



# Raven Power

June 26, 2013

Martha Hynson  
Maryland Department of the Environment  
Land Management Administration  
Solid Waste Program  
1800 Washington Boulevard, Suite 605  
Baltimore, Maryland 21230-1719

RECEIVED

JUN 28 2013

SOLID WASTE  
OPERATIONS DIVISION

Re: Amended Annual Generator Tonnage Reports for Calendar Year 2012  
Brandon Shores and H. A. Wagner Electric Generating Stations

Dear Ms. Hynson:

Enclosed as requested please find signed amended copies of the 2012 Annual Generator Tonnage Reports for the Brandon Shores and H. A. Wagner generating facilities. These reports cover the period from January 1, 2012 to December 31, 2012 for all of the coal-fired units at these facilities and have been amended based on updated generation, disposal and reuse data, and to reflect the disposal of fly ash stored on site at the end of 2012.

Please direct any questions concerning these amended reports to me at 410-787-5188, or by email at [amontier@raven-power.com](mailto:amontier@raven-power.com). You may also contact Thomas Weissinger, Director, Environmental, at 410-787-5532, or by email at [tweissinger@raven-power.com](mailto:tweissinger@raven-power.com)

Regards,

Anthony Montier  
Sr. Environmental Specialist

Enclosures (2)



# MARYLAND DEPARTMENT OF THE ENVIRONMENT

1800 Washington Boulevard • Suite 605 • Baltimore, Maryland 21230-1719

410-537-3315 • 800-633-6101 x3315 • [www.mde.state.md.us](http://www.mde.state.md.us)

Land Management Administration • Solid Waste Program

## **Coal Combustion Byproducts (CCBs) Annual Generator Tonnage Report Instructions for Calendar Year 2012**

The following is general information relating to the requirement for reporting quantities of coal combustion byproducts (CCBs) that were managed in the State of Maryland during calendar year 2012. Please answer the questions on the form provided, attaching additional information and any requested supplemental information to the back of the form. *Note that the form for this year requires both volume and weight of the CCBs produced. If you know one of these parameters but not the others, for example, you have the tonnage produced but not the volume, you may calculate the other parameter; however, please provide the calculations and assumptions that you used in your estimate.* Questions can be directed to the Solid Waste Program at (410) 537-3315 or via email at [edexter@mde.state.md.us](mailto:edexter@mde.state.md.us).

**I. Background.** This requirement that generators of CCBs submit an annual report was instituted in the Code of Maryland Regulations COMAR 26.04.10.08, that was promulgated effective December 1, 2008. The regulation requires that any non-residential generator of CCBs submit a report to the Department by March 1 of each year describing the manner in which CCBs generated within the State were managed during the preceding calendar year. Additional information and specific instructions follow. For more detailed information, please refer to COMAR 26.04.10.08.

### **II. General Information and Applicability.**

**A. Definitions.** CCBs are defined in COMAR 26.04.10.02B as:

*"(3) Coal Combustion Byproducts. (a) "Coal combustion byproducts" means the residue generated by or resulting from the burning of coal.  
(b) "Coal combustion byproducts" includes fly ash, bottom ash, boiler slag, pozzolan, and other solid residuals removed by air pollution control devices from the flue gas and combustion chambers of coal burning furnaces and boilers, including flue gas desulfurization sludge and other solid residuals recovered from flue gas by wet or dry methods."*

A generator of CCBs is defined in COMAR 26.04.10.02B as:

*"(9) Generator.  
(a) "Generator" means a person whose operations, activities, processes, or actions create coal combustion byproducts.  
(b) "Generator" does not include a person who only generates coal combustion byproducts by burning coal at a private residence."*



Facility Name: C. P. Crane Generating Station

## CCB Tonnage Report – 2012

**B. Applicability.** If you or your company meets the definition of a generator of CCBs as defined above, you must provide the information as required below. For the purposes of this report, “you” shall hereinafter refer to the generator defined above. Please note that COMAR 26.04.10.08 requires generators of CCBs to submit an annual report to the Department concerning the disposition of the CCBs that they generated the previous year. **THIS INCLUDES CCBS THAT WERE NOT SEPARATELY COLLECTED BUT WERE PRODUCED BY THE BURNING OF COAL AND WERE DIRECTLY CONTRIBUTED TO A PRODUCT, such as cement.** Where the amount cannot be directly measured, estimates based on the amount of coal burned can be used. The method of determining the volume of CCBs produced must be described.

**III. Required Information.** The following information must be provided to the Department by March 1, 2013:

A. Contact information:

Facility Name: C. P. Crane

Name of Permit Holder: C. P. Crane LLC

Facility Address: 1001 Carroll Island Road  
Street

Facility Address: Chase Maryland 21220  
City State Zip

County: Baltimore County

Contact Information (Person filing report or Environmental Manager)

Facility Telephone No.: 410-682-9797 Facility Fax No.: 410-682-9805

Contact Name: Anthony Montier

Contact Title: Sr. Environmental Specialist

Contact Address: 1005 Brandon Shores Road, Suite 100  
Street

Contact Address: Baltimore Maryland 21226  
City State Zip

Contact Email: amontier@raven-power.com

Contact Telephone No.: 410-787-5188 Contact Fax No.: 410-787-5160

*For questions on how to complete this form, please contact the Solid Waste Program at 410-537-3315*



B. A description of the process that generates the CCBs, including the type of coal or other raw material that generates the CCBs. If the space provided is insufficient, please attach additional pages:

The C. P. Crane electric generating facility has two coal fired units which produce electricity for commercial sale. Unit 1 is equipped with a Babcock & Wilcox once-through subcritical cyclone fired wet bottom boiler, and Unit 2 is equipped with a Babcock & Wilcox drum type cyclone fired wet bottom boiler. Both units burn sub-bituminous Powder River Basin (“PRB”) coal from the North Antelope Rochelle Mine alone, or in combination with bituminous Northern Appalachian coal from the Bailey Coal Mine in Pennsylvania. Coal is transported to the plant by rail and stored in a pile adjacent to the plant. The coal is prepared for use by two Pennsylvania hammer mill type crushers. After crushing, a proprietary additive, Cyclean, is added to the coal to aid in slag flow and reduce mercury in the flue gas.

The CCB handling process is the same for both units. Boiler slag (aka bottom ash) created by the combustion process is recovered from the bottom of the boilers and stored in de-watering bins for later disposal. Heavy fly ash particles in the flue gas stream drop into hoppers below the air heaters and are removed by vacuum truck and transported to a temporary storage area on site for eventual disposal. Finer particulate fly ash is captured on fabric bags in bag houses downstream of the air heaters and falls down to storage hoppers below. The fly ash is pneumatically conveyed from the hoppers to storage silos and eventually loaded on to trucks and sent off site for beneficial reuse or disposal.

C. The volume and weight of CCBs generated during calendar year 2012, including an identification of the different types of CCBs generated and the volume of each type generated. If the space provided is insufficient, please attach additional pages in a similar format. If converting from volume to weight or weight to volume, please provide your calculations and assumptions.

**Table I: Volume and Weight of CCBs Generated for Calendar Year 2012:** Please note the change to this table from previous years, to include both the volume and weight of the types of CCBs your facility produces.

<b>Volume and Weight of CCBs Generated for Calendar Year 2012</b>			
Fly Ash Type of CCB	Boiler Slag Type of CCB	----	----
13,782	16,778	----	----
Volume of CCB, in Cubic Yards	Volume of CCB, in Cubic Yards	Volume of CCB, in Cubic Yards	Volume of CCB, in Cubic Yards
10,233	12,458	----	----
Weight of CCB, in Tons	Weight of CCB, in Tons	Weight of CCB, in Tons	Weight of CCB, in Tons



Additional notes:

Coal combustion byproducts (“CCB”) are reported in dry tons. Cubic yards are calculated using a conversion factor of 1 ton = 1.3468 cubic yards.

D. Descriptions of any modeling or risk assessments, or both, conducted relating to the CCBs or their use that were performed by you or your company during the reporting year. Please attach this information to the report.

No modeling or risk assessments were conducted during 2012.

E. Copies of all laboratory reports of all chemical characterizations of the CCBs. Please attach this information to the report.

See attached.

F. A description of how you disposed of or used your CCBs in calendar year 2012, identifying:

(a) The types and volume of CCBs disposed of or used (if different than described in Paragraph C above) including any CCBs stored during the previous calendar year, the location of disposal, mine reclamation and use sites, and the type and volume of CCBs disposed of or used at each site:

Fly Ash

10,233 tons (13,782 CY) of fly ash was landfilled at Fort Armistead Road – Lot 15 Landfill in Baltimore, MD.

Boiler Slag

12,458 tons (16,778 CY) of boiler slag was delivered to Virginia Materials in Norfolk, VA for use as abrasive material and roofing granules.

and (b) The different uses by type and volume of CCBs:

See (a) above.

G. A description of how you intend to dispose of or use CCBs in the next 5 years, identifying:

(a) The types and volume of CCBs intended to be disposed of or used, the location of intended disposal, mine reclamation and use sites, and the type and volume of CCBs intended to be disposed of or used at each site:

Fly Ash

Raven projects that as much as 13,000 tons (17,500 CY) of flyash will be generated each year for the next five years. Unless suitable beneficial uses are identified, the fly ash will be disposed of in the company-owned Fort Armistead Road - Lot 15 LLC landfill in Baltimore, Maryland. This landfill is permitted and authorized to accept CCBs for disposal.

Boiler Slag

Raven projects that approximately 15,000 tons (20,100 CY) of boiler slag will be generated each year for the next five years, all of which will be beneficially used for blasting grit and/or roofing granules.

and (b) The different intended uses by type and volume of CCBs.



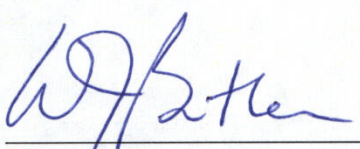
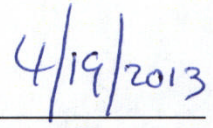
Fly Ash

While there are currently no identified beneficial uses for the projected 13,000 tons (17,500 CY) of fly ash that may be generated over the next 5 years, it is possible that all or some portion of the fly ash generated at C.P. Crane will be beneficially used. The potential exists that with proper certification as a Class C fly ash, it can be beneficially used in concrete products.

Boiler Slag

Approximately 15,000 tons (20,100 CY) each year will be beneficially used for blasting grit and/or roofing granules.

**IV. Signature and Certification.** An authorized official of the generator must sign the annual report, and certify as to the accuracy and completeness of the information contained in the annual report:

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	William J. Butler Plant Manager, C. P. Crane 410-682-9701 _____ Name, Title, & Telephone No. (Print or Type)	 _____ Date
_____ Your Email Address		

**V: Attachments (please list):**

1. Annual TCLP 2012 Certificate of Analysis, February 15, 2012
2. Crane Fly Ash Certificate of Analysis, March 12, 2012
3. Wyoming Analytical Laboratories Chemical Analysis, June 5, 2012



# Analytical Report for

**Constellation Energy Group - CP Crane plant**

**Certificate of Analysis No.: 12020811**

**Project Manager: Joshua Sawyers**

**Project Name : Annual TCLP 2012**

**Project Location: C.P. Crane**



**February 15, 2012**

**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  
FAX 410-788-8723

# PHASE SEPARATION SCIENCE, INC.



February 15, 2012

**Joshua Sawyers**  
**Constellation Energy Group - CP Crane plant**  
1001 Carroll Island Rd  
Baltimore, MD 21220

Reference: PSS Work Order No: **12020811**  
Project Name: Annual TCLP 2012  
Project Location: C.P. Crane

Dear Joshua Sawyers :

This report includes 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 **12020811**.

All work reported herein has been performed in accordance with current NELAP standards referenced methodologies, PSS Standard Operating Procedures and the PSS Quality Assurance Manual unless otherwise noted in the Case Narrative Summary. 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 March 14, 2012. 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 5 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](mailto:info@phaseonline.com).

Sincerely,

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**Dan Prucnal**  
Laboratory Manager





## Sample Summary

Client Name: Constellation Energy Group - CP Crane plant

Project Name: Annual TCLP 2012

Project ID: N/A

Work Order Number: 12020811

The following samples were received under chain of custody by Phase Separation Science (PSS) on 02/08/2012 at 01:30 pm

Lab Sample Id	Sample Id	Matrix	Date/Time Collected
12020811-001	Air Heater Ash 2012	SOLID	02/08/2012 08:30
12020811-002	Slag 2012	SOLID	02/08/2012 08:40
12020811-003	Ash Silo 2012	SOLID	02/08/2012 08:50
12020811-004	Baghouse Bag 2012	SOLID	02/08/2012 09:00

Please reference the Chain of Custody and Sample Receipt Checklist for specific container counts and preservatives. Any sample conditions not in compliance with sample acceptance criteria are described in Case Narrative Summary.

### Notes:

1. The presence of common laboratory contaminants such as acetone, methylene chloride and phthalates, may be considered a possible laboratory artifact. Where observed, appropriate consideration of data should be taken.
2. The following analytical results are never reported on a dry weight basis: pH, flashpoint, moisture and paint filter test.
3. Drinking water samples collected for the purpose of compliance with SDWA may not be suitable for their intended use unless collected by a certified sampler [COMAR 26.08.05.07.C.2].

### Standard Flags/Abbreviations:

- B A target analyte or common laboratory contaminant was identified in the method blank. Its presence indicates possible field or laboratory contamination.
- C Results Pending Final Confirmation.
- E The data exceeds the upper calibration limit; therefore, the concentration is reported as estimated.
- Fail The result exceeds the regulatory level for Toxicity Characteristic (TCLP) as cited in 40 CFR 261.24 Table 1.
- J The target analyte was positively identified below the reporting limit but greater than the LOD.
- LOD Limit of Detection. An estimate of the minimum amount of a substance that an analytical process can reliably detect. An LOD is analyte and matrix specific.
- ND Not Detected at or above the reporting limit.
- RL PSS Reporting Limit.
- U Not detected.





## Case Narrative Summary

**Client Name: Constellation Energy Group - CP Crane plant**

**Project Name: Annual TCLP 2012**

Project ID: N/A

Work Order Number: 12020811

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Any holding time exceedances, deviations from the method specifications, regulatory requirements or variations to the procedures outlined in the PSS Quality Assurance Manual are outlined below.

**Sample Receipt:**

All sample receipt conditions were acceptable.

**NELAP accreditation was held for all analyses performed unless noted below. See [www.phaseonline.com](http://www.phaseonline.com) for complete PSS scope of accreditation.**



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: 12020811

Constellation Energy Group - CP Crane plant, Baltimore, MD  
 February 15, 2012

Project Name: Annual TCLP 2012  
 Project Location: C.P. Crane

**Sample ID: Air Heater Ash 2012**      **Date/Time Sampled: 02/08/2012 08:30**      **PSS Sample ID: 12020811-001**  
**Matrix: SOLID**      **Date/Time Received: 02/08/2012 13:30**

TCLP Metals      Analytical Method: SW-846 6020 A      Preparation Method: 3010A

	Result	Units	RL	Flag	Dil	TCLP Limit	Prepared	Analyzed	Analyst
Arsenic	ND	mg/L	0.050		1	5	02/10/12	02/10/12 14:03	1034
Barium	ND	mg/L	1.0		1	100	02/10/12	02/10/12 14:03	1034
Cadmium	ND	mg/L	0.050		1	1	02/10/12	02/10/12 14:03	1034
Chromium	ND	mg/L	0.050		1	5	02/10/12	02/10/12 14:03	1034
Lead	ND	mg/L	0.050		1	5	02/10/12	02/10/12 14:03	1034
Mercury	ND	mg/L	0.0020		1	0.2	02/10/12	02/14/12 16:22	1034
Selenium	ND	mg/L	0.050		1	1	02/10/12	02/10/12 14:03	1034
Silver	ND	mg/L	0.050		1	5	02/10/12	02/14/12 16:22	1034

**Sample ID: Slag 2012**      **Date/Time Sampled: 02/08/2012 08:40**      **PSS Sample ID: 12020811-002**  
**Matrix: SOLID**      **Date/Time Received: 02/08/2012 13:30**

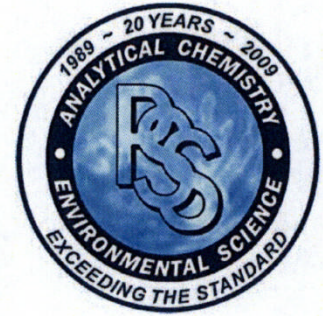
TCLP Metals      Analytical Method: SW-846 6020 A      Preparation Method: 3010A

	Result	Units	RL	Flag	Dil	TCLP Limit	Prepared	Analyzed	Analyst
Arsenic	ND	mg/L	0.050		1	5	02/10/12	02/10/12 14:09	1034
Barium	ND	mg/L	1.0		1	100	02/10/12	02/10/12 14:09	1034
Cadmium	ND	mg/L	0.050		1	1	02/10/12	02/10/12 14:09	1034
Chromium	ND	mg/L	0.050		1	5	02/10/12	02/10/12 14:09	1034
Lead	ND	mg/L	0.050		1	5	02/10/12	02/10/12 14:09	1034
Mercury	ND	mg/L	0.0020		1	0.2	02/10/12	02/14/12 16:28	1034
Selenium	ND	mg/L	0.050		1	1	02/10/12	02/10/12 14:09	1034
Silver	ND	mg/L	0.050		1	5	02/10/12	02/14/12 16:28	1034



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: 12020811

Constellation Energy Group - CP Crane plant, Baltimore, MD  
 February 15, 2012

Project Name: Annual TCLP 2012  
 Project Location: C.P. Crane

**Sample ID: Ash Silo 2012**      **Date/Time Sampled: 02/08/2012 08:50**      **PSS Sample ID: 12020811-003**  
**Matrix: SOLID**      **Date/Time Received: 02/08/2012 13:30**

TCLP Metals      Analytical Method: SW-846 6020 A      Preparation Method: 3010A

	Result	Units	RL	Flag	Dil	TCLP Limit	Prepared	Analyzed	Analyst
Arsenic	0.059	mg/L	0.050		1	5	02/10/12	02/10/12 14:14	1034
Barium	2.6	mg/L	1.0		1	100	02/10/12	02/10/12 14:14	1034
Cadmium	ND	mg/L	0.050		1	1	02/10/12	02/10/12 14:14	1034
Chromium	0.056	mg/L	0.050		1	5	02/10/12	02/10/12 14:14	1034
Lead	ND	mg/L	0.050		1	5	02/10/12	02/10/12 14:14	1034
Mercury	ND	mg/L	0.0020		1	0.2	02/10/12	02/14/12 16:34	1034
Selenium	0.18	mg/L	0.050		1	1	02/10/12	02/10/12 14:14	1034
Silver	ND	mg/L	0.050		1	5	02/10/12	02/14/12 16:34	1034

**Sample ID: Baghouse Bag 2012**      **Date/Time Sampled: 02/08/2012 09:00**      **PSS Sample ID: 12020811-004**  
**Matrix: SOLID**      **Date/Time Received: 02/08/2012 13:30**

TCLP Metals      Analytical Method: SW-846 6020 A      Preparation Method: 3010A

	Result	Units	RL	Flag	Dil	TCLP Limit	Prepared	Analyzed	Analyst
Arsenic	ND	mg/L	0.050		1	5	02/10/12	02/10/12 14:20	1034
Barium	ND	mg/L	1.0		1	100	02/10/12	02/10/12 14:20	1034
Cadmium	ND	mg/L	0.050		1	1	02/10/12	02/10/12 14:20	1034
Chromium	ND	mg/L	0.050		1	5	02/10/12	02/10/12 14:20	1034
Lead	ND	mg/L	0.050		1	5	02/10/12	02/10/12 14:20	1034
Mercury	ND	mg/L	0.0020		1	0.2	02/10/12	02/14/12 16:39	1034
Selenium	ND	mg/L	0.050		1	1	02/10/12	02/10/12 14:20	1034
Silver	ND	mg/L	0.050		1	5	02/10/12	02/14/12 16:39	1034





# Phase Separation Science, Inc

## Sample Receipt Checklist

<b>Work Order #</b>	12020811	<b>Received By</b>	Rachel Davis
<b>Client Name</b>	Constellation Energy Group - CP Cræ	<b>Date Received</b>	02/08/2012 01:30:00 PM
<b>Project Name</b>	Annual TCLP 2012	<b>Delivered By</b>	Trans Time Express
<b>Project Number</b>	N/A	<b>Tracking No</b>	Not Applicable
<b>Disposal Date</b>	03/14/2012	<b>Logged In By</b>	Rachel Davis

### Shipping Container(s)

No. of Coolers	1	Ice	Present
Custody Seal(s) Intact?	N/A	Temp (deg C)	2
Seal(s) Signed / Dated?	N/A	Temp Blank Present	No

### Documentation

COC agrees with sample labels?	Yes
Chain of Custody	Yes

Sampler Name	<u>Joshua Sawyers</u>
MD DW Cert. No.	<u>N/A</u>

### Sample Container

Appropriate for Specified Analysis?	Yes
Intact?	Yes
Labeled and Labels Legible?	Yes

Custody Seal(s) Intact?	Not Applicable
Seal(s) Signed / Dated	Not Applicable

Total No. of Samples Received 4

Total No. of Containers Received 4

### Preservation

Metals	(pH<2)	N/A
Cyanides	(pH>12)	N/A
Sulfide	(pH>9)	N/A
TOC, COD, Phenols	(pH<2)	N/A
TOX, TKN, NH3, Total Phos	(pH<2)	N/A
VOC, BTEX (VOA Vials Rcvd Preserved)	(pH<2)	N/A
Do VOA vials have zero headspace?		N/A

### 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 which require thermal preservation shall be considered acceptable when received at a temperature above freezing to 6°C. Samples that are hand delivered on the day that they are collected may not meet these criteria but shall be considered acceptable if there is evidence that the chilling process has begun such as arrival on ice.

Samples Inspected/Checklist Completed By: Rachel Davis Date: 02/08/2012  
Rachel Davis

PM Review and Approval: Lynn Moran Date: 02/09/2012  
Lynn Moran



**Analytical Report for**  
**Constellation Power Generation**  
**Certificate of Analysis No.: 12030719**

**Project Manager: John Basciano**  
**Project Name : Crane Fly Ash**



**March 12, 2012**  
**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  
FAX 410-788-8723

# PHASE SEPARATION SCIENCE, INC.



March 12, 2012

**John Basciano**  
**Constellation Power Generation**  
1005 Brandon Shores Road  
Baltimore, MD 21226

Reference: PSS Work Order No: **12030719**  
Project Name: Crane Fly Ash

Dear John Basciano :

This report includes 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 **12030719**.

All work reported herein has been performed in accordance with current NELAP standards referenced methodologies, PSS Standard Operating Procedures and the PSS Quality Assurance Manual unless otherwise noted in the Case Narrative Summary. 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 April 11, 2012. 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 5 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](mailto:info@phaseonline.com).

A handwritten signature in black ink that reads "Dan Prucnal".

---

**Dan Prucnal**  
Laboratory Manager





## Sample Summary

Client Name: Constellation Power Generation

Project Name: Crane Fly Ash

Project ID: N/A

Work Order Number: 12030719

The following samples were received under chain of custody by Phase Separation Science (PSS) on 03/07/2012 at 03:15 pm

Lab Sample Id	Sample Id	Matrix	Date/Time Collected
12030719-001	Crane Fly Ash	SOLID	03/06/2012 09:00

Please reference the Chain of Custody and Sample Receipt Checklist for specific container counts and preservatives. Any sample conditions not in compliance with sample acceptance criteria are described in Case Narrative Summary.

### Notes:

1. The presence of common laboratory contaminants such as acetone, methylene chloride and phthalates, may be considered a possible laboratory artifact. Where observed, appropriate consideration of data should be taken.
2. The following analytical results are never reported on a dry weight basis: pH, flashpoint, moisture and paint filter test.
3. Drinking water samples collected for the purpose of compliance with SDWA may not be suitable for their intended use unless collected by a certified sampler [COMAR 26.08.05.07.C.2].

### Standard Flags/Abbreviations:

- B A target analyte or common laboratory contaminant was identified in the method blank. Its presence indicates possible field or laboratory contamination.
- C Results Pending Final Confirmation.
- E The data exceeds the upper calibration limit; therefore, the concentration is reported as estimated.
- Fail The result exceeds the regulatory level for Toxicity Characteristic (TCLP) as cited in 40 CFR 261.24 Table 1.
- J The target analyte was positively identified below the reporting limit but greater than the LOD.
- LOD Limit of Detection. An estimate of the minimum amount of a substance that an analytical process can reliably detect.  
An LOD is analyte and matrix specific.
- ND Not Detected at or above the reporting limit.
- RL PSS Reporting Limit.
- U Not detected.





## Case Narrative Summary

Client Name: Constellation Power Generation

Project Name: Crane Fly Ash

Project ID: N/A

Work Order Number: 12030719

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Any holding time exceedances, deviations from the method specifications, regulatory requirements or variations to the procedures outlined in the PSS Quality Assurance Manual are outlined below.

**Sample Receipt:**

Sample(s) received at a temperature greater than 6 degrees C and ice was not present.

**General Comments:**

Results reported on an as received basis.

**NELAP accreditation was held for all analyses performed unless noted below. See [www.phaseonline.com](http://www.phaseonline.com) for complete PSS scope of accreditation.**



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: 12030719

**Constellation Power Generation, Baltimore, MD**

March 12, 2012

Project Name: Crane Fly Ash

Sample ID: Crane Fly Ash      Date/Time Sampled: 03/06/2012 09:00      PSS Sample ID: 12030719-001  
Matrix: SOLID      Date/Time Received: 03/07/2012 15:15

Total Metals

Analytical Method: SW-846 6020 A

Preparation Method: 3050B

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Beryllium	3.8	mg/kg	2.5		1	03/08/12	03/09/12 16:28	1033





# Phase Separation Science, Inc

## Sample Receipt Checklist

<b>Work Order #</b>	12030719	<b>Received By</b>	Sara Dorr
<b>Client Name</b>	Constellation Power Generation	<b>Date Received</b>	03/07/2012 03:15:00 PM
<b>Project Name</b>	Crane Fly Ash	<b>Delivered By</b>	Client
<b>Project Number</b>	N/A	<b>Tracking No</b>	Not Applicable
<b>Disposal Date</b>	04/11/2012	<b>Logged In By</b>	Sara Dorr

### Shipping Container(s)

No. of Coolers	1	Ice	Absent
Custody Seal(s) Intact?	N/A	Temp (deg C)	13
Seal(s) Signed / Dated?	N/A	Temp Blank Present	No

### Documentation

COC agrees with sample labels?	Yes
Chain of Custody	Yes

Sampler Name	<u>Not Provided</u>
	<u>N/A</u>

### Sample Container

Appropriate for Specified Analysis?	Yes
Intact?	Yes
Labeled and Labels Legible?	Yes

Custody Seal(s) Intact?	Not Applicable
Seal(s) Signed / Dated	Not Applicable

Total No. of Samples Received 1

Total No. of Containers Received 1

### Preservation

Metals	(pH<2)	N/A
Cyanides	(pH>12)	N/A
Sulfide	(pH>9)	N/A
TOC, COD, Phenols	(pH<2)	N/A
TOX, TKN, NH3, Total Phos	(pH<2)	N/A
VOC, BTEX (VOA Vials Rcvd Preserved)	(pH<2)	N/A
Do VOA vials have zero headspace?		N/A

### 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 which require thermal preservation shall be considered acceptable when received at a temperature above freezing to 6°C. Samples that are hand delivered on the day that they are collected may not meet these criteria but shall be considered acceptable if there is evidence that the chilling process has begun such as arrival on ice.

Sample(s) received at a temperature greater than 6 degrees C and ice was not present.

Samples Inspected/Checklist Completed By: Sara Dorr Date: 03/07/2012  
Sara Dorr

PM Review and Approval: Lynn Moran Date: 03/09/2012  
Lynn Moran





# WYOMING ANALYTICAL LABORATORIES, INC.

14335 W. 44th Avenue  
Golden, CO 80403

www.wal-lab.com  
Email: walxray@aol.com

(303) 278-2446  
Fax: (303) 278-2439

June 05, 2012

Bud Werner  
CTL Thompson, Materials Engineers, Inc.  
22 Lipan St.  
Denver, CO 80223

Denver Division #: 120508-3  
Sample ID: L.P. Crane CTL 12157  
PO#:

CHEMICAL ANALYSIS  
WT%, DRY BASIS

Silicon Dioxide, SiO <sub>2</sub>	27.07
Aluminum Oxide, Al <sub>2</sub> O <sub>3</sub>	16.18
Iron Oxide, Fe <sub>2</sub> O <sub>3</sub>	6.70
Total (SiO <sub>2</sub> + Al <sub>2</sub> O <sub>3</sub> + Fe <sub>2</sub> O <sub>3</sub> )	49.96
Calcium Oxide, CaO	25.37
Magnesium Oxide, MgO	6.03
Sodium Oxide, Na <sub>2</sub> O	2.78
Potassium Oxide, K <sub>2</sub> O	0.63
Titanium Dioxide, TiO <sub>2</sub>	1.28
Manganese Dioxide, MnO <sub>2</sub>	0.02
Phosphorus Pentoxide, P <sub>2</sub> O <sub>5</sub>	1.61
Strontium Oxide, SrO	0.38
Barium Oxide, BaO	0.74
Sulfur Trioxide, SO <sub>3</sub>	4.28
Loss on Ignition (750°C)	6.91
Total	100.00
Moisture (105°C), as Received	0.31

Analysis per ASTM C 311

Charles R. Wilson  
Division Manager

MEMBER  
ACIL