

COAL BANK SAMPLE

COAL:SEAHAM (VANE TEMPEST)

GRADE:SINGLES

SEAM:\* C \*

BCC COAL RANK CODE:601

ECE / ISO CLASSIFICATION:633

PROXIMATE ANALYSIS

(% a.d.)	
Moisture	4.7
Ash	4.0
Volatile matter	32.3
Fixed carbon	59.0
Volatile matter (dmmf)	35.6

ULTIMATE ANALYSIS (%)

Carbon (dmmf)	85.4
Hydrogen (dmmf)	5.1
Oxygen (dmmf)	6.8
Nitrogen (dmmf)	1.87

ASH ANALYSIS  
(% on ash)

Na <sub>2</sub> O	2.2
K <sub>2</sub> O	0.9
CaO	3.7
MgO	2.1
Fe <sub>2</sub> O <sub>3</sub>	20.9
Al <sub>2</sub> O <sub>3</sub>	21.4
SiO <sub>2</sub>	44.2
SO <sub>3</sub>	4.2
TiO <sub>2</sub>	1.0
Mn <sub>3</sub> O <sub>4</sub>	0.1
P <sub>2</sub> O <sub>5</sub>	0.3

CAKING PROPERTIES

Swelling Index	6
Gray-King Coke Type	G4

Organic sulphur (db)	0.62
Sulphate as S (db)	<0.02
Pyritic sulphur as S (db)	0.36

Chlorine (db)	0.26
Carbon dioxide (db)	0.15
Mineral matter (db)	4.87

CALORIFIC VALUE

kJ / kg (daf)	35020
---------------	-------

MACERAL ANALYSIS

(% by volume, mmf)	
Vitrinite	83
Exinite	8
Inertinite	9

ASH FUSION RANGE (°C) \*

Deformation temp.	1120
Hemisphere temp.	1150
Flow temp.	1300

\*Test atmosphere: reducing (50% CO<sub>2</sub> / 50% H<sub>2</sub>)

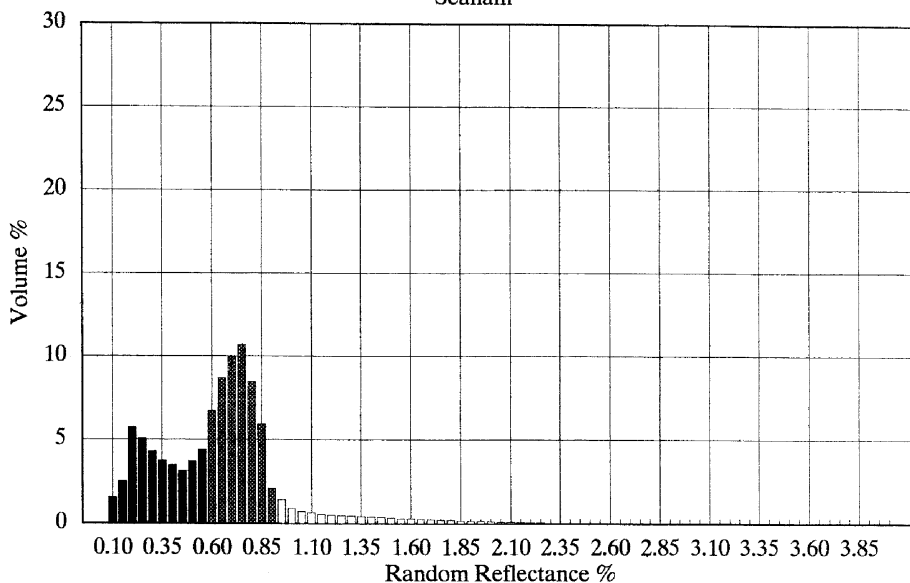
ad: as analysed  
db: dry basis  
daf: dry, ash free  
dmmf: dry, mineral matter free  
mmf: mineral matter free

This analysis is typical of this specially selected sample, but there may be slight variations between the data given above and that of the actual sample supplied.

APPENDIX 11B

REFLECTANCE HISTOGRAM

Seaham



□ Inertinite    ■ Liptinite    ▨ Vitrinite

Mean random vitrinite reflectance 0.71

Vitrinite Standard Deviation 0.08

**COAL BANK SAMPLE**

**COAL: THORESBY**

**GRADE: SMALLS**

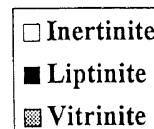
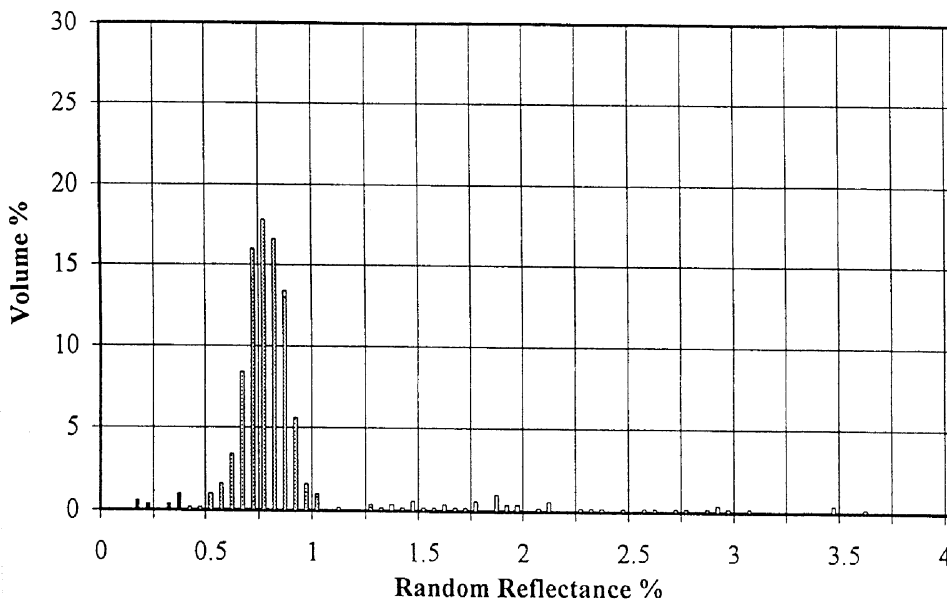
**BCC COAL RANK CODE: N/A**

PROXIMATE ANALYSIS (% a.d.)		ULTIMATE ANALYSIS (%)		ASH ANALYSIS (% on ash)		
Loss on Ignition (db)	83.7	Carbon (dmmf)	85.1	Na <sub>2</sub> O	2.1	
Moisture	2.8	Hydrogen (dmmf)	4.95	K <sub>2</sub> O	3.8	<b>ASH FUSION RANGE</b>
Ash	15.8	Oxygen (dmmf)	8.2	CaO	3.7	<b>(Deg.C)</b>
Volatile matter	30	Total Nitrogen (dmmf)	1.91	MgO	1.4	Reducing atmosphere
Fixed carbon	51.4	Total Sulphur (db)	2.11	Fe <sub>2</sub> O <sub>3</sub>	11.8	(50% CO <sub>2</sub> / 50% H <sub>2</sub> )
Volatile matter (dmmf)	38.1	Chlorine (db)	0.6	Al <sub>2</sub> O <sub>3</sub>	22.3	Deformation temp.
		Mineral matter (db)	19.01	SiO <sub>2</sub>	49.9	Hemisphere temp.
		Carbon dioxide (db)	0.51	TiO <sub>2</sub>	0.9	Flow temp.
		Forms of Sulphur		SO <sub>3</sub>	3.7	
		Organic Sulphur (db)	0.99	P <sub>2</sub> O <sub>5</sub>	<0.5	Oxidising atmosphere
		Sulphate as S (db)	0.02	Mn <sub>3</sub> O <sub>4</sub>	0.1	
		Pyritic Sulphur as S (db)	1.1			Deformation temp.
		Forms of Nitrogen*				Hemisphere temp.
		Pyridinic Nitrogen (%)	39(28)			Flow temp.
		Pyrolic Nitrogen (%)	49(56)			
		Quaternary Nitrogen (%)	12(16)			
				<b>KEY</b>		
				ad:	as analysed	
				db:	dry basis	
				daf:	dry, ash free	
				dmmf:	dry, mineral matter free	
				mmf:	mineral matter free	
<b>HARDGROVE INDEX</b>	52					
<b>CAKING PROPERTIES</b>						
Swelling Index	4.5	<b>CALORIFIC VALUE</b>				
Gray-King Coke Type	D	<b>kJ / kg (db)</b>	28540			
		<b>kJ / kg (daf)</b>	34100			
<b>MACERAL ANALYSIS</b>						
<b>(% by volume, mmf)</b>						
Vitrinite	86.4					
Liptinite	3.4					
Inertinite	10.2					
Mean Random Vitrinite Reflectance	0.73					
Vitrinite Reflectance Standard Deviation	0.1					

This analysis is typical of the selected sample but there may be slight variations between the data given and that of actual samples supplied.  
 \* It is generally accepted that <10% of coal-N is bound in amino groups and that the inclusion of amino-N tends to make the fit worse when resolving N 1s spectra.  
 Where two sets of "Forms of Nitrogen" values have been given (the second set in brackets), the spectral curve fitting is inconclusive.

APPENDIX 12B

**INTERACTIVE REFLECTANCE HISTOGRAM  
THORESBY COAL**



COAL BANK SAMPLE

COAL:KELLINGLEY

GRADE:SINGLES

SEAM:SILKSTONE

BCC COAL RANK CODE:502

ECE / ISO CLASSIFICATION:634

PROXIMATE ANALYSIS (% a.d.)		ULTIMATE ANALYSIS (%)		ASH ANALYSIS (% on ash)	
Moisture	4.7	Carbon (dmmf)	85.1	Na <sub>2</sub> O	4.2
Ash	5.0	Hydrogen (dmmf)	5.9	K <sub>2</sub> O	1.5
Volatile matter	37.1	Oxygen (dmmf)	5.7	CaO	12.5
Fixed carbon	53.2	Nitrogen (dmmf)	2.12	MgO	0.6
Volatile matter (dmmf)	41.6			Fe <sub>2</sub> O <sub>3</sub>	23.2
				Al <sub>2</sub> O <sub>3</sub>	17.6
HARDGROVE INDEX	34	Organic sulphur (db)	0.84	SiO <sub>2</sub>	31.4
		Sulphate as S (db)	<0.1	SO <sub>3</sub>	2.6
CAKING PROPERTIES		Pyritic sulphur as S (db)	0.73	TiO <sub>2</sub>	0.6
Swelling Index	4.5			Mn <sub>2</sub> O <sub>4</sub>	0.1
Gray-King Coke Type	G6	Chlorine (db)	0.41	P <sub>2</sub> O <sub>5</sub>	6.6
		Carbon dioxide (db)	0.11		
		Mineral matter (db)	6.31		
CALORIFIC VALUE		MACERAL ANALYSIS			
kJ / kg (daf)	35440	(% by volume, mmf)			
		Vitrinite	69		
		Exinite	19		
		Inertinite	12		
ASH FUSION RANGE (°C) *					
Deformation temp.	1040				
Hemisphere temp.	1080				
Flow temp.	1110				

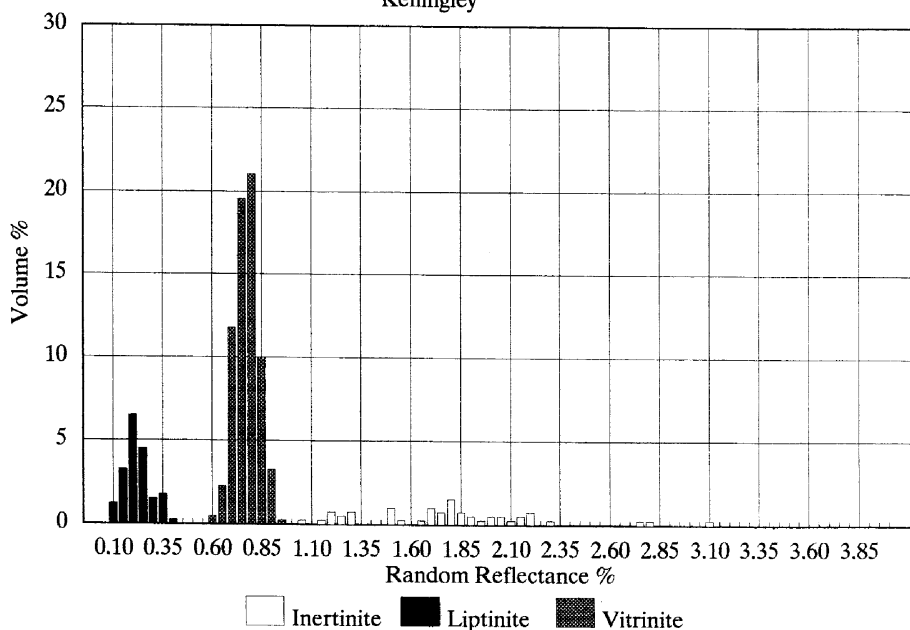
\*Test atmosphere: reducing (50% CO<sub>2</sub> / 50% H<sub>2</sub>)

ad: as analysed  
db: dry basis  
daf: dry, ash free  
dmmf: dry, mineral matter free  
mmf: mineral matter free

This analysis is typical of this specially selected sample, but there may be slight variations between the data given above and that of the actual sample supplied.

APPENDIX 13B

INTERACTIVE REFLECTANCE HISTOGRAM  
Kellingley



Mean random vitrinite reflectance 0.75  
Vitrinite Standard Deviation 0.06

COAL BANK SAMPLE

COAL:TRENTHAM (HEM HEATH)

GRADE:SINGLES

SEAM:

BCC COAL RANK CODE:702

ECE / ISO CLASSIFICATION:632

PROXIMATE ANALYSIS

(% a.d.)	
Moisture	4.5
Ash	3.5
Volatile matter	34.1
Fixed carbon	57.9
Volatile matter (dmmf)	37.3

CAKING PROPERTIES

Swelling Index	5
Gray-King Coke Type	G

CALORIFIC VALUE

kJ / kg (daf)	34580
---------------	-------

ASH FUSION RANGE (°C) \*

Deformation temp.	1180
Hemisphere temp.	1230
Flow temp.	1310

ULTIMATE ANALYSIS (%)

Carbon (dmmf)	84.8
Hydrogen (dmmf)	5.1
Oxygen (dmmf)	7.0
Nitrogen (dmmf)	1.86

Organic sulphur (db)	0.65
Sulphate as S (db)	<0.1
Pyritic sulphur as S (db)	0.21

Chlorine (db)	0.80
Carbon dioxide (db)	0.34
Mineral matter (db)	4.36

MACERAL ANALYSIS

(% by volume , mmf)	
Vitrinite	76
Exinite	7
Inertinite	17

ASH ANALYSIS

(% on ash)	
Na <sub>2</sub> O	2.3
K <sub>2</sub> O	0.5
CaO	10.6
MgO	2.3
Fe <sub>2</sub> O <sub>3</sub>	17.4
Al <sub>2</sub> O <sub>3</sub>	23.7
SiO <sub>2</sub>	30.8
SO <sub>3</sub>	7.6
TiO <sub>2</sub>	0.6
Mn <sub>3</sub> O <sub>4</sub>	0.2
P <sub>2</sub> O <sub>5</sub>	1.4

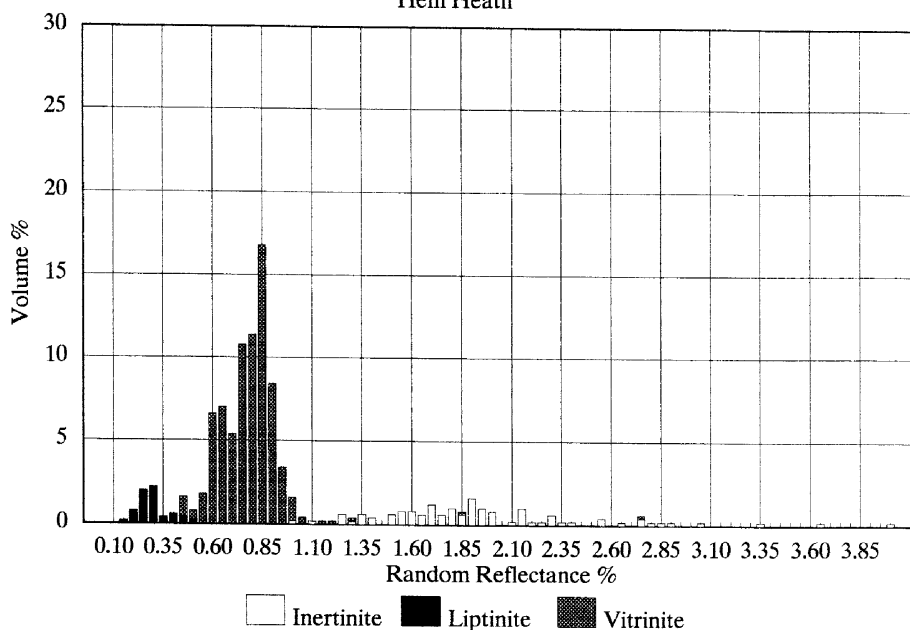
\*Test atmosphere: reducing (50% CO<sub>2</sub> / 50% H<sub>2</sub>)

This analysis is typical of this specially selected sample, but there may be slight variations between the data given above and that of the actual sample supplied.

ad: as analysed  
 db: dry basis  
 daf: dry , ash free  
 dmmf: dry , mineral matter free  
 mmf: mineral matter free

APPENDIX 14B

INTERACTIVE REFLECTANCE HISTOGRAM  
 Hem Heath



Mean random vitrinite reflectance 0.76  
 Vitrinite Standard Deviation 0.17

**COAL BANK SAMPLE**

**COAL: PITTSBURGH NO.8**

GRADE: SMALLS

BCC COAL RANK CODE: N/A

PROXIMATE ANALYSIS (% a.d.)		ULTIMATE ANALYSIS (%)		ASH ANALYSIS (% on ash)	
Moisture	1.4	Carbon (dmmf)	84.6	Na <sub>2</sub> O	0.5
Ash	11.3	Hydrogen (dmmf)	5.06	K <sub>2</sub> O	1.7
Volatile matter	31.1	Oxygen (dmmf)	7.6	CaO	6.4
Fixed carbon	56.2	Nitrogen (dmmf)	1.67	MgO	1.5
Volatile matter (dmmf)	36.5			Fe <sub>2</sub> O <sub>3</sub>	12.9
		Organic sulphur (db)		Al <sub>2</sub> O <sub>3</sub>	24.7
		Sulphate as S (db)		SiO <sub>2</sub>	43.4
		Pyritic sulphur as S (db)		SO <sub>3</sub>	6.1
				TiO <sub>2</sub>	1.1
				Mn <sub>2</sub> O <sub>4</sub>	<0.1
				P <sub>2</sub> O <sub>5</sub>	1.0
CAKING PROPERTIES		Chlorine (db)	0.07		
Swelling Index	6.5	Carbon dioxide (db)	0.51		
Gray-King Coke Type	G	Mineral matter (db)	13.56		
CALORIFIC VALUE		MACERAL ANALYSIS (% by volume, mmf)			
kJ / kg (daf)	34440	Vitrinite	89		
		Liptinite	1		
		Inertinite	10		
ASH FUSION RANGE (°C) *					
Deformation temp.	1175				
Hemisphere temp.	1225				
Flow temp.	1270				

\*Test atmosphere: reducing (50% CO<sub>2</sub> / 50% H<sub>2</sub>)

ad: as analysed  
db: dry basis  
daf: dry, ash free

This analysis is typical of this specially selected sample, but there may be slight variations between the data given above and that of the actual sample supplied.

NB This coal was selected for the DTI Collaborative NO<sub>x</sub> Programme

It is a blend produced to a required specification for UK power station use.

APPENDIX 15B

**INTERACTIVE REFLECTANCE HISTOGRAM  
PITTSBURGH No. 8 COAL**

