

# Alpha Resources, Inc.

## Certificate Of Analysis

AR-2773

### ULTIMATE COAL STANDARD

LOT # 773913

LID # 773913

#### DRIED BASIS VALUES

Proximate Analysis	ASTM		Ultimate Analysis	ASTM	
% Ash.....	5.03 +/- 0.24	D3174/D7582	% Carbon.....	79.70 +/- 2.06	D5373
% Volatile Matter.....	29.48 +/- 0.98	D3175/D7582	% Hydrogen.....	3.13 +/- 0.71	D5373
% Fixed Carbon (calculated)	65.49	D3172	% Nitrogen.....	0.64 +/- 0.13	D5373
% Sulfur.....	0.52 +/- 0.03	D4239	% Oxygen (calculated)...	10.98	D3176
Btu.....	12572 +/- 109	D5865	MAF/DAF BTU	13238 +/- 92	D3180
Mineral Analysis	ASTM		Sulfur Forms	ASTM	
Silica.....	27.30 +/- 6.49	D4326/D6349	% Pyritic.....	(0.06)	D2492
Alumina.....	16.15 +/- 3.24	D4326/D6349	% Organic (calculated)...	(0.43)	D2492
Titania.....	0.92 +/- 0.06	D4326/D6349	% Sulfate.....	(0.03)	D2492
Ferric Oxide.....	7.33 +/- 0.55	D4326/D6349			
Calcium Oxide.....	19.36 +/- 2.42	D4326/D6349	Ash Fusion Temperature	Degrees F	Degrees F
Magnesium Oxide.....	5.24 +/- 1.18	D4326/D6349	ASTM D1857	Reducing	Oxidizing
Potassium Oxide.....	0.31 +/- 0.08	D4326/D6349	Initial deformation...	2065	2163
Sodium Oxide.....	1.82 +/- 0.57	D4326/D6349	Softening.....	2105	2201
Sulfur Trioxide.....	19.17 +/- 2.01	D4326/D6349	Hemispherical.....	2130	2226
Phosphorus Pentoxide.....	0.48 +/- 0.10	D4326/D6349	Fluid/Final.....	2185	2275
Strontium Oxide.....	0.39 +/- 0.12	D4326/D6349			
Barium Oxide.....	0.51 +/- 0.05	D4326/D6349	% Chlorine.....	(<0.01)	
Manganese Oxide...	0.03	D4326/D6349			
Undetermined (calculated)	(0.99)				

**NMI REFERENCES USED: SRM 2685b, Benzoic Acid**

#### Notes:

The material used in production of this standard was prepared and sampled in accordance with ARI 031 and ISO Guide 34-2009. The uncertainty values represent the expanded uncertainty (k=2, two sigma, 95% confidence) obtained through analytical testing by the mentioned ASTM methods, and may not reflect your testing capabilities. Normal test procedures should be employed when using this standard; this includes using the *reproducibility* and *repeatability* factors of the method for establishing analytical uncertainty if needed. When necessary, professional judgment is applied toward consideration of data and statistical information. The statistical analysis and the overall direction and coordination of the analytical measurements leading to certification were performed by K.E. Dyer, Technical Manager at Alpha Resources.

The samples for round robin testing were selected in accordance with ARI 014. The above values relate only to the material used to produce this standard. The analytical samples should be dried or corrected for moisture as per the test method you are using. This bottle contains 50g fine coal powder (-60 mesh). Kept sealed this product has an indefinite shelf life. Once opened this certificate is valid for two years. Keep sealed tight and store under normal laboratory conditions.

Remedies for any claimed defect in this product will be limited to product replacement or refund of the purchase price. In no event shall Alpha Resources be liable for incidental or consequential damages. This is a Certified Reference Material (Working Standard) and is traceable to the above mentioned NMI references. For good laboratory practice it is recommended that all standards be verified prior to use.

#### EXPIRATION DATE

**THIS CRM IS VALID FOR TWO YEARS FROM THE DATE OF OPENING**

CERTIFIED February 24, 2014

