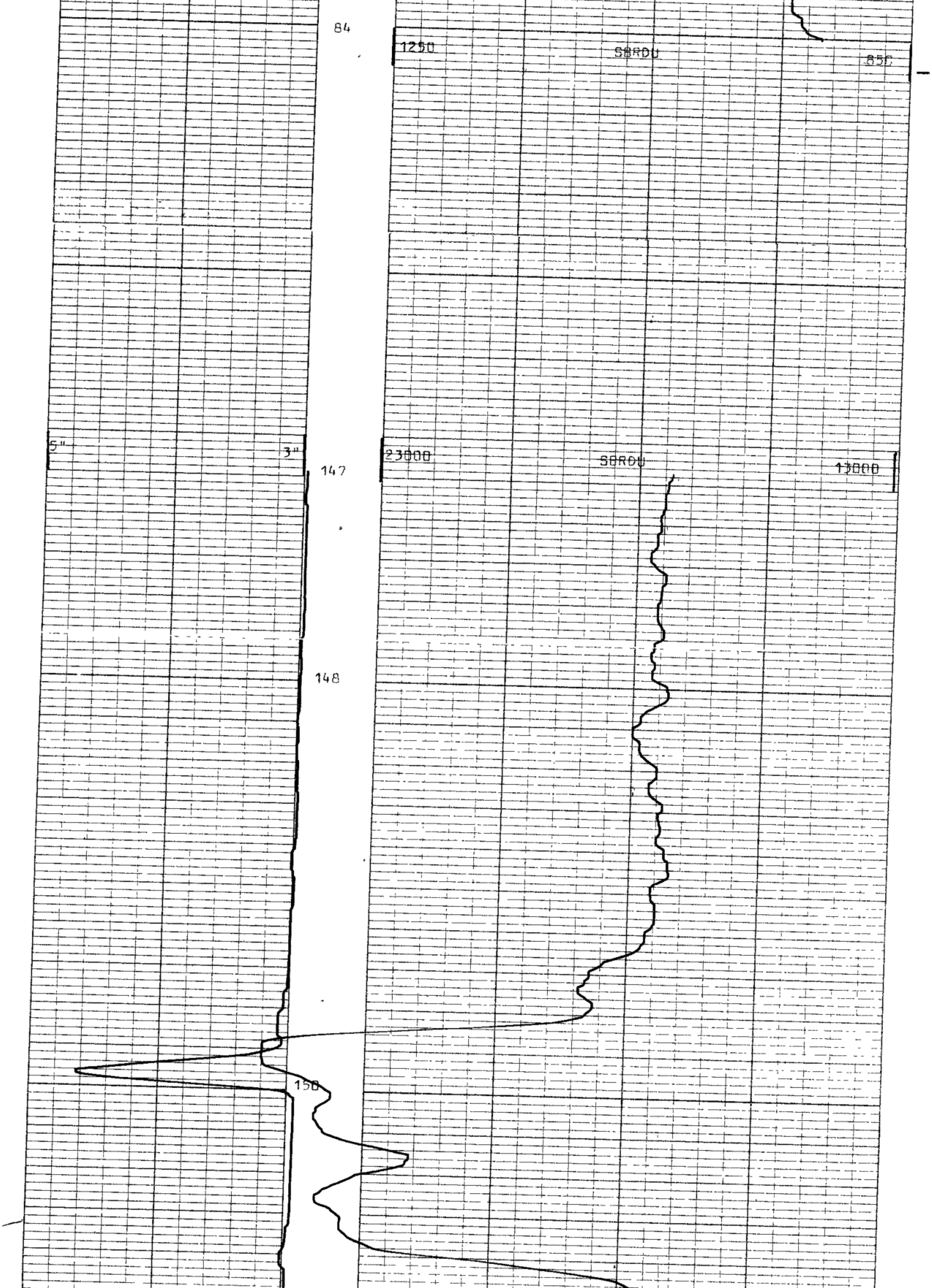
LOG SUITE
CALIPER
B R DENSITY

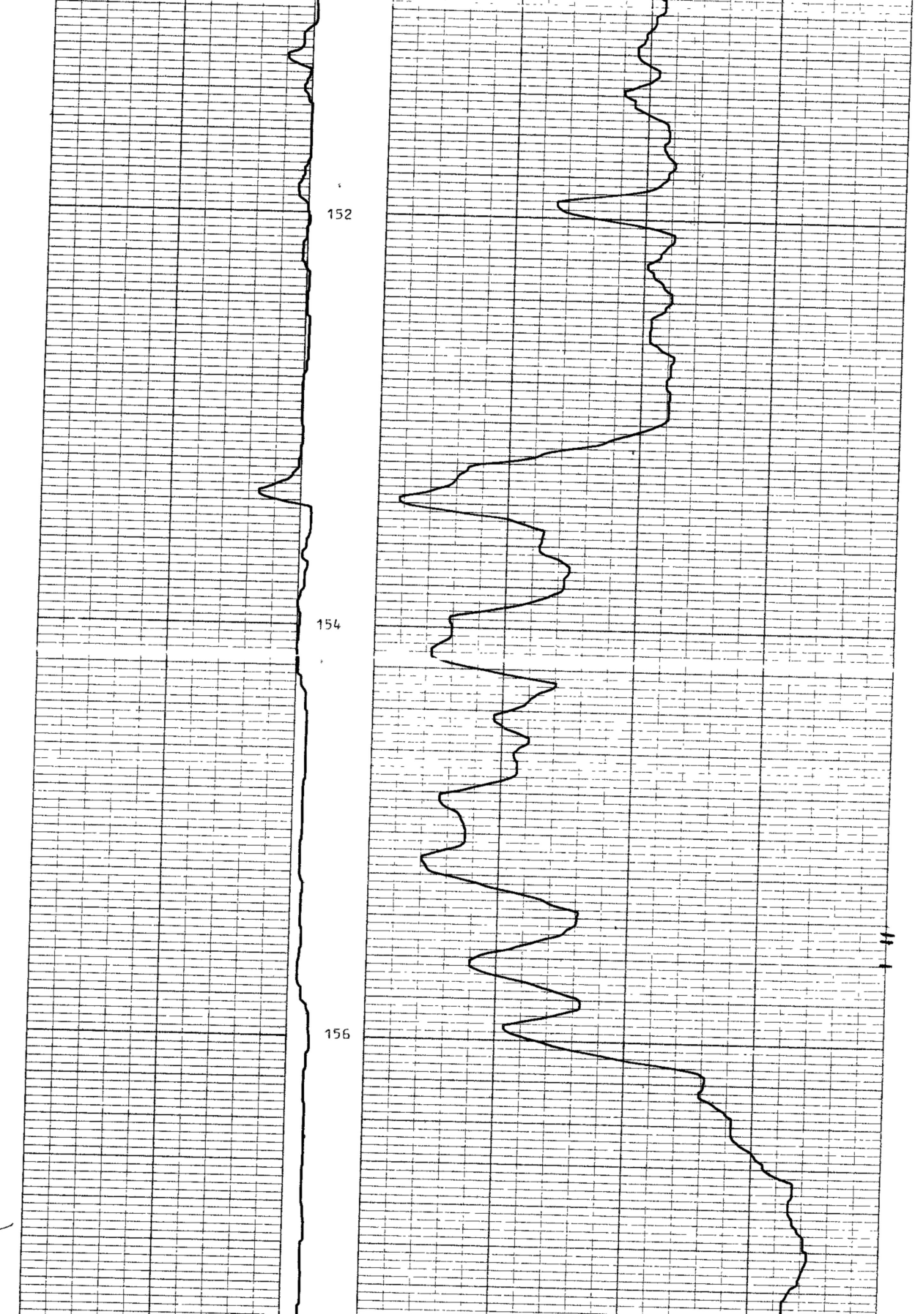
B P B SEAM THICKNESS LOG

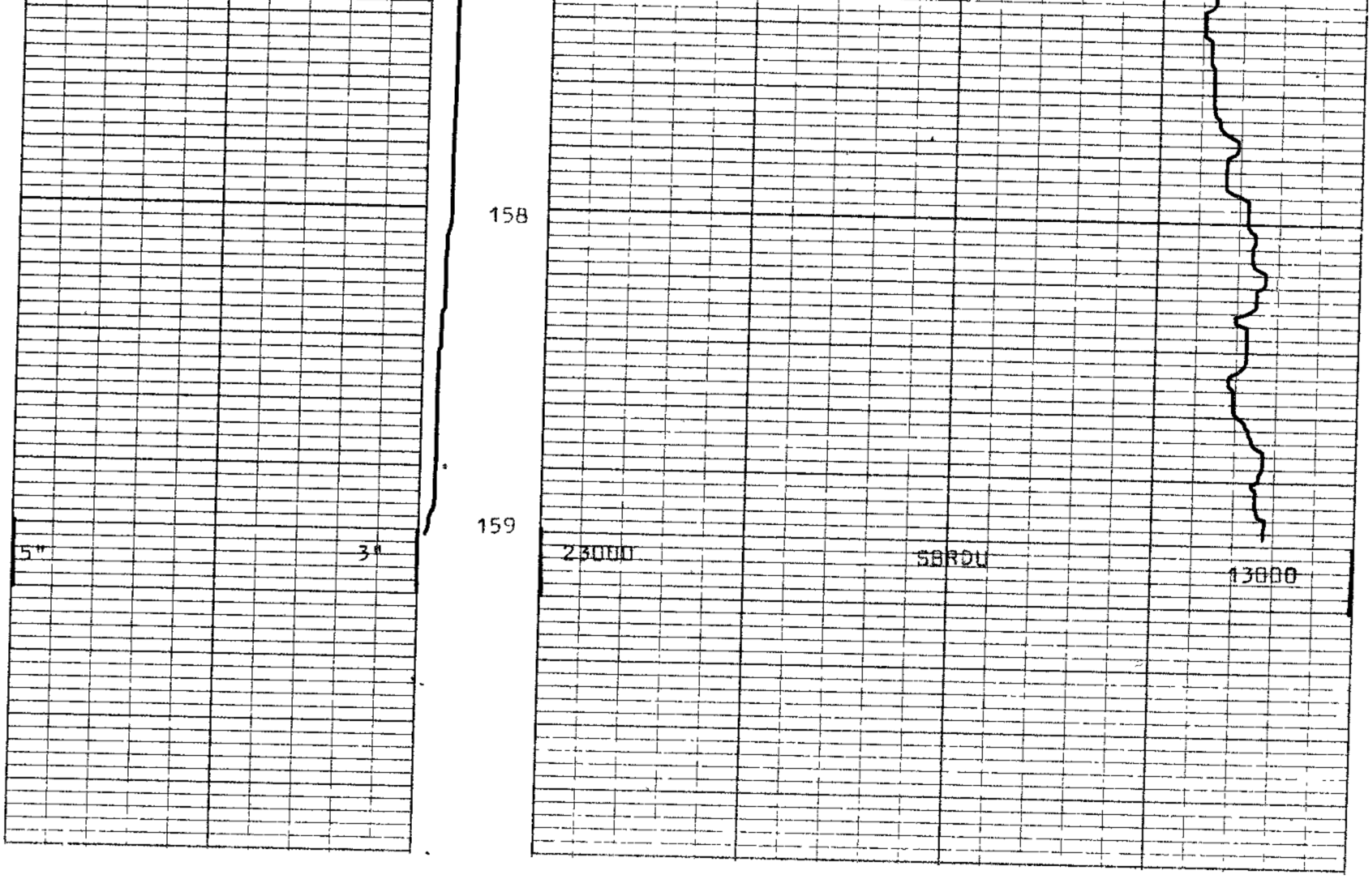












BPB

COAL LITHOLOGY LOG

SONDE TYPE: COAL COMBINATION SONDE

LOG SUITE: GAMMA RAY, L S DENSITY, CALIPER

BOREHOLE: CA 112

CLIENT: MARATHON

AREA: CATAMARAN

COUNTRY: AUSTRALIA(TAS)

DATE LOGGED: 10/5/82

768042

DEPTH SCALE 1:200

1 OF 3 LOGS

5 cm

BOREHOLE DATA

		BPB	DRILLER
PERMANENT DATUM	Ground level		
ELEVATION OF P D			
MEASUREMENTS FROM	106		
DEPTH REACHED	106.61		108.0
CASING SHOE			
BIT SIZES	1 TO	2 TO	
	3 TO	4 TO	
CASING SIZES	1 TO	2 TO	

FLUID DATA

NATURE	Air /Water
SG	
LEVEL	1.0
VISCOSITY	
Rm at meas temp	
BHT	

OPERATION DATA

FIRST READING	106
LAST READING	1
INTERVAL LOGGED	105
UNIT-TRUCK No	V309/39
ENGINEER	M.Andrews
WITNESS	

EQUIPMENT AND RECORDING DATA

COAL COMBINATION SONDE

LOG	EQUIPMENT			TAPING			PANEL			CAL COEFF	DEPTHS			SEAM LOG RUN
	SONDE	SOURCE	CALIBRATOR	LOG TAPED	RECORD SPEED	DIRECT or REPLAY	SPEED	T/C SECS	NORM		FROM	TO	INTERVAL	
GAMMA RAY	1798		393	Y	9,3	D	9,3	1,3		1.93	106	1	105	Y
L S DENSITY		5654	Water	"	"	"	"	1/3,1	6.08	-	"	"	"	"
CALIPER	SIDEWALL POSITION		-	"	"	"	"	1/3	-	-	"	"	"	"

COAL QUALITY/SEAM THICKNESS LOG INTERVALS (Refer to relevant log)

		INTERVAL TOTAL
FROM	50	
TO	38	
INTERVAL	12	= 12

ADDITIONAL SONDES RUN

SONDE	LOG	GENERAL SCALE LOG	DETAIL SCALE LOG

REFER TO ADDITIONAL HEADINGS

REMARKS

Due to unstable borehole conditions, the hole could only be logged through the HQ rods.

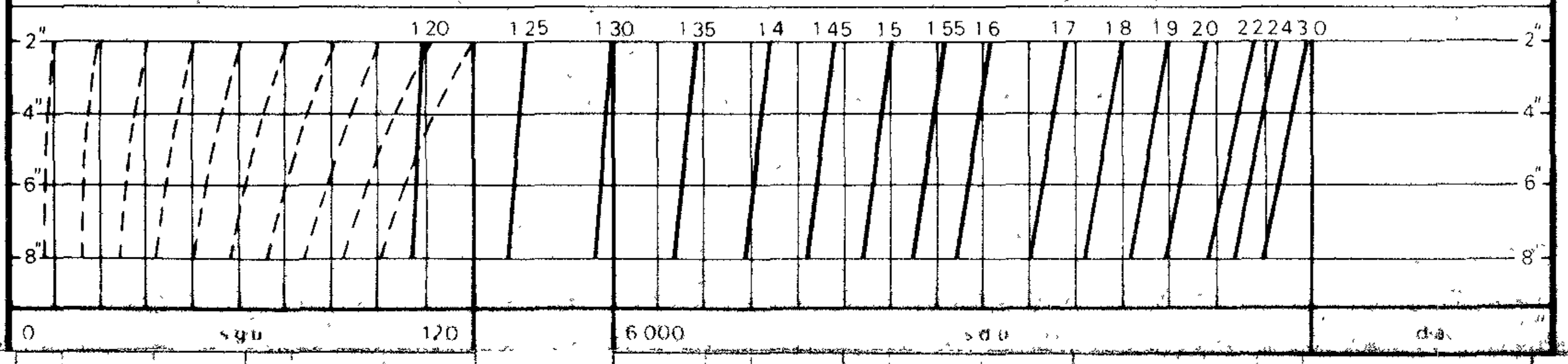
B PB COAL LITHOLOGY LOG

CALIBRATION DATA

JIG No 393 VALUE 553 @ 2" DIAM	JIG CAL DATE 8/5/82 JIG VALUE 10K3 SDU @ 1.1 g/cm³
JIG MARK SHOWN AT ABOVE VALUE – 200	JIG No Water SPAN 1200-0 NORM SDU/CPS = 6.08

GAMMA RAY	DEPTH	COAL BULK DENSITY g/cm³	CALIPER INCHES

HOLE SIZE CORRECTION DATA



82-1769

5 cm

BPB

COAL QUALITY LOG

BOREHOLE CA 112

CLIENT MARATHON 768043

AREA CATAMARAN

COUNTRY AUSTRALIA(TAS)

DATE LOGGED 10/5/82

DEPTH SCALE 1:20

2 OF 3 LOGS

BOREHOLE DATA	REFER TO LITHOLOGY LOG
OPERATION DATA	REFER TO LITHOLOGY LOG

EQUIPMENT AND RECORDING DATA

COAL COMBINATION SONDE

SIDEWALL POSITION

LOG	TAPING			PANEL			CAL CURVE
	LOG TAPED	RECORDING SPEED	DIRECT/ REPLAY	SPEED	T.C. SECS	NORM	
GAMMA RAY	V	3	R	2.5	1		1.93
LS DENSITY	"	"	"	"	"	16.08	

SOURCE SONDE AND CALIBRATION

REFER TO LITHOLOGY LOG

COAL QUALITY LOG INTERVALS

FROM	50	
TO	38	
INTERVAL	12	
FROM		INTERVAL TOTAL
TO		
INTERVAL		12

REMARKS

Hole was logged through HQ rods

SONDE TYPE
COAL COMBINATION SONDE

LOG SUITE
GAMMA RAY
L S DENSITY

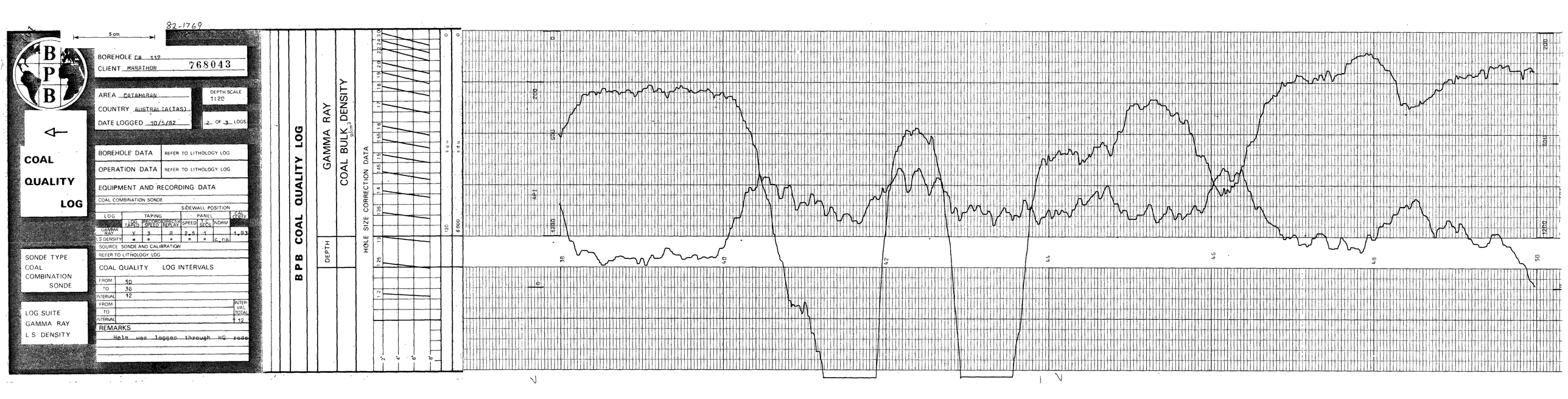
BPB COAL QUALITY LOG

GAMMA RAY

COAL BULK DENSITY g/cm³

DEPTH

HOLE SIZE CORRECTION DATA



102

82-1769

5 cm

BOREHOLE CA 112

CLIENT MARATHON 768044

AREA CATAMARAN

COUNTRY AUSTRALIA(TAS)

DATE LOGGED 10/5/82

DEPTH SCALE 1:20

3 OF 3 LOGS

SEAM THICKNESS LOG

BOREHOLE DATA	REFER TO LITHOLOGY LOG
OPERATION DATA	REFER TO LITHOLOGY LOG

EQUIPMENT AND RECORDING DATA

COAL COMBINATION SONDE

SIDEWALL POSITION

LOG	TAPING				PANEL			CORE
	LOG TAPED	RECORD SPEED	DIRECT OF REPLAY		SPEED	SECS	NORM	
CALIPER								
BR DENSITY	Y	3	R		2.5	1/3	6.43	

SOURCE SONDE AND CALIBRATION

REFER TO LITHOLOGY LOG

SEAM THICKNESS LOG INTERVALS

FROM	50	
TO	38	
INTERVAL	12	
FROM		INTERVAL TOTAL
TO		
INTERVAL		12

REMARKS

Hole was logged through HQ rods

SONDE TYPE
COAL COMBINATION SONDE

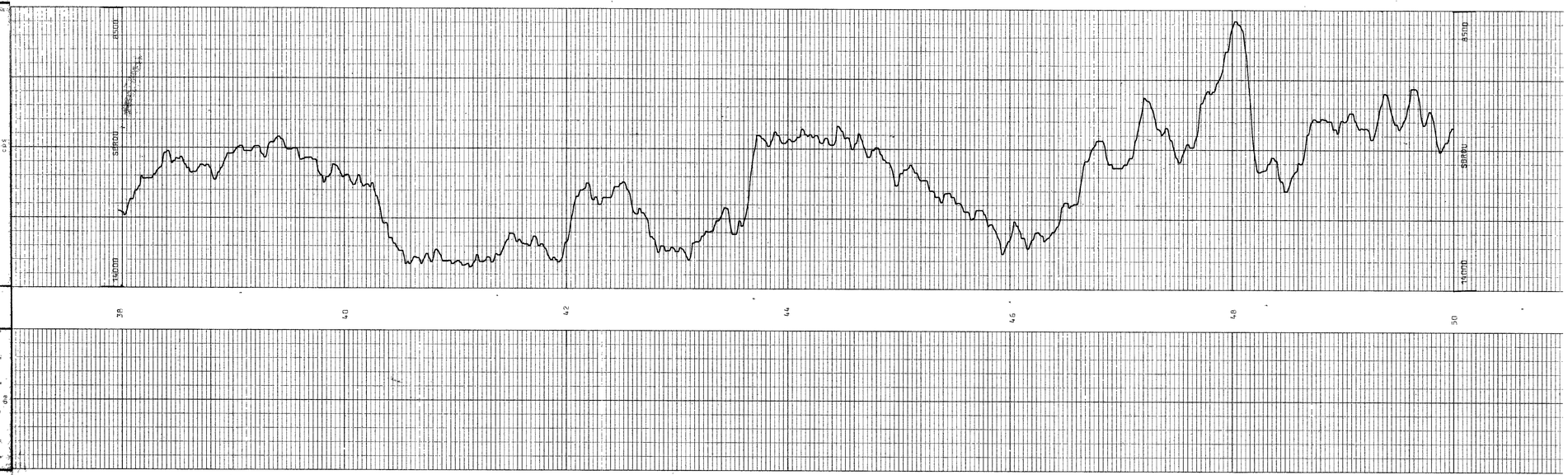
LOG SUITE
CALIPER
BR DENSITY

B P B SEAM THICKNESS LOG

BED RESOLUTION DENSITY

DEPTH

CALIPER INCHES



Appendix IV

Petrographic Report

127

Pontifex & Associates Pty. Ltd.

768046

TEL. 332 6744
A.H. 31 3816

26 KENSINGTON ROAD, ROSE PARK
SOUTH AUSTRALIA

P.O. BOX 91, NORWOOD
SOUTH AUSTRALIA 5067

MINERALOGICAL REPORT NO. 3599

12th February, 1982

TO:	Mr. W. Barbour, Marathon Petroleum Pty. Ltd., P.O. Box 687, BRISBANE, QLD. 4001
YOUR REFERENCE:	Your letter dated 18/12/81
MATERIAL:	Drill core samples
IDENTIFICATION:	CA2 57.50; 67.20 CA2 75.10; 87.40
WORK REQUESTED:	Thin section and petrographic description
SAMPLES & SECTIONS:	Returned to you with this report

PONTIFEX & ASSOCIATES PTY. LTD.

COMMENTS

Each sample is described petrographically. At the normal thickness of the thin sections (30 microns) coal is essentially opaque, thus allowing negligible information to be gained from normal petrographic observations. Thinner sections can be prepared with difficulty but the information thus gained is also limited, and did not appear to be warranted for this investigation.

Comments on the suitability of these samples for marker horizons (questioned in your covering letter) are as follows -

The three samples -

CA2 57.20 - coal layers within arkosic silty to fine sandy claystone
CA2 67.20 - massive coal (durain?)
CA2 87.40 - laminated carbonaceous claystone

objectively do not appear to have petrographic characteristics which would be specifically diagnostic enough, to render them as likely marker horizons. This assumption however would need to be confirmed by consideration of the petrology with the spatial representation of the samples within the sedimentary sequence of interest, also how different or similar these samples may be to this sequence as a whole.

Sample CA2 75.20 is an altered, thin bedded, airfall tuff, composed mainly of compact ash, largely glass shards, i.e. it is vitroclastic. It seems highly likely that this could be sufficiently distinctive to be used as a marker horizon.

This facies is petrologically similar to the Reid's Mistake Formation, Swansea Head, N.S.W., described in Journal Geol.Soc. Aust. Vol 25, Pt8, pp 473-481.

**

CA2 57.50 : disrupted irregular coal beds intercalated within an unsorted, lithic, coaly, arkosic fine-sandy claystone, with lenses and laminations of carbonaceous claystone

This core consists of light grey, incorporating irregular, bifurcating thin beds of coal to 10 mm thick. The sediment is dominated by a clay matrix crowded with angular sedimentary detritus of silt to rare medium sand size and composed of the following, listed in approximate decreasing order of abundance :-

.. carbonaceous (coaly) fragments, including cellular plant fragments
.. fragments of silty claystone
.. fragments of altered K-spar (highlighted stained yellow on the section offcut)
.. fragments of quartz and 'chert'
.. fragments of plagioclase
.. detrital micas, mainly biotite

Some cellular plant fragments are quite sinuous and continuous along the bedding. Minor irregular laminations and lenses of carbonaceous claystone ± coal fragments are intercalated within this grey sediment, also within the coal bands.

The coal bands are commonly disrupted, and the sediment locally intrudes the areas of dislocation with micro-bedding in these intrusions quite disconformable to the prevailing macro-bedding. These areas of disruption thus appear to have developed by soft sediment deformation.

Irregular, partly crenulated stringers of diagenetic carbonate, also of adularia and/or zeolite (?laumontite) cut the coal and the sediment. Accessory pyrite occurs along some dislocation structures.

The coal, seen in normal petrographic thin sections (of 30 microns thick) is totally opaque, thus they do not display any diagnostic characteristics.

CA2 67.20 : massive coal (?durain variety),
minor thin layers of ?vitrain;
minor stringers of carbonate ± adularia
and/or zeolite; sparse silt and clays

Macroscopically this piece of core consists of homogeneous massive coal, essentially dull, without lustre and with negligible stratification. It is apparently a durain variety of black coal. A single layer, 5 mm thick is somewhat more vitreous, with concoidal fracture, and may be considered as vitrain.

Microscopic examination of the normal petrographic thickness reveals an opaque mass, with rare fragments of plant debris (macerals) very poorly discernible.

Very sparse quartz silt, and thin tongues of carbonaceous clay can be seen along the bedding, but these have no specific diagnostic characteristics.

Several white stringers of extremely fine carbonate ± adularia and/or zeolite cut the rock, as in the coal in 57.50.

768050

CA2 75.10 : thin bedded airfall tuff, composed mainly of compact ash, largely glass shards (i.e. vitroclastic); completely altered to clay/sericite; minor thin interbeds of detrital clays and carbonaceous mudstone laminations

This rock consists almost entirely of devitrification and other alteration products which completely replace a thin bedded, very compact vitroclastic mass of tuffaceous ash, predominantly of glass shards. These products include clay-sericite, possible palagonite, and ultrafine apparently secondary K-spar.

The primary texture of the compacted, but bedded, glass shards is well preserved within these alteration products; there is no evidence of fhlow however, thus indicating an airfall tuff not an ignimbrite. Rare very small (tuff) crystals of felspar and quartz are scattered.

Minor shredded and streaky foliae of carbonaceous (plant) material $\pm$ admixed clays are intercalated at irregular intervals. Thin beds of apparently detrital clays incorporating a lower concentration of tuffaceous ash and single shards are intercalated.

A weakly developed axial plane cleavage is oblique to the primary layering.

CA2 87.40 : laminated carbonaceous claystone, minor microfaults

This is essentially a laminated carbonaceous claystone (or mudstone). Individual laminations are differentiated on the basis of different concentrations and slightly different grain size of fine carbonaceous material variably 1% to 60%, within a matrix of detrital clays, extremely fine detrital sericite (unoriented) and rare silt.

The darker beds (obviously with most carbonaceous material) occur at irregular intervals within the sequence. Rare very small lenses of arkosic siltstone are locally intercalated.

The sequence is cut by hairline fractures which extend over 30 mm, and these cause dislocation of the beds of up to 2 mm.

APPENDIX VIII

Landsat Interpretation of the Mt. Lloyd - Catamaran Area, Southern Tasmania using Thematic Classification Techniques.

M. J. LONGMAN & ASSOCIATES

LANDSAT PROCESSORS AND INTERPRETERS

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73 OUTRAM STREET, WEST PERTH
WESTERN AUSTRALIA 6005
PHONE (09) 322 2739
AFTER HOURS (09) 385 9469

LANDSAT INTERPRETATION

OF THE

MT LLOYD - CATAMARAN AREA

SOUTHERN TASMANIA

USING

THEMATIC

CLASSIFICATION

TECHNIQUES

by

M.J. Longman

January, 1983

Perth, W.A.

Map Sheet SK 55-8

Table of Contents

	Page
1.0 SUMMARY	1-1
2.0 CONCLUSION	2-1
3.0 INTRODUCTION	3-1
3.1 Location	3-1
3.2 Physiography	3-1
3.3 Vegetation	3-1
3.4 Climate	3-2
4.0 GEOLOGY	4-1
4.1 Regional Geology	4-1
4.2 Detailed Geology	4-1
4.2.1 Ordovican	4-1
4.2.2 Upper Carboniferous-Permain	4-1
4.2.3 Triassic	4-2
4.2.4 Jurassic	4-2
4.2.5 Cainozoic	4-2
5.0 LANDSAT INVESTIGATIONS	5-1
5.1 Landsat Data	5-1
5.2 Analysis Method	5-1
5.3 Geographical Control	5-1
6.0 CONTROL FOR THEMATIC CLASSIFICATION	6-1
6.1 Final Map Production	6-2
7.0 DISCUSSION OF RESULTS	7-1
8.0 REFERENCES	8-1

Table of Contents (continued)

PLATES (at 1:25,000 scale)

Mt. Lloyd Area

Landsat - Thematic Classification Maps

Plate 1 - North west corner row 400, column 1550
Plate 2 - North west corner row 400, column 1800
Plate 3 - North west corner row 650, column 1550
Plate 4 - North west corner row 650, column 1800

Landsat - Lineament Interpretation

Plate 5 - Northern area
Plate 6 - Southern area

Geeveston - Catamaran Area

Landsat - Thematic Classification Maps

Plate 1 - North west corner row 1027, column 1800
Plate 2 - North west corner row 1027, column 2050
Plate 3 - North west corner row 1277, column 1762
Plate 4 - North west corner row 1277, column 2008
Plate 5 - North west corner row 1526, column 1758

Landsat - Lineament Interpretation

Plate 7 - Northern area
Plate 8 - Central area
Plate 9 - Southern area

1.0 SUMMARY

In the Mt. Lloyd, Catamaran and Geeveston areas of Southern Tasmania, computer processing of digital Landsat data and thematic classification techniques has been used in an attempt to distinguish between outcropping Tertiary basalt, Jurassic dolerite and Triassic coal measures, transported scree, talus and rocks of doleritic origin, and alluvial areas underlain by Permian and Triassic sediments.

A cloud free digital Landsat image No 2255-023085 acquired on 15th January 1982 by the Landsat 2 satellite was used in the computer processing. Geological ground control in the Catamaran district was provided by drill hole information and a geological map at 1:25,000 scale.

Fifteen signature classes totalling thirty three separate signatures, arranged in three reliability groups were developed in the control area containing the geological information. These signatures were then used to produce nine thematic maps at 1:25,000 scale outlining the distribution of these signatures in the Mt. Lloyd, Geeveston and Catamaran districts.

Ground checking of these areas are required to verify the distribution, as the thematic mapping technique assumes that the response of the vegetation cover directly correlates with the underlying rock type.

To accompany the digital classification maps, visual interpretation of the linear features shown on the Landsat image has been undertaken. This interpretation has been produced on five separate map sheets at 1:25,000 scale.

2.0 CONCLUSION

A thematic classification technique based on computer processing of digital landsat image No 2255-023085 in the Catamaran district of Southern Tasmania has shown that in the control area, where drill hole and geological information is available, dolerite, basalt, dolerite scree, and talus can be identified and distinguished from the Triassic Coal Measures and other Triassic rocks.

Nine thematic maps at 1:25,000 scale have been produced showing the distribution of these signatures in the Mt. Lloyd and the Catamaran - Geeveston district.

To accompany the thematic maps, a visual lineament interpretation of the same Landsat digital data has been produced.

3.0 INTRODUCTION

3.1 Location

The area mapped, approximately 2,100 sq kilometres, is located in two areas in southern Tasmania. The larger area, 1700 sq kilometers in size, is located between Geeveston and Catamaran and the smaller area, 400 sq kilometres in size, is located at Mt Lloyd, south-west of New Norfolk. It is covered by the Landsat image, Hobart No 2255-023085 and is included by the southern portion of the 1:250,000 map sheet Hobart (SK 55-8) The permanent settlements in the area are Geeveston, Strathblane, Hastings, Lune River and Catamaran.

3.2 Physiography

The area studied is mountainous with a relief of up to 1500 metres. In the western areas where the pre-Permian rocks form residuals, the ranges tend to be ridge-like, while areas in the east tend to be covered by flat lying Jurassic dolerite. These ranges tend to be plateau-like with deeply dissected valleys and sharp scarps where the underlying Triassic and Permian rocks are exposed. Adjacent to the coastline, narrow coastal plains occur, but these are of limited extent.

3.3 Vegetation

The areas are occupied by two major forest types, a typical rainforest in the north and west, and a dry sclerophyll forest in the Southport area.

Due to the dissected and hilly topography which covers most of the study area, and the rapid changes in rock type and parent rock material, the vegetation appears to form local environments within the broader forest types.

In the dry sclerophyll forest, well defined species definition occurs on the western and eastern slopes of the hills and classification techniques must develop signatures for the environments.

Typically on Jurassic dolerite soils the western slopes are composed of a Eucalyptus linearis, E. viminalis cover while the eastern slopes are covered with E. obliqua and E. viminalis.

In Triassic Sandstone areas, the western slopes have an E. globulus cover, the hill crests an E. amygdalina, E. viminalis cover and the eastern slopes an E. obliqua, E. viminalis cover while in Permian areas E. tasmanica and E. viminalis are the dominant species.

In the wetter rainforest areas, the distinction between the parent rock types becomes less distinct with Notofagus sp. tending to dominate in the moister areas.

The natural patterns have been modified by forestry and agriculture activities and frequent fire burns. In these areas classification techniques reflect surface changes rather than the underlying rock type.

3.4 Climate

The area of interest is between latitude 42° 45'S and 43° 45'S. The climate is temperate marine dominated by westerly winds. Thus on a broad basis the climate is predictable with similar patterns from year to year. This regular pattern influences the vegetation which under natural conditions tends to be stable showing only seasonal variations.

In the study area the annual rainfall varies from 100 - 200 mms. spread throughout the year, but with the main period between April and November.

The mean temperature range varies from 17°C in January to 7°C in July, with peak temperature in January reaching 40°C and minimum temperature in July falling to minus 12°C.

4.2.3 Triassic

The Triassic rocks are composed of lacustrine and fluviatile deposits of quartzite, lithic arenites, minor conglomerate and coal beds. Sandstone dominates in the lower part of the succession being quartzose in the basal units with increasing feldspathic contact in the higher portion of the succession.

In the upper coal bearing portion of the succession, feldspathic sandstone dominates, and lutites become more common forming up to half the succession in selected areas. Coal is restricted to the upper portion of the succession closely related to the feldspathic sandstone units.

4.2.4 Jurassic

During the middle Jurassic widespread intrusion of tholeiitic magma took place forming dyke like bodies in the pre-Permian rocks and sills parallel to bedding in the Permian and Triassic rocks.

These sills, up to 500 metres thick, dominate in the area. Multiple sills have been observed in the one stratigraphic succession and interpretation suggests that two sills are present south of Catamaran.

The contact with the adjacent sediments are sharp and only a narrow chilled margin is present. No large scale assimilation of the country rock has been observed. One local variant of the tholeiitic suite is a granophysic differentiate which tends to occur above feeder dykes.

4.2.5 Cainozoic

During the late Mesozoic and Early Tertiary, widespread normal faulting produced the graben or step fault structures throughout the area. In these depressions under lacustrine conditions clays and silts were deposited. At major fault intersections, olivine basalt lavas were extruded together with the associated tuffaceous sediments.

Widespread lateritisation occurred during the late Tertiary followed by a period of glaciation in the Pleistocene.

4.0 GEOLOGY

4.1 Regional Geology

In the area of interest Jurassic dolerite, intruded as flat lying sills into both the Permian and Triassic rocks is the dominant rock unit.

The oldest rocks exposed on the western margin of the area are limestones of Ordovician age unconformably overlain by Permain rocks of glacial origin. Overlying the Permian rocks with a major disconformity is the lacustrine Triassic succession.

During a period of block faulting in the Late Cretaceous and Early Tertiary, basalts has been intruded along major fault zones.

4.2 Detailed Geology

4.2.1 Ordovican

Exposed in the west of the area, these rocks are composed dominantly of well bedded limestone with minor chert horizons.

4.2.2 Upper Carboniferous-Permain

These rocks are composed of glacial marine sequence of interbedded basal pebbly tillite overlain by siltstone and mudstone, with rare limestone horizons. This unit is overlain disconformably by an erratically developed fresh water sequence, locally carbonaceous, which in turn again is overlain by a monotonous sequence of siltstone and mudstone.

5.0 LANDSAT INVESTIGATIONS

5.1 Landsat Data

Digital data from the Landsat 2 Satellite has been used to process the area covered by the Hobart Landsat image. This image was sensed on the 15th January 1982. It is cloud free and the sun elevation was at a maximum.

5.2 Analysis Method

The digital Landsat data was analysed using programmes developed by our organization to operate on our PDP11-44 computing system.

Two main programmes are used, the first an interactive programme which allows the digital data to be processed in small blocks up to a maximum of 6000 acres, 50 x 120 pixels, and individually display the response of each pixel on each band.

The second programme which takes these selected responses and produces and plots maps at any selected scale and projection.

In addition to the two main programmes, subsiduary programmes read the data from the Landsat data tapes, perform various statistical smoothing operations to remove noise and sensor inbalance. Other programmes automatically classify the data and produce classifications which are statistically valid.

Subsiduary programmes are used to establish geographical control and adjust the data to match the required map projection.

5.3 Geographical Control

One of the greatest problems associated with the interpretation of Landsat data is to obtain accurate ground control and relate the Landsat digital image to the existing data bases.

Although actual Latitude and Longitude are provided with the Landsat data, these have been calculated from the theoretical orbit of the satellite and as such have little reference to the actual area sensed on the ground.

To provide accurate ground control, to within 200 metres or better, data points which are visible on the digital data and can be accurately located on the ground must be used. These points are determined using the pixel grid for reference in the Landsat data and Latitude and Longitude from the ground control maps.

By statistical analysis of this data, making due allowance for variations in the mirror scan rate, pitch and height variations in the satellite itself and corrections for the earth's rotation, an accuracy of 150-200 metres could be expected in an individual area on the final maps.

Variation in the control points used to correct the digital data to the Transverse Mercator Base map, the residual error after the above corrections had been applied varied between 8 and 112 metres.

6.0 CONTROL FOR THEMATIC CLASSIFICATION

As the ground or vegetation response for the various rock types could not be determined by either ground radiometer traverses or aircraft scans, the sensor responses had to be calibrated by accurately locating known geological features on the digital image data and determining the actual responses of each sensor in that area.

To provide the most accurate ground data, the location of each of the drill holes in the area, Holes No CA 101 to 120 inclusive were plotted on the satellite pixel grid and the sensor response of the surrounding 4 pixels was determined. As this accuracy is at the limit of reasonable ground control using 1:25,000 scale base maps, the values of the response of the pixels corresponding to a 5 x 5 pixel block (25 acres) were also determined to augment the signatures existing in the smaller area.

To provide correlation throughout the mapped region, these twenty areas were analysed using an automatic classification technique and the responses graded as to reliability, on a pixel by pixel basis, of characterising each rock type. The response range of each pixel was then increased in unit values on a band by band basis until a compromise was reached between an increased coverage of the control areas with increased false responses from rock units unassociated with the control unit.

Even in the relatively small area occupied by the control drill holes, each rock type could not be characterised by one signature without considerable false responses, so in all cases multiple signatures were used to characterise each unit, in an attemp to minimise false responses.

To provide ground control in areas away from the drill hole locations, the geological maps, one at 25,000 scale provided by Marathon and one at 1:250,000 scale produced by the Geological Survey of Tasmania were used.

Again as with the drill hole information, areas were selected which were composed of the one rock type and an automatic classification technique was used to extract those responses which could be used to characterise that area.

Where these signatures corresponded to those derived from the drill hole data, greater reliability could be placed on these signatures than those which had no direct correlation.

During this phase of the development, it was noted that certain responses were widespread and appeared to be independent of rock type. These areas could not be classified using this technique and appear as blank areas on the final maps.

In all, in excess of 2,000 classification signatures were tested and finally 33 signatures were selected which appeared to have specific responses, particularly within the control areas. These 33 signatures were combined into groups and presented on the final maps as fifteen groups in three reliability categories.

The first priority signatures were eight in number, composed of four dolerite, one basalt and three sandstone signatures. These signatures had minimal false responses in the control areas, but due to the restricted range of responses in each band, tended to be restricted in coverage.

The second priority signatures were twelve in number, and composed of two dolerite, four dolerite talus and scree, two basalt talus and three sandstone signatures. These signatures were less reliable in the control area, but again had restricted responses and ground coverage.

The third category signatures were twelve in number and were composed of two dolerite signatures, four dolerite talus signatures and six signatures which appeared to correspond to soils overlying sandstone in the control area. These signatures as a group are less reliable, tend to have wider responses and more widespread coverage.

A water signature, corresponding to clear water was determined to provide in addition to the geographic grid, details for location in the southern areas.

6.1 Final Map Production

Sixteen maps at 1:25000 scale have been produced. Eight maps cover the Catamaran Geeveston area, five digital classification maps and three lineament maps, while in the Mt Lloyd area four digital classification and two lineament maps were plotted.

In all cases, due to the oblique path of the satellite more area was processed than was actually contained within the Exploration Areas to assure that the area was adequetely covered. This was particularily true in the case of the lineament maps where many of the lineaments were major trends extending throughtout the southern portion of the State.

7.0 DISCUSSION OF RESULTS

The thematic classification mapping technique relies on the fact that an identical response from each of the Landsat sensors represents a unique situation and it is assumed that all areas with that identical response will also be identical.

However, there are many exceptions to this assumption and the interpretation of thematic maps must in many areas be treated with caution.

The commonest cause of false responses is the averaging effect of between two extreme responses, e.g. a sandy beach and water where intermediate responses composed of all variations between the responses for sand and water can be obtained. This effect is generally restricted to small areas of a few pixels in size and can be visually isolated.

The other false response which is more difficult to identify is when the vegetation cover does not reflect the underlying rock type. This response can be due to many causes. Seasonal conditions tend to have an overriding effect on vegetation cover. The most obvious cases can be seen after heavy rainfall where variations in the response tends to be minimised, while at the other extreme, in drought conditions almost no variation can be detected.

Another feature that affects the reliability of the classification is the distance from the control area, particularly where climatic patterns undergo rapid change. In these situations, signatures developed in one area have almost no possibility of being applied on a regional basis.

The following comments can be applied to the signatures developed in the Catamaran area.

1. Signature A - Dolerite Outcrop

   This is a composite signature composed of four sub-divisions and is the broadest signature response plotted. The composite theme has a variation of 2% in brightness on band 4, 2% on band 5, 5% on band 6 and 6% on band 7.

   Because of the wide response on bands 6 and 7 the signature could be expected to have wide coverage, but would tend to have false responses associated with its distribution. Reducing the responses on bands 6 and 7 resulted in restricted area coverage without significantly reducing the false responses.

2. Signature B - Basalt Outcrop

This signature developed in the vicinity of drill hole No CA106 is a single signature with a reflective range of 3% on each band. This signature would be expected to have minimal false responses, but from its distribution there appears to be an overlapping response with that of fine grained dolerite.

No combination of signatures were able to eliminate this dual response, so association of signatures would be needed to verify the distribution. Small areas closely associated with dolerite and sandstone signatures would probably represent fine grained contact zones, while isolated larger areas would represent basalt.

3. Signature C - Triassic Coal Measures

This is a composite signature of two sub-signatures developed in the Catamaran area from drill hole locations and known outcrops. The range of response is 1% on band 4, 3% on band 5, 3% on band 6 and 2% on band 7.

With such restricted tolerances the signature would be expected to be very specific and could be interpretated with reasonable reliability. Other rock units composed of sandstone and shale sequences could be expected to provide false responses.

4. Signature D - Dolerite Sub-outcrop

This is a composite signature composed of three sub-signatures. The range of responses are 3% on band 4, 3% on band 5, 7% on band 6 and 2% on band 7. With the wide range of response on band 6, false identifications could be expected. When this range was reduced, very scattered coverage was obtained in the type area.

5. Signature E - Dolerite Scree

This signature was developed from the drill hole data in the Catamaran area and is composed of two sub-signatures. It is quite a specific signature with response ranges of 2% on band 4, 2% on band 5, 3% on band 6 and 2% on band 7. With this response range, false identifications should be minimal.

6. Signature T - Dolerite Talus and Soil

This is a composite signature composed of two sub-signatures developed in the Catamaran area. The signature has a response range of 2% on band 4, 2% on band 5, 4% on band 6 and 3% on band 7. Due to the relatively wide range on bands 6 and 7 some false identification could expected, however when the response range was restricted scattered areas were obtained.

7. Signature G - Basalt Talus and Soil

This is a composite signature developed near drill hole No CA106 and has a response range of 3% on all bands. It is always closely associated with Signature B and could be associated with soils derived from chilled dolerite margins as well as basalt outcrop.

8. Signature H - Triassic Coal Measures

This is a composite signature composed of three sub-signatures, developed from the drill hole data in the Catamaran area. The signature should be quite specific as the response ranges were 2% on all bands.

As the signatures were developed over an alternating sandstone and shale succession, other sandstone and shale sequences could provide a similar response.

9. Signature I - Dolerite Weathered insitu

This signature has been developed in areas of known dolerite outcrop with a heavy forest cover. It is a composite signature composed of two sub-signatures. The signature ranges are 1% on band 4, 2% on band 5, 3% on band 6 and 2% on band 7.

This limited response range suggests that the signature should be quite specific, but as it has been developed in heavy forest cover, this may dominate in the classification rather than the underlying rock type.

10. Signature X - Dolerite Talus and Soil

This is a composite theme composed of the sub-signatures with an overall response range of 1% on band 4, 2% on band 5, 1% on band 6 and 2% on band 7. With this response range it is anticipated that the signature should be quite specific and false responses would be minimal.

11. Signatures K, L, N, and P - Triassic Rocks - Soil covered

These signatures have been developed in areas mapped as Triassic sandstone or Triassic coal measures on the geological map and modified to provide minimal false responses. This group of signatures have the widest responses, and as such would tend to be the least reliable of the signatures developed.

Interpretation of the areas covered by these signatures must be treated with caution. Six sub-signatures have been used to produce the range of responses with signature L with a response range of 3% on all bands, being typical of the developed signatures.

12. Signature W - Water

This signature has been developed to assist in location of the areas of interest. The response has been restricted to areas of deeper water and tidal areas, mud flats, swamps, etc. have not been covered by the classification. This signature shows a normal response range for thematic classification techniques of 14% on band 4, 12% on band 5, 12% on band 6 and 10% on band 7.

13. Unclassified Areas

These areas have been plotted as areas without distinguishing symbols. They are outside the range of the classification used or are composed of areas which have no diagnostic features. In general they correspond to ground that has been altered by agriculture or forestry activities, road construction or recent fire burns.

8.0 REFERENCES

FARMER N, 1979, Geological Atlas, 1:250,000 Series, Sheet SK 55-8 Hobart, Explanatory Report, Geological Survey, Tasmania.

LEAMAN D, 1981, Interpretation of Geophysical Surveys, Catamaran Area [EL 6/79] Unpublished.

152

USER: MPAL -AT PRO

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LABEL: PRT036 -FORM MPALA4

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STARTED: 81-06-25.16:20, ON: PRO BY: PRO

153

LITHOLOGICAL LOG REPORT

MARATHON PETROLEUM AUSTRALIA LIMITED

PROJECT: Catamaran

LEASE: Catamaran EL 6/79

PROVINCE:

STATE: Tasmania

GENERATED: 11'th June, 1982

768072

154

11 Jun 82

HOLE NUMBER : CA 101

DATA SOURCE : Marathon Pet. Aust, Ltd

LOGGER : Tim Brain

Date commenced : 14 Nov 81

Date completed : 17 Nov 81

LOCATION:

NORTHING : 51864.45

EASTING : 4911.76

ELEVATION :

DRILLING:

CONTRACTOR :

DRILL TYPE :

HOLE SIZE :

CORE SIZE :

TOTAL DEPTH : 42.18m

GEOPHYSICAL:

CONTRACTOR : BPB Instruments

PROBE DEPTH : 36.81m

LOGS RUN : Resistivity
Caliper
Natural Gamma
Long Spaced Density

FROM	TO	LITHOLOGY
		********** DESCRIPTION **********
0.00 -	3.00	CLAY, grey, very sticky.
3.00 -	5.50	BASALT, brown, moderately weathered.
5.50 -	15.00	BASALT, dark bluish-grey, fine grained, slightly weathered
		********** BASE OF WEATHERING **********
15.00 -	42.18	BASALT, light greenish-grey, fine grained, some siliceous nodules, unweathered. Abandoned in basalt due to drillingProblems
	42.18	********** TOTAL DEPTH **********

156

HOLE NUMBER : CA 102

DATA SOURCE : Marathon Pet. Aust, Ltd

LOGGER : Tim Brain

Date commenced : 17 Nov 81

Date completed : 01 Dec 81

LOCATION:

NORTHING : 51877.31

EASTING : 4915.18

ELEVATION :

DRILLING:

CONTRACTOR :

DRILL TYPE :

HOLE SIZE : 64

CORE SIZE :

TOTAL DEPTH : 170.00m

GEOPHYSICAL:

CONTRACTOR : BPB Instruments

PROBE DEPTH : 168.41m

LOGS RUN : Resistivity
Caliper
Natural Gamma
Long Spaced Density

157

FROM	TO	LITHOLOGY
		********** CHIP DESCRIPTION **********
BLADES		
0.00	3.00	CLAY, grey, very sticky.
3.00	5.00	SANDSTONE, light to medium grey, argillaceous matrix some carbonaceous fragments, sticky.
5.00	7.00	MUDSTONE, dark grey, carbonaceous mudstone near top of unit, very sticky.
7.00	8.00	CLAYSTONE, light brownish-grey, sticky.
8.00	10.00	CLAYSTONE, light grey, very sticky.
10.00	14.85	MUDSTONE, dark grey, some thin coal bands throughout interval slightly carbonaceous.
14.85	14.90	COAL.
		********** CORE & GEOPHYSICAL LOGS DESCRIPTION ********
DIAMOND CORING		
14.90	14.94	CLAYSTONE, light to medium brown, coal laminae near top of unit coal wisps throughout interval, weak rock, solid core, thinly bedded abrupt basal contact.
14.94	14.95	COAL, <10% BRIGHT, broken core, very thinly bedded abrupt basal contact.
14.95	14.96	CLAYSTONE, light to medium brown, arenaceous, weak rock, solid core, thinly bedded abrupt basal contact.
14.96	15.16	COAL, <10% BRIGHT, solid core, transitional basal contact.
15.16	15.17	COAL, HEAVY (INFERIOR COAL), black, weak rock, solid core, transitional basal contact.
15.17	15.42	COAL, <10% BRIGHT, rare claystone pods near base of unit, solid core, abrupt basal contact.
15.42	15.45	CARBONACEOUS MUDSTONE, very weak rock, very broken core.
15.45	15.47	COAL, HEAVY (INFERIOR COAL), broken core.
15.47	15.58	CARBONACEOUS MUDSTONE, dark grey, very weak rock, broken core.
15.58	16.02	NO SAMPLE RETURN.

158

FROM	TO	LITHOLOGY
16.02	16.41	MUDSTONE, medium to dark grey, very weak rock, broken core, laminated transitional basal contact.
16.41	17.14	SANDSTONE, light to medium grey, very fine grained, rare calcareous traces, weak rock, broken core, laminated transitional basal contact.
17.14	17.38	SANDSTONE, light to medium grey, fine grained, some thin slightly carbonaceous laminae throughout interval, weak rock, solid core, abrupt basal contact.
17.38	17.39	SANDSTONE, dark brownish-black, very fine grained, carbonaceous, very weak rock, solid core, abrupt basal contact.
17.39	17.41	SANDSTONE, light to medium grey, fine grained, weak rock, solid core, abrupt basal contact.
17.41	17.43	SANDSTONE, dark brownish-black, very fine grained, carbonaceous, very weak rock, solid core, abrupt basal contact.
17.43	17.45	SANDSTONE, light to medium grey, fine grained, weak rock, solid core, abrupt basal contact.
17.45	17.46	SANDSTONE, dark brownish-black, very fine grained, carbonaceous, very weak rock, solid core, abrupt basal contact.
17.46	17.63	SANDSTONE, light to medium grey, fine grained, carbonaceous laminae near top of unit, weak rock, solid core, laminated transitional basal contact.
17.63	17.90	SANDSTONE, light grey, fine grained, weak rock, solid core, occasional calcite on joint surfaces, occasional calcite bedding surfaces.
		********** CHIP DESCRIPTION **********
BLADES		
17.90	21.00	NO SAMPLE RETURN.
21.00	26.00	SANDSTONE, light grey, fine to medium grained, some carbonaceous fragments some thin coal bands near middle of unit, friable, common quartz fragments. Common clear yellow crystalline grain Towards top of unit
26.00	27.00	SANDSTONE, light to medium grey, fine to medium grained, friable.

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159

FROM	TO	LITHOLOGY
27.00	29.00	SANDSTONE, light grey, fine to medium grained, some carbonaceous fragments thin coal bands throughout interval, friable.
29.00	31.00	SANDSTONE, light grey, fine to medium grained, some carbonaceous fragments argillaceous matrix mudstone bands near base of unit, friable.
31.00	32.00	SANDSTONE, light grey, argillaceous matrix, friable.
32.00	33.40	MUDSTONE, medium to dark grey, hard rare pyritic mudstone granular.
33.40	33.57	COAL.
		********** CORE & GEOPHYSICAL LOGS DESCRIPTION ********
DIAMOND CORING		
33.57	34.52	NO SAMPLE RETURN.
		********** CHIP DESCRIPTION **********
BLADES		
34.52	35.00	NO SAMPLE RETURN.
35.00	36.00	MUDSTONE, medium to dark grey, carbonaceous in part.
36.00	36.50	COAL, HEAVY (INFERIOR COAL).
36.50	37.00	MUDSTONE, medium to dark grey.
37.00	38.50	CLAYSTONE, light greenish-grey, arenaceous in part.
38.50	40.00	DOLERITE, light grey, fine grained, hard.
40.00	42.00	DOLERITE, dark bluish-grey, fine grained.
42.00	44.40	DOLERITE, light to medium greenish-grey, fine grained.
		********** CORE & GEOPHYSICAL LOGS DESCRIPTION ********
DIAMOND CORING		
44.40	44.45	DOLERITE, light brownish-grey, very fine grained, very strong rock, solid core.
44.45	45.27	DOLERITE, light brownish-grey, fine grained, siliceous bands near top of unit, very strong rock, solid core, occasional pyrite disseminated. Grain size getting slightly coarserWith depth
45.27	48.17	DOLERITE, light brownish-grey, some siliceous, very strong rock, solid core. Veins

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160

FROM	TO	LITHOLOGY
48.17	51.07	DOLERITE, light greenish-grey, fine grained, very strong rock, broken core, joints with moderately close spacing, common zeolite on joint surfaces, occasional pyrite on joint surfaces.
51.07	51.27	DOLERITE, light to medium grey, very fine grained, very strong rock, broken core, deformed basal contact.
51.27	51.58	SANDSTONE, grey, fine grained, quartz lithic, moderately strong rock, broken core, transitional basal contact.
51.58	51.64	SANDSTONE, light to medium grey, fine grained, quartz lithic numerous carbonaceous laminae, moderately strong rock, broken core, transitional basal contact.
51.64	51.84	SANDSTONE, grey, fine grained, quartz lithic, moderately strong rock, solid core, abrupt basal contact. Quartz veins
51.84	51.86	COAL, <10% BRIGHT, very weak rock, broken core, transitional basal contact, occasional pyrite on cleats.
51.86	52.21	COAL, HEAVY (INFERIOR COAL), very weak rock, solid core, transitional basal contact.
52.21	52.25	CLAYSTONE, numerous carbonaceous wisps, very weak rock, solid core, abrupt basal contact.
52.25	52.28	COAL, HEAVY (INFERIOR COAL), erosional basal contact.
52.28	52.31	CLAYSTONE, medium to dark grey, carbonaceous near base of unit, very stiff, solid core, transitional basal contact.
52.31	52.53	CLAYSTONE, light to medium brown, very stiff, very broken core.
52.53	54.07	MUDSTONE, light grey, very weak rock, very broken core.
54.07	54.11	MUDSTONE, light grey, very weak rock, very broken core, transitional basal contact.
54.11	54.49	MUDSTONE, grey, arenaceous fragments, very stiff, broken core, transitional basal contact, faults. Brecciated

FROM	TO	LITHOLOGY
54.49	55.38	SANDSTONE, grey, fine grained, mudstone phases near top of unit pyritic phases near base of unit, very weak rock, solid core, transitional basal contact, occasional pyrite bedding surfaces.
55.38	55.43	SANDSTONE, light grey, fine grained, calcareous cement, very weak rock, solid core, transitional basal contact.
55.38	56.03	SANDSTONE, light to medium grey, fine grained, very weak rock, solid core, occasional calcite traces.
56.03	56.18	SANDSTONE, light to medium grey, fine grained, numerous mudstone phases, very weak rock, solid core.
56.18	56.29	SANDSTONE, light grey, fine grained, very weak rock, solid core, transitional basal contact, common calcite lenses, common calcite infilled vesicles.
56.29	56.40	SANDSTONE, grey, fine to medium grained, very weak rock, solid core.
56.40	57.24	NO SAMPLE RETURN.
57.24	57.39	SANDSTONE, grey, fine to medium grained, very weak rock, solid core, abrupt basal contact.
57.39	57.40	MUDSTONE, dark brown, very weak rock, solid core, abrupt basal contact.
57.40	57.43	SANDSTONE, grey, fine to medium grained, thin mudstone lenses near base of unit, very weak rock, solid core, abrupt basal contact.
57.43	57.46	MUDSTONE, dark brown, very weak rock, solid core, erosional basal contact, occasional pyrite bedding surfaces.
57.46	57.49	SANDSTONE, grey, fine to medium grained, thin calcareous bands near top of unit, very weak rock, solid core, abrupt basal contact.
57.49	57.75	SANDSTONE, grey, fine to medium grained, very weak rock, solid core, occasional pyrite infilled vesicles, common calcite infilled vesicles. Brecciated zone within
57.75	58.16	SANDSTONE, grey, fine to medium grained, rare mudstone phases rare siliceous bands, very weak rock, solid core, occasional calcite infilled vesicles.

FROM	TO	LITHOLOGY
58.16	59.24	SANDSTONE, grey, fine to medium grained, carbonaceous bands near base of unit, very weak rock, solid core, abrupt basal contact.
59.24	59.30	COAL, HEAVY (INFERIOR COAL), transitional basal contact.
59.30	59.37	CARBONACEOUS MUDSTONE, dark brownish-black, very stiff, broken core, transitional basal contact.
59.37	59.45	COAL, 10 - 40% BRIGHT, broken core.
59.45	59.49	COAL, <10% BRIGHT, solid core.
59.49	59.59	COAL, HEAVY (INFERIOR COAL), erosional basal contact.
59.59	59.75	SILTSTONE, light to medium grey, very weak rock, solid core, transitional basal contact.
59.75	60.07	SANDSTONE, grey, fine grained, very weak rock, solid core.
60.07	60.81	SANDSTONE, light grey, fine grained, thin coal lenses near top of unit fining upwards, very weak rock, solid core, abrupt basal contact.
60.81	62.42	SANDSTONE, grey, fine to medium grained, some carbonaceous fragments rare pyritic phases, very weak rock, broken core.
62.42	63.07	NO SAMPLE RETURN.
63.07	64.57	SANDSTONE, grey, fine grained, thin carbonaceous laminae near top of unit, very weak rock, broken core.
64.57	65.15	SANDSTONE, grey, fine to medium grained, some calcareous lenses quartzose (>90% quartz), very weak rock, solid core, abrupt basal contact.
65.15	65.99	SANDSTONE, grey, fine to medium grained, rare thin carbonaceous laminae throughout interval pyritic bands near top of unit quartzose (>90% quartz), very weak rock, solid core.
65.99	66.35	NO SAMPLE RETURN.
66.35	67.38	SANDSTONE, grey, fine to medium grained, quartzose (>90% quartz), weak rock, solid core, abrupt basal contact, occasional mica disseminated. With wisps and lenses and flame stru Ctures of a hard dark brown sediment , very fine grained, possibly a shale.

FROM	TO	LITHOLOGY
67.38	67.52	CLAYSTONE, light greyish-cream, arenaceous in part, very weak rock, solid core, abrupt basal contact, occasional mica bedding surfaces.
67.52	67.59	COAL, <10% BRIGHT, solid core, abrupt basal contact.
67.59	67.68	COAL, HEAVY (INFERIOR COAL), solid core. Bright coal lenses towards top of unIt
67.68	67.78	NO SAMPLE RETURN.
67.78	67.96	MUDSTONE, light brownish-grey, carbonaceous bands near base of unit, very stiff, broken core, with slickensides. Brecciated 110
67.96	68.06	COAL, <10% BRIGHT, solid core, abrupt basal contact.
68.06	68.14	CLAYSTONE, light greyish-cream, very stiff, solid core.
68.14	68.27	COAL, <10% BRIGHT, carbonaceous shaly bands, broken core.
68.27	68.28	CLAYSTONE, light greyish-cream, very stiff, solid core.
68.28	69.01	MUDSTONE, light to medium grey, arenaceous phases, very weak rock, solid core. Brecciated
69.01	69.23	NO SAMPLE RETURN.
69.23	71.20	MUDSTONE, light to medium grey, arenaceous phases near top of unit, very weak rock, solid core. Slightly brecciated, very thinly bedd Ed towards base of unit
71.20	71.97	SANDSTONE, light grey, very fine grained, very weak rock, solid core, very thinly bedded.
71.97	72.07	NO SAMPLE RETURN.
72.07	73.07	MUDSTONE, light to medium grey, silty in part, very weak rock, solid core, transitional basal contact. Brecciated in part
73.07	74.03	SILTSTONE, light to medium grey, thin mudstone bands near base of unit, very weak rock, thickly bedded.
74.03	74.10	SANDSTONE, light grey, very fine grained, very weak rock, solid core, abrupt basal contact.
74.10	74.37	COAL, <10% BRIGHT, broken core.

FROM	TO	LITHOLOGY
74.37	74.42	NO SAMPLE RETURN.
74.42	74.54	COAL, <10% BRIGHT, broken core.
74.54	74.55	CLAYSTONE, light brownish-cream, very stiff, solid core.
74.55	74.78	COAL, <10% BRIGHT, broken core.
74.78	74.94	CLAYSTONE, light greyish-cream, carbonaceous wisps, very stiff, solid core.
74.94	75.07	NO SAMPLE RETURN.
75.07	75.24	TUFF, light creamy-grey, very weak rock, abrupt basal contact. Glass shards altered to sericite, clay.
75.24	75.43	SANDSTONE, medium to dark grey, fine grained, thin mudstone laminae near top of unit, very weak rock, solid core, abrupt basal contact.
75.43	75.52	COAL, <10% BRIGHT, broken core, abrupt basal contact.
75.52	75.87	CLAYSTONE, light brownish-grey, carbonaceous wisps and lenses, very weak rock, solid core, abrupt basal contact.
75.87	75.95	COAL, <10% BRIGHT, very broken core.
75.95	76.00	COAL, HEAVY (INFERIOR COAL), arenaceous mudstone near top of unit, solid core, abrupt basal contact.
76.00	76.20	MUDSTONE, dark grey, very weak rock, broken core, transitional basal contact.
76.20	77.10	NO SAMPLE RETURN.
77.10	77.93	SILTSTONE, light to medium grey, slightly carbonaceous and arenaceous laminae throughout interval, very weak rock, solid core, laminated abrupt basal contact.
77.93	77.98	MUDSTONE, dark grey, very stiff, solid core, abrupt basal contact.
77.98	78.07	SILTSTONE, light to medium grey, slightly carbonaceous and arenaceous laminae throughout interval, very weak rock, solid core, with cross lamination, laminated.

FROM	TO	LITHOLOGY
78.07	79.64	SILTSTONE, slightly carbonaceous and arenaceous laminae throughout interval, very weak rock, solid core, laminated.
79.64	80.47	NO SAMPLE RETURN.
80.47	80.95	SILTSTONE, dark grey, slightly carbonaceous some arenaceous laminae near middle of unit, very weak rock, solid core, laminated.
80.95	81.07	NO SAMPLE RETURN.
81.07	82.04	SILTSTONE, dark greyish-black, carbonaceous arenaceous bands near base of unit thin coal bands near base of unit, very weak rock, solid core.
82.04	82.10	NO SAMPLE RETURN.
82.10	82.41	SANDSTONE, light to medium grey, very fine grained, carbonaceous and arenaceous bands throughout interval, very weak rock, solid core, laminated abrupt basal contact.
82.41	84.07	SANDSTONE, light grey, fine grained, some carbonaceous wisps some calcareous bands and lenses, very weak rock, solid core.
84.07	87.06	SANDSTONE, light grey, fine grained, some carbonaceous laminae throughout interval near top of unit and near base of unit calcareous bands near base of unit, very weak rock, solid core.
87.06	87.07	NO SAMPLE RETURN.
87.07	87.28	SANDSTONE, light grey, fine grained, very weak rock, solid core, abrupt basal contact.
87.28	87.51	CARBONACEOUS MUDSTONE, dark blackish-grey, very weak rock, solid core, laminated transitional basal contact.
87.51	87.64	CARBONACEOUS MUDSTONE, dark blackish-grey, very weak rock, solid core, abrupt basal contact.
87.64	87.67	COAL, HEAVY (INFERIOR COAL), solid core, abrupt basal contact.
87.67	87.71	COAL, <10% BRIGHT, broken core, abrupt basal contact.
87.71	87.74	CLAYSTONE, light greyish-brown, very stiff, solid core, abrupt basal contact.

FROM	TO	LITHOLOGY
87.74	87.82	COAL, <10% BRIGHT, broken core, abrupt basal contact.
87.82	87.85	CLAYSTONE, light creamy-grey, very stiff, solid core, abrupt basal contact.
87.85	87.90	COAL, 10 - 40% BRIGHT, broken core, abrupt basal contact.
87.90	89.76	SILTSTONE, light to medium grey, some arenaceous bands slightly carbonaceous near top of unit carbonaceous laminae near base of unit, very weak rock, solid core, very thinly bedded.
89.76	90.07	NO SAMPLE RETURN.
90.07	90.40	SILTSTONE, light to medium grey, arenaceous near base of unit, very weak rock, solid core, transitional basal contact.
90.40	92.81	MUDSTONE, medium to dark grey, slightly carbonaceous hard carbonaceous bands near middle of unit and near base of unit, very weak rock, solid core, transitional basal contact.
92.81	92.94	COAL, <10% BRIGHT, solid core, abrupt basal contact.
92.94	92.95	COAL, 10 - 40% BRIGHT, very broken core, abrupt basal contact.
92.95	92.96	COAL, HEAVY (INFERIOR COAL), solid core, abrupt basal contact.
92.96	92.98	COAL, 10 - 40% BRIGHT, broken core, abrupt basal contact.
92.98	93.01	COAL, HEAVY (INFERIOR COAL), solid core.
93.01	93.04	NO SAMPLE RETURN.
93.04	95.40	SILTSTONE, medium to dark grey, slightly carbonaceous near base of unit, very weak rock, solid core, very thinly bedded transitional basal contact.
95.40	96.00	SANDSTONE, grey, fine grained, silty bands throughout interval, very weak rock, solid core. **** following line in error ****096.00096.022d
96.02	96.12	SANDSTONE, grey, fine grained, very weak rock, solid core, abrupt basal contact.
96.12	98.19	MUDSTONE, medium to dark grey, thin carbonaceous bands carbonaceous wisps near top of unit silty bands near middle of unit calcareous phases silty, very weak rock, solid core, erosional basal contact.

FROM	TO	LITHOLOGY
98.19	98.37	SILTSTONE, light to medium grey, carbonaceous laminae near base of unit, very weak rock, solid core, abrupt basal contact.
98.37	98.75	SANDSTONE, light grey, fine grained, slightly carbonaceous bands near middle of unit fining upwards, very weak rock, solid core, abrupt basal contact.
98.75	98.86	SILTSTONE, light to medium grey, slightly carbonaceous near base of unit, very weak rock, solid core, laminated transitional basal contact.
98.86	98.90	SANDSTONE, light grey, fine grained, very weak rock, solid core, transitional basal contact, with slickensides.
98.90	99.04	SILTSTONE, light to medium grey, laminae near top of unit slightly carbonaceous near base of unit, very weak rock, solid core.
99.04	99.14	SILTSTONE, medium to dark grey, slightly carbonaceous throughout interval, very weak rock, solid core, with cross lamination, laminated transitional basal contact.
99.14	101.50	SANDSTONE, light grey, fine grained, bands with carbonaceous wisps near top of unit fining upwards, very weak rock, solid core, abrupt basal contact.
101.50	101.69	SANDSTONE, grey, very fine grained, very weak rock, solid core, abrupt basal contact.
101.69	102.03	SANDSTONE, light grey, fine grained, very weak rock, solid core. Finer sand towards middle of unit
102.03	105.07	SANDSTONE, light grey, fine grained, very weak rock, solid core.
105.07	107.65	SANDSTONE, light grey, fine grained, carbonaceous laminae near top of unit carbonaceous wisps near top of unit and near middle of unit, very weak rock, solid core, transitional basal contact.
107.65	107.93	SANDSTONE, light grey, fine to medium grained, very weak rock, solid core, transitional basal contact.
107.93	108.07	SANDSTONE, light grey, fine grained, very weak rock, solid core.

FROM	TO	LITHOLOGY
108.07	111.04	SANDSTONE, light grey, fine grained, very weak rock, solid core. Fining upwards from middle of unit
111.04	111.07	NO SAMPLE RETURN.
111.07	113.37	SANDSTONE, light grey, fine grained, very weak rock, solid core. Thin silty bands at 111.77m and 112.57m
113.37	113.51	SANDSTONE, light grey, fine grained, argillaceous matrix near top of unit, very weak rock, solid core, transitional basal contact.
113.51	113.55	CARBONACEOUS SHALE, black, very stiff, solid core, transitional basal contact.
113.55	113.61	COAL, HEAVY (INFERIOR COAL), solid core, abrupt basal contact.
113.61	114.05	SANDSTONE, light grey, fine grained, carbonaceous wisps near top of unit carbonaceous phases near base of unit, very weak rock, solid core. Band 3cm thick of mudstone fragments , subrounded, in an arenaceous matrixAt 113.70m
114.05	115.42	SANDSTONE, light grey, fine grained, coal lenses near base of unit, very weak rock, solid core, transitional basal contact.
115.42	116.06	SANDSTONE, light grey, fine grained, near top of unit coal lenses near top of unit numerous thin coal lenses throughout interval mudstone phases near top of unit and near base of unit, very weak rock, solid core, transitional basal contact.
116.06	116.55	SANDSTONE, light grey, fine grained, very weak rock, solid core, transitional basal contact.
116.55	117.07	SANDSTONE, light grey, fine to medium grained, thin coal lenses throughout interval carbonaceous mudstone near base of unit fining upwards, very weak rock, solid core.
117.07	117.18	SANDSTONE, light grey, fine to medium grained, very weak rock, solid core, abrupt basal contact.
117.18	119.54	SANDSTONE, light grey, fine grained, carbonaceous wisps near top of unit numerous carbonaceous and coal lenses and wisps near base of unit, very weak rock, solid core, abrupt basal contact.

FROM	TO	LITHOLOGY
119.54	119.62	SANDSTONE, light to medium grey, very fine grained, very weak rock, solid core, transitional basal contact.
119.62	120.06	SANDSTONE, light grey, fine grained, thick coal lenses near top of unit numerous carbonaceous wisps throughout interval, very weak rock, solid core.
120.06	120.07	NO SAMPLE RETURN.
120.07	121.40	SANDSTONE, light grey, fine grained, mudstone phases near top of unit carbonaceous bands near base of unit, very weak rock, solid core, erosional basal contact.
121.40	121.46	SILTSTONE, dark greyish-black, carbonaceous, very weak rock, broken core, abrupt basal contact.
121.46	121.61	SANDSTONE, light grey, fine grained, very weak rock, solid core, transitional basal contact.
121.61	121.99	SILTSTONE, light to medium grey, carbonaceous wisps throughout interval, very weak rock, solid core, transitional basal contact.
121.99	123.07	SANDSTONE, light grey, fine grained, very weak rock, solid core.
123.07	124.16	SANDSTONE, light grey, fine grained, some carbonaceous wisps throughout interval, very weak rock, solid core, abrupt basal contact.
124.16	126.05	DOLERITE, light greyish-green, very fine grained, moderately weak rock, solid core.
126.05	126.11	DOLERITE, light greyish-green, very fine grained, moderately weak rock, solid core, deformed basal contact.
126.11	126.47	SANDSTONE, light grey, fine grained, hard, weak rock, solid core, transitional basal contact.
126.47	126.49	SILTSTONE, dark greyish-black, carbonaceous, very weak rock, broken core, abrupt basal contact.
126.49	129.07	SANDSTONE, light grey, fine grained, hard, weak rock, solid core.
129.07	129.08	NO SAMPLE RETURN.

170

FROM	TO	LITHOLOGY
129.08	132.06	SANDSTONE, light grey, fine grained, weak rock, solid core, occasional mica bedding surfaces.
132.06	135.03	SANDSTONE, light to medium grey, fine grained, carbonaceous wisps and fragments near middle of unit, very weak rock, solid core.
135.03	138.07	SANDSTONE, light to medium grey, fine grained, very weak rock, solid core, rare calcite infilled vesicles.
138.07	141.04	SANDSTONE, light grey, fine grained, very weak rock, solid core.
141.04	144.07	SANDSTONE, light grey, fine grained, very weak rock, solid core, rare calcite infilled vesicles.
144.07	150.07	SANDSTONE, light grey, fine grained, very weak rock, solid core, occasional calcite infilled vesicles.
		********** CHIP DESCRIPTION **********
ROLLER BIT		
150.07	161.50	SANDSTONE, light cream, fine grained, quartz feldspathic slightly carbonaceous well sorted. Most no sample return
161.50	170.00	SANDSTONE, light cream, fine grained, quartz feldspathic slightly carbonaceous well sorted. Most no sample return hole abandoned E to poor sample and slow drillingrate
	170.00	********** TOTAL DEPTH **********

768089

171

HOLE NUMBER : CA 103

DATA SOURCE : Marathon Pet. Aust, Ltd

LOGGER : Richard Bacon

Date commenced : 04 Dec 81

Date completed : 09 Dec 81

LOCATION:

NORTHING : 51825.57

EASTING : 4903.92

ELEVATION :

DRILLING:

CONTRACTOR :

DRILL TYPE :

HOLE SIZE : 150

CORE SIZE :

TOTAL DEPTH : 28.50m

GEOPHYSICAL:

CONTRACTOR :

PROBE DEPTH :

LOGS RUN :

172

FROM	TO	LITHOLOGY
		********** CHIP DESCRIPTION **********
0.00 -	5.00	SOIL, creamy-brown, argillaceous, moderately weathered.
5.00 -	28.50	SANDSTONE, brownish-grey, fine to medium grained, argillaceous matrix some claystone clasts limonitic, weak rock. DOLERITE, greenish-grey, very strong rock. Hole abandoned in scree dueTo water flow and caving
	28.50	********** TOTAL DEPTH **********

HOLE NUMBER : CA 104

DATA SOURCE : Marathon Pet. Aust, Ltd

LOGGER : Richard Bacon

Date commenced : 09 Dec 81

Date completed : 11 Dec 81

LOCATION:

NORTHING : 51803.86

EASTING : 4906.17

ELEVATION :

DRILLING:

CONTRACTOR :

DRILL TYPE :

HOLE SIZE : 100

CORE SIZE :

TOTAL DEPTH : 39.00m

GEOPHYSICAL:

CONTRACTOR :

PROBE DEPTH :

LOGS RUN :

FROM	TO	LITHOLOGY
		********** CHIP DESCRIPTION **********
HAMMER		
0.00 -	4.50	SOIL, reddish-brown, fine to medium grained, argillaceous matrix, moderately weathered. Weathered lithic sandstone
4.50 -	6.50	DOLERITE, very strong rock.
6.50 -	8.00	SANDSTONE, reddish-brown, fine to medium grained, argillaceous matrix moderately sorted, weak rock.
8.00 -	12.80	CLAY, creamy-red, soft.
12.80 -	39.00	DOLERITE, very strong rock, intermixed with: SANDSTONE, grey, medium to coarse grained, argillaceous matrix lithic (predominately rock fragments), weak rock, intermixed with: CLAY, creamy-grey, soft. Dolerite scree in sandstone and clayMatrix Hole abandoned in dolerite scree Due to drilling problems
	39.00	********** TOTAL DEPTH **********

175

HOLE NUMBER : CA 105

DATA SOURCE : Marathon Pet. Aust. Ltd

LOGGER : Richard Bacon

Date commenced : 11 Dec 81

Date completed : 14 Dec 81

LOCATION:

NORTHING : 51845.27

EASTING : 4919.20

ELEVATION :

DRILLING:

CONTRACTOR :

DRILL TYPE :

HOLE SIZE : 64

CORE SIZE :

TOTAL DEPTH : 78.86m

GEOPHYSICAL:

CONTRACTOR :

PROBE DEPTH :

LOGS RUN :

768094

FROM	TO	LITHOLOGY
		********** CHIP DESCRIPTION **********
0.00	5.00	SOIL, fine to medium grained, argillaceous matrix.
5.00	6.00	SANDSTONE, light to medium grey, fine to medium grained, quartz lithic angular well sorted.
6.00	9.00	SANDSTONE, medium to dark grey, fine grained, quartz lithic well sorted.
9.00	10.00	SANDSTONE, medium to dark grey, fine to medium grained, quartz lithic angular well sorted.
10.00	13.00	SANDSTONE, medium to dark grey, fine grained, with argillaceous cement.
13.00	18.00	SANDSTONE, medium to dark grey, fine grained, quartz lithic angular well sorted.
18.00	20.00	SANDSTONE, medium to dark grey, fine to medium grained, quartz lithic angular well sorted.
20.00	24.00	SANDSTONE, medium to dark grey, fine to medium grained, quartz lithic angular well sorted.
24.00	25.00	SANDSTONE, dark grey, fine to medium grained, quartz lithic angular well sorted.
25.00	30.00	SANDSTONE, light to medium grey, fine grained, with argillaceous cement.
30.00	32.00	SANDSTONE, light to medium grey, fine grained, with argillaceous cement.
32.00	39.00	SANDSTONE, medium to dark grey, fine to medium grained, quartz lithic angular well sorted.
39.00	40.00	SANDSTONE, dark grey, fine to medium grained, quartz lithic angular well sorted.
40.00	41.00	SILTSTONE, medium to dark grey, fine grained, carbonaceous.
41.00	44.00	SILTSTONE, dark grey, fine grained, carbonaceous.
44.00	48.25	SANDSTONE, dark grey, fine to medium grained, interbedded coal. Probable contamination of chip samples , no trace of coal in first runCore run

177

FROM	TO	LITHOLOGY
		********** CORE DESCRIPTION **********
48.25 -	58.87	SANDSTONE, light to medium grey, medium grained, quartz lithic, moderately weak rock. Common weathered biotite fragments Decreasing downwards, Lithic pebble at 57.6m
58.87 -	59.00	SANDSTONE, light to medium grey, fine to medium grained, quartz lithic, moderately weak rock, abrupt basal contact.
59.00 -	59.68	SANDSTONE, light to medium grey, medium to coarse grained, rare coal wisps, moderately weak rock, erosional basal contact, common brown iron oxide fragments.
59.68 -	60.76	SILTSTONE, light to medium grey, sporadic carbonaceous partings, weak rock. Calcite veins towards base of Unit
60.76 -	60.87	SANDSTONE, grey, medium grained, argillaceous matrix, weak rock, abrupt basal contact, common calcite.
60.87 -	61.31	COAL, HEAVY (INFERIOR COAL), sporadic dull coal lenses, common calcite. Calcite veins towards top of unit, no Apparent cleat patterns
61.31 -	61.36	CARBONACEOUS SHALE, dark brownish-grey, medium grained, sporadic coal lenses, weak rock, transitional basal contact.
61.36 -	61.43	CARBONACEOUS SHALE, dark brownish-grey, medium grained, rare coal lenses, weak rock, transitional basal contact.
61.43 -	61.53	SILTSTONE, creamy-brown, fine to medium grained, slightly carbonaceous sporadic coal wisps, weak rock, erosional basal contact.
61.53 -	61.68	COAL, MID LUSTROUS TO DULL, sporadic shaly lenses, transitional basal contact.
61.68 -	61.77	COAL, HEAVY (INFERIOR COAL), transitional basal contact.
61.77 -	61.86	SHALE, creamy-brown, fine grained, slightly carbonaceous sporadic coal wisps, weak rock, transitional basal contact.
61.86 -	61.95	MUDSTONE, greyish-green, very fine grained, calcareous, very weak rock, transitional basal contact. Softening towards base

178

FROM	TO	LITHOLOGY
61.95	62.04	CLAY, rare coal, firm, transitional basal contact.
62.04	62.21	CLAYSTONE, rare coal, very weak rock, abrupt basal contact.
62.21	62.94	COAL, HEAVY (INFERIOR COAL), rare pyritic traces, transitional basal contact, common calcite on joint surfaces. Sporadic shaley and clayey lenses
62.94	63.36	COAL, MID LUSTROUS TO DULL, some pyritic traces, common calcite on joint surfaces. With common intermediate coal bands
		********** DESCRIPTION **********
63.36	63.42	COAL, HEAVY (INFERIOR COAL), transitional basal contact, common calcite on joint surfaces. Grading downwards to carbonaceousshale
63.42	63.69	CARBONACEOUS SHALE, grey, fine grained, argillaceous matrix fining upwards, weak rock, transitional basal contact.
63.69	64.71	30% SILTSTONE, brownish-grey, quartz lithic, moderately weak rock, interbedded with: 70% SHALE, brownish-grey, moderately weak rock.
64.71	65.99	SANDSTONE, bluish-grey, medium grained, quartz lithic, moderately weak rock, transitional basal contact, occasional brown iron oxide fragments.
65.99	67.01	SANDSTONE, grey, coarse grained, quartz lithic fining upwards, common brown iron oxide fragments.
67.01	67.24	80% SILTSTONE, grey, fine to medium grained, arenaceous, moderately weak rock, transitional basal contact, interbedded with: 20% SANDSTONE, grey, medium grained, arenaceous, moderately weak rock, transitional basal contact.
67.24	67.73	SANDSTONE, bluish-grey, coarse grained, quartz lithic, moderately weak rock, abrupt basal contact.
67.73	67.93	SANDSTONE, light to medium grey, medium grained, argillaceous matrix, moderately weak rock, abrupt basal contact. Common coal lenses and fragments
67.93	68.41	SANDSTONE, grey, coarse grained, rare carbonaceous partings quartz lithic, moderately weak rock.

768097

FROM	TO	LITHOLOGY
68.41	68.70	SANDSTONE, coarse grained, numerous coal fragments argillaceous matrix lithic (predominately rock fragments), moderately weak rock, abrupt basal contact.
68.70	69.40	SANDSTONE, medium to coarse grained, some carbonaceous partings rare coal fragments, moderately weak rock, transitional basal contact.
69.40	70.00	SANDSTONE, coarse grained, numerous carbonaceous partings some coal fragments, transitional basal contact.
70.00	70.55	SANDSTONE, medium to coarse grained, calcareous throughout interval, abrupt basal contact, common brown iron oxide fragments. Pyrite on contact with dolerite
70.55	71.06	DOLERITE, light greenish-grey, calcareous throughout interval, abrupt basal contact, common calcite. Metasomatised calcified dolerite
71.06	78.86	DOLERITE, dark greenish-grey, common calcite. Hole abandoned at 78.86m due to cave- In around rods and loss of 14 rodsDown hole
	78.86	********** TOTAL DEPTH **********

180

HOLE NUMBER : CA 106

DATA SOURCE : Marathon Pet. Aust, Ltd

LOGGER : Richard Bacon

Date commenced : 04 Feb 82

Date completed : 26 Feb 82

LOCATION:

NORTHING : 51864.66

EASTING : 4911.74

ELEVATION :

DRILLING:

CONTRACTOR : Stackpoole Drilling

DRILL TYPE : Rotary-percussion

HOLE SIZE : 153

CORE SIZE :

TOTAL DEPTH : 234.16m

GEOPHYSICAL:

CONTRACTOR : BPB Instruments

PROBE DEPTH : 233.20m

LOGS RUN : Natural Gamma
Long Spaced Density
Caliper
Resistivity
Bed Resolution Density

181

FROM	TO	LITHOLOGY
		********** CHIP DESCRIPTION **********
HAMMER		
0.00 -	1.00	SOIL, light creamy-brown, fine to medium grained, argillaceous matrix, firm, highly weathered.
1.00 -	4.00	SOIL, light orangy-brown, fine to medium grained, argillaceous matrix, firm, highly weathered.
4.00 -	5.00	SOIL, light brown, medium grained, argillaceous matrix, stiff, moderately weathered.
5.00 -	22.00	BASALT, greenish-grey, fine to medium grained, slightly weathered.
22.00 -	23.00	BASALT, greenish-grey, fine grained, strong rock, slightly weathered.
		********** BASE OF WEATHERING **********
23.00 -	32.71	BASALT, greenish-grey, fine grained, strong rock.
		********** CORE & GEOPHYSICAL LOGS DESCRIPTION ********
DIAMOND CORING		
32.71 -	33.21	BASALT, grey, fine grained, very strong rock, common calcite lenses, common quartz infilled vesicles.
33.21 -	33.30	BASALT, dark greenish-grey, fine to medium grained, very strong rock. Medium grained pyroxene rich Xenoliths in very fineGrained basalt vein
33.30 -	33.95	BASALT, some calcareous lenses, common quartz infilled vesicles.
33.95 -	34.03	INTRUSIVE ROCK, dark greenish-grey, moderately strong rock. Fine to coarse grain basic intrusive Alteration to surrounding basalt
34.03 -	34.40	BASALT, grey, fine grained, some calcareous lenses, occasional quartz infilled vesicles.
34.40 -	36.22	INTRUSIVE ROCK, dark greenish-grey, fine grained, strong rock, common quartz infilled vesicles. Fine grained basic intrusive with Coarser grained altered basalt xeno
36.22 -	39.41	BASALT, grey, fine grained, some calcareous lenses, very strong rock, common quartz infilled vesicles. Altered band 38.38-38.43 metres

182

FROM	TO	LITHOLOGY
39.41	39.83	BASALT, brown, fine to medium grained, soft. Severely altered rock, some feldsparAltered to clay
39.83	44.26	BASALT, grey, fine grained, some calcareous lenses, very strong rock, common quartz infilled vesicles.
44.26	45.58	INTRUSIVE ROCK, dark greenish-grey, very fine grained, numerous calcareous lenses, strong rock, abundant quartz infilled vesicles. Fine to coarse basic intrusive with Altered basalt xenoliths
45.58	45.94	BASALT, light grey, some calcareous lenses, very strong rock. Slightly altered by intrusives
45.94	45.99	INTRUSIVE ROCK, dark greenish-grey, very fine grained, numerous calcareous lenses, strong rock.
45.99	46.41	BASALT, grey, fine grained, some calcareous lenses, very strong rock, abundant quartz infilled vesicles. Alteration of basalt at contactsWith intrusives
46.41	46.93	INTRUSIVE ROCK, dark greenish-grey, fine grained, numerous calcareous lenses, strong rock, abundant quartz infilled vesicles, common calcite infilled vesicles. Basic intrusive with altered basaltXenoliths
46.93	47.48	BASALT, light grey, some calcareous lenses. Slightly altered
47.48	48.21	INTRUSIVE ROCK, dark greenish-grey, some calcareous lenses. Basic intrusive with few basaltXenoliths
48.21	51.69	BASALT, grey, fine to medium grained, some calcareous lenses. Occassional basic intrusive veins
51.69	52.03	BRECCIA. Basalt fragments(90%) in basicIntrusive(10%)
52.03	72.13	BASALT, greenish-grey, fine grained, very strong rock, rare quartz infilled vesicles, occasional calcite lenses. Occassional basic intrusive veins. Vesicles and grain size finingDownwards.
72.13	72.35	50% BASALT, greenish-grey, fine grained, weak rock. 50% SANDSTONE, grey, very fine grained, weak rock. Lower contact zone of basalt with sand Stone, sandstone is brecciated set in a Basalt matrix, lithologicalDescription as follows.

FROM	TO	LITHOLOGY
72.35	72.68	SANDSTONE, grey, fine grained, quartz lithic mudstone near base of unit, weak rock. Recrystallised 1
72.68	72.73	MUDSTONE, grey, weak rock, abrupt basal contact.
72.73	72.82	COAL, HEAVY (INFERIOR COAL), black, carbonaceous mudstone in part, very weak rock, abrupt basal contact.
72.82	75.20	MUDSTONE, medium to dark grey, some silty phases, very weak rock, broken core.
75.20	76.86	MUDSTONE, medium to dark greenish-grey, broken core, very weak rock. Some purple organic staining
76.86	77.01	NO SAMPLE RETURN.
77.01	77.38	MUDSTONE, grey, very weak rock, broken core, transitional basal contact.
77.38	77.57	MUDSTONE, green, very weak rock, very broken core. Some purple organic staining
77.57	78.86	MUDSTONE, greenish-grey, very weak rock, broken core. Minor organic staining (purple)
78.86	79.76	MUDSTONE, light greenish-grey, very weak rock, transitional basal contact. Common light to medium clastic lenses
79.76	80.48	MUDSTONE, greenish-grey, argillaceous matrix, weak rock, transitional basal contact. Common brown and green bands and lense
80.48	80.89	SILTSTONE, grey, numerous mudstone clasts argillaceous matrix, weak rock, broken core, transitional basal contact.
80.89	81.79	SANDSTONE, medium grained, argillaceous matrix some coal wisps, transitional basal contact. Medium to very coarse mudstone clasts
81.79	81.89	SILTSTONE, grey, argillaceous matrix, moderately weak rock, abrupt basal contact.
81.89	81.90	COAL, HEAVY (INFERIOR COAL), abrupt basal contact. Coal lense with pyrite infilling
81.90	83.45	SILTSTONE, pale pinkish-grey, fine grained, argillaceous matrix some coal, moderately weak rock.

FROM	TO	LITHOLOGY
83.45	83.57	COAL, HEAVY (INFERIOR COAL), some mudstone clasts, deformed basal contact, faults with slickensides.
83.57	84.01	SILTSTONE, grey, argillaceous matrix, moderately weak rock.
84.01	84.15	MUDSTONE, grey, very fine grained, argillaceous matrix, deformed basal contact.
84.15	84.88	SILTSTONE, greenish-grey, some slightly carbonaceous bands, moderately weak rock, transitional basal contact.
84.88	85.32	SILTSTONE, brownish-grey, numerous slightly carbonaceous bands argillaceous matrix, moderately weak rock, transitional basal contact.
85.32	88.18	MUDSTONE, greenish-grey, very fine grained, argillaceous matrix some carbonaceous wisps, weak rock, broken core, transitional basal contact.
88.18	88.28	SANDSTONE, grey, fine grained, argillaceous matrix, weak rock, transitional basal contact.
88.28	88.38	SILTSTONE, grey, argillaceous matrix, weak rock, transitional basal contact.
88.38	88.52	SANDSTONE, grey, fine grained, argillaceous matrix, weak rock, transitional basal contact.
88.52	88.63	SILTSTONE, grey, argillaceous matrix, weak rock, transitional basal contact.
88.63	88.66	SANDSTONE, grey, fine grained, weak rock, transitional basal contact, rare calcite lenses.
88.66	90.06	MUDSTONE, greenish-grey, very fine grained, argillaceous matrix, moderately weak rock, transitional basal contact.
90.06	90.65	SILTSTONE, grey, fine grained, argillaceous matrix fining upwards, weak rock, transitional basal contact.
90.65	92.02	SANDSTONE, grey, fine grained, argillaceous matrix fining upwards, moderately weak rock, abrupt basal contact, rare calcite lenses.
92.02	93.74	SANDSTONE, grey, fine to medium grained, fining upwards calcareous cement, moderately weak rock, abrupt basal contact, occasional calcite lenses.

FROM	TO	LITHOLOGY
93.74	93.76	30% SANDSTONE, grey, fine to medium grained, abrupt basal contact, intermixed with: 70% COAL, bands, abrupt basal contact, rare calcite lenses.
93.76	95.50	SANDSTONE, grey, medium grained, fining upwards arenaceous well sorted, moderately weak rock, erosional basal contact.
95.50	96.24	PEBBLE CONGLOMERATE, grey, pebble, fining upwards well-rounded poorly sorted calcareous cement, deformed basal contact. SANDSTONE, grey, medium grained.
96.24	96.27	COAL, HEAVY (INFERIOR COAL), deformed basal contact, abundant calcite lenses.
96.27	96.55	PEBBLE CONGLOMERATE, grey, pebble, fining upwards well-rounded poorly sorted calcareous cement arenaceous matrix, transitional basal contact. SANDSTONE, grey.
96.55	96.84	PEBBLE CONGLOMERATE, grey, pebble, well-rounded poorly sorted calcareous cement, transitional basal contact, rare pyrite. No matrix present
96.84	97.00	PEBBLE CONGLOMERATE, grey, pebble, well-rounded poorly sorted arenaceous matrix calcareous cement, erosional basal contact. SANDSTONE, grey, lithic (predominately rock fragments). CARBONACEOUS MUDSTONE, fine grained. Orange red crystals between somePebbles. In joints between surrounding pebbles
97.00	97.27	NO SAMPLE RETURN.
97.27	97.32	COAL, HEAVY (INFERIOR COAL).
97.32	97.36	MUDSTONE, light to medium grey, arenaceous in part, very weak rock, very broken core.
97.36	97.38	MUDSTONE, brownish-black, carbonaceous in part coal laminae, very weak rock, solid core, abrupt basal contact.
97.38	97.64	85% CARBONACEOUS MUDSTONE, black, with numerous coal fragments, very weak rock, very broken core, interbedded with: 15% COAL, HEAVY (INFERIOR COAL), phases and laminae, abrupt basal contact.

FROM	TO	LITHOLOGY
97.64	97.89	MUDSTONE, brownish-black, carbonaceous coal fragments throughout interval, very weak rock, very broken core, transitional basal contact.
97.89	98.12	CARBONACEOUS MUDSTONE, black, coal thin bands throughout interval, solid core, very weak rock.
98.12	98.17	50% CARBONACEOUS MUDSTONE, black, very weak rock, interbedded with: 50% CONGLOMERATE, bands mudstone in part, weak rock, solid core.
98.44	98.45	CLAYSTONE, light brownish-cream, stiff, fragmented, abrupt basal contact.
98.45	98.46	COAL, HEAVY (INFERIOR COAL), broken core, moderately weak rock, abrupt basal contact.
98.46	98.52	SILTSTONE, light to medium grey, very weak rock, solid core, abrupt basal contact.
98.52	98.58	CARBONACEOUS MUDSTONE, medium to dark black, numerous coal bands and laminae, weak rock, solid core, abrupt basal contact.
98.58	98.60	COAL, HEAVY (INFERIOR COAL), thin mudstone bands, weak rock, very broken core, cleats with moderately close spacing.
98.60	98.91	NO SAMPLE RETURN.
98.91	98.92	CARBONACEOUS MUDSTONE, black, numerous thin coal bands and argillaceous matrix throughout interval coal in part, weak rock, very broken core.
98.92	98.93	SANDSTONE, light greenish-grey, very fine grained, argillaceous matrix, very stiff, solid core, abrupt basal contact.
98.93	99.20	CARBONACEOUS MUDSTONE, black, thin mudstone bands near top of unit mudstone lenses near top of unit coal fragments laminae and bands throughout interval mudstone bands near base of unit, solid core, very weak rock.
99.20	99.35	90% SANDSTONE, greyish-black, fine grained, carbonaceous calcareous cement, very broken core, very weak rock. 10% COAL, HEAVY (INFERIOR COAL), fragments.
99.35	99.54	CARBONACEOUS MUDSTONE, brownish-black, some coal laminae, very broken core, weak rock, common calcite.

FROM	TO	LITHOLOGY
99.54	99.55	MUDSTONE, creamy-brown, slightly carbonaceous rare coal fragments, weak rock, broken core.
99.55	99.67	90% CARBONACEOUS MUDSTONE, brownish-black, some coal laminae, weak rock, transitional basal contact, intermixed with: 10% COAL, brown, fragments, very broken core.
99.67	99.85	50% CARBONACEOUS MUDSTONE, dark brownish-black, weak rock, abrupt basal contact, occasional calcite, intermixed with: 50% COAL, fragments, very broken core.
99.85	100.21	MUDSTONE, light brownish-grey, slightly carbonaceous some coal fragments some carbonaceous laminae near top of unit, moderately weak rock, broken core, transitional basal contact.
100.21	100.23	CARBONACEOUS MUDSTONE, brownish-black, coal fragments near top of unit, weak rock.
100.23	100.37	MUDSTONE, brownish-grey, slightly carbonaceous coal fragments near top of unit, broken core, moderately weak rock.
100.37	100.40	COAL, HEAVY (INFERIOR COAL), brownish-black.
100.40	100.45	CARBONACEOUS MUDSTONE, brownish-black, moderately weak rock.
100.45	100.52	COAL, HEAVY (INFERIOR COAL), black, abrupt basal contact.
100.52	100.57	CLAYSTONE, creamy-brown, numerous coal fragments, firm, abrupt basal contact.
100.57	100.61	COAL, HEAVY (INFERIOR COAL), dark brownish-black, hard.
100.61	100.66	MUDSTONE, creamy-brown, slightly carbonaceous coal bands near middle of unit, weak rock, broken core.
100.66	100.71	COAL, HEAVY (INFERIOR COAL), brownish-black, transitional basal contact, occasional calcite on cleats.
100.71	100.78	CARBONACEOUS MUDSTONE, brownish-black, numerous coal fragments near middle of unit, moderately weak rock, broken core, abrupt basal contact, common calcite infilling fault discontinuities.
100.78	100.80	SILTSTONE, creamy-brown, calcareous cement coal fragments near top of unit, very weak rock, broken core, abrupt basal contact.

FROM	TO	LITHOLOGY
100.80	100.85	MUDSTONE, greyish-brown, rare carbonaceous fragments calcareous cement, moderately weak rock, broken core, transitional basal contact.
100.85	100.96	MUDSTONE, light brownish-black, carbonaceous some coal fragments, weak rock, very broken core, transitional basal contact, occasional calcite, rare pyrite.
100.96	100.98	CARBONACEOUS MUDSTONE, dark brownish-black, very weak rock, transitional basal contact.
100.98	101.04	COAL, HEAVY (INFERIOR COAL), dark brownish-black, transitional basal contact.
101.04	101.06	CARBONACEOUS MUDSTONE, dark brownish-black, moderately weak rock.
101.06	101.08	MUDSTONE, brownish-black, carbonaceous some coal fragments, stiff, very broken core, abrupt basal contact.
101.08	101.09	MUDSTONE, light brownish-grey, slightly carbonaceous, weak rock, abrupt basal contact.
101.09	101.12	COAL, HEAVY (INFERIOR COAL), brownish-black, transitional basal contact.
101.12	101.26	MUDSTONE, brownish-black, slightly carbonaceous some coal fragments, moderately weak rock, broken core.
101.26	101.68	SILTSTONE, brownish-grey, carbonaceous some coal fragments, moderately weak rock, broken core, abrupt basal contact.
101.68	101.75	CARBONACEOUS MUDSTONE, dark brownish-black, rare coal laminae, moderately weak rock, broken core, abrupt basal contact.
101.75	102.66	SILTSTONE, brownish-grey, carbonaceous in part some coal fragments numerous near base of unit, moderately weak rock, solid core, weak rock, transitional basal contact.
102.66	104.50	SILTSTONE, dark grey, slightly carbonaceous calcareous cement near top of unit argillaceous matrix, weak rock, broken core, transitional basal contact. Fractures and breaks concoidally
104.50	104.85	SANDSTONE, grey, fine grained, lithic (predominately rock fragments) argillaceous matrix, weak rock, transitional basal contact.

FROM	TO	LITHOLOGY
104.85	105.65	SILTSTONE, grey, argillaceous matrix some carbonaceous fragments near base of unit slightly carbonaceous near base of unit, moderately weak rock.
105.65	106.08	MUDSTONE, medium to dark greyish-black, slightly carbonaceous in part with some carbonaceous traces, weak rock, very broken core, transitional basal contact, joints. Has a conchoidal fracture
106.08	106.38	MUDSTONE, medium to dark blackish-grey, slightly carbonaceous near top of unit and near base of unit sub-angular phases near middle of unit, weak rock, solid core, transitional basal contact.
106.38	106.40	CARBONACEOUS MUDSTONE, black, weak rock, solid core, abrupt basal contact.
106.40	107.40	MUDSTONE, medium to dark grey, carbonaceous laminae near top of unit, weak rock, broken core, transitional basal contact.
107.40	107.60	NO SAMPLE RETURN.
107.60	107.63	SANDSTONE, brownish-grey, fine grained, mudstone matrix, weak rock, solid core, transitional basal contact.
107.63	114.30	MUDSTONE, medium to dark brownish-grey, slightly carbonaceous near top of unit numerous carbonaceous mudstone fragments throughout interval arenaceous in part some carbonaceous mudstone pellets throughout interval, very weak rock, broken core. Some bands of swelling clay Some purple organic staining
114.30	114.42	NO SAMPLE RETURN.
114.42	114.58	MUDSTONE, dark grey, mudstone pellets near top of unit, very weak rock, broken core, transitional basal contact. Common purplish brown staining
114.58	115.08	MUDSTONE, dark grey, very stiff, very broken core, transitional basal contact. Probably a shear zone, mudstone is Brecciated, soft and has slickensides
115.08	115.46	SILTSTONE, medium to dark brownish-grey, calcareous bands near base of unit, very weak rock, solid core, transitional basal contact.

FROM - TO	LITHOLOGY
115.46 - 115.87	MUDSTONE, dark purplish-grey, very weak rock, solid core, transitional basal contact. Abundent purple staining
115.87 - 116.95	MUDSTONE, medium to dark grey, mudstone pellets phases near middle of unit, broken core, very weak rock.
116.95 - 117.09	MUDSTONE, dark grey, some carbonaceous mudstone pellets, weak rock, solid core, transitional basal contact.
117.09 - 117.30	80% MUDSTONE, dark grey, some carbonaceous mudstone pellets, weak rock, very broken core, interbedded with: 20% SANDSTONE, dark grey, fine grained, with numerous mudstone fragments sub-angular matrix, weak rock.
117.30 - 118.72	SILTSTONE, medium to dark grey, mudstone near top of unit, broken core, weak rock, abrupt basal contact.
118.72 - 119.16	SANDSTONE, grey, fine to medium grained, fining upwards numerous silty and mudstone laminae and bands throughout interval some mudstone pellets near middle of unit calcareous bands near middle of unit lithic (predominately rock fragments), weak rock, broken core, abrupt basal contact.
119.16 - 119.21	MUDSTONE, brown, very stiff, fragmented, abrupt basal contact.
119.21 - 119.42	SANDSTONE, greenish-grey, fine to medium grained, calcareous bands near top of unit quartz lithic, weak rock, broken core, abrupt basal contact.
119.42 - 119.65	MUDSTONE, brownish-grey, calcareous bands near base of unit, very weak rock, broken core.
119.65 - 120.30	SANDSTONE, greenish-grey, fine to medium grained, quartz lithic, weak rock, very broken core.
120.30 - 122.48	SANDSTONE, greenish-grey, fine to medium grained, lithic (predominately rock fragments) calcareous cement carbonaceous bands near middle of unit and near base of unit mudstone matrix near base of unit, weak rock, solid core, transitional basal contact.
122.48 - 122.69	MUDSTONE, medium to dark blackish-brown, carbonaceous near top of unit arenaceous in part, very weak rock, solid core, transitional basal contact.

FROM	TO	LITHOLOGY
122.69	122.81	SANDSTONE, light brown, fine to medium grained, mudstone matrix calcareous, broken core, transitional basal contact.
122.81	123.22	CARBONACEOUS MUDSTONE, dark brownish-black, some thin coal bands and laminae, weak rock, broken core, abrupt basal contact.
123.22	124.61	MUDSTONE, brownish-grey, silty laminae bands near base of unit and near middle of unit, weak rock, solid core, abrupt basal contact.
124.61	125.30	MUDSTONE, dark brownish-black, carbonaceous slightly carbonaceous in part thin coal bands near middle of unit and near base of unit, weak rock, broken core, abrupt basal contact.
125.30	126.30	MUDSTONE, medium to dark grey, silty phases near middle of unit, weak rock, solid core.
126.30	127.86	50% SANDSTONE, light to medium grey, very fine grained, weak rock, abrupt basal contact, interbedded with: 50% SILTSTONE, medium to dark grey, laminae and bands, weak rock, abrupt basal contact.
127.86	128.00	SANDSTONE, light to medium grey, fine grained, weak rock, broken core, transitional basal contact.
128.00	129.09	SILTSTONE, dark grey, with numerous arenaceous bands and laminae, weak rock, solid core, abrupt basal contact.
129.09	129.19	SANDSTONE, light to medium grey, fine to medium grained, with siltstone bands throughout interval, weak rock, solid core, abrupt basal contact.
129.19	129.30	SILTSTONE, dark grey, weak rock, solid core.
129.30	129.45	SILTSTONE, dark grey, arenaceous bands and laminae throughout interval, weak rock, solid core, abrupt basal contact.
129.45	129.55	SANDSTONE, light to medium grey, fine grained, weak rock, solid core, abrupt basal contact.
129.55	129.59	MUDSTONE, dark blackish-grey, silty slightly carbonaceous, weak rock, solid core, abrupt basal contact.
129.59	129.72	SANDSTONE, light to medium grey, fine grained, argillaceous matrix near base of unit some carbonaceous traces, broken core, weak rock, transitional basal contact.

FROM	TO	LITHOLOGY
129.72	129.77	50% SANDSTONE, light to medium grey, very fine grained. 50% MUDSTONE, dark blackish-grey, laminae slightly carbonaceous, weak rock, transitional basal contact.
129.77	129.88	MUDSTONE, dark grey, silty arenaceous laminae near base of unit, weak rock, solid core, transitional basal contact.
129.88	130.30	SANDSTONE. Interbedded sequence of fine sandstone And silty mudstones, units are 1 to 5 Cm thick, sandstones display deformed Erosional bases, they often show rework Ed mudstone pellets, mudstone is finely Laminated with silt and sand
130.30	130.55	SANDSTONE, light to medium grey, fine to medium grained, some thin mudstone bands and laminae, weak rock, solid core, abrupt basal contact.
130.55	130.58	MUDSTONE, dark blackish-grey, slightly carbonaceous numerous arenaceous laminae near top of unit, weak rock, solid core, abrupt basal contact.
130.58	131.13	SANDSTONE, light to medium grey, fine grained, fining upwards numerous thin mudstone bands near top of unit thick mudstone bands near base of unit quartz lithic, weak rock, solid core, abrupt basal contact.
131.13	131.19	MUDSTONE, arenaceous bands near top of unit silty laminae near base of unit, weak rock, solid core, transitional basal contact.
131.19	131.38	SANDSTONE, light grey, fine to medium grained, calcareous cement mudstone laminae near base of unit quartz lithic, weak rock, solid core.
131.38	131.68	MUDSTONE, dark blackish-grey, arenaceous laminae near top of unit arenaceous bands near base of unit minor coal laminae near base of unit, weak rock, solid core, abrupt basal contact.
131.68	131.74	SANDSTONE, light to medium grey, very fine grained, thin carbonaceous laminae throughout interval, weak rock, solid core, abrupt basal contact.
131.74	131.47	MUDSTONE, dark blackish-grey, slightly carbonaceous, very weak rock, solid core, abrupt basal contact. Thin bright coal band base unit

193

FROM	TO	LITHOLOGY
131.47	131.92	SANDSTONE, fine grained, slightly carbonaceous mudstone bands throughout interval fining upwards calcareous cement carbonaceous wisps, weak rock, deformed basal contact.
131.92	131.93	COAL, >90% BRIGHT, solid core, deformed basal contact.
131.93	131.95	SANDSTONE, light to medium grey, fine to medium grained, lithic (predominately rock fragments), weak rock, broken core, deformed basal contact.
131.95	131.96	MUDSTONE, brown, numerous carbonaceous pellets, very weak rock, very broken core, abrupt basal contact.
131.96	132.30	COAL, HEAVY (INFERIOR COAL), carbonaceous mudstone in part slightly fissile, weak rock, fragmented.
132.30	132.32	MUDSTONE, dark brownish-grey, slightly carbonaceous, weak rock, very broken core, abrupt basal contact.
132.32	132.46	COAL, HEAVY (INFERIOR COAL), mudstone in part, weak rock, very broken core, abrupt basal contact.
132.46	132.49	MUDSTONE, dark brown, arenaceous in part, weak rock, solid core, abrupt basal contact.
132.49	132.98	COAL, HEAVY (INFERIOR COAL), broken core, moderately weak rock.
132.98	133.03	MUDSTONE, light greyish-brown, coal lenses near top of unit slightly silty, weak rock, solid core, abrupt basal contact.
133.03	133.07	SANDSTONE, light brownish-cream, fine grained, calcareous cement, moderately weak rock, solid core, abrupt basal contact.
133.07	133.09	MUDSTONE, light brownish-cream, silty coal lenses near middle of unit coal wisps near base of unit, weak rock, solid core, abrupt basal contact.
133.09	133.27	COAL, HEAVY (INFERIOR COAL), weak rock, solid core, abrupt basal contact, cleats with close spacing.
133.27	133.29	MUDSTONE, brown, numerous coal lenses, weak rock, solid core, abrupt basal contact.
133.29	133.77	COAL, HEAVY (INFERIOR COAL), mottled purplish, thin argillaceous bands, broken core, moderately weak rock, transitional basal contact, cleats with close spacing.

FROM	TO	LITHOLOGY
133.77	133.82	CARBONACEOUS MUDSTONE, dark brownish-black, numerous thin coal lenses and bands throughout interval, weak rock, broken core, abrupt basal contact.
133.82	133.96	COAL, <10% BRIGHT, broken core, moderately weak rock, abrupt basal contact.
133.96	134.06	MUDSTONE, light brownish-grey, some coal wisps, weak rock, broken core, deformed basal contact. Flame structure intrusion of Underlying coal is 3 cm. wide and exTo top of unit
134.06	134.19	COAL, <10% BRIGHT, with mudstone pellets, moderately weak rock, broken core, abrupt basal contact.
134.19	134.30	MUDSTONE, light greyish-brown, numerous argillaceous pellets coal wisps, weak rock, solid core, abrupt basal contact.
134.30	134.55	COAL, <10% BRIGHT, broken core, cleats with close spacing.
134.55	135.36	COAL, <10% BRIGHT, fragmented, abrupt basal contact.
135.36	136.04	MUDSTONE, medium to dark grey, slightly carbonaceous, weak rock, broken core, abrupt basal contact, slight plantlet remains bedding surfaces.
136.04	136.12	CARBONACEOUS SHALE, dark brownish-black, coal lenses, weak rock, solid core, abrupt basal contact.
136.12	136.70	SILTSTONE, grey, weak rock, solid core, transitional basal contact.
136.70	137.26	MUDSTONE, medium to dark grey, slightly carbonaceous near base of unit, weak rock, solid core, abrupt basal contact.
137.26	137.35	COAL, <10% BRIGHT. Unit contains a cobble of very hard Black material, very fine grained May be a basic volcanic bomb as it Appears to have a chilled edge and Possibly small vesicles
137.35	137.80	SILTSTONE, grey, mudstone near top of unit, weak rock, solid core, abrupt basal contact.
137.80	138.43	SANDSTONE, light grey, fine grained, quartz feldspathic calcareous cement, weak rock, broken core, transitional basal contact.

FROM	TO	LITHOLOGY
138.43	138.80	SILTSTONE, grey, with mudstone bands and laminae, weak rock, solid core, abrupt basal contact
138.80	139.62	SANDSTONE, light to medium grey, some carbonaceous laminae, weak rock, broken core, abrupt basal contact.
139.62	139.68	SILTSTONE, medium to dark grey, weak rock, solid core, abrupt basal contact.
139.68	140.58	SANDSTONE, light grey, fine to medium grained, numerous carbonaceous laminae lithic (predominately rock fragments), weak rock, solid core, abrupt basal contact.
140.58	140.68	SILTSTONE, dark grey, arenaceous laminae near base of unit, weak rock, solid core, transitional basal contact.
140.68	140.77	SANDSTONE, light to medium grey, fine grained, lithic (predominately rock fragments), weak rock, solid core, abrupt basal contact.
140.77	141.30	MUDSTONE, medium to dark grey, weak rock, very broken core.
141.30	141.80	CARBONACEOUS MUDSTONE, black, shaly in part some coal bands near base of unit, weak rock, fragmented, transitional basal contact. Some of mudstone is almost aStoney coal
141.80	142.06	CLAYSTONE, light to medium grey, stiff, solid core, abrupt basal contact.
142.06	142.18	CARBONACEOUS SHALE, black, coal, weak rock, fragmented, transitional basal contact.
142.18	142.26	COAL, HEAVY (INFERIOR COAL), carbonaceous mudstone near base of unit, moderately weak rock, broken core, transitional basal contact.
142.26	142.38	CARBONACEOUS MUDSTONE, black, slightly carbonaceous near base of unit, weak rock, solid core, transitional basal contact.
142.38	142.49	CLAYSTONE, brown, weak rock, solid core, abrupt basal contact.
142.49	142.67	CARBONACEOUS MUDSTONE, black, coal in part, very broken core, weak rock, abrupt basal contact. Close to a stoney coal in parts

FROM	TO	LITHOLOGY
142.67	144.30	MUDSTONE, medium to dark brownish-grey, weak rock, broken core. End of hq core, start of nq core
144.30	144.78	MUDSTONE, medium to dark grey, silty near base of unit, weak rock, solid core, abrupt basal contact.
144.78	144.93	SANDSTONE, grey, very fine grained, weak rock, solid core, transitional basal contact.
144.93	145.68	70% MUDSTONE, medium to dark grey, silty in part, weak rock, interbedded with: 30% SANDSTONE, very fine grained, phases and laminae, solid core, abrupt basal contact.
145.68	146.50	SANDSTONE, light grey, fine grained, some carbonaceous laminae mudstone phases and laminae near base of unit, broken core, moderately weak rock, abrupt basal contact.
146.50	146.53	MUDSTONE, blackish-grey, moderately weak rock, solid core, abrupt basal contact.
146.53	146.71	SANDSTONE, greyish-green, fine grained, mudstone thin bands near base of unit, moderately weak rock, solid core.
146.71	146.74	MUDSTONE, dark grey, silty laminae throughout interval, weak rock, solid core, abrupt basal contact.
146.74	147.40	NO SAMPLE RETURN.
147.40	147.42	MUDSTONE, dark grey, weak rock, fragmented.
147.42	147.60	SANDSTONE, light greenish-grey, fine grained, coal lenses near base of unit quartz feldspathic mudstone pellets near base of unit mudstone laminae, weak rock, broken core, erosional basal contact.
147.60	147.90	MUDSTONE, dark grey, weak rock, broken core, transitional basal contact.
147.90	148.78	SILTSTONE, light to medium grey, weak rock, broken core, transitional basal contact.
148.78	150.37	SANDSTONE, light greenish-grey, very fine grained, fining upwards mudstone phases near top of unit mudstone laminae and bands throughout interval, weak rock, broken core.
150.37	150.73	MUDSTONE, grey, silty laminae slightly carbonaceous bands near middle of unit, broken core, weak rock, abrupt basal contact.

FROM	TO	LITHOLOGY
150.73	150.93	CARBONACEOUS MUDSTONE, medium to dark brownish-black, carbonaceous pellets near middle of unit coal near top of unit, very weak rock, solid core, abrupt basal contact.
150.93	151.09	COAL, HEAVY (INFERIOR COAL), carbonaceous mudstone near base of unit, broken core, moderately weak rock, transitional basal contact.
151.09	151.16	MUDSTONE, blackish-brown, coal lenses near base of unit argillaceous pellets near base of unit, weak rock, solid core, abrupt basal contact.
151.16	151.24	COAL, <10% BRIGHT, weak rock, solid core, abrupt basal contact.
151.24	151.28	MUDSTONE, light brown, coal bands near top of unit and near middle of unit, weak rock, solid core, abrupt basal contact.
151.28	151.44	COAL, <10% BRIGHT, mudstone near base of unit, weak rock, solid core, transitional basal contact.
151.44	151.46	CARBONACEOUS MUDSTONE, black, coal, weak rock, solid core, abrupt basal contact.
151.46	151.50	SANDSTONE, light greyish-brown, very fine grained, mudstone matrix, weak rock, broken core, abrupt basal contact.
151.50	151.80	CARBONACEOUS MUDSTONE, brownish-black, weak rock, solid core.
151.80	153.10	MUDSTONE, brownish-grey, silty in part, very broken core.
153.10	153.35	NO SAMPLE RETURN.
153.35	153.51	MUDSTONE, brownish-grey, silty near base of unit, weak rock, solid core, transitional basal contact.
153.51	154.48	SILTSTONE, grey, arenaceous in part, weak rock, solid core, transitional basal contact.
154.48	161.16	SANDSTONE, fine grained, fining upwards argillaceous matrix quartzose (>90% quartz), very weak rock, solid core, transitional basal contact. 1% black brown platy mineral
161.16	161.29	50% MUDSTONE, medium to dark grey, pellets, weak rock, intermixed with: 50% SANDSTONE, light grey, fine grained, matrix argillaceous matrix, very weak rock, solid core, abrupt basal contact.

FROM	TO	LITHOLOGY
161.29	161.45	SANDSTONE, light grey, fine grained, argillaceous matrix some mudstone pellets quartzose (>90% quartz), very weak rock, solid core, abrupt basal contact.
161.45	161.50	80% MUDSTONE, medium to dark grey, pellets, weak rock, erosional basal contact, intermixed with: 20% SANDSTONE, light grey, fine grained, matrix argillaceous matrix coal lenses near base of unit, very weak rock, solid core.
161.50	161.64	SANDSTONE, light grey, fine grained, argillaceous matrix quartzose (>90% quartz) coal laminae near middle of unit, very weak rock, solid core, abrupt basal contact.
161.64	161.80	90% MUDSTONE, medium to dark grey, pellets, weak rock, intermixed with: 10% SANDSTONE, light grey, fine grained, matrix, abrupt basal contact.
161.80	163.45	SANDSTONE, light grey, fine grained, argillaceous matrix numerous mudstone laminae near middle of unit and near base of unit, weak rock, abrupt basal contact.
163.45	163.49	SILTSTONE, medium to dark brownish-grey, weak rock, solid core, abrupt basal contact.
163.49	163.91	SANDSTONE, light brownish-grey, numerous mudstone laminae near top of unit and near base of unit, weak rock, solid core, abrupt basal contact.
163.91	165.28	SANDSTONE, light grey, fine to medium grained, quartz feldspathic fining upwards, weak rock, solid core, transitional basal contact. 1% brown platy mineral
165.28	166.34	SANDSTONE, light whitish-grey, medium grained, feldspathic (predom. feldspar fragments) fining upwards, weak rock, solid core, transitional basal contact. 1% brown platy mineral
166.34	167.41	SANDSTONE, light whitish-grey, medium to coarse grained, feldspathic (predom. feldspar fragments) some quartz feldspathic moderately sorted sub-angular, weak rock, solid core, transitional basal contact.
167.41	168.89	SANDSTONE, light whitish-grey, medium grained, feldspathic (predom. feldspar fragments) quartz feldspathic in part sub-angular poorly sorted some carbonaceous wisps and laminae, weak rock, solid core, transitional basal contact.

FROM	TO	LITHOLOGY
168.89	169.37	SANDSTONE, light light whitish-grey grey, fine to medium grained, mudstone pebbles near top of unit numerous coal wisps and laminae throughout interval feldspathic (predom. feldspar fragments), weak rock, solid core, transitional basal contact.
169.37	172.38	SANDSTONE, light whitish-grey, fine to medium grained, coal lenses near base of unit quartz feldspathic poorly sorted angular, weak rock, solid core, transitional basal contact.
172.38	172.46	70% SANDSTONE, light whitish-grey, fine to medium grained, some coal lenses, weak rock, transitional basal contact, intermixed with: 30% SILTSTONE, medium to dark grey, fragments, weak rock.
172.46	172.92	SANDSTONE, light whitish-grey, fine grained, numerous mudstone fragments near top of unit feldspathic (predom. feldspar fragments) coal lenses near middle of unit, weak rock, solid core, abrupt basal contact.
172.92	173.11	80% SILTSTONE, medium to dark grey, pebbles, weak rock, intermixed with: 20% SANDSTONE, light whitish-grey, medium grained, matrix fining upwards feldspathic (predom. feldspar fragments), weak rock, abrupt basal contact.
173.11	173.37	SANDSTONE, light whitish-grey, fine grained, fining upwards feldspathic (predom. feldspar fragments), weak rock, solid core, abrupt basal contact.
173.37	173.48	SILTSTONE, medium to dark grey, arenaceous lenses near base of unit arenaceous bands near top of unit, weak rock, solid core, abrupt basal contact.
173.48	173.56	SANDSTONE, light whitish-grey, fine grained, quartz feldspathic, weak rock, solid core, erosional basal contact.
173.56	173.73	50% SILTSTONE, brown, arenaceous in part, weak rock, intermixed with: 50% SANDSTONE, light whitish-grey, medium grained, matrix feldspathic (predom. feldspar fragments), weak rock, with mud pellers, transitional basal contact. Unit consists of partially reworked Siltstone and fine sandstone beds set In a sandstone matrix.

200

FROM	TO	LITHOLOGY
173.73	175.30	SANDSTONE, light whitish-grey, medium to coarse grained, mudstone pellets near base of unit coal bands near base of unit feldspathic (predom. feldspar fragments) poorly sorted angular, weak rock, solid core, erosional basal contact. Reworked siltstone pebbles from underl Ying unit at base ,2 to 4 cm.
175.30	175.45	SILTSTONE, dark grey, mudstone near top of unit arenaceous lenses near middle of unit, abrupt basal contact.
175.45	175.86	70% SANDSTONE, light whitish-grey, medium grained, feldspathic (predom. feldspar fragments) poorly sorted angular, weak rock, transitional basal contact, intermixed with: 30% SILTSTONE, dark grey, fragments, weak rock, solid core. Siltstone fragments .5 to 4 c
175.86	178.98	SANDSTONE, light whitish-grey, medium to coarse grained, feldspathic (predom. feldspar fragments) poorly sorted angular some mudstone pellets throughout interval some carbonaceous traces, very broken core.
178.98	179.43	NO SAMPLE RETURN.
179.43	179.52	SANDSTONE, light greenish-white, very fine grained, quartzose (>90% quartz) numerous tuffaceous fragments, moderately strong rock, solid core, abrupt basal contact. Tuffaceous fragments 0.1 to 1 cm in si Ze , consist of plagioclase (1 mm) Set in a green-black groundmass,heavil Y altered,possibly an andesitic tuff The sandstone appears to have been sillcified
179.52	179.55	COAL, <10% BRIGHT, broken core, weak rock, abrupt basal contact.
179.55	180.16	CLAYSTONE, light green, slightly carbonaceous near base of unit, stiff, broken core, abrupt basal contact.
180.16	181.30	CARBONACEOUS MUDSTONE, black, coal in part, weak rock, broken core, abrupt basal contact.
181.30	181.31	CLAYSTONE, light green, stiff, solid core, abrupt basal contact.

201

FROM	TO	LITHOLOGY
181.31	181.34	CARBONACEOUS MUDSTONE, dark brownish-black, very weak rock, solid core, abrupt basal contact.
181.34	181.36	COAL, HEAVY (INFERIOR COAL), weak rock, solid core, abrupt basal contact.
181.36	181.45	MUDSTONE, brown, carbonaceous near base of unit, very stiff, broken core.
181.45	181.59	COAL, HEAVY (INFERIOR COAL), mudstone in part, moderately weak rock, solid core, abrupt basal contact.
181.59	181.64	MUDSTONE, blackish-brown, slightly carbonaceous coal phases near middle of unit, weak rock, solid core, abrupt basal contact.
181.64	181.78	COAL, HEAVY (INFERIOR COAL), black, solid core, moderately weak rock, transitional basal contact.
181.78	181.81	CARBONACEOUS MUDSTONE, dark brownish-black, coal in part, moderately weak rock, solid core, transitional basal contact.
181.81	182.02	COAL, <10% BRIGHT, solid core, moderately strong rock, abrupt basal contact.
182.02	182.49	CARBONACEOUS MUDSTONE, black, coal near base of unit, very weak rock, solid core, transitional basal contact.
182.49	182.52	COAL, HEAVY (INFERIOR COAL), solid core, abrupt basal contact.
182.52	182.56	CLAYSTONE, light green, stiff, broken core, abrupt basal contact.
182.56	182.70	CARBONACEOUS MUDSTONE, dark brownish-black, weak rock, solid core, abrupt basal contact.
182.70	182.81	CLAYSTONE, light green, solid core, very stiff, abrupt basal contact.
182.81	183.25	MUDSTONE, dark grey, coal near middle of unit, fragmented, weak rock.
183.25	183.28	
183.28	183.45	CARBONACEOUS MUDSTONE, black, very stiff, fragmented.

202

FROM	TO	LITHOLOGY
183.45	183.60	CLAYSTONE, light green, very stiff, non sticky, abrupt basal contact.
183.60	184.23	CARBONACEOUS MUDSTONE, black, coal in part coal near base of unit, moderately weak rock, fragmented, transitional basal contact.
184.23	184.28	COAL, 40 - 60% BRIGHT, broken core, abrupt basal contact.
184.28	184.55	MUDSTONE, arenaceous in part, very broken core, weak rock, abrupt basal contact.
184.55	184.65	SANDSTONE, light grey, very fine grained, mudstone phases near middle of unit, weak rock, solid core, abrupt basal contact.
184.65	187.00	MUDSTONE, blackish-brown, slightly carbonaceous near base of unit, weak rock, solid core, transitional basal contact.
187.00	187.18	CARBONACEOUS MUDSTONE, dark brownish-black, weak rock, solid core, abrupt basal contact.
187.18	187.20	CLAYSTONE, light green, calcareous bands near middle of unit, very weak rock, solid core, abrupt basal contact.
187.20	187.25	COAL, <10% BRIGHT, solid core, abrupt basal contact.
187.25	187.30	CLAYSTONE, blackish-brown, coal lenses near top of unit, broken core, very weak rock, abrupt basal contact.
187.30	187.46	COAL, 10 - 40% BRIGHT, solid core, transitional basal contact.
187.46	187.83	COAL, <10% BRIGHT, blackish-brown, coal laminae and bands, moderately weak rock, solid core, transitional basal contact.
187.83	188.48	SILTSTONE, medium to dark grey, mudstone near top of unit arenaceous near base of unit, weak rock.
188.48	188.67	CARBONACEOUS MUDSTONE, dark brownish-black, weak rock, very broken core, abrupt basal contact.
188.67	188.72	SANDSTONE, light grey, fine grained, weak rock, very broken core, transitional basal contact.
188.72	189.25	COAL, HEAVY (INFERIOR COAL), solid core, moderately weak rock, abrupt basal contact.

FROM	TO	LITHOLOGY
189.25	189.29	CLAYSTONE, light greenish-grey, very weak rock, very broken core, abrupt basal contact.
189.29	189.49	COAL, <10% BRIGHT, very broken core, moderately weak rock, deformed basal contact.
189.49	189.62	CARBONACEOUS MUDSTONE, medium to dark blackish-brown, slightly carbonaceous in part coal bands near middle of unit, weak rock, solid core, transitional basal contact.
189.62	189.64	COAL, HEAVY (INFERIOR COAL), solid core, abrupt basal contact.
189.64	189.67	MUDSTONE, light to medium blackish-grey, solid core, weak rock, abrupt basal contact.
189.67	189.75	COAL, HEAVY (INFERIOR COAL), black, weak rock, very broken core, abrupt basal contact.
189.75	189.78	MUDSTONE, medium to dark blackish-brown, slightly carbonaceous slightly arenaceous, weak rock, very broken core, abrupt basal contact.
189.78	190.12	COAL, <10% BRIGHT, very broken core, weak rock, transitional basal contact.
190.12	190.26	COAL, 10 - 40% BRIGHT, weak rock, solid core.
190.26	190.31	MUDSTONE, grey, slightly carbonaceous near top of unit, weak rock, solid core, with mud pellers, abrupt basal contact.
190.31	190.41	COAL, <10% BRIGHT, very broken core, weak rock, abrupt basal contact.
190.41	190.51	CLAYSTONE, brown, carbonaceous near base of unit and coal near base of unit, weak rock, very broken core, with mud pellers, abrupt basal contact.
190.51	190.54	COAL, HEAVY (INFERIOR COAL), numerous argillaceous pellets throughout interval, weak rock, solid core, abrupt basal contact.
190.54	190.55	MUDSTONE, blackish-grey, slightly carbonaceous coal wisps, weak rock, solid core, abrupt basal contact.
190.55	190.61	COAL, <10% BRIGHT, thin mudstone bands near middle of unit, weak rock, broken core, abrupt basal contact.

FROM	TO	LITHOLOGY
190.61	191.22	MUDSTONE, medium to dark brown, slightly carbonaceous carbonaceous near top of unit, weak rock, very broken core, transitional basal contact.
191.22	193.09	SILTSTONE, grey, weak rock, broken core.
193.09	195.28	SILTSTONE, grey, some arenaceous phases near base of unit, very broken core, weak rock.
195.28	196.03	50% SANDSTONE, light to medium grey, very fine grained, weak rock. 50% SILTSTONE, grey, weak rock, broken core, transitional basal contact.
196.03	197.53	SANDSTONE, light to medium grey, very fine grained, silty near top of unit slightly silty near middle of unit, weak rock, broken core, transitional basal contact.
197.53	198.07	SANDSTONE, light grey, fine grained, fining upwards quartzose (>90% quartz), weak rock, broken core, abrupt basal contact.
198.07	198.27	SANDSTONE, light to medium grey, very fine grained, fining upwards, weak rock, solid core, transitional basal contact.
198.27	204.35	SANDSTONE, light grey, fine to medium grained, fining upwards quartz lithic coal traces near base of unit, solid core, weak rock.
204.35	204.36	COAL, <10% BRIGHT, lenses, solid core, weak rock, abrupt basal contact.
204.36	205.11	SANDSTONE, light grey, fine to medium grained, quartz lithic, weak rock, solid core, abrupt basal contact.
205.11	205.12	MUDSTONE, brownish-grey, weak rock, solid core, abrupt basal contact.
205.12	207.65	SANDSTONE, light greenish-grey, fine grained, weak rock, solid core, transitional basal contact.
207.65	208.04	SANDSTONE, light green, fine grained, numerous coal lenses throughout interval, weak rock, solid core, abrupt basal contact.
208.04	208.10	CARBONACEOUS SHALE, blackish-brown, coal bands throughout interval, weak rock, solid core, abrupt basal contact. Stoney coal lamina show a disturbed be Dding ,in core section it looks like Colliform banding in agates

768123

FROM	TO	LITHOLOGY
208.10	208.21	SANDSTONE, light green, fine grained, coal lenses near top of unit, moderately weak rock, solid core, abrupt basal contact.
208.21	208.39	COAL, HEAVY (INFERIOR COAL), broken core, abrupt basal contact.
208.39	208.55	CLAYSTONE, light brown, carbonaceous near top of unit, stiff, very broken core.
208.55	209.08	NO SAMPLE RETURN.
209.08	209.57	COAL, <10% BRIGHT, fragmented.
209.57	209.61	CLAYSTONE, light brown, very stiff, very broken core, abrupt basal contact.
209.61	210.19	COAL, <10% BRIGHT, thin mudstone bands near top of unit and near middle of unit, broken core, abrupt basal contact.
210.19	210.26	CLAYSTONE, light brown, coal bands near middle of unit, solid core, very stiff.
210.26	210.30	CLAYSTONE, light brown, fragmented, very soft.
210.30	210.39	COAL, <10% BRIGHT, very broken core.
210.39	210.41	CLAYSTONE, light brownish-cream, coal lenses throughout interval, very stiff, very broken core.
210.41	210.52	COAL, HEAVY (INFERIOR COAL), broken core.
210.52	210.94	CLAYSTONE, light greenish-grey, slightly carbonaceous near base of unit numerous calcareous bands, very stiff, very broken core, abrupt basal contact.
210.94	211.37	COAL, <10% BRIGHT, fragmented.
211.37	211.58	NO SAMPLE RETURN.
211.58	211.61	CARBONACEOUS MUDSTONE, dark brownish-black, argillaceous pellets, very weak rock, very broken core.
211.61	212.41	COAL, <10% BRIGHT, fragmented, abrupt basal contact.
212.41	213.22	MUDSTONE, medium to dark brownish-grey, slightly carbonaceous near top of unit, fragmented, weak rock.

206

FROM	TO	LITHOLOGY
213.22	213.62	MUDSTONE, brownish-grey, weak rock, very broken core.
213.62	213.91	CLAYSTONE, light green, very stiff, broken core, abrupt basal contact.
213.91	213.98	MUDSTONE, medium to dark blackish-brown, slightly carbonaceous arenaceous near base of unit, weak rock, solid core, transitional basal contact.
213.98	214.70	SANDSTONE, light grey, fine to medium grained, quartz lithic, weak rock, broken core, abrupt basal contact.
214.70	214.85	MUDSTONE, medium to dark brownish-grey, silty near top of unit arenaceous phases near middle of unit, weak rock, solid core, abrupt basal contact.
214.85	219.32	SANDSTONE, light grey, fine to medium grained, quartz lithic fining upwards, weak rock, solid core, abrupt basal contact. Brown platey mineral on bedding planes
219.32	219.76	SANDSTONE, light to medium grey, very fine grained, weak rock, solid core.
219.76	223.36	SANDSTONE, light grey, fine to medium grained, quartz lithic silty near base of unit, weak rock, solid core. Brown platey mineral on bedding planes
223.36	223.38	COAL, <10% BRIGHT, broken core, transitional basal contact.
223.38	223.43	COAL, HEAVY (INFERIOR COAL), solid core, transitional basal contact.
223.43	223.73	MUDSTONE, greyish-black, slightly carbonaceous, moderately weak rock, solid core, abrupt basal contact.
223.73	223.75	COAL, <10% BRIGHT, very broken core, abrupt basal contact.
223.75	224.10	CARBONACEOUS MUDSTONE, black, very weak rock, solid core.
224.10	224.77	CARBONACEOUS MUDSTONE, black, very weak rock, broken core, deformed basal contact.
224.77	225.28	DOLERITE, light green, very fine grained, moderately weak rock, transitional basal contact. Calcite veins intruding sediments with Some reddish brown minerization possiBly cinnebar

207

FROM	TO	LITHOLOGY
225.28	226.72	DOLERITE, dark grey, fine grained. Extensivly veined, brecciated in parts
226.72	230.60	DOLERITE, dark grey, fine grained. Extensivly fractured and jointed to 5 cm. spacing , some calcareous veins
230.60	231.28	DOLERITE, dark grey, fine grained, fining upwards.
231.28	234.16	DOLERITE, dark grey, fine to medium grained.
	234.16	********** TOTAL DEPTH **********

208

HOLE NUMBER : CA 107

DATA SOURCE : Marathon Pet. Aust, Ltd

LOGGER : W. J. Thornley

Date commenced : 06 Mar 82

Date completed : 10 Mar 82

LOCATION:

NORTHING : 51803.46

EASTING : 4906.07

ELEVATION :

DRILLING:

CONTRACTOR : Stackpoole Drilling

DRILL TYPE : Rotary-percussion

HOLE SIZE : 153

CORE SIZE :

TOTAL DEPTH : 57.46m

GEOPHYSICAL:

CONTRACTOR :

PROBE DEPTH :

LOGS RUN :

FROM	TO	LITHOLOGY

********** CHIP DESCRIPTION **********

HAMMER

0.00 - 1.00 SOIL, brown.

1.00 - 11.00 95% CLAY, yellowish-brown, highly weathered, intermixed with:
5% SAND, light to dark grey, fine grained, lithic (predominately rock fragments), moderately weathered.

11.00 - 19.00 50% CLAY, yellowish-brown, moderately weathered, intermixed with:
50% SANDSTONE, white, fine grained, fragments, slightly weathered.

19.00 - 23.00 80% SANDSTONE, yellow, fragments, slightly weathered, intermixed with:
20% CLAY, yellowish-brown, moderately weathered.

23.00 - 27.00 NO SAMPLE RETURN. Hammer unable to return wet weathered Sample , roller bit could not cut hard Dolerite , change to diamond core

********** CORE DESCRIPTION **********

DIAMOND CORING

27.00 - 27.10 DOLERITE, dark blackish-grey, medium grained, very strong rock, unweathered, solid core.

27.10 - 27.23 50% DOLERITE, greyish-black, medium grained, very strong rock, unweathered, intermixed with:
50% DOLERITE, light yellowish-brown, weak rock, highly weathered.

27.23 - 27.46 . Loss probably in sediment; serpentine Matrix;dolerite dyke breccia , which Washed away as it was weathered

27.46 - 28.06 DOLERITE, yellowish-brown, strong rock, moderately weathered, fragmented.

********** BASE OF COAL WEATHERING **********

28.06 - 29.99 . Probably from washing away of weathere D sepentine and country rock matrix

29.99 - 30.46 BRECCIA. Dyke breccia composed of, 80 % Metamorphosed mudstone matrix yellow Ish brown, with 20 % dolerite fragment S.5 to 5 cm. in size, light grey colo Ur, very stiff, highly weaterered, angulaR fragments

FROM	TO	LITHOLOGY
30.46	30.63	DOLERITE, blackish-grey, medium grained, very strong rock, unweathered, solid core.
30.63	30.76	MUDSTONE, light green. Mudstone, contact metamorphism , some dolerite fragments bottom of Unit, very small (71mm.) throughout, sl Ightly weathered
30.76	30.83	DOLERITE, light to dark greenish-grey, medium grained, strong rock, slightly weathered, solid core.
30.83	31.25	MUDSTONE, light green. Mudstone , slightly weathered, Dolerite fragments of varying gra In size; throughout, 1mm. to 5 cm, fragm Ents slightly to moderatly weathered, Some yellow iron oxide stains, goodState of core
31.25	31.32	DOLERITE, light to dark grey, fine to medium grained, very strong rock, sligHtly weathered, solid core.
31.32	31.76	DOLERITE, light to dark greenish-grey. 80% serpentine matrix , slight weather Ed, 20% dolerite fragments , fine to Medium grained, slightly weathered, siz E of fragments , 5 cm to less than 1mm . matrix may have intermixed country rOck sediment
31.76	31.91	DOLERITE, blackish-grey, fine grained, very strong rock, unweathered, broken core.
31.91	32.23	60% DOLERITE, light to dark blackish-grey, fine to medium grained, fragments, slightly weathered, intermixed with: 40% matrix, light green slightly Weathered, matrix intermixed mudstoneAnd serpentine
32.23	32.33	DOLERITE, medium to dark blackish-grey, fine grained, very strong rock, unweathered, solid core.
32.33	32.45	DOLERITE, light to medium greenish-grey. 70 % serpentine slightly weathered 6 cm. dolerite fragment, and some lith Ic fragments 6cm: to less than 1mm, These lithic fragments are xenoliths Of country rock , some appear to be Carbonaceous mudstones and others a Green mud stone all are altered and Thermally metamorphosed.
32.45	33.10	BRECCIA. 80 % matrix , light green, slightly Weathered, 20 % dolerite fragments, fine To medium grained, matrix probably con Sists of serpentine and mudstones.

211

FROM	TO	LITHOLOGY
33.10 -	33.46	NO SAMPLE RETURN.
33.46 -	33.86	MUDSTONE. Mudstone ,light green,gritty,some gre En mudstone clasts and some dolerite Fragments,all less than 4 cm in size, Thermally metamorphosed
33.86 -	33.93	SANDSTONE, light to medium grey, very fine grained, micaceous fragments quartzose (>90% quartz), weak rock, solid core, abrupt basal contact. Muscovite flakes 1%Thermally metamorphosed
33.93 -	34.09	BRECCIA. 40 % serpentine,20% dolerite fragments Fine grained,40 % mudstone fragments
34.09 -	34.22	DOLERITE, blackish-grey, fine grained, very strong rock, solid core.
34.22 -	36.46	BRECCIA. 70% serpentine slightly weathered,20% Green mudstone fragments,many show Signs of rounding ,10 % dolerite fragm Ents, fine grained
36.46 -	37.45	MUDSTONE, greenish-brown. Gritty fragments throughout,slightly Weathered,thermally metamorphosed.
37.45 -	37.55	DOLERITE, blackish-grey, fine grained, very strong rock, unweathered, solid core.
37.55 -	38.76	BRECCIA. 80 % serpentine blackish green,20% d Olerite fragments , some mudstone frag Ments ,some signs of slight weathering Serpintine matrix may contain intermix Ed altered mudstones
		********** BASE OF WEATHERING **********
38.76 -	39.46	NO SAMPLE RETURN.
39.46 -	39.87	DOLERITE, blackish-grey, fine grained, very strong rock, unweathered, broken core.
39.87 -	39.99	BRECCIA, fragmented. 60 % serpentine, 20 % dolerite fragmen Ts fine grained ,20 % lithic fragments Black ,very stiff
39.99 -	40.84	BRECCIA. 80 % dolerite,fine grained ,blackish Grey,20 % serpentine matrix ,green

212

FROM	TO	LITHOLOGY
40.84	41.21	NO SAMPLE RETURN.
41.21	42.16	BRECCIA, fragmented. 60 % dolerite fragments, fine grained b Lackish grey, set in a matrix of greenSerpentine
42.16	42.60	DOLERITE, blackish-grey, fine grained, very broken core. 10 % green serpentine matrix
42.60	44.10	BRECCIA. 50 % dolerite fragments, fine grained, Blackish grey, 50% green serpentine matRix
44.10	44.38	DOLERITE, blackish-grey, fine to medium grained, very strong rock, solid core.
44.38	45.51	BRECCIA, fragmented. 50 % dolerite fragments blackish grey 50 % serpentine matrix light green Some black lithic fragments
45.51	45.97	DOLERITE, blackish-grey, fine grained, broken core, very strong rock.
45.97	46.17	BRECCIA, fragmented. 70 % dolerite, green grey fragments, 30 % serpentine matrix , some black cou -ntry rock fragments.
46.17	46.74	DOLERITE, blackish-grey, fine to medium grained, broken core, very strong rock, slight calcite on joint surfaces.
46.74	47.16	BRECCIA, fragmented. 80 % dolerite, green grey fragments fin E grained , 20% serpentine matrix, green
47.16	47.66	DOLERITE, blackish-grey, fine grained, very strong rock, solid core. Brecciated vein top and middle of unit
47.66	48.76	BRECCIA, fragmented. 50 % serpentine matrix brown, 50% doler Ite fragments grey black, fine graiNed
48.76	48.91	DOLERITE, blackish-grey, fine grained, very strong rock, solid core.
48.91	49.12	BRECCIA, fragmented. 70 % serpentine matrix greenish brown 30 % dolerite fragments, blackish greyFine grained

213

FROM	TO	LITHOLOGY
49.12 -	50.00	DOLERITE, blackish-grey, fine grained, broken core. Brecciated 2 cm. vein at 49.39 m.
50.00 -	50.07	BRECCIA, fragmented. 80 % dolerite fragments ,black,very fi Ne grained,20 % serpentine matrix,Green.
50.07 -	50.11	NO SAMPLE RETURN.
50.11 -	50.41	BRECCIA, fragmented. 60 % dolerite fragments ,fine grained, Grey ,40% serpentine matrix brown Calcereous near base of unit.
50.41 -	50.66	DOLERITE, blackish-grey, solid core, very strong rock.
50.66 -	51.60	BRECCIA, fragmented. 65 % dolerite fragments,greenish grey Fine to very fine grained ,35% serpent Ine matrix brownish green ;dolerite Fragments range size from 1 mm to 4cm
51.60 -	52.53	DOLERITE, blackish-grey, fine to medium grained, solid core, very strong rock, massive.
52.53 -	54.38	BRECCIA, fragmented. 65 % dolerite fragments ,fine grained Green to grey in colour ,fragments up To 10 cm. in size ,small fragments oft En have an altered outer rim; 35% serp Entine green to brown matrix;some of The fragments may be extensively alterEd sandstones
54.38 -	54.46	NO SAMPLE RETURN.
54.46 -	55.71	BRECCIA, fragmented. 50 % dolerite fragments ,fine grained Green grey ,50 % serpentine matrixGreen brown
55.71 -	56.14	DOLERITE, blackish-grey, fine grained, very strong rock, solid core.
56.14 -	57.24	BRECCIA. 75 % dolerite fragments grey to green Fine to very fine grained,fragments up To 10 cm. in size small fragments show Alteration rims ;25 % serpentine matri X greenish brown ,some of the fragment S may be extensivly altered sandstones
57.24 -	57.46	NO SAMPLE RETURN. Abandoned,poor drilling
	57.46	********** TOTAL DEPTH **********

768132

214

11 Jun 82

HOLE NUMBER : CA 108

DATA SOURCE : Marathon Pet. Aust, Ltd

LOGGER : W. J. Thornley

Date commenced : 11 Mar 82

Date completed : 18 Mar 82

LOCATION:

NORTHING : 51800.33

EASTING : 4890.48

ELEVATION :

DRILLING:

CONTRACTOR : Stackpoole Drilling

DRILL TYPE : Rotary

HOLE SIZE : 153

CORE SIZE :

TOTAL DEPTH : 39.43m

GEOPHYSICAL:

CONTRACTOR : BPB Instruments

PROBE DEPTH : 19.00m

LOGS RUN : Natural Gamma
Long Spaced Density
Caliper
Resistivity
Bed Resolution Density

215

FROM	TO	LITHOLOGY
		********** CHIP DESCRIPTION **********
BLADES		
0.00 -	1.00	SANDSTONE, light yellowish-green, fine grained, argillaceous matrix, soft, slightly weathered.
1.00 -	2.00	SANDSTONE, fine grained, argillaceous matrix, very soft, slightly weathered. 1 to 2 cm coal band at 1.5 m. moderateLy weathered
		********** BASE OF COAL WEATHERING **********
2.00 -	3.00	SANDSTONE, light yellowish-green, fine grained, argillaceous matrix, very soft, slightly weathered.
3.00 -	3.60	MUDSTONE, medium to dark grey, very stiff, slightly weathered.
		********** CORE & GEOPHYSICAL LOGS DESCRIPTION ********
DIAMOND CORING		
3.60 -	5.49	MUDSTONE, medium to dark grey, silty, weak rock, slightly weathered, fragmented.
5.49 -	5.92	NO SAMPLE RETURN. Sandstone washed away, very soft
5.92 -	6.32	SANDSTONE, light green, fine grained, poorly sorted sub-angular feldspathic (predom. feldspar fragments), very weak rock, slightly weathered, occasional yellow iron oxide staining. 55 % quartz, 30%, feldspar, 15% lithics
6.32 -	6.36	SANDSTONE, light green, fine grained, poorly sorted sub-angular feldspathic (predom. feldspar fragments), fragmented, slightly weathered, very weak rock. 55 % quartz, 30%, feldspar, 15% lithics
6.36 -	6.38	MUDSTONE, medium to dark grey, weak rock, slightly weathered, very broken core.
6.38 -	7.06	SANDSTONE, light green, fine to medium grained, quartz feldspathic moderately sorted sub-angular fining upwards, fragmented, slightly weathered, very weak rock. 85 % quartz , 15% feldspar, 5% lithics
7.06 -	9.43	NO SAMPLE RETURN.
9.43 -	9.80	SANDSTONE, light green, very weak rock, slightly weathered, very broken core, abrupt basal contact, faults with moderately wide spacing, occasional yellow iron oxide staining.

216

FROM	TO	LITHOLOGY
9.80	9.88	CARBONACEOUS MUDSTONE, dark greyish-black, thin coal bands near top of unit, firm, slightly weathered, solid core, transitional basal contact.
9.88	9.98	MUDSTONE, light to dark grey, slightly carbonaceous near top of unit siliceous mudstone pebbles near middle of unit, stiff, slightly weathered, solid core, abrupt basal contact.
9.98	10.24	SANDSTONE, green, very fine grained, argillaceous matrix well sorted sub-rounded quartzose (>90% quartz), solid core, slightly weathered, very weak rock, abrupt basal contact.
10.24	10.45	SANDSTONE, light to medium greenish-grey, medium grained, poorly sorted sub-angular quartz feldspathic, very weak rock, slightly weathered, solid core. 85 % quartz , 10 % feldspar 5% lithics
10.45	12.43	Sandstone washed away
		********** CHIP DESCRIPTION **********
ROLLER BIT		
12.43	14.43	SANDSTONE, green, fine grained, quartzose (>90% quartz) poorly sorted sub-rounded, loose, slightly weathered. 90 % quartz , 5% feldspar, 5% lithics
14.43	15.43	SANDSTONE, light blackish-green, fine to medium grained, litho-feldspathic (<80% qtz, rf>felds) poorly sorted sub-rounded, loose, slightly weathered, occasional yellow iron oxide staining. 75 % quartz ,is lithics (mixed provena Nce),10 % feldspars ,lithic content de Creasing upwards
		********** BASE OF WEATHERING **********
15.43	16.00	90% MUDSTONE, grey, carbonaceous in part shaly in part, very weak rock. 10% COAL, fragments.
		********** CORE & GEOPHYSICAL LOGS DESCRIPTION ********
DIAMOND CORING		
16.00	16.08	MUDSTONE, dark grey, weak rock, solid core, abrupt basal contact, faults.
16.08	16.15	SILTSTONE, yellowish-grey, lenses, very weak rock, solid core, erosional basal contact. Interformational slump

217

FROM	TO	LITHOLOGY
16.15	16.32	SILTSTONE, yellowish-grey, carbonaceous laminae near top of unit and near base of unit, erosional basal contact. Brecciated slump material set in a ver Y fine grained sandstone matrix.
16.32	16.60	MUDSTONE, dark grey, silty near middle of unit, weak rock, solid core, transitional basal contact. Thin coal band at 16.42 meteres
16.60	16.70	MUDSTONE, medium to dark grey, fragmented.
16.70	16.82	MUDSTONE, grey, silty laminae near top of unit and near base of unit, weak rock, solid core, abrupt basal contact.
16.82	16.84	SANDSTONE, light to medium grey, very fine grained, silty, solid core, weak rock. Fine dyklets intruding overlying unit
16.84	17.08	MUDSTONE, medium to dark grey, silty laminae throughout interval, weak rock, solid core. Faulted basal contact at 45 degrees
17.08	17.20	SILTSTONE, grey, numerous carbonaceous laminae, very weak rock, solid core, abrupt basal contact. Numerous compaction faults in random Directions showing throws of up to 1cm , spacings 1 to 3 cm.
17.20	17.23	MUDSTONE, dark grey, silty laminae throughout interval, very weak rock, solid core, abrupt basal contact. Laminations are planar cross beds at I5 degrees to the bedding surfaces.
17.23	17.67	SILTSTONE, grey, some laminae, very broken core, weak rock, transitional basal contact.
17.67	17.78	MUDSTONE, dark grey, very weak rock, broken core, transitional basal contact.
17.78	18.30	MUDSTONE, medium to dark grey, silty laminae near base of unit, weak rock, broken core.
18.30	18.43	NO SAMPLE RETURN.
18.43	18.48	MUDSTONE, dark grey, very weak rock, broken core, with disturbed bedding. Vertically dipping mudstone fragment Possibly slump material

218

FROM	TO	LITHOLOGY
18.48	18.59	MUDSTONE, dark grey, laminae throughout interval, weak rock, broken core, abrupt basal contact.
18.59	18.70	MUDSTONE, dark grey, very weak rock, broken core, with disturbed bedding, abrupt basal contact. Brecciated
18.70	18.92	MUDSTONE, moderately weak rock, fragmented, abrupt basal contact.
18.92	18.99	SANDSTONE, very fine grained, silty carbonaceous laminae, solid core, moderately weak rock, abrupt basal contact.
18.99	19.21	70% MUDSTONE, light yellow, matrix, very stiff, with disturbed bedding, abrupt basal contact, intermixed with: 30% SILTSTONE, yellowish-brown, hard fragments, moderately weak rock. Mudstone /siltstone breccia
19.21	19.27	CLAYSTONE, light greenish-white, carbonaceous laminae near middle of unit bentonitic, firm, solid core, abrupt basal contact.
19.27	19.28	CARBONACEOUS MUDSTONE, black, thin coal laminae throughout interval, solid core, firm.
19.28	19.39	MUDSTONE, grey, very weak rock, solid core, abrupt basal contact, slight yellow iron oxide staining.
19.39	19.42	CARBONACEOUS MUDSTONE, black, coal laminae, solid core, stiff, abrupt basal contact.
19.42	19.45	CARBONACEOUS SHALE, dark brownish-black, moderately weak rock, solid core, abrupt basal contact.
19.45	19.48	CARBONACEOUS MUDSTONE, black, coal laminae, solid core, firm, abrupt basal contact.
19.48	19.53	CLAYSTONE, light green, firm, solid core, abrupt basal contact, occasional yellow iron oxide staining.
19.53	19.57	CLAYSTONE, light whitish-grey, slightly carbonaceous in part, firm, solid core, abrupt basal contact.
19.57	19.71	MUDSTONE, light grey, very stiff, broken core.

219

FROM	TO	LITHOLOGY
19.71	20.21	NO SAMPLE RETURN.
20.21	20.82	DOLERITE, medium to dark grey, very fine grained, very broken core, very strong rock.
20.82	21.27	DOLERITE, medium to dark blackish-grey, fine grained, very strong rock, solid core.
21.27	21.43	NO SAMPLE RETURN.
21.43	22.53	DOLERITE, dark blackish-grey, very fine grained, broken core, very strong rock.
22.53	22.62	DOLERITE, dark blackish-grey, very fine grained, very broken core, very strong rock.
22.62	23.00	DOLERITE, dark greenish-grey, very fine grained, very broken core, very strong rock. Calcite on joint surfaces, joint spacinG 3 to 6 cm.
23.00	23.84	DOLERITE, dark grey, fine grained, very strong rock, broken core, joints with moderately wide spacing with tight, planar, smooth discontin's.
23.84	23.91	NO SAMPLE RETURN.
23.91	24.11	DOLERITE, dark greenish-grey, fine grained, broken core, very strong rock, joints with close spacing with tight, planar, smooth discontin's, common calcite on joint surfaces.
24.11	24.21	DOLERITE, dark greenish-grey, fine grained, very broken core, very strong rock, joints with close spacing with open, non-planar, discontinuities, abundant calcite on joint surfaces.
24.21	24.36	DOLERITE, dark greenish-grey, fine grained, very strong rock, broken core.
24.36	26.09	DOLERITE, dark greenish-grey, fine grained, very broken core, very strong rock, joints with close spacing, occasional calcite on joint surfaces.
26.09	26.39	DOLERITE, medium to dark greenish-grey, fine grained, very strong rock, fragmented, slight calcite on joint surfaces. Brecciated in parts, some green serpentIne present

220

FROM	TO	LITHOLOGY
26.39	26.72	DOLERITE, medium to dark greenish-grey, fine grained, broken core, very strong rock, joints with close spacing, occasional calcite on joint surfaces.
26.72	27.12	DOLERITE, medium to dark greenish-grey, fine grained, very broken core, very strong rock.
27.12	27.33	DOLERITE, medium to dark greenish-grey, fine grained, broken core, very strong rock.
27.33	27.43	NO SAMPLE RETURN.
27.43	27.70	DOLERITE, medium to dark greenish-grey, fine grained, fragmented, very strong rock.
27.70	28.07	NO SAMPLE RETURN.
28.07	28.35	DOLERITE, medium to dark greenish-grey, fine grained, very strong rock, fragmented.
28.35	28.38	DOLERITE, medium to dark grey, very strong rock, fragmented, abrupt basal contact.
28.38	29.25	BRECCIA, fragmented. 60% serpentine ,green , 40% dolerite Fragments ,fine grained
29.25	29.32	BRECCIA, fragmented. Serpentine,light brown,some 6cm fragm Ents of dolerite
29.32	29.54	DOLERITE, dark greenish-grey, fine grained, very strong rock, fragmented.
29.54	29.68	NO SAMPLE RETURN.
29.68	31.08	DOLERITE, medium to dark greenish-grey, fine grained, very strong rock, solid core, abrupt basal contact. Brecciated,with a calcareous matrix
31.08	31.41	DOLERITE, dark blackish-grey, fine to medium grained, very strong rock, solid core, joints with moderately wide spacing, occasional calcite on joint surfaces.
31.41	32.29	BRECCIA, broken core. 60% serpentine matrix,brown,soft,inte Rmixed with,40% dolerite fragments,up To 6 cm. in size,fine grained ,greenisH grey

221

FROM	TO	LITHOLOGY
32.29 -	32.42	DOLERITE, dark blackish-grey, fine to medium grained, very strong rock, solid core, abrupt basal contact.
32.42 -	33.21	DOLERITE, medium to dark greenish-grey, fine grained, very strong rock, solid core. Brecciated, calcareous matrix
33.21 -	33.46	NO SAMPLE RETURN.
33.46 -	33.97	DOLERITE, medium to dark greenish-grey, fine to medium grained, calcareous bands near top of unit, very strong rock, solid core.
33.97 -	35.21	DOLERITE, medium to dark greenish-grey, fine grained, solid core, very strong rock. Brecciated, fragments up to 10 cm, brown Serpentine and calcite matrix
35.21 -	35.27	BRECCIA, solid core. 75 % brown serpentine matrix, with 25 % dolerite fragments , fine grained
35.27 -	39.43	DOLERITE, medium to dark greenish-grey, fine to medium grained, very strong rock, solid core. Brecciated in parts, brown serpentine And calcite occuring as matrix and banDs Abandoned, poor drilling
	39.43	********** TOTAL DEPTH **********

222

11 Jun 82

HOLE NUMBER : CA 109

DATA SOURCE : Marathon Pet. Aust, Ltd

LOGGER : W.J. Thornley

Date commenced : 19 Mar 82

Date completed : 09 Apr 82

LOCATION:

NORTHING : 51824.75

EASTING : 4905.30

ELEVATION :

DRILLING:

CONTRACTOR : Stackpoole Drilling

DRILL TYPE : Rotary-percussion

HOLE SIZE : 152

CORE SIZE :

TOTAL DEPTH : 300.36m

GEOPHYSICAL:

CONTRACTOR : BPB Instruments

PROBE DEPTH : 210.00m

LOGS RUN : Natural Gamma
Long Spaced Density
Caliper
Resistivity
Bed Resolution Density

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223

FROM	TO	LITHOLOGY
		********** CHIP DESCRIPTION **********
HAMMER		
0.00 -	1.00	SOIL, medium to dark blackish-brown, arenaceous, very soft.
		********** BASE OF ALLUVIUM **********
1.00 -	2.00	SANDSTONE, light greenish-grey, fine grained, argillaceous matrix, soft, moderately weathered.
2.00 -	3.00	SANDSTONE, light yellowish-green, fine to medium grained, argillaceous matrix, firm, moderately weathered, common yellow iron oxide staining.
		********** BASE OF COAL WEATHERING **********
3.00 -	4.00	SANDSTONE, light grey, fine to medium grained, quartz lithic moderately sorted sub-angular, friable, slightly weathered.
4.00 -	5.00	SANDSTONE, light grey, fine to medium grained, quartz lithic moderately sorted sub-angular, loose, slightly weathered.
5.00 -	6.00	SANDSTONE, light grey, fine to medium grained, quartz feldspathic, very stiff, slightly weathered, occasional yellow iron oxide staining.
6.00 -	7.00	80% SANDSTONE, light grey, fine to medium grained, quartz feldspathic, very weak rock, slightly weathered, interbedded with: 20% MUDSTONE, dark grey, slightly siliceous, moderately weak rock, unweathered.
		********** BASE OF WEATHERING **********
7.00 -	8.00	SANDSTONE, light grey, fine to medium grained, moderately sorted sub-angular, weak rock, unweathered.
8.00 -	9.00	80% SANDSTONE, light grey, fine to medium grained, quartz feldspathic moderately sorted sub-angular, weak rock, unweathered, interbedded with: 10% SILTSTONE, medium to dark grey, bands, weak rock, interbedded with: 10% CARBONACEOUS SHALE, dark brownish-black, weak rock.
9.00 -	10.00	95% SANDSTONE, light grey, fine to medium grained, quartz feldspathic poorly sorted sub-angular, weak rock, interbedded with: 5% CARBONACEOUS SHALE, dark brownish-black, bands, very weak rock.

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224

FROM	TO	LITHOLOGY
10.00	11.63	NO SAMPLE RETURN.
		********** CORE & GEOPHYSICAL LOGS DESCRIPTION ********
		DIAMOND CORING
11.63	12.04	SANDSTONE, grey, very fine grained, hard, moderately strong rock, fragmented. Recrystallised
12.04	12.09	DOLERITE, dark greenish-grey, fine grained, very strong rock, fragmented.
12.09	12.43	NO SAMPLE RETURN.
12.43	12.46	SANDSTONE, white, coarse grained, quartzose (>90% quartz), moderately strong rock, fragmented. Recrystallised
12.46	12.48	SANDSTONE, light greyish-white, very fine grained, moderately strong rock, fragmented. Recrystallised
12.48	12.52	SANDSTONE, light greenish-grey, fine grained, sub-angular moderately sorted quartz lithic, broken core, fragmented.
12.52	12.57	MUDSTONE, dark blackish-grey, moderately strong rock, fragmented.
12.57	12.72	SANDSTONE, light greenish-grey, fine grained, weak rock, solid core.
12.72	12.76	MUDSTONE, dark grey, very broken core, abrupt basal contact.
12.76	12.85	SANDSTONE, light whitish-green, fine to medium grained, quartz feldspathic poorly sorted sub-angular thin coal bands, solid core, weak rock, with mud pellers, abrupt basal contact. Large mudstone clast 6 cm. size
12.85	13.11	MUDSTONE, dark grey, slightly carbonaceous in part, very broken core, erosional basal contact.
13.11	20.84	SANDSTONE, light grey, fine to medium grained, sub-rounded moderately sorted lithic (predominately rock fragments) near top of unit feldspatho-lithic (<80% qtz, felds>rf.) near base of unit coal laminae and wisps near base of unit, solid core, weak rock, massive, abrupt basal contact.

225

FROM	TO	LITHOLOGY
20.84	20.86	COAL, 10 - 40% BRIGHT, solid core, abrupt basal contact.
20.86	21.28	SANDSTONE, light grey, fine grained, coal lenses near middle of unit, broken core, with mud pellers. Coal lense has a woody textur
21.28	21.53	NO SAMPLE RETURN.
21.53	27.43	SANDSTONE, light grey, fine grained, moderately sorted sub-angular quartzose (>90% quartz) near top of unit quartz feldspathic near base of unit, broken core, weak rock, massive, transitional basal contact.
27.43	27.53	NO SAMPLE RETURN.
27.53	29.40	SANDSTONE, light grey, fine grained, quartzose (>90% quartz) moderately sorted sub-angular, solid core.
29.40	29.61	SANDSTONE, light grey, fine grained, sub-angular well sorted quartz feldspathic numerous coal lenses and wisps, solid core, weak rock, massive, transitional basal contact.
29.61	30.57	SANDSTONE, light grey, fine grained, some coal wisps feldspathic (predom. feldspar fragments) sub-rounded moderately sorted, solid core, weak rock, massive, transitional basal contact.
30.57	31.70	SANDSTONE, light grey, fine grained, rare coal wisps feldspathic (predom. feldspar fragments) sub-angular poorly sorted, solid core, weak rock, massive, with mud pellers, abrupt basal contact.
31.70	31.71	COAL, HEAVY (INFERIOR COAL), lenses, solid core, abrupt basal contact.
31.71	34.34	SANDSTONE, light greenish-grey, fine grained, slightly chloritic in part some mudstone laminae feldspathic (predom. feldspar fragments) sub-angular moderately sorted, weak rock, solid core, with mud pellers, erosional basal contact.
34.34	34.35	MUDSTONE, medium to dark grey, silty, broken core, erosional basal contact.
34.35	41.11	SANDSTONE, light grey, fine grained, quartz feldspathic near top of unit feldspathic (predom. feldspar fragments) near base of unit moderately sorted sub-angular, solid core, weak rock, massive, transitional basal contact, slight bedding surfaces.

FROM	TO	LITHOLOGY
41.11	41.61	SANDSTONE, light grey, medium grained, numerous coal traces and thin bands, broken core, with mud pellers, transitional basal contact.
41.61	44.05	SANDSTONE, light grey, fine to medium grained, feldspathic (predom. feldspar fragments) moderately sorted sub-rounded some carbonaceous traces, solid core, massive, transitional basal contact.
44.05	44.45	SANDSTONE, light greenish-grey, fine to medium grained, slightly chloritic, broken core, with disturbed bedding, abrupt basal contact, faults with close spacing
44.45	45.53	SANDSTONE, light grey, fine to medium grained, moderately sorted sub-angular, solid core, weak rock, transitional basal contact, faults. Quartz 70 %, feldspar 25%, lithics 5%
45.53	46.31	SANDSTONE, light to medium blackish-grey, carbonaceous wisps and coal lenses throughout interval quartzose (>90% quartz) poorly sorted sub-angular, solid core, very weak rock, with mud pellers, with disturbed bedding, transitional basal contact, faults. Probable slump material ,faulted and Slightly brecciated
46.31	47.29	SANDSTONE, light grey, fine to medium grained, fining upwards rare carbonaceous traces moderately sorted sub-rounded quartzose (>90% quartz), solid core, very weak rock, transitional basal contact. 93 % quartz ,5 % feldspar ,2% lithics
47.29	47.40	SANDSTONE, light grey, very fine grained, fining upwards coal lenses and laminae throughout interval quartzose (>90% quartz), solid core, very weak rock, transitional basal contact.
47.40	47.56	SANDSTONE, light whitish-grey, medium grained, fining upwards rare coal traces moderately sorted sub-angular, solid core, weak rock, abrupt basal contact. 88 % quartz, 10 % feldspar 2% lithics
47.56	48.53	SANDSTONE, light grey, fine grained, sub-angular moderately sorted quartzose (>90% quartz), solid core, massive, transitional basal contact. 90 % quartz, 9 % feldspar 1% lithics

FROM	TO	LITHOLOGY
48.53 -	51.53	SANDSTONE, light grey, fine to medium grained, fining upwards moderately sorted sub-angular quartzose (>90% quartz) near top of unit quartz feldspathic near base of unit slightly chloritic in part, solid core, weak rock, massive.
51.53 -	54.50	SANDSTONE, light grey, medium grained, some carbonaceous traces near top of unit quartzose (>90% quartz) sub-rounded moderately sorted, solid core, massive, transitional basal contact. Quartz 90 %, feldspars 5%, lithics 5%
54.50 -	54.53	NO SAMPLE RETURN.
54.53 -	57.11	SANDSTONE, light greenish-grey, fine to medium grained, slightly chloritic in part quartzose (>90% quartz) sub-angular well sorted, solid core, weak rock, abrupt basal contact. 93 % quartz, 5 % feldspars , 2% lithics
57.11 -	57.23	CARBONACEOUS SHALE, medium to dark blackish-brown, coal partings, weak rock, very broken core, deformed basal contact.
57.23 -	61.52	SANDSTONE, light greenish-grey, fine to medium grained, slightly chloritic quartz feldspathic moderately sorted sub-angular, solid core, moderately weak rock, abrupt basal contact. 83 % quartz , 15% feldspar , 2% lithics
61.52 -	61.53	50% SILTSTONE, brown, laminae, solid core, interbedded with: 50% SANDSTONE, light grey, very fine grained, laminae, transitional basal contact.
61.53 -	61.95	SANDSTONE, light greenish-grey, fine grained, chloritic near base of unit quartzose (>90% quartz) sub-rounded moderately sorted, solid core, moderately weak rock, with mud pellers, transitional basal contact. Quartz 95 %, feldspar 4% , lithics 1%
61.95 -	62.26	SANDSTONE, whitish-green, sub-rounded moderately sorted chloritic quartzose (>90% quartz), moderately weak rock, very broken core, with disturbed bedding, transitional basal contact. Quartz 90 % , feldspar 10%, slumped
62.26 -	62.54	SANDSTONE, light greenish-grey, fine to medium grained, fining upwards slightly chloritic sub-angular poorly sorted quartz feldspathic, solid core, moderately weak rock, with mud pellers, deformed basal contact. 15 % feldspar, 1 % lithic, 84 % quartz

228

FROM	TO	LITHOLOGY
62.54 -	63.14	80% MUDSTONE, greenish-grey, chloritic, weak rock, with disturbed bedding, deformed basal contact, faults with slickensides. 20% SANDSTONE, light greenish-grey, fine grained, quartz feldspathic sub-angular poorly sorted, solid core. Sandstone occurs as a completely detac Hed flame structure.
63.14 -	63.39	SANDSTONE, light to medium greenish-grey, fine grained, numerous mudstone pellets quartz feldspathic sub-angular poorly sorted, very broken core, erosional basal contact.
63.39 -	63.45	MUDSTONE, greenish-grey, slightly chloritic, solid core, deformed basal contact.
63.45 -	63.53	SANDSTONE, light greenish-grey, fine grained, numerous mudstone pellets, very broken core, erosional basal contact.
63.53 -	63.58	MUDSTONE, medium to dark grey, very weak rock, deformed basal contact.
63.58 -	63.72	SANDSTONE, light greenish-grey, fine grained, numerous mudstone pellets slightly chloritic quartz feldspathic, solid core, weak rock, deformed basal contact.
63.72 -	63.87	SILTSTONE, arenaceous laminae near top of unit, solid core, abrupt basal contact.
63.87 -	66.53	SANDSTONE, light grey, fine grained, sub-rounded moderately sorted quartzose (>90% quartz) some coal traces and lenses near top of unit, solid core, massive, transitional basal contact. 90 % quartz, 4% feldspar, 4 % lithic
66.53 -	70.57	SANDSTONE, light greenish-grey, fine to medium grained, numerous coal laminae and lenses near middle of unit slightly chloritic in part mudstone near base of unit quartz feldspathic near top of unit feldspathic (predom. feldspar fragments) near middle of unit quartzose (>90% quartz) near base of unit, solid core, moderately weak rock, massive, transitional basal contact.
70.57 -	70.61	80% SANDSTONE, green, very fine grained, chloritic, solid core, abrupt basal contact, intermixed with: 20% CARBONACEOUS MUDSTONE, dark brownish-black, fragments. Slump breccia

FROM	TO	LITHOLOGY
70.61	70.63	CARBONACEOUS MUDSTONE, dark brownish-black, fragmented.
70.63	70.71	SANDSTONE, blackish-green, very fine grained, chloritic mudstone matrix, very broken core, transitional basal contact.
70.71	71.01	SANDSTONE, light greenish-grey, fine to medium grained, fining upwards slightly chloritic quartz feldspathic sub-angular well sorted, solid core, weak rock, with mud pellers, abrupt basal contact. 84% quartz , 12 % feldspar, 4 % lithic
71.01	71.16	50% SANDSTONE, grey, very fine grained, numerous carbonaceous laminae, solid core, abrupt basal contact, intermixed with: 50% SILTSTONE, phases carbonaceous laminae, weak rock.
71.16	71.62	SANDSTONE, light to medium grey, fine grained, numerous coal and shaly laminae and thin lenses, solid core, weak rock, abrupt basal contact.
71.62	72.53	SANDSTONE, light greenish-grey, fine grained, quartzose (>90% quartz) slightly chloritic sub-angular well sorted, solid core, weak rock, massive, abrupt basal contact. 90 % quartz , 6 % feldspar ,4 % lithic
72.53	72.60	MUDSTONE, medium to dark grey, very stiff, very broken core, abrupt basal contact.
72.60	72.88	CARBONACEOUS MUDSTONE, black, hard, moderately weak rock, very broken core, abrupt basal contact.
72.88	73.94	SANDSTONE, light grey, fine grained, mudstone pellets bands near base of unit quartz feldspathic sub-angular, solid core, moderately weak rock, abrupt basal contact. Quartz 78 % , feldspar 16% , lithics 6 %
73.94	74.00	CARBONACEOUS SHALE, medium to dark blackish-brown, coal partings, solid core, abrupt basal contact.
74.00	74.04	SANDSTONE, light grey, fine grained, quartz feldspathic, solid core, abrupt basal contact.
74.04	74.07	COAL, HEAVY (INFERIOR COAL), black, lenses, solid core, deformed basal contact.
74.07	74.28	SANDSTONE, light grey, fine grained, numerous coal and shaly laminae and thin bands near middle of unit feldspathic (predom. feldspar fragments) sub-angular moderately sorted, solid core, weak rock, abrupt basal contact.

FROM	TO	LITHOLOGY
74.28 -	74.32	CARBONACEOUS SHALE, medium to dark blackish-brown, solid core, very weak rock, abrupt basal contact.
74.32 -	74.52	SANDSTONE, light grey, fine grained, thick shaly lenses near middle of unit some shaly traces throughout interval feldspathic (predom. feldspar fragments), solid core, weak rock, abrupt basal contact.
74.52 -	74.65	CARBONACEOUS SHALE, medium to dark blackish-brown, slightly coal near middle of unit, solid core, abrupt basal contact.
74.65 -	75.53	SANDSTONE, light grey, fine grained, quartzose (>90% quartz) sub-rounded well sorted, moderately weak rock, solid core, with mud pellers, transitional basal contact. 94 % quartz , 3 % feldspar ,3 % lithic
75.53 -	78.53	SANDSTONE, light whitish-grey, fine grained, quartzose (>90% quartz) well sorted sub-rounded, solid core, moderately weak rock, transitional basal contact. 97 % quartz , 2 % lithics 1 % feldspar
78.53 -	82.21	SANDSTONE, light grey, fine to medium grained, quartzose (>90% quartz) near top of unit moderately sorted sub-rounded quartz feldspathic near middle of unit and near base of unit fining upwards, solid core, moderately weak rock, massive. 80 % quartz ,14 % feldspars ,6% lithic
82.21 -	83.23	SANDSTONE, light grey, medium grained, quartz feldspathic sub-rounded moderately sorted, weak rock, solid core, massive, transitional basal contact. Quartz 75 %, feldspar 20 %, lithics 5 %
83.23 -	83.56	SANDSTONE, light grey, fine to medium grained, mudstone pellets throughout interval coal lenses and traces throughout interval moderately sorted sub-angular quartz feldspathic, moderately weak rock, solid core, transitional basal contact. Quartz 82 %, feldspar 13 %, lithics 5 %
83.56 -	84.21	SANDSTONE, light grey, fine grained, coal lenses near middle of unit silty laminae throughout interval, weak rock, solid core, abrupt basal contact.

231

FROM	TO	LITHOLOGY
84.21	84.23	CARBONACEOUS MUDSTONE, black, lenses, solid core, abrupt basal contact.
84.23	84.53	SANDSTONE, light greenish-grey, fine to medium grained, slightly chloritic near middle of unit and near base of unit carbonaceous mudstone fragments near top of unit, solid core, weak rock, transitional basal contact.
84.53	85.24	SANDSTONE, light grey, fine grained, feldspathic (predom. feldspar fragments) some mudstone bands near base of unit sub-angular moderately sorted, weak rock, broken core, abrupt basal contact. 70 % quartz ,25 % feldspar,5 % lithics
85.24	85.31	MUDSTONE, medium to dark grey, arenaceous laminae near middle of unit, solid core, abrupt basal contact.
85.31	85.81	SANDSTONE, light grey, fine to medium grained, mudstone laminae near middle of unit shaly lenses near base of unit, solid core, weak rock, abrupt basal contact.
85.81	86.14	SILTSTONE, medium to dark grey, arenaceous laminae near middle of unit, solid core, abrupt basal contact.
86.14	87.98	SANDSTONE, light whitish-grey, fine to medium grained, quartz feldspathic sub-angular moderately sorted fining upwards, solid core, abrupt basal contact. 82 % quartz,10 % feldspar ,8 % lithics
87.98	89.63	SANDSTONE, light whitish-grey, fine to medium grained, fining upwards some slightly carbonaceous laminae angular moderately sorted, solid core, transitional basal contact.
89.63	92.09	SANDSTONE, light grey, medium grained, mudstone near base of unit some carbonaceous mudstone lenses, solid core, weak rock, transitional basal contact.
92.09	94.01	SANDSTONE, light grey, fine to medium grained, fining upwards rare carbonaceous laminae, weak rock, solid core, massive, abrupt basal contact.
94.01	94.02	COAL, >90% BRIGHT, thin bands, solid core, abrupt basal contact.

232

FROM	TO	LITHOLOGY
94.02	94.61	SANDSTONE, light grey, fine to medium grained, mudstone fragments near base of unit, very weak rock, weak rock, massive, transitional basal contact.
94.61	94.95	SANDSTONE, light grey, fine to medium grained, numerous coal thin bands near top of unit mudstone fragments near base of unit, weak rock, solid core, transitional basal contact.
94.95	97.80	SANDSTONE, light grey, medium grained, quartz lithic moderately sorted sub-angular, solid core, weak rock, massive, abrupt basal contact.
97.80	97.90	CARBONACEOUS MUDSTONE, dark brownish-black, very weak rock, solid core, deformed basal contact.
97.90	97.99	SANDSTONE, light grey, fine to medium grained, lenses carbonaceous mudstone fragments near top of unit, weak rock, solid core, abrupt basal contact.
97.99	98.13	CARBONACEOUS MUDSTONE, dark brownish-black, very weak rock, solid core, abrupt basal contact.
98.13	98.17	SANDSTONE, light grey, fine to medium grained, carbonaceous mudstone lenses near middle of unit quartz lithic, solid core, weak rock, abrupt basal contact.
98.17	98.18	CLAYSTONE, blackish-brown, carbonaceous, very stiff, solid core, abrupt basal contact.
98.18	98.19	SANDSTONE, light grey, fine grained, carbonaceous mudstone fragments near middle of unit, weak rock, solid core, massive, deformed basal contact.
98.19	98.20	CARBONACEOUS MUDSTONE, black, very weak rock, solid core, deformed basal contact.
98.20	98.32	SANDSTONE, light grey, fine grained, numerous mudstone fragments and coal traces, weak rock, solid core, transitional basal contact.
98.32	100.12	SANDSTONE, light grey, fine to medium grained, rare carbonaceous traces, solid core, massive, abrupt basal contact.
100.12	100.45	SANDSTONE, light to medium grey, very fine grained, carbonaceous laminae throughout interval, solid core, abrupt basal contact, slight yellow iron oxide on joint surfaces.

FROM - TO	LITHOLOGY
100.45 - 102.17	SANDSTONE, light grey, medium grained, solid core, massive, transitional basal contact.
102.17 - 105.58	SANDSTONE, light greenish-grey, medium to coarse grained, carbonaceous mudstone fragments near base of unit quartz lithic, solid core, weak rock, massive, abrupt basal contact.
105.58 - 106.98	SANDSTONE, light to medium grey, fine to medium grained, fining upwards carbonaceous laminae near middle of unit and near base of unit, solid core, weak rock, transitional basal contact.
106.98 - 107.70	SANDSTONE, light greenish-grey, fine to medium grained, numerous carbonaceous mudstone fragments and laminae throughout interval, broken core, weak rock, abrupt basal contact.
107.70 - 107.71	CARBONACEOUS MUDSTONE, dark brownish-black, very weak rock, broken core, abrupt basal contact.
107.71 - 107.78	SANDSTONE, light reddish-grey, fine grained, feldspathic (predom. feldspar fragments) mudstone bands and traces throughout interval, broken core, abrupt basal contact. Some red iron mineral occuring as st Aining,which transgresses bedding plAnes
107.78 - 108.14	CARBONACEOUS MUDSTONE, black, coal in part, very weak rock, solid core, abrupt basal contact.
108.14 - 108.20	SANDSTONE, grey, very fine grained, some calcareous traces, weak rock, solid core.
108.20 - 108.63	MUDSTONE, medium to dark grey, silty in part arenaceous near base of unit, very weak rock, solid core, transitional basal contact.
108.63 - 108.99	SILTSTONE, grey, numerous arenaceous laminae and phases, very weak rock, solid core, abrupt basal contact.
108.99 - 109.00	COAL, HEAVY (INFERIOR COAL), lenses, solid core, abrupt basal contact.
109.00 - 109.31	SANDSTONE, light to medium grey, fine grained, some mudstone pellets and coal traces, solid core, weak rock, abrupt basal contact.
109.31 - 109.32	COAL, <10% BRIGHT, bands, solid core, abrupt basal contact.

234

FROM	TO	LITHOLOGY
109.32	109.37	SANDSTONE, light to medium whitish-grey, fine grained, numerous carbonaceous traces throughout interval, weak rock, solid core, abrupt basal contact.
109.37	109.62	MUDSTONE, brown, very weak rock, very broken core, abrupt basal contact.
109.62	109.78	SANDSTONE, light to medium grey, fine grained, mudstone pellets throughout interval coal traces near middle of unit, solid core, weak rock, abrupt basal contact.
109.78	110.36	SANDSTONE, light greenish-grey, fine to medium grained, fining upwards, weak rock, solid core, massive, transitional basal contact, occasional calcite on joint surfaces.
110.36	110.76	SANDSTONE, light greenish-grey, medium grained, fining upwards, weak rock, solid core, massive, abrupt basal contact, occasional calcite on joint surfaces.
110.76	114.53	SANDSTONE, light greenish-grey, fine to medium grained, some silty laminae, solid core, weak rock, transitional basal contact, rare calcite on joint surfaces.
114.53	116.10	SANDSTONE, light greenish-grey, medium grained, quartzose (>90% quartz) moderately sorted angular, solid core, weak rock, massive, transitional basal contact.
116.10	117.22	SANDSTONE, light whitish-grey, fine to medium grained, quartzose (>90% quartz) moderately sorted sub-angular coal lenses near middle of unit, solid core, weak rock, massive, abrupt basal contact. Quartz 90 % , feldspar 10%
117.22	117.24	COAL, 10 - 40% BRIGHT, solid core, abrupt basal contact.
117.24	118.13	SANDSTONE, light grey, fine to medium grained, coal bands near top of unit and near base of unit, solid core, weak rock, massive, deformed basal contact.
118.13	118.18	COAL, HEAVY (INFERIOR COAL), lenses, solid core, abrupt basal contact.
118.18	118.21	SANDSTONE, light grey, fine grained, feldspathic (predom. feldspar fragments), solid core, weak rock, abrupt basal contact. Some red iron staining

FROM	TO	LITHOLOGY
118.21	118.26	CARBONACEOUS MUDSTONE, black, very weak rock, solid core, abrupt basal contact.
118.26	118.33	80% MUDSTONE, medium to dark brownish-grey, fragments rare, solid core, transitional basal contact, intermixed with: 20% SANDSTONE, light to medium grey, very fine grained, matrix.
118.33	121.44	SANDSTONE, light grey, fine to medium grained, fining upwards some silty laminae throughout interval quartz feldspathic sub-angular moderately sorted, solid core, weak rock, abrupt basal contact.
121.44	122.69	50% SILTSTONE, medium to dark blackish-grey, numerous calcareous laminae, solid core, transitional basal contact, interbedded with: 50% SANDSTONE, light grey, very fine grained, bands and laminae.
122.69	123.46	SILTSTONE, medium to dark grey, numerous thin arenaceous laminae throughout interval, solid core, weak rock, transitional basal contact.
123.46	123.53	NO SAMPLE RETURN.
123.53	124.66	70% SANDSTONE, light whitish-grey, very fine grained, solid core, transitional basal contact, interbedded with: 30% SILTSTONE, grey, laminae and phases numerous carbonaceous laminae, weak rock.
124.66	125.41	SANDSTONE, light to medium grey, fine grained, numerous silty and carbonaceous laminae throughout interval, solid core, weak rock, transitional basal contact.
125.41	126.48	SANDSTONE, light grey, fine to medium grained, some silty laminae near top of unit fining upwards, solid core, weak rock, massive.
126.48	126.53	NO SAMPLE RETURN.
126.53	129.52	SANDSTONE, light grey, fine to medium grained, sub-rounded moderately sorted quartzose (>90% quartz), moderately weak rock, solid core, massive.
129.52	129.53	NO SAMPLE RETURN.

FROM	TO	LITHOLOGY
129.53	130.74	SANDSTONE, grey, fine to medium grained, moderately sorted sub-angular quartz lithic, solid core, massive, transitional basal contact. 82 % quartz ,5 % feldspar,12% lithics
130.74	130.81	SANDSTONE, light greenish-grey, fine to medium grained, moderately sorted sub-rounded quartz lithic, fragmented, massive, transitional basal contact. 82 % quartz ,5 % feldspar,12% lithics
130.81	131.01	SANDSTONE, light greenish-grey, medium grained, moderately sorted sub-rounded quartz lithic, broken core, weak rock, massive, transitional basal contact. Quartz 89 % ,feldspar 7%,lithics 4%
131.01	131.08	SANDSTONE, light reddish-grey, medium grained, feldspathic (predom. feldspar fragments) sub-rounded well sorted, solid core, weak rock, massive, transitional basal contact. 70 % quartz ,35% feldspar ,5% lithics Some red iron staining
131.08	132.82	SANDSTONE, light grey, fine to medium grained, quartz feldspathic some mudstone fragments near middle of unit mudstone lenses near base of unit, solid core, weak rock, massive, abrupt basal contact.
132.82	132.86	SILTSTONE, blackish-brown, slightly carbonaceous, weak rock, abrupt basal contact.
132.86	132.94	SANDSTONE, light greenish-grey, medium grained, quartz feldspathic sub-angular moderately sorted, weak rock, solid core, massive, abrupt basal contact.
132.94	133.02	MUDSTONE, blackish-grey, silty slightly carbonaceous, solid core, abrupt basal contact.
133.02	133.03	SANDSTONE, light reddish-green, medium grained, litho-feldspathic (<80% qtz, rf>felds) sub-rounded moderately sorted, broken core, massive, abrupt basal contact, occasional calcite on joint surfaces. Quartz 65 %,feldspar 15 %,lithics 20 % Some red iron staining
133.03	133.07	MUDSTONE, blackish-grey, slightly carbonaceous, very weak rock, broken core, abrupt basal contact.

237

FROM	TO	LITHOLOGY
133.07	133.66	SANDSTONE, light greenish-grey, medium grained, rare laminae lithic (predominately rock fragments) sub-angular moderately sorted, broken core, weak rock, abrupt basal contact. Abundent red iron staining in parts
133.66	133.69	SILTSTONE, grey, broken core.
133.69	141.63	SANDSTONE, light grey, medium grained, litho-feldspathic (<80% qtz, rf>felds) angular moderately sorted, solid core, massive, rare calcite on joint surfaces. 5 to 15 % feldspar, 15 % lithics, some Phases of red iron staining
141.63	144.72	SANDSTONE, light grey, medium to coarse grained, some mudstone pellets near base of unit sub-angular moderately sorted quartzose (>90% quartz) and quartz lithic, solid core, moderately weak rock, massive, abrupt basal contact, occasional calcite on joint surfaces. Red iron staining middle of unit Quartz 80 to 90 % , feldspar 5 to 2 % Lithics 15 to 5 %
144.72	146.50	SANDSTONE, light reddish-grey, medium grained, sub-angular moderately sorted quartz feldspathic quartzose (>90% quartz) near base of unit, weak rock, solid core, massive, transitional basal contact, joints with wide spacing, occasional calcite on joint surfaces. Quartz 80 to 92 % , feldspars 5 to 20% Lithics 5 to 2 % , commen red iron stai Ning middle unit
146.50	147.69	SANDSTONE, light grey, medium to coarse grained, some mudstone pellets bands near middle of unit and near base of unit quartz feldspathic near middle of unit quartzose (>90% quartz) near top of unit and near base of unit sub-angular moderately sorted, weak rock, solid core, abrupt basal contact. Quartz 94 % feldspars 3 % lithics 3 % Some red iron staining middle of uniT
147.69	147.92	MUDSTONE, medium to dark blackish-grey, pellets bands arenaceous matrix, weak rock, broken core, abrupt basal contact.
147.92	148.13	SANDSTONE, light reddish-green, medium grained, with some mudstone pellets litho-feldspathic (<80% qtz, rf>felds) sub-angular, weak rock, broken core, transitional basal contact. Red iron stains , 10% white feldspa R, 18 % lithics , 72 % quartz

238

FROM	TO	LITHOLOGY
148.13	164.03	SANDSTONE, light grey, medium grained, sub-angular and sub-angular moderately sorted quartzose (>90% quartz) rare quartz feldspathic, weak rock, solid core, massive, transitional basal contact. Most of unit above 90 % quartz, about 4 % lithics with white feldspar the re Maining portion.
164.03	164.34	SANDSTONE, reddish-green, medium grained, quartz lithic some quartzose (>90% quartz), weak rock, solid core, massive, abrupt basal contact. Commen red iron stains in parts
164.34	164.35	MUDSTONE, medium to dark blackish-grey, slightly carbonaceous in part lenses, very weak rock, broken core, abrupt basal contact.
164.35	165.36	SANDSTONE, light greenish-grey, medium grained, numerous thin mudstone fragments and laminae near middle of unit sub-angular moderately sorted litho-feldspathic (<80% qtz, rf>felds), weak rock, broken core, massive, abrupt basal contact. 80 % quartz , 10 % white feldsar, 10%Lithics
165.36	165.52	SANDSTONE, greenish-red, medium grained, some mudstone pellets and fragments, solid core, weak rock, massive, erosional basal contact. Commen red iron staining
165.52	165.78	65% SANDSTONE, greenish-grey, fine to medium grained, matrix, weak rock, erosional basal contact, intermixed with: 35% MUDSTONE, dark grey, fragments rare, moderately weak rock, solid core.
165.78	166.10	SANDSTONE, green, fine to medium grained, chloritic, weak rock, broken core, abrupt basal contact.
166.10	167.16	SANDSTONE, light reddish-grey, medium grained, quartz feldspathic sub-rounded moderately sorted, weak rock, solid core, massive, transitional basal contact. Feldspar 15 %, lithics 2 %, some red iroN staining
167.16	171.46	SANDSTONE, light greenish-grey, fine to medium grained, moderately sorted sub-angular quartz feldspathic, weak rock, solid core, massive, transitional basal contact. Rare red iron stains

239

FROM	TO	LITHOLOGY
171.46	171.53	NO SAMPLE RETURN.
171.53	172.05	SANDSTONE, light grey, medium grained, quartz feldspathic moderately sorted angular, weak rock, solid core, massive, deformed basal contact.
172.05	172.22	MUDSTONE, dark grey, very weak rock, broken core, deformed basal contact.
172.22	174.88	SANDSTONE, light greenish-grey, medium grained, some thin chloritic mudstone laminae and lenses near base of unit quartz feldspathic, weak rock, solid core, massive, transitional basal contact.
174.88	175.75	SANDSTONE, light reddish-grey, medium grained, some thin mudstone pellets bands near base of unit angular moderately sorted, weak rock, solid core, massive, transitional basal contact. Commen red iron staining in parts
175.75	179.06	SANDSTONE, light grey, medium grained, feldspatho-lithic (<80% qtz, felds>rf.) sub-angular well sorted mudstone fragments near middle of unit, weak rock, solid core, massive, transitional basal contact. 75 % quartz ,15 % feldspar,10%Lithics
179.06	179.50	SANDSTONE, green, fine grained, litho-feldspathic (<80% qtz, rf>felds) moderately sorted sub-angular, very weak rock, solid core, massive, common. Minor red iron staining
179.50	180.39	SANDSTONE, light greenish-grey, fine to medium grained, numerous silty laminae near middle of unit and near base of unit litho-feldspathic (<80% qtz, rf>felds) moderately sorted sub-angular, weak rock, solid core, with mud pellers, abrupt basal contact. 80 % quartz ,10 % feldspar ,10 % Ithics ,rare flakes of muscovite,colou Rless and brown.
180.39	183.92	SANDSTONE, light grey, fine to medium grained, feldspathic (predom. feldspar fragments) sub-angular moderately sorted, weak rock, solid core, massive, abrupt basal contact. 65 % quartz,25 % feldspar,10 % lithics Minor red iron staining in parts

240

FROM	TO	LITHOLOGY
183.92	183.97	CARBONACEOUS MUDSTONE, dark brownish-black, coal in part with coal fragments throughout interval, very weak rock, solid core, transitional basal contact.
183.97	184.04	COAL, <10% BRIGHT, solid core, transitional basal contact.
184.04	184.35	COAL, 60 - 90% BRIGHT, broken core, abrupt basal contact.
184.35	184.78	MUDSTONE, medium to dark grey, solid core, very weak rock, with disturbed bedding, abrupt basal contact. Probably a slump breccia
184.78	184.79	COAL, 10 - 40% BRIGHT, fragmented, abrupt basal contact.
184.79	185.13	MUDSTONE, medium to dark grey, very weak rock, solid core, with disturbed bedding, abrupt basal contact.
185.13	185.17	MUDSTONE, medium to dark blackish-grey, slightly carbonaceous, very stiff, solid core, abrupt basal contact.
185.17	185.51	MUDSTONE, medium to dark grey, slightly silty near base of unit, very stiff, solid core, transitional basal contact.
185.51	186.61	SILTSTONE, brownish-grey, arenaceous bands and laminae near middle of unit, very weak rock, solid core, abrupt basal contact.
186.61	187.30	SANDSTONE, light grey, fine grained, numerous thin mudstone laminae near middle of unit and near base of unit quartzose (>90% quartz) well sorted, weak rock, broken core, transitional basal contact.
187.30	190.84	SANDSTONE, light grey, fine to medium grained, quartzose (>90% quartz) well sorted sub-angular rare micaceous fragments, solid core, weak rock, massive, abrupt basal contact. Quartz 98 % , feldspars 1 %, lithics 1 % Rare brown mica fragments , possiblyMuscovite
190.84	196.34	SANDSTONE, light grey, medium grained, quartzose (>90% quartz) near top of unit quartz feldspathic near base of unit, weak rock, solid core, massive, transitional basal contact. Quartz 85 to 98 %, feldspar 2 to 15 %, Lithics 1 to 5 % , more mature top ofUnit

241

FROM	TO	LITHOLOGY
196.34	199.80	SANDSTONE, light greenish-grey, fine to medium grained, quartzose (>90% quartz) and quartz feldspathic phases throughout interval sub-angular moderately sorted some carbonaceous laminae near middle of unit, broken core, weak rock, transitional basal contact.
199.80	200.06	SANDSTONE, reddish-green, fine to medium grained, litho-feldspathic (<80% qtz, rf>felds) moderately sorted sub-angular, solid core, weak rock, massive, transitional basal contact. 80 % quartz, 10 % feldspar, 10 % lithics Some red iron stains
200.06	204.53	SANDSTONE, medium grained, moderately sorted sub-angular quartzose (>90% quartz) some quartz feldspathic some mudstone pellets near middle of unit, solid core, weak rock, massive, abrupt basal contact. Quartz generally above 90 % , feldspars Less than 10 %, lithics up to 5 %.
204.53	204.55	MUDSTONE, dark grey, silty, very weak rock, solid core, abrupt basal contact.
204.55	204.89	85% SANDSTONE, light greenish-grey, medium grained, sub-angular quartzose (>90% quartz) moderately sorted, weak rock, massive, erosional basal contact, intermixed with: 20% SILTSTONE, rare fragments angular lenses some slightly carbonaceous, weak rock, solid core.
204.89	208.45	SANDSTONE, light grey, medium grained, quartzose (>90% quartz) angular moderately sorted, solid core, weak rock, massive, abrupt basal contact. Quartz 93 %, lithics 5 %, feldspars 2 %
208.45	209.36	SANDSTONE, greenish-red, medium grained, quartz lithic sub-angular moderately sorted, weak rock, solid core, massive, transitional basal contact. Quartz 85 %, 15 % lithics, 5 % feldspar Commen red iron staining
209.36	211.27	SANDSTONE, light greenish-grey, medium grained, quartzose (>90% quartz) sub-angular moderately sorted, weak rock, broken core, transitional basal contact. Quartz 92 %, lithics 5 %, feldspars 3 %
211.27	215.28	SANDSTONE, light reddish-green, medium grained, quartz lithic, weak rock, solid core, massive, transitional basal contact.

242

FROM	TO	LITHOLOGY
215.28	220.52	SANDSTONE, light grey, medium grained, quartzose (>90% quartz) and quartz feldspathic phases, weak rock, solid core, massive, transitional basal contact.
220.52	220.61	MUDSTONE, dark grey, very weak rock, solid core, abrupt basal contact.
220.61	221.37	SANDSTONE, light greenish-grey, medium grained, quartz feldspathic sub-angular moderately sorted, weak rock, solid core, transitional basal contact.
221.37	221.97	SANDSTONE, light greenish-grey, medium grained, numerous mudstone fragments, broken core, weak rock, transitional basal contact.
221.97	222.20	60% MUDSTONE, greyish-red, rare fragments, very weak rock, erosional basal contact, intermixed with: 40% SANDSTONE, reddish-green, medium grained, matrix, weak rock, solid core.
222.20	222.98	SANDSTONE, greenish-grey, medium to coarse grained, weak rock, solid core, massive, abrupt basal contact, slight calcite on joint surfaces.
222.98	223.17	SANDSTONE, light grey, fine to medium grained, some thin carbonaceous laminae throughout interval quartzose (>90% quartz), weak rock, solid core, abrupt basal contact.
223.17	224.43	SANDSTONE, light reddish-grey, medium grained, sub-angular moderately sorted feldspatho-lithic (<80% qtz, felds>rf.), weak rock, solid core, massive, abrupt basal contact, joints with wide spacing. 75 % quartz, 15 % feldspar 10% lithics Commen red iron mineral staining Twinned yellow gypsum in open joints
224.43	225.00	SANDSTONE, green, fine to medium grained, quartzose (>90% quartz) angular and sub-angular moderately sorted, very weak rock, broken core, massive, transitional basal contact, joints with wide spacing. 93 % quartz, 5 % feldspar, 2 % lithics Abundent green staining
225.00	225.22	SANDSTONE, light grey, fine to medium grained, quartzose (>90% quartz), weak rock, solid core, massive, abrupt basal contact.

243

FROM	TO	LITHOLOGY
225.22	225.31	SANDSTONE, green, fine grained, quartzose (>90% quartz), very weak rock, solid core, abrupt basal contact.
225.31	225.48	SANDSTONE, light grey, fine to medium grained, quartzose (>90% quartz), weak rock, solid core, massive.
225.48	225.53	NO SAMPLE RETURN.
225.53	225.76	SANDSTONE, light grey, fine grained, quartzose (>90% quartz) sub-angular moderately sorted, weak rock, solid core, massive, abrupt basal contact. Quartz 93 % , lithics 5 %. feldspars 2 %
225.76	230.05	SANDSTONE, light grey, medium grained, angular moderately sorted litho-feldspathic (<80% qtz, rf>felds), weak rock, solid core, massive, deformed basal contact. Quartz 80 %, feldspar 10%, lithics 10 % Green and red alteration zone around Calcareous veining, veins dip 75 deg Rees, alteration zones extend 10 to 20 Cm. from the veins, vein spacing 30 cm. To 1.5 m.
230.05	230.11	MUDSTONE, light to dark grey, fragments with arenaceous matrix near top of unit and near base of unit mudstone bands near middle of unit, very weak rock, solid core, deformed basal contact.
230.11	230.31	SANDSTONE, light to medium grey, fine grained, thin carbonaceous wisps throughout interval, solid core, weak rock, transitional basal contact.
230.31	232.00	SANDSTONE, light grey, fine to medium grained, fining upwards mudstone near base of unit quartzose (>90% quartz) sub-angular moderately sorted, solid core, weak rock, massive, abrupt basal contact. Quartz 90 %, feldspars 2 %, lithics 8 %
232.00	232.12	SANDSTONE, light to medium grey, very fine grained, coal bands near middle of unit mudstone fragments lenses near base of unit quartzose (>90% quartz), weak rock, solid core, abrupt basal contact.
232.12	232.55	SANDSTONE, light grey, fine grained, fining upwards quartzose (>90% quartz) some thin carbonaceous laminae near middle of unit some thin mudstone pellets bands near base of unit, weak rock, solid core, abrupt basal contact.

244

FROM	TO	LITHOLOGY
232.55	232.60	SANDSTONE, light to medium grey, fine to medium grained, some rare mudstone fragments near base of unit quartzose (>90% quartz), weak rock, solid core, massive, abrupt basal contact.
232.60	232.83	MUDSTONE, light to medium grey, silty laminae and phases throughout interval some thin slightly carbonaceous laminae throughout interval, weak rock, solid core. Faulted basal contact at 45 degrees
232.83	233.28	MUDSTONE, black, very weak rock, solid core, massive, abrupt basal contact.
233.28	233.30	BRECCIA, black, mudstone, very weak rock, solid core, with disturbed bedding, abrupt basal contact.
233.30	233.45	MUDSTONE, black, silty near base of unit, very weak rock, solid core, massive, transitional basal contact.
233.45	233.96	SANDSTONE, medium to dark blackish-grey, very fine grained, mudstone matrix, very weak rock, solid core, massive, abrupt basal contact.
233.96	234.22	SANDSTONE, light to medium blackish-grey, fine grained, some mudstone matrix in part, weak rock, solid core, transitional basal contact.
234.22	234.70	SANDSTONE, light blackish-grey, fine grained, numerous thin mudstone laminae throughout interval, weak rock, solid core, abrupt basal contact.
234.70	236.87	SANDSTONE, light grey, fine to medium grained, fining upwards numerous thin mudstone laminae throughout interval quartzose (>90% quartz) well sorted angular, weak rock, solid core, abrupt basal contact. Quartz 96 %, feldspar 2 %, lithics 2 %
236.87	238.27	SANDSTONE, light whitish-grey, medium to coarse grained, some mudstone laminae quartz lithic moderately sorted angular, weak rock, solid core, abrupt basal contact. Quartz 88 %, lithics 10 %, feldspar 2 %
238.27	238.63	SILTSTONE, grey, rare arenaceous laminae, weak rock, solid core, abrupt basal contact.
238.63	238.68	COAL, HEAVY (INFERIOR COAL), black, shaly, very weak rock, fragmented, transitional basal contact.

245

FROM	TO	LITHOLOGY
238.68	238.73	CARBONACEOUS MUDSTONE, black, slightly coal near top of unit, very weak rock, solid core, abrupt basal contact.
238.73	238.76	COAL, <10% BRIGHT, black, fissile, weak rock, solid core, abrupt basal contact.
238.76	238.86	CARBONACEOUS MUDSTONE, black, coal in part, very weak rock, very broken core, abrupt basal contact.
238.86	238.94	MUDSTONE, medium to dark grey, silty near base of unit, weak rock, solid core, abrupt basal contact.
238.94	239.10	SILTSTONE, light to medium grey, arenaceous near base of unit, very weak rock, solid core, abrupt basal contact.
239.10	240.09	75% SILTSTONE, grey, weak rock, abrupt basal contact, interbedded with: 20% MUDSTONE, medium to dark grey, laminae thin, weak rock, interbedded with: 5% SANDSTONE, light to medium grey, very fine grained, phases, weak rock, solid core.
240.09	240.18	COAL, 10 - 40% BRIGHT, solid core, abrupt basal contact.
240.18	240.55	MUDSTONE, light to medium grey, silty bands near middle of unit, solid core, abrupt basal contact.
240.55	240.57	MUDSTONE, black, slightly carbonaceous, very stiff, solid core, abrupt basal contact.
240.57	240.78	MUDSTONE, grey, slightly carbonaceous lenses near middle of unit and near base of unit, very weak rock, broken core, transitional basal contact.
240.78	240.96	MUDSTONE, grey, silty near base of unit, weak rock, broken core, transitional basal contact.
240.96	241.42	80% SANDSTONE, light to medium grey, very fine grained, weak rock, transitional basal contact. 20% MUDSTONE, dark grey, laminae and bands, weak rock, solid core.
241.42	241.60	SILTSTONE, medium to dark grey, mudstone laminae and phases, weak rock, solid core, transitional basal contact.

FROM	TO	LITHOLOGY
241.60	242.57	SANDSTONE, very fine grained, silty and mudstone laminae throughout interval, weak rock, solid core, abrupt basal contact.
242.57	244.44	MUDSTONE, black, slightly carbonaceous silty near base of unit thick arenaceous bands near base of unit, weak rock, broken core, massive, abrupt basal contact.
244.44	244.46	COAL, <10% BRIGHT, solid core, abrupt basal contact, cleats with close spacing, abundant calcite on cleats.
244.46	245.35	MUDSTONE, medium to dark grey, slightly silty in part, solid core, weak rock, abrupt basal contact.
245.35	245.41	SILTSTONE, grey, solid core, weak rock, abrupt basal contact.
245.41	246.01	MUDSTONE, medium to dark grey, solid core, weak rock, massive.
246.01	246.23	NO SAMPLE RETURN.
246.23	247.08	SILTSTONE, dark grey, numerous arenaceous laminae throughout interval, broken core, very weak rock, abrupt basal contact.
247.08	247.32	SANDSTONE, light greenish-grey, fine grained, lithic (predominately rock fragments) fining upwards, weak rock, solid core, erosional basal contact.
247.32	247.52	MUDSTONE, dark grey, silty, solid core, massive, abrupt basal contact.
247.52	248.97	SANDSTONE, light greenish-grey, fine to medium grained, lithic (predominately rock fragments) some carbonaceous mudstone laminae throughout interval, solid core, weak rock, abrupt basal contact.
248.97	249.15	SANDSTONE, grey, very fine grained, numerous thin carbonaceous laminae throughout interval, weak rock, solid core, abrupt basal contact.
249.15	249.23	SILTSTONE, grey, very weak rock, solid core, abrupt basal contact.
249.23	249.30	SANDSTONE, light greenish-grey, fine grained, lithic (predominately rock fragments) some thin carbonaceous laminae near base of unit, very weak rock, solid core, abrupt basal contact.

FROM - TO	LITHOLOGY
249.30 - 249.33	SILTSTONE, arenaceous near top of unit some mudstone laminae near base of unit, weak rock, solid core, abrupt basal contact.
249.33 - 249.86	SANDSTONE, light greenish-grey, lithic (predominately rock fragments) numerous carbonaceous laminae throughout interval, weak rock, solid core, abrupt basal contact.
249.86 - 249.91	SILTSTONE, medium to dark grey, weak rock, solid core, abrupt basal contact.
249.91 - 251.29	SANDSTONE, light grey, medium grained, rare carbonaceous traces lithic (predominately rock fragments), weak rock, solid core, transitional basal contact.
251.29 - 253.23	SANDSTONE, light reddish-grey, medium grained, thin coal bands near middle of unit lithic (predominately rock fragments), broken core, weak rock, massive, transitional basal contact, common red iron oxide staining.
253.23 - 254.76	SANDSTONE, light grey, medium grained, some thin carbonaceous laminae near middle of unit, broken core, weak rock, transitional basal contact.
254.76 - 255.81	SANDSTONE, light reddish-green, medium grained, lithic (predominately rock fragments) some laminae, very broken core, weak rock, transitional basal contact, common red iron oxide staining.
255.81 - 256.18	SANDSTONE, light grey, medium grained, some carbonaceous laminae lithic (predominately rock fragments), weak rock, solid core, abrupt basal contact.
256.18 - 256.71	SANDSTONE, light greyish-green, medium grained, lithic (predominately rock fragments), weak rock, solid core, abrupt basal contact, common calcite on joint surfaces.
256.71 - 256.95	CARBONACEOUS MUDSTONE, black, some coal fragments near middle of unit, very stiff, broken core, abrupt basal contact.
256.95 - 256.96	SILTSTONE, light brown, very stiff, solid core, abrupt basal contact.
256.96 - 257.65	COAL, <10% BRIGHT, slightly fissile some thin mudstone partings, very weak rock, broken core, abrupt basal contact.

FROM	TO	LITHOLOGY
257.65	257.91	MUDSTONE, medium to dark grey, weak rock, very broken core, transitional basal contact.
257.91	260.12	SILTSTONE, brownish-grey, some mudstone phases near middle of unit and near base of unit, weak rock, very broken core, abrupt basal contact.
260.12	260.29	SILTSTONE, light to medium greenish-grey, arenaceous and mudstone fragments throughout interval, very stiff, solid core, with disturbed bedding, abrupt basal contact. Faulted basal contact at 45 degrees
260.29	260.38	SILTSTONE, medium to dark grey, very weak rock, fragmented.
260.38	261.19	SANDSTONE, light grey, fine grained, some carbonaceous laminae near base of unit, broken core, transitional basal contact.
261.19	261.38	SANDSTONE, light reddish-green, fine grained, silty fragments throughout interval, fragmented.
261.38	261.53	NO SAMPLE RETURN.
261.53	261.69	SANDSTONE, green, fine grained, silty fragments throughout interval, solid core, abrupt basal contact.
261.69	261.78	SILTSTONE, red, weak rock, solid core, abrupt basal contact. Faulted basal contact at 45 degrees,co Mmon red iron staining
261.78	264.53	SANDSTONE, light reddish-green, medium grained, lithic (predominately rock fragments), weak rock, broken core, transitional basal contact. Common red iron staining throughout
264.53	265.90	SANDSTONE, light grey, medium to coarse grained, fining upwards lithic (predominately rock fragments), weak rock, solid core, transitional basal contact.
265.90	271.16	SANDSTONE, greenish-red, medium grained, weak rock, solid core, transitional basal contact. Unit heavily altered,abundant red iron Staining and chloritic alteration,ext Ensive calcite veining on joint surfac Es, 10 to 50 cm. spacing,dipping at 80 Degrees to core axis

FROM	TO	LITHOLOGY
271.16	272.06	SANDSTONE, light grey, medium grained, some carbonaceous laminae near top of unit lithic (predominately rock fragments) angular, weak rock, broken core, transitional basal contact.
272.06	272.29	SANDSTONE, reddish-green, medium grained, lithic (predominately rock fragments) moderately sorted sub-angular, weak rock, solid core, transitional basal contact.
272.29	272.75	SANDSTONE, light grey, medium grained, lithic (predominately rock fragments) moderately sorted sub-angular, broken core, very weak rock, transitional basal contact.
272.75	273.34	SANDSTONE, reddish-green, fine to medium grained, numerous carbonaceous mudstone fragments throughout interval lithic (predominately rock fragments), very weak rock, solid core, transitional basal contact. Abundent red iron staining
273.34	274.16	SANDSTONE, light grey, medium grained, lithic (predominately rock fragments) angular moderately sorted some carbonaceous laminae and mudstone fragments, broken core, weak rock, abrupt basal contact.
274.16	274.21	COAL, HEAVY (INFERIOR COAL), weak rock, solid core, abrupt basal contact.
274.21	274.30	MUDSTONE, dark grey, slightly carbonaceous near top of unit, solid core, weak rock, abundant pyrite on joint surfaces.
274.30	274.66	MUDSTONE, dark grey, very broken core, abrupt basal contact. Faulted basal contact at 80 degrees
274.66	275.62	MUDSTONE, medium to dark grey, very weak rock, solid core, with disturbed bedding, transitional basal contact. Severly brecciated, angular mudstone fr Agments upto 10 cm. size, in amudstoneMatrix
275.62	276.53	MUDSTONE, medium to dark grey, some silty laminae, very weak rock, solid core, abrupt basal contact, faults with slickensides.

250

FROM	TO	LITHOLOGY
276.53	276.70	COAL, HEAVY (INFERIOR COAL), carbonaceous mudstone phases near top of unit, very weak rock, broken core, abrupt basal contact.
276.70	276.85	MUDSTONE, dark blackish-grey, silty near base of unit, weak rock, broken core, abrupt basal contact.
276.85	276.90	COAL, HEAVY (INFERIOR COAL), shaly, solid core, weak rock, abrupt basal contact.
276.90	277.15	COAL, <10% BRIGHT, broken core, abrupt basal contact.
277.15	277.17	COAL, HEAVY (INFERIOR COAL), shaly, solid core, abrupt basal contact.
277.17	277.21	SANDSTONE, black, very fine grained, coal matrix, solid core, weak rock, abrupt basal contact.
277.21	277.28	SILTSTONE, black, carbonaceous, weak rock, solid core, transitional basal contact.
277.28	278.39	SILTSTONE, light to dark grey, arenaceous and mudstone laminae throughout interval, weak rock, solid core, abrupt basal contact.
278.39	279.82	SANDSTONE, light grey, fine grained, lithic (predominately rock fragments) some carbonaceous laminae throughout interval, weak rock, solid core, abrupt basal contact.
279.82	279.95	SILTSTONE, medium to dark grey, arenaceous lenses near base of unit, weak rock, solid core, abrupt basal contact.
279.95	280.00	SANDSTONE, light grey, fine grained, solid core, abrupt basal contact.
280.00	280.14	MUDSTONE, dark grey, silty in part, solid core, abrupt basal contact.
280.14	280.24	SANDSTONE, light grey, fine grained, thick mudstone bands near middle of unit, solid core, abrupt basal contact.
280.24	280.74	SILTSTONE, dark grey, weak rock, solid core, abrupt basal contact. Basal contact step faulted with two fa Ults at 75 degrees
280.74	282.70	SANDSTONE, light greyish-red, fine to medium grained, carbonaceous bands near middle of unit lithic (predominately rock fragments), weak rock, broken core. Common red iron staining middle unit a Nd base unit

768169

251

FROM	TO	LITHOLOGY
282.70	282.80	50% SANDSTONE, light to medium grey, fine grained, weak rock, intermixed with: 50% MUDSTONE, dark grey, fragments, weak rock, solid core, erosional basal contact.
282.80	282.99	SILTSTONE, dark grey, some arenaceous phases, weak rock, solid core, abrupt basal contact.
282.99	283.05	SANDSTONE, grey, very fine grained, silty near top of unit fining upwards some carbonaceous laminae, weak rock, solid core, abrupt basal contact.
283.05	283.33	60% SANDSTONE, grey, very fine grained, weak rock, interbedded with: 40% SILTSTONE, bands and laminae, weak rock, solid core, abrupt basal contact.
283.33	283.42	MUDSTONE, light to dark grey, silty laminae, weak rock, solid core, abrupt basal contact, joints with moderately close spacing with tight, planar, smooth discontin's, common calcite on joint surfaces.
283.42	283.95	MUDSTONE, greyish-black, broken core, weak rock, abrupt basal contact, joints with moderately close spacing with tight, planar, smooth discontin's.
283.95	283.96	SANDSTONE, grey, very fine grained, weak rock, solid core, abrupt basal contact.
283.96	284.40	60% MUDSTONE, medium to dark blackish-grey, weak rock, abrupt basal contact, interbedded with: 40% SANDSTONE, light to medium grey, very fine grained, laminae and bands, weak rock, solid core.
284.40	284.47	CARBONACEOUS MUDSTONE, black, some coal fragments, stiff, very broken core, abrupt basal contact.
284.47	284.49	COAL, <10% BRIGHT, solid core, abrupt basal contact.
284.49	284.73	MUDSTONE, black, carbonaceous in part, weak rock, abrupt basal contact, joints with tight, planar, smooth discontin's.
284.73	284.77	COAL, <10% BRIGHT, solid core, abrupt basal contact, occasional zeolite traces. Clinonoctilite, a zeolite from heat a Lteration effects of dolerite sill

252

FROM	TO	LITHOLOGY
284.77	284.80	CARBONACEOUS MUDSTONE, black, solid core, weak rock, abrupt basal contact.
284.80	284.86	COAL, <10% BRIGHT, black, broken core, transitional basal contact.
284.86	284.93	COAL, HEAVY (INFERIOR COAL), black, very broken core, abrupt basal contact.
284.93	284.96	CARBONACEOUS MUDSTONE, black, firm, abrupt basal contact.
284.96	285.03	COAL, HEAVY (INFERIOR COAL), with carbonaceous mudstone phases throughout interval, fragmented.
285.03	285.35	CARBONACEOUS MUDSTONE, black, coal fragments, firm, fragmented.
285.35	285.53	Core loss
285.53	285.78	COAL, HEAVY (INFERIOR COAL), some carbonaceous mudstone bands, fragmented.
285.78	286.25	MUDSTONE, greyish-black, carbonaceous near top of unit and slightly carbonaceous near base of unit and near middle of unit, very broken core, abrupt basal contact, common gypsum on joint surfaces.
286.25	286.29	SANDSTONE, black, very fine grained, mudstone matrix, abrupt basal contact.
286.29	287.14	MUDSTONE, blackish-grey, slightly carbonaceous, weak rock, broken core, abrupt basal contact, joints with moderately close spacing with open, planar, smooth discontin's, common gypsum on joint surfaces.
287.14	287.28	SANDSTONE, blackish-grey, very fine grained, slightly carbonaceous, weak rock, solid core, abrupt basal contact.
287.28	287.41	SILTSTONE, greyish-black, slightly carbonaceous, fragmented.
287.41	288.53	NO SAMPLE RETURN. Core loss End of hq core and start of nq
288.53	289.94	MUDSTONE, medium to dark grey, slightly carbonaceous near top of unit, very broken core, weak rock, abrupt basal contact, joints with close spacing with tight, planar, smooth discontin's, abundant calcite on joint surfaces.

768171

253

FROM	TO	LITHOLOGY
289.94	290.39	SANDSTONE, light greenish-grey, very fine grained, solid core, weak rock, transitional basal contact, abundant calcite on joint surfaces.. 1 cm. calcite vein middle unit, at 80 Degrees to core axis
290.39	290.51	SILTSTONE, blackish-grey, slightly arenaceous, weak rock, solid core, transitional basal contact.
290.51	290.61	SANDSTONE, medium to dark brownish-grey, very fine grained, some carbonaceous laminae, weak rock, solid core, abrupt basal contact, joints with tight, planar, smooth discontin's, calcite on joint surfaces.
290.61	290.88	SANDSTONE, light reddish-green, fine grained, weak rock, very broken core, abrupt basal contact, joints with tight, planar, smooth discontin's, common zeolite, calcite on joint surfaces. Some thermal metamorphism
290.88	291.06	DOLERITE, greenish-grey, very fine grained, very strong rock, solid core, joints with tight, planar, smooth discontin's, calcite on joint surfaces.
291.06	291.36	NO SAMPLE RETURN.
291.36	291.46	DOLERITE, blackish-grey, very strong rock, solid core, massive, abrupt basal contact.
291.46	291.78	SILTSTONE, reddish-green, some arenaceous phases, broken core, weak rock. Some thermal metamorphism
291.78	292.08	SILTSTONE, light to medium grey, weak rock, solid core, transitional basal contact.
292.08	292.40	SILTSTONE, black, slightly carbonaceous, weak rock, solid core, transitional basal contact. Traces of yellow iron mineral top of u Nit, slightly thermally metamorphosed
292.40	293.24	MUDSTONE, greenish-red, weak rock, solid core, transitional basal contact, joints with moderately wide spacing, occasional calcite on joint surfaces. Common red iron mineral, slightly therm Ally metamorphosed
293.24	293.95	SILTSTONE, light to medium greenish-grey, slightly arenaceous some laminae throughout interval, weak rock, broken core. Green staining, possibly chloritic, lami Nations altered to green mineral, sligh Tly thermally metamorphosed

768172

254

FROM - TO	LITHOLOGY
293.95 - 294.08	NO SAMPLE RETURN.
294.08 - 294.25	SILTSTONE, light grey, some laminae near base of unit, very broken core, weak rock, transitional basal contact. Slightly thermally metamorphosed
294.25 - 294.32	SILTSTONE, greenish-red, arenaceous laminae throughout interval, weak rock, solid core. Slightly thermally metamorphosed
294.32 - 294.36	NO SAMPLE RETURN.
294.36 - 294.57	SANDSTONE, light to medium brownish-green, very fine grained, numerous mudstone laminae, broken core, weak rock, abrupt basal contact, joints with tight, planar, smooth discontin's. Talc on joint surfaces, slightly metamoRphosed
294.57 - 294.87	MUDSTONE, light to medium brownish-green, very broken core, very weak rock, abrupt basal contact. Slightly brecciated, with talc onJoints
294.87 - 294.96	MUDSTONE, dark green, very weak rock, broken core, transitional basal contact, common calcite.
294.96 - 295.40	SILTSTONE, mottled brownish-green, arenaceous near base of unit, weak rock, broken core, transitional basal contact, joints with tight, planar, smooth discontin's, abundant calcite on joint surfaces.
295.40 - 295.91	DOLERITE, dark grey, fine grained, very strong rock, solid core, transitional basal contact.
295.91 - 297.33	DOLERITE, dark green, fine grained, with arenaceous clasts, strong rock, broken core, abundant calcite on joint surfaces. Brecciated,
297.33 - 297.36	NO SAMPLE RETURN.
297.36 - 297.67	DOLERITE, dark greenish-grey, fine grained, very strong rock, solid core, transitional basal contact, abundant calcite on joint surfaces. Brecciated
297.67 - 298.26	DOLERITE, greenish-grey, fine grained, very strong rock, broken core, transitional basal contact. Veins with calcite and talc

255

FROM	TO	LITHOLOGY
298.26	300.36	DOLERITE, greenish-grey, fine grained, very strong rock, broken core, joints with tight, planar, smooth discontin's.
	300.36	********** TOTAL DEPTH **********

256

HOLE NUMBER : CA 110

DATA SOURCE : Marathon Pet. Aust, Ltd

LOGGER : W.J. Thornley

Date commenced : 18 Mar 82

Date completed : 20 Apr 82

LOCATION:

NORTHING : 51852.72

EASTING : 4923.72

ELEVATION :

DRILLING:

CONTRACTOR : Stackpoole Drilling

DRILL TYPE : Rotary

HOLE SIZE : 960

CORE SIZE :

TOTAL DEPTH : 304.00m

GEOPHYSICAL:

CONTRACTOR : BPB Instruments

PROBE DEPTH : 299.00m

LOGS RUN : Natural Gamma
Long Spaced Density
Caliper
Resistivity
Bed Resolution Density

257

FROM	TO	LITHOLOGY
		********** CHIP DESCRIPTION **********
HAMMER		
0.00 -	1.00	SOIL, light brown, arenaceous, soft.
		********** BASE OF ALLUVIUM **********
1.00 -	4.00	MUDSTONE, medium to dark brown, rare coal fragments, firm, slightly weathered, occasional yellow iron oxide staining.
		********** BASE OF WEATHERING **********
4.00 -	12.00	MUDSTONE, medium to dark grey, rare coal fragments rare slightly carbonaceous wisps, firm, unweathered.
12.00 -	14.00	90% MUDSTONE, medium to dark grey, firm, interbedded with: 10% SILTSTONE, grey, bands throughout interval, very weak rock.
14.00 -	16.00	90% CARBONACEOUS SHALE, moderately weak rock, interbedded with: 5% CARBONACEOUS MUDSTONE, black, very soft. 5% MUDSTONE, light greyish-brown, some carbonaceous wisps, very weak rock.
16.00 -	18.00	50% CARBONACEOUS MUDSTONE, black, very soft, interbedded with: 35% COAL, interbedded with: 15% MUDSTONE, medium to dark grey, very weak rock.
18.00 -	20.00	NO SAMPLE RETURN.
20.00 -	24.00	60% SANDSTONE, light grey, fine grained, loose, interbedded with: 40% MUDSTONE, medium to dark grey, bands, very weak rock.
24.00 -	28.00	SANDSTONE, light to medium grey, fine to medium grained, coal bands near base of unit, loose.
28.00 -	29.00	COAL.
29.00 -	30.00	85% COAL, carbonaceous shaly in part. 15% MUDSTONE, light brownish-grey.
30.00 -	31.00	95% COAL, carbonaceous shaly in part. 5% MUDSTONE, light brownish-grey.
31.00 -	34.00	SANDSTONE, light to medium grey, fine grained, silty phases.

258

FROM	TO	LITHOLOGY
34.00	36.00	95% SANDSTONE, light grey, fine grained, quartz lithic. 5% COAL, HEAVY (INFERIOR COAL).
BLADES		
36.00	38.00	70% SANDSTONE, light to medium grey, fine grained. 30% MUDSTONE, medium to dark grey.
38.00	45.00	MUDSTONE, medium to dark grey, silty near base of unit some arenaceous phases near base of unit.
45.00	46.00	90% MUDSTONE, medium to dark grey, interbedded with: 10% CARBONACEOUS SHALE, dark brownish-black, bands.
46.00	49.00	70% MUDSTONE, grey, interbedded with: 30% SANDSTONE, light to medium grey, very fine grained, argillaceous matrix.
49.00	51.00	70% SANDSTONE, light to medium grey, very fine grained, argillaceous matrix. 30% MUDSTONE, medium to dark grey.
51.00	55.00	60% MUDSTONE, medium to dark grey, interbedded with: 40% SANDSTONE, light grey, fine grained.
55.00	59.00	SANDSTONE, light grey, fine to medium grained, quartz lithic poorly sorted sub-angular.
59.00	61.00	MUDSTONE, brownish-grey.
61.00	65.00	SANDSTONE, light grey, fine to medium grained, quartzose (>90% quartz) moderately sorted sub-angular. 90 % quartz , 6% lithics, 4 % feldspar
65.00	66.00	70% MUDSTONE, brown, interbedded with: 30% SANDSTONE, light whitish-grey, medium grained, quartzose (>90% quartz) moderately sorted sub-angular.
66.00	70.00	60% SANDSTONE, light whitish-grey, fine to medium grained, quartzose (>90% quartz) moderately sorted sub-angular, interbedded with: 40% SILTSTONE, medium to dark grey.
70.00	71.00	SANDSTONE, light grey, fine to medium grained, quartz lithic.
71.00	73.00	60% SANDSTONE, light grey, fine to medium grained, quartz lithic, interbedded with:
0.00	0.00	40% SHALE, dark blackish-grey, carbonaceous in part.

768177

FROM	TO	LITHOLOGY
73.00	74.00	90% CARBONACEOUS SHALE, medium to dark brownish-black, interbedded with: 5% COAL, HEAVY (INFERIOR COAL). 5% CLAYSTONE, light greyish-brown.
74.00	75.00	95% CARBONACEOUS SHALE, dark brownish-black, rare coal fragments, interbedded with: 5% CLAYSTONE, light greyish-white.
75.00	76.00	80% CARBONACEOUS SHALE, medium to dark black, interbedded with: 15% COAL, HEAVY (INFERIOR COAL). 5% CLAYSTONE, light brownish-cream.
76.00	77.00	75% CARBONACEOUS SHALE, dark brownish-black, coal in part, interbedded with: 20% COAL, <10% BRIGHT. 5% CLAYSTONE, light brownish-cream.
77.00	78.00	80% CARBONACEOUS SHALE, dark brownish-black, coal in part, interbedded with: 20% COAL, HEAVY (INFERIOR COAL).
78.00	79.00	80% MUDSTONE, medium to dark brown, slightly carbonaceous. 15% SANDSTONE, light grey, fine grained, quartz lithic argillaceous matrix.
79.00	81.00	70% MUDSTONE, medium to dark greyish-brown. 30% SANDSTONE, light grey, fine grained, argillaceous matrix.
81.00	88.00	SANDSTONE, light grey, medium grained, quartz feldspathic sub-angular moderately sorted.
88.00	89.00	95% MUDSTONE, medium to dark brownish-grey. 5% COAL, bands.
89.00	90.00	MUDSTONE, dark grey.
90.00	91.00	85% MUDSTONE, dark grey. 15% COAL, bands.
91.00	92.00	60% CARBONACEOUS SHALE, black, coal slightly fissile. 35% COAL, HEAVY (INFERIOR COAL). 5% MUDSTONE, brownish.
92.00	93.00	60% COAL, HEAVY (INFERIOR COAL). 40% CARBONACEOUS SHALE, black, coal.

260

FROM	TO	LITHOLOGY
93.00	94.00	75% COAL, HEAVY (INFERIOR COAL). 20% CARBONACEOUS SHALE, black, coal. 5% CLAYSTONE, light to dark brownish-cream.
94.00	96.00	MUDSTONE, brownish-grey, arenaceous phases near base of unit.
96.00	100.00	SANDSTONE, light grey, fine grained, some mudstone fragments quartz feldspathic sub-rounded moderately sorted.
100.00	101.40	DOLERITE, very fine grained, moderately strong rock.
		********** CORE & GEOPHYSICAL LOGS DESCRIPTION ********
DIAMOND CORING		
101.40	102.06	DOLERITE, black, very fine grained, very strong rock, solid core. Some veining present
102.06	102.36	DOLERITE, mottled greyish-black, very fine grained, very strong rock, solid core, joints with moderately close spacing with tight, non-planar discontinuities.
102.36	102.60	DOLERITE, medium to dark greenish-black, very fine grained, solid core, very strong rock, joints with close spacing with tight, non-planar discontinuities.
102.60	103.10	NO SAMPLE RETURN.
103.10	106.10	DOLERITE, mottled black, very fine grained, very strong rock, solid core, transitional basal contact, joints with moderately close spacing with tight, non-planar discontinuities.
106.10	108.18	DOLERITE, mottled black, fine to medium grained, fining upwards, solid core, very strong rock, massive, transitional basal contact.
108.18	109.16	DOLERITE, mottled black, medium grained, solid core, very strong rock, massive, transitional basal contact.
109.16	112.10	DOLERITE, mottled black, fine grained, very strong rock, solid core, joints with moderately wide spacing with tight, non-planar discontinuities.
112.10	115.44	DOLERITE, black, very fine grained, very strong rock, solid core, abrupt basal contact, joints with wide spacing with tight, non-planar discontinuities.

768179

FROM	TO	LITHOLOGY
115.44	115.78	SANDSTONE, blackish-grey, very fine grained, mudstone laminae and thin bands throughout interval, solid core, strong rock, abrupt basal contact.
115.78	116.11	SANDSTONE, light to medium grey, fine grained, moderately strong rock, solid core, abrupt basal contact.
116.11	116.25	DOLERITE, light green, very fine grained, strong rock, solid core.
116.25	117.85	SANDSTONE, light whitish-grey, fine grained, silty laminae near base of unit, solid core, weak rock, massive, abrupt basal contact. Recrystallized top of unit
117.85	117.99	DOLERITE, light green, very fine grained, lithic (predominately rock fragments) fragments throughout interval, very broken core, moderately strong rock, abrupt basal contact. Fragments of sandstone and mudstone
117.99	118.10	MUDSTONE, brown, moderately strong rock, very broken core.
118.10	118.26	70% SANDSTONE, light to medium brown, very fine grained, matrix, solid core, intermixed with: 20% MUDSTONE, light to medium green, fragments chloritic, intermixed with: 10% SANDSTONE, light whitish-grey, very fine grained.
118.26	119.60	SANDSTONE, light grey, fine to medium grained, solid core, very weak rock, abrupt basal contact.
119.60	119.97	MUDSTONE, medium to dark blackish-brown, carbonaceous in part coal fragments near top of unit, solid core.
119.97	120.23	CARBONACEOUS MUDSTONE, black, solid core, abrupt basal contact, faults with slickensides.
120.23	120.28	MUDSTONE, light to medium brown, broken core, abrupt basal contact.
120.28	120.35	COAL, HEAVY (INFERIOR COAL), black, solid core, transitional basal contact.
120.35	120.79	MUDSTONE, brown, solid core, abrupt basal contact.
120.79	121.10	SILTSTONE, grey, solid core.

262

FROM	TO	LITHOLOGY

********** CHIP DESCRIPTION **********

ROLLER BIT

121.10 - 122.00	80% MUDSTONE, grey. 20% COAL.
122.00 - 124.00	SANDSTONE, light grey, medium grained, quartzose (>90% quartz) sub-angular well sorted.
124.00 - 126.00	SANDSTONE, light grey, fine grained, quartzose (>90% quartz) sub-angular moderately sorted. 90 % quartz ,7 % feldspar ,3 % lithics
126.00 - 127.00	SANDSTONE, light grey, medium grained, quartz feldspathic sub-angular moderately sorted.
127.00 - 128.00	60% SANDSTONE, light grey, medium grained, quartz lithic sub-angular moderately sorted. 40% MUDSTONE, medium to dark brownish-grey.
128.00 - 130.00	SANDSTONE, light grey, fine grained, quartzose (>90% quartz) sub-rounded moderately sorted.
130.00 - 134.00	SANDSTONE, light grey, fine to medium grained, quartz lithic sub-rounded moderately sorted. 88 % quartz ,10 % lithics ,2% feldspar R ,becomming more quartzose to base ofUnit
134.00 - 138.00	SANDSTONE, light grey, fine to medium grained, quartzose (>90% quartz) sub-rounded moderately sorted some mudstone bands throughout interval.
138.00 - 144.00	SANDSTONE, light grey, fine to medium grained, quartz lithic sub-angular moderately sorted quartzose (>90% quartz) near base of unit.
144.00 - 145.00	60% SANDSTONE, light grey, fine grained, quartzose (>90% quartz), intermixed with: 40% SILTSTONE, dark grey.
145.00 - 146.00	SILTSTONE, medium to dark blackish-grey, carbonaceous in part arenaceous in part.
146.00 - 147.00	95% MUDSTONE, dark blackish-grey, carbonaceous and shaly in part. 5% COAL.
147.00 - 149.00	70% SILTSTONE, grey, intermixed with: 30% SANDSTONE, light to medium grey, fine grained, lithic (predominately rock fragments).

768181

FROM	TO	LITHOLOGY
149.00	150.00	80% SILTSTONE, grey. 20% COAL.
150.00	151.00	60% SHALE, light to dark greyish-black, coal in part, intermixed with: 40% SANDSTONE, light whitish-grey, very fine grained.
151.00	153.00	95% MUDSTONE, medium to dark grey. 5% COAL.
153.00	155.00	90% MUDSTONE, dark brownish-grey, interbedded with: 10% COAL.
155.00	156.00	MUDSTONE, brown.
156.00	159.00	MUDSTONE, grey, some arenaceous phases.
159.00	160.00	95% SANDSTONE, light to medium grey, very fine grained, interbedded with: 5% COAL.
160.00	162.00	SANDSTONE, light to medium grey, medium grained, quartzose (>90% quartz). 65% SANDSTONE, medium grained, quartz lithic. 30% SILTSTONE, greyish-brown. 5% CARBONACEOUS SHALE.
162.00	164.00	90% SANDSTONE, light to medium grey, fine grained, quartz feldspathic sub-angular well sorted. 10% SILTSTONE, brownish-grey.
164.00	165.00	SANDSTONE, light grey, fine to medium grained, sub-angular quartz feldspathic moderately sorted.
165.00	166.00	SANDSTONE, light grey, fine grained, angular quartzose (>90% quartz) well sorted thin mudstone bands. 95 % quartz, 3 % feldspar, 2 % lithics
166.00	167.00	85% SANDSTONE, light dark whitish-grey grey, fine grained, quartz feldspathic angular.
167.00	168.00	50% SILTSTONE, medium to dark grey, intermixed with: 50% SANDSTONE, medium to dark grey, very fine grained.
168.00	169.00	90% SANDSTONE, light grey, fine grained, quartzose (>90% quartz). 10% SILTSTONE, medium to dark grey.
169.00	170.00	SANDSTONE, light grey, fine to medium grained, quartzose (>90% quartz) sub-angular moderately sorted.

FROM	TO	LITHOLOGY
170.00	183.00	SANDSTONE, light grey, fine to medium grained, quartzose (>90% quartz) sub-angular moderately sorted. 91 % quartz ,8 % feldspar,1 % lithics Slightly more feldspathic middle ofUnit
183.00	185.00	SANDSTONE, grey, fine to medium grained, quartz lithic some thin coal bands.
185.00	194.00	SANDSTONE, light to medium grey, fine to medium grained, quartz lithic.
194.00	196.00	90% SANDSTONE, light to medium grey, fine to medium grained, interbedded with: 10% MUDSTONE, dark grey.
196.00	208.00	SANDSTONE, grey, medium grained, quartzose (>90% quartz) and moderately sorted. Quartz 90 %,lithics 5 %,feldspar 5%.
208.00	215.00	SANDSTONE, light to medium grey, fine grained, quartz lithic with quartzose (>90% quartz) near base of unit.
215.00	223.00	95% SANDSTONE, light to medium grey, fine to medium grained, quartzose (>90% quartz) sub-angular moderately sorted, rare pyrite fragments, interbedded with: 5% MUDSTONE, dark grey.
223.00	230.00	SANDSTONE, light to medium greenish-grey, medium grained, quartz feldspathic with rare pyritic mudstone sub-angular moderately sorted.
230.00	231.00	SANDSTONE, light to medium greenish-grey, fine grained, quartz feldspathic sub-angular moderately sorted with minor mudstone bands and rare coal.
231.00	233.00	65% MUDSTONE, dark blackish-grey, shaly in part, interbedded with: 35% SANDSTONE, light to medium greenish-grey, fine to medium grained, quartz feldspathic sub-angular well sorted and minor coal lenses near base of unit.
233.00	242.00	95% SANDSTONE, light to medium bluish-grey, fine to medium grained, quartz feldspathic well sorted sub-angular, with bands of: 5% MUDSTONE, dark blackish-grey, with some rare sporadic coal fragments near top of unit.

FROM	TO	LITHOLOGY
242.00	244.00	90% SANDSTONE, light to medium grey, fine grained, quartzose (>90% quartz) sub-rounded well sorted, with bands of: 10% MUDSTONE, dark grey, minor pyritic fragments.
244.00	246.00	55% SANDSTONE, light grey, fine to medium grained, quartzose (>90% quartz) well sorted sub-angular, intermixed with: 35% MUDSTONE, dark blackish-grey, shaly in part with minor coal bands. 10% DOLERITE, dark blackish-grey, fine grained, sill.
246.00	254.00	95% SANDSTONE, light to medium grey, fine to medium grained, quartz lithic moderately sorted sub-angular, with bands of: 5% MUDSTONE, dark blackish-grey.
254.00	257.00	90% MUDSTONE, dark blackish-grey, with minor argillaceous bands. 10% SANDSTONE, light to medium greenish-grey, fine grained, near base of unit quartz feldspathic.
257.00	261.00	90% SANDSTONE, light to medium greenish-grey, fine grained, quartz lithic well sorted sub-angular, irregularly interbedded with: 10% MUDSTONE, dark blackish-grey, near top of unit slightly shaly.
261.00	263.00	55% SANDSTONE, light to medium greenish-grey, fine to medium grained, quartz lithic well sorted sub-angular, interbedded with: 45% MUDSTONE, dark blackish-grey.
263.00	265.00	SANDSTONE, light to medium greenish-grey, fine to medium grained, quartz lithic moderately sorted sub-angular with minor mudstone bands.
265.00	266.00	SANDSTONE, light to medium greenish-grey, fine grained, quartz lithic well sorted sub-rounded.
266.00	267.00	95% SANDSTONE, light to medium greenish-grey, fine to medium grained, quartz lithic moderately sorted sub-angular, with bands of: 5% MUDSTONE, dark blackish-grey.
267.00	268.00	90% SANDSTONE, light to medium greenish-grey, fine grained, quartz lithic well sorted sub-rounded, with bands of: 10% DOLERITE, dark blackish-grey, fine grained, sill hard.

FROM	TO	LITHOLOGY
268.00	269.00	SANDSTONE, light to medium greenish-grey, fine grained, quartzose (>90% quartz) well sorted sub-angular.
269.00	272.00	65% SANDSTONE, light to medium greenish-grey, fine grained, quartzose (>90% quartz) *moderately sorted sub-angular.* 15% MUDSTONE, dark greyish-black, hard granular quartzose (>90% quartz).
272.00	275.00	SANDSTONE, light to medium greenish-grey, fine to medium grained, quartz feldspathic moderately sorted sub-angular with some lithic (predominately rock fragments) fragments and minor mudstone bands, rare mica.
275.00	276.00	SANDSTONE, light to medium greenish-grey, fine to medium grained, quartz lithic moderately sorted sub-angular.
276.00	277.00	85% MUDSTONE, light to medium whitish-grey, interbedded with: 15% SANDSTONE, light to medium greenish-grey, fine to medium grained, quartz lithic poorly sorted sub-angular.
277.00	279.00	80% SANDSTONE, light to medium greenish-grey, fine to medium grained, quartz feldspathic moderately sorted sub-angular, irregularly interbedded with: 20% MUDSTONE, light to medium whitish-grey, hard.
279.00	282.00	60% SANDSTONE, light to medium greenish-grey, fine grained, quartz lithic moderately sorted sub-angular. 40% MUDSTONE, medium to dark grey.
282.00	285.00	90% SANDSTONE, light to medium greenish-grey, fine to medium grained, quartz lithic moderately sorted sub-angular, irregularly interbedded with: 10% MUDSTONE, light to dark grey, silty in part.
285.00	292.00	95% SANDSTONE, light to medium greenish-grey, fine to medium grained, quartz lithic moderately sorted sub-angular, rare pyrite nodules, with bands of: 5% MUDSTONE, dark blackish-grey.
292.00	293.00	80% SANDSTONE, light to medium greenish-grey, medium to coarse grained, lithic (predominately rock fragments) moderately sorted sub-angular, interbedded with: 20% CLAY, white, slightly ferruginous, sticky.

FROM	TO	LITHOLOGY
293.00	295.00	SANDSTONE, medium to dark grey, fine to medium grained, lithic (predominately rock fragments) moderately sorted sub-angular with sporadic argillaceous and mudstone bands.
295.00	302.00	SANDSTONE, light to medium grey, fine to medium grained, quartz lithic well sorted sub-angular.
302.00	304.00	SANDSTONE, light to medium greenish-grey, medium grained, lithic (predominately rock fragments) moderately sorted sub-angular.
	304.00	********** TOTAL DEPTH **********

268

11 Jun 82

HOLE NUMBER : CA 111

DATA SOURCE : Marathon Pet. Aust, Ltd

LOGGER : Ross MacConnachie

Date commenced : 16 Apr 82

Date completed : 12 May 82

LOCATION:

NORTHING : 51797.82

EASTING : 4889.36

ELEVATION :

DRILLING:

CONTRACTOR : Stackpoole Drilling

DRILL TYPE :

HOLE SIZE : 960

CORE SIZE :

TOTAL DEPTH : 171.50m

GEOPHYSICAL:

CONTRACTOR : BPB Instruments

PROBE DEPTH : 168.00m

LOGS RUN : Natural Gamma
Long Spaced Density
Caliper
Resistivity
Bed Resolution Density

FROM	TO	LITHOLOGY
		********** CHIP DESCRIPTION **********
		ROLLER BIT
0.00	2.00	CLAY, light to dark yellowish-brown, arenaceous in part with some boulder.
		HAMMER
2.00	5.00	85% CLAY, medium to dark yellowish-brown, arenaceous, highly weathered, with clasts of: 15% DOLERITE, green, pebble, highly weathered.
5.00	8.00	95% SANDSTONE, medium to dark brownish-green, fine to medium grained, lithic (predominately rock fragments) moderately sorted angular, highly weathered, with clasts of: 5% CLAY, light to medium reddish-orange, argillaceous matrix near top of unit, highly weathered, grading into:
		ROLLER BIT
8.00	12.00	SAND, light to medium green, fine to medium grained, lithic (predominately rock fragments) poorly sorted angular, moderately weathered, grading into:
12.00	17.00	SAND, light to medium greenish-brown, fine grained, litho-feldspathic (<80% qtz, rf>felds) moderately sorted sub-angular, moderately weathered, grading into:
17.00	18.00	SAND, light to medium brown, fine to medium grained, quartz lithic moderately sorted sub-angular, slightly weathered.
		********** CORE DESCRIPTION **********
		DIAMOND CORING
18.00	18.14	NO SAMPLE RETURN. Core loss
18.14	18.25	GRAVEL, mottled grey, pebble, basaltic and arenaceous, very broken core.
		********** BASE OF ALLUVIUM **********
18.25	18.65	SANDSTONE, light to medium yellowish-brown, fine grained, quartzose (>90% quartz), moderately weak rock, slightly weathered, very broken core, with mud pellers.
18.65	19.70	SANDSTONE, light to medium yellowish-brown, fine to medium grained, quartzose (>90% quartz), moderately weak rock, slightly weathered, very broken core, joints with moderately close spacing with open, non-planar, discontinuities.

270

FROM	TO	LITHOLOGY
19.70	19.74	CLAYSTONE, white, sticky, firm.
19.74	20.30	SANDSTONE, light to medium orangy-brown, medium grained, quartz feldspathic, broken core, slightly weathered, moderately weak rock, joints with open, planar, rough discontinuities.
20.30	21.55	NO SAMPLE RETURN. Core loss
21.55	22.01	SANDSTONE, medium to dark greenish-blue, fine to medium grained, litho-feldspathic (<80% qtz, rf>felds), very broken core, slightly weathered, weak rock, joints with moderately close spacing, occasional yellow iron oxide staining.
22.01	22.35	SANDSTONE, medium to dark bluish-green, fine grained, litho-feldspathic (<80% qtz, rf>felds), moderately weak rock, slightly weathered, broken core, occasional yellow iron oxide staining.
22.35	22.48	60% SANDSTONE, medium to dark bluish-green, fine grained, litho-feldspathic (<80% qtz, rf>felds), very broken core, slightly weathered, intermixed with: 40% MUDSTONE, medium to dark yellowish-brown, very broken core, slightly weathered.
22.48	23.95	NO SAMPLE RETURN. Core loss
23.95	24.03	45% SANDSTONE, medium to dark greenish-blue, medium grained, feldspatho-lithic (<80% qtz, felds>rf.), weak rock, slightly weathered. 55% SANDSTONE, light to medium greenish-brown, fine to medium grained, lithic (predominately rock fragments), moderately weak rock, slightly weathered, very broken core.
24.03	24.23	SANDSTONE, light to medium greenish-blue, medium grained, feldspatho-lithic (<80% qtz, felds>rf.), moderately weak rock, slightly weathered, broken core, joints with moderately close spacing with tight, planar, smooth discontin's.
24.23	24.65	NO SAMPLE RETURN. Core loss
24.65	24.99	SANDSTONE, light to medium brownish-blue, medium grained, litho-feldspathic (<80% qtz, rf>felds) poorly sorted and granular near top of unit, very broken core, slightly weathered, moderately weak rock.

271

FROM	TO	LITHOLOGY
24.99	25.10	SANDSTONE, light to medium brownish-green, very fine grained, lithic (predominately rock fragments) argillaceous matrix and pebbly angular in part, very stiff, slightly weathered, broken core, erosional basal contact.
25.10	25.50	SANDSTONE, light to medium bluish-green, fine to medium grained, litho-feldspathic (<80% qtz, rf>felds), moderately weak rock, broken core, abrupt basal contact.
25.50	25.70	MUDSTONE, green, arenaceous and pebbly near middle of unit, firm, broken core, abrupt basal contact, joints with moderately close spacing with slickensides, rare red iron oxide on joint surfaces.
25.70	25.92	MUDSTONE, varigated blackish-green, carbonaceous in part, stiff, broken core, abrupt basal contact.
25.92	26.80	SANDSTONE, medium to dark greenish-brown, fine to medium grained, litho-feldspathic (<80% qtz, rf>felds), firm, moderately weathered, very broken core, abrupt basal contact.
26.80	26.90	CARBONACEOUS MUDSTONE, dark greyish-black, soft, fragmented.
26.90	27.65	NO SAMPLE RETURN. Core loss
27.65	27.91	80% CARBONACEOUS MUDSTONE, dark bluish-black, argillaceous with numerous, stiff, unweathered, joints with tight, planar, smooth discontin's, intermixed with: 20% SANDSTONE, pale bluish-grey, very fine grained, clasts and lenses quartz lithic, stiff, broken core, with disturbed bedding.
27.91	27.95	CLAYSTONE, dark orangy-brown, slightly carbonaceous, very stiff, broken core, massive, slight brown iron oxide staining.
27.95	27.98	CLAYSTONE, light to medium whitish-green, fragmented, very stiff, deformed basal contact.
27.98	28.04	80% SANDSTONE, pale brownish-grey, medium grained, litho-feldspathic (<80% qtz, rf>felds) well sorted, moderately weak rock, broken core, joints with open, non-planar, discontinuities. 20% CLAYSTONE, light to medium whitish-green, very stiff, transitional basal contact.

272

FROM	TO	LITHOLOGY
28.04	28.43	SANDSTONE, pale brownish-grey, medium grained, litho-feldspathic (<80% qtz, rf>felds) well sorted, moderately weak rock, broken core, abrupt basal contact.
28.43	28.47	MUDSTONE, light brownish-tan, silty with arenaceous fragments, weak rock, broken core.
28.47	28.55	SANDSTONE, light to medium bluish-green, fine to medium grained, lithic (predominately rock fragments), weak rock, broken core, deformed basal contact, joints with wide spacing with open, planar, smooth discontin's.
28.55	28.65	SANDSTONE, pale brownish-grey, fine to medium grained, litho-feldspathic (<80% qtz, rf>felds), weak rock, broken core, massive, deformed basal contact.
28.65	28.89	BRECCIA, mottled greenish-orange, medium to coarse grained, arenaceous matrix fining upwards hard near base of unit poorly sorted pebbly angular mudstone, very stiff, slightly weathered, broken core, transitional basal contact, joints with moderately wide spacing.
28.89	29.00	BRECCIA, dark reddish-brown, pebble, numerous mudstone fragments, very broken core, slightly weathered, deformed basal contact, with slickensides.
29.00	29.13	SANDSTONE, light whitish-brown, fine to medium grained, litho-feldspathic (<80% qtz, rf>felds) with numerous mudstone fragments, moderately weak rock, slightly weathered, broken core, deformed basal contact, joints.
29.13	29.18	BRECCIA, medium to dark orangy-brown, pebble, mudstone with arenaceous fragments, stiff, very broken core, abrupt basal contact.
29.18	29.49	SANDSTONE, pale brownish-white, fine to medium grained, litho-feldspathic (<80% qtz, rf>felds), moderately weak rock, broken core.
29.49	30.65	NO SAMPLE RETURN.
30.65	30.77	SANDSTONE, pale greenish-brown, fine to medium grained, quartz lithic with sub-rounded, moderately weak rock, very broken core. Dolerite pebbles

273

FROM	TO	LITHOLOGY
30.77	30.93	SANDSTONE, varigated greenish-brown, fine to medium grained, quartz lithic poorly sorted with mudstone clasts, broken core, weak rock.
30.93	31.10	BRECCIA, varigated blackish-tan, pebble, sub-angular arenaceous with minor arenaceous matrix, loose, very broken core, transitional basal contact. Dolerite pebbles
31.10	31.14	BRECCIA, varigated greenish-brown, arenaceous litho-feldspathic (<80% qtz, rf>felds) clasts and matrix, fragmented, slightly weathered, soft.
31.14	33.65	NO SAMPLE RETURN.
33.65	33.69	SANDSTONE, light to medium greenish-brown, fine grained, litho-feldspathic (<80% qtz, rf>felds), very broken core, unweathered, weak rock.
33.69	33.96	50% SANDSTONE, light to medium orangy-brown, fine grained, litho-feldspathic (<80% qtz, rf>felds), broken core, with clasts of: 50% SANDSTONE, pale brownish-tan, fine grained, litho-feldspathic (<80% qtz, rf>felds) sub-rounded pebbles, weak rock. Incomplete alteration gives "clasts"
33.96	34.13	SANDSTONE, varigated yellowish-green, litho-feldspathic (<80% qtz, rf>felds), weak rock, very broken core, transitional basal contact.
34.13	34.80	SANDSTONE, mottled bluish-grey, medium grained, litho-feldspathic (<80% qtz, rf>felds), broken core, unweathered, moderately weak rock, massive, transitional basal contact, joints with wide spacing, rare yellow iron oxide staining.
34.80	35.27	SANDSTONE, mottled brownish-grey, medium grained, litho-feldspathic (<80% qtz, rf>felds), very broken core, moderately weak rock, massive, abrupt basal contact, moderate yellow iron oxide staining.
35.27	36.50	65% METAMORPHIC ROCK, green, argillaceous, very stiff, broken core, common calcite disseminated. 35% DOLERITE, dark grey, fine grained, poorly sorted angular in part and sub-rounded in part, strong rock. Granule to 9cm size range with someCalcite veins
36.50	36.65	NO SAMPLE RETURN.

FROM	TO	LITHOLOGY
36.65	37.40	60% METAMORPHIC ROCK, green, argillaceous slightly granular, very stiff, transitional basal contact, common calcite disseminated, with cobbles of: 40% DOLERITE, dark grey, fine grained, poorly sorted angular, strong rock, broken core.
37.40	39.62	50% METAMORPHIC ROCK, green, argillaceous slightly granular, very weak rock, common calcite disseminated. 50% DOLERITE, dark grey, fine grained, angular, strong rock. Fractured around rim of dolerite
39.62	39.65	NO SAMPLE RETURN.
39.65	40.70	50% BRECCIA, green, matrix arenaceous in part, weak rock, occasional calcite disseminated, with cobbles of: 50% DOLERITE, dark grey, fine grained, angular, strong rock, broken core, transitional basal contact.
40.70	40.80	60% BRECCIA, pale brownish-green, argillaceous matrix, weak rock, abundant red iron oxide staining. 40% DOLERITE, dark grey, fine grained, sub-angular, broken core, abrupt basal contact.
40.80	41.29	70% BRECCIA, medium to dark greenish-grey, argillaceous arenaceous matrix, loose, with cobbles of: 30% DOLERITE, dark grey, angular, moderately strong rock.
41.29	42.65	DOLERITE, very broken core, slightly weathered. Brecciated in parts with hard green Sandy matrix and minor brown clayey Matrix. gypsum? on cobble faces
42.65	44.74	70% DOLERITE, dark greyish-grey, fine grained, cobbles, moderately strong rock, slightly weathered, transitional basal contact, joints, rare brown iron oxide staining, intermixed with: 30% CLAYSTONE, medium to dark yellowish-grey, matrix slightly fibrous with mudstone clasts, very weak rock, broken core. And dolerite cobbles
44.74	45.10	DOLERITE, medium to dark greenish-brown, fine grained, very broken core, slightly weathered, abrupt basal contact. Brecciated with pebbles in silty'matrix'.
45.10	45.60	DOLERITE, dark grey, medium grained, strong rock, unweathered, solid core, abrupt basal contact.
45.60	45.65	BRECCIA, medium to dark greenish-grey, fragmented.

FROM	TO	LITHOLOGY
45.65	47.68	65% BRECCIA, mottled greyish-brown, pebbly with mudstone cobbles silty matrix, weak rock, broken core. 35% DOLERITE, dark greenish-grey, fine to medium grained, moderately weak rock, abrupt basal contact.
47.68	47.97	DOLERITE, dark grey, fine grained, solid core, strong rock, abrupt basal contact. Large boulder in breccia?
47.97	48.35	BRECCIA, mottled greyish-brown, pebble, with arenaceous and doleritic clasts and cobbles sub-angular in part, moderately strong rock, broken core, very weak rock, abrupt basal contact.
48.35	48.58	SANDSTONE, pale brownish-grey, fine grained, feldspatho-lithic (<80% qtz, felds>rf.) poorly sorted sub-angular, moderately strong rock, solid core, slight yellow iron oxide staining. Boulder in breccia?
48.58	48.65	NO SAMPLE RETURN. Core loss
48.65	48.93	SANDSTONE, pale brownish-grey, fine grained, feldspatho-lithic (<80% qtz, felds>rf.), moderately strong rock, solid core, abrupt basal contact.
48.93	50.22	BRECCIA, dark greenish-grey, pebble, minor matrix with, weak rock, broken core, transitional basal contact, slight yellow iron oxide staining. Dolerite clasts to cobble size
50.22	51.00	CLAYSTONE, pale greyish-brown, arenaceous in part with rare arenaceous fragments, weak rock, broken core, transitional basal contact, moderate yellow iron oxide staining. Dolerite fragments.
51.00	51.07	SANDSTONE, light to medium bluish-green, fine grained, litho-feldspathic (<80% qtz, rf>felds), broken core, weak rock, slight yellow iron oxide staining. Fragmented with massive milky matrix
51.07	51.16	SANDSTONE, light to medium bluish-green, fine grained, litho-feldspathic (<80% qtz, rf>felds), solid core, weak rock, abrupt basal contact.
51.16	51.25	SANDSTONE, light to medium orangy-brown, fine grained, litho-feldspathic (<80% qtz, rf>felds), broken core, very stiff, transitional basal contact, joints with moderately wide spacing with open, planar, rough discontinuities, moderate brown iron oxide staining.

FROM	TO	LITHOLOGY
51.25 -	52.14	SANDSTONE, mottled bluish-brown, fine to medium grained, litho-feldspathic (<80% qtz, rf>felds), very weak rock, broken core, abrupt basal contact, joints with wide spacing with open, non-planar, discontinuities, slight brown iron oxide staining.
52.14 -	53.15	DOLERITE, varigated greenish-grey, fine grained, pebbles and some cobbles, very stiff, broken core, common calcite disseminated. Serpentinitic matrix with some Indistinct dolerite boundaries
53.15 -	53.28	BRECCIA, dark greenish-grey, pebbly, very stiff, very broken core, slight red iron oxide staining. Dolerite with serpentinitic matrix
53.28 -	54.54	BRECCIA, pale greyish-brown, pebble, mudstone clasts poorly sorted with argillaceous matrix, solid core, very weak rock, deformed basal contact. Bleached appearance with some pale Blue coloured regions
54.54 -	54.65	MUDSTONE, dark blackish-grey, with numerous hard arenaceous and some mudstone pebbles slightly carbonaceous, broken core, weak rock.
54.65 -	55.10	MUDSTONE, medium to dark bluish-black, slightly carbonaceous with hard slightly carbonaceous mudstone and slightly carbonaceous arenaceous angular clasts, weak rock, solid core, erosional basal contact.
55.10 -	56.34	SANDSTONE, light bluish-grey, fine grained, quartzose (>90% quartz) fining upwards numerous hard arenaceous clasts with slightly carbonaceous arenaceous and mudstone lenses and slightly carbonaceous clasts near top of unit and near middle of unit, very stiff, solid core, with disturbed bedding, transitional basal contact.
56.34 -	56.77	MUDSTONE, medium to dark blackish-grey, slightly carbonaceous arenaceous with mudstone and rare pebbles, stiff, broken core, transitional basal contact.
56.77 -	57.65	SANDSTONE, pale bluish-grey, fine grained, quartz feldspathic slightly carbonaceous in part pebbly with mudstone clasts and mudstone pebbly bands and sporadic carbonaceous lenses near base of unit and near top of unit, stiff, thinly bedded.

277

FROM	TO	LITHOLOGY
57.65	57.83	MUDSTONE, dark bluish-grey, slightly carbonaceous in part with pebbles and granular mudstone clasts, weak rock, broken core, abrupt basal contact, joints with open, non-planar, discontinuities.
57.83	57.85	MUDSTONE, dark blackish-grey, carbonaceous with numerous peaty clasts, weak rock, broken core, abrupt basal contact.
57.85	57.88	COAL, HEAVY (INFERIOR COAL), black, broken core, abrupt basal contact.
57.88	58.13	MUDSTONE, dark bluish-grey, some carbonaceous lenses near top of unit and numerous mudstone clasts, weak rock, solid core, transitional basal contact, joints with open, non-planar, discontinuities.
58.13	58.30	MUDSTONE, medium to dark grey, arenaceous with minor granular mudstone clasts, very stiff, fragmented, joints with moderately close spacing.
58.30	58.37	CLAYSTONE, medium to dark bluish-grey, minor mudstone lenses near base of unit, stiff, broken core, massive.
58.37	58.76	MUDSTONE, slightly arenaceous with rare lithic (predominately rock fragments) fragments and numerous mudstone pellets, very stiff, very broken core, abrupt basal contact.
58.76	58.84	SANDSTONE, dark greyish-black, very fine grained, carbonaceous poorly sorted, very stiff, broken core, transitional basal contact.
58.84	58.85	CLAYSTONE, light greyish-green, broken core, stiff, transitional basal contact.
58.85	59.05	MUDSTONE, mottled grey, carbonaceous in part and with mudstone pebbles throughout interval, weak rock, broken core, abrupt basal contact.
59.05	59.40	80% SANDSTONE, medium to dark bluish-grey, fine grained, litho-feldspathic (<80% qtz, rf>felds) argillaceous matrix, weak rock, joints with moderately close spacing with open, planar, rough discontinuities, intermixed with: 20% SANDSTONE, medium to dark blackish-grey, fine grained, litho-feldspathic (<80% qtz, rf>felds) moderately sorted, moderately strong rock, solid core.

278

FROM	TO	LITHOLOGY
59.40	59.49	SANDSTONE, medium to dark bluish-grey, fine grained, litho-feldspathic (<80% qtz, rf>felds) argillaceous matrix, fragmented, firm.
59.49	60.30	NO SAMPLE RETURN. Core loss
60.30	60.32	SILTSTONE, medium to dark greenish-grey, fragmented, weak rock, massive.
60.32	60.54	SANDSTONE, medium to dark grey, medium grained, lithic (predominately rock fragments) poorly sorted, weak rock, broken core, transitional basal contact, joints with moderately wide spacing with open, planar, rough discontinuities.
60.54	60.74	SANDSTONE, medium to dark grey, fine grained, lithic (predominately rock fragments) with well sorted lenses and lenses with well-rounded slightly carbonaceous mudstone clasts, weak rock, broken core, medium bedded, abrupt basal contact, joints with moderately close spacing with open, non-planar, discontinuities.
60.74	60.77	MUDSTONE, dark blackish-grey, carbonaceous, very broken core, very stiff, transitional basal contact.
61.77	61.20	SANDSTONE, medium to dark grey, fine to medium grained, lithic (predominately rock fragments) mudstone matrix with rare mudstone clasts near top of unit and some well sorted phases carbonaceous partings near base of unit, very stiff, solid core, abrupt basal contact.
61.20	61.62	SANDSTONE, light to dark grey, fine to medium grained, lithic (predominately rock fragments) fining upwards moderately sorted, moderately weak rock, broken core, abrupt basal contact.
61.62	61.64	MUDSTONE, dark blackish-grey, slightly carbonaceous, weak rock, broken core, abrupt basal contact.
61.64	61.80	SANDSTONE, medium to dark grey, fine to medium grained, lithic (predominately rock fragments) well sorted bands minor mudstone lenses, moderately weak rock, solid core, with scour and fill structures, abrupt basal contact.
61.80	61.81	CARBONACEOUS MUDSTONE, black, solid core, weak rock, abrupt basal contact.

279

FROM	TO	LITHOLOGY
61.81	62.05	70% SANDSTONE, light to medium grey, fine grained, lithic (predominately rock fragments), weak rock, interbedded with: 30% SANDSTONE, medium to dark grey, medium to coarse grained, near middle of unit lithic (predominately rock fragments), weak rock, solid core, with mud pellers, abrupt basal contact.
62.05	62.25	SANDSTONE, medium to dark bluish-grey, very fine grained, lithic (predominately rock fragments), weak rock, broken core, abrupt basal contact, joints with moderately wide spacing with open, planar, smooth discontin's.
62.25	62.40	SANDSTONE, medium to dark bluish-grey, medium grained, lithic (predominately rock fragments) some carbonaceous lenses near base of unit, weak rock, broken core, with planar bedding, abrupt basal contact.
62.40	62.46	50% SANDSTONE, medium to dark bluish-grey, fine grained, lithic (predominately rock fragments) argillaceous matrix, very weak rock, transitional basal contact, intermixed with: 50% MUDSTONE, dark blackish-grey, carbonaceous, very stiff, broken core, abrupt basal contact.
62.46	62.49	MUDSTONE, dark blackish-grey, carbonaceous in part with slightly arenaceous lenses, with planar bedding, abrupt basal contact.
62.49	62.50	CLAYSTONE, light to medium purplish-grey, stiff, broken core, abrupt basal contact.
62.50	62.97	CLAYSTONE, light to medium bluish-grey, some coal fragments, very stiff, very broken core, joints with moderately close spacing.
62.97	63.15	NO SAMPLE RETURN. Core loss
63.15	63.17	NO SAMPLE RETURN, dark grey, mudstone clasts and arenaceous fragments, fragmented, loose. Approx.60cm of loose material
63.17	63.19	CLAYSTONE, pale bluish-grey, weak rock, very broken core, massive.
63.19	63.25	SANDSTONE, medium to dark green, fine to medium grained, litho-feldspathic (<80% qtz, rf>felds), moderately weak rock, very broken core.

FROM	TO	LITHOLOGY
63.25	63.50	MUDSTONE, mottled grey, carbonaceous lenses, very stiff, very broken core.
63.50	63.65	SANDSTONE, dark grey, fine grained, lithic (predominately rock fragments) slightly carbonaceous argillaceous matrix, very broken core, weak rock, massive.
63.65	63.72	SANDSTONE, mottled greenish-grey, fine grained, litho-feldspathic (<80% qtz, rf>felds), fragmented, moderately weak rock.
63.72	63.84	SANDSTONE, medium to dark grey, fine to medium grained, litho-feldspathic (<80% qtz, rf>felds) some carbonaceous laminae, broken core, moderately weak rock, with cross lamination, transitional basal contact, joints with moderately wide spacing.
63.84	64.01	MUDSTONE, medium to dark blackish-grey, slightly arenaceous in part and slightly carbonaceous, very weak rock, broken core, abrupt basal contact, joints.
64.01	64.07	CLAYSTONE, medium to dark brownish-grey, some arenaceous fragments, very stiff, broken core, abrupt basal contact.
64.07	64.46	MUDSTONE, light to dark brown, slightly carbonaceous in part argillaceous, stiff, very broken core.
64.46	64.55	CARBONACEOUS MUDSTONE, dark brownish-black, some argillaceous lenses, stiff, broken core, abrupt basal contact.
64.55	64.69	MUDSTONE, dark bluish-grey, argillaceous with minor arenaceous fragments pebbles and carbonaceous near base of unit, very stiff, broken core, abrupt basal contact.
64.69	64.71	CARBONACEOUS MUDSTONE, brownish-black, pebbly, very broken core, weak rock, abrupt basal contact.
64.71	64.77	CLAYSTONE, pale orangy-brown, stiff, solid core, abrupt basal contact.
64.77	64.81	CARBONACEOUS MUDSTONE, dark blackish-brown, with minor argillaceous bands, very stiff, broken core, abrupt basal contact.

FROM	TO	LITHOLOGY
64.81	64.83	CLAYSTONE, pale pinkish-brown, broken core, stiff, transitional basal contact.
64.83	64.86	CARBONACEOUS MUDSTONE, black, broken core, stiff, transitional basal contact.
64.86	65.05	CLAYSTONE, pale pinkish-brown, with some carbonaceous lenses, broken core, stiff, abrupt basal contact.
65.05	65.06	CARBONACEOUS MUDSTONE, black, slightly coal, very broken core, abrupt basal contact.
65.06	65.09	CARBONACEOUS MUDSTONE, brownish-black, broken core, very stiff, abrupt basal contact.
65.09	65.11	COAL, HEAVY (INFERIOR COAL), black, very broken core, abrupt basal contact.
65.11	65.30	MUDSTONE, brownish-black, carbonaceous near top of unit and near base of unit with sporadic thin coal bands throughout interval, weak rock, very broken core, abrupt basal contact, joints with moderately close spacing.
65.30	65.35	CLAYSTONE, pale grey, very stiff, broken core, abrupt basal contact.
65.35	65.51	MUDSTONE, medium to dark grey, carbonaceous with thin coal bands near base of unit, weak rock, very broken core, abrupt basal contact.
65.51	65.53	COAL, <10% BRIGHT, black, very broken core, abrupt basal contact.
65.53	65.62	MUDSTONE, medium to dark blackish-grey, carbonaceous, abrupt basal contact, joints.
65.62	65.65	COAL, <10% BRIGHT, black, fragmented.
65.65	65.73	COAL, <10% BRIGHT, black, very broken core.
65.73	65.82	COAL, HEAVY (INFERIOR COAL), black, broken core.
65.82	65.83	CLAYSTONE, grey, very broken core.
65.83	66.85	NO SAMPLE RETURN. Wash: Mudstone loose whih some sand Grains and clay bands
66.85	67.36	MUDSTONE, dark blackish-grey, with some argillaceous fragments and mudstone clasts carbonaceous in part, loose, fragmented.

282

FROM	TO	LITHOLOGY
67.36	67.40	COAL, HEAVY (INFERIOR COAL), black, very broken core.
67.40	67.43	COAL, <10% BRIGHT, black, very broken core.
67.43	67.51	COAL, HEAVY (INFERIOR COAL), black, solid core, cleats.
67.51	67.52	CLAYSTONE, dark reddish-brown, slightly carbonaceous, fragmented, very stiff, abrupt basal contact.
67.52	67.57	CLAYSTONE, dark reddish-brown, slightly carbonaceous, solid core, very stiff, abrupt basal contact.
67.57	67.61	MUDSTONE, dark blackish-grey, slightly carbonaceous and silty, moderately weak rock, broken core, abrupt basal contact.
67.61	67.62	COAL, <10% BRIGHT, black, broken core, transitional basal contact.
67.62	67.63	70% CLAYSTONE, pale pinkish-brown, very stiff, interbedded with: 30% COAL, <10% BRIGHT, black, broken core.
67.63	67.67	40% COAL, HEAVY (INFERIOR COAL), black, very broken core, intermixed with: 60% MUDSTONE, greyish-black, very broken core.
67.67	67.75	MUDSTONE, blackish-grey, carbonaceous, broken core, joints.
67.75	67.89	MUDSTONE, blackish-grey, carbonaceous, fragmented, weak rock.
67.89	67.90	CARBONACEOUS MUDSTONE, very broken core, weak rock.
67.91	67.92	CLAYSTONE, greyish-white, firm, abrupt basal contact.
67.92	67.95	CARBONACEOUS MUDSTONE, black, firm, very broken core.
67.95	68.06	COAL, <10% BRIGHT, black, broken core, transitional basal contact.
68.06	68.10	COAL, HEAVY (INFERIOR COAL), brownish-black, broken core, transitional basal contact.
68.10	68.11	COAL, <10% BRIGHT, broken core, abrupt basal contact.
68.11	68.12	CARBONACEOUS MUDSTONE, brownish-black, broken core, abrupt basal contact.

FROM	TO	LITHOLOGY
68.12	68.16	70% COAL, <10% BRIGHT, black, broken core, abrupt basal contact, with bands of: 30% CARBONACEOUS MUDSTONE, brownish-black, thin bands, very stiff, broken core.
68.16	68.45	SILTSTONE, mottled grey, slightly carbonaceous near top of unit with some arenaceous bands, weak rock, broken core, transitional basal contact, joints.
68.45	68.84	SANDSTONE, light to medium grey, fine grained, lithic (predominately rock fragments) with minor silty bands near top of unit some carbonaceous partings near base of unit, broken core, moderately weak rock, with planar bedding, abrupt basal contact.
68.84	69.01	MUDSTONE, medium to dark grey, some pebbly clasts, very stiff, very broken core, abrupt basal contact.
69.01	69.17	SILTSTONE, medium to dark grey, minor arenaceous bands, moderately weak rock, broken core, transitional basal contact, joints.
69.17	69.19	MUDSTONE, medium to dark brownish-grey, very broken core, stiff.
69.19	69.42	SILTSTONE, light to medium grey, with sporadic arenaceous lenses slightly carbonaceous partings, moderately weak rock, broken core, with cross lamination, transitional basal contact, joints.
69.42	69.75	SANDSTONE, light grey, very fine grained, litho-feldspathic (<80% qtz, rf>felds) with numerous slightly carbonaceous siltstone laminae near top of unit, moderately weak rock, broken core, joints.
69.65	70.54	MUDSTONE, varigated blackish-grey, silty with numerous slightly carbonaceous partings, solid core, moderately weak rock, with planar bedding, very thinly bedded, transitional basal contact.
70.54	70.67	MUDSTONE, blackish-grey, silty with slightly carbonaceous partings, solid core, moderately weak rock, with planar bedding, transitional basal contact, very thinly bedded, joints with moderately close spacing with tight, planar, smooth discontin's.

284

FROM	TO	LITHOLOGY
70.67	72.06	MUDSTONE, blackish-grey, slightly carbonaceous with silty laminae throughout interval, solid core, weak rock, with planar bedding.
72.06	72.33	MUDSTONE, blackish-grey, slightly carbonaceous silty, moderately weak rock, solid core, massive, erosional basal contact.
72.33	72.56	MUDSTONE, brownish-black, slightly carbonaceous carbonaceous in part, very broken core, weak rock, transitional basal contact.
72.56	72.99	MUDSTONE, black, slightly carbonaceous slightly slightly silty bands near base of unit, solid core, weak rock, transitional basal contact.
72.99	73.31	MUDSTONE, mottled greyish-black, slightly carbonaceous and with slightly carbonaceous thin silty laminae, solid core, weak rock, abrupt basal contact.
73.31	73.42	MUDSTONE, varigated pinkish-black, carbonaceous with numerous claystone clasts, solid core, weak rock, transitional basal contact.
73.42	73.58	MUDSTONE, brownish-black, carbonaceous with minor thin argillaceous laminae, very broken core, weak rock, transitional basal contact.
73.58	73.63	MUDSTONE, light to dark blackish-brown, argillaceous and carbonaceous, weak rock, broken core, abrupt basal contact.
73.63	73.89	MUDSTONE, black, carbonaceous, very broken core, weak rock.
73.89	73.91	CLAYSTONE, pale pinkish-white, weak rock, broken core, transitional basal contact.
73.91	74.00	CARBONACEOUS MUDSTONE, dark brownish-black, with thin coal lenses near base of unit, broken core, weak rock.
74.00	74.15	NO SAMPLE RETURN. Core loss
74.15	74.23	CARBONACEOUS MUDSTONE, dark brownish-black, with minor thin coal lenses throughout interval, moderately weak rock, solid core, transitional basal contact.
74.23	74.31	CLAYSTONE, with numerous thin coal and carbonaceous lenses throughout interval, solid core, weak rock.

285

FROM	TO	LITHOLOGY
74.31	74.38	CLAYSTONE, pale brownish-grey, fragmented, very stiff, abrupt basal contact.
74.33	74.40	COAL, HEAVY (INFERIOR COAL), black, some claystone lenses near base of unit, solid core, transitional basal contact.
74.40	74.46	CARBONACEOUS MUDSTONE, black, with some carbonaceous argillaceous lenses, solid core, abrupt basal contact.
74.46	74.48	COAL, HEAVY (INFERIOR COAL), black, solid core, abrupt basal contact.
74.48	74.49	CLAYSTONE, pale pinkish-grey, numerous coal lenses, solid core, transitional basal contact.
74.49	74.64	COAL, <10% BRIGHT, black, solid core.
74.64	74.70	COAL, <10% BRIGHT, black, very broken core.
74.70	74.84	MUDSTONE, grey, carbonaceous lenses near top of unit and near base of unit, solid core, abrupt basal contact.
74.84	75.10	CLAYSTONE, pale brownish-grey, some carbonaceous wisps, broken core, weak rock, abrupt basal contact, cleats with moderately close spacing.
75.10	75.20	COAL, <10% BRIGHT, black, very broken core, transitional basal contact.
75.20	75.33	CLAYSTONE, medium to dark pinkish-brown, numerous coal wisps, solid core, transitional basal contact.
75.33	75.34	COAL, <10% BRIGHT, solid core, transitional basal contact.
75.34	75.36	MUDSTONE, medium to dark brownish-grey, some carbonaceous wisps, broken core, moderately weak rock, transitional basal contact, joints with wide spacing.
75.36	75.38	CARBONACEOUS MUDSTONE, dark brownish-black, carbonaceous near base of unit, solid core, moderately weak rock, transitional basal contact.
75.38	75.43	COAL, HEAVY (INFERIOR COAL), black, solid core, transitional basal contact.
75.43	75.52	COAL, <10% BRIGHT, broken core, cleats with moderately close spacing with tight, non-planar discontinuities.

FROM	TO	LITHOLOGY
75.52	75.57	NO SAMPLE RETURN. Core loss
75.57	75.63	70% SANDSTONE, light bluish-grey, very fine grained, quartz lithic, moderately weak rock, interbedded with: 30% CLAY, light bluish-grey, arenaceous in part, stiff, fragmented.
75.63	75.65	CLAY, light bluish-grey, stiff.
75.65	75.81	SANDSTONE, light bluish-grey, fine grained, litho-feldspathic (<80% qtz, rf>felds) with some argillaceous lenses argillaceous matrix coal clasts near base of unit, stiff, broken core.
75.81	75.87	CLAYSTONE, medium to dark brown, thin carbonaceous lenses near top of unit and rare coal lenses near middle of unit carbonaceous near base of unit, very stiff, broken core, erosional basal contact.
75.87	75.90	COAL, <10% BRIGHT, black, thick carbonaceous claystone bands near base of unit, broken core, transitional basal contact.
75.90	76.01	COAL, <10% BRIGHT, black, transitional basal contact.
76.01	76.04	90% CLAY, dark pinkish-brown, weak rock, abrupt basal contact, with lenses of: 10% COAL, <10% BRIGHT, near top of unit and near middle of unit, broken core.
76.04	76.09	COAL, <10% BRIGHT, black, broken core.
76.09	76.15	CARBONACEOUS MUDSTONE, black, conchoidal fragments, very broken core, massive.
76.15	76.18	CARBONACEOUS MUDSTONE, black, fragmented, weak rock.
76.18	76.22	CARBONACEOUS MUDSTONE, black, broken core, weak rock.
76.22	76.32	60% CARBONACEOUS MUDSTONE, black, broken core, deformed basal contact, joints with open, non-planar, discontinuities, intermixed with: 40% CLAY, dark reddish-brown, lenses with rare coal laminae and coal lenses near base of unit, weak rock, transitional basal contact.
76.32	76.40	MUDSTONE, dark blackish-grey, carbonaceous, broken core, weak rock, transitional basal contact.

FROM	TO	LITHOLOGY
76.40	76.55	CARBONACEOUS MUDSTONE, black, weak rock, very broken core, transitional basal contact.
76.55	76.65	CLAYSTONE, dark greyish-brown, carbonaceous in part with carbonaceous wisps near middle of unit, very broken core, weak rock.
76.65	76.93	CLAYSTONE, light to dark greyish-brown, slightly carbonaceous in part, weak rock, very broken core, transitional basal contact.
76.93	77.14	CLAYSTONE, light to medium brownish-grey, thin carbonaceous partings near base of unit, very stiff, solid core, abrupt basal contact.
77.14	77.18	SILTSTONE, light to medium bluish-grey, argillaceous near base of unit, very stiff, broken core, transitional basal contact, joints with open, planar, smooth discontin's.
77.18	77.20	CLAYSTONE, light to dark bluish-grey, siltstone near top of unit, very stiff, broken core.
77.20	77.23	MUDSTONE, dark blackish-brown, claystone near top of unit and carbonaceous near base of unit, very stiff, broken core, transitional basal contact.
77.23	77.32	CLAYSTONE, light to medium brownish-grey, slightly carbonaceous near top of unit with slightly carbonaceous laminae, very stiff, broken core.
77.32	77.35	CLAYSTONE, light grey, very stiff, very broken core.
77.35	77.36	CLAYSTONE, light to medium reddish-brown, weak rock, very broken core, erosional basal contact.
77.36	77.48	CONGLOMERATE, black, minor calcareous lenses, broken core, deformed basal contact.
77.48	77.64	MUDSTONE, light to dark brownish-grey, rare carbonaceous wisps, solid core, weak rock, transitional basal contact.
77.64	77.66	CARBONACEOUS MUDSTONE, dark greyish-brown, carbonaceous laminae, solid core, weak rock, transitional basal contact.
77.66	77.68	MUDSTONE, light to dark brownish-grey, carbonaceous wisps, solid core, transitional basal contact.

288

FROM	TO	LITHOLOGY
77.68	77.83	55% CARBONACEOUS MUDSTONE, dark brownish-black, thin coal laminae, solid core, intermixed with: 45% CLAYSTONE, light to medium brownish-grey, weak rock.
77.83	77.85	NO SAMPLE RETURN. Core loss
77.85	78.01	CARBONACEOUS MUDSTONE, black, very broken core, very stiff, transitional basal contact.
78.01	78.10	65% CLAYSTONE, light to dark pinkish-brown, broken core, transitional basal contact, with lenses of: 35% CARBONACEOUS MUDSTONE, black, weak rock.
78.10	78.44	COAL, HEAVY (INFERIOR COAL), black, with some minor thin argillaceous laminae near top of unit and near middle of unit, broken core, abrupt basal contact.
78.44	78.50	SANDSTONE, light to medium pinkish-brown, very fine grained, argillaceous, very broken core, weak rock, transitional basal contact.
78.50	78.66	CLAYSTONE, pale pinkish-brown, rare slightly carbonaceous wisps, solid core, moderately weak rock.
78.66	79.09	CLAYSTONE, light brownish-grey, solid core, moderately weak rock, transitional basal contact.
79.09	79.21	CLAYSTONE, light to medium pinkish-brown, slightly arenaceous, fragmented, weak rock, abrupt basal contact. Discrepency in depth due to Difference between core and bpb
		********** CORE & GEOPHYSICAL LOGS DESCRIPTION ********
78.62	78.69	CONGLOMERATE, black, thin arenaceous argillaceous bands near top of unit, solid core.
78.69	78.74	COAL, HEAVY (INFERIOR COAL), black, very broken core.
78.74	78.83	COAL, <10% BRIGHT, black, very broken core.
78.83	78.89	CARBONACEOUS MUDSTONE, black, moderately weak rock, solid core.
78.89	78.94	COAL, <10% BRIGHT, black, very broken core.
78.94	78.97	75% CLAYSTONE, dark brown, carbonaceous, very broken core, abrupt basal contact, with lenses of: 25% COAL, <10% BRIGHT, black, near top of unit, weak rock.

289

FROM	TO	LITHOLOGY
78.97	79.00	COAL, HEAVY (INFERIOR COAL), black, solid core, transitional basal contact.
79.00	79.06	COAL, <10% BRIGHT, black, solid core.
79.06	79.12	CARBONACEOUS MUDSTONE, dark brownish-black, broken core, transitional basal contact.
79.12	79.17	CLAYSTONE, dark pinkish-brown, slightly carbonaceous near top of unit, very broken core, abrupt basal contact.
79.17	79.30	COAL, HEAVY (INFERIOR COAL), black, argillaceous wisps near top of unit, solid core, transitional basal contact.
79.30	79.31	CLAYSTONE, light to dark pinkish-brown, solid core, transitional basal contact.
79.31	79.43	CARBONACEOUS MUDSTONE, black, thin coal bands, solid core, deformed basal contact.
79.43	79.45	COAL, 60 - 90% BRIGHT, black, solid core, deformed basal contact.
79.45	79.52	CARBONACEOUS MUDSTONE, black, broken core, transitional basal contact, joints with slickensides.
79.52	79.56	70% COAL, HEAVY (INFERIOR COAL), black, solid core, transitional basal contact. 30% COAL, MID LUSTROUS TO BRIGHT, black, thin near base of unit, solid core.
79.56	79.70	COAL, HEAVY (INFERIOR COAL), black, some thin dull coal bands near base of unit, broken core, transitional basal contact.
79.30	79.73	COAL, <10% BRIGHT, black, broken core, abrupt basal contact.
79.73	79.81	COAL, HEAVY (INFERIOR COAL), black, very broken core.
79.81	79.83	CLAYSTONE, dark brown, carbonaceous, solid core, abrupt basal contact.
79.83	79.91	COAL, HEAVY (INFERIOR COAL), black, solid core, joints.
79.91	79.95	COAL, <10% BRIGHT, black, very broken core, abrupt basal contact.

FROM	TO	LITHOLOGY
79.95	79.99	CLAYSTONE, medium to dark reddish-brown, fragmented.
79.99	80.02	COAL, <10% BRIGHT, fragmented.
80.02	80.18	COAL, <10% BRIGHT, solid core, transitional basal contact.
80.18	80.30	COAL, 10 - 40% BRIGHT, black, with minor claystone bands near middle of unit, solid core, transitional basal contact.
80.30	80.33	CLAYSTONE, dark blackish-brown, carbonaceous, solid core, abrupt basal contact.
80.33	80.48	90% COAL, HEAVY (INFERIOR COAL), black, solid core, abrupt basal contact, with bands of: 10% COAL, MID LUSTROUS TO BRIGHT, black, near middle of unit.
80.48	81.53	COAL, <10% BRIGHT, solid core, transitional basal contact.
80.53	80.60	COAL, HEAVY (INFERIOR COAL), broken core.
80.60	80.61	COAL, 40 - 60% BRIGHT, broken core, abrupt basal contact.
80.61	80.62	COAL, <10% BRIGHT, solid core, abrupt basal contact.
80.62	81.68	CLAY, dark blackish-brown, carbonaceous, solid core, transitional basal contact, irregularly interbedded with: Discrepency = difference core & bpb
		********** CORE DESCRIPTION **********
81.26	81.36	CLAYSTONE, carbonaceous in part, very broken core, moderately weak rock, abrupt basal contact.
81.36	81.52	CLAYSTONE, light to medium pinkish-grey, slightly carbonaceous near top of unit, very broken core, very stiff, abrupt basal contact.
81.52	81.54	CLAYSTONE, light to medium grey, slightly carbonaceous with carbonaceous mudstone lenses, erosional basal contact.
81.54	81.70	CARBONACEOUS MUDSTONE, medium to dark black, minor coal lenses near base of unit, solid core, weak rock. 5 centimetres core gain
81.65	81.89	MUDSTONE, medium to dark brownish-grey, with rare carbonaceous lenses near top of unit, weak rock, solid core, transitional basal contact.

FROM	TO	LITHOLOGY
81.89	82.08	MUDSTONE, dark grey, slightly carbonaceous near base of unit, weak rock. S1
82.08	82.72	SANDSTONE, medium to dark grey, very fine grained, litho-feldspathic (<80% qtz, rf>felds) with rare sporadic coal fragments and lenses near top of unit and sporadic carbonaceous lenses rare near base of unit, solid core, moderately weak rock, transitional basal contact.
82.72	82.86	SILTSTONE, medium to dark brownish-grey, solid core, moderately weak rock, transitional basal contact.
82.86	83.13	MUDSTONE, medium to dark pinkish-grey, slightly silty, solid core, moderately weak rock.
83.13	83.42	SILTSTONE, light to medium pinkish-grey, with some slightly carbonaceous argillaceous laminae, moderately weak rock, broken core, transitional basal contact.
83.42	83.82	SILTSTONE, light to medium grey, with numerous slightly arenaceous laminae fining upwards in part, solid core, moderately weak rock, with planar bedding, very thinly bedded, transitional basal contact.
83.82	83.92	SILTSTONE, slightly arenaceous with some slightly carbonaceous laminae, solid core, moderately weak rock, with cross lamination, transitional basal contact.
83.92	83.98	SANDSTONE, light to medium grey, very fine grained, lithic (predominately rock fragments) well sorted, broken core, moderately weak rock, with cross lamination, abrupt basal contact.
83.98	84.25	SANDSTONE, light to medium bluish-grey, fine grained, lithic (predominately rock fragments), solid core, moderately strong rock, with cross lamination, transitional basal contact.
84.25	84.34	SANDSTONE, light to medium bluish-grey, fine to medium grained, lithic (predominately rock fragments), broken core, moderately strong rock, massive.
84.25	84.26	SANDSTONE, light to medium grey, fine to medium grained, lithic (predominately rock fragments) moderately sorted, very broken core, moderately strong rock, massive, abrupt basal contact.

292

FROM	TO	LITHOLOGY
84.26	84.38	SANDSTONE, medium to dark grey, fine grained, lithic (predominately rock fragments) with some mudstone matrix lenses, solid core, moderately weak rock, with cross lamination, transitional basal contact.
84.38	84.65	SANDSTONE, light bluish-grey, fine grained, lithic (predominately rock fragments) well sorted, broken core, moderately strong rock, massive.
84.65	84.83	SANDSTONE, light bluish-grey, fine grained, lithic (predominately rock fragments) well sorted, solid core, moderately strong rock, massive.
84.83	85.11	SANDSTONE, light to medium grey, very fine grained, lithic (predominately rock fragments) with minor slightly carbonaceous laminae and some thin mudstone bands, broken core, moderately strong rock, with cross lamination, abrupt basal contact.
85.11	86.18	SANDSTONE, pale bluish-grey, fine to medium grained, litho-feldspathic (<80% qtz, rf>felds) well sorted argillaceous matrix sub-angular with rare thin slightly carbonaceous partings near base of unit, solid core, moderately strong rock, massive, transitional basal contact.
86.18	86.31	SANDSTONE, fine to medium grained, litho-feldspathic (<80% qtz, rf>felds) well sorted, solid core, moderately strong rock, massive, transitional basal contact.
86.31	86.87	SANDSTONE, pale bluish-grey, fine to medium grained, litho-feldspathic (<80% qtz, rf>felds) rare thin mudstone partings and wisps near top of unit and slightly fining upwards, solid core, moderately strong rock. Massive apart from sparse Lamination at about 5 degrees
86.87	87.31	SANDSTONE, pale bluish-grey, medium grained, litho-feldspathic (<80% qtz, rf>felds), solid core, moderately strong rock, transitional basal contact. Slight, sparce x-lamination
87.31	87.39	SANDSTONE, light to medium bluish-grey, fine grained, litho-feldspathic (<80% qtz, rf>felds) with sporadic carbonaceous fragments and laminae, solid core, moderately strong rock, transitional basal contact.
87.39	87.46	SANDSTONE, pale bluish-grey, fine grained, litho-feldspathic (<80% qtz, rf>felds) with thin coal lenses, solid core, weak rock, with disturbed bedding, with mud pellers, transitional basal contact.

FROM	TO	LITHOLOGY
87.46	87.66	SANDSTONE, light to medium bluish-grey, fine to medium grained, litho-feldspathic (<80% qtz, rf>felds) well sorted minor rare thin mudstone laminae, broken core, moderately strong rock.
87.65	88.06	SANDSTONE, light bluish-grey, fine to medium grained, litho-feldspathic (<80% qtz, rf>felds) moderately sorted sporadic mudstone laminae with rare coal fragments, broken core, moderately strong rock, with cross lamination, transitional basal contact.
88.06	88.60	SANDSTONE, light bluish-grey, fine to medium grained, litho-feldspathic (<80% qtz, rf>felds) well sorted, solid core, moderately strong rock, joints with wide spacing with tight, non-planar discontinuities, calcite on joint surfaces.
88.60	88.86	SANDSTONE, light bluish-grey, fine to medium grained, litho-feldspathic (<80% qtz, rf>felds) with lenses with sporadic carbonaceous fragments, solid core, moderately strong rock, with cross lamination, transitional basal contact.
88.86	88.99	SANDSTONE, light bluish-grey, medium grained, litho-feldspathic (<80% qtz, rf>felds) with minor carbonaceous lenses and some laminae and rare mudstone fragments, solid core, moderately strong rock, with cross lamination, transitional basal contact.
88.99	89.72	SANDSTONE, light bluish-grey, medium grained, litho-feldspathic (<80% qtz, rf>felds) rare sporadic mudstone laminae, solid core, moderately strong rock, with cross lamination, transitional basal contact.
89.72	90.64	SANDSTONE, light bluish-grey, fine to medium grained, litho-feldspathic (<80% qtz, rf>felds) well sorted, broken core, moderately strong rock, massive.
90.64	90.65	NO SAMPLE RETURN.
90.65	91.37	SANDSTONE, light to medium bluish-grey, medium grained, lithic (predominately rock fragments), solid core, moderately strong rock, massive, transitional basal contact.
91.37	91.52	SANDSTONE, light to medium bluish-grey, fine to medium grained, lithic (predominately rock fragments) rare thin carbonaceous partings, solid core, moderately strong rock, with cross lamination, transitional basal contact.

FROM	TO	LITHOLOGY
91.52	92.01	SANDSTONE, light to medium bluish-grey, fine to medium grained, litho-feldspathic (<80% qtz, rf>felds), solid core, moderately strong rock, with trough cross bedding, transitional basal contact.
92.01	93.63	SANDSTONE, light to medium bluish-grey, fine to medium grained, litho-feldspathic (<80% qtz, rf>felds), solid core, moderately strong rock, with cross lamination.
93.63	93.65	NO SAMPLE RETURN. Core loss
93.65	94.60	SANDSTONE, pale grey, fine grained, lithic (predominately rock fragments), solid core, strong rock. Slight lamination at about 5 deg to Horizontal
94.60	95.00	SANDSTONE, pale grey, fine grained, lithic (predominately rock fragments), strong rock, broken core, massive, transitional basal contact.
95.00	95.60	SANDSTONE, pale grey, fine grained, lithic (predominately rock fragments) with rare sporadic thin mudstone matrix laminae and, broken core, strong rock, with cross lamination, transitional basal contact. A single carbonaceous lense at 65.22 Meters (2mm thick)
95.60	96.65	SANDSTONE, pale grey, fine grained, lithic (predominately rock fragments), strong rock, broken core, massive. Single carbonaceous lense and a few Mudstone clasts at 96.63 metres
96.65	96.71	SANDSTONE, light grey, fine to medium grained, litho-feldspathic (<80% qtz, rf>felds) with thin carbonaceous partings near top of unit sporadic coal fragments and mudstone pebbles, broken core, strong rock, transitional basal contact.
96.71	97.06	SANDSTONE, light grey, fine to medium grained, lithic (predominately rock fragments) rare sporadic mudstone fragments, solid core, strong rock, transitional basal contact.
97.06	97.12	20% SANDSTONE, pale whitish-grey, fine grained, litho-feldspathic (<80% qtz, rf>felds), strong rock, transitional basal contact, with clasts of: 80% MUDSTONE, light to medium grey, angular poorly sorted, moderately weak rock, solid core.

FROM	TO	LITHOLOGY
97.12	97.16	85% SANDSTONE, light grey, fine to medium grained, lithic (predominately rock fragments), strong rock, transitional basal contact, with clasts of: 15% MUDSTONE, light grey, sub-angular with thin carbonaceous lenses near top of unit, moderately weak rock.
97.16	97.24	25% SANDSTONE, pale whitish-grey, fine to medium grained, lithic (predominately rock fragments), strong rock, transitional basal contact, with clasts of: 75% MUDSTONE, light to medium grey, granule cobble, poorly sorted, weak rock.
97.24	97.61	70% SANDSTONE, pale whitish-grey, fine to medium grained, lithic (predominately rock fragments), strong rock, transitional basal contact, interbedded with: 17% MUDSTONE, light to medium grey, poorly sorted, weak rock, with lenses of: 13% COAL, black, solid core, with disturbed bedding.
97.61	97.77	85% SANDSTONE, pale whitish-grey, fine to medium grained, lithic (predominately rock fragments) fining upwards, strong rock, transitional basal contact, with clasts of: 15% MUDSTONE, light to medium grey, pebble, near middle of unit in part and near base of unit, weak rock, solid core.
97.77	98.25	SANDSTONE, pale grey, fine grained, lithic (predominately rock fragments) with minor mudstone clasts near middle of unit and rare sporadic clasts throughout interval, solid core, strong rock, massive, erosional basal contact.
98.25	98.31	CARBONACEOUS MUDSTONE, dark brownish-black, with thin coal laminae near top of unit, broken core, weak rock, abrupt basal contact, occasional calcite infilled vesicles.
98.31	98.38	MUDSTONE, dark blackish-grey, carbonaceous, broken core, moderately weak rock, abrupt basal contact, joints with wide spacing.
98.38	98.42	CLAYSTONE, brownish-grey, with thin carbonaceous mudstone lenses, broken core, moderately weak rock.
98.42	98.46	CARBONACEOUS MUDSTONE, black, solid core, transitional basal contact.
98.46	98.47	CARBONACEOUS MUDSTONE, black, weak rock.

FROM	TO	LITHOLOGY
98.47	98.50	COAL, HEAVY (INFERIOR COAL), black, fragmented, transitional basal contact.
98.50	98.54	COAL, HEAVY (INFERIOR COAL), broken core, abrupt basal contact.
98.54	98.55	CLAYSTONE, medium to dark pinkish-brown, slightly carbonaceous near base of unit, solid core, moderately weak rock, abrupt basal contact.
98.55	98.59	COAL, HEAVY (INFERIOR COAL), solid core.
98.59	98.65	COAL, <10% BRIGHT, black, very broken core, abrupt basal contact.
98.65	98.75	CARBONACEOUS MUDSTONE, black, broken core, moderately weak rock, abrupt basal contact, occasional calcite infilled vesicles.
98.75	99.08	MUDSTONE, medium to dark brownish-grey, slightly carbonaceous in part, weak rock, broken core, abrupt basal contact.
99.08	99.09	COAL, MID LUSTROUS TO BRIGHT, black, fragmented, abrupt basal contact.
99.09	99.18	MUDSTONE, dark blackish-grey, slightly carbonaceous, very broken core, weak rock.
99.18	99.19	COAL, MID LUSTROUS TO BRIGHT, black, fragmented.
99.19	99.65	MUDSTONE, dark blackish-grey, carbonaceous, fragmented, weak rock, joints.
99.65	99.70	90% MUDSTONE, dark blackish-grey, carbonaceous, moderately weak rock, with bands of: 10% COAL, MID LUSTROUS TO BRIGHT, black, thin bands, very broken core.
99.70	99.90	MUDSTONE, dark blackish-grey, carbonaceous with sporadic thin coal bands, moderately weak rock, broken core.
99.90	100.04	80% CARBONACEOUS MUDSTONE, dark greyish-black, with sporadic thin coal lenses near top of unit, fragmented, abrupt basal contact. 20% CLAYSTONE, pale pinkish-brown, near base of unit.
100.04	100.07	65% CARBONACEOUS MUDSTONE, dark brownish-black, weak rock, deformed basal contact, with lenses of: 35% COAL, MID LUSTROUS TO BRIGHT, broken core.

FROM	TO	LITHOLOGY
100.07	100.18	MUDSTONE, light to medium grey, carbonaceous near top of unit with coal wisps sporadic throughout interval, moderately strong rock, solid core, transitional basal contact.
100.18	100.46	MUDSTONE, light to medium grey, silty lenses and rare coal wisps near top of unit, solid core, strong rock, transitional basal contact.
100.46	100.95	SILTSTONE, light to medium grey, with some thin mudstone bands near top of unit and slightly arenaceous bands near base of unit fining upwards, solid core, strong rock, transitional basal contact.
100.95	101.30	SILTSTONE, mottled grey, some silty mudstone bands and some arenaceous bands near base of unit, solid core, strong rock, with cross lamination, transitional basal contact, joints.
101.30	102.15	SANDSTONE, light bluish-grey, very fine grained, lithic (predominately rock fragments) with thin slightly silty bands, solid core, strong rock, with cross lamination, transitional basal contact, joints with open, non-planar, discontinuities, abundant calcite on joint surfaces.
102.15	102.32	SANDSTONE, pale pinkish-green, very fine grained, lithic (predominately rock fragments) with minor mudstone pellets, solid core, strong rock, with trough cross bedding, abrupt basal contact.
102.32	102.58	SANDSTONE, light to medium greyish-blue, very fine grained, lenses, broken core, strong rock, massive.
102.58	102.65	NO SAMPLE RETURN.
102.65	103.40	SANDSTONE, light greyish-blue, very fine grained, lithic (predominately rock fragments), solid core, moderately strong rock, massive, transitional basal contact.
103.40	104.03	SANDSTONE, light to medium greyish-blue, very fine grained, lithic (predominately rock fragments) minor carbonaceous partings near base of unit and rare slightly carbonaceous partings near top of unit, broken core, moderately strong rock, with cross lamination, abrupt basal contact.

FROM	TO	LITHOLOGY
104.03	104.21	SANDSTONE, light bluish-grey, fine to medium grained, litho-feldspathic (<80% qtz, rf>felds), moderately strong rock, solid core, massive, transitional basal contact.
104.21	104.31	SANDSTONE, light to medium bluish-grey, very fine grained, litho-feldspathic (<80% qtz, rf>felds) silty with some carbonaceous partings, moderately strong rock, broken core, abrupt basal contact.
104.31	104.63	SANDSTONE, light bluish-grey, fine grained, litho-feldspathic (<80% qtz, rf>felds), moderately strong rock, solid core, transitional basal contact.
104.63	105.05	SANDSTONE, light bluish-grey, fine grained, litho-feldspathic (<80% qtz, rf>felds) sporadic carbonaceous laminae coal fragments, moderately strong rock, solid core, with cross lamination, transitional basal contact.
105.05	105.62	SANDSTONE, light grey, fine grained, litho-feldspathic (<80% qtz, rf>felds) rare mudstone partings, moderately strong rock, broken core, with cross lamination, joints with wide spacing.
105.62	105.65	NO SAMPLE RETURN. Core loss
105.65	106.42	SANDSTONE, light bluish-grey, fine grained, litho-feldspathic (<80% qtz, rf>felds), solid core, strong rock, massive, transitional basal contact.
106.42	106.89	SANDSTONE, light bluish-grey, fine grained, litho-feldspathic (<80% qtz, rf>felds) rare sporadic carbonaceous laminae, broken core, strong rock, transitional basal contact.
106.89	107.01	80% SANDSTONE, light bluish-grey, fine grained, litho-feldspathic (<80% qtz, rf>felds), moderately strong rock, with lenses of: 20% CARBONACEOUS MUDSTONE, dark reddish-brown, with coal laminae, weak rock, solid core, transitional basal contact.
107.01	108.40	SANDSTONE, light bluish-grey, fine grained, litho-feldspathic (<80% qtz, rf>felds), broken core, transitional basal contact, joints with moderately close spacing with open, planar, rough discontinuities. Rare carbonaceous partings at 107.22 And 108.29 to 108.40m

FROM	TO	LITHOLOGY
108.40	108.70	SANDSTONE, light bluish-grey, fine to medium grained, litho-feldspathic (<80% qtz, rf>felds), strong rock, very broken core, joints with very wide spacing with open, planar, rough discontinuities, common calcite on joint surfaces.
108.70	108.85	SANDSTONE, light grey, fine to medium grained, litho-feldspathic (<80% qtz, rf>felds) minor coal fragments partings, broken core, moderately strong rock, with planar bedding, transitional basal contact.
108.85	109.22	SANDSTONE, light grey, fine grained, litho-feldspathic (<80% qtz, rf>felds) minor argillaceous laminae, solid core, moderately strong rock, with planar bedding, transitional basal contact.
109.22	109.84	SANDSTONE, light grey, fine grained, litho-feldspathic (<80% qtz, rf>felds), broken core, moderately strong rock, massive, transitional basal contact.
109.84	110.73	SANDSTONE, light bluish-grey, fine to medium grained, litho-feldspathic (<80% qtz, rf>felds) with sporadic mudstone pebbles throughout interval, broken core, moderately strong rock, transitional basal contact.
110.73	111.16	SANDSTONE, light grey, fine grained, litho-feldspathic (<80% qtz, rf>felds) with rare minor slightly moderately sorted matrix lenses throughout interval, solid core, moderately strong rock, with planar bedding, transitional basal contact.
111.16	111.65	SANDSTONE, light grey, fine grained, litho-feldspathic (<80% qtz, rf>felds) slightly fining upwards, solid core, moderately strong rock, massive, with mud pellers.
111.65	112.66	SANDSTONE, light grey, fine grained, litho-feldspathic (<80% qtz, rf>felds), very broken core, moderately strong rock, transitional basal contact.
112.66	112.93	SANDSTONE, light grey, fine grained, litho-feldspathic (<80% qtz, rf>felds) carbonaceous partings, very broken core, moderately strong rock, with planar bedding, transitional basal contact.

300

FROM	TO	LITHOLOGY
112.93	113.84	SANDSTONE, light grey, fine to medium grained, litho-feldspathic (<80% qtz, rf>felds), solid core, strong rock.
113.84	114.50	NO SAMPLE RETURN. Core loss
114.50	115.26	SANDSTONE, light grey, fine to medium grained, litho-feldspathic (<80% qtz, rf>felds), solid core, strong rock, transitional basal contact.
115.26	115.91	SANDSTONE, light to medium grey, fine grained, litho-feldspathic (<80% qtz, rf>felds) sporadic carbonaceous partings, solid core, strong rock.
115.91	116.45	SANDSTONE, light grey, fine grained, litho-feldspathic (<80% qtz, rf>felds) fining upwards slightly, solid core, strong rock, massive, transitional basal contact.
116.45	117.50	SANDSTONE, light grey, fine grained, litho-feldspathic (<80% qtz, rf>felds) minor carbonaceous partings near base of unit, solid core, strong rock, with planar bedding.
117.50	118.17	SANDSTONE, light grey, very fine grained, litho-feldspathic (<80% qtz, rf>felds) minor slightly carbonaceous partings near top of unit, solid core, strong rock, with planar bedding, transitional basal contact, joints with open, planar, rough discontinuities, rare calcite on joint surfaces.
118.17	119.67	SANDSTONE, light grey, fine grained, litho-feldspathic (<80% qtz, rf>felds) fining upwards, solid core, strong rock, massive, erosional basal contact.
119.67	119.69	80% CARBONACEOUS MUDSTONE, dark brownish-black, moderately weak rock, abrupt basal contact, with bands of: 20% COAL, MID LUSTROUS TO BRIGHT, black, very broken core.
119.69	119.77	SANDSTONE, light to medium grey, very fine grained, lithic (predominately rock fragments) carbonaceous partings, very broken core, strong rock, with cross lamination, abrupt basal contact.
119.77	119.81	30% SANDSTONE, light whitish-grey, fine grained, litho-feldspathic (<80% qtz, rf>felds), strong rock, with clasts of: 70% MUDSTONE, medium to dark grey, moderately strong rock, fragmented, transitional basal contact.

768219

FROM	TO	LITHOLOGY
119.81	120.47	SANDSTONE, light whitish-grey, fine to medium grained, litho-feldspathic (<80% qtz, rf>felds), very broken core, strong rock.
120.47	120.50	NO SAMPLE RETURN. Core loss
120.50	121.83	SANDSTONE, light whitish-grey, fine to medium grained, litho-feldspathic (<80% qtz, rf>felds) sporadic carbonaceous partings, broken core, strong rock, with cross lamination, transitional basal contact.
121.83	122.49	SANDSTONE, light grey, fine to medium grained, litho-feldspathic (<80% qtz, rf>felds) some bands with carbonaceous partings, solid core, strong rock, transitional basal contact.
122.49	122.60	SANDSTONE, light grey, fine to medium grained, litho-feldspathic (<80% qtz, rf>felds) with mudstone fragments, solid core, strong rock, transitional basal contact.
122.49	122.85	SANDSTONE, light grey, fine to medium grained, litho-feldspathic (<80% qtz, rf>felds) with sporadic carbonaceous wisps, solid core, strong rock, transitional basal contact.
122.85	122.93	SANDSTONE, light to medium blackish-grey, fine grained, litho-feldspathic (<80% qtz, rf>felds) numerous slightly carbonaceous partings fining upwards, solid core, strong rock, transitional basal contact.
122.93	123.55	SANDSTONE, light grey, fine to medium grained, litho-feldspathic (<80% qtz, rf>felds) well sorted rare mudstone fragments, broken core, strong rock.
123.50	124.53	SANDSTONE, light grey, fine grained, litho-feldspathic (<80% qtz, rf>felds) with rare carbonaceous laminae, broken core, strong rock, transitional basal contact.
124.53	124.59	SANDSTONE, medium to dark blackish-grey, fine grained, litho-feldspathic (<80% qtz, rf>felds) with numerous carbonaceous laminae, broken core, strong rock, transitional basal contact, common calcite disseminated.
124.07	125.28	SANDSTONE, light to medium grey, fine grained, litho-feldspathic (<80% qtz, rf>felds) with carbonaceous laminae and thin coal bands near top of unit, very broken core, strong rock, transitional basal contact.

302

FROM	TO	LITHOLOGY
125.28	125.40	SANDSTONE, light to medium grey, fine grained, lithic (predominately rock fragments) with numerous slightly carbonaceous mudstone fragments, solid core, moderately strong rock, transitional basal contact, common calcite disseminated.
125.40	125.47	SANDSTONE, medium to dark grey, very fine grained, lithic (predominately rock fragments), solid core, strong rock, transitional basal contact.
125.47	125.73	SANDSTONE, medium to dark grey, lithic (predominately rock fragments) numerous slightly carbonaceous mudstone pebbles and slightly carbonaceous lenses, very broken core, strong rock, transitional basal contact, common calcite disseminated.
125.73	125.88	SANDSTONE, medium to dark greenish-grey, fine grained, lithic (predominately rock fragments) with some mudstone fragments fining upwards, very broken core, strong rock, erosional basal contact, joints, abundant calcite on joint surfaces.
125.88	125.89	MUDSTONE, light greyish-brown, argillaceous, solid core, moderately strong rock, transitional basal contact, grading into:
125.89	125.93	CARBONACEOUS MUDSTONE, black, very broken core, moderately strong rock.
125.93	126.07	SANDSTONE, medium to dark greenish-grey, fine grained, lithic (predominately rock fragments) with coal bands near middle of unit, fragmented, moderately weak rock.
126.07	126.14	SANDSTONE, medium to dark greenish-grey, fine grained, lithic (predominately rock fragments) with numerous slightly carbonaceous well-rounded mudstone pebbles, solid core, moderately weak rock, abrupt basal contact.
126.14	126.45	SANDSTONE, medium to dark greenish-grey, fine grained, lithic (predominately rock fragments) with some carbonaceous laminae near base of unit, fragmented, moderately weak rock, joints.
126.45	126.50	NO SAMPLE RETURN. Core loss
126.50	126.62	SANDSTONE, medium to dark greenish-grey, fine grained, lithic (predominately rock fragments), very broken core, moderately strong rock, erosional basal contact, joints.

FROM	TO	LITHOLOGY
126.62	126.70	SANDSTONE, medium to dark greenish-grey, fine grained, lithic (predominately rock fragments) with numerous thin coal lenses, broken core, moderately strong rock, erosional basal contact.
126.70	126.76	40% SANDSTONE, medium to dark greenish-grey, fine grained, lithic (predominately rock fragments), moderately strong rock, with disturbed bedding, erosional basal contact, with lenses of: 60% COAL, 10 - 40% BRIGHT, black, fragmented.
126.76	126.97	SANDSTONE, light to medium grey, fine grained, lithic (predominately rock fragments) with minor mudstone laminae, very broken core, moderately strong rock.
126.97	127.07	SANDSTONE, medium to dark greenish-grey, fine grained, lithic (predominately rock fragments) with carbonaceous wisps, very broken core, moderately strong rock, transitional basal contact.
127.07	127.87	SANDSTONE, light grey, fine to medium grained, lithic (predominately rock fragments) with rare mudstone laminae slightly carbonaceous in part, solid core, strong rock, with planar bedding.
127.87	128.36	SANDSTONE, light grey, fine to medium grained, lithic (predominately rock fragments) with sporadic carbonaceous laminae, solid core, strong rock, abrupt basal contact.
128.36	128.37	CARBONACEOUS MUDSTONE, dark blackish-grey, broken core, moderately strong rock.
128.37	128.43	80% SANDSTONE, medium to dark greenish-grey, fine grained, lithic (predominately rock fragments), moderately strong rock, with disturbed bedding, transitional basal contact, with lenses of: 20% COAL, HEAVY (INFERIOR COAL), black, and carbonaceous lenses, fragmented.
128.43	128.81	SANDSTONE, light to medium grey, fine to medium grained, lithic (predominately rock fragments) with sporadic carbonaceous wisps, very broken core, strong rock, with mud pellers, transitional basal contact.
128.81	129.37	SANDSTONE, light bluish-grey, fine grained, litho-feldspathic (<80% qtz, rf>felds) well sorted fining upwards, solid core, strong rock, massive.

304

FROM	TO	LITHOLOGY
129.37	129.50	NO SAMPLE RETURN. Core loss
129.50	130.38	SANDSTONE, light bluish-grey, fine grained, litho-feldspathic (<80% qtz, rf>felds) with mudstone pebbles near middle of unit and slightly carbonaceous partings near base of unit, solid core, strong rock, with planar bedding, transitional basal contact.
130.38	130.79	SANDSTONE, light bluish-grey, fine grained, litho-feldspathic (<80% qtz, rf>felds), strong rock, solid core, massive, transitional basal contact.
130.38	130.84	80% SANDSTONE, light grey, fine grained, litho-feldspathic (<80% qtz, rf>felds), strong rock, transitional basal contact, with clasts of: 20% MUDSTONE, medium to dark grey, solid core.
130.84	131.77	SANDSTONE, light bluish-grey, fine to medium grained, litho-feldspathic (<80% qtz, rf>felds) minor carbonaceous partings near base of unit, solid core, strong rock, massive, transitional basal contact, joints with wide spacing with open, planar, smooth discontin's, abundant calcite on joint surfaces.
131.77	132.09	SANDSTONE, light bluish-grey, fine grained, litho-feldspathic (<80% qtz, rf>felds) minor carbonaceous partings, solid core, strong rock, with planar bedding, transitional basal contact.
132.09	132.27	SANDSTONE, light to medium grey, very fine grained, lithic (predominately rock fragments) with numerous carbonaceous partings, solid core, strong rock, with planar bedding, transitional basal contact.
132.27	132.50	SANDSTONE, light grey, fine grained, litho-feldspathic (<80% qtz, rf>felds), solid core, strong rock, massive.
132.50	132.70	SANDSTONE, light to medium grey, fine grained, lithic (predominately rock fragments) minor carbonaceous partings throughout interval, broken core, strong rock, with planar bedding, transitional basal contact.
132.70	133.00	SANDSTONE, light to medium grey, fine grained, lithic (predominately rock fragments) rare carbonaceous partings, very broken core, strong rock, with planar bedding, transitional basal contact, joints, rare pyrite on joint surfaces.

FROM	TO	LITHOLOGY
133.00	133.44	SANDSTONE, light to medium grey, fine grained, lithic (predominately rock fragments) rare carbonaceous partings and minor carbonaceous partings near base of unit, solid core, strong rock, with planar bedding, transitional basal contact.
133.44	133.48	SANDSTONE, dark green, fine grained, lithic (predominately rock fragments) with carbonaceous clasts, solid core, strong rock, erosional basal contact.
133.48	133.51	CARBONACEOUS MUDSTONE, black, very broken core, moderately weak rock, erosional basal contact.
133.51	133.62	SANDSTONE, dark green, fine grained, lithic (predominately rock fragments) with carbonaceous laminae throughout interval, fragmented, strong rock.
133.62	134.50	SANDSTONE, light to medium pinkish-grey, fine grained, litho-feldspathic (<80% qtz, rf>felds), broken core, strong rock, transitional basal contact, joints with very wide spacing with open, planar, rough discontinuities.
134.50	135.31	SANDSTONE, light to medium pinkish-grey, fine to medium grained, litho-feldspathic (<80% qtz, rf>felds) well sorted argillaceous matrix, solid core, strong rock.
135.31	135.50	NO SAMPLE RETURN.
135.50	135.73	SANDSTONE, light to medium grey, fine grained, thin mudstone laminae litho-feldspathic (<80% qtz, rf>felds), broken core, strong rock, abrupt basal contact.
135.73	135.75	CARBONACEOUS MUDSTONE, black, arenaceous in part, very broken core, strong rock.
135.75	135.96	SANDSTONE, light to medium grey, fine grained, litho-feldspathic (<80% qtz, rf>felds) with some coal laminae near top of unit and mudstone clasts near base of unit, broken core, strong rock, transitional basal contact, joints with open, planar, rough discontinuities.
135.96	136.24	SANDSTONE, light to medium grey, litho-feldspathic (<80% qtz, rf>felds) with sporadic carbonaceous partings, solid core, strong rock, with planar bedding, abrupt basal contact.

FROM	TO	LITHOLOGY
136.24	136.28	50% SANDSTONE, litho-feldspathic (<80% qtz, rf>felds), strong rock, erosional basal contact. 50% CARBONACEOUS MUDSTONE, arenaceous in part, strong rock, solid core, solid core.
136.28	136.31	CARBONACEOUS MUDSTONE, arenaceous in part, strong rock, fragmented, abrupt basal contact.
136.31	136.34	SANDSTONE, light to medium blackish-grey, fine grained, numerous carbonaceous wisps, broken core, strong rock, abrupt basal contact.
136.34	136.44	SANDSTONE, light to medium grey, fine grained, litho-feldspathic (<80% qtz, rf>felds) sporadic carbonaceous laminae, broken core, strong rock, erosional basal contact.
136.44	136.45	CARBONACEOUS MUDSTONE, broken core, erosional basal contact.
136.44	136.73	SANDSTONE, brownish-grey, fine grained, litho-feldspathic (<80% qtz, rf>felds) with sporadic carbonaceous laminae and some mudstone pebbles, broken core, strong rock.
136.73	136.87	SANDSTONE, medium to dark blackish-grey, fine grained, numerous carbonaceous laminae, broken core.
136.87	136.89	CARBONACEOUS MUDSTONE, black, moderately weak rock, fragmented.
136.89	137.69	SANDSTONE, medium to dark grey, fine grained, litho-feldspathic (<80% qtz, rf>felds) with carbonaceous laminae and mudstone clasts, very broken core, strong rock, with planar bedding, occasional calcite disseminated.
137.69	137.80	SANDSTONE, light to medium purplish-grey, fine grained, litho-feldspathic (<80% qtz, rf>felds) argillaceous matrix, fragmented, moderately strong rock, massive, joints.
137.80	137.98	SANDSTONE, litho-feldspathic (<80% qtz, rf>felds) sporadic carbonaceous laminae, broken core, strong rock, transitional basal contact, occasional calcite disseminated.
137.98	138.30	SANDSTONE, medium to dark grey, litho-feldspathic (<80% qtz, rf>felds), very broken core, strong rock.

307

FROM	TO	LITHOLOGY
138.30	138.50	NO SAMPLE RETURN. Core loss
138.50	138.68	SANDSTONE, medium to dark whitish-grey, fine grained, lithic (predominately rock fragments) with sporadic coal laminae, broken core, strong rock, abrupt basal contact.
138.68	138.69	CARBONACEOUS MUDSTONE, black, strong rock, very broken core, abrupt basal contact.
138.69	138.92	SANDSTONE, medium to dark grey, fine grained, lithic (predominately rock fragments) with sporadic carbonaceous laminae, strong rock, fragmented, strong rock.
138.92	139.09	SANDSTONE, lithic (predominately rock fragments) with some carbonaceous laminae, broken core, strong rock, abrupt basal contact.
139.09	139.30	CARBONACEOUS MUDSTONE, black, hard, very broken core, strong rock.
139.30	139.40	NO SAMPLE RETURN.
139.40	139.60	MUDSTONE, medium to dark grey, very broken core, moderately strong rock, transitional basal contact.
139.60	140.28	SILTSTONE, light to dark grey, with numerous mudstone laminae and some arenaceous bands near base of unit, broken core, moderately strong rock, with planar bedding, transitional basal contact, joints with tight, non-planar discontinuities, common calcite on joint surfaces.
140.28	140.39	SANDSTONE, light to medium grey, very fine grained, lithic (predominately rock fragments), solid core, strong rock, transitional basal contact.
140.39	141.02	70% MUDSTONE, medium to dark grey, moderately strong rock, irregularly interbedded with: 30% SILTSTONE, light to dark grey, moderately strong rock, fragmented.
141.02	141.50	NO SAMPLE RETURN. Core loss gained in next run
141.02	141.04	COAL, <10% BRIGHT, black, very broken core, with planar bedding, abrupt basal contact.
141.04	141.13	CARBONACEOUS MUDSTONE, black, with thin coal sub-angular throughout interval, broken core, strong rock, joints, abundant calcite on joint surfaces.

FROM	TO	LITHOLOGY
141.13	141.29	CARBONACEOUS MUDSTONE, black, minor coal bands, fragmented, moderately strong rock.
141.29	141.35	MUDSTONE, light to medium bluish-grey, very broken core, moderately weak rock, abrupt basal contact, joints with slickensides.
141.35	141.39	MUDSTONE, greyish-black, fragmented, strong rock, abrupt basal contact.
141.39	141.50	MUDSTONE, medium to dark grey, granule, very broken core.
141.50	142.13	MUDSTONE, light to medium grey, slightly silty near base of unit, fragmented, moderately weak rock, transitional basal contact, joints with open, planar, smooth discontin's.
142.13	142.28	SANDSTONE, light to medium grey, very fine grained, lithic (predominately rock fragments), solid core, strong rock, transitional basal contact.
142.28	142.41	MUDSTONE, light to dark grey, solid core, strong rock.
142.41	142.47	CLAYSTONE, medium to dark grey, weak rock, very broken core.
142.47	142.57	SILTSTONE, light to medium grey, lithic (predominately rock fragments) with numerous mudstone laminae, fragmented, strong rock.
142.57	142.66	SILTSTONE, light to medium grey, rare mudstone laminae, broken core, strong rock, transitional basal contact.
142.66	142.72	MUDSTONE, with silty laminae and minor arenaceous laminae, solid core, strong rock, abrupt basal contact.
142.72	142.18	70% MUDSTONE, medium to dark grey, near base of unit with silty laminae, fragmented, solid core, with trough cross bedding, abrupt basal contact. 30% SANDSTONE, light to medium grey, very fine grained, near top of unit, strong rock.
142.78	142.79	SANDSTONE, fine grained, litho-feldspathic (<80% qtz, rf>felds), strong rock, solid core, with load casts, erosional basal contact.
142.79	143.05	55% SANDSTONE, light to medium grey, very fine grained, litho-feldspathic (<80% qtz, rf>felds), solid core, erosional basal contact, interbedded with: 30% MUDSTONE, medium to dark grey, strong rock, with laminae of: 20% SILTSTONE, light to medium grey.

FROM	TO	LITHOLOGY
143.05	143.12	MUDSTONE, grey, with silty laminae, solid core, strong rock, abrupt basal contact.
143.12	143.36	SANDSTONE, light grey, fine grained, litho-feldspathic (<80% qtz, rf>felds) fining upwards with mudstone bands near middle of unit, solid core, strong rock.
143.36	143.59	MUDSTONE, medium to dark grey, with silty laminae and lenses throughout interval carbonaceous partings near base of unit, solid core, strong rock, with cross lamination, abrupt basal contact.
143.59	144.20	SANDSTONE, pale greenish-grey, fine grained, litho-feldspathic (<80% qtz, rf>felds) fining upwards slightly, solid core, strong rock, massive, occasional pyrite disseminated.
144.22	144.55	SANDSTONE, light greenish-grey, fine grained, litho-feldspathic (<80% qtz, rf>felds) with minor carbonaceous bands near middle of unit, broken core, strong rock, abrupt basal contact.
144.55	144.80	SANDSTONE, light bluish-grey, fine grained, with numerous thin carbonaceous and coal laminae, broken core, strong rock, with cross lamination, transitional basal contact.
144.80	147.30	SANDSTONE, light bluish-grey, fine grained, litho-feldspathic (<80% qtz, rf>felds) with rare carbonaceous partings sporadic throughout interval, solid core, strong rock, joints with extremely wide spacing with open, planar, rough discontinuities, abundant calcite on joint surfaces.
147.30	147.51	SANDSTONE, light bluish-grey, fine grained, litho-feldspathic (<80% qtz, rf>felds) bands with numerous carbonaceous partings near base of unit, broken core, strong rock, with cross lamination, transitional basal contact.
147.51	148.43	SANDSTONE, light bluish-grey, fine to medium grained, litho-feldspathic (<80% qtz, rf>felds) fining upwards slightly, solid core, strong rock, massive, transitional basal contact.
148.43	148.51	SANDSTONE, light grey, fine grained, litho-feldspathic (<80% qtz, rf>felds) with numerous carbonaceous partings, broken core, strong rock, with trough cross bedding, transitional basal contact.

FROM	TO	LITHOLOGY
148.51	149.62	SANDSTONE, light whitish-grey, fine to medium grained, litho-feldspathic (<80% qtz, rf>felds) fining upwards with thin bands with numerous coal lenses, solid core, strong rock, with disturbed bedding, transitional basal contact.
149.62	149.87	SANDSTONE, light bluish-grey, fine grained, litho-feldspathic (<80% qtz, rf>felds) well sorted minor carbonaceous phases near top of unit, solid core, strong rock, erosional basal contact.
149.87	149.92	CARBONACEOUS MUDSTONE, black, weak rock, fragmented.
149.92	150.16	CLAYSTONE, mottled pinkish-brown, slightly carbonaceous in part, very broken core, moderately weak rock.
150.16	150.20	NO SAMPLE RETURN.
150.20	150.49	CLAYSTONE, light bluish-grey, slightly arenaceous in part, very broken core, very stiff, abrupt basal contact.
		********** CORE & GEOPHYSICAL LOGS DESCRIPTION ********
149.89	149.98	COAL, 10 - 40% BRIGHT, black, fragmented.
149.98	150.08	NO SAMPLE RETURN. Core loss
150.08	150.20	COAL, <10% BRIGHT, black, very broken core. Broken base at 45 degrees
150.20	150.26	NO SAMPLE RETURN.
150.26	150.29	COAL, 10 - 40% BRIGHT, black, fragmented.
150.29	150.35	CARBONACEOUS MUDSTONE, brownish-black, very broken core, abrupt basal contact.
150.35	150.67	NO SAMPLE RETURN.
150.67	150.71	COAL, 10 - 40% BRIGHT, black, very broken core.
150.71	150.74	COAL, 10 - 40% BRIGHT, fragmented.
150.74	150.80	COAL, 10 - 40% BRIGHT, broken core, abrupt basal contact, common calcite infilled vesicles.
150.80	150.82	COAL, <10% BRIGHT, black, fragmented.
150.82	151.00	MUDSTONE, medium to dark grey, argillaceous near top of unit, broken core, weak rock, joints with moderately close spacing with tight, non-planar discontinuities, abundant on joint surfaces.

311

FROM	TO	LITHOLOGY
151.00	151.17	SILTSTONE, light to medium grey, with numerous mudstone laminae, broken core, moderately weak rock, with trough cross bedding.
151.17	151.23	MUDSTONE, medium to dark grey, with rare siltstone laminae near top of unit, broken core, moderately weak rock, with trough cross bedding, joints with moderately close spacing with tight, planar, smooth discontin's, abundant on joint surfaces.
151.23	151.31	NO SAMPLE RETURN.
151.31	151.34	MUDSTONE, medium to dark grey, silty in part with rare coal lenses, fragmented, moderately weak rock, joints with moderately close spacing with tight, planar, smooth discontin's, abundant on joint surfaces.
151.34	151.44	MUDSTONE, dark grey, slightly carbonaceous, very broken core, very stiff.
151.44	151.62	92% MUDSTONE, dark grey, slightly carbonaceous, fragmented, intermixed with: 8% CARBONACEOUS MUDSTONE, dark greyish-black, fragmented.
151.62	151.76	CLAYSTONE, light to medium pinkish-grey, stiff, fragmented.
151.76	151.80	MUDSTONE, light to dark grey, silty in part, very broken core, joints with moderately close spacing with open, planar, smooth discontin's.
151.80	152.02	NO SAMPLE RETURN.
152.02	152.07	MUDSTONE, light to dark grey, silty in part, fragmented, moderately weak rock, abrupt basal contact.
152.07	152.10	MUDSTONE, light to dark grey, broken core, weak rock, abrupt basal contact, joints with close spacing, abundant clay on joint surfaces.
152.10	152.27	MUDSTONE, light to dark grey, some silty bands, broken core, transitional basal contact, joints with moderately close spacing with open, planar, smooth discontin's.
152.27	152.52	MUDSTONE, light to medium grey, slightly carbonaceous silty near base of unit, fragmented, moderately weak rock, abrupt basal contact.

FROM	TO	LITHOLOGY
152.52	152.92	SILTSTONE, light to medium purplish-grey, with numerous mudstone and slightly carbonaceous partings and arenaceous in part, very broken core, strong rock, with trough cross bedding, abrupt basal contact.
152.92	152.93	MUDSTONE, black, carbonaceous with arenaceous laminae, broken core, strong rock.
152.93	153.05	NO SAMPLE RETURN.
153.05	153.06	SANDSTONE, medium to dark grey, very fine grained, lithic (predominately rock fragments) with numerous carbonaceous partings, broken core, strong rock, with trough cross bedding, abrupt basal contact.
153.06	153.10	SANDSTONE, black, carbonaceous, fragmented.
153.10	153.18	COAL, HEAVY (INFERIOR COAL), fragmented.
153.18	153.24	NO SAMPLE RETURN.
153.24	153.26	COAL, 10 - 40% BRIGHT, black, fragmented.
153.26	153.30	COAL, <10% BRIGHT, black, very broken core, abundant calcite disseminated.
153.30	153.65	NO SAMPLE RETURN.
153.65	153.68	CARBONACEOUS MUDSTONE, black, fragmented, weak rock.
153.68	153.70	CARBONACEOUS MUDSTONE, black, claystone, very broken core, stiff.
153.70	153.75	NO SAMPLE RETURN. Core loss.
153.75	153.81	COAL, HEAVY (INFERIOR COAL), black, fragmented.
153.81	153.82	CARBONACEOUS MUDSTONE, black, fragmented, very stiff, abrupt basal contact.
153.82	153.88	COAL, HEAVY (INFERIOR COAL), black, very broken core.
153.88	154.01	COAL, HEAVY (INFERIOR COAL), very broken core.
154.01	154.07	COAL, HEAVY (INFERIOR COAL), fragmented.
154.07	154.25	COAL, HEAVY (INFERIOR COAL), very broken core.
154.25	154.27	COAL, HEAVY (INFERIOR COAL), black, fragmented, moderately weak rock.

313

FROM	TO	LITHOLOGY
154.27	154.30	COAL, <10% BRIGHT, very broken core, cleats with moderately close spacing, abundant calcite on cleats.
154.30	154.41	COAL, <10% BRIGHT, broken core, cleats with moderately wide spacing, common calcite on cleats.
154.41	154.65	COAL, HEAVY (INFERIOR COAL), broken core, transitional basal contact, occasional pyrite disseminated.
154.65	154.78	COAL, <10% BRIGHT, broken core, cleats with open, planar, rough discontinuities, abundant calcite disseminated.
154.78	154.82	COAL, <10% BRIGHT, fragmented.
154.82	154.86	COAL, HEAVY (INFERIOR COAL), very broken core.
154.86	155.17	COAL, <10% BRIGHT, black, very broken core.
155.17	155.20	COAL, <10% BRIGHT, very broken core.
155.20	155.22	COAL, <10% BRIGHT, fragmented.
155.22	155.31	COAL, <10% BRIGHT, broken core.
155.31	155.40	COAL, <10% BRIGHT, very broken core, cleats.
155.40	155.45	NO SAMPLE RETURN. Core loss.
155.45	155.63	COAL, <10% BRIGHT, broken core, cleats with moderately wide spacing.
155.63	155.78	COAL, <10% BRIGHT, broken core, occasional calcite disseminated.
155.78	155.84	NO SAMPLE RETURN.
155.84	155.92	COAL, <10% BRIGHT, broken core, occasional calcite disseminated.
156.50	156.04	COAL, <10% BRIGHT, solid core, erosional basal contact, abundant calcite infilled vesicles.
156.04	156.62	NO SAMPLE RETURN. **** following line in error **** . . 2d coal adjusted to bpb log-depth
		********** CORE DESCRIPTION **********
156.62	156.83	METAMORPHIC ROCK, light to medium greyish-green, mudstone, moderately strong rock, transitional basal contact. Many thin calcite veins - altered

768232

FROM	TO	LITHOLOGY
156.83	157.00	DOLERITE, medium to dark greenish-grey, very fine grained, strong rock, solid core, transitional basal contact, occasional calcite disseminated.
157.00	159.50	DOLERITE, medium to dark grey, fine grained, fining upwards, broken core, very strong rock, joints with very wide spacing with tight, planar, smooth discontin's, abundant calcite on joint surfaces.
159.50	160.80	DOLERITE, medium to dark greenish-grey, fine grained, fining upwards, very strong rock, solid core, transitional basal contact, joints with moderately wide spacing with tight, planar, smooth discontin's, common calcite on joint surfaces.
160.80	161.20	DOLERITE, medium to dark greenish-grey, fine grained, fining upwards, very strong rock, solid core, transitional basal contact, joints with moderately wide spacing with tight, planar, smooth discontin's.
161.20	161.60	DOLERITE, medium to dark greenish-grey, fine grained, thin calcareous laminae, moderately strong rock, solid core, joints with moderately wide spacing with tight, planar, smooth discontin's, calcite on joint surfaces.
161.60	162.56	DOLERITE, medium to dark greenish-grey, fine to medium grained, strong rock, broken core, massive, transitional basal contact.
162.56	163.40	DOLERITE, medium to dark greenish-grey, fine to medium grained, strong rock, solid core, transitional basal contact.
163.40	164.75	DOLERITE, fine grained, strong rock, solid core, massive, erosional basal contact.
164.75	164.95	DOLERITE, fine to medium grained, strong rock, erosional basal contact. Flowbanding
164.95	165.50	DOLERITE, medium to dark greenish-grey, fine to medium grained, solid core, with planar bedding, thinly bedded. H5 4
165.50	166.30	DOLERITE, medium to dark grey, fine grained, solid core, very strong rock, transitional basal contact, joints with wide spacing with open, planar, rough discontinuities, abundant calcite on joint surfaces.

315

FROM	TO	LITHOLOGY
166.30	167.80	DOLERITE, medium to dark grey, fine grained, with sporadic throughout interval, very strong rock. Clusters of medium calcite grains
167.80	168.50	DOLERITE, medium to dark grey, fine to medium grained, very strong rock, solid core, transitional basal contact.
168.50	169.40	DOLERITE, medium to dark grey, fine to medium grained, solid core, very strong rock.
169.40	170.60	DOLERITE, medium to dark grey, fine to medium grained, solid core, very strong rock, joints with wide spacing with tight, planar, rough discontin's.
170.60	171.50	DOLERITE, medium to dark grey, fine to medium grained, solid core, very strong rock.
	171.50	********** TOTAL DEPTH **********

316

11 Jun 82

HOLE NUMBER : CA 112

DATA SOURCE : Marathon Pet. Aust, Ltd

LOGGER : Ross MacConnachie

Date commenced : 24 Apr 82

Date completed : May 82

LOCATION:

NORTHING : 51804.43

EASTING : 4908.40

ELEVATION :

DRILLING:

CONTRACTOR : Stackpoole Drilling

DRILL TYPE : Rotary

HOLE SIZE : 960

CORE SIZE :

TOTAL DEPTH : 108.40m

GEOPHYSICAL:

CONTRACTOR : BPB Instruments

PROBE DEPTH : 105.00m

LOGS RUN : Natural Gamma
Long Spaced Density
Caliper
Bed Resolution Density

317

FROM	TO	LITHOLOGY
		********** CHIP DESCRIPTION **********
	ROLLER BIT	
0.00 -	3.50	CLAY, light to medium orangy-brown, arenaceous with some hard argillaceous bands near base of unit, highly weathered.
	HAMMER	
3.50 -	7.00	CLAY, varigated orangy-red, slightly arenaceous in part, highly weathered, common red iron oxide staining.
7.00 -	12.00	70% CLAY, mottled whitish-brown, arenaceous, highly weathered. 30% DOLERITE, dark grey, fine grained, unweathered. Sandstone texture in parts
12.00 -	17.00	50% CLAY, medium to dark orangy-brown, arenaceous in part, highly weathered, intermixed with: 50% SAND, light to medium brown, argillaceous in part and pebbly in part.
17.00 -	20.00	85% CLAY, medium to dark orangy-brown, slightly arenaceous, fragments: 10% SANDSTONE, varigated whitish-red, fine grained, highly weathered, occasional red iron oxide staining, with clasts of: 5% DOLERITE, varigated whitish-yellow, fine grained, highly weathered.
20.00 -	31.50	NO SAMPLE RETURN, medium to dark orangy-brown. Hammer in water, throwing mud-but nothing solid
		********** BASE OF ALLUVIUM **********
	ROLLER BIT	
31.50 -	31.70	DOLERITE, dark grey, very fine grained, unweathered.
		********** CORE & GEOPHYSICAL LOGS DESCRIPTION ********
	DIAMOND CORING	
31.70 -	31.85	DOLERITE, dark grey, fine grained, moderately strong rock, solid core, joints Apears solid but material on joint Surface suggests a large fragment
31.85 -	32.00	40% DOLERITE, dark grey, very fine grained, moderately strong rock, broken core, slight brown iron oxide staining. Alteration around perimeters 60% METAMORPHIC ROCK, green, fragmented, very stiff.
32.00 -	32.25	25% METAMORPHIC ROCK, medium to dark green, matrix, very stiff, interbedded with: 75% DOLERITE, dark grey, sub-rounded fragments, moderately strong rock, broken core, slight brown iron oxide staining.

FROM	TO	LITHOLOGY
32.25	32.90	DOLERITE, dark greenish-grey, angular fragments, moderately strong rock. In sparce dark green matrix and Growths on cracks around dolerite Fragments -some quartz growths
32.90	33.10	NO SAMPLE RETURN. Core loss
33.10	34.25	DOLERITE, dark greenish-grey, fragments, very broken core, transitional basal contact. Brecciated with growths on cracks
34.25	35.12	DOLERITE, dark greenish-grey, fragments, broken core, joints, occasional calcite on joint surfaces. Brecciated with growths
35.12	36.10	DOLERITE, dark greenish-grey, fragments, fragmented.
36.10	36.26	DOLERITE, dark green, fragments, weak rock, fragmented.
36.26	36.45	MUDSTONE, mottled brownish-grey, argillaceous, fragmented, weak rock, occasional yellow iron oxide staining. Altered
36.45	36.48	CLAYSTONE, varigated reddish-white, with numerous carbonaceous mudstone clasts, very stiff, broken core, abrupt basal contact, common red iron oxide staining.
36.48	36.51	CARBONACEOUS MUDSTONE, black, slightly lenses, very stiff, solid core, abrupt basal contact.
36.51	36.56	MUDSTONE, blackish-grey, slightly carbonaceous, very stiff, solid core, abrupt basal contact.
36.56	36.60	CARBONACEOUS MUDSTONE, black, broken core, very stiff.
36.60	36.78	MUDSTONE, medium to dark bluish-grey, argillaceous arenaceous in part, very stiff, transitional basal contact, joints with tight, non-planar discontinuities. Glassy apearance
36.78	36.90	BRECCIA, dark bluish-grey, mudstone fragments angular and mudstone matrix slightly carbonaceous, broken core, very stiff, abrupt basal contact.
36.90	36.91	CARBONACEOUS MUDSTONE, medium to dark reddish-brown, soft, broken core, abrupt basal contact.

FROM	TO	LITHOLOGY
36.91	37.16	95% MUDSTONE, dark bluish-grey, with mudstone fragments, stiff, joints, with lenses of: 5% CARBONACEOUS MUDSTONE, medium to dark reddish-brown, sporadic throughout interval, very broken core.
37.16	37.26	MUDSTONE, dark bluish-grey, argillaceous and slightly carbonaceous, fragmented, stiff, transitional basal contact.
37.06	37.25	80% CARBONACEOUS MUDSTONE, black, claystone, stiff, with disturbed bedding, transitional basal contact, with lenses of: 20% MUDSTONE, light bluish-grey, slightly silty claystone, broken core.
37.25	37.37	CLAYSTONE, light bluish-grey, silty in part with some carbonaceous laminae, stiff, very broken core, with disturbed bedding, abrupt basal contact.
37.47	37.46	CARBONACEOUS MUDSTONE, black, hard lenses near base of unit, very stiff, solid core, transitional basal contact, joints.
37.46	37.47	CLAYSTONE, light grey, broken core, weak rock, deformed basal contact.
37.47	37.65	METAMORPHIC ROCK, green, argillaceous some lithic (predominately rock fragments) fragments, fragmented, weak rock.
37.65	39.00	NO SAMPLE RETURN. Core loss
		********** CHIP DESCRIPTION **********
ROLLER BIT		
39.00	40.00	90% METAMORPHIC ROCK, mottled green, argillaceous in part, intermixed with: 5% MUDSTONE, light pinkish-grey, interbedded with: 5% COAL, black.
40.00	41.00	20% METAMORPHIC ROCK, green, matrix, fragments: 15% DOLERITE, dark grey, hard, intermixed with: 20% MUDSTONE, light bluish-grey, interbedded with: 40% CARBONACEOUS MUDSTONE, black, interbedded with: 5% COAL, black.
BLADES		
41.00	42.00	15% METAMORPHIC ROCK, dark green, matrix, fragments: 5% DOLERITE, dark grey, fine grained, intermixed with: 55% MUDSTONE, varigated yellowish-grey, interbedded with: 15% CARBONACEOUS MUDSTONE, greyish-black. 10% COAL, black.

320

FROM	TO	LITHOLOGY
42.00	43.00	60% CARBONACEOUS MUDSTONE, black, shaly in part, interbedded with: 5% COAL, black. 30% MUDSTONE, light, argillaceous, interbedded with: 5% METAMORPHIC ROCK, green.
43.00	44.00	55% SANDSTONE, pale greyish-white, fine grained, quartz lithic sub-angular well sorted cement. 45% CARBONACEOUS MUDSTONE, black, shaly in part.
44.00	45.00	CARBONACEOUS MUDSTONE, black, shaly in part with near middle of unit coal bands.
45.00	46.00	SANDSTONE, light greenish-grey, fine to medium grained, lithic (predominately rock fragments) sub-rounded moderately sorted with some carbonaceous mudstone bands.
46.00	47.00	60% SANDSTONE, varigated yellowish-green, fine grained, lithic (predominately rock fragments) quartz lithic in part moderately sorted sub-rounded. 35% MUDSTONE, black, carbonaceous and shaly, with bands of: 5% COAL, black.
47.00	48.00	60% SANDSTONE, greyish-white, fine to medium grained, litho-feldspathic (<80% qtz, rf>felds) angular moderately sorted, with bands of: 35% CLAYSTONE, varigated yellowish-orange, interbedded with: 5% CARBONACEOUS MUDSTONE, black.
ROLLER BIT		
48.00	50.00	60% SANDSTONE, white, fine to medium grained, lithic (predominately rock fragments) sub-angular, with bands of: 20% DOLERITE, dark greyish-green, fine grained, fragments: 20% MUDSTONE, mottled grey, carbonaceous in part.
50.00	51.00	85% SANDSTONE, light greenish-white, fine grained, lithic (predominately rock fragments), interbedded with: 10% MUDSTONE, mottled grey, carbonaceous coal in part, irregularly interbedded with: 5% DOLERITE, black, near top of unit.
51.00	55.00	SANDSTONE, pale, fine grained, fining upwards poorly sorted. Much of sample is contaminated by Carb. mudstone and soft multi- Coloured clays and rare coalFragments

768239

FROM	TO	LITHOLOGY
55.00	56.00	50% SANDSTONE, light, very fine grained, poorly sorted fining upwards sub-angular, interbedded with: 45% MUDSTONE, black, intermixed with: 5% COAL, black.
BLADES		
56.00	57.00	40% CARBONACEOUS SHALE, black, fissile some mudstone, interbedded with: 30% COAL, black. 30% SANDSTONE, light, very fine grained, fining upwards.
57.00	59.00	90% SANDSTONE, light greyish-green, fine grained, litho-feldspathic (<80% qtz, rf>felds) cement sub-angular moderately sorted. 5% COAL, black. 5% CARBONACEOUS SHALE, black, and carbonaceous mudstone.
59.00	62.00	SANDSTONE, light greyish-green, fine to medium grained, quartz lithic sub-angular moderately sorted. Quartz:80%, lithics:18%, Feldspar:about 2%.
ROLLER BIT		
62.00	63.00	SANDSTONE, light greenish-grey, fine to medium grained, lithic (predominately rock fragments) sub-angular moderately sorted with minor carbonaceous mudstone and coal bands.
63.00	64.00	80% SANDSTONE, pale whitish-green, fine grained, feldspatho-lithic (<80% qtz, felds>rf.) sub-angular moderately sorted argillaceous matrix. 5% MUDSTONE, carbonaceous in part with some coal bands. 10% DOLERITE, dark greenish-grey, fine grained. 5% CLAYSTONE, pale brownish-green, granular in part.
64.00	65.00	50% DOLERITE, dark grey, fine grained, hard, intermixed with: 25% DOLERITE, dark green, fine grained, with bands of: 15% CLAYSTONE, light brownish-green, slightly fissile granular, interbedded with: 10% SANDSTONE, light greenish-white, feldspatho-lithic (<80% qtz, felds>rf.) argillaceous matrix.
65.00	66.00	75% DOLERITE, dark grey, fine grained, intermixed with: 25% DOLERITE, dark grey, fine grained.
66.00	67.00	50% METAMORPHIC ROCK, dark green, argillaceous and fibrous, intermixed with: 45% DOLERITE, dark grey, fine grained, minor haematitic fragments. 15% MUDSTONE, medium to dark brownish-grey, and. 25% SILTSTONE, varigated brownish-green, slightly arenaceous hard.

322

FROM	TO	LITHOLOGY
67.00	68.00	70% SANDSTONE, light greenish, fine grained, litho-feldspathic (<80% qtz, rf>felds) poorly sorted angular. 15% METAMORPHIC ROCK, dark green. 10% DOLERITE, dark grey, fine grained. 5% MUDSTONE, medium to dark grey.
68.00	69.00	90% SANDSTONE, light whitish-green, fine to medium grained, quartz feldspathic poorly sorted sub-angular, with bands of: 3% COAL, black. 70% MUDSTONE, medium to dark cream, slightly carbonaceous in part.
69.00	71.00	SANDSTONE, white, fine to medium grained, quartzose (>90% quartz) quartz feldspathic in part poorly sorted sub-angular with some coal and mudstone bands.
71.00	73.00	SANDSTONE, pale whitish-grey, fine to medium grained, litho-feldspathic (<80% qtz, rf>felds) moderately sorted sub-angular, grading into: Quartz:70%, lithics:21%, felds 9%
73.00	78.00	SANDSTONE, pale greenish-white, fine to medium grained, quartz lithic poorly sorted angular cement quartzose (>90% quartz) near base of unit.
78.00	79.00	SANDSTONE, pale greenish-white, fine grained, quartz lithic poorly sorted sub-angular.
79.00	81.00	SANDSTONE, light yellowish-green, fine grained, quartzose (>90% quartz) moderately sorted sub-angular with argillaceous matrix in part. Yellow stained quartz 94% felds 9% More lithics toward base
81.00	83.00	60% SANDSTONE, light to medium green, fine to medium grained, quartzose (>90% quartz) slightly quartz lithic poorly sorted sub-angular, irregularly interbedded with:
83.00	85.00	85% SANDSTONE, pale greenish-white, fine grained, quartzose (>90% quartz) sub-angular moderately sorted, interbedded with: 5% DOLERITE, dark grey, fine grained, hard, intermixed with: 5% METAMORPHIC ROCK, dark green, fibrous, with bands of: 5% SANDSTONE, light to medium yellowish-green, very fine grained, quartzose (>90% quartz) argillaceous matrix well sorted.

323

FROM	TO	LITHOLOGY
85.00	92.00	SANDSTONE, light greyish-green, fine to medium grained, quartzose (>90% quartz) sub-angular poorly sorted rare granular calcareous.
92.00	97.00	SANDSTONE, light greyish-green, fine grained, quartzose (>90% quartz) sub-angular poorly sorted.
97.00	98.00	SANDSTONE, light greyish-green, fine grained, quartz feldspathic sub-angular poorly sorted. Quartz:85%, lithics:5%, feldspar
98.00	104.00	98% SANDSTONE, light greyish-green, fine grained, quartzose (>90% quartz) sub-angular poorly sorted quartz lithic in part. 1% SANDSTONE, light greenish-grey, medium grained, quartzose (>90% quartz) moderately sorted sub-angular argillaceous matrix with minor rare sporadic haematitic, moderately strong rock, very broken core. 1% SANDSTONE, light greenish-grey, fine to medium grained, quartzose (>90% quartz) poorly sorted sub-angular argillaceous matrix lithic (predominately rock fragments) in part, moderately strong rock, fragmented. Losing water badly from 100m blocks Of sandstone from core-(evidently Fallen in) jointing. description:
104.00	105.00	SANDSTONE, varigated greyish-white, fine to medium grained, quartz lithic poorly sorted sub-angular argillaceous matrix.
105.00	106.00	75% SANDSTONE, pale greenish-white, fine to medium grained, quartz feldspathic poorly sorted sub-angular, interbedded with: 10% SILTSTONE, pale whitish-grey, claystone in part, with bands of: 10% DOLERITE, dark grey, fine grained, fining upwards hard, fining upwards to: 5% DOLERITE, dark grey. Glassey
106.00	107.00	40% METAMORPHIC ROCK, varigated whitish-grey, medium grained, arenaceous quartzose (>90% quartz) micaceous in part with some granular haematitic. 60% DOLERITE, dark greenish-grey, fine grained, hard claystone.
		********** CORE DESCRIPTION **********
DIAMOND CORING		
107.00	108.40	DOLERITE, grey, fine grained, strong rock, solid core, joints with moderately close spacing with tight, planar, rough discontin's, occasional calcite on joint surfaces.
	108.40	********** TOTAL DEPTH **********

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3'2"

FINISHED: 82-06-11.18:58

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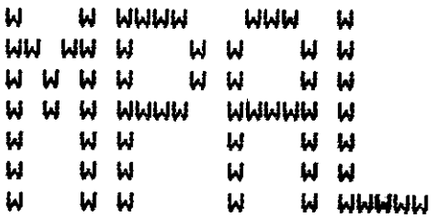

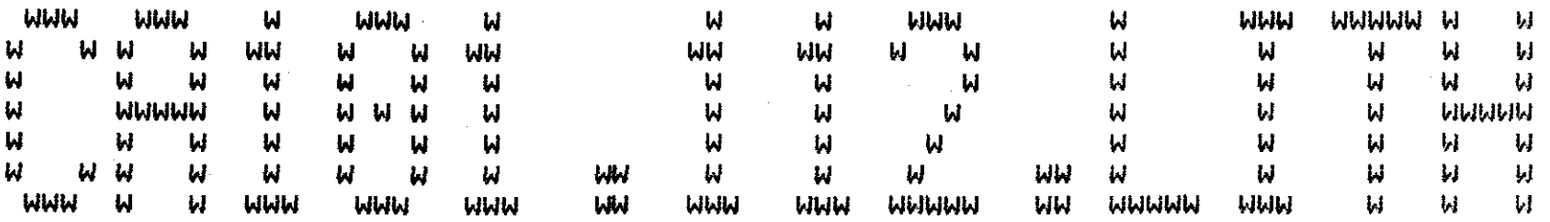

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USER: MPAL -AT PRO

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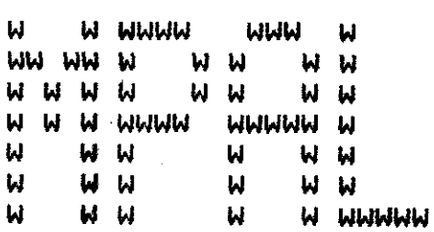

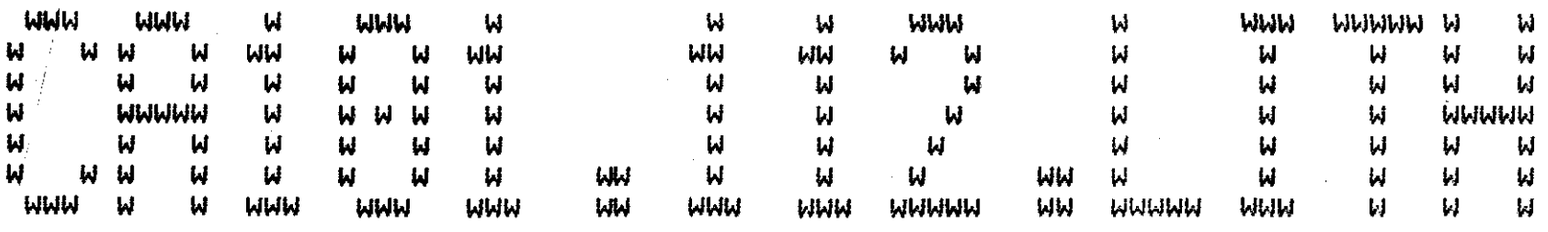

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