



RECEIVED  
24  
FEB 18 2015  
SOLID WASTE  
OPERATIONS DIVISION

February 19, 2015

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

Re: Calendar Year 2014 Generator Tonnage Reports for the Brandon Shores, C. P. Crane, and H. A. Wagner Electric Generating Stations

Dear Ms. Hynson:

Enclosed please find the 2014 Coal Combustion Byproducts (CCBs) Annual Generator Tonnage Reports for Raven Power's Brandon Shores, Charles P. Crane, and Herbert A. Wagner generating facilities. These reports cover the period from January 1, 2014 to December 31, 2014 for the coal-fired units at these facilities and reflect coal combustion byproduct production, beneficial reuse, and disposal.

For any questions regarding these reports, please feel free to contact 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 (3)

# MARYLAND DEPARTMENT OF THE ENVIRONMENT

Land Management Administration • Solid Waste Program  
1800 Washington Boulevard • Suite 605 • Baltimore Maryland 21230-1719  
410-537-3315 • 800-633-6101 x3315 • [www.mde.maryland.gov](http://www.mde.maryland.gov)

---

## **Coal Combustion Byproducts (CCBs) Annual Generator Tonnage Report Instructions for Calendar Year 2014**

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 2014. 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 [ed.dexter@maryland.gov](mailto:ed.dexter@maryland.gov).

**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: Brandon Shores Generating Station

## CCB Tonnage Report – 2014

**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, 2015:

A. Contact information:

Facility Name: Brandon Shores Generating Station

Name of Permit Holder: Brandon Shores LLC

Facility Address: 2030 Brandon Shores Road  
Street

Facility Address: Baltimore Maryland 21226  
City State Zip

County: Anne Arundel

Contact Information (Person filing report or Environmental Manager)

Facility Telephone No.: 410-787-5531 Facility Fax No.: \_\_\_\_\_

Contact Name: Anthony Montier

Contact Title: Environmental Manager

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 Brandon Shores electrical generating station consists of two coal fired units which produce electricity for commercial sale. Both units are equipped with Babcock & Wilcox natural circulation radiant boilers. For both units, bituminous coal is delivered by barge and stored in a pile adjacent to the plant. A proprietary additive, Chem-Mod®, is added to the coal for NO<sub>x</sub> and mercury reduction as it is conveyed by belt from the coal pile to storage bunkers in the plant. The coal is then pulverized and fed by air to the boilers where it is burned using low NO<sub>x</sub> burners.

On both units, the heavier ash (a.k.a. bottom ash) drops to the bottom of the boilers where it is conveyed by high-pressure water to settling bins before being eventually loaded onto trucks for beneficial reuse or disposal. Lighter ash (a.k.a. fly ash) is conveyed by furnace air flow to electrostatic precipitators where the ash is collected on charged plates and falls to storage hoppers below. The fly ash from the hoppers is then conveyed pneumatically to storage silos before being loaded onto trucks and sent off site for beneficial reuse or disposal. However, before the fly ash is sent off site, a portion of the fly ash that is high in carbon is separated out and sent back to the plant to be re-burned. In 2014, 12,308 tons (16,576 CY) of this high-carbon material was transferred back to Brandon Shores for re-burning. Later in the flue gas stream, pulse jet fabric filters downstream of the precipitators remove any remaining fly ash which has been mixed with powdered activated carbon and hydrated lime injected into the flue gas stream for emissions control. This fly ash is conveyed to storage silos for eventual reuse or disposal.

Brandon Shores' wet flue gas desulfurization ("FGD") scrubbers produce CCBs which include fly ash, gypsum, and FGD sludge. These CCBs are stored under cover on site before being loaded onto trucks for eventual beneficial reuse or disposal.

Waste water fines are the product of CCB clean up or area wash downs and are sent to the settling basin at the internal waste water treatment plant for storage. This basin is periodically de-watered and the CCBs are allowed to dry before being dug out, loaded on trucks, and sent for disposal.

C. The volume and weight of CCBs generated during calendar year 2014, 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 2014:** 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 2014</b>				
Fly Ash	Bottom Ash	Gypsum	FGD Sludge	Waste Water Fines
Type of CCB	Type of CCB	Type of CCB	Type of CCB	Type of CCB
186,005	21,050	266,569	4,057	1,547
Volume of CCB, in Cubic Yards	Volume of CCB, in Cubic Yards	Volume of CCB, in Cubic Yards	Volume of CCB, in Cubic Yards	Volume of CCB, in Cubic Yards
138,109	15,630	197,866	3,012	1,149
Weight of CCB, in Tons	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.

FGD sludge is generated from the operation of the FGD water treatment system.

Waste water fines are from the waste water settling basin and consist largely of fly ash and bottom ash.

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 performed in 2014.

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

Laboratory reports are attached.

F. A description of how you disposed of or used your CCBs in calendar year 2014, 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 - Beneficial Reuse

105,296 tons (141,813 CY) delivered to Separation Technologies, Inc. in Baltimore, MD for use in concrete.

16,491 tons (22,210 CY) delivered to Lehigh in Union Bridge, MD for use in cement manufacturing.

Fly Ash - Disposal

16,108 tons (21,694 CY) of fly ash was delivered to Fort Armistead Road – Lot 15 LLC landfill in Baltimore, MD for landfilling.

Fly Ash – Storage

214 tons (288 CY) of fly ash was stored on site at the end of 2014.

Bottom Ash - Beneficial Reuse

5,075 tons (6,835 CY) delivered to Lehigh in Union Bridge, MD for use in cement manufacturing.

Bottom Ash - Disposal

10,555 tons (14,215 CY) of bottom ash was delivered to Fort Armistead Road – Lot 15 LLC landfill in Baltimore, MD for landfilling.

Gypsum - Beneficial Reuse

95,609 tons (128,766 CY) delivered to US Gypsum in Baltimore, MD for use in wallboard manufacturing.

68,747 tons (92,588 CY) delivered to National Gypsum in Baltimore, MD for use in wallboard manufacturing.

15,713 tons (21,162 CY) delivered to SCB International in Keystone, PA for use in cement manufacturing.

749 tons (1,009 CY) delivered to the USDA in Crisfield, MD for use in agricultural runoff control experiments.

9,235 tons (12,438 CY) delivered to Lehigh in Union Bridge, MD for use in cement manufacturing.

372 tons (502 CY) delivered to MERG in Baltimore, MD for use in cement manufacturing.

1,216 tons (1,638 CY) delivered to MERG in Nazareth, PA for use in cement manufacturing.

142 tons (191 CY) delivered to MERG in Martinsburg, VA for use in cement manufacturing.

63 tons (85 CY) delivered to Sports Aggregate in Centreville, VA for use in fertilizer mix.

Gypsum - Disposal

4,623 tons (6,309 CY) of gypsum was delivered to Fort Armistead Road – Lot 15 LLC landfill in Baltimore, MD for landfilling.

Gypsum – Storage

1,397 tons (1,881 CY) of gypsum was stored on site at the end of 2014.

FGD Sludge - Disposal

3,012 tons (4,057 CY) of FGD sludge was delivered to Fort Armistead Road – Lot 15 LLC landfill in Baltimore, MD for landfilling.

367 tons (494 CY) of FGD sludge stored on site at the end of 2013 was delivered to Fort Armistead Road – Lot 15 landfill in Baltimore, MD for landfilling (*note that these tons were accounted for in CY2013's Paragraph C and are not included in the FGD Sludge total in Paragraph C above*).

Waste Water Fines - Disposal

1,149 tons (1,547 CY) of waste water fines delivered to Fort Armistead Road – Lot 15 LLC landfill in Baltimore, MD for landfilling.

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

Fly Ash

121,787 tons (164,023 CY) of fly ash was used in concrete and cement manufacturing.

Bottom Ash

5,075 tons (6,835 CY) of bottom ash was used in cement manufacturing.

Gypsum

164,356 tons (221,354 CY) of gypsum was used in wallboard manufacturing.

749 tons (1,009 CY) was used for use for agriculture and agricultural runoff control experiments.

26,678 tons (35,931 CY) was used in concrete and cement manufacturing.

63 tons (85 CY) was used in the making of fertilizer.

If the space provided is insufficient, please attach additional pages in a similar format.

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 296,000 tons (396,640 CY) of fly ash will be generated each year for the next five years. Approximately 285,000 tons (382,000 CY) of fly ash will be beneficially used in cement and/or concrete products, and the remaining 11,000 tons (14,740 CY) will be disposed of in the Fort Armistead Road - Lot 15 LLC Landfill in Baltimore, MD.

Bottom Ash

Raven projects that approximately 18,000 tons (23,600 CY) of bottom ash will be generated each year for the next five years, of which 15,000 tons (19,700) CY of will be beneficially used in cement and/or concrete products and 3,000 tons

(3,900 CY) will be disposed of in the Fort Armistead Road - Lot 15 LLC landfill in Baltimore, MD.

Gypsum

Raven projects that as much as 150,000 tons (202,000 CY) of gypsum will be generated each year for the next five years, all of which will be beneficially used in drywall, cement, or concrete products, and for agricultural uses.

FGD Sludge

Raven projects that as much as 4,000 tons (5,400 CY) of FGD Sludge will be generated each year for the next five years, all of which will be disposed of in the Fort Armistead Road - Lot 15 LLC landfill in Baltimore, MD.

Waste Water Fines

Raven projects that as much as 750 tons (1,000 CY) of waste water fines will be generated each year for the next five years, all of which will be disposed of in the Fort Armistead Road - Lot 15 LLC landfill in Baltimore, MD.

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

Fly Ash

Approximately 285,000 tons (396,640 CY) of fly ash each year will be beneficially used in the manufacturing of cement or concrete.

Bottom Ash

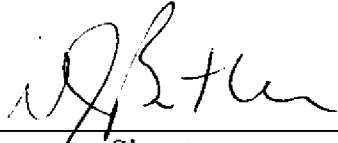
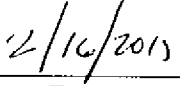
Approximately 15,000 tons (19,700 CY) of bottom ash each year will be beneficially used in the manufacturing of cement or concrete.

Gypsum

Approximately 150,000 tons (202,000 CY) of gypsum each year will be beneficially used in drywall, cement and concrete products, or agricultural uses.



**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:

<p><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.</b></p>		
 _____ Signature	William Butler Authorized Representative, 410-787-5489 _____ Name, Title, & Telephone No. (Print or Type)	 _____ Date
	wbutler@raven-power.com _____ Your Email Address	

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

1. Certificate of Analysis No. 14013011 - Brandon Shores Fly Ash from U1 PJFF
2. Certificate of Analysis No. 14052914 - Brandon Shores IWWT Sludge (U2 Wash)
3. Certificate of Analysis No. 14073013 - Brandon Shores IWWT Sludge

# **Analytical Report for**

**Raven Power Holdings, LLC - BS Power Plant**

**Certificate of Analysis No.: 14013011**

**Project Manager: David May**

**Project Name : Brandon Flyash UIPJFF**

**Project Location: Brandon Shores**



**February 6, 2014**

**Phase Separation Science, Inc.**

**6630 Baltimore National Pike**

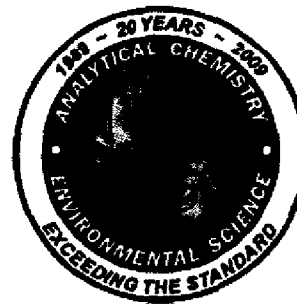
**Baltimore, MD 21228**

**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 6, 2014

**David May**  
**Raven Power Holdings, LLC - BS Power Plant**  
2030 Brandon Shores Road  
Baltimore, MD 21226

Reference: PSS Work Order(s) No: **14013011**  
Project Name: Brandon Flyash UIPJFF  
Project Location: Brandon Shores

Dear David May :

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(s) numbered **14013011**.

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 6, 2014. 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 of 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,

---

**Dan Prucnal**  
Laboratory Manager



## Sample Summary

Client Name: Raven Power Holdings, LLC - BS Power Plant

Project Name: Brandon Flyash UIPJFF

Work Order Number(s): 14013011

The following samples were received under chain of custody by Phase Separation Science (PSS) on 01/30/2014 at 01:55 pm

Lab Sample Id	Sample Id	Matrix	Date/Time Collected
14013011-001	Brandon Flyash	SOLID	01/30/14 10:00

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 a common laboratory contaminant such as methylene chloride may be considered a possible laboratory artifact. Where observed, appropriate consideration of data should be taken.
2. Unless otherwise noted in the case narrative, results are reported on a dry weight basis with the exception of 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].
4. The analyses of 1,2-dibromo-3-chloropropane (DBCP) and 1,2-dibromoethane (EDB) by EPA 524.2 and calcium, magnesium, sodium and iron by EPA 200.8 are not currently promulgated for use in testing to meet the Safe Drinking Water Act and as such cannot be used for compliance purposes. The listings of the current promulgated methods for testing in compliance with the Safe Drinking Water Act can be found in the 40 CFR part 141.1, for the primary drinking water contaminants, and part 141.3, for the secondary drinking water contaminants.
5. Sample prepared under EPA 3550C with concentrations greater than 20 mg/Kg should employ the microtip extraction procedure if required to meet data quality objectives.
6. The analysis of acrolein by EPA 624 must be analyzed within three days of sampling unless pH is adjusted to 4-5 units [40 CFR part 136.3(e)].

### 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.

### Certifications:

NELAP Certifications: PA 68-03330, VA 460156  
State Certifications: MD 179, WV 303  
Regulated Soil Permit: P330-12-00268  
NSWC USCG Accepted Laboratory  
LDBA MWWA LD1997-0041-2015

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: 14013011

Raven Power Holdings, LLC - BS Power Plant, Baltimore, MD  
 February 6, 2014

Project Name: Brandon Flyash UIPJFF  
 Project Location: Brandon Shores

Sample ID: Brandon Flyash

Date/Time Sampled: 01/30/2014 10:00

PSS Sample ID: 14013011-001

Matrix: SOLID

Date/Time Received: 01/30/2014 13:55

% Solids: 95

Inorganic Anions

Analytical Method: EPA 300.0

Preparation Method: E300.0P

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Sulfate	13,000	mg/kg	260		5	02/04/14	02/06/14 11:50	1044

Sample ID: Brandon Flyash

Date/Time Sampled: 01/30/2014 10:00

PSS Sample ID: 14013011-001

Matrix: SOLID

Date/Time Received: 01/30/2014 13:55

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	01/31/14	01/31/14 14:57	1033
Barium	ND	mg/L	1.0		1	100	01/31/14	01/31/14 14:57	1033
Cadmium	ND	mg/L	0.050		1	1	01/31/14	01/31/14 14:57	1033
Chromium	ND	mg/L	0.050		1	5	01/31/14	01/31/14 14:57	1033
Lead	ND	mg/L	0.050		1	5	01/31/14	01/31/14 14:57	1033
Mercury	ND	mg/L	0.0020		1	0.2	01/31/14	01/31/14 14:57	1033
Selenium	0.94	mg/L	0.050		1	1	01/31/14	01/31/14 14:57	1033
Silver	ND	mg/L	0.050		1	5	01/31/14	01/31/14 14:57	1033



## Case Narrative Summary

**Client Name: Raven Power Holdings, LLC - BS Power Plant**

**Project Name: Brandon Flyash UIPJFF**

Work Order Number(s): 14013011

---

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.

The analyses of chlorine, pH, dissolved oxygen, temperature and sulfite for drinking water and non-potable samples tested for compliance have a maximum holding time of 15 minutes. As such, all laboratory analyses for these analytes exceed holding times.

**Sample Receipt:**

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

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



**Analytical Data Package Information Summary**

**Work Order(s): 14013011**

Report Prepared For: Raven Power Holdings, LLC - BS Power Plant

Project Name: Brandon Flyash UIPJFF

Project Manager: David May

Method	Client Sample Id	Analysis Type	Lab Sample Id	Analyst	Mix	Prep Batch	Analytical Batch	Sampled	Prepared	Analyzed
<b>ASTM D2216 05</b>	Brandon Flyash	Initial	14013011-001	1050	S	111505	111505	01/30/2014	01/30/2014 17:50	01/30/2014 17:50
	Brandon Flyash	Reanalysis	14013011-001	1044	S	49083	111623	01/30/2014	02/04/2014 14:37	02/06/2014 11:50
<b>EPA 300.0</b>	Brandon Flyash	Initial	14013011-001	1033	W	49037	111525	01/30/2014	01/31/2014 08:35	01/31/2014 14:57
	49037-1-BKS	BKS	49037-1-BKS	1033	W	49037	111525	-----	01/31/2014 08:35	01/31/2014 13:35
	49037-1-BLK	BLK	49037-1-BLK	1033	W	49037	111525	-----	01/31/2014 08:35	01/31/2014 13:29
	FSK-20140123-01 S	MS	14012907-001 S	1033	W	49037	111525	01/23/2014	01/31/2014 08:35	01/31/2014 13:47
<b>SW-846 6020 A</b>	FSK-20140123-01 SD	MSD	14012907-001 SD	1033	W	49037	111525	01/23/2014	01/31/2014 08:35	01/31/2014 13:53

# Blank Summary 14013011

Raven Power Holdings, LLC - BS Power Plant, Baltimore, MD  
Brandon Flyash UIPJFF

Analytical Method: SW-846 6020 A  
Matrix: WATER

Prep Method: SW3010A

Sample Id: 49037-1-BLK

Lab Sample Id: 49037-1-BLK

Date Analyzed: Jan-31-14 13:29

Analyst: 1033

Date Prep: Jan-31-14 08:35

Tech: 1034

Seq Number: 111525

Parameter	Case Number	Result	RL	LOD	Units	Flag	Dil
Arsenic	7440-38-2	ND	0.05000	0.05000	mg/L	U	1
Barium	7440-39-3	ND	1.000	1.000	mg/L	U	1
Cadmium	7440-43-9	ND	0.05000	0.05000	mg/L	U	1
Chromium	7440-47-3	ND	0.05000	0.05000	mg/L	U	1
Lead	7439-92-1	ND	0.05000	0.05000	mg/L	U	1
Mercury	7439-97-6	ND	0.002000	0.002000	mg/L	U	1
Selenium	7782-49-2	ND	0.05000	0.05000	mg/L	U	1
Silver	7440-22-4	ND	0.05000	0.05000	mg/L	U	1



# Blank Spike Recovery

**Project Name: Brandon Flyash UIPJFF**

**Work Order #:** 14013011

**Project ID:** N/A

**Prep Batch #:** 49037

**Date Prepared:** 01/31/2014 08:35

**Sample ID:** 49037-1-BKS

**Matrix:** Water

**Lab Batch ID:** 111525

**Date Analyzed:** 01/31/2014 13:29

**Analyst:** 1033

**Reporting Units:** mg/L

## BLANK /BLANK SPIKE RECOVERY STUDY

TCLP Metals  Analytes	Blank Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Control Limits %R	Flags
Arsenic	<0.05000	0.4000	0.3906	98	80-120	
Barium	<1.000	2.000	2.265	113	80-120	
Cadmium	<0.05000	0.4000	0.3869	97	80-120	
Chromium	<0.05000	0.4000	0.3864	97	80-120	
Lead	<0.05000	0.4000	0.3981	100	80-120	
Mercury	<0.002000	0.0100	0.0103	103	80-120	
Selenium	<0.05000	0.4000	0.3518	88	80-120	
Silver	<0.05000	0.4000	0.3838	96	80-120	

Blank Spike Recovery [D] = 100\*(([C])/[B])

**Phase Separation Science, Inc.  
6630 Baltimore National Pike  
Baltimore, MD 21228**

H= Recovery of BS,BSD or both exceeded the laboratory control limits  
F = RPD exceeded the laboratory control limits  
L = Recovery of BS,BSD or both below the laboratory control limits



# SAMPLE CHAIN OF CUSTODY/AGREEMENT FORM

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

## PHASE SEPARATION SCIENCE, INC.

PSS		PAGE	OF
<b>1</b> CLIENT: raven power ft. smallwood llc. OFFICE LOC. brandon shores PROJECT MGR: david may    PHONE NO.: 4435646849 EMAIL: dlmay@raven-power.com    FAX NO.: 4107875577 PROJECT NAME: Brandon Fiyash    PROJECT NO.: SITE LOCATION: brandon shores    P.O. NO.: SAMPLERS: david may    DW CERT NO.:		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 Preservative Used	
CONTAINERS	NO.	SAMPLE TYPE G=COMP G=GRAB	REMARKS Click to enter Remarks
1		TOTAL SULFATE TCLP Metals	<input checked="" type="checkbox"/> 5-Day <input type="checkbox"/> 3-Day <input type="checkbox"/> 2-Day <input type="checkbox"/> Next Day <input type="checkbox"/> Emergency <input type="checkbox"/> Other Data Deliverables Required: <b>COA</b>
<b>2</b> SAMPLE IDENTIFICATION Brandon Fiyash		DATE 11/30/14	TIME 10A
MATRIX (See Codes) WS		<b>3</b> Relinquished By: (1) [Signature]    Received By: [Signature] Relinquished By: (2) [Signature]    Received By: [Signature] Relinquished By: (3) [Signature]    Received By: [Signature]	
<b>4</b> Relinquished By: (4)		DATE 11/30/14	TIME 1:55
Relinquished By: (4)		DATE 11/30/14	TIME 1:55

6630 Baltimore National Pike • Route 40 West • Baltimore, Maryland 21228 • (410) 747-8770 • (800) 932-9047 • Fax (410) 788-8723  
 The client (Client Name), by signing, or having client's agent sign, this "Sample Chain of Custody/Agreement Form", agrees to pay for the above requested services per the latest version of the Service Brochure or PSS-provided quotation including any and all attorney's or other reasonable fees if collection becomes necessary.



# Phase Separation Science, Inc

## Sample Receipt Checklist

<b>Work Order #</b>	14013011	<b>Received By</b>	Robyn Rhudy
<b>Client Name</b>	Raven Power Holdings, LLC - BS Po	<b>Date Received</b>	01/30/2014 01:55:00 PM
<b>Project Name</b>	Brandon Flyash UIPJFF	<b>Delivered By</b>	Trans Time Express
<b>Disposal Date</b>	03/06/2014	<b>Tracking No</b>	Not Applicable
<b>Shipping Container(s)</b>		<b>Logged In By</b>	Robyn Rhudy
No. of Coolers	1		
Custody Seal(s) Intact?	N/A	Ice	Absent
Seal(s) Signed / Dated?	N/A	Temp (deg C)	15
		Temp Blank Present	No

### Documentation

COC agrees with sample labels?	Yes	Sampler Name	<u>David May</u>
Chain of Custody	Yes	MD DW Cert. No.	<u>N/A</u>

### Sample Container

Appropriate for Specified Analysis?	Yes	Custody Seal(s) Intact?	Not Applicable
Intact?	Yes	Seal(s) Signed / Dated	Not Applicable
Labeled and Labels Legible?	Yes		

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:

*Robyn Rhudy*

Date: 01/30/2014

Robyn Rhudy

PM Review and Approval:

*Lynn Jackson*

Date: 01/30/2014

Lynn Jackson

**Analytical Report for**  
**Raven Power Holdings, LLC - BS Power Plant**  
**Certificate of Analysis No.: 14052914**

**Project Manager: Gary Lawn**  
**Project Name : U-2 Wash**  
**Project Location: 01 + 02 Lagoons**



**June 2, 2014**  
**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.



June 2, 2014

**Gary Lawn**  
**Raven Power Holdings, LLC - BS Power Plant**  
2030 Brandon Shores Road  
Baltimore, MD 21226

Reference: PSS Work Order(s) No: **14052914**  
Project Name: U-2 Wash  
Project Location: 01 + 02 Lagoons

Dear Gary Lawn :

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(s) numbered **14052914**.

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 July 3, 2014. 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 of 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,

---

**Dan Prucnal**

Laboratory Manager



## Sample Summary

Client Name: Raven Power Holdings, LLC - BS Power Plant

Project Name: U-2 Wash

Work Order Number(s): 14052914

The following samples were received under chain of custody by Phase Separation Science (PSS) on 05/29/2014 at 03:45 pm

Lab Sample Id	Sample Id	Matrix	Date/Time Collected
14052914-001	01 Lagoon	WASTE WATER	05/29/14 07:30
14052914-002	02 Lagoon	WASTE WATER	05/29/14 07:30

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 a common laboratory contaminant such as methylene chloride may be considered a possible laboratory artifact. Where observed, appropriate consideration of data should be taken.
2. Unless otherwise noted in the case narrative, results are reported on a dry weight basis with the exception of 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].
4. The analyses of 1,2-dibromo-3-chloropropane (DBCP) and 1,2-dibromoethane (EDB) by EPA 524.2 and calcium, magnesium, sodium and iron by EPA 200.8 are not currently promulgated for use in testing to meet the Safe Drinking Water Act and as such cannot be used for compliance purposes. The listings of the current promulgated methods for testing in compliance with the Safe Drinking Water Act can be found in the 40 CFR part 141.1, for the primary drinking water contaminants, and part 141.3, for the secondary drinking water contaminants.
5. Sample prepared under EPA 3550C with concentrations greater than 20 mg/Kg should employ the microtip extraction procedure if required to meet data quality objectives.
6. The analysis of acrolein by EPA 624 must be analyzed within three days of sampling unless pH is adjusted to 4-5 units [40 CFR part 136.3(e)].

### Standard Flags/Abbreviations:

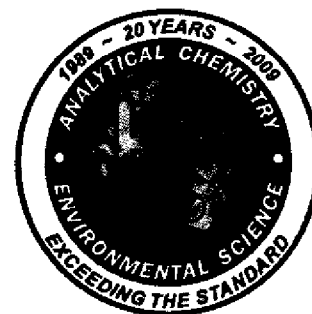
- B A target analyte or common laboratory contaminant was identified in the method blank. Its presence indicates possible field or laboratory contamination.
- C Results Pending Final Confirmation.
- E The data exceeds the upper calibration limit; therefore, the concentration is reported as estimated.
- 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.

### Certifications:

NELAP Certifications: PA 68-03330, VA 460156  
State Certifications: MD 179, WV 303  
Regulated Soil Permit: P330-12-00268  
NSWC USCG Accepted Laboratory  
LDBE MWAALD1997-0041-2015

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: 14052914

Raven Power Holdings, LLC - BS Power Plant, Baltimore, MD  
 June 2, 2014

Project Name: U-2 Wash  
 Project Location: 01 + 02 Lagoons

**Sample ID: 01 Lagoon**  
**Matrix: WASTE WATER**

**Date/Time Sampled: 05/29/2014 07:30** **PSS Sample ID: 14052914-001**

**Date/Time Received: 05/29/2014 15:45**

Metals

Analytical Method: EPA 200.8

Preparation Method: 200.8

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Copper	ND	ug/L	1.0		1	05/30/14	05/30/14 13:33	1034
Iron	ND	ug/L	100		1	05/30/14	05/30/14 13:33	1034

**Sample ID: 02 Lagoon**  
**Matrix: WASTE WATER**

**Date/Time Sampled: 05/29/2014 07:30** **PSS Sample ID: 14052914-002**

**Date/Time Received: 05/29/2014 15:45**

Metals

Analytical Method: EPA 200.8

Preparation Method: 200.8

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Copper	ND	ug/L	1.0		1	05/30/14	05/30/14 14:35	1034
Iron	ND	ug/L	100		1	05/30/14	05/30/14 14:35	1034



## Case Narrative Summary

Client Name: Raven Power Holdings, LLC - BS Power Plant

Project Name: U-2 Wash

Work Order Number(s): 14052914

---

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.

The analyses of chlorine, pH, dissolved oxygen, temperature and sulfite for drinking water and non-potable samples tested for compliance have a maximum holding time of 15 minutes. As such, all laboratory analyses for these analytes exceed holding times.

### 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.**





# Analytical Data Package Information Summary

Work Order(s): 14052914

Report Prepared For: Raven Power Holdings, LLC - BS Power Plant

Project Name: U-2 Wash

Project Manager: Gary Lawn

Method	Client Sample Id	Analysis Type	Lab Sample Id	Analyst	Mix	Prep Batch	Analytical Batch	Sampled	Prepared	Analyzed
EPA 200.8	01 Lagoon	Initial	14052914-001	1034	W	50594	114242	05/29/2014	05/30/2014 09:07	05/30/2014 13:33
	02 Lagoon	Initial	14052914-002	1034	W	50594	114242	05/29/2014	05/30/2014 09:07	05/30/2014 14:35
	50594-1-BKS	BKS	50594-1-BKS	1034	W	50594	114242	-----	05/30/2014 09:07	05/30/2014 13:27
	50594-1-BLK	BLK	50594-1-BLK	1034	W	50594	114242	-----	05/30/2014 09:07	05/30/2014 13:21
	01 Lagoon S	MS	14052914-001 S	1034	W	50594	114242	05/29/2014	05/30/2014 09:07	05/30/2014 13:40
	01 Lagoon SD	MSD	14052914-001 SD	1034	W	50594	114242	05/29/2014	05/30/2014 09:07	05/30/2014 13:46

# Blank Summary 14052914

Raven Power Holdings, LLC - BS Power Plant, Baltimore, MD

U-2 Wash

<b>Analytical Method:</b> EPA 200.8	Prep Method: E200.8_PREP
Matrix: WATER	

Sample Id: 50594-1-BLK	Lab Sample Id: 50594-1-BLK						
Date Analyzed: May-30-14 13:21	Analyst: 1034	Date Prep: May-30-14 09:07	Tech: 1034				
	Seq Number: 114242						
Parameter	Cas Number	Result	RL	LOD	Units	Flag	Dil
Copper	7440-50-8	ND	1.000	0.5000	ug/L	U	1
Iron	7439-89-6	ND	100	50.00	ug/L	U	1

# Blank Spike Recovery

**Project Name: U-2 Wash**

**Work Order #:** 14052914

**Project ID:** N/A

**Prep Batch #:** 50594

**Date Prepared:** 05/30/2014 09:07

**Sample ID:** 50594-1-BKS

**Matrix:** Water

**Lab Batch ID:** 114242

**Date Analyzed:** 05/30/2014 13:21

**Analyst:** 1034

**Reporting Units:** ug/L

**BLANK /BLANK SPIKE RECOVERY STUDY**

Metals  Analytes	Blank Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Control Limits %R	Flags
Copper	<1.000	40.00	39.86	100	85-115	
Iron	<100	400	412.1	103	85-115	

Blank Spike Recovery [D] = 100\*(([C])/[B])

**Phase Separation Science, Inc.**  
**6630 Baltimore National Pike**  
**Baltimore, MD 21228**

H= Recovery of BS,BSD or both exceeded the laboratory control limits  
 F = RPD exceeded the laboratory control limits  
 L = Recovery of BS,BSD or both below the laboratory control limits



# SAMPLE CHAIN OF CUSTODY/AGREEMENT FORM

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

## PHASE SEPARATION SCIENCE, INC.

1 \* CLIENT: *RAVEN POWER LLC* \* OFFICE LOC: *BANDON SHOPS* PAGE 1 OF 1  
Work Order #: *14052914*

Matrix Codes: SW=Surface Wtr, GW=Ground Wtr, WW=Waste Wtr, O=Oil, S=Soil, L=Liquid, SOL=Solid, A=Air, WI=Wipe  
\* PROJECT MGR: *GARY LARUN* \* PHONE NO.: *(410) 287-6605*  
EMAIL: *G.LARUN@RAVEN-POWER.COM*  
\* PROJECT NAME: *U-2 WAST* PROJECT NO.:  
SITE LOCATION: *01 + 02 LA GOON* P.O. NO.:  
SAMPLER(S): *GARY LARUN* DW CERT NO.:

LAB NO.	* SAMPLE IDENTIFICATION	* DATE (SAMPLED)	* TIME (SAMPLED)	MATRIX (See Codes)	SAMPLE TYPE	Preservatives Used	Analytical Method Required	REMARKS
	<i>01 LA GOON</i>	<i>5/29/14</i>	<i>0730</i>	<i>WW</i>	<i>G</i>	<i>NON</i>	<i>3</i>	<i>TOTAL METALS</i>
	<i>02 LA GOON</i>	<i>5/29/14</i>	<i>0730</i>	<i>WW</i>	<i>G</i>	<i>NON</i>	<i>3</i>	<i>ETA 200, B</i>
								<i>NON-SPECIES</i>

2 \*Requested TAT (One TAT per COC)  
 5-Day  3-Day  2-Day  
 Next Day  Emergency  Other

3 Data Deliverables Required:  
COA  QC SUMM  CLP LIKE  OTHER

4 Special Instructions:  
*C.C. DAVID MAY WITH THE RESULTS/REPORT.*

5 Relinquished By: (1) *Gary Larun* Date: *5/29/14* Time: *0845* Received By: *D. Deome*  
Relinquished By: (2) *D. Deome* Date: *11* Time: *1545* Received By: *[Signature]*  
Relinquished By: (3) Date: Time Received By:  
Relinquished By: (4) Date: Time Received By:

6 # of Coolers: *1*  
Custody Seal: *ABS*  
Ice Present: *prog* Temp: *4°C*  
Shipping Carrier: *FTE*

7 STATE RESULTS REPORTED TO:  
MD  DE  PA  VA  WV  OTHER

8 DW COMPLIANCE? YES  EDD FORMAT TYPE

6630 Baltimore National Pike • Route 40 West • Baltimore, Maryland 21228 • (410) 747-8770 • (800) 932-9047 • Fax (410) 788-8723  
The client (Client Name), by signing, or having client's agent sign, this "Sample Chain of Custody/Agreement Form", agrees to pay for the above requested services per the latest version of the Service Brochure or PSS-provided quotation including any and all attorney's or other reasonable fees if collection becomes necessary. \* = REQUIRED



# Phase Separation Science, Inc

## Sample Receipt Checklist

<b>Work Order #</b>	14052914	<b>Received By</b>	Evan Richardson
<b>Client Name</b>	Raven Power Holdings, LLC - BS Po	<b>Date Received</b>	05/29/2014 03:45:00 PM
<b>Project Name</b>	U-2 Wash	<b>Delivered By</b>	Trans Time Express
<b>Disposal Date</b>	07/03/2014	<b>Tracking No</b>	Not Applicable
		<b>Logged In By</b>	Jacob Prucnal

### Shipping Container(s)

No. of Coolers 1

Custody Seal(s) Intact? N/A

Seal(s) Signed / Dated? N/A

Ice Present

Temp (deg C) 4

Temp Blank Present No

### Documentation

COC agrees with sample labels? Yes

Chain of Custody Yes

Sampler Name Gary Lawn

MD DW Cert. No. N/A

### 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 2

Total No. of Containers Received 2

### Preservation

Metals (pH<2) Yes

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

624 VOC (Rcvd at least one unpreserved VOA vial) 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:

Jacob Prucnal

Date: 05/29/2014

PM Review and Approval:

Simon Crisp

Date: 05/30/2014

**Analytical Report for**  
**Raven Power Holdings, LLC - BS Power Plant**  
**Certificate of Analysis No.: 14073013**

**Project Manager: Gary Lawn**  
**Project Name : Sludge**  
**Project Location: Brandon Shores**



**August 1, 2014**  
**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.



August 1, 2014

Gary Lawn  
Raven Power Holdings, LLC - BS Power Plant  
2030 Brandon Shores Road  
Baltimore, MD 21226

Reference: PSS Work Order(s) No: **14073013**  
Project Name: Sludge  
Project Location: Brandon Shores

Dear Gary Lawn :

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(s) numbered **14073013**.

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 September 3, 2014. 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 of 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,

A handwritten signature in black ink, appearing to read 'Cathy Thompson'.

---

**Cathy Thompson**  
QA Officer



**Sample Summary**  
**Client Name: Raven Power Holdings, LLC - BS Power Plant**  
**Project Name: Sludge**

**Work Order Number(s): 14073013**

The following samples were received under chain of custody by Phase Separation Science (PSS) on 07/30/2014 at 11:34 am

Lab Sample Id	Sample Id	Matrix	Date/Time Collected
14073013-001	01 Lagoon	SOLID WASTE	07/29/14 08:45
14073013-002	03 Lagoon	SOLID WASTE	07/29/14 09:15

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 a common laboratory contaminant such as methylene chloride may be considered a possible laboratory artifact. Where observed, appropriate consideration of data should be taken.
2. Unless otherwise noted in the case narrative, results are reported on a dry weight basis with the exception of 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].
4. The analyses of 1,2-dibromo-3-chloropropane (DBCP) and 1,2-dibromoethane (EDB) by EPA 524.2 and calcium, magnesium, sodium and iron by EPA 200.8 are not currently promulgated for use in testing to meet the Safe Drinking Water Act and as such cannot be used for compliance purposes. The listings of the current promulgated methods for testing in compliance with the Safe Drinking Water Act can be found in the 40 CFR part 141.1, for the primary drinking water contaminants, and part 141.3, for the secondary drinking water contaminants.
5. Sample prepared under EPA 3550C with concentrations greater than 20 mg/Kg should employ the microtip extraction procedure if required to meet data quality objectives.
6. The analysis of acrolein by EPA 624 must be analyzed within three days of sampling unless pH is adjusted to 4-5 units [40 CFR part 136.3(e)].

**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.

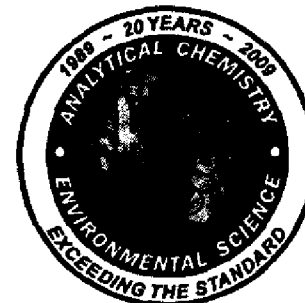
**Certifications:**

NELAP Certifications: PA 68-03330, VA 460156  
State Certifications: MD 179, WV 303  
Regulated Soil Permit: P330-12-00268  
NSWC USCG Accepted Laboratory  
LDBE MWAA LD1997-0041-2015



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: 14073013  
 Raven Power Holdings, LLC - BS Power Plant, Baltimore, MD  
 August 1, 2014

Project Name: Sludge  
 Project Location: Brandon Shores

**Sample ID: 01 Lagoon**

**Matrix: SOLID WASTE**

Paint Filter Liquids Test

**Date/Time Sampled: 07/29/2014 08:45** **PSS Sample ID: 14073013-001**

**Date/Time Received: 07/30/2014 11:34**

Analytical Method: SW-846 9095

Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Pass				1	07/31/14	07/31/14 08:30	1022

Paint Filter

**Sample ID: 03 Lagoon**

**Matrix: SOLID WASTE**

Paint Filter Liquids Test

**Date/Time Sampled: 07/29/2014 09:15** **PSS Sample ID: 14073013-002**

**Date/Time Received: 07/30/2014 11:34**

Analytical Method: SW-846 9095

Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Pass				1	07/31/14	07/31/14 08:50	1022

Paint Filter



## Case Narrative Summary

**Client Name: Raven Power Holdings, LLC - BS Power Plant**

**Project Name: Sludge**

Work Order Number(s): 14073013

---

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.

The analyses of chlorine, pH, dissolved oxygen, temperature and sulfite for drinking water and non-potable samples tested for compliance have a maximum holding time of 15 minutes. As such, all laboratory analyses for these analytes exceed holding times.

**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.**



**Analytical Data Package Information Summary**

**Work Order(s): 14073013**

Report Prepared For: Raven Power Holdings, LLC - BS Power Plant

Project Name: Sludge

Project Manager: Gary Lawn

Method	Client Sample Id	Analysis Type	Lab Sample Id	Analyst	Mix	Prep Batch	Analytical Batch	Sampled	Prepared	Analyzed
ASTM D2216 05	01 Lagoon	Initial	14073013-001	1045	S	115616	115616	07/29/2014	07/30/2014 12:31	07/30/2014 12:31
	03 Lagoon	Initial	14073013-002	1045	S	115616	115616	07/29/2014	07/30/2014 12:31	07/30/2014 12:31
SW-846 9095	01 Lagoon	Initial	14073013-001	1022	S	115630	115630	07/29/2014	07/31/2014 08:30	07/31/2014 08:30
	03 Lagoon	Initial	14073013-002	1022	S	115630	115630	07/29/2014	07/31/2014 08:50	07/31/2014 08:50
	01 Lagoon D	MD	14073013-001 D	1022	S	115630	115630	07/29/2014	07/31/2014 08:40	07/31/2014 08:40

# PHASE SEPARATION SCIENCE, INC.

## QC Summary 14073013

Raven Power Holdings, LLC - BS Power Plant  
Sludge

**Analytical Method: SW-846 9095**

Seq Number: 115630

Matrix: Solid Waste

Parent Sample Id: 14073013-001

MD Sample Id: 14073013-001 D

Parameter	Parent Result	MD Result	%RPD	RPD Limit	Units	Analysis Date	Flag
Paint Filter	Pass	Pass	0	0		07/31/14 08:40	

F = RPD exceeded the laboratory control limits

X = Recovery of MS, MSD or both outside of QC Criteria

H = Recovery of BS, BSD or both exceeded the laboratory control limits

L = Recovery of BS, BSD or both below the laboratory control limits





# Phase Separation Science, Inc

## Sample Receipt Checklist

<b>Work Order #</b>	14073013	<b>Received By</b>	Jacob Prucnal
<b>Client Name</b>	Raven Power Holdings, LLC - BS Po	<b>Date Received</b>	07/30/2014 11:34:00 AM
<b>Project Name</b>	Sludge	<b>Delivered By</b>	Trans Time Express
<b>Disposal Date</b>	09/03/2014	<b>Tracking No</b>	Not Applicable
		<b>Logged In By</b>	Jacob Prucnal

### Shipping Container(s)

No. of Coolers 1

Custody Seal(s) Intact?

N/A

Ice

Present

Seal(s) Signed / Dated?

N/A

Temp (deg C)

1

Temp Blank Present No

### Documentation

COC agrees with sample labels?

Yes

Sampler Name

Gary Lawn

Chain of Custody

Yes

MD DW Cert. No.

N/A

### Sample Container

Appropriate for Specified Analysis?

Yes

Custody Seal(s) Intact?

Not Applicable

Intact?

Yes

Seal(s) Signed / Dated

Not Applicable

Labeled and Labels Legible?

Yes

Total No. of Samples Received 2

Total No. of Containers Received 2

### 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

624 VOC (Rcvd at least one unpreserved VOA vial)

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:

*Jacob Prucnal*

Date: 07/30/2014

Jacob Prucnal

PM Review and Approval:

*Lynn Jackson*

Date: 07/31/2014

Lynn Jackson