





September 18, 2012

CONSIGNOR/SHIPPER
PBS COALS INC 1576 STOYSTOWN ROAD -
FRIEDENS, PA 15541, USA
FAX: (814) 445-2809

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CERTIFICATE OF ANALYSIS

Vessel: "ALAM PENTING", Holds #1/2/3/4/5/6/7
Bill of Lading Date: September 3, 2012
Port of Loading: Norfolk Port, U.S.A.
Port of Discharge: El Dekheila Port, Egypt
Consignee: 
Notify Party: 
Total Tons: 76950.195 Metric
Shipper's ID - Cargo Description: PBS BLEND COKING COAL

SGS Minerals Sample ID: 252-1210195-010R2

As instructed, we prepared and analyzed the samples for this shipment in accordance with applicable ASTM Standard Methods. The MECHANICAL sampling system was used to collect samples during the loading of the vessel at NS Pier 6, Norfolk Port, U.S.A., September 2 - 3, 2012.

Our Laboratory reports the following composite results:

| | <u>Method</u> | <u>As Received</u> | <u>Dry</u> |
|----------------------------|----------------------|--------------------|------------|
| Moisture, Total % | ASTM D3302 | 7.74 | |
| Ash % | ASTM D3174 | 7.29 | 7.90 |
| Volatile Matter % | ASTM D3175 | 26.03 | 28.21 |
| Fixed Carbon % | ASTM D3172 (by diff) | 58.94 | 63.89 |
| Sulfur, Total % | ASTM D4239 (A) | 0.93 | 1.01 |
| Net CV @ Constant Pressure | ASTM D5865 | 7052 | 7692 |

| <u>Tests</u> | <u>Result</u> | <u>Unit</u> | <u>Method</u> |
|---------------------------------------|---------------|-------------|---------------|
| Average Coke Strength Reaction (CSR) | 53.7 | % | ASTM D5341 |
| Coke Strength Reaction of Run 1 (CSR) | 54.4 | % | ASTM D5341 |
| Coke Strength Reaction of Run 2 (CSR) | 53.0 | % | ASTM D5341 |
| FREE SWELLING INDEX (FSI) | | | |
| Free Swelling Index | 8.0 | --- | ASTM D720 |
| HARDGROVE GRINDABILITY | | | |
| Hardgrove Grindability Index | 83 | --- | ASTM D409 |
| Hardgrove Grindability Moisture | 1.04 | % | ASTM D409 |
| DILATOMETER - Audibert Arnu | | | |
| Maximum Contraction | -16 | % | ASTM D5515 |
| Maximum Dilatation | 32 | % | ASTM D5515 |
| Softening Temperature | 401 | °C | ASTM D5515 |
| Temperature of Maximum Contraction | 423 | °C | ASTM D5515 |
| Temperature of Maximum Dilatation | 476 | °C | ASTM D5515 |

Respectfully submitted,
SGS NORTH AMERICA INC.

Newport News Laboratory

SGS North America Inc | Minerals Services Division
12650 McManus Boulevard, Suite 105, Newport News, VA 23602 | (757) 874-9430 | (757) 874-9439 | www.us.sgs.com/minerals





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| Tests | Result | Unit | Method |
|------------------------------------|--------|------|------------|
| GIESELER PLASTOMETER | | | |
| Maximum Fluidity | 711 | DDPM | ASTM D2639 |
| Initial Softening Temperature | 403 | °C | ASTM D2639 |
| Maximum Fluid Temperature | 438 | °C | ASTM D2639 |
| Solidification Temperature | 477 | °C | ASTM D2639 |
| Plastic Range | 74 | °C | ASTM D2639 |
| PETROGRAPHIC ANALYSIS | | | |
| Vitrinoid Type V-7 | 4.3 | % | ASTM D2798 |
| Vitrinoid Type V-8 | 13.0 | % | ASTM D2798 |
| Vitrinoid Type V-9 | 9.9 | % | ASTM D2798 |
| Vitrinoid Type V-10 | 4.9 | % | ASTM D2798 |
| Vitrinoid Type V-13 | 1.2 | % | ASTM D2798 |
| Vitrinoid Type V-14 | 11.7 | % | ASTM D2798 |
| Vitrinoid Type V-15 | 10.5 | % | ASTM D2798 |
| Vitrinoid Type V-16 | 5.6 | % | ASTM D2798 |
| Vitrinoid Type V-17 | 0.6 | % | ASTM D2798 |
| Vitrinite | 61.7 | % | ASTM D2799 |
| Exinite | 4.7 | % | ASTM D2799 |
| Resinite | 0.3 | % | ASTM D2799 |
| Semifusinite (Reactive) | 4.5 | % | US Steel |
| Total Reactives | 71.2 | % | US Steel |
| Semifusinite (Inert) | 8.9 | % | US Steel |
| Micrinite | 14.3 | % | ASTM D2799 |
| Fusinite | 1.0 | % | ASTM D2799 |
| Mineral Matter | 4.6 | % | ASTM D2799 |
| Total Inerts | 28.8 | % | US Steel |
| Composition Balance Index | 1.62 | --- | US Steel |
| Rank Index | 5.16 | --- | US Steel |
| Mean Maximum Vitrinite Reflectance | 1.20 | % | ASTM D2798 |

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| <u>Tests</u> | <u>Result</u> | <u>Unit</u> | <u>Method</u> |
|---|----------------|-------------|---------------|
| FUSION TEMPERATURE OF ASH, REDUCING | | | |
| Initial Deformation | 2620 | °F | ASTM D1857 |
| Softening | 2600 | °F | ASTM D1857 |
| Hemispherical | >2700 | °F | ASTM D1857 |
| Fluid | >2700 | °F | ASTM D1857 |
| ANALYSIS OF ASH | | | |
| Potassium Oxide, K ₂ O | 2.23 | % | ASTM D4326 |
| Sodium Oxide, Na ₂ O | 0.53 | % | ASTM D4326 |
| Phosphorus Pentoxide, P ₂ O ₅ | 0.46 | % | ASTM D4326 |
| Phosphorus, P | 0.20 | % | ASTM D4326 |
| Silicon Dioxide, SiO ₂ | 49.11 | % | ASTM D4326 |
| Aluminum Oxide, Al ₂ O ₃ | 30.86 | % | ASTM D4326 |
| Titanium Dioxide, TiO ₂ | 1.49 | % | ASTM D4326 |
| Iron Oxide, Fe ₂ O ₃ | 9.12 | % | ASTM D4326 |
| Calcium Oxide, CaO | 2.46 | % | ASTM D4326 |
| Magnesium Oxide, MgO | 1.01 | % | ASTM D4326 |
| Sulfur Trioxide, SO ₃ | 2.39 | % | ASTM D5016 |
| Strontium Oxide, SrO | 0.17 | % | ASTM D4326 |
| Barium Oxide, BaO | 0.15 | % | ASTM D4326 |
| Manganese Oxide, MnO ₂ | 0.02 | % | ASTM D4326 |
| Undetermined | 0.00 | % | |
| Sum of Oxides | 100.00 | % | |
| Silica Value | 79.59 | --- | |
| Base Acid Ratio | 0.19 | --- | |
| T250 Temperature | 2741 | °F | |
| Fouling Index | 0.10 | --- | |
| Slagging Index | 0.19 | --- | |
| Type of Ash | BITUMINOUS --- | | |

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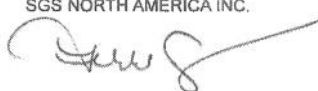
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| <u>Tests</u> | <u>Result</u> | <u>Unit</u> | <u>Method</u> |
|---------------------------|---------------|-------------|---------------|
| PHOSPHORUS IN COAL | | | |
| Phosphorus, AR | 0.015 | % | ASTM D4208 |
| Phosphorus, Dry coal | 0.016 | % | ASTM D4208 |
| P2O5, Dry coal | 0.036 | % | ASTM D4208 |

SIEVE ANALYSIS ASTM D4749/D293

| <u>Passing</u> | <u>Retained on</u> | <u>% Weight</u> | <u>CUMULATIVE RESULTS</u> | |
|----------------|--------------------|-----------------|---------------------------|------------------|
| | | | <u>% Retained</u> | <u>% Passing</u> |
| ----- | 50mm Rd | 1.49 | 1.49 | 98.51 |
| 50mm Rd | 25mm | 13.62 | 15.11 | 84.89 |
| 25mm | 12.5mm Sq | 15.72 | 30.83 | 69.17 |
| 12.5mm Sq | 0.5mm Sq | 52.57 | 83.40 | 16.60 |
| 0.5mm Sq | 0 | 16.60 | 100.00 | 16.60 |

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