

Global Coal Sales Group, LLC.

Signal Peak Energy - Bull Mountain Mine No.1

Typical Coal Quality Analysis

Proximate Analysis	As Rec'd	Dry
Moisture %	19.37	---
Ash %	5.89	7.30
Volatile Matter %	30.53	37.97
Fixed Carbon %*	43.77	54.17
Sulfur %	0.45	0.55
Btu/Lbs	10,240	12,700
kcal/kg	5,693	7,060
kcal/kg (Net)	5,374	6,805
MAF Btu/Lbs	13,700	0

Ash Mineral Analysis %	Ignited	SO ₃ free
SiO ₂	43.04	48.33
Al ₂ O ₃	26.72	30.00
TiO ₂	0.98	1.10
Fe ₂ O ₃	3.79	4.26
CaO	8.34	9.36
MgO	1.64	1.84
K ₂ O	0.49	0.55
Na ₂ O	2.92	3.28
P ₂ O ₅	0.20	0.22
SrO	0.58	0.65
BaO	0.27	0.31
Mn ₃ O ₄	0.08	0.09
SO ₃	10.94	---
Undetermined	0	0

Sulfur Forms %	As Rec'd	Dry
Pyritic Sulfur	0.06	0.07
Organic Sulfur	0.37	0.46
Sulfate Sulfur	<0.01	---

Combustion Products	Lbs/M Btu	Kg/M Btu
Ash	5.75	2.61
Sulfur	0.44	0.20
SO ₂	0.87	0.40
H ₂ O**	63.05	28.60
Na ₂ O	0.17	0.08
CO ₂	209.13	94.86

Ultimate Analysis	As Rec'd	Dry
Moisture %	19.37	---
Carbon %	58.41	72.48
Hydrogen %	4.01	4.98
Nitrogen %	1.04	1.29
Sulfur %	0.45	0.55
Ash %	5.89	7.30
Oxygen %*	10.84	13.39

Fusion Temperature (°F)	Reducing	Oxidizing
Initial Deformation	2,374	2,398
Softening (H=W)	2,453	2,480
Hemispherical (H=1/2W)	2,470	2,510
Fluid	2,562	2,598

Fusion Temperature (°C)	Reducing	Oxidizing
Initial Deformation	1,301	1,314
Softening (H=W)	1,345	1,360
Hemispherical (H=1/2W)	1,355	1,377
Fluid	1,405	1,426

Trace Elements	Dry µg /g
Arsenic	3.51
Boron	49.92
Cadmium	0.01
Chlorine	29.35
Fluorine	34.57
Lead	3.93
Mercury	0.05
Nickel	1.62
Phosphorus	0.01
Selenium	0.43
Vanadium	9.34

Miscellaneous	
Hardgrove Grindability (HGI)	50
Fixed Carbon:Volatile ratio*	1.43
Slagging Index	0.01

* Calculated based on difference

** Assuming Empirical Formula of Coal as C₁₃₇H₉₇O₉NS

Updated as of 2018-08-09