



Page 1 of 6

HARD ROCK COAL MINING

Testing and Analysing of Standard Project No: VR006

For Free Moisture, Proximate, Total Sulfur, Calorific Value
And Relative Density Analysis

Report No:	21011120
Report To:	Mr Craig Astill Managing Director Hard Rock Coal Mining PO Box 3051 Pahran East, 3181 Victoria
Report CC:	Mr Ken Morrison Hard Rock Coal Mining 31 Gray Street Fingal, 7214 Tasmania
Sampled By:	Client
Samples Received:	June 2012
Order No:	HRCMEX 56
Date Reported:	13 July 2012

Greg Van Gestel
Laboratory Manager
ALS Coal Division - Richlands

ADDRESS 478 Freeman Road Richlands QLD 4077 Australia | PHONE +61 7 3713 8400 | FAX +61 7 3217 0774
ACIRL Pty Ltd ABN 41 000 513 888 Part of the ALS Group A Campbell Brothers Limited Company



www.alsglobal.com

RIGHT SOLUTIONS RIGHT PARTNER



REPORT No: 21011120
Date: 13/07/12 Page 2 of 6

ANALYSIS AND TESTING REPORT

HARD ROCK COAL COMPANY

Sample Details	Project - VR006 Sample:HVC100 Mass:0.32 kg	Project - VR006 Sample:HVC101 Mass:0.55 kg	Project - VR006 Sample:HVC102 Mass:1.28 kg
PROXIMATE ANALYSIS			
Air Dried Moisture %	5.2	6.0	5.6
Ash %	60.4	24.4	67.4
Volatile Matter %	18.5	24.5	14.3
Fixed Carbon %	15.9	45.2	12.7
Free Moisture % (a.r.)	2.4	1.6	1.8
Total Sulfur %	0.34	0.43	0.13
CALORIFIC VALUE			
Calorific Value MJ/kg	8.80	22.44	4.75
Calorific Value kcal/kg	2100	5358	1136
Relative Density	1.96	1.54	2.08

All results reported to air dried basis unless noted
a.r. = as received basis

Sample Details	Project - VR006 Sample:HVC103 Mass:0.42 kg	Project - VR006 Sample:HVC104 Mass:0.43 kg	Project - VR006 Sample:HVC105 Mass:0.42 kg
PROXIMATE ANALYSIS			
Air Dried Moisture %	5.6	6.0	5.1
Ash %	11.9	70.0	16.6
Volatile Matter %	35.7	13.8	27.7
Fixed Carbon %	46.8	10.2	50.6
Free Moisture % (a.r.)	1.5	2.2	2.1
Total Sulfur %	0.61	0.21	0.45
CALORIFIC VALUE			
Calorific Value MJ/kg	27.01	4.57	25.99
Calorific Value kcal/kg	6452	1092	6208
Relative Density	1.38	2.08	1.45

All results reported to air dried basis unless noted
a.r. = as received basis



REPORT No: 21011120
Date: 13/07/12 Page 3 of 6

ANALYSIS AND TESTING REPORT

HARD ROCK COAL COMPANY

Sample Details	Project - VR006 Sample:HVC106 Mass:0.67 kg	Project - VR006 Sample:HVC107 Mass:0.39 kg	Project - VR006 Sample:HVC108 Mass:0.35 kg
PROXIMATE ANALYSIS			
Air Dried Moisture %	4.6	5.2	3.1
Ash %	52.1	24.5	68.4
Volatile Matter %	19.0	23.6	15.3
Fixed Carbon %	24.3	46.7	13.2
Free Moisture % (a.r.)	1.8	1.4	1.6
Total Sulfur %	0.23	0.35	0.11
CALORIFIC VALUE			
Calorific Value MJ/kg	12.32	22.69	5.24
Calorific Value kcal/kg	2944	5420	1250
Relative Density	1.84	1.53	2.15

All results reported to air dried basis unless noted
a.r. = as received basis

Sample Details	Project - VR006 Sample:HVC109 Mass:3.72 kg	Project - VR006 Sample:HVC110 Mass:1.58 kg	Project - VR006 Sample:HVC111 Mass:0.82 kg
PROXIMATE ANALYSIS			
Air Dried Moisture %	5.3	3.7	2.5
Ash %	29.2	34.1	75.7
Volatile Matter %	24.5	22.3	13.2
Fixed Carbon %	41.0	39.9	8.6
Free Moisture % (a.r.)	2.5	1.5	1.4
Total Sulfur %	0.41	0.38	0.08
CALORIFIC VALUE			
Calorific Value MJ/kg	19.99	20.89	1.39
Calorific Value kcal/kg	4774	4990	332
Relative Density	1.59	1.64	2.31

All results reported to air dried basis unless noted
a.r. = as received basis



REPORT No: 21011120
Date: 13/07/12 Page 4 of 6

ANALYSIS AND TESTING REPORT

HARD ROCK COAL COMPANY

Sample Details	Project - VR006 Sample:HVC112 Mass:1.20 kg	Project - VR006 Sample:HVC113 Mass:1.44 kg	Project - VR006 Sample:HVC114 Mass:0.87 kg
PROXIMATE ANALYSIS			
Air Dried Moisture %	3.9	2.7	3.8
Ash %	32.1	81.7	35.2
Volatile Matter %	21.7	11.6	20.3
Fixed Carbon %	42.3	4.0	40.7
Free Moisture % (a.r.)	1.3	1.6	1.6
Total Sulfur %	0.39	0.02	0.30
CALORIFIC VALUE			
Calorific Value MJ/kg	20.63	1.19	19.12
Calorific Value kcal/kg	4928	284	4568
Relative Density	1.62	2.39	1.67

All results reported to air dried basis unless noted
a.r. = as received basis

Sample Details	Project - VR006 Sample:HVC115 Mass:0.44 kg	Project - VR006 Sample:HVC116 Mass:0.82 kg
PROXIMATE ANALYSIS		
Air Dried Moisture %	2.5	4.4
Ash %	70.6	17.2
Volatile Matter %	15.9	30.8
Fixed Carbon %	11.0	47.6
Free Moisture % (a.r.)	1.7	1.7
Total Sulfur %	0.13	0.56
CALORIFIC VALUE		
Calorific Value MJ/kg	4.03	26.01
Calorific Value kcal/kg	964	6212
Relative Density	2.20	1.44

All results reported to air dried basis unless noted
a.r. = as received basis

**ACCREDITED TESTS**

HARD COAL TEST	ABBREVIATION	STANDARD /REFERENCE
Abrasion Index	AI	AS1038.19
Adiabatic Self Heating		AL035 (In-House)
Ash	A	AS1038.3
Ash Fusibility		AS1038.15
Carbon		AS1038.6.4
Carbonate Carbon	C _m	AS1038.23
Chlorine	Cl	AS1038.8
Crucible Swelling Number	CSN	AS1038.12.1
Dilatometer		AS 1038.12.3
Fixed Carbon	FC	AS1038.3
Float/Sink Analysis	F/S	AS4156.1
Forms of Sulfur	FOS [S _o , S _p , S _s]	AS1038.11
Gieseler		AS1038.12.4.1
Gray King Coke Type	GKCT	AS1038.12.2
Hardgrove Grindability Index	HGI	AS1038.20
Hydrogen	H	AS1038.6.4
Moisture (residual)	M _r	AS1038.3
Moisture Holding Capacity	MHC	AS1038.17
Nitrogen	N	AS1038.6.4
Oxygen	O	AS1038.16
Phosphorus	P	BS1016.14
Relative Density	RD	AS1038.21.1.1
Relative Ignition Temperature	RIT	AL030 (In-House)
Size Analysis		AS3881
Gross Calorific Value	q	AS1038.5
Total Moisture	M	AS1038.1
Total Sulfur	S	AS1038.6.3.3
Volatile Matter	VM	AS1038.3
Ash Analysis		AL044 (In-House) *

COKE TEST	ABBREVIATION	STANDARD /REFERENCE
Proximate Analysis		AS 1038.4

Note(s):

1. Acceptance and reporting of results is in accordance with AS1038.16
2. Sampling by ACIRL is in accordance with the following AS2617 (seams, insitu);
AS4264.1 Sampling Procedures ;
AS4264.4 Determination of Precision and Bias
3. All analyses reported to Air-Dried Basis unless otherwise indicated.
- *4. Ash Analysis performed at ACIRL Maitland laboratory (accreditation held).
Based on AS1038.14.2, variation ICP instead of flame for species excitation.



Page 6 of 6

NON ACCREDITED TEST

The following tests are not covered in by the scope of accreditation relating to the laboratories technical accreditation.

<u>TEST</u>	<u>STANDARD/REFERENCE</u>
Drop Shatter	AS2519
Durham Cone	AS1038.25
Froth Flotation	AS4156.2 and Client Specific Procedures
Mineral Matter	AS1038.22
Pre- Treatment	AS2519
Roadway Dusts	QLD Department of Mines and Energy – Quality of incompatible dust, sampling and analysis of roadway dust in underground coal mine – Coal Mining Safety and Health Act 1999 Recognised Standard – No. 05, July 2003
Roga Index	ISO335
Caking Index	ISO15585
Sapozhnikov	Journal of Mine Metals and Fuels India Oct 1978
Size Adjustment	AS2519

COAL DIVISION

AUSTRALIA

Richlands – Head Office

478 Freeman Road
Richlands QLD 4077
Phone: +61 7 3713 8400
Fax: +61 7 3217 0774
Email: ALSCoalRichlands@alsglobal.com

Bowen

3 Fitzalan Street
Bowen QLD 4805
Phone: +61 7 4963 9300
Fax: +61 7 4952 3211
Email: ALSCoalBowen@alsglobal.com

Collie

Lot 2073 Collins Street
Collie WA 6225
Phone: +61 8 9734 3622
Fax: +61 8 9734 4174
Email: ALSCoalCollie@alsglobal.com

Emerald

6-8 McCosker Street
Emerald QLD 4720
Phone: +61 7 4988 2600
Fax: +61 7 4982 4049
Email: ALSCoalEmerald@alsglobal.com

Gladstone

46 Callemondah Drive
Gladstone QLD 4680
Phone: +61 7 4971 5600
Fax: +61 7 4971 5601
Email: ALSCoalGladstone@alsglobal.com

Gunnedah

5-7 Talbot Road
Gunnedah NSW 2380
Phone: +61 2 6742 0058
Fax: +61 2 6742 0068
Email: ALS CoalGunnedah@alsglobal.com

CANADA

Richmond

11191 Coppersmith Place
Richmond BC V7A 5H1
Phone: +1 604241 3166
Fax: +1 604 241 3126
Email: ALSCoalRichmond@alsglobal.com

Ipswich

1 Acirl Street
Riverview QLD 4303
Phone: +61 7 3810 5200
Fax: +61 7 3816 0332
Email: ALSCoalIpswich@alsglobal.com

Lithgow

Unit 3, 16 Donald Street
Lithgow NSW 2790
Phone: +61 2 6350 7400
Fax: +61 2 6352 3583
Email: ALSCoalLithgow@alsglobal.com

Mackay

5 John Vella Drive
Paget QLD 4740
Phone: +61 7 4963 9300
Fax: +61 74952 3211
Email: ALSCoalMackay@alsglobal.com

Maitland

Junction Street
Telarah NSW 2320
Phone: +61 2 4932 2200
Fax: +61 2 4932 4069
Email: ALSCoalMaitland@alsglobal.com

Muswellbrook

Unit 2, Lot 6 Industrial Close
Muswellbrook NSW 2333
Phone: +61 2 6542 2400
Fax: +61 2 6543 3234
Email: ALSCoalMuswellbrook@alsglobal.com

Newcastle

2 Spit Island Close
Mayfield NSW 2304
Phone: +61 2 4014 2600
Fax: +61 2 4014 2699
Email: ALSCoalNewcastle@alsglobal.com

SOUTH AFRICA

Witbank

1 Grysbok Street
Tasbet Place
Witbank 1035 Mpumalanga
Phone: +27 13 692 8000
Fax: +27 13 692 5609

Minerals

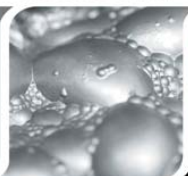
Metallurgy


Coal

Environmental Tribology

Food &

Pharmaceutical Industrial



Coal 

www.alsglobal.com