Constellation Energy Group

1005 Brandon Shores Road
Baltimore, Maryland 21226

Constellation Power Source Generation (CPSG) is providing this coal combustion byproducts (CCBs) information in accordance with COMAR 26.04.10.08 for the **C.P. Crane Electric Generation Station** located in eastern Baltimore County.

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

Facility Name: C.P. Crane Electric Generation Station

Name of Permit Holder: Constellation Power Source Generation

Facility Address: 101 Carroll Island Road
Street

Facility Address: Chase Maryland 21220
City State Zip

County: Baltimore

Facility Telephone No.: 410.682.9797 Facility Fax No.: 410.682.9805

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)):

The C.P. Crane Generating Station (Crane) is located along Seneca Creek in eastern Baltimore County. The plant consists of two coal-fired units: Unit 1, which is nominally rated at 190 MW, and which began operating in 1961; and Unit 2, which is nominally rated at 209 MW, and which began operating in 1963. Both units use cyclone-type boilers manufactured by Babcock and Wilcox (B&W). Coal is supplied to the plant via rail and is stored adjacent to the plant. The coal is prepared for use by four Pennsylvania crushers per boiler. It is gravity-fed to the boilers after transport into the plant via mechanical conveyor. Each unit is equipped with a baghouse for capture and control of particulate matter (PM) emissions. Ash is collected from the baghouse hoppers and conveyed pneumatically to storage silos from where it is loaded into trucks for final disposition.

Coals burned in 2008 at the C.P. Crane Plant came from Central Appalachian and Powder River Basin sources, and are summarized below:

Mine Location	Tons
Greene Co. PA	547,807
Monongalia Co. WV	76,392
Powder River Basin WY	197,224
Total	821,423

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

CCBs produced at the C.P. Crane electric generation station during this reporting period consist of fly ash and boiler slag, and are summarized below.

Table 1: CCBs Produced in Past Five Years
C.P. Crane Electric Generation Station

Year	Fly Ash (tons)	Boiler Slag (tons)
2008	43,208	39,926
2007	41,023	52,175
2006	47,448	51,019
2005	50,527	54,330
2004	39,381	42,346

D. Descriptions of any modeling or risk assessments (26.04.10.08 A.(4)):

Prior to October, 2007 CPSG placed certain CCBs generated at the C.P. Crane plant and not used for other beneficial uses, at the Rossville surface mine reclamation facility in Rosedale, MD. CPSG has completed certain investigations in conjunction with the submittal of the Rossville site to the Maryland Voluntary Cleanup Program (VCP) during 2008. However, actual modeling or risk assessments have not been completed for the site as of this date.

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:

- Fly Ash, TCLP-Metals Analysis, Phase Separation Science, Inc., July 9, 2008
- Fly Ash, Total Oxides, Standard Laboratories, Inc., August 15, 2008
- Fly Ash, Available Alkalies, CTL|Thompson Materials Engineers, Inc., August 25, 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 the Rossville site in Rosedale, Maryland were used for surface mine restoration. CCBs delivered to Mountainview Landfill in Allegany County, Maryland were used for daily cover in that municipal solid waste (MSW) landfill, as authorized by MDE. CCBs delivered to Waste Management were used for daily cover in MSW landfills located in Charles City and King George, Virginia. Boiler slag delivered to Virginia Materials in Baltimore, Maryland and Norfolk, Virginia was processed and used for blasting grit, roofing shingles grit and asphalt paving.

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
C.P. Crane Electric Generation Station

Year	CCB Receiver	Fly Ash (tons)	Boiler Slag (tons)	CCBs Use
2008	Virginia Materials		39,926	blast & roofing grit, paving
	Waste Mgmt, VA	40,644		landfill, daily cover
	Mountainview LF, MD	2,564		landfill, daily cover
2007	Virginia Materials		52,175	blast & roofing grit, paving
	Waste Mgmt, VA	9,817		landfill, daily cover
	Rossville	31,206		mine reclamation
2006	Virginia Materials		51,019	blast & roofing grit, paving
	Rossville	47,448		mine reclamation
2005	Virginia Materials		54,330	blast & roofing grit, paving
	Rossville	50,527		mine reclamation
2004	Virginia Materials		42,346	blast & roofing grit, paving
	Rossville	39,381		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 below.

CCBs delivered to Mountainview Landfill in Allegany County, Maryland, will be used for daily cover in that MSW landfill, as authorized by MDE. CCBs delivered to Waste Management of Virginia will be used for daily cover in MSW landfills located in Charles City and King George, Virginia. Boiler slag delivered to Virginia Materials in Baltimore, Maryland and Norfolk, Virginia will be processed and used for blasting grit, roofing shingles grit and asphalt paving.

CPSG is currently pursuing purchase of a permitted industrial waste landfill in Baltimore City. If the purchase and re-permitting is successful, fly ash 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 below.

Table 3: CCBs Use/Disposal Projections for the Next Five Years
C.P. Crane Electric Generation Station

Year	Fly Ash	Tons Used	Tons Disposed	Boiler Slag	Tons Used	Tons Disposed
2009	Mountainview LF, MD		30,000	Virginia Materials	31,878	
	Waste Mgmt, VA		22,744			
	Total	0	52,744	Total	31,878	0
2010	Mountainview LF, MD		30,000	Virginia Materials	19,679	
	Waste Mgmt, VA		2,559			
	Total	0	32,559	Total	19,679	0
2011	Mountainview LF, MD		30,000	Virginia Materials	25,011	
	Waste Mgmt, VA		11,382			
	Total	0	41,382	Total	25,011	0
2012	Mountainview LF, MD		30,000	Virginia Materials	25,842	
	Waste Mgmt, VA		12,758			
	Total	0	42,758	Total	25,842	0
2013	Mountainview LF, MD		30,000	Virginia Materials	26,603	
	Waste Mgmt, VA		14,016			
	Total	0	44,016	Total	26,603	0

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 Quinn.Morrison@constellation.com Email Address	3/13/09 Date

Analytical Report for

Constellation Energy Group

Certificate of Analysis No.: 8070103

Project Manager: John Basciano
Project Name : Crane Fly Ash
Project Location: Crane Station

July 9, 2008

Phase Separation Science, Inc.
6630 Baltimore National Pike
Baltimore, MD 21228
Phone: (410) 747-8770
Fax: (410) 788-8723

OFFICES:
6630 BALTIMORE NATIONAL PIKE
ROUTE 40 WEST
BALTIMORE, MD 21228
410-747-8770
800-932-9047

PHASE SEPARATION SCIENCE, INC.

July 9, 2008

John Basciano
Constellation Energy Group
1015 Brandon Shores Rd.
Baltimore, MD 21226

Reference: PSS Work Order No: **8070103**
Project Name : **Crane Fly Ash**
Project Location: **Crane Station**

Dear John Basciano :

The attached Analytical and QC Summary lists the analytical results from the analyses performed on the samples received under the project name referenced above and identified with the Phase Separation Science (PSS) Work Order numbered **8070103**.

All work reported herein has been performed in accordance with referenced methodologies, PSS Standard Operating Procedures and the PSS Quality Assurance Manual. PSS is limited in liability to the actual cost of the sample analysis done.

PSS reserves the right to return any unused samples, extracts or related solutions. Otherwise, the samples are scheduled for disposal, without any further notice, on August 5, 2008. This includes any samples that were received with a request to be held but lacked a specific hold period. It is your responsibility to provide a written request defining a specific disposal date if additional storage is required. Upon receipt , the request will be acknowledged by PSS, thus extending the storage period.

This report shall not be reproduced except in full, without the written approval of an authorized PSS representative. A copy of this report will be retained by PSS for at least 10 years, after which time it will be disposed without further notice, unless prior arrangements have been made.

We thank you for selecting Phase Separation Science, Inc. to serve your analytical needs. If you have any questions concerning this report, do not hesitate to contact us at 410-747-8770 or info@phaseonline.com.

Dan Prucnal

Dan Prucnal
Laboratory Manager

OFFICES:
6630 BALTIMORE NATIONAL PIKE
ROUTE 40 WEST
BALTIMORE, MD 21228
410-747-8770
800-932-9047
FAX 410-788-8723

PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 8070103

Constellation Energy Group, Baltimore, MD

July 9, 2008

Project Name: Crane Fly Ash
Project Location: Crane Station

Sample ID: Crane Fly Ash **Date/Time Sampled: 06/17/2008 08:00** **PSS Sample ID: 8070103-001**
Matrix: SOLID **Date/Time Received: 07/01/2008 09:07**

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	07/08/08	07/08/08 13:20	1034
Barium	ND	mg/L	100		1	07/08/08	07/08/08 13:20	1034
Cadmium	ND	mg/L	1.0		1	07/08/08	07/08/08 13:20	1034
Chromium	ND	mg/L	5.0		1	07/08/08	07/08/08 13:20	1034
Lead	ND	mg/L	5.0		1	07/08/08	07/08/08 13:20	1034
Mercury	ND	mg/L	0.200		1	07/08/08	07/08/08 13:20	1034
Selenium	**0.113**	mg/L	1.0		1	07/08/08	07/08/08 13:20	1034
Silver	ND	mg/L	5.0		1	07/08/08	07/08/08 13:20	1034

SAMPLE CHAIN OF CUSTODY/AGREEMENT FORM

PHASE SEPARATION SCIENCE, INC.

www.phaseonline.com
email: info@phaseonline.com

(1) CLIENT: CONSTELLATION ENERGY OFFICE LOC.: COAL YARD
PROJECT MGR: JOHN BASCIANO PHONE NO.: (410) 917 3202
JOHN.M.BASCIANO
EMAIL: @CONSTELLATION.COM FAX NO.: (410) 787 5424
PROJECT NAME: CRANE FLY ASH PROJECT NO.:
SITE LOCATION: CRANE STATION P.O. NO.:
SAMPLERS:

PSS Work Order #: 8070103 PAGE 1 OF 1

Matrix Codes: SW=Surface Wtr DW=Drinking Wtr GW=Ground Wtr WW=Waste Wtr O=Oil S=Soil WL=Waste Liquid WS=Waste Solid W=Wipe

(2)

LAB NO.	SAMPLE IDENTIFICATION	DATE	TIME	MATRIX (See Codes)	No. CONTAINERS	SAMPLE TYPE C=COMP G=GRAB	Preservatives Used	(3) Analysis/ Method Required: TCLP Metals	REMARKS
1	CRANE FLY ASH	6/17	8 AM	FLY ASH	1	G			

(5)

Relinquished By: (1)	Date	Time	Received By:
John Bascian	7/1	8 AM	
Relinquished By: (2)	Date	Time	Received By:
		9.17	
Relinquished By: (3)	Date	Time	Received By:
Relinquished By: (4)	Date	Time	Received By:

(4)

Requested Turnaround Time
☒ 5-Day ☐ 3-Day ☐ 2-Day
☐ Next Day ☐ Emergency ☐ Other

Data Deliverables Required:

# of Coolers: 0
Custody Seal: ABS
Ice Present: NO Temp: 22°C
Shipping Carrier: HAND

Special Instructions:
PLEASE LABEL SAMPLE.
CRANE FLY ASH

6630 Baltimore National Pike • Route 40 West • Baltimore, Maryland 21228 • (410) 747-8770 • (800) 932-9047 • Fax (410) 788-8723

SAMPLE CHAIN OF CUSTODY/AGREEMENT FORM

PHASE SEPARATION SCIENCE, INC.

www.phaseonline.com
email: info@phaseonline.com

(1)
CLIENT: CONSTELLATION ENERGY OFFICE LOC. COAL YARD
PROJECT MGR: JOHN BASCIANO PHONE NO.: (410) 917 3202
EMAIL: JOHN.M.BASCIANO@CONSTELLATION.COM FAX NO.: (410) 787 5424
PROJECT NAME: CRANE FLY ASH PROJECT NO.:
SITE LOCATION: CRANE STATION P.O. NO.:
SAMPLERS:

PSS Work Order #: 8070103 PAGE 1 OF 1

Matrix Codes:
SW=Surface Wtr DW=Drinking Wrt GW=Ground Wtr WW=Waste Wtr O=Oil S=Soil WL=Waste Liquid WS=Waste Solid W= Wipe

(2)

LAB NO.	SAMPLE IDENTIFICATION	DATE	TIME	MATRIX (See Codes)	No. CONTAINERS	SAMPLE TYPE C = COMP G = GRAB	Preservatives Used	Analysis/ Method Required (3) TCLP Metals	REMARKS
1	CRANE FLY ASH	6/17	8 Am	FLY ASH	1	G			

(5)

Relinquished By: (1)	Date	Time	Received By:
John Bascian	7/1	8 AM	
Relinquished By: (2)	Date	Time	Received By:
		9:17	
Relinquished By: (3)	Date	Time	Received By:
Relinquished By: (4)	Date	Time	Received By:

(4)

Requested Turnaround Time
☒ 5-Day ☐ 3-Day ☐ 2-Day
☐ Next Day ☐ Emergency ☐ Other

Data Deliverables Required:

# of Coolers: 0
Custody Seal: ABS
Ice Present: NO Temp: 22°C
Shipping Carrier: HAND

Special Instructions:
PLEASE LABEL SAMPLE.
CRANE FLY ASH

6630 Baltimore National Pike • Route 40 West • Baltimore, Maryland 21228 • (410) 747-8770 • (800) 932-9047 • Fax (410) 788-8723

Phase Separation Science, Inc

Sample Receipt Checklist

Wo Number	8070103	**Received By**	Rachel Davis
Client Name	Constellation Energy Group	**Date Received**	07/01/2008 09:07:00 AM
Project Name	Crane Fly Ash	**Delivered By**	Client
Project Number	N/A	**Tracking No**	Not Applicable
		Logged In By	Rachel Davis

Shipping Container(s)

No. of Coolers	0	Ice	Absent
Custody Seals	Absent	Temp (deg C)	22
Seal Condition	None	Temp Blank Present	No

Documentation

COC agrees with sample labels? X Yes or ____ No

Chain of Custody (COC) X Yes or ____ No

Sample Container

Appropiate for Specified Analysis?	Yes X	No ____	Custody Seal(s)	Yes ____	No X
Intact?	X	____	Custody Seal(s) Intact?	____	X
Labeled and Labels Legible	X	____	Seal(s) Signed / Dated	____	X
Total No. of Samples Received	1		Total No. of Containers Received	1	

Preservation

		Yes	No	N/A
Metals	(pH<2)	____	____	X
Cyanides	(pH>12)	____	____	X
Sulfide	(pH>9)	____	____	X
TOC, COD, Phenols	(pH<2)	____	____	X
TOX, TKN, NH3, Total Phos	(pH<2)	____	____	X
VOC, BTEX (VOA Vials Rcvd Preserved)	(pH<2)	____	____	X
Do VOA vials have zero headspace?		____	____	____

Comments: (Any "No" response must be detailed in the comments section below.)

For any improper preservation conditions, list sample ID, preservative added (reagent ID number) below as well as documentation of any client notification as well as client instructions. Samples for pH, chlorine and dissolved oxygen should be analyzed as soon as possible, preferably in the field at the time of sampling.

Samples Inspected/Checklist Completed By: _____ Date: 7/1/8

PM Review and Approval: _____ Date: 7/1/08

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

DATE: 8-29-2008
SAMPLE NO. 972555

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

SAMPLE ID: CRANE FLYASH

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

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

OTHER ID:

CERTIFICATE OF ANALYSIS

SCREEN TEST		CUMULATIVE DOWN	CUMULATIVE UP
+325m	53.50%	53.50%	100.00%
325m x 0	46.50%	100.00%	46.50%
	100.00%		

	ASTM METHOD	AS RECEIVED	DRY BASIS
MOISTURE	D2961 D3302 D3173	0.21%	
LOSS ON IGNITION		11.62%	11.65%

ASH MINERAL
D2795 D3682

SILICON DIOXIDE	33.96 %
ALUMINUM OXIDE	15.75 %
FERRIC OXIDE	15.53 %
CALCIUM OXIDE	10.93 %
SODIUM OXIDE	0.55 %
POTASSIUM OXIDE	1.66 %
SULFUR TRIOXIDE	3.05 %
Available Alkalies(as Na20)	1.51 %

APPROVED BY
APPROVED BY

BLACK SEAL ANALYSIS

CTL | THOMPSON
MATERIALS ENGINEERS, INC.

Chemical and Physical Analysis of Fly Ash

Developed For: *Standard Laboratories, Inc.*
P.O. Box 214
Cresson, PA 16630

Ticket: *8335*	Plant of Origin: *Crane*	Sample Date Range:
Job: *14611*	Sample ID:	to:
Report Date: *10/20/2008*	Docket: *972555 -*	Date Received: *08/25/2008*

Chemical Composition (%)

(by Wyoming Analytical Laboratories, Inc.)

			ASTM C 618-03 Specifications 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
			AASHTO M 295-00 Specifications	
Available Alkalies (as Na_2O):	*0.9*		1.5 Max	1.5 Max
Sodium Oxide:		*0.39*		
Potassium Oxide:		*0.83*		

Physical Test Results

		ASTM C 618-03 Specifications Class F	Class C
Fineness, Retained on #325 Sieve (%):	*56.2*	34 Max	34 Max
Strength Activity Index (%)			
Ratio to Control @ 7 Days:	*77.3*		
Ratio to Control @ 28 Days:	*79.8*	75 Min	75 Min
Water Requirement, % of Control:	*99.2*	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^3:	*2.63*		

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

COLORADO REGISTERED ORVILLE R. WERNER II 14540 10-20-8 PROFESSIONAL ENGINEER

CTL | Thompson Materials Engineers, Inc.

Orville R. Werner II, P.E.

22 Lipan Street | Denver, Colorado 80223 | Telephone: 303-825-0777 Fax: 303-893-1568