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CRA EXPLORATION PTY LIMITED

LARGE CORE DRILLING OF THE  
YORK PLAINS COAL DEPOSIT

EL 18/82 TASMANIA

**MICROFILMED**

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	DEPT. OF MINES			
REF. No.	9390			85

Author: T G Summons

Date: 9 August 1985

Submitted to: T W Dickson

Accepted by:



Copies: CRAE Hobart  
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Tasmania  
Mineral Resource Studies

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REPORT NO: 13489

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### SUMMARY

Detailed ply-by-ply correlation of Seam U in the York Plains Coal Deposit indicates a variability in the physical dimensions, the principal of which are the cumulative coal width and linear percentage of coal.

These parameters vary by up to 25% and 8% respectively, and suggest the range of tonnage variation that may be expected in the estimated total coal resource.

Washability results indicate that most of the objective qualities of black coal required for use in a thermal power station in Tasmania can be met with accompanying satisfactory yields.

### INTRODUCTION

This report was written at the request of T W Dickson (CRAE Hobart) to review the results of a "large" diameter core drilling programme over part of the York Plains Coal Deposit, in central Tasmania during December 1984.

The "large" diameter (100mm) coring programme was undertaken to provide more reliable data on the coal washability characteristics, following the results of earlier (September-October 1984) float-sink testing of small diameter (NQ) cores.

Adopting the terminology of A.S. 2519 (1982), exploration stage 1 (Regional Assessment) of the York Plains area took place in October/November 1983 (Summons 1984), stage 2 (Commercial Evaluation) occurred between September and October 1974 (Dickson et al 1984), and the stage described in this report took place in December 1984.

Exploration stage 3 (Mine Planning) is intended to "..... confirm existing data required for preparation, plan + design ...."; it involves the pre-treatment of coal core by crushing, grinding, and/or breakdown in water to achieve particle size and density distributions similar to that expected from the coal after mining and preparation. (NB. Pre-treatment requires a sample mass of  $\gg 50$  kg).

The sample masses obtained from the recent 100mm core drilling were:-

Seam U	(DD84 PT43)	-	33.41 kg
Seam U <sub>1</sub>	(DD84 PT44)	-	24.94 kg
Seam U <sub>2</sub>	(DD84 PT44)	-	32.84 kg

Since these samples were  $< 50$  kg, and were not pre-treated, this recent phase of drilling must be regarded as an extension of stage 2.

#### CONCLUSIONS

1. Physical variation of the coal seams over short intervals in the York Plains Coal Deposit appear to be as follows:-
  - 1.1 Gross Seam/Width -  $\ll \pm 15\%$
  - 1.2 Cumulative Coal Width -  $\ll \pm 25\%$
  - 1.3 Linear Percentage Coal -  $\ll \pm 8\%$
2. Direct comparisons of "slim" core with large core coal washabilities are premature based on the existing data, and would require further sampling, drilling etc.
3. The objective coal qualities (defined by the Hydro-Electric Commission of Tasmania) can be met in respect of ash and specific energy by washing the coal.

However, the washability results indicate the volatile matter (DAF) may only average 20%, which is below the required value of 22%.

4. Optimum washery yields in the ranges 68-87% may be obtained by producing a washed coal product containing 32-34% ash, 20.2-26.3% volatile matter (DAF), and 21MJ/kg specific energy.

1. GENERAL

1.1 Drilling

Drilling was done using a crawler mounted Warman-Scout 250 rig; holes were pre-collared with either a blade or hammer bit to within a few metres of the top of the coal seams.

Core drilling was then commenced, using a 100mm diameter tungsten carbide bit, attached to a 3m long core barrel containing a split inner tube.

This drilling was done "conventionally", with the removal of the complete barrel (double tube) after each run.

Bad ground conditions in the vicinity of DD84 PT27, necessitated the abandonment of two holes (PT41, 42) before PT43 was successfully completed.

1.2 Logging

Lithological logging was done (where possible) on site and the results are presented both graphically and in written form. The core was also photographed with colour film, and these photos are filed in the CRAE Hobart Office.

1.3 Sampling and Analysis

The coal (and stone) samples were packed in plastic bags, each sampling weighing  $\approx 3.5$  kg, and air freighted to the Australian Coal Industry Research Laboratories (ACIRL) in Maitland. The samples were air dried, weighed and crushed to pass - 11.2mm.

Pre-determined working sections were then reconstituted and separated in organic liquids of relative density; 1.40, 1.50, 1.60, 1.70, 1.80, 1.90, 2.00, 2.10 and 2.20.

Following this, each RD fraction was weighed and analysed for proximate analyses, total sulphur and specific energy.

2. SEAM CORRELATION

Written logs of the 100mm coal holes (DD84 PT43, 44) are appended to this report; graphic logs of the earlier "slim" core holes (DD84 PT27, 37) and the adjacent 100mm holes are depicted in Figure 1. Detailed ply-by-ply correlation is shown in Table 1.

↓  
*from slim hole to large hole only.*

## 2.1 Drill Holes DD84 PT27 and 43

### 2.1.1 Gross Seam Width

The gross seam width between the holes varies only slightly from 2.70m in PT27 to 2.63m in PT43.

### 2.1.2 Cumulative Coal Width

Cumulative coal thickness varies considerably from approximately 1.82m in PT27 to 1.57m in PT43; the linear percentage of coal reflects this variation, ranging from 67.4% in PT27 to 59.7% in PT43. Within the interval originally sampled (18.05-20.35m) in PT27, the linear percentage coal was assumed to be 82.2% but is more likely to be 75.6% with an equivalent interval in PT43 from 19.15-20.35m having 53.6%.

### 2.1.3 Working Sections

Potential working sections reflect the deterioration of the seam in PT43; in PT27 the likely working section is 1.94m (18.05-19.99m), whereas in PT43 it may only be 1.28m (18.72-20.0m).

### 2.1.4 Brightness

The brightness correlation between the holes ranges from poor to moderate, with PT43 having more vitrinite rich plies throughout the seam. Correlation of the seams was based predominantly on the similarities of the stone bands, and partly on the vitrinite content.

### 2.1.5 Comments

The deterioration of the seam between PT27 and PT43 is apparently due to the decreased width of plies, the concomitant increased width of the stone bands, and the greater proportion of interbedded and inferior (heavy dull) coal in PT43.

The extremely broken nature of the core from both PT27 and PT43, the "bad ground" conditions for drilling, and the poor correlation of the coal plies, suggest the presence of one or more faults (of limited throw) peripheral to a major dislocation.

TABLE 1

DD84 PT27

DD84 PT43

007

Ply (Band) No.	From (m)	To (m)	Width (m)	Coal Type (s)	Ply (Band) No.	From (m)	To (m)	Width (m)	Coal Type (s)
1	17.65	17.73	0.08	D	1	18.72	18.97	0.25	Db
(1)	17.73	18.05	0.32	-	(1)	18.97	19.15	0.18	-
2	18.05	18.24	0.19	D	? 2	19.15	19.22	0.07	Bd (Inter-bedded with Shale)
(2)	18.24	?	(?0.19)	-	(2)	19.22	19.34	0.12	-
3	?	19.09	(?0.66)	Dmb, Db	3	19.34	20.00	0.66	D, Dmb, Db, D
(3)	19.09	19.19	0.10	-	} (3)	20.00	20.45	0.45	-
4	19.19	19.22	0.03	D					
(4)	19.22	19.31	0.09	-	4	20.45	20.70	0.25	Heavy dull Db
5	19.31	19.86	0.55	D	(4)	20.70	20.88	0.18	-
(5)	19.86	19.93	0.07	-	5	20.88	20.94	0.06	Bd
6	19.93	19.99	0.06	Dmb	(5)	20.94	20.98	0.04	-
(6)	19.99	20.03	0.04	-	6	20.98	21.02	0.04	Bd
7	20.03	20.05	0.02	D	} ?7	21.02	21.16	0.14	Heavy dull
(7)	20.05	20.07	0.02	-					
8	20.07	20.22	0.15	D	(6)	21.16	21.25	0.09	-
(8)	20.22	20.27	0.05	-	8	21.25	21.35	0.10	Bd
9	20.27	20.35	0.08	D, Db					

Total Coal ≈ 1.82

Total Bands ≈ 0.88

Total Coal - 1.57

Total Bands - 1.06

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TABLE 1

DD84 PT37

DD84 PT44

800

Ply (Band) No	From (m)	To (m)	Width (m)	Coal Type (s)	Ply (Band) No	From (m)	To (m)	Width (m)	Coal Type (s)
1	16.87	17.18	0.31	D	1	17.28	17.43	0.15	D
(1)	17.18	17.35	0.17	-	(1)	17.43	17.47	0.04	-
2	17.35	18.81	1.46	D,Db	2	17.47	17.53	0.06	D
(2)	18.81	18.94	0.13	-	(2)	17.53	17.66	0.13	-
3	18.94	18.96	0.02	D	3	17.66	19.23	1.57	D,Dmb
(3)	18.96	19.00	0.04	-	(3)	19.23	19.40	0.17	-
4	19.00	19.07	0.07	Db	4	19.40	19.49	0.09	Db

Total Coal - 1.86  
Total Bands - 0.34

Total Coal - 1.87  
Total Bands - 0.34

5	22.46	22.52	0.06	D					
(5)	22.52	22.58	0.06	-					
6	22.58	23.18	0.60	D,Dmb	5	22.80	23.36	0.56	D,Dmb,Db
(6)	23.18	23.27	0.09	-	(5)	23.36	23.46	0.10	-
7	23.27	23.53	0.26	Dmb	6	23.46	23.79	0.33	Db
(7)	23.53	23.77	0.24	-	(6)	23.79	23.99	0.20	-
8	23.77	24.22	0.45	D,Dmb	7	23.99	24.56	0.57	D,Dmb,Db
(8)	24.22	24.26	0.04	-	(7)	24.56	24.60	0.04	-
9	24.26	24.38	0.12	Db	8	24.60	25.10	0.50	D,Dmb,Db
(9)	24.38	24.43	0.05	-	(8)	25.10	25.17	0.07	-
10	24.43	25.26	0.83	D,Db,DB	9	25.17	26.04	0.87	D,Dmb,Db,

Total Coal - 2.32  
Total Bands - 0.48

Total Coal - 2.83  
Total Bands - 0.41

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## 2.2 Drill Holes DD84 PT37 and 44

### 2.2.1 Seam U<sub>1</sub>

#### 2.2.1.1 Gross Seam Width

This parameter shows negligible variations between the holes.

#### 2.2.1.2 Cumulative Coal Width

This parameter also shows a negligible variation between the holes (1.86m in PT37, 1.87m in PT44), as does the linear percentage of coal (84.5% in PT37, 84.6% in PT44).

However, ply-by-ply correlation (Table 1) shows minor variations in the widths of the plies and bands.

#### 2.2.1.3 Working Sections

These parameters show negligible variation between the holes.

#### 2.2.1.4 Brightness

The brightness correlation between the holes is reasonable, with the central (main) ply ranging from predominantly dull (D) coal in PT37 to mostly Dmb coal in PT44. Maximum brightness of the total seam is approx. 30% (Db).

### 2.2.2 Seam U<sub>2</sub>

#### 2.2.2.1 Gross Seam Width

This parameter varies markedly, from 2.80m PT37 to 3.24m in PT44; details are shown in Figure 1 and Table 1.

#### 2.2.2.2 Cumulative Coal Width

This parameter is directly related to the increased gross width, ranging from 2.32m in PT37 to 2.83m in PT44.

Linear percentage coal figures also reflect this trend, from 82.9% in PT37 to 87.3% in PT44.

These increased values reflect a consistent increase in the individual ply widths in PT44, from ply 6 down to the base of the seam. This increase varies from +5% to +317%, the most marked change being between ply 9 (0.12m) in PT37 and its correlate, ply 8 (0.50m) in PT44.

#### 2.2.2.3 Working Sections

These parameters vary directly in accordance with the changes in cumulative coal thicknesses.

#### 2.2.2.4 Brightness

The brightness character of the plies in seam U<sub>2</sub> show good correlation between holes, although apparently slightly brighter in PT44 than in PT37; the most pronounced change in vitrinite content corresponds to the most changed ply width (ie ply 8 in PT44).

### 3. COAL WASHABILITIES

Washability diagrams for seam U as intersected in the large diameter holes PT43 and PT44 are depicted in Figures 2, 3 and 4. As these holes were drilled immediately adjacent to earlier NQ cored holes, PT27 and PT37 respectively, the relative changes in washability character have been shown in Figures 5, 6 and 7.

Indicative properties of black coal required by the Hydro-Electric Commission of Tasmania for a thermal power station have been incorporated in the data shown in Table 2. The minimum specific energy required is 21 MJ/Kg, the minimum volatile matter (DAF) is 22% and the maximum ash of 30%.

DRILL HOLE	SEAM	ASH %	YIELD %	VM (DAF) %	S.E. MJ/Kg	Comments
PT27	U	<u>25.0</u>	51.0	25.1	24.2	Estimation of associated yield, ash etc for VM(DAF) of 22.0% is not applicable, because all values are >22.0%.
"	"	<u>30.0</u>	62.0	25.8	22.0	
PT43	"	<u>25.0</u>	37.0	25.2	24.4	
"	"	<u>30.0</u>	44.5	25.8	22.2	
PT27	"	32.5	68.0	26.3	<u>21.0</u>	
PT43	"	33.0	49.0	26.3	<u>21.0</u>	
PT37	U1	<u>25.0</u>	58.0	19.3	23.8	* Max VM(DAF) = 21.6%
"	"	<u>30.0</u>	70.5	20.0	22.0	
PT44	"	<u>25.0</u>	69.5	19.2	23.7	
"	"	<u>30.0</u>	83.0	19.9	21.7	
PT37	"	32.5	76.0	20.5	<u>21.0</u>	
PT44	"	32.0	87.0	20.2	<u>21.0</u>	
PT37	"	39.0	89.0	<u>22.0</u>	18.4	
PT44	"	NA	NA	*	NA	
PT37	U2	<u>25.0</u>	70.0	17.2	24.5	** All samples are <22% VM(DAF)
"	"	<u>30.0</u>	77.0	18.0	23.0	
PT44	"	<u>25.0</u>	71.0	19.0	24.2	
"	"	<u>30.0</u>	78.0	19.7	22.6	
PT37	"	35.0	85.0	18.9	<u>21.0</u>	
PT44	"	34.0	84.5	20.2	<u>21.0</u>	
PT37	"	NA	NA	(	NA	
PT44	"	NA	NA	( **	NA	

4. DISCUSSION

Before any rigorous comparison of washability results can be made, certain important qualifications regarding the data must be enumerated.

The most significant qualification is that prior to the programme of large coring, the extent of local variation of the seams was not known. This is probably best exemplified between holes PT27 and PT43, and also between holes PT37 and PT44 (for Seam U<sub>2</sub>).

These variations were detailed in Section 2, and make any attempts at direct comparison of the washability results problematic.

The maximum variation in gross seam width is  $\pm 15\%$  between holes PT37 and PT44, while cumulative coal thickness varies by  $\pm 25\%$  between holes PT27 and PT43, and by  $\pm 20\%$  between holes PT37 and PT43. Linear percentages of coal range in average variation from  $\pm 5\%$  to  $\pm 8\%$ .

The only direct comparisons which can be made with confidence are for seam U<sub>1</sub> between holes PT37 and PT44; for constant ash, the yield increases by + 18% to + 20%, while for constant specific energy, the yield shows an increase of approximately + 15% (from the NQ core to the 100mm core in all cases).

The possible "best cases" for consideration in the design of a preparation plant are as follows:-

Seam U (PT27)

Washed product with 32.5% ash, 26.3% vm (DAF) and 21.0 MJ/Kg specific energy, for a yield of 68.0%.

Seam U<sub>1</sub> (PT44)

Washed product with 32.0% ash, 20.2% vm (DAF) and 21.0 MJ/Kg specific energy, for a yield of 87.0%.

Seam U<sub>2</sub> (PT44)

Washed product with 34.0% ash, 20.2% vm (DAF) and 21.0 MJ/Kg specific energy, for a yield of 84.5%.

5. REFERENCES

- AS.2519 (1982) Guide to the evaluation of hard coal deposits using borehole techniques
- Dickson T W, 1984 Parattah EL 18/82, Geology & Lea J and Coal Resource Estimation, Summons T G York Plains Area, CRAE Unpublished Report 12961
- Summons T G 1984 Exploration Report for the Year ending 30.9.84 for EL's 18/82, 19/82 and 20/82, CRAE Unpublished Report 12862

6. LIST OF APPENDICES

- Appendix 1 Lithological Logs of Holes DD84 PT41, 42, 43 and 44

7. LIST OF PLANS

	<u>Title</u>	<u>Scale</u>	<u>CRAE No</u>
✓ Fig 1	Correlation of Large Diameter Cored Holes (100mm) with previous NQ Cored Holes (48mm)	1:100	TASh 2742
✓ Fig 2	DD84 PT43 Washability Diagram Seam U Working Section 18.72 - 21.35m	As Shown	TASh 2412
✓ Fig 3	DD84 PT44 Washability Diagram Seam U1 Working Section 17.28 - 19.49m	As Shown	TASh 2413
✓ Fig 4	DD84 PT44 Washability Diagram Seam U2 Working Section 22.80 - 26.04m	As Shown	TASh 2414
✓ Fig 5	Comparison of Slim Line Core and Large Diameter Core Coal Washabilities (PT27 & PT43) Seam U	As Shown	TASh 2698
✓ Fig 6	Comparison of Slim Line Core and Large Diameter Core Coal Washabilities (PT37 & PT44) Seam U1	As Shown	TASh 2699

	<u>Title</u>	<u>Scale</u>	<u>CRAE No</u>
✓ Fig 7	Comparison of Slim Line Core and Large Diameter Core Coal Washabilities (PT37 & PT44) Seam U2	As Shown	TASh 2700

APPENDIX I

LITHOLOGICAL LOGS OF HOLES

DD84 PT41, 42, 43 and 44

C.R.A. EXPLORATION PTY. LIMITED  
DRILL CORE LOG

SHEET No. 1

TENEMENT NAME... PARATTAL No. EL18/82

PLAN - MAP REFERENCE.....

DEPTH 21.00m HOLE No. DD84 PT41

CASING LEFT..... DPO No(s).....

CO-ORDINATES (539596E, 5320188N) AZIMUTH NA DRILLERS OVERLAND COMMENCED 5.12.84  
RL COLLAR 432m ASL INCLINATION -90° DRILL TYPE SCOUT 250 COMPLETED 5.12.84

DEPTH		CORE RECOVERY		CORE SIZE	CORE DESCRIPTION	WEATH.	DEFECT SPACING	Sample No.	From (m)	To (m)	Rec (m)	ASSAY VALUES (Analysed by .....							
From (m)	To (m)	m	%									Composites							
												RD	A	RD	A	M	VM	S	SE
0	18.28	OPEN	HOLE		0 - 6.0 Dolerite scree														
18.28	19.80	1.52	100	4"	6.0- 6.5 Sandstone, lithic, minor grey (and khaki) Mudstone	FW													
					6.5- 7.0 Coal, oxidised ± carb mudstone	HW													
19.80	21.00	OPEN	HOLE		7.0- 8.0 Mudstone, grey/brown	MW													
					8.0-12.00 Mudstone, grey	SN/F													
					12.00-16.00 Mudstone and siltstone	F													
					16.00-21.00 Sandstone, lithic, f to mg	F													
												SOH 21.00m							
												NB: Coal intersection may be <1m thick, but oxidized/ soft nature of the coal in conjunction with sample contamination prevented a more accurate estimate of the width							

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DRILL CORE LOG

SHEET No. 1

TENEMENT NAME...PABATTAL... No. E118/82

PLAN - MAP REFERENCE.....

DEPTH..... 32.25m..... HOLE No. DD84PT42

CASING LEFT..... DPO No(s).....

CO-ORDINATES (539592E, 5320182N) AZIMUTH..... NA..... DRILLERS..... OVERLAND..... COMMENCED..... 6.12.84.....  
RL COLLAR..... 432m ASL..... INCLINATION..... -90°..... DRILL TYPE..... SCOUT 250..... COMPLETED..... 6.12.84.....

DEPTH		CORE RECOVERY		CORE SIZE	CORE DESCRIPTION	WEATH.	DEFECT SPACING	Sample No.	From (m)	To (m)	Rec (m)	ASSAY VALUES   Analysed by .....							
From (m)	To (m)	m	%									Composites							
												RD	A	RD	A	M	VM	S	SE
0	19.62	OPEN HOLE			0-4.0 Dolerite scree														
					4.0-5.5 Sandstone, lithic and grey to brown/khaki mudstone	{ HW													
19.62	21.47	1.85	100	4"	5.5-6.3 Coal, oxidized	HW				BASE OXIDATION 11.0m									
21.47	31.10	OPEN HOLE			6.3-12.1 Mudstone, grey to brown	MW													
31.10	32.25	1.15	100	4"	12.1-18.0 Siltstone and fg lithic sandstone	F													
					18.0-19.62 Mudstone, grey to dark grey with minor carbonaceous interbeds														
					19.62-29.0 Sandstone, lithic, mg														
					29.0-31.0 Mudstone, grey														
					31.0-31.10 Coal, dull (Dmb)														
					31.10-32.25 Shale and mudstone, grey, extremely broken														
					BOH 32.25m														

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DRILL CORE LOG

SHEET No. 1

TENEMENT NAME.....PARATTAH..... No FL18/82

PLAN - MAP REFERENCE.....00.....

CO-ORDINATES  $\approx$  (539684E, 5320176N) AZIMUTH.....NA..... DRILLERS.....OVERLAND..... COMMENCED.....7.12.84..... DEPTH.....21.87m..... HOLE No. DR84PT43.....

RL COLLAR..... $\approx$  442m ASL..... INCLINATION.....-90°..... DRILL TYPE.....SCOUT 250..... COMPLETED.....11.12.84..... CASING LEFT..... DPO No(s).....

DEPTH		CORE RECOVERY		CORE SIZE	CORE DESCRIPTION	WEATH.	DEFECT SPACING	Sample No.	From (m)	To (m)	Rec (m)	ASSAY VALUES (Analysed by ACIRL)											
From (m)	To (m)	m	%									RD	A	RD	A	M	VM	S	SE				
0	13.5	OPEN	HOLE		0-9.0 Dolerite scree																		
Hole Cemented					9.0-13.5	Mudstone - badly contaminated by dolerite	MW/F																
13.5	17.57	OPEN	HOLE		13.5-17.57 ?Mudstone - no samples returned but water	?F																	
17.57	19.50	1.93	100	4"	colour suggested mudstone and/or siltstone																		
19.50	21.87	2.33	98	4"	17.57-18.72 Mudstone, grey, minor laminae																		
					18.72-18.97 Coal, dull, 25%B (Db), broken																		
					18.97-19.01 Shale, dark brown																		
					19.01-19.15 Shale, buff to grey/green			989856	18.72	19.22	0.50												
					19.15-19.22 Interbedded dark brown shale and bright coal (Bd)																		
					19.22-19.27 Shale/mudstone, dark brown																		
					19.27-19.34 Mudstone, carbonaceous																		
					19.34-19.42 Coal, dull (D to Dmb) broken and contam. with underlying shale			989857	19.22	19.71	0.49												
					19.42-19.50 Shale, brown, and coal (D) .... sample badly contaminated and may be similar to 19.15-19.22m																		
					19.50-19.71 Coal dull 3% B(Dmb) broken & contam with shale above																		
					19.71-19.85 Coal, dull, 30%B (Db)																		
					19.85-19.95 Coal, 50% B (DB)			989858	19.71	20.00	0.29												
					19.95-20.00 Coal, dull (D/Dmb), broken and possibly contaminated with underlying mudstone																		
					20.00-20.05 Mudstone, carbonaceous																		
					20.05-20.45 Shale, buff to cream and v.pale grey/green			989859	20.00	20.45	0.45												
					20.45-20.53 Coal, ave.30% B(Db) broken																		
					20.53-20.70 ?Coal, heavy dull and carbon. mudstone minor 1mm Bd coal plies			989860	20.45	20.88	0.43												
					20.70-20.80 Mudstone, carbonaceous, $\pm$ heavy dull coal																		
					20.80-20.88 Shale, carbon. with minor bright coal plies																		

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 DRILL CORE LOG

SHEET No. 2

TENEMENT NAME..... No. ....

PLAN - MAP REFERENCE.....

DEPTH..... HOLE No. DD84 PT43

CASING LEFT..... DPO No(s).....

COORDINATES..... AZIMUTH..... DRILLERS..... COMMENCED.....

RL COLLAR..... INCLINATION..... DRILL TYPE..... COMPLETED.....

DEPTH		CORE RECOVERY		CORE SIZE	CORE DESCRIPTION	WEATH.	DEFECT SPACING	Sample No.	From (m)	To (m)	Rec (m)	ASSAY VALUES   Analysed by							
From (m)	To (m)	m	%									RD	A	RD	A	M	VM	S	SE
					20.88-20.94 Coal, bright 75% B(Bd), soft														
					20.94-20.98 Shale/mudstone, dark brown														
					20.98-21.02 Coal, bright (Bd), soft														
					21.02-21.11 ?Coal, heavy dull and carbon. mudstone, minor														
					5 vol% 1-3mm Bd coal plies and v. minor mud pellets														
					21.11-21.16 ?Coal, heavy dull, and carbon. mudstone, minor														
					(25 vol%) < 1mm Bd coal plies			989861	20.88	21.35	0.47								
					21.16-21.25 Shale, brown and carbon. for basal 0.01m														
					21.25-21.32 Coal, 70%B(Bd), soft														
					21.32-21.35 Interbedded carbonaceous shale and Bd coal plies														
					21.35-21.45 Mudstone, shaley, dark grey														
					21.45-21.87 Mudstone, grey														
					EOH 21.87m														
					NB: Hole adjacent to DD84 PT27														

096020

C.R.A. EXPLORATION PTY. LIMITED  
DRILL CORE LOG

SHEET No. 1.....

TENEMENT NAME..... PARAITAH..... No. EL18/8

PLAN - MAP REFERENCE.....

CO-ORDINATES <sup>N</sup> (539582E 5320995N) AZIMUTH..... NA..... DRILLERS..... OVERLAND..... COMMENCED..... 7.12.84..... DEPTH..... 26.40m..... HOLE No..... D84.PH4.....

RL COLLAR..... 400m ASL..... INCLINATION..... -90°..... DRILL TYPE..... SCOUT 250..... COMPLETED..... 8.12.84..... CASING LEFT..... DPO No(s)..... 0

DEPTH		CORE RECOVERY		CORE SIZE	CORE DESCRIPTION	WEATH.	DEFECT SPACING	Sample No.	From (m)	To (m)	Rec (m)	ASSAY VALUES (Analysed by ACIRL)							
From (m)	To (m)	m	%									RD	A	RD	A	M	VM	S	SE
0	16.57	OPEN	HOLE		0-16.57 Sandstone, lithic, fg mg & cg, minor siltstone and mudstone horizons														
16.57	18.64	2.00	97	4"	16.57-17.14 Sandstone, lithic, f to mg	F													
					17.14-17.24 Core loss - 0.03m of grey shaley mudstone														
					(± carbonaceous shale) recovered														
					17.24-17.28 Shale, carbonaceous														
					17.28-17.43 Coal, dull (D)														
					17.43-17.47 Interbedded brown shale and heavy dull coal			989843	17.28	17.66	0.38								
					17.47-17.53 Coal, dull (D)														
					17.53-17.56 Shale, dk grey & carbonaceous														
					17.56-17.66 Mudstone, grey, orange zeolite in joints														
					17.66-18.23 Coal, dull ≈ 2% B(Dmb) v. minor orange zeolite in cleats, and v. minor brown shale interbeds			989844	17.66	18.31	0.65								
					18.23-18.31 Coal, dull (D), fissile & Soft														
					18.31-18.68 Coal, dull (D) v. minor brown shale interbeds			989845	18.31	18.68	0.37								
					18.68-19.23 Coal, dull, 1-5% B(Dmb)			989846	18.68	19.23	0.55								
					19.23-19.32 Shale, cream to pale brown/buff														
					19.32-19.40 Interbedded coal (dull & bright) & carbon.														
18.64	19.62	0.85	87	4"	to buff shales, total coal ≈ 70 vol %			989847	19.23	19.49	0.26								
					19.40-19.49 Coal, dull 30% B(Db) hard, with calcite & orange zeolite in fractures, ? v. minor coreloss in coal														
					19.49-19.62 Mudstone, grey - most, if not all of the														
					0.13m coreloss occurred in this interval (- core lifters could not grab the mudstone)														
19.62	22.40	OPEN	HOLE		19.62-22.40 Mudstone & siltstone, minor sandstone (lithic) cuttings														
					22.40-22.61 Mudstone, grey to dark grey														
					22.61-22.64 Coal, heavy dull														
					22.64-22.80 Shale, brown, minor grey mudstone														

096021





Australian Coal Industry Research Laboratories Ltd.  
Incorporated in NSW

KM/bm

REPORT TO :

Mr. T. Dickson,  
Chief Geologist,  
CRA Exploration Pty. Limited,  
P.O. Box 138,  
ROSNY PARK, TASMANIA 7018

REPORT ON :

The Analysis of Borecore Samples from  
DRILL HOLE DD84 PT-43  
DRILL HOLE DD84 PT-44

PREPARED BY :

Kerie Miller

REFERENCES :

Oral Instructions (3.12.84) T. Dickson to J. Williams  
Telex (10.12.1984) T. Summons to J. Williams  
Telex (12.12.1984) T. Summons to J. Williams  
Oral Instructions (10.12.1984) T. Dickson to J. Williams  
Telex (19.12.1984) K. Miller to T. Dickson

REPORT NO :

02/3382

DATE :

19 December, 1984

*Kerie Miller for*  
.....  
J. Williams,  
Manager,  
Maitland Laboratory.

INTRODUCTION

Nineteen (19) samples from drill holes DD84 PT-43 and DD84 PT-44 were delivered to ACIRL Maitland laboratory on 10 December, 1984 and 13 December, 1984.

Each sample was air dried, weighed and crushed to pass 11.2mm.

Nominated working sections were reconstituted and separated in organic liquids of relative density 1.40, 1.50, 1.60, 1.70, 1.80, 1.90, 2.00, 2.10 and 2.20.

Each relative density fraction was weighed, prepared and analysed for proximate analysis, total sulphur and specific energy.

Reserve relative density fractions at 4mm top size were retained from fractions greater than 200g mass.

024



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# ANALYSIS AND TESTING REPORT

Report No. 02/3382

Date 19 December, 1984

Authorisation .....

Client CRA Exploration Pty. Limited

Report to Mr. T. Dickson,  
Chief Geologist,  
P.O. Box 138,  
ROSNY PARK, TAS. 7018

## RESULTS

### DRILL HOLE DD84 PT-43

<u>Sample Number</u>	<u>Depth (m)</u>		<u>Thickness (m)</u>	<u>Mass (kg)</u>
	<u>From</u>	<u>To</u>		
989856	18.72	19.22	0.50	5.932
989857	19.22	19.71	0.49	4.829
989858	19.71	20.00	0.29	3.944
989859	20.00	20.45	0.45	7.263
989860	20.45	20.88	0.43	5.545
989861	20.88	21.35	0.47	5.900

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Chief Geologist,  
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ROSNY PARK, TAS. 7018

RESULTS (continued)DRILL HOLE DD84 PT-44

<u>Sample Number</u>	<u>Depth (m)</u>		<u>Thickness (m)</u>	<u>Mass (kg)</u>
	<u>From</u>	<u>To</u>		
989843	17.28	17.66	0.38	5.210
989844	17.66	18.31	0.65	7.115
989845	18.31	18.68	0.37	4.140
989846	18.68	19.23	0.55	5.160
989847	19.23	19.49	0.26	3.315
989848	22.80	23.14	0.34	3.696
989849	23.14	23.46	0.32	3.878
989850	23.46	23.79	0.33	3.251
989351	23.79	24.17	0.38	4.906
989352	24.17	24.60	0.43	4.715
989353	24.60	25.17	0.57	4.613
989354	25.17	25.60	0.43	4.201
989355	25.60	26.04	0.44	3.576

*Kene Miller*

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Report to Mr. T. Dickson,  
Chief Geologist,  
P.O. Box 138,  
ROSNY PARK, TAS. 7018

### RESULTS (Continued)

#### DRILL HOLE D084 PT-43

#### FLOAT AND SINK ANALYSIS

Working Section : 18.72m - 21.35m

Size Fraction : - 11.2mm + 0mm

<u>Relative Density</u> <u>Fraction</u>	<u>Mass</u> <u>%</u>	<u>Moisture</u> <u>%</u>	<u>FRACTIONAL AIR DRIED BASIS</u>				<u>Specific</u> <u>Energy</u> <u>MJ/kg</u>
			<u>Ash</u> <u>%</u>	<u>Volatiles</u> <u>Matter</u> <u>%</u>	<u>Fixed</u> <u>Carbon</u> <u>%</u>	<u>Sulphur</u> <u>%</u>	
F 1.40	10.3	2.0	10.3	21.8	65.9	0.51	31.28
1.40 - 1.50	7.7	3.5	18.3	19.3	58.9	0.41	27.40
1.50 - 1.60	8.9	5.1	27.4	16.5	51.0	0.32	22.96
1.60 - 1.70	4.8	5.2	38.1	15.4	41.3	0.29	18.74
1.70 - 1.80	9.5	6.8	50.8	12.7	29.7	0.21	13.28
1.80 - 1.90	4.8	8.2	57.6	11.0	23.2	0.16	9.54
1.90 - 2.00	8.7	8.4	62.7	10.7	18.2	0.12	6.80
2.00 - 2.10	7.1	9.5	70.5	10.2	9.8	0.06	3.26
2.10 - 2.20	15.0	10.4	79.0	8.7	1.9	0.02	0.80
S 2.20	23.2	9.2	82.2	8.5	0.1	0.10	0.24



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Chief Geologist,  
P.O. Box 138,  
ROSNY PARK, TAS. 7018

## RESULTS (Continued)

### DRILL HOLE DOB4 PT-43

### FLOAT AND SINK ANALYSIS

Working Section : 18.72m - 21.35m

Size Fraction : - 11.2mm + 0mm

<u>Relative Density</u> <u>Fraction</u>	<u>Mass</u> %	<u>Moisture</u> %	<u>CUMULATIVE AIR DRIED BASIS</u>				<u>Specific</u> <u>Energy</u> MJ/kg
			<u>Ash</u> %	<u>Volatile</u> <u>Matter</u> %	<u>Fixed</u> <u>Carbon</u> %	<u>Sulphur</u> %	
F1.40	10.3	2.0	10.3	21.8	65.9	0.51	31.28
F1.50	18.0	2.6	13.7	20.7	63.0	0.47	29.62
F1.60	26.9	3.5	18.2	19.3	59.0	0.42	27.42
F1.70	31.7	3.7	21.3	18.7	56.3	0.40	26.10
F1.80	41.2	4.4	28.1	17.3	50.2	0.36	23.14
F1.90	46.0	4.8	31.1	16.7	47.4	0.34	21.72
F2.00	54.7	5.4	36.2	15.7	42.7	0.30	19.36
F2.10	61.8	5.9	40.1	15.1	38.9	0.27	17.50
F2.20	76.8	6.7	47.7	13.8	31.8	0.22	14.24
Raw Coal	100.0	7.3	55.7	12.6	24.4	0.20	11.00



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P.O. Box 138,  
ROSNY PARK, TAS. 7018

## RESULTS (Continued)

DRILL HOLE 0084 PT-44

### FLOAT AND SINK ANALYSIS

Working Section : 17.28m - 19.49m

Size Fraction : - 11.2mm + 0mm

Relative Density Fraction	Mass %	Moisture %	FRACTIONAL AIR DRIED BASIS				Specific Energy MJ/kg	
			Ash %	Volatile Matter %	Fixed Carbon %	Sulphur %		
F	1.40	6.5	3.0	12.8	14.1	70.1	0.39	29.14
1.40 - 1.50	14.3	6.3	16.2	13.3	64.2	0.30	26.62	
1.50 - 1.60	33.2	2.9	24.9	14.1	58.1	0.26	23.52	
1.60 - 1.70	14.3	2.9	37.4	13.0	46.7	0.22	19.34	
1.70 - 1.80	6.9	4.0	46.8	11.4	37.8	0.18	15.34	
1.80 - 1.90	3.8	4.2	55.7	10.6	29.5	0.15	12.04	
1.90 - 2.00	4.2	4.1	66.3	10.5	19.1	0.15	7.02	
2.00 - 2.10	1.7	4.9	71.9	9.2	14.0	0.10	4.86	
2.10 - 2.20	2.6	5.1	78.1	8.9	7.9	0.09	3.06	
S	2.20	12.5	6.1	86.0	7.7	0.2	0.14	0.28



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CRA Exploration Pty. Limited  
Mr. T. Dickson,  
Chief Geologist,  
P.O. Box 138,  
ROSNY PARK, TAS. 7018

## RESULTS (Continued)

### DRILL HOLE 0084 PT-44

#### FLOAT AND SINK ANALYSIS

Working Section : 17.28m - 19.49m

Size Fraction : - 11.2mm + 0mm

<u>Relative Density Fraction</u>	<u>Mass %</u>	<u>Moisture %</u>	<u>CUMULATIVE AIR DRIED BASIS</u>				<u>Specific Energy MJ/kg</u>
			<u>Ash %</u>	<u>Volatile Matter %</u>	<u>Fixed Carbon %</u>	<u>Sulphur %</u>	
F1.40	6.5	3.0	12.8	14.1	70.1	0.39	29.14
F1.50	20.8	5.3	15.1	13.6	66.0	0.33	27.40
F1.60	54.0	3.8	21.1	13.9	61.2	0.29	25.02
F1.70	68.3	3.6	24.5	13.7	58.2	0.27	23.82
F1.80	75.2	3.7	26.6	13.5	56.2	0.26	23.06
F1.90	79.0	3.7	28.0	13.4	54.9	0.26	22.52
F2.00	83.2	3.7	29.9	13.2	53.2	0.25	21.74
F2.10	84.9	3.7	30.8	13.1	52.4	0.25	21.40
F2.20	87.5	3.8	32.2	13.0	51.0	0.25	20.86
Raw Coal	100.0	4.1	38.9	12.3	44.7	0.23	18.28



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*Kenn Miller*  
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Chief Geologist,  
P.O. Box 138,  
ROSNY PARK, TAS. 7018

## RESULTS (Continued)

### DRILL HOLE D084 PT-44

#### FLOAT AND SINK ANALYSIS

Working Section : 22.80m - 26.04m

Size Fraction : - 11.2mm + 0mm

<u>Relative Density Fraction</u>	<u>Mass %</u>	<u>Moisture %</u>	<u>FRACTIONAL AIR DRIED BASIS</u>				<u>Specific Energy MJ/kg</u>	
			<u>Ash %</u>	<u>Volatile Matter %</u>	<u>Fixed Carbon %</u>	<u>Sulphur %</u>		
F	1.40	14.1	3.7	9.4	14.0	72.9	0.43	30.64
1.40 - 1.50	19.4	1.2	13.6	15.0	70.2	0.37	29.02	
1.50 - 1.60	18.7	1.9	25.5	14.0	58.6	0.31	24.00	
1.60 - 1.70	8.1	2.4	36.5	13.4	47.7	0.25	19.56	
1.70 - 1.80	4.1	2.8	48.4	12.9	35.9	0.19	14.68	
1.80 - 1.90	1.3	3.0	49.6	12.4	35.0	0.18	14.26	
1.90 - 2.00	1.7	2.8	61.3	11.5	24.4	0.14	9.56	
2.00 - 2.10	2.0	3.2	71.1	10.4	15.3	0.09	5.42	
2.10 - 2.20	1.9	4.2	77.4	8.8	9.6	0.04	3.40	
S	2.20	28.7	6.1	86.1	6.1	1.7	0.01	0.72



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Report to Mr. T. Dickson,  
Chief Geologist,  
P.O. Box 138,  
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## RESULTS (Continued)

### DRILL HOLE DD84 PT-44

#### FLOAT AND SINK ANALYSIS

Working Section : 22.80m - 26.04m

Size Fraction : - 11.2mm + 0mm

<u>Relative Density Fraction</u>	<u>Mass %</u>	<u>Moisture %</u>	<u>CUMULATIVE AIR DRIED BASIS</u>				<u>Specific Energy MJ/kg</u>
			<u>Ash %</u>	<u>Volatile Matter %</u>	<u>Fixed Carbon %</u>	<u>Sulphur %</u>	
F1.40	14.1	3.7	9.4	14.0	72.9	0.43	30.64
F1.50	33.5	2.3	11.8	14.6	71.3	0.40	29.70
F1.60	52.2	2.1	16.7	14.4	66.8	0.37	27.66
F1.70	60.3	2.2	19.4	14.2	64.2	0.35	26.58
F1.80	64.4	2.2	21.2	14.2	62.4	0.34	25.82
F1.90	65.7	2.2	21.8	14.1	61.9	0.34	25.58
F2.00	67.4	2.2	22.8	14.1	60.9	0.33	25.18
F2.10	69.4	2.3	24.2	13.9	59.6	0.32	24.62
F2.20	71.3	2.3	25.6	13.8	58.3	0.32	24.04
Raw Coal	100.0	3.4	43.0	11.6	42.0	0.23	17.36

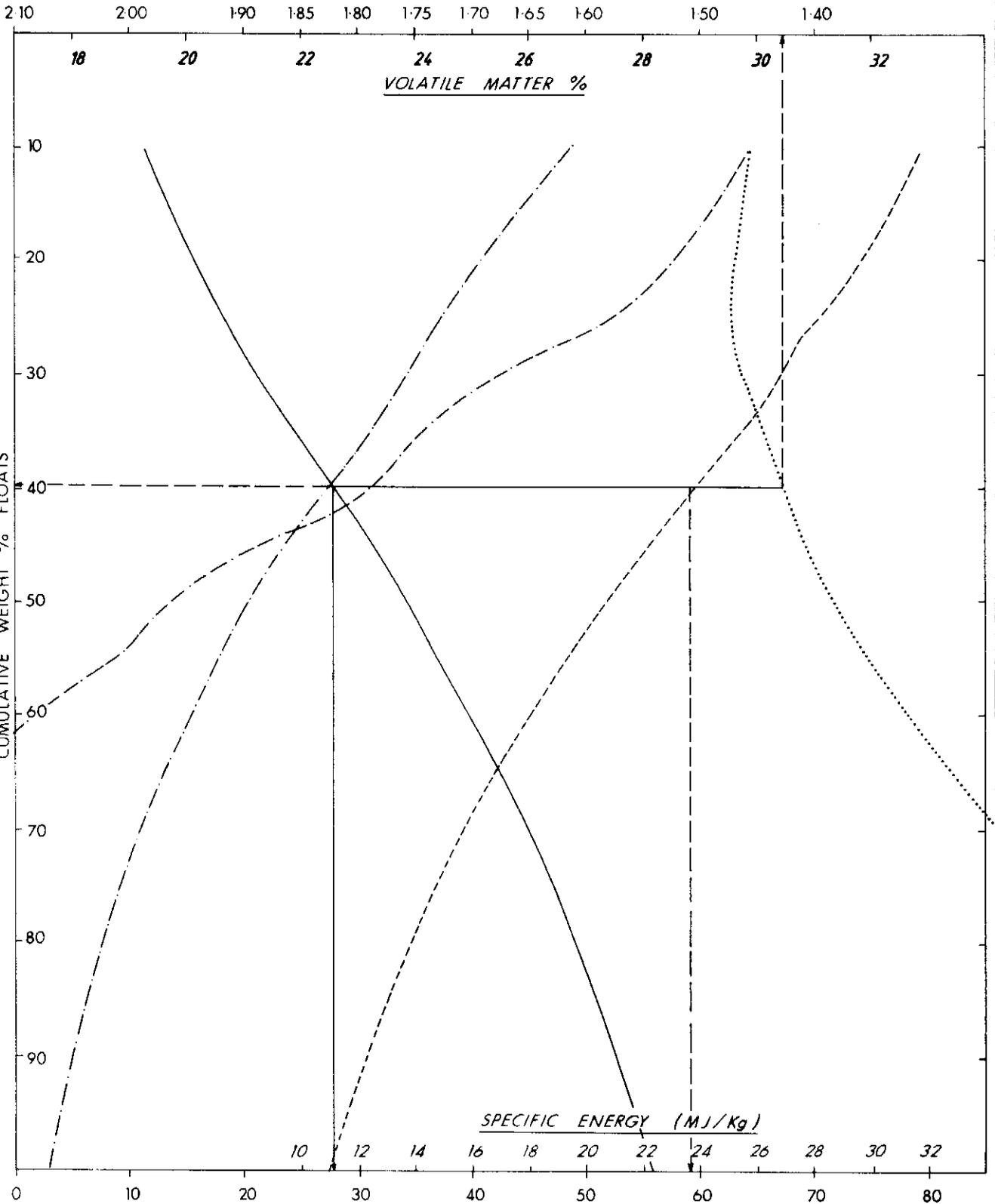


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SPECIFIC GRAVITY

096033



ASH %

Figure 2.

- CUMULATIVE FLOATS CURVE
- - - - - VOLATILE MATTER (a.d.)
- ..... VOLATILE MATTER (d.a.f.)
- . - . - DENSOMETRIC CURVE
- - - - - SPECIFIC ENERGY (MJ/Kg)

CRA EXPLORATION PTY. LIMITED

PARATTAH E.L. 18/82  
DD 84 PT 43

WASHABILITY DIAGRAM  
SEAM U

WORKING SECTION - 18.72 - 21.35m

REF.	SK 55-6	DRAWN	R.T.
SCALE	As shown	REPORT No.	13489
AUTHOR	I.C.	PLAN No.	TASH 2412
DATE	21-12-1984		

95 2479

034

SPECIFIC GRAVITY

096034

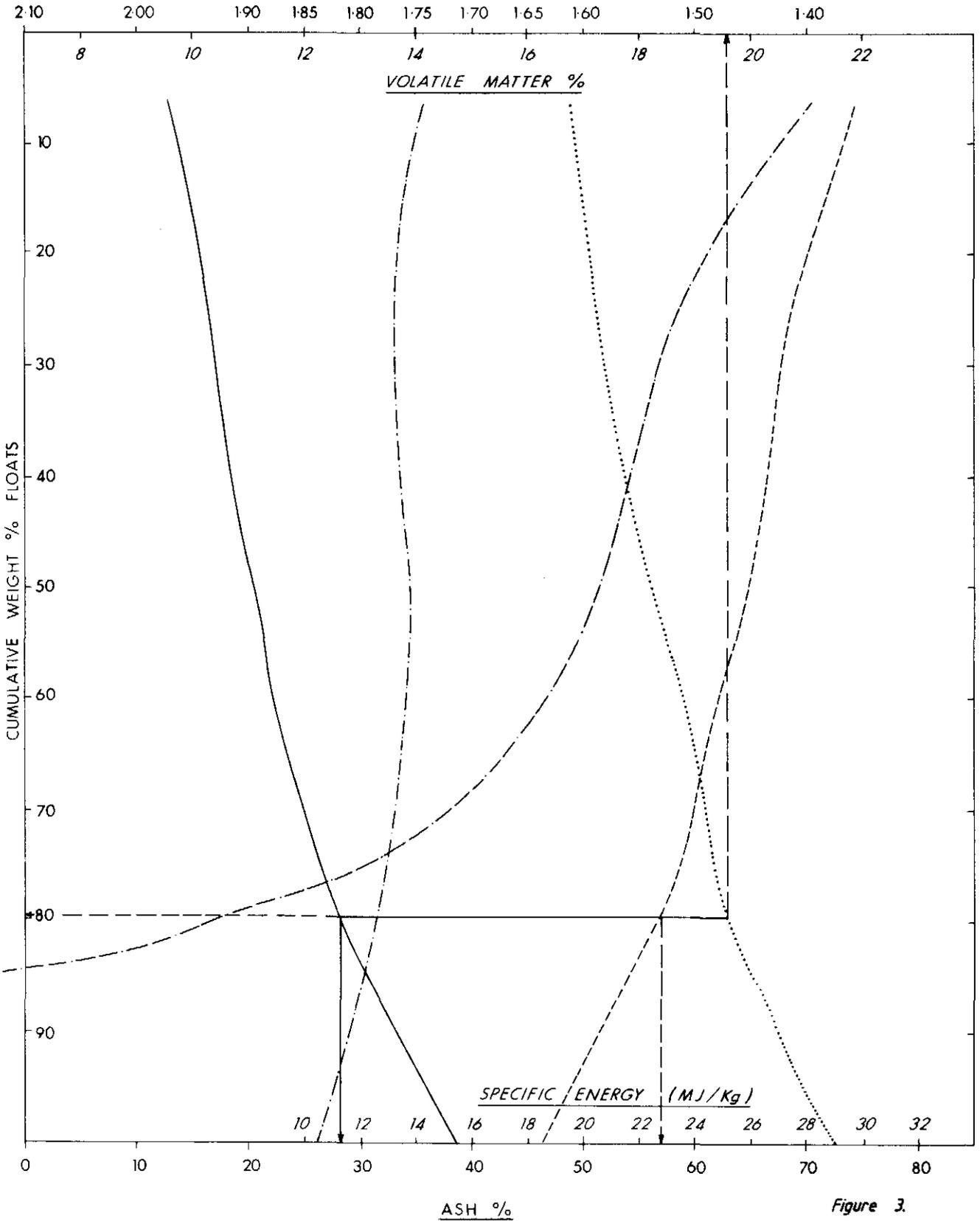


Figure 3.

- CUMULATIVE FLOATS CURVE
- - - - - VOLATILE MATTER (a.d.)
- ..... VOLATILE MATTER (d.a.f.)
- - - - - DENSOMETRIC CURVE
- . - . - . SPECIFIC ENERGY (MJ/Kg)

CRA EXPLORATION PTY. LIMITED

PARATTAH E.L. 18/82  
 DD 84 PT 44  
 WASHABILITY DIAGRAM  
 SEAM U1  
 WORKING SECTION - 17.28 - 19.49m

REF	SK 55-6	DRAWN	R.T.
SCALE	As shown	REPORT No.	13489
AUTHOR	I.C.	PLAN No.	TASH 2413
DATE	21-12-1984		

85-2479

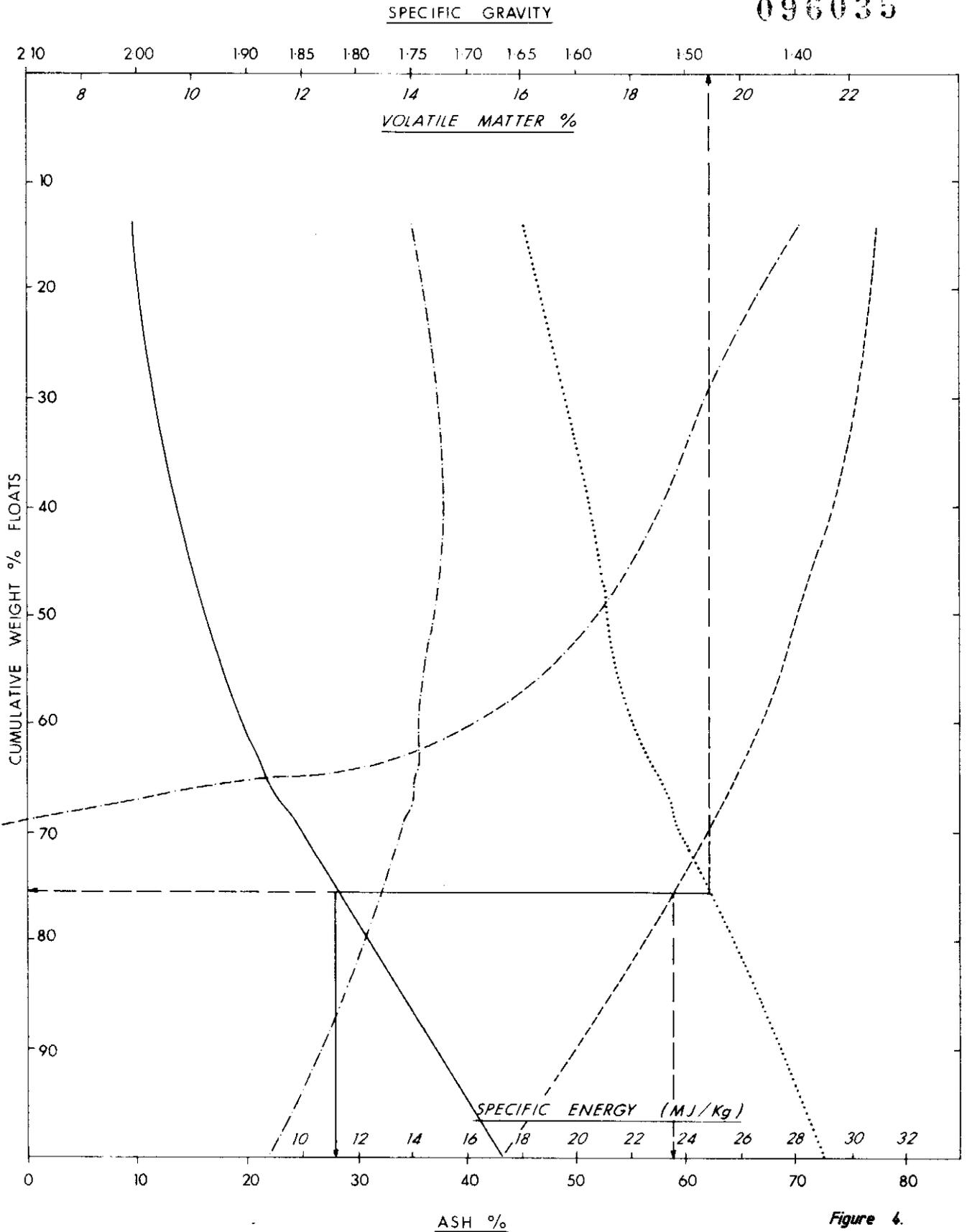


Figure 4.

- CUMULATIVE FLOATS CURVE
- - - - - VOLATILE MATTER (a.d.)
- ..... VOLATILE MATTER (d.a.f.)
- - - - - DENSOMETRIC CURVE
- ..... SPECIFIC ENERGY (MJ/Kg)

**CRA EXPLORATION PTY. LIMITED**

PARATTAH E.L. 18/82  
 DD 84 PT 44  
 WASHABILITY DIAGRAM  
 SEAM U2  
 WORKING SECTION - 22-80 - 26-04m

REF	SK 55-6	DRAWN	R.T.
SCALE	As shown	REPORT No.	13489
AUTHOR	I.C.	PLAN No.	TASH 2414
DATE	21-12-1984		

85-2479

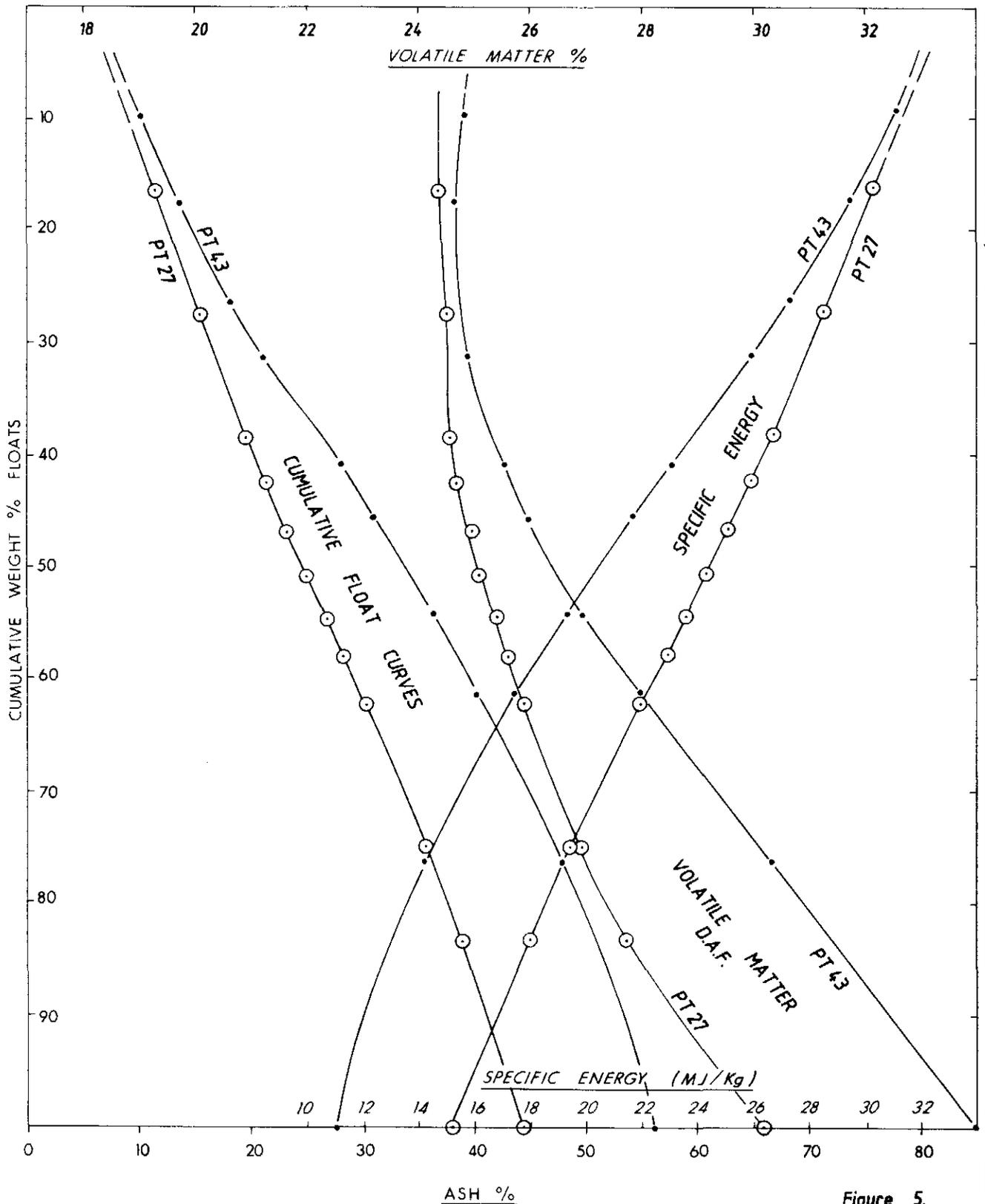


Figure 5.

CRA EXPLORATION PTY. LIMITED

YORK PLAINS COAL DEPOSIT  
 PARATTAH E.L. 18/82  
 COMPARISON OF SLIM LINE CORE  
 AND LARGE DIAMETER CORE  
 Coal Washabilities ( PT27 & PT43 )

- SLIM CORE ( DD84 PT27 )
- LARGE CORE ( DD84 PT43 )

SEAM 'U'

Refer logs and other data for details on seam variation.

REF. SK55 - 6	( 8313 )
SCALE As Shown	DRAWN R.T.
AUTHOR T.G.S.	REPORT No. 13489
DATE 1 - 8 - 1985	PLAN No. TASH 2698

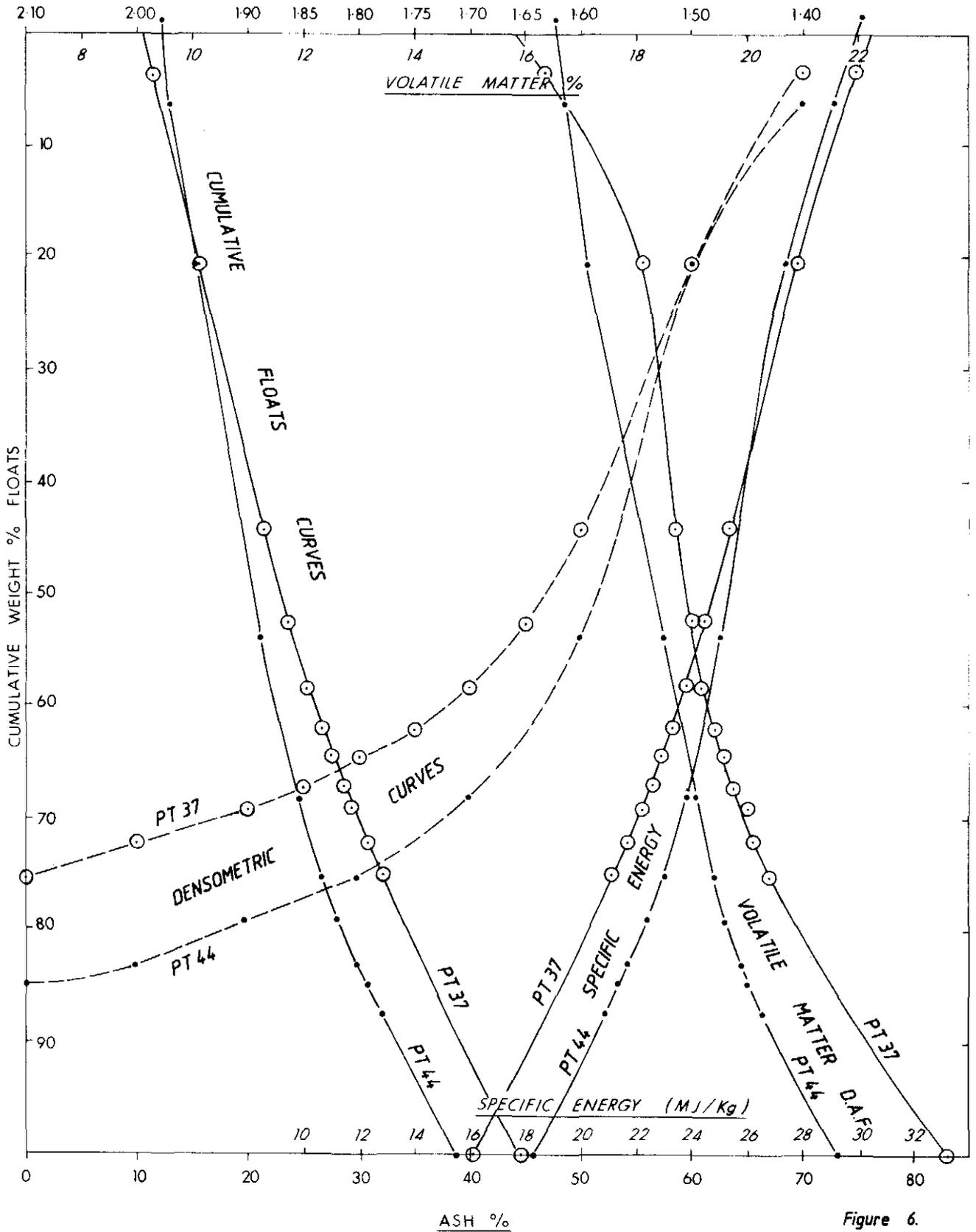


Figure 6.

CRA EXPLORATION PTY. LIMITED

YORK PLAINS COAL DEPOSIT  
 PARATTAH E.L. 18/82  
 COMPARISON OF SLIM LINE CORE  
 AND LARGE DIAMETER CORE  
 Coal Washabilities ( PT37 & PT44 )

○—○ SLIM CORE ( DD84 PT37 )

●—● LARGE CORE ( DD84 PT44 )

SEAM 'U1'

Refer logs and other data for details  
 on seam variation.

REF.	SK55 - 6	( 8313 )
SCALE	As Shown	DRAWN R.T.
AUTHOR	T.G.S.	REPORT No. 13489
DATE	1 - 8 - 1985	PLAN No. TASH 2699

85-2479

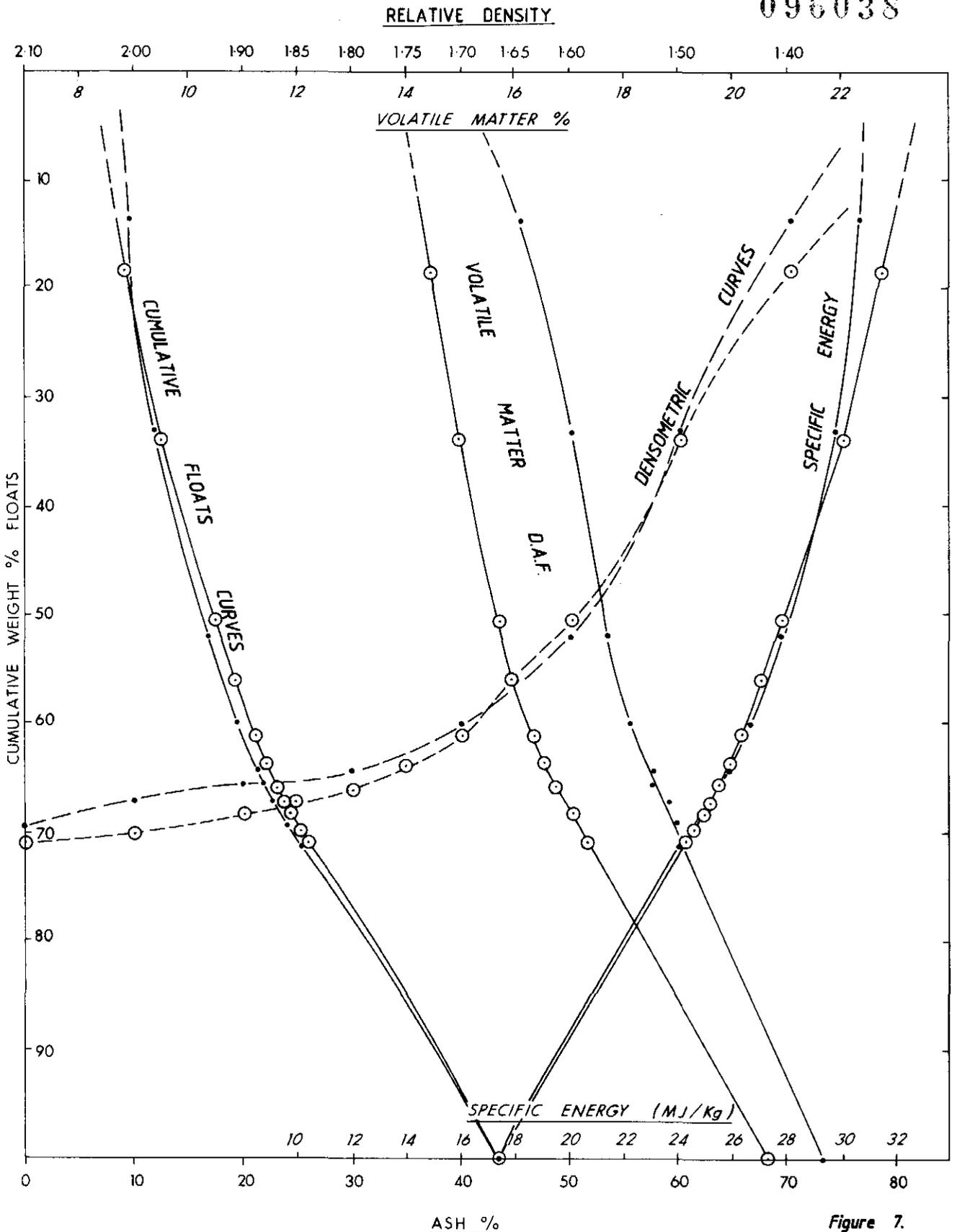


Figure 7.

- SLIM CORE ( DD84 PT37 )
- LARGE CORE ( DD84 PT44 )

SEAM 'U2'

Refer logs and other data for details on seam variation.

**CRA EXPLORATION PTY. LIMITED**

YORK PLAINS COAL DEPOSIT  
 PARATTAH E.L. 18/82  
 COMPARISON OF SLIM LINE CORE  
 AND LARGE DIAMETER CORE  
 Coal Washabilities ( PT37 & PT44 )

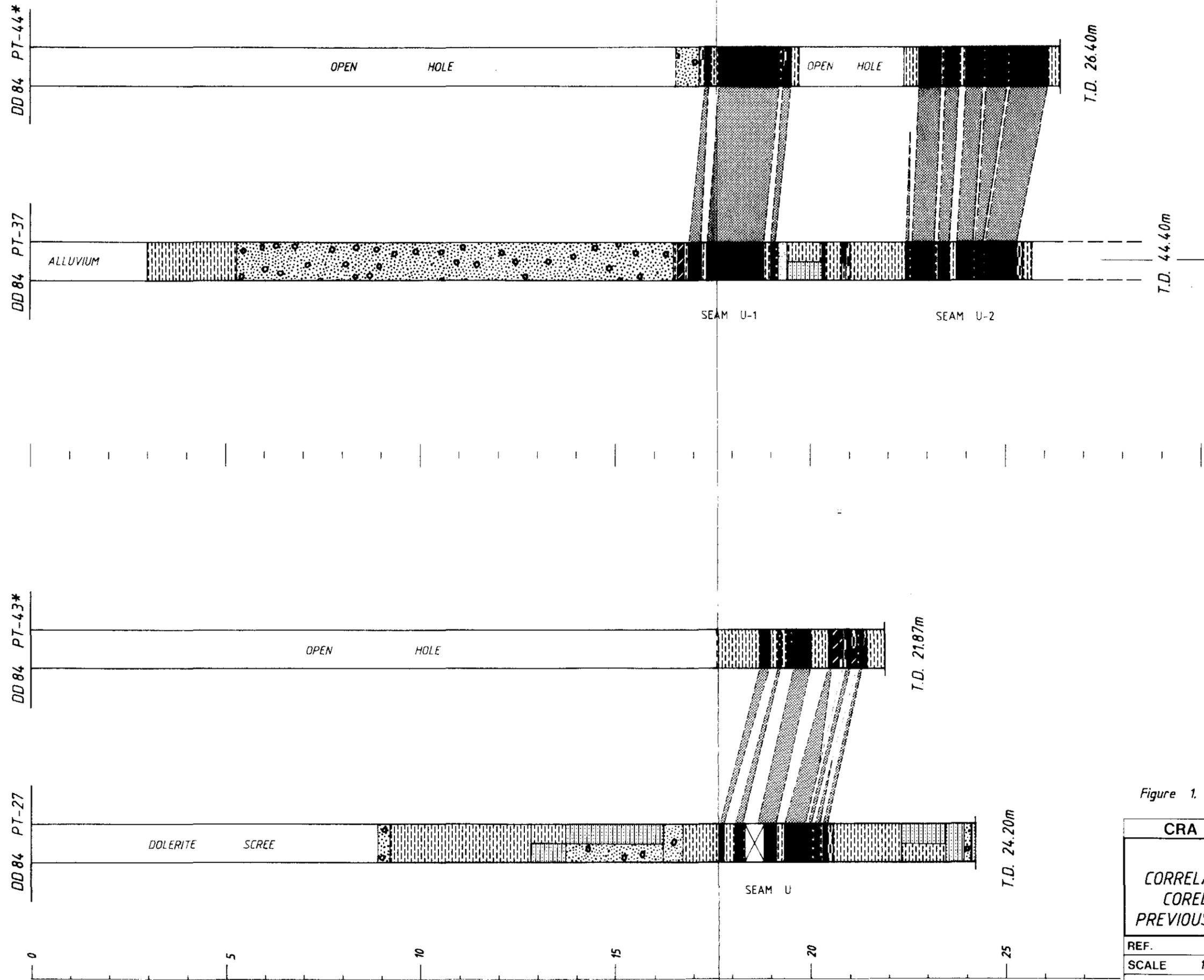
REF.	SK55 - 6	( 8313 )
SCALE	As Shown	DRAWN R.T.
AUTHOR	T.G.S.	REPORT No. 13489
DATE	1 - 8 - 1985	PLAN No. TASH 2700

032

096039

Depth in metres

Depth in metres



5 cm

LEGEND

- Siltstone
- Lithic Sandstone
- Quartz Sandstone
- Core Loss
- Coal
- Heavy Dull Coal
- Carbonaceous Mudstone / Shale
- Grey - Brown Mudstone / Shale

\* N.B. \*  
 DD84 } PT-27 NQ (48mm)  
 DD84 } PT-37  
 DD84 } PT-43 L.D.H. (100mm)  
 DD84 } PT-44

Figure 1.

CRA EXPLORATION PTY. LIMITED			
PARATTAH E.L. 18/82			
CORRELATION OF LARGE DIAMETER			
CORED HOLES ( 100mm ) WITH			
PREVIOUS NQ CORED HOLES ( 48mm )			
REF.	SK 55 - 6	( 8313 )	
SCALE	1 : 100	DRAWN	R.T.
AUTHOR	T.G.S.	REPORT No.	13489
DATE	5 8 1985	PLAN No	TASH 2742