



1005 Brandon Shores Road  
Baltimore, Maryland 21226

Constellation Power Generation (CPG) is providing this coal combustion byproducts (CCBs) information in accordance with COMAR 26.04.10.08 for the **Brandon Shores Electric Generation Station** located at the Constellation Power Fort Smallwood Complex in northeastern Anne Arundel County, Maryland.

**A. Contact information (26.04.10.08 A.(1)):**

Facility Name: Brandon Shores Electric Generation Station

Name of Permit Holder: Constellation Power Source Generation

Facility Address: 2030 Brandon Shores Road  
Street

Facility Address: Baltimore Maryland 21226  
City State Zip

County: Anne Arundel

Facility Telephone No.: 410.787.6928 Facility Fax No.: 410.787.5577

Contact Information (Person filing report or Environmental Manager)

Contact Name: John E. Murosko, P.G.

Contact Title: Program Manager

Contact Address: 1005 Brandon Shores Road  
Street

Contact Address: Baltimore Maryland 21226  
City State Zip

Contact Email: john.murosko@constellation.com

Contact Telephone No.: 410.787.5471 Contact Fax No.: 410.787.6637



**B. Description of the CCBs generation process (26.04.10.08 A.(2)):**

**Brandon Shores (BS):** The Brandon Shores Generation Station consists of two coal-fired generating units with a combined nominal generating capacity of approximately 1,370 megawatts (MW). Brandon Shores is co-located on a 483-acre site with the H.A. Wagner Generating Station along Fort Smallwood Road in northern Anne Arundel County. Unit #1 was placed in commercial service in 1984, and Unit #2 was placed in commercial service in 1991. Both units are natural circulation radiant boilers manufactured by Babcock and Wilcox (B&W). The plant currently utilizes low-sulfur “compliance coal,” which is delivered to the Brandon Shores site by barge and stored in areas adjacent to Units 1 and 2. The coal is transferred to the plant storage bunkers via conveyor belts, after which the coal is pulverized and blown into the furnace where combustion of the coal is accomplished utilizing low NOx burners. Currently, for each unit, the flue gas is passed through hot-side electrostatic precipitators (ESPs) to collect the particulate matter (PM) emissions, followed by selective catalytic reduction (SCR) to reduce the nitrogen oxides (NOx) emissions. Ash is collected from the ESP hoppers and conveyed pneumatically to storage silos from where it is loaded into trucks for final disposition.

Coals burned in 2008 at the Brandon Shores Plant from Central Appalachian and South American sources, and are summarized below:

Mine Location	Tons
Kanawha Co. WV	3,039,104
Knott Co. KY	142,390
Colombia S.A.	145,385
Total	3,326,879

**C. Annual report of CCBs generated during the last 5 calendar years (26.04.10.08 A.(3)):**

CCBs produced at the Brandon Shores electric generation station during this reporting period consist of fly ash and bottom ash, and are summarized below.

**Table 1: CCBs Produced in Past Five Years  
Brandon Shores Electric Generation Station**

Year	Fly Ash (tons)	Bottom Ash (tons)
2008	444,779	22,562
2007	386,403	27,523
2006	421,546	32,164
2005	427,241	30,608
2004	489,583	31,050

**D. Descriptions of modeling or risk assessments conducted in the previous year  
(26.04.10.08 A.(4)):**

Prior to September, 2007, Constellation placed CCBs generated at the Brandon Shores and H.A.Wagner facilities and not used for other beneficial uses, at the BBSS facility in Gambrills, MD. Constellation conducted certain modeling or risk assessments in 2008 related to the CCBs placed at the BBSS location. More specifically, it performed modeling of the groundwater flow and CCB-related constituent movement for use in evaluating prospective remedial options at the BBSS site. The modeling results were used to support the "Alternatives Analysis and Proposed Remediation Report," dated May 5, 2008 and submitted to the Director of the Water Management Administration, MDE on May 7, 2008. Additional modeling or risk assessments that may have been in progress in connection with asserted or threatened private claims (not involving MDE as a party) are privileged and confidential, were incomplete or preliminary, and may not even be related specifically to CCBs.

**E. Copies of all laboratory reports of all chemical characterizations of the CCBs  
(26.04.10.08 A.(5)):**

The following analytical results for CCBs sampled in 2008 are attached to this report:

- Processed Fly Ash, Oxides/Alkalies, CTL|Thompson Materials Engineers, Inc., February 3, 2008
- Processed Fly Ash, Oxides/Alkalies, CTL|Thompson Materials Engineers, Inc., February 10, 2008
- Processed Fly Ash, Oxides/Alkalies, CTL|Thompson Materials Engineers, Inc., May 25, 2008
- Processed Fly Ash, Oxides/Alkalies, CTL|Thompson Materials Engineers, Inc., June 1, 2008
- Processed Fly Ash, Oxides/Alkalies, CTL|Thompson Materials Engineers, Inc., June 8, 2008
- Fly Ash, BS#1, Ash, Oxides/Alkalies, CTL|Thompson Materials Engineers, Inc., August 25, 2008
- Fly Ash, BS#2, Ash, Oxides/Alkalies, CTL|Thompson Materials Engineers, Inc., August 25, 2008
- Fly Ash, BS#4, Ash, Oxides/Alkalies, CTL|Thompson Materials Engineers, Inc., August 25, 2008
- Processed Fly Ash, Oxides/Alkalies, CTL|Thompson Materials Engineers, Inc., October 5, 2008
- Processed Fly Ash, Oxides/Alkalies, CTL|Thompson Materials Engineers, Inc., November, 30, 2008
- Bottom Ash, Total Oxides, Standard Laboratories, Inc., August 15, 2008
- Fly Ash, Brandon Silo 1, Total Oxides, Standard Laboratories, Inc., August 15, 2008
- Fly Ash, Brandon Silo 2, Total Oxides, Standard Laboratories, Inc., August 15, 2008
- Fly Ash, BS #4 Rejects, Total Oxides, Standard Laboratories, Inc., August 15, 2008
- Fly Ash, Brandon 1, TCLP Metals, Phase Separation Science, Inc., May 27, 2008
- Fly Ash, Brandon 2, TCLP Metals, Phase Separation Science, Inc., May 27, 2008
- High Carbon Fly Ash, Trace Elements, SGS, November 19, 2008

**F. Descriptions of how CCBs were used and/or disposed (26.04.10.08 A.(6)):**

The following table documents the types and volumes of the CCBs used or disposed of in the last 5 calendar years.

- CCBs delivered to BBSS in Gambrills, MD were used for surface mine restoration.
- CCBs delivered to Waste Management were used for daily cover in municipal solid waste (MSW) landfills located in Charles City and King George, VA.
- CCBs delivered to Mountainview Landfill in Allegany County, MD were used for daily cover in that MSW landfill, as authorized by MDE.
- STI processed fly ash from Brandon Shores, distributing their product to concrete plants throughout the mid-Atlantic region.
- CCBs delivered to Lehigh Cement in Union Bridge, MD were used in concrete production.
- CCBs delivered to Bonsal in White Marsh, MD were used as flowable fill in area projects.
- CCBs delivered to Bulk Materials, Inc. Miami, Florida, were delivered to concrete plants in FL for suitability testing in concrete blocks.

From time to time within this reporting period, small amounts of CCBs (from 5 gallons to less than 20 tons) were delivered to various entities for testing and evaluation of various uses, including metals extraction, grout mixtures and concrete mixtures.

**Table 2: CCBs Used/Disposed in Past Five Years  
Brandon Shores Electric Generation Station**

Year	CCB Receiver	Fly Ash (tons)	Bottom Ash (tons)	CCBs Use
2008	STI	237,628		concrete
	Lehigh	95,470		concrete
	Bulk Materials, Int'l		1,149	concrete testing
	Waste Mgmt, VA	107,317	21,377	landfill, daily cover
	Mountainview LF, MD	4,364		landfill, daily cover
2007	STI	274,571		concrete
	Lehigh	59,009	1,981	concrete
	Bonsal	1,012		flowable fill
	BBSS	43,361	24,940	mine reclamation
	Waste Mgmt, VA	8,450	602	landfill, daily cover
2006	STI	292,000		concrete
	Lehigh	29,417		concrete
	Bonsal	8,977		flowable fill
	BBSS	91,151	32,164	mine reclamation
2005	STI	259,000		concrete
	Lehigh	57,877	97	concrete
	Bonsal	7,850		flowable fill
	BBSS	102,514	30,511	mine reclamation
2004	STI	137,400		concrete
	Lehigh	116,082	17,572	concrete
	Bonsal	16,586		flowable fill
	BBSS	219,515	13,477	mine reclamation

**G. Projections for CCBs use or disposal for the next 5 years (26.04.10.08 A.(7)):**

The estimates provided in this section represent the best information that CPSG has available at this time. CPSG's goal is to maximize beneficial reuse over disposal and is continually seeking new markets which, if successful, could alter the projections provided in Table 3 on the following page.

CCBs delivered to Waste Management of Virginia will be used for daily cover in MSW landfills located in Charles City and King George, VA.

- CCBs delivered to Mountainview Landfill in Allegany County, MD, will be used for daily cover in that MSW landfill, as authorized by MDE.
- CCBs delivered to STI will be used in concrete plants throughout the mid-Atlantic region.
- CCBs delivered to Lehigh Cement in Union Bridge, MD will be used in concrete production.
- In late 2009, a flue gas desulfurization (FGD) system currently under construction for the Brandon Shores plant will be started for testing, and will be fully operational in 2010. FGD solids generated will be landfilled pending potential arrangements for acceptable uses.

CPSG is currently pursuing purchase of a permitted industrial waste landfill in Baltimore City. If the purchase and re-permitting is successful, CCBs not used for beneficial purposes will be placed in this landfill at the projected tonnages beginning in late 2010 rather than the landfills indicated in Table 3 on the following page.

**Table 3: CCBs Use/Disposal Projections for the Next Five Years  
Brandon Shores Electric Generation Station**

Year	Fly Ash	Tons Used	Tons Disposed	Bottom Ash	Tons Used	Tons Disposed	FGD Materials	Tons Used	Tons Disposed
2009	Waste Mgt		165,372	Waste Mgt		26,232			25,000
	STI	309,041							
	Lehigh	24,000							
	<b>Total</b>	<b>333,041</b>	<b>165,372</b>	<b>Total</b>		<b>26,232</b>	<b>Total</b>		<b>25,000</b>
2010	Waste Mgt		183,434	Waste Mgt		27,005	Waste Mgt		240,000
	STI	306,670							
	Lehigh	24,000							
	<b>Total</b>	<b>329,670</b>	<b>183,434</b>	<b>Total</b>		<b>27,005</b>	<b>Total</b>		<b>240,000</b>
2011	Waste Mgt		186,127	Waste Mgt		26,849	Waste Mgt		240,000
	STI	300,000							
	Lehigh	24,000							
	<b>Total</b>	<b>324,000</b>	<b>186,127</b>	<b>Total</b>		<b>26,849</b>	<b>Total</b>		<b>240,000</b>
2012	Waste Mgt		160,658	Waste Mgt		25,508	Waste Mgt		240,000
	STI	300,000							
	Lehigh	24,000							
	<b>Total</b>	<b>324,000</b>	<b>160,658</b>	<b>Total</b>		<b>25,508</b>	<b>Total</b>		<b>240,000</b>
2013	Waste Mgt		179,939	Waste Mgt		26,523	Waste Mgt		240,000
	STI	300,000							
	Lehigh	24,000							
	<b>Total</b>	<b>324,000</b>	<b>179,939</b>	<b>Total</b>		<b>26,523</b>	<b>Total</b>		<b>240,000</b>

**H. Signature and Certification (26.04.10.08 B):**

This is to certify that, to the best of my knowledge, the information contained in this report and any attached documents are true, accurate, and complete.

 Signature	Quinn Morrison, Director-Asset Operations 410.787.5399 <hr/> Quinn.Morrison@constellation.com Email Address	3/13/09 Date
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## Chemical and Physical Analysis of Fly Ash

Developed For: *Separation Technologies, LLC*  
 101 Hampton Avenue  
 Needham, MA 02494

<b>Ticket: 8028</b> <b>Job: 14421</b> <b>Report Date: 03/25/2008</b>	<b>Plant of Origin: ST Baltimore</b> <b>Sample ID:</b> <b>Docket: -</b>	<b>Sample Date Range: 01/28/2008</b> <b>to: 02/03/2008</b> <b>Date Received: 02/08/2008</b>
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<b><u>Chemical Composition (%)</u></b>		<b>ASTM C 618-05 Specifications</b>	
<small>(by Wyoming Analytical Laboratories, Inc.)</small>		<b><u>Class F</u></b>	<b><u>Class C</u></b>
<b>Total Silica, Aluminum, Iron:</b>	<b>92.9</b>	70.0 Min	50.0 Min
Silicon Dioxide:	59.9		
Aluminum Oxide:	30.2		
Iron Oxide:	2.7		
Sulfur Trioxide:	0.0	5.0 Max	5.0 Max
Calcium Oxide:	0.8		
Moisture Content:	0.1	3.0 Max	3.0 Max
Loss on Ignition:	0.9	6.0 Max	6.0 Max
		<b>AASHTO M 295-00 Specifications</b>	
Available Alkalies (as Na <sub>2</sub> O):	0.6	1.5 Max	1.5 Max
Sodium Oxide:	0.12		
Potassium Oxide:	0.70		

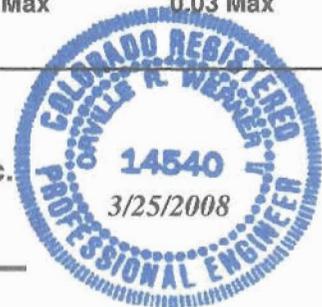
<b><u>Physical Test Results</u></b>		<b>ASTM C 618-05 Specifications</b>	
		<b><u>Class F</u></b>	<b><u>Class C</u></b>
Fineness, Retained on #325 Sieve (%):	19.4	34 Max	34 Max
Strength Activity Index (%)			
Ratio to Control @ 7 Days:	75.9		
Ratio to Control @ 28 Days:	79.6	75 Min	75 Min
Water Requirement, % of Control:	95.0	105 Max	105 Max
Soundness, Autoclave Expansion (%):	-0.03	0.8 Max	0.8 Max
Drying Shrinkage, Increase @ 28 Days (%):	-0.01	0.03 Max	0.03 Max
Density Mg/m <sup>3</sup> :	2.12		

Comments: *Meets Class F, ASTM C 618 and AASHTO M 295*

CTL | Thompson Materials Engineers, Inc.



Orville R. Werner II, P.E.



## Chemical and Physical Analysis of Fly Ash

Developed For: *Separation Technologies, LLC*  
 101 Hampton Avenue  
 Needham, MA 02494

<b>Ticket: 8038</b> <b>Job: 14421</b> <b>Report Date: 03/25/2008</b>	<b>Plant of Origin: ST Baltimore</b> <b>Sample ID:</b> <b>Docket: -</b>	<b>Sample Date Range: 01/24/2008</b> <b>to: 02/10/2008</b> <b>Date Received: 02/14/2008</b>
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<b><u>Chemical Composition (%)</u></b>		<b>ASTM C 618-05 Specifications</b>	
<small>(by Wyoming Analytical Laboratories, Inc.)</small>		<b><u>Class F</u></b>	<b><u>Class C</u></b>
<b>Total Silica, Aluminum, Iron:</b>	<b>92.7</b>	70.0 Min	50.0 Min
Silicon Dioxide:	60.1		
Aluminum Oxide:	29.9		
Iron Oxide:	2.7		
Sulfur Trioxide:	0.0	5.0 Max	5.0 Max
Calcium Oxide:	0.9		
Moisture Content:	0.1	3.0 Max	3.0 Max
Loss on Ignition:	0.9	6.0 Max	6.0 Max
		<b>AASHTO M 295-00 Specifications</b>	
Available Alkalies (as Na <sub>2</sub> O):	0.5	1.5 Max	1.5 Max
Sodium Oxide:	0.09		
Potassium Oxide:	0.59		

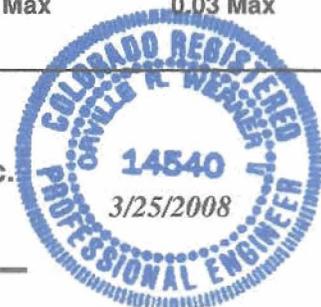
<b><u>Physical Test Results</u></b>		<b>ASTM C 618-05 Specifications</b>	
		<b><u>Class F</u></b>	<b><u>Class C</u></b>
Fineness, Retained on #325 Sieve (%):	19.3	34 Max	34 Max
Strength Activity Index (%)			
Ratio to Control @ 7 Days:	79.3		
Ratio to Control @ 28 Days:	88.1	75 Min	75 Min
Water Requirement, % of Control:	95.0	105 Max	105 Max
Soundness, Autoclave Expansion (%):	-0.03	0.8 Max	0.8 Max
Drying Shrinkage, Increase @ 28 Days (%):	0.00	0.03 Max	0.03 Max
Density Mg/m <sup>3</sup> :	2.29		

Comments: *Meets Class F, ASTM C 618 and AASHTO M 295*

CTL | Thompson Materials Engineers, Inc.

*Orville R. Werner II*

Orville R. Werner II, P.E.



## Chemical and Physical Analysis of Fly Ash

Developed For: *Separation Technologies, LLC*  
 101 Hampton Avenue  
 Needham, MA 02494

<b>Ticket: 8193</b> <b>Job: 14421</b> <b>Report Date: 08/07/2008</b>	<b>Plant of Origin: ST Baltimore</b> <b>Sample ID:</b> <b>Docket: -</b>	<b>Sample Date Range: 05/19/2008</b> <b>to: 05/26/2008</b> <b>Date Received: 06/03/2008</b>
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<u>Chemical Composition (%)</u> <small>(by Wyoming Analytical Laboratories, Inc.)</small>		ASTM C 618-05 Specifications	
		<u>Class F</u>	<u>Class C</u>
Total Silica, Aluminum, Iron:	93.0	70.0 Min	50.0 Min
Silicon Dioxide:	59.9		
Aluminum Oxide:	29.9		
Iron Oxide:	3.2		
Sulfur Trioxide:	0.0	5.0 Max	5.0 Max
Calcium Oxide:	0.7		
Moisture Content:	0.0	3.0 Max	3.0 Max
Loss on Ignition:	0.5	6.0 Max	6.0 Max
		AASHTO M 295-00 Specifications	
Available Alkalies (as Na <sub>2</sub> O):	0.6	1.5 Max	1.5 Max
Sodium Oxide:	0.13		
Potassium Oxide:	0.77		

<u>Physical Test Results</u>		ASTM C 618-05 Specifications	
		<u>Class F</u>	<u>Class C</u>
Fineness, Retained on #325 Sieve (%):	23.3	34 Max	34 Max
Strength Activity Index (%)			
Ratio to Control @ 7 Days:	78.3		
Ratio to Control @ 28 Days:	81.8	75 Min	75 Min
Water Requirement, % of Control:	95.0	105 Max	105 Max
Soundness, Autoclave Expansion (%):	-0.01	0.8 Max	0.8 Max
Drying Shrinkage, Increase @ 28 Days (%):	0.00	0.03 Max	0.03 Max
Density Mg/m <sup>3</sup> :	2.16		

Comments: *Meets Class F, ASTM C 618 and AASHTO M 295*

CTL | Thompson Materials Engineers, Inc.

*Orville R. Werner II*

Orville R. Werner II, P.E.



# Chemical and Physical Analysis of Fly Ash

Developed For: *Separation Technologies, LLC*  
 101 Hampton Avenue  
 Needham, MA 02494

<b>Ticket: 8204</b> <b>Job: 14421</b> <b>Report Date: 08/07/2008</b>	<b>Plant of Origin: ST Baltimore</b> <b>Sample ID:</b> <b>Docket: -</b>	<b>Sample Date Range: 05/26/2008</b> <b>to: 06/01/2008</b> <b>Date Received: 06/16/2008</b>
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<b><u>Chemical Composition (%)</u></b>		<b>ASTM C 618-05 Specifications</b>	
<small>(by Wyoming Analytical Laboratories, Inc.)</small>		<b><u>Class F</u></b>	<b><u>Class C</u></b>
<b>Total Silica, Aluminum, Iron:</b>	<b>91.4</b>	70.0 Min	50.0 Min
Silicon Dioxide:	89.9		
Aluminum Oxide:	26.5		
Iron Oxide:	3.1		
Sulfur Trioxide:	0.0	5.0 Max	5.0 Max
Calcium Oxide:	1.2		
Moisture Content:	0.1	3.0 Max	3.0 Max
Loss on Ignition:	1.5	6.0 Max	6.0 Max
		<b>AASHTO M 295-00 Specifications</b>	
Available Alkalies (as Na <sub>2</sub> O):	0.6	1.5 Max	1.5 Max
Sodium Oxide:	0.11		
Potassium Oxide:	0.69		

<b><u>Physical Test Results</u></b>		<b>ASTM C 618-05 Specifications</b>	
		<b><u>Class F</u></b>	<b><u>Class C</u></b>
Fineness, Retained on #325 Sieve (%):	21.4	34 Max	34 Max
Strength Activity Index (%)			
Ratio to Control @ 7 Days:	75.7		
Ratio to Control @ 28 Days:	88.2	75 Min	75 Min
Water Requirement, % of Control:	95.0	105 Max	105 Max
Soundness, Autoclave Expansion (%):	-0.03	0.8 Max	0.8 Max
Drying Shrinkage, Increase @ 28 Days (%):	0.00	0.03 Max	0.03 Max
Density Mg/m <sup>3</sup> :	2.12		

Comments: *Meets Class F, ASTM C 618 and AASHTO M 295*

CTL | Thompson Materials Engineers, Inc.

*Orville R. Werner II*

Orville R. Werner II, P.E.



## Chemical and Physical Analysis of Fly Ash

Developed For: *Separation Technologies, LLC*  
 101 Hampton Avenue  
 Needham, MA 02494

Ticket: 8205 Job: 14421 Report Date: 08/07/2008	Plant of Origin: <i>ST Baltimore</i> Sample ID: Docket: -	Sample Date Range: 06/02/2008 to: 06/08/2008 Date Received: 06/16/2008
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<u>Chemical Composition (%)</u> <small>(by Wyoming Analytical Laboratories, Inc.)</small>		ASTM C 618-05 Specifications	
		<u>Class F</u>	<u>Class C</u>
Total Silica, Aluminum, Iron:	91.9	70.0 Min	50.0 Min
Silicon Dioxide:	60.5		
Aluminum Oxide:	28.1		
Iron Oxide:	3.4		
Sulfur Trioxide:	0.0	5.0 Max	5.0 Max
Calcium Oxide:	0.9		
Moisture Content:	0.1	3.0 Max	3.0 Max
Loss on Ignition:	1.2	6.0 Max	6.0 Max
		AASHTO M 295-00 Specifications	
Available Alkalies (as Na <sub>2</sub> O):	0.5	1.5 Max	1.5 Max
Sodium Oxide:	0.13		
Potassium Oxide:	0.58		

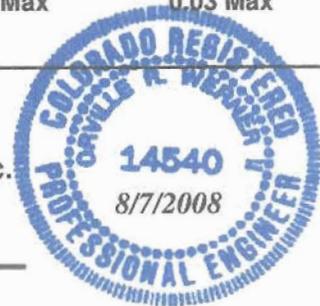
<u>Physical Test Results</u>		ASTM C 618-05 Specifications	
		<u>Class F</u>	<u>Class C</u>
Fineness, Retained on #325 Sieve (%):	20.1	34 Max	34 Max
Strength Activity Index (%)			
Ratio to Control @ 7 Days:	77.1		
Ratio to Control @ 28 Days:	89.6	75 Min	75 Min
Water Requirement, % of Control:	95.0	105 Max	105 Max
Soundness, Autoclave Expansion (%):	-0.02	0.8 Max	0.8 Max
Drying Shrinkage, Increase @ 28 Days (%):	0.00	0.03 Max	0.03 Max
Density Mg/m <sup>3</sup> :	2.13		

Comments: *Meets Class F, ASTM C 618 and AASHTO M 295*

CTL | Thompson Materials Engineers, Inc.

*Orville R. Werner II*

Orville R. Werner II, P.E.



## Chemical and Physical Analysis of Fly Ash

Developed For: *Standard Laboratories, Inc.*  
P.O. Box 214  
Cresson, PA 16830

Ticket: 8331 Job: 14611 Report Date: 10/20/2008	Plant of Origin: <i>Brandon Shore</i> Sample ID: <i>B.S. #1</i> Docket: 972553 -	Sample Date Range: to: Date Received: 08/25/2008																											
<b>Chemical Composition (%)</b> <i>(by Wyoming Analytical Laboratories, Inc.)</i>		<b>ASTM C 618-03 Specifications</b> <table border="1"> <thead> <tr> <th></th> <th>Class F</th> <th>Class C</th> </tr> </thead> <tbody> <tr> <td>Total Silica, Aluminum, Iron:</td> <td>70.0 Min</td> <td>50.0 Min</td> </tr> <tr> <td>Silicon Dioxide:</td> <td></td> <td></td> </tr> <tr> <td>Aluminum Oxide:</td> <td></td> <td></td> </tr> <tr> <td>Iron Oxide:</td> <td></td> <td></td> </tr> <tr> <td>Sulfur Trioxide:</td> <td>5.0 Max</td> <td>5.0 Max</td> </tr> <tr> <td>Calcium Oxide:</td> <td></td> <td></td> </tr> <tr> <td>Moisture Content:</td> <td>3.0 Max</td> <td>3.0 Max</td> </tr> <tr> <td>Loss on Ignition:</td> <td>6.0 Max</td> <td>6.0 Max</td> </tr> </tbody> </table>		Class F	Class C	Total Silica, Aluminum, Iron:	70.0 Min	50.0 Min	Silicon Dioxide:			Aluminum Oxide:			Iron Oxide:			Sulfur Trioxide:	5.0 Max	5.0 Max	Calcium Oxide:			Moisture Content:	3.0 Max	3.0 Max	Loss on Ignition:	6.0 Max	6.0 Max
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Available Alkalies (as Na <sub>2</sub> O):	0.5																												
Sodium Oxide:	0.10																												
Potassium Oxide:	0.57																												
	1.5 Max	1.5 Max																											
<b>Physical Test Results</b>		<b>ASTM C 618-03 Specifications</b> <table border="1"> <thead> <tr> <th></th> <th>Class F</th> <th>Class C</th> </tr> </thead> <tbody> <tr> <td>Fineness, Retained on #325 Sieve (%):</td> <td>34 Max</td> <td>34 Max</td> </tr> <tr> <td>Strength Activity Index (%):</td> <td></td> <td></td> </tr> <tr> <td>Ratio to Control @ 7 Days:</td> <td></td> <td></td> </tr> <tr> <td>Ratio to Control @ 28 Days:</td> <td>75 Min</td> <td>75 Min</td> </tr> <tr> <td>Water Requirement, % of Control:</td> <td>105 Max</td> <td>105 Max</td> </tr> <tr> <td>Soundness, Autoclave Expansion (%):</td> <td>0.8 Max</td> <td>0.8 Max</td> </tr> <tr> <td>Drying Shrinkage, Increase @ 28 Days (%):</td> <td>0.03 Max</td> <td>0.03 Max</td> </tr> <tr> <td>Density Mg/m<sup>3</sup>:</td> <td></td> <td></td> </tr> </tbody> </table>		Class F	Class C	Fineness, Retained on #325 Sieve (%):	34 Max	34 Max	Strength Activity Index (%):			Ratio to Control @ 7 Days:			Ratio to Control @ 28 Days:	75 Min	75 Min	Water Requirement, % of Control:	105 Max	105 Max	Soundness, Autoclave Expansion (%):	0.8 Max	0.8 Max	Drying Shrinkage, Increase @ 28 Days (%):	0.03 Max	0.03 Max	Density Mg/m <sup>3</sup> :		
	Class F	Class C																											
Fineness, Retained on #325 Sieve (%):	34 Max	34 Max																											
Strength Activity Index (%):																													
Ratio to Control @ 7 Days:																													
Ratio to Control @ 28 Days:	75 Min	75 Min																											
Water Requirement, % of Control:	105 Max	105 Max																											
Soundness, Autoclave Expansion (%):	0.8 Max	0.8 Max																											
Drying Shrinkage, Increase @ 28 Days (%):	0.03 Max	0.03 Max																											
Density Mg/m <sup>3</sup> :																													

Comments: *At the client's request chemical analysis not performed.*

CTL | Thompson Materials Engineers, Inc.

*Orville R. Werner*  
Orville R. Werner II, P.E.



## Chemical and Physical Analysis of Fly Ash

Developed For: *Standard Laboratories, Inc.*  
P.O. Box 214  
Cresson, PA 16830

Ticket: 8332 Job: 14611 Report Date: 10/20/2008	Plant of Origin: <i>Brandon Shore</i> Sample ID: <i>B.S. #2</i> Docket: 972552 -	Sample Date Range: to: Date Received: 08/25/2008
---	--	--

<u>Chemical Composition (%)</u> <small>(by Wyoming Analytical Laboratories, Inc.)</small>		ASTM C 618-03 Specifications	
		<u>Class F</u>	<u>Class C</u>
Total Silica, Aluminum, Iron:		70.0 Min	50.0 Min
Silicon Dioxide:			
Aluminum Oxide:			
Iron Oxide:			
Sulfur Trioxide:		5.0 Max	5.0 Max
Calcium Oxide:			
Moisture Content:		3.0 Max	3.0 Max
Loss on Ignition:		6.0 Max	6.0 Max
		AASHTO M 295-00 Specifications	
Available Alkalies (as Na <sub>2</sub> O):	0.5	1.5 Max	1.5 Max
Sodium Oxide:	0.13		
Potassium Oxide:	0.56		

<u>Physical Test Results</u>		ASTM C 618-03 Specifications	
		<u>Class F</u>	<u>Class C</u>
Fineness, Retained on #325 Sieve (%):	27.7	34 Max	34 Max
Strength Activity Index (%)			
Ratio to Control @ 7 Days:	79.8		
Ratio to Control @ 28 Days:	89.8	75 Min	75 Min
Water Requirement, % of Control:	99.2	105 Max	105 Max
Soundness, Autoclave Expansion (%):	-0.02	0.8 Max	0.8 Max
Drying Shrinkage, Increase @ 28 Days (%):	0.00	0.03 Max	0.03 Max
Density Mg/m <sup>3</sup> :	2.15		

Comments: *At the client's request chemical analysis not performed.*

CTL | Thompson Materials Engineers, Inc.

*Orville R. Werner II*  
Orville R. Werner II, P.E.



## Chemical and Physical Analysis of Fly Ash

Developed For: *Standard Laboratories, Inc.*  
P.O. Box 214  
Cresson, PA 16830

Ticket: 6833 Job: 14811 Report Date: 10/20/2008	Plant of Origin: <i>Brandon Stone</i> Sample ID: <i>B.S. #4</i> Docket: 972554 -	Sample Date Range: to: Date Received: 08/25/2008
---	--	--

<u>Chemical Composition (%)</u> <small>(by Wyoming Analytical Laboratories, Inc.)</small>	ASTM C 618-03 Specifications	
	<u>Class F</u>	<u>Class C</u>
Total Silica, Aluminum, Iron:	70.0 Min	50.0 Min
Silicon Dioxide:		
Aluminum Oxide:		
Iron Oxide:		
Sulfur Trioxide:	5.0 Max	5.0 Max
Calcium Oxide:		
Moisture Content:	3.0 Max	3.0 Max
Loss on Ignition:	6.0 Max	6.0 Max
	AASHTO M 295-00 Specifications	
Available Alkalies (as Na <sub>2</sub> O): 0.5	1.5 Max	1.5 Max
Sodium Oxide: 0.12		
Potassium Oxide: 0.57		

<u>Physical Test Results</u>	ASTM C 618-03 Specifications	
	<u>Class F</u>	<u>Class C</u>
Fineness, Retained on #325 Sieve (%): 47.8	34 Max	34 Max
Strength Activity Index (%)		
Ratio to Control @ 7 Days: 67.6		
Ratio to Control @ 28 Days: 70.3	75 Min	75 Min
Water Requirement, % of Control: 117.8	105 Max	105 Max
Soundness, Autoclave Expansion (%): -0.01	0.8 Max	0.8 Max
Drying Shrinkage, Increase @ 28 Days (%): 0.01	0.03 Max	0.03 Max
Density Mg/m <sup>3</sup> : 2.07		

Comments: *At the client's request chemical analysis not performed.*

CTL | Thompson Materials Engineers, Inc.

*Orville R. Werner II*

Orville R. Werner II, P.E.



## Chemical and Physical Analysis of Fly Ash

Developed For: *Separation Technologies, LLC*  
101 Hampton Avenue  
Needham, MA 02494

<b>Ticket: 8409</b> <b>Job: 14421</b> <b>Report Date: 12/05/2008</b>	<b>Plant of Origin: ST Baltimore</b> <b>Sample ID:</b> <b>Docket: -</b>	<b>Sample Date Range: 08/29/2008</b> <b>to: 10/06/2008</b> <b>Date Received: 10/14/2008</b>
--	---	---

<b>Chemical Composition (%)</b> <small>(by Wyoming Analytical Laboratories, Inc.)</small>		<b>ASTM C 618-03 Specifications</b>	
		<b>Class F</b>	<b>Class C</b>
<b>Total Silica, Aluminum, Iron:</b>	<b>92.0</b>	<b>70.0 Min</b>	<b>50.0 Min</b>
Silicon Dioxide:	58.2		
Aluminum Oxide:	30.7		
Iron Oxide:	3.1		
Sulfur Trioxide:	0.0	5.0 Max	5.0 Max
Calcium Oxide:	0.9		
Moisture Content:	0.1	3.0 Max	3.0 Max
Loss on Ignition:	1.4	6.0 Max	6.0 Max
		<b>AASHTO M 295-00 Specifications</b>	
<b>Available Alkalies (as Na<sub>2</sub>O):</b>	<b>0.5</b>	<b>1.5 Max</b>	<b>1.5 Max</b>
Sodium Oxide:	0.00		
Potassium Oxide:	0.60		

<b>Physical Test Results</b>		<b>ASTM C 618-03 Specifications</b>	
		<b>Class F</b>	<b>Class C</b>
<b>Fineness, Retained on #325 Sieve (%):</b>	<b>21.3</b>	<b>34 Max</b>	<b>34 Max</b>
<b>Strength Activity Index (%)</b>			
Ratio to Control @ 7 Days:	86.2		
Ratio to Control @ 28 Days:	87.5	75 Min	75 Min
Water Requirement, % of Control:	95.0	105 Max	105 Max
Soundness, Autoclave Expansion (%):	-0.04	0.8 Max	0.8 Max
Drying Shrinkage, Increase @ 28 Days (%):	0.00	0.03 Max	0.03 Max
Density Mg/m <sup>3</sup> :	2.15		

Comments: *Meets Class F, ASTM C 618 and AASHTO M 295*

CTL | Thompson Materials Engineers, Inc.

*Orville R. Werner II*

Orville R. Werner II, P.E.



## Chemical and Physical Analysis of Fly Ash

Developed For: *Separation Technologies, LLC*  
 101 Hampton Avenue  
 101 Hampton Avenue, MA 02494

Ticket: 8516 Job: 14421 Report Date: 02/10/2009	Plant of Origin: <i>ST Baltimore</i> Sample ID: Docket: -	Sample Date Range: 11/17/2008 to: 11/30/2008 Date Received: 12/05/2008
---	---	--

<u>Chemical Composition (%)</u> <small>(by Wyoming Analytical Laboratories, Inc.)</small>		ASTM C 618-08 Specifications	
		<u>Class F</u>	<u>Class C</u>
Total Silica, Aluminum, Iron:	92.6	70.0 Min	50.0 Min
Silicon Dioxide:	59.7		
Aluminum Oxide:	30.1		
Iron Oxide:	2.8		
Sulfur Trioxide:	0.0	5.0 Max	5.0 Max
Calcium Oxide:	0.7		
Moisture Content:	0.1	3.0 Max	3.0 Max
Loss on Ignition:	1.3	6.0 Max	6.0 Max
		AASHTO M295-06 Specifications	
Available Alkalies (as Na <sub>2</sub> O):	0.5	1.5 Max	1.5 Max
Sodium Oxide:	0.11		
Potassium Oxide:	0.61		

<u>Physical Test Results</u>		ASTM C 618-08 Specifications	
		<u>Class F</u>	<u>Class C</u>
Fineness, Retained on #325 Sieve (%):	26.3	34 Max	34 Max
Strength Activity Index (%)			
Ratio to Control @ 7 Days:	75.6		
Ratio to Control @ 28 Days:	77.9	75 Min	75 Min
Water Requirement, % of Control:	95.0	105 Max	105 Max
Soundness, Autoclave Expansion (%):	-0.05	0.8 Max	0.8 Max
Drying Shrinkage, Increase @ 28 Days (%):	0.00	0.03 Max	0.03 Max
Density Mg/m <sup>3</sup> :	2.11		

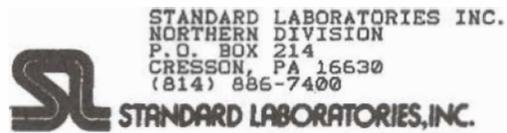
Comments: *Meets Class F, ASTM C 618 and AASHTO M 295*

CTL | Thompson Materials Engineers, Inc.



Orville R. Werner II, P.E.





STANDARD LABORATORIES INC.  
 NORTHERN DIVISION  
 P.O. BOX 214  
 CRESSON, PA 16630  
 (814) 886-7400

STANDARD LABORATORIES, INC.

DATE: 8-29-2008  
 SAMPLE NO. 972556

CONSTELLATION POWER SOURCE  
 GENERATION INC.  
 2025 BRANDON SHORES ROAD  
 BALTIMORE, MD 21226

SAMPLE ID: BRANDON BOTTON ASH

OPERATING CO.:  
 SAMPLED BY: CUSTOMER PROVIDED  
 MINE:  
 LOCATION:

DATE SAMPLED: 8/15/08  
 WEATHER:  
 GROSS WEIGHT:

DATE RECEIVED: 8/15/08

OTHER ID:

CERTIFICATE OF ANALYSIS

SCREEN TEST		CUMULATIVE	
		DOWN	UP
+325m	93.18%	93.18%	100.00%
325m x 0	6.82%	100.00%	6.82%
	100.00%		

	ASTM METHOD	AS RECEIVED	DRY BASIS
MOISTURE	D2961 D3302 D3173	27.68%	
LOSS ON IGNITION		6.24%	8.63%

ASH MINERAL  
 D2795 D3682

SILICON DIOXIDE	35.00 %
ALUMINUM OXIDE	14.18 %
FERRIC OXIDE	3.23 %
CALCIUM OXIDE	0.73 %
SODIUM OXIDE	0.24 %
POTASSIUM OXIDE	1.35 %
SULFUR TRIOXIDE	0.30 %
Available Alkalies(as Na2O)	1.02 %

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STANDARD LABORATORIES, INC.

DATE: 8-29-2008  
 SAMPLE NO. 972553

CONSTELLATION POWER SOURCE  
 GENERATION INC.  
 2025 BRANDON SHORES ROAD  
 BALTIMORE, MD 21226

SAMPLE ID: BRANDON SILO # 1

OPERATING CO. :  
 SAMPLED BY: CUSTOMER PROVIDED  
 MINE:  
 LOCATION:

DATE SAMPLED: 8/15/08  
 WEATHER:  
 GROSS WEIGHT:

DATE RECEIVED: 8/15/08

OTHER ID:

CERTIFICATE OF ANALYSIS

SCREEN TEST		CUMULATIVE	
		DOWN	UP
+325m	23.15%	23.15%	100.00%
325m x 0	76.85%	100.00%	76.85%
	100.00%		

	ASTM METHOD	AS RECEIVED	DRY BASIS
MOISTURE	D2961 D3302 D3173	0.21%	
LOSS ON IGNITION		8.28%	8.30%

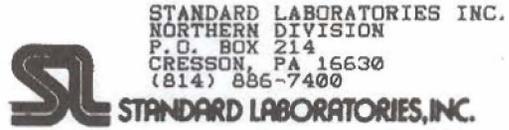
ASH MINERAL  
 D2795 D3682

SILICON DIOXIDE	37.86 %
ALUMINUM OXIDE	19.50 %
FERRIC OXIDE	3.76 %
CALCIUM OXIDE	0.91 %
SODIUM OXIDE	0.31 %
POTASSIUM OXIDE	1.89 %
SULFUR TRIOXIDE	0.25 %
Available Alkalies(as Na2O )	1.40 %

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DATE: 8-29-2008  
SAMPLE NO. 972552

CONSTELLATION POWER SOURCE  
GENERATION INC.  
2025 BRANDON SHORES ROAD  
BALTIMORE, MD 21226

SAMPLE ID: BRANDON SILO # 2

OPERATING CO. :  
SAMPLED BY: CUSTOMER PROVIDED  
MINE:  
LOCATION:

DATE SAMPLED: 8/15/08  
WEATHER:  
GROSS WEIGHT:

DATE RECEIVED: 8/15/08

OTHER ID:

CERTIFICATE OF ANALYSIS

SCREEN TEST		CUMULATIVE	
		DOWN	UP
+325m	22.04%	22.04%	100.00%
325m x 0	77.96%	100.00%	77.96%
	100.00%		

	ASTH METHOD	AS RECEIVED	DRY BASIS
MOISTURE	D2961 D3302 D3173	0.16%	
LOSS ON IGNITION		5.35%	5.36%

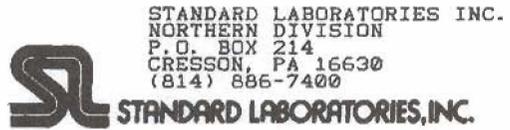
  

ASH MINERAL D2795 D3682	
SILICON DIOXIDE	55.67 %
ALUMINUM OXIDE	25.72 %
FERRIC OXIDE	3.75 %
CALCIUM OXIDE	1.27 %
SODIUM OXIDE	0.34 %
POTASSIUM OXIDE	1.92 %
SULFUR TRIOXIDE	0.25 %
Available Alkalies(as Na2O)	1.45 %

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STANDARD LABORATORIES, INC.

DATE: 8-29-2008  
 SAMPLE NO. 972554

CONSTELLATION POWER SOURCE  
 GENERATION INC.  
 2025 BRANDON SHORES ROAD  
 BALTIMORE, MD 21226

SAMPLE ID: BS # 4 FLYASH REJECTS

OPERATING CO.:  
 SAMPLED BY: CUSTOMER PROVIDED  
 MINE:  
 LOCATION:

DATE SAMPLED: 8/15/08  
 WEATHER:  
 GROSS WEIGHT:

DATE RECEIVED: 8/15/08

OTHER ID:

CERTIFICATE OF ANALYSIS

SCREEN TEST		CUMULATIVE	
		DOWN	UP
+325 $\mu$	39.35%	39.35%	100.00%
325 $\mu$ x 0	60.65%	100.00%	60.65%
	100.00%		

	ASTM METHOD	AS RECEIVED	DRY BASIS
MOISTURE	D2961 D3302 D3173	0.44%	
LOSS ON IGNITION		27.92%	28.04%

ASH MINERAL  
 D2795 D3682

SILICON DIOXIDE	40.06 %
ALUMINUM OXIDE	19.67 %
FERRIC OXIDE	4.70 %
CALCIUM OXIDE	1.07 %
SODIUM OXIDE	0.30 %
POTASSIUM OXIDE	1.64 %
SULFUR TRIOXIDE	0.52 %

Available Alkalies( as Na<sub>2</sub>O ) 1.25 %

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 800-932-9047  
 FAX 410-788-8723

# PHASE SEPARATION SCIENCE, INC.



## CERTIFICATE OF ANALYSIS

No: 8052702

Constellation Energy Group, Baltimore, MD

June 3, 2008

Project Name: Typical Coal Samples

Project Location: Various

Sample ID: Wagner 3 Fly Ash domes      Date/Time Sampled: 05/27/2008 09:00      PSS Sample ID: 8052702-001  
 Matrix: SOLID      Date/Time Received: 05/27/2008 10:05

TCLP Metals

Analytical Method: SW846 6020A

Preparation Method: SW846 3010A

	Result	Units	TCLP Limit	Flag	Dil	Prepared	Analyzed	Analyst
Arsenic	ND	mg/L	5.0		1	05/30/08	05/30/08 13:57	1034
Barium	ND	mg/L	100		1	05/30/08	05/30/08 13:57	1034
Cadmium	ND	mg/L	1.0		1	05/30/08	05/30/08 13:57	1034
Chromium	ND	mg/L	5.0		1	05/30/08	05/30/08 13:57	1034
Lead	ND	mg/L	5.0		1	05/30/08	05/30/08 13:57	1034
Mercury	ND	mg/L	0.200		1	05/30/08	05/30/08 13:57	1034
Selenium	ND	mg/L	1.0		1	05/30/08	05/30/08 13:57	1034
Silver	ND	mg/L	5.0		1	05/30/08	05/30/08 13:57	1034

Sample ID: Brandon 1 Fly Ash domes      Date/Time Sampled: 05/27/2008 09:00      PSS Sample ID: 8052702-002  
 Matrix: SOLID      Date/Time Received: 05/27/2008 10:05

TCLP Metals

Analytical Method: SW846 6020A

Preparation Method: SW846 3010A

	Result	Units	TCLP Limit	Flag	Dil	Prepared	Analyzed	Analyst
Arsenic	ND	mg/L	5.0		1	05/30/08	05/30/08 14:27	1034
Barium	ND	mg/L	100		1	05/30/08	05/30/08 14:27	1034
Cadmium	ND	mg/L	1.0		1	05/30/08	05/30/08 14:27	1034
Chromium	ND	mg/L	5.0		1	05/30/08	05/30/08 14:27	1034
Lead	ND	mg/L	5.0		1	05/30/08	05/30/08 14:27	1034
Mercury	ND	mg/L	0.200		1	05/30/08	05/30/08 14:27	1034
Selenium	ND	mg/L	1.0		1	05/30/08	05/30/08 14:27	1034
Silver	ND	mg/L	5.0		1	05/30/08	05/30/08 14:27	1034

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# PHASE SEPARATION SCIENCE, INC.



## CERTIFICATE OF ANALYSIS

No: 8052702

Constellation Energy Group, Baltimore, MD

June 3, 2008

Project Name: Typical Coal Samples

Project Location: Various

Sample ID: Brandon 2 Fly Ash domes Date/Time Sampled: 05/27/2008 09:00 PSS Sample ID: 8052702-003  
 Matrix: SOLID Date/Time Received: 05/27/2008 10:05

TCLP Metals

Analytical Method: SW846 6020A

Preparation Method: SW846 3010A

	Result	Units	TCLP Limit	Flag	Dil Prepared	Analyzed	Analyst
Arsenic	ND	mg/L	5.0		1 05/30/08	05/30/08 14:33	1034
Barium	ND	mg/L	100		1 05/30/08	05/30/08 14:33	1034
Cadmium	ND	mg/L	1.0		1 05/30/08	05/30/08 14:33	1034
Chromium	ND	mg/L	5.0		1 05/30/08	05/30/08 14:33	1034
Lead	ND	mg/L	5.0		1 05/30/08	05/30/08 14:33	1034
Mercury	ND	mg/L	0.200		1 05/30/08	05/30/08 14:33	1034
Selenium	ND	mg/L	1.0		1 05/30/08	05/30/08 14:33	1034
Silver	ND	mg/L	5.0		1 05/30/08	05/30/08 14:33	1034

Sample ID: Wagner 3 Bottom Ash domes Date/Time Sampled: 05/27/2008 09:00 PSS Sample ID: 8052702-004  
 Matrix: SOLID Date/Time Received: 05/27/2008 10:05

TCLP Metals

Analytical Method: SW846 6020A

Preparation Method: SW846 3010A

	Result	Units	TCLP Limit	Flag	Dil Prepared	Analyzed	Analyst
Arsenic	ND	mg/L	5.0		1 05/30/08	05/30/08 14:39	1034
Barium	ND	mg/L	100		1 05/30/08	05/30/08 14:39	1034
Cadmium	ND	mg/L	1.0		1 05/30/08	05/30/08 14:39	1034
Chromium	ND	mg/L	5.0		1 05/30/08	05/30/08 14:39	1034
Lead	ND	mg/L	5.0		1 05/30/08	05/30/08 14:39	1034
Mercury	ND	mg/L	0.200		1 05/30/08	05/30/08 14:39	1034
Selenium	ND	mg/L	1.0		1 05/30/08	05/30/08 14:39	1034
Silver	ND	mg/L	5.0		1 05/30/08	05/30/08 14:39	1034



December 11, 2008

Constellation Power Source  
111 Market Place  
2nd Floor Candler Bldg.  
Baltimore, MD 21297

Sample identification by  
SGS

Kind of sample Coal  
reported to us  
Sample taken at Brandon Shores  
Sample taken by Yourselves  
Date sampled November 19, 2008  
Date received November 25, 2008

BRANDON SHORES  
#1 SAMPLE CONT.  
13TH EL CARBON ASH  
0430 hours  
11/19/08

Submitted By: Jason Hastings

Analysis Report No. 231-12632-13

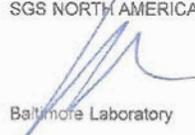
PROXIMATE ANALYSIS

	<u>As Received</u>	<u>Dry Basis</u>
% Moisture	15.15	xxxxx
% Ash	54.97	64.79
% Volatile	1.04	1.23
% Fixed Carbon	<u>28.84</u>	<u>33.98</u>
	100.00	100.00
Btu/lb	3975	4685
% Sulfur	0.21	0.25
MAF Btu		13306

ULTIMATE ANALYSIS

	<u>As Received</u>	<u>Dry Basis</u>
% Moisture	15.15	xxxxx
% Carbon	30.20	35.59
% Hydrogen	0.00	0.00
% Nitrogen	0.32	0.38
% Sulfur	0.21	0.25
% Ash	54.97	64.79
% Oxygen(diff)	<u>-0.85</u>	<u>-1.01</u>
	100.00	100.00

Respectfully submitted,  
SGS NORTH AMERICA INC.

  
Baltimore Laboratory

SGS North America Inc.

Minerals Services Division

1501-A East Patapsco Avenue, Baltimore, MD 21226 t (410) 355-1958 f (410) 355-1965 www.us.sgs.com/minerals



December 11, 2008

Constellation Power Source  
111 Market Place  
2nd Floor Candler Bldg.  
Baltimore, MD 21297

Sample identification by  
SGS

Kind of sample reported to us Coal

BRANDON SHORES  
#1 SAMPLE CONT.  
13TH EL CARBON ASH  
0430 hours  
11/19/08

Sample taken at Brandon Shores

Sample taken by Yourselves

Date sampled November 19, 2008

Submitted By: Jason Hastings

Date received November 25, 2008

Analysis Report No. 231-12632-13

TRACE ELEMENTS IN COAL

Antimony	<2.0 ppm
	21.0 ppm
Barium	56.0 ppm
Beryllium	22.0 ppm
Cadmium	<2.0 ppm
Chromium	179.0 ppm
Cobalt	68.0 ppm
Copper	101.0 ppm
Lead	49.0 ppm
Lithium	88.0 ppm
Manganese	77.0 ppm
Molybdenum	<2.0 ppm
Nickel	110.0 ppm
Selenium	<2.0 ppm
Silver	<2.0 ppm
Strontium	105.0 ppm
Tin	<2.0 ppm
Vanadium	361.0 ppm
Zinc	83.0 ppm
Zirconium	178.0 ppm

Respectfully submitted,  
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Baltimore, MD 21297

Sample identification by  
SGS

Kind of sample reported to us Coal  
Sample taken at Brandon Shores  
Sample taken by Yourselfs  
Date sampled November 19, 2008  
Date received November 25, 2008

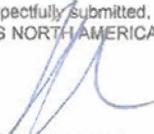
BRANDON SHORES  
#1 SAMPLE CONT.  
13TH EL CARBON ASH  
0430 hours  
11/19/08

Submitted By: Jason Hastings

Analysis report no. 231-12632-13

<u>PARAMETER</u>	<u>RESULTS</u>
THALLIUM, Tl	<2.0 ug/g
MERCURY, Hg	<0.03 ug/g

Respectfully Submitted,  
SGS NORTH AMERICA INC.

  
Baltimore Laboratory

SGS logo

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December 11, 2008

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Baltimore, MD 21297

Sample identification by  
SGS

Kind of sample Coal  
reported to us

BRANDON SHORES  
#2 SAMPLE CONT.  
13TH EL CARBON ASH  
1300 hours  
11/19/08

Sample taken at Brandon Shores

Sample taken by Yourselves

Date sampled November 19, 2008

Submitted By: Jason Hastings

Data received November 25, 2008

Analysis Report No. 231-12632-14

PROXIMATE ANALYSIS

	<u>As Received</u>	<u>Dry Basis</u>
% Moisture	19.79	XXXXX
% Ash	50.20	62.59
% Volatile	0.23	0.29
% Fixed Carbon	29.78	37.12
	<u>100.00</u>	<u>100.00</u>
Btu/lb	4005	4993
% Sulfur	0.21	0.26
MAF Btu		13347

ULTIMATE ANALYSIS

	<u>As Received</u>	<u>Dry Basis</u>
% Moisture	19.79	XXXXX
% Carbon	30.15	37.59
% Hydrogen	0.00	0.00
% Nitrogen	0.35	0.44
% Sulfur	0.21	0.26
% Ash	50.20	62.59
% Oxygen (diff)	<u>-0.70</u>	<u>-0.88</u>
	<u>100.00</u>	<u>100.00</u>

Respectfully submitted,  
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December 11, 2008

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Sample identification by  
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Kind of sample Coal  
reported to us

BRANDON SHORES  
#2 SAMPLE CONT.  
13TH EL CARBON ASH  
1300 hours  
11/19/08

Sample taken at Brandon Shores

Sample taken by Yourselves

Date sampled November 19, 2008

Submitted By: Jason Hastings

Date received November 25, 2008

Analysis Report No. 231-12632-14

### TRACE ELEMENTS IN COAL

Antimony	<2.0 ppm
Arsenic	29.0 ppm
Barium	159.0 ppm
Beryllium	21.0 ppm
Cadmium	<2.0 ppm
Chromium	185.0 ppm
Cobalt	71.0 ppm
Copper	101.0 ppm
Lead	85.0 ppm
Lithium	109.0 ppm
Manganese	85.0 ppm
Molybdenum	<2.0 ppm
Nickel	132.0 ppm
Selenium	<2.0 ppm
Silver	<2.0 ppm
Strontium	244.0 ppm
Tin	<2.0 ppm
Vanadium	372.0 ppm
Zinc	89.0 ppm
Zirconium	218.0 ppm

Respectfully submitted,  
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BRANDON SHORES  
#2 SAMPLE CONT.  
13TH EL CARBON ASH  
1300 hours  
11/19/08

Sample taken at Brandon Shores

Sample taken by Yourselves

Date sampled November 19, 2008

Submitted By: Jason Hastings

Date received November 25, 2008

Analysis report no. 231-12632-14

<u>PARAMETER</u>	<u>RESULTS</u>
THALLIUM, Tl	<2.0 ug/g
MERCURY, Hg	<0.03 ug/g

Respectfully submitted,  
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BRANDON SHORES  
#3 SAMPLE CONT.  
13TH EL CARBON ASH  
2000 hours  
11/19/08

Sample taken at Brandon Shores

Sample taken by Yourselves

Date sampled November 19, 2008

Submitted By: Jason Hastings

Date received November 25, 2008

Analysis Report No. 231-12632-15

PROXIMATE ANALYSIS

	<u>As Received</u>	<u>Dry Basis</u>
% Moisture	16.10	xxxxx
% Ash	58.01	69.14
% Volatile	0.67	0.80
% Fixed Carbon	<u>25.22</u>	<u>30.06</u>
	100.00	100.00
Btu/lb	3386	4036
% Sulfur	0.18	0.21
MAF Btu		13078

ULTIMATE ANALYSIS

	<u>As Received</u>	<u>Dry Basis</u>
% Moisture	16.10	xxxxx
% Carbon	25.95	30.93
% Hydrogen	0.00	0.00
% Nitrogen	0.33	0.39
% Sulfur	0.18	0.21
% Ash	58.01	69.14
% Oxygen (diff)	<u>-0.57</u>	<u>-0.67</u>
	100.00	100.00

Respectfully submitted,  
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Baltimore, MD 21297

Sample identification by  
SGS

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BRANDON SHORES  
#3 SAMPLE CONT.  
13TH EL CARBON ASH  
2000 hours  
11/19/08

Sample taken at Brandon Shores

Sample taken by Yourselves

Date sampled November 19, 2008

Submitted By: Jason Hastings

Date received November 25, 2008

Analysis Report No. 231-12632-15

TRACE ELEMENTS IN COAL

Antimony	<2.0 ppm
Arsenic	21.0 ppm
Barium	212.0 ppm
Beryllium	23.0 ppm
Cadmium	<2.0 ppm
Chromium	188.0 ppm
Cobalt	75.0 ppm
Copper	106.0 ppm
Lead	88.0 ppm
Lithium	130.0 ppm
Manganese	107.0 ppm
Molybdenum	<2.0 ppm
Nickel	102.0 ppm
Selenium	<2.0 ppm
Silver	<2.0 ppm
Strontium	273.0 ppm
Tin	<2.0 ppm
Vanadium	404.0 ppm
Zinc	85.0 ppm
Zirconium	265.0 ppm

Respectfully submitted,  
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Baltimore Laboratory

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2000 hours  
11/19/08

Sample taken at Brandon Shores

Sample taken by Yourselves

Date sampled November 19, 2008

Submitted By: Jason Hastings

Date received November 25, 2008

Analysis report no. 231-12632-15

<u>PARAMETER</u>	<u>RESULTS</u>
THALLIUM, Tl	<2.0 ug/g
MERCURY, Hg	<0.03 ug/g

Respectfully submitted,  
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