Alpha Resources, Inc.
Certificate Of Analysis

AR-2771
ULTIMATE COKE STANDARD (METALLURGICAL)
LOT # 771311 LID # 771311
DRIED BASIS VALUES

Proximate Analysis		**ASTM**
% Ash……	8.04+/-0.21	D3174/D5142
% Volatile Matter…….	0.85+/-0.18	D3175/D5142
% Fixed Carbon (calculated)	91.11	D3172
% Sulfur……	0.60+/-0.01	D4239B
Btu……	13123	D5865

Ultimate Analysis		**ASTM**
% Carbon……	90.33+/-0.6	D5373
% Hydrogen……	<0.5	D5373
% Nitrogen……	1.17 +/-0.03	D5373
% Oxygen (calculated)…	<0.5	D5373
MAF/DAF BTU	14243	D5865

%Mineral Analysis		**ASTM**
Silica……	46.59 +/-0.97	D4326/D3682
Alumina……	26.63 +/-0.98	D4326/D3682
Titanium Oxide……	1.42 +/-0.18	D4326/D3682
Ferric Oxide……	15.97 +/-0.3	D4326/D3682
Calcium Oxide……	3.00 +/-0.19	D4326/D3682
Magnesium Oxide……	1.19 +/-0.11	D4326/D3682
Potassium Oxide……	1.74 +/-0.09	D4326/D3682
Sodium Oxide……	0.65 +/-0.13	D4326/D3682
Sulfur Trioxide……	1.99 +/-0.23	D4326/D3682
Phosphorus Pentoxide……	0.25 +/-0.05	D4326/D3682
Strontium Oxide……	0.11+/-0.01	D4326/D3682
Barium Oxide……	0.17 +/-0.02	D4326/D3682
Manganese Oxide…	0.1	D4326/D3682
Undetermined (calculated)	0.29	

Sulfur Forms		**ASTM**
% Pyritic……	0.02	D2492
% Organic (calculated)…	0.58	D2492
% Sulfate……	<0.01	D2492

Ash Fusion Temperature ASTM D1857	**Degrees F Reducing**	**Degrees F Oxidizing**
Initial deformation…	2223	2486
Softening……..	2396	2523
Hemispherical……..	2439	2556
Fluid/Final……	2480	2581
% Chlorine……	(0.05)	Reference

The material used in production of this standard was sampled in accordance with ARI 031.The uncertainty values represent the normal standard deviation (k=1, one sigma, 68% confidence) obtained through analytical testing, and may not reflect your testing capabilities. Normal ASTM procedures should be employed when using this standard; this includes using the *reproducibility* and *repeatability* factors for establishing method expanded 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 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 under a nitrogen atmosphere for a minimum of 70 minutes at 107˚ C +/- 3˚C until a steady mass is achieved.

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 (CRM). 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 June 8, 2011

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