



# AES Warrior Run

*we are the energy*

11600 Mexico Farms Road, SE • Cumberland, MD 21502 • (301) 777-0055 • FAX (301) 777-8772

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February 11, 2019

Re: CCB Report

Ms. Martha Hynson, Chief  
Solid Waste Operations Division  
Maryland Department of the Environment  
1800 Washington Blvd.  
Baltimore, MD 21230-1719

**RECEIVED**

**FEB 12 2019**

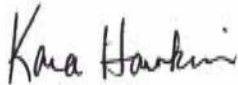
**LAND MANAGEMENT ADMIN.  
SOLID WASTE PROGRAM**

Ms. Hynson,

Please find the enclosed CCB report for AES Warrior Run, LLC. We have completed the report as required and included applicable attachments.

If there are any questions about this report, please do not hesitate to contact us.

Regards,



Kara Hawkins  
Environmental Specialist  
AES Warrior Run

**MARYLAND DEPARTMENT OF THE ENVIRONMENT**

Land and Materials 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)

**RECEIVED**

**FEB 11 2019**

**Coal Combustion Byproducts (CCBs)  
Annual Generator Tonnage Report  
Instructions for Calendar Year 2018**

**LAND MANAGEMENT ADMIN.  
SOLID WASTE PROGRAM**

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 2018. 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 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: AES Warrior Run

## CCB Tonnage Report – 2018

**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, 2019:

A. Contact information:

Facility Name: AES Warrior Run

Name of Permit Holder: AES Warrior Run, LLC

Facility Address: 11600 Mexico Farms Rd. SE  
Street

Facility Address: Cumberland MD 21502  
City State Zip

County: Allegany

Contact Information (Person filing report or Environmental Manager)

Facility Telephone No.: 301-777-0055 Facility Fax No.: 301-777-8772

Contact Name: Kara Hawkins

Contact Title: Environmental Specialist

Contact Address: 11600 Mexico Farms Rd. SE  
Street

Contact Address: Cumberland MD 21502  
City State Zip

Contact Email: kara.hawkins@aes.com

Contact Telephone No.: 301-777-0055 ext. 1105 Contact Fax No.: 301-777-8772

*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:

AES Warrior Run (AES) is an electric co-generation facility located at 11600 Mexico Farms Road, S.E in Cumberland in Allegany County in Maryland. The Facility operates a 180-megawatt coal-fired steam electric cogeneration plant and a 150-ton per day food grade carbon dioxide production plant. The facility consists of an ABB CE coal-fired atmospheric fluidized bed combustion boiler (AFBC) burning bituminous coal and Number 2 fuel oil as a start-up fuel.

Selective non-catalytic reduction (SNCR) system provides supplemental control of nitrogen oxides (NOx) to the AFBC boiler design. Sulfur dioxide (SO2) emissions are controlled by the introduction of limestone into the fluidized bed of the boiler. A bag house controls particulate emissions in the boiler flue gas.

Bed ash is removed at the bottom of the boiler and is loaded into a silo for eventual removal. Fly ash is removed at the bottom of the baghouse, air heater, and boiler backpass sections and is kept segregated from the bed ash in a separate silo. Both flyash and bed ash are mixed with small amounts of service water (to control dusting) and loaded into trucks for disposal off-site.

AES commenced commercial operation on February 10, 2000, and produces electricity for distribution by the Potomac Electric Power Company. The applicable SIC Code for the facility is 4911 - Electric Services

C. The volume and weight of CCBs generated during calendar year 2018, 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 2018:** Please note that this table includes both the volume and weight of the types of CCBs your facility produces.

<b>Volume and Weight of CCBs Generated for Calendar Year 2018</b>			
<u>Fly Ash</u> Type of CCB	<u>Bed Ash</u> Type of CCB	<u>Slag Ash</u> Type of CCB	<u>Type of CCB</u>
386,119.39	145,708.01	8,286.35	
Volume of CCB, in Cubic Yards	Volume of CCB, in Cubic Yards	Volume of CCB, in Cubic Yards	Volume of CCB, in Cubic Yards
218,224.49	94,360.02	4,962.58	
Weight of CCB, in Tons	Weight of CCB, in Tons	Weight of CCB, in Tons	Weight of CCB, in Tons

Additional notes:

Slag ash consists of fly ash and bed ash as a mixture. We use the term slag ash to differentiate from the discreet fly ash and bed ash in our system.

Volumes were determined with the calculated densities of: Fly Ash = 0.57 tons/cu yd, Bed Ash = 0.65 tons/cu yd, Slag Ash = 0.60 tons/cu yd

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.

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

F. A description of how you disposed of or used your CCBs in calendar year 2018, 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:

2018	Fly Ash Tons	Fly Ash CuYds	Bed Ash Tons	Bed Ash CuYds	Slag Ash Tons	Slag Ash CuYds	Use
Cabin Run Mine	148,950.78	263,548.72	77,925.14	120,329.74	3,604.61	6,018.86	Mine Reclamation
ARJ Coal Mine	39,926.20	70,644.13	1,351.47	2,086.90	-	-	Mine Reclamation
Walker Brothers Coal Mine		-	4,109.19	6,345.29	950.44	1,587.01	Mine Reclamation
Carlos Coal Mine	12,543.51	22,194.08	5,281.61	8,155.71	407.53	680.48	Mine Reclamation
Hampshire Hill Coal Mine	9,484.00	16,780.68	3,771.85	5,824.38		-	Mine Reclamation
419 Coal Mine	4,935.60	8,732.89	1,876.76	2,898.04		-	Mine Reclamation
MDE Elk Lick Project		-	44.00	67.94		-	AMD Restoration
FSU Grouting Project	2,384.40	4,218.88		-		-	Under Building Stabilization
<b>Total</b>	<b>218,224.49</b>	<b>386,119.39</b>	<b>94,360.02</b>	<b>145,708.01</b>	<b>4,962.58</b>	<b>8,286.35</b>	

Facility Name: AES Warrior Run

**CCB Tonnage Report – 2018**

and (b) The different uses by type and volume of CCBs:  
See chart above.

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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:

No change, same as previous years.

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

No change, same as previous years.

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

Facility Name: AES Warrior Run

**CCB Tonnage Report – 2018**

**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.		
 <hr/> Signature	<u>Peter Bajc</u> <u>Plant Manager</u> <u>301-777-0055</u> <hr/>	<u>02/7/19</u> Date
	Name, Title, & Telephone No. (Print or Type)  <u>peter.bajc@aes.com</u> Your Email Address	

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

- TCLP-Total Metals analysis fly & bed ash \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_
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# GEOCHEMICAL TESTING

Environmental and Energy Services

2425 N. Centre Ave.  
Cumberland, MD 21501

814-445-6666

FAX: 814-445-6726

Wednesday, March 28, 2018

Mel Sines  
AES - WARRIOR RUN INC  
11600 MEXICO FARMS SE  
CUMBERLAND, MD 21502

Order No.: G1803D00

Dear Mel Sines:

Geochemical Testing received 3 sample(s) on 3/23/2018 for the analyses presented in the following report.

There were no problems with the analyses and all QC data met NELAC, EPA, and laboratory specifications except where noted in the Case Narrative or Laboratory Results.

If you have any questions regarding these tests results, please feel free to call.

Sincerely,

Timothy W. Bergstresser  
Director of Technical Services

nelac

**Geochemical Testing**

Date: 28-Mar-18

CLIENT: AES - WARRIOR RUN INC

Project:

Lab Order: G1803D00

**CASE NARRATIVE**

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No problems were encountered during analysis of this workorder, except if noted in this report.

**Legend:**

ND - Not Detected

J - Indicates an estimated value

U - The analyte was not detected at or above the listed concentration, which is below the laboratory quantitation limit.

B - Analyte detected in the associated Method Blank

Q - Qualifier    QL - Quantitation Limit    DF - Dilution Factor

S - Spike Recovery outside accepted recovery limits

R - RPD outside accepted recovery limits

E - Value above quantitation range

\*\* - Value exceeds Action Limit

H - Method Hold Time Exceeded

MCL - Contaminant Limit



# Laboratory Results

## Geochemical Testing

Date: 28-Mar-18

**CLIENT:** AES - WARRIOR RUN INC  
**Lab Order:** G1803D00  
**Project:**  
**Lab ID:** G1803D00-001  
**Matrix:** ASH

**Client Sample ID:** Fly Ash

C88706

**Sampled By:** AES Warrior Run  
**Collection Date:** 3/16/2018  
**Received Date:** 3/23/2018 12:25:41 PM

Analyses	Result	QL	Q	Units	DF	Date Prepared	Date Analyzed
<b>MERCURY</b>							
		Analyst: RLL					ASTM D 6722
Mercury	1.18	0.010		mg/Kg-dry	1		03/26/18 1:13 PM
<b>TOTAL METALS</b>							
		Analyst: LNG				EPA 3050	EPA 6010
Aluminum	35100	10		mg/Kg-dry	1	03/26/18 9:00 AM	03/27/18 1:35 PM
Antimony	< 2.0	2.0		mg/Kg-dry	1	03/26/18 9:00 AM	03/28/18 6:34 PM
Arsenic	81.3	2.0		mg/Kg-dry	1	03/26/18 9:00 AM	03/28/18 6:34 PM
Barium	422	1.0		mg/Kg-dry	1	03/26/18 9:00 AM	03/26/18 6:34 PM
Beryllium	3.03	0.10		mg/Kg-dry	1	03/26/18 9:00 AM	03/26/18 6:34 PM
Boron	30.0	5.0		mg/Kg-dry	1	03/26/18 9:00 AM	03/27/18 1:35 PM
Cadmium	< 0.2	0.2		mg/Kg-dry	1	03/26/18 9:00 AM	03/26/18 6:34 PM
Chromium	40.5	1.0		mg/Kg-dry	1	03/26/18 9:00 AM	03/26/18 6:34 PM
Cobalt	12.9	0.5		mg/Kg-dry	1	03/26/18 9:00 AM	03/26/18 6:34 PM
Copper	33.2	1.0		mg/Kg-dry	1	03/26/18 9:00 AM	03/26/18 6:34 PM
Lead	22.2	2.0		mg/Kg-dry	1	03/26/18 9:00 AM	03/26/18 6:34 PM
Lithium	77.0	1.0		mg/Kg-dry	1	03/26/18 9:00 AM	03/26/18 6:34 PM
Manganese	76.8	1.0		mg/Kg-dry	1	03/26/18 9:00 AM	03/26/18 6:34 PM
Molybdenum	6.6	2.0		mg/Kg-dry	1	03/26/18 9:00 AM	03/26/18 6:34 PM
Nickel	31.9	1.0		mg/Kg-dry	1	03/26/18 9:00 AM	03/26/18 6:34 PM
Selenium	11.6	2.0		mg/Kg-dry	1	03/26/18 9:00 AM	03/26/18 6:34 PM
Silver	< 0.5	0.5		mg/Kg-dry	1	03/26/18 9:00 AM	03/26/18 6:34 PM
Vanadium	71.9	0.5		mg/Kg-dry	1	03/26/18 9:00 AM	03/27/18 1:35 PM
Zinc	56.8	1.0		mg/Kg-dry	1	03/26/18 9:00 AM	03/26/18 6:34 PM
<b>TCLP METALS</b>							
		Analyst: LNG				SM 3112 B	EPA 7470
Mercury	< 0.0002	0.0002		mg/L	1	03/27/18 10:35 AM	03/27/18 12:54 PM
<b>CARBONATE RESULTS</b>							
		Analyst: LNG					CALCULATED
Calcium Carbonate	28.2			%	1		03/26/18 12:00 AM
Calcium Carbonate Equivalent	30.6			%	1		03/26/18 12:00 AM
Magnesium Carbonate	3.7			%	1		03/26/18 12:00 AM
<b>MAJOR / MINOR ELEMENTS IN ASH</b>							
		Analyst: LNG				ASTM D 6349	EPA 6010
Calcium Oxide	14.06	0.02		% Dry	2	03/24/18 1:40 AM	03/26/18 11:31 AM
Magnesium Oxide	1.76	0.02		% Dry	2	03/24/18 1:40 AM	03/26/18 11:31 AM
<b>TCLP METALS</b>							
		Analyst: LNG				EPA 200.2	EPA 6010
Aluminum	< 0.1	0.1		mg/L	1	03/26/18 9:00 AM	03/26/18 5:23 PM
Antimony	< 0.02	0.02		mg/L	1	03/26/18 9:00 AM	03/26/18 5:23 PM
Arsenic	< 0.02	0.02		mg/L	1	03/26/18 9:00 AM	03/26/18 5:23 PM
Barium	1.4	0.3		mg/L	1	03/26/18 9:00 AM	03/26/18 5:23 PM
Beryllium	< 0.001	0.001		mg/L	1	03/26/18 9:00 AM	03/26/18 6:23 PM



## Laboratory Results

### Geochemical Testing

Date: 28-Mar-18

**CLIENT:** AES - WARRIOR RUN INC  
**Lab Order:** G1803D00  
**Project:**  
**Lab ID:** G1803D00-001  
**Matrix:** ASH

**Client Sample ID:** Fly Ash

C88706

**Sampled By:** AES Warrior Run  
**Collection Date:** 3/16/2018  
**Received Date:** 3/23/2018 12:25:41 PM

Analyses	Result	QL	Q	Units	DF	Date Prepared	Date Analyzed
<b>TCLP METALS</b>							
		Analyst: LNG				EPA 200.2	EPA 6010
Boron	0.16	0.05		mg/L	1	03/26/18 9:00 AM	03/27/18 1:23 PM
Cadmium	< 0.002	0.002		mg/L	1	03/26/18 9:00 AM	03/26/18 5:23 PM
Chromium	0.16	0.01		mg/L	1	03/26/18 9:00 AM	03/26/18 5:23 PM
Cobalt	< 0.005	0.005		mg/L	1	03/26/18 9:00 AM	03/26/18 5:23 PM
Copper	< 0.01	0.01		mg/L	1	03/26/18 9:00 AM	03/26/18 5:23 PM
Lead	< 0.02	0.02		mg/L	1	03/26/18 9:00 AM	03/26/18 5:23 PM
Lithium	0.17	0.01		mg/L	1	03/26/18 9:00 AM	03/26/18 5:23 PM
Manganese	< 0.01	0.01		mg/L	1	03/26/18 9:00 AM	03/26/18 5:23 PM
Molybdenum	0.20	0.02		mg/L	1	03/26/18 9:00 AM	03/26/18 5:23 PM
Nickel	< 0.01	0.01		mg/L	1	03/26/18 9:00 AM	03/26/18 5:23 PM
Selenium	0.03	0.02		mg/L	1	03/26/18 9:00 AM	03/26/18 5:23 PM
Silver	< 0.005	0.005		mg/L	1	03/26/18 9:00 AM	03/26/18 5:23 PM
Vanadium	0.022	0.005		mg/L	1	03/26/18 9:00 AM	03/26/18 5:23 PM
Zinc	< 0.01	0.01		mg/L	1	03/26/18 9:00 AM	03/26/18 5:23 PM
<b>TCLP EXTRACTION</b>							
		Analyst: ALD					EPA 1311
Extraction Fluid Used	2.0				1		03/25/18 10:00 AM
Final pH	12.0	1.0			1		03/25/18 10:00 AM
Initial pH	12.7	1.0			1		03/25/18 10:00 AM
pH with HCl	12.2				1		03/25/18 10:00 AM
TCLP, non-volatile	NA				1		03/25/18 10:00 AM



# Laboratory Results

## Geochemical Testing

Date: 28-Mar-18

**CLIENT:** AES - WARRIOR RUN INC  
**Lab Order:** G1803D00  
**Project:**  
**Lab ID:** G1803D00-002  
**Matrix:** ASH

**Client Sample ID:** Bed Ash North  
  
**Sampled By:** AES Warrior Run  
**Collection Date:** 3/16/2018  
**Received Date:** 3/23/2018 12:25:41 PM

C88707

Analyses	Result	QL	Q	Units	DF	Date Prepared	Date Analyzed
<b>MERCURY</b>							
		Analyst: RLL					ASTM D 6722
Mercury	0.019	0.010		mg/Kg-dry	1		03/26/18 1:13 PM
<b>TOTAL METALS</b>							
		Analyst: LNG				EPA 3050	EPA 6010
Aluminum	27900	10		mg/Kg-dry	1	03/26/18 9:00 AM	03/27/18 1:39 PM
Antimony	< 2.0	2.0		mg/Kg-dry	1	03/26/18 9:00 AM	03/26/18 6:38 PM
Arsenic	66.6	2.0		mg/Kg-dry	1	03/26/18 9:00 AM	03/26/18 6:38 PM
Barium	243	1.0		mg/Kg-dry	1	03/26/18 9:00 AM	03/26/18 6:38 PM
Beryllium	2.20	0.10		mg/Kg-dry	1	03/26/18 9:00 AM	03/26/18 6:38 PM
Boron	31.6	5.0		mg/Kg-dry	1	03/26/18 9:00 AM	03/27/18 1:39 PM
Cadmium	< 0.2	0.2		mg/Kg-dry	1	03/26/18 9:00 AM	03/26/18 6:38 PM
Chromium	36.6	1.0		mg/Kg-dry	1	03/26/18 9:00 AM	03/26/18 6:38 PM
Cobalt	9.4	0.5		mg/Kg-dry	1	03/26/18 9:00 AM	03/26/18 6:38 PM
Copper	21.0	1.0		mg/Kg-dry	1	03/26/18 9:00 AM	03/26/18 6:38 PM
Lead	7.3	2.0		mg/Kg-dry	1	03/26/18 9:00 AM	03/26/18 6:38 PM
Lithium	45.6	1.0		mg/Kg-dry	1	03/26/18 9:00 AM	03/26/18 6:38 PM
Manganese	94.3	1.0		mg/Kg-dry	1	03/26/18 9:00 AM	03/26/18 6:38 PM
Molybdenum	4.7	2.0		mg/Kg-dry	1	03/26/18 9:00 AM	03/26/18 6:38 PM
Nickel	23.1	1.0		mg/Kg-dry	1	03/26/18 9:00 AM	03/26/18 6:38 PM
Selenium	< 2.0	2.0		mg/Kg-dry	1	03/26/18 9:00 AM	03/26/18 6:38 PM
Silver	< 0.6	0.6		mg/Kg-dry	1	03/26/18 9:00 AM	03/26/18 6:38 PM
Vanadium	64.9	0.5		mg/Kg-dry	1	03/26/18 9:00 AM	03/27/18 1:39 PM
Zinc	40.0	1.0		mg/Kg-dry	1	03/26/18 9:00 AM	03/26/18 6:38 PM
<b>TCLP METALS</b>							
		Analyst: LNG				SM 3112 B	EPA 7470
Mercury	< 0.0002	0.0002		mg/L	1	03/27/18 10:55 AM	03/27/18 12:56 PM
<b>CARBONATE RESULTS</b>							
		Analyst: LNG					CALCULATED
Calcium Carbonate	44.7			%	1		03/26/18 12:00 AM
Calcium Carbonate Equivalent	51.3			%	1		03/26/18 12:00 AM
Magnesium Carbonate	5.5			%	1		03/26/18 12:00 AM
<b>MAJOR / MINOR ELEMENTS IN ASH</b>							
		Analyst: LNG				ASTM D 6349	EPA 6010
Calcium Oxide	25.06	0.02		% Dry	2	03/24/18 1:40 AM	03/26/18 11:36 AM
Magnesium Oxide	2.64	0.02		% Dry	2	03/24/18 1:40 AM	03/26/18 11:36 AM
<b>TCLP METALS</b>							
		Analyst: LNG				EPA 200.2	EPA 6010
Aluminum	< 0.1	0.1		mg/L	1	03/26/18 9:00 AM	03/26/18 5:28 PM
Antimony	< 0.02	0.02		mg/L	1	03/26/18 9:00 AM	03/26/18 5:26 PM
Arsenic	< 0.02	0.02		mg/L	1	03/26/18 9:00 AM	03/26/18 5:28 PM
Barium	0.7	0.3		mg/L	1	03/26/18 9:00 AM	03/26/18 5:28 PM
Beryllium	< 0.001	0.001		mg/L	1	03/26/18 9:00 AM	03/26/18 5:28 PM



## Laboratory Results

### Geochemical Testing

Date: 28-Mar-18

CLIENT: AES - WARRIOR RUN INC

Client Sample ID: Bed Ash North

Lab Order: G1803D00

C88707

Project:

Sampled By: AES Warrior Run

Lab ID: G1803D00-002

Collection Date: 3/16/2018

Matrix: ASH

Received Date: 3/23/2018 12:25:41 PM

Analyses	Result	QL	Q	Units	DF	Date Prepared	Date Analyzed
<b>TCLP METALS</b>		Analyst: LNG				EPA 200.2	EPA 8010
Boron	0.13	0.05		mg/L	1	03/26/18 9:00 AM	03/27/18 1:27 PM
Cadmium	< 0.002	0.002		mg/L	1	03/26/18 9:00 AM	03/26/18 5:28 PM
Chromium	< 0.01	0.01		mg/L	1	03/26/18 9:00 AM	03/26/18 5:28 PM
Cobalt	< 0.005	0.005		mg/L	1	03/26/18 9:00 AM	03/26/18 5:28 PM
Copper	< 0.01	0.01		mg/L	1	03/26/18 9:00 AM	03/26/18 5:28 PM
Lead	< 0.02	0.02		mg/L	1	03/26/18 9:00 AM	03/26/18 5:28 PM
Lithium	0.14	0.01		mg/L	1	03/26/18 9:00 AM	03/26/18 5:28 PM
Manganese	< 0.01	0.01		mg/L	1	03/26/18 9:00 AM	03/26/18 5:28 PM
Molybdenum	0.10	0.02		mg/L	1	03/26/18 9:00 AM	03/26/18 5:28 PM
Nickel	< 0.01	0.01		mg/L	1	03/26/18 9:00 AM	03/26/18 5:28 PM
Selenium	< 0.02	0.02		mg/L	1	03/26/18 9:00 AM	03/26/18 5:28 PM
Silver	< 0.005	0.005		mg/L	1	03/26/18 9:00 AM	03/26/18 5:28 PM
Vanadium	0.014	0.005		mg/L	1	03/26/18 9:00 AM	03/26/18 5:28 PM
Zinc	< 0.01	0.01		mg/L	1	03/26/18 9:00 AM	03/26/18 5:28 PM
<b>TCLP EXTRACTION</b>		Analyst: ALD					EPA 1311
Extraction Fluid Used	1.0				1		03/25/18 10:00 AM
Final pH	12.6	1.0			1		03/25/18 10:00 AM
Initial pH	11.5	1.0			1		03/25/18 10:00 AM
pH with HCl	2.0				1		03/25/18 10:00 AM
TCLP, non-volatile	NA				1		03/25/18 10:00 AM



# Laboratory Results

## Geochemical Testing

Date: 28-Mar-18

CLIENT: AES - WARRIOR RUN INC  
 Lab Order: G1803D00  
 Project:  
 Lab ID: G1803D00-003  
 Matrix: ASH

Client Sample ID: Bes Ash South  
 Sampled By: AES Warrior Run  
 Collection Date: 3/16/2018  
 Received Date: 3/23/2018 12:25:41 PM

C88708

Analyses	Result	QL	Q	Units	DF	Date Prepared	Date Analyzed
<b>MERCURY</b>							
		Analyst: RLL					ASTM D 6722
Mercury	< 0.010	0.010		mg/Kg-dry	1		03/26/18 1:13 PM
<b>TOTAL METALS</b>							
		Analyst: LNG				EPA 3050	EPA 6010
Aluminum	26700	10		mg/Kg-dry	1	03/26/18 9:00 AM	03/27/18 1:42 PM
Antimony	< 2.0	2.0		mg/Kg-dry	1	03/26/18 9:00 AM	03/26/18 6:43 PM
Arsenic	66.7	2.0		mg/Kg-dry	1	03/26/18 9:00 AM	03/26/18 6:43 PM
Barium	233	1.0		mg/Kg-dry	1	03/26/18 9:00 AM	03/26/18 6:43 PM
Beryllium	2.29	0.10		mg/Kg-dry	1	03/26/18 9:00 AM	03/26/18 6:43 PM
Boron	31.7	5.0		mg/Kg-dry	1	03/26/18 9:00 AM	03/26/18 1:42 PM
Cadmium	< 0.2	0.2		mg/Kg-dry	1	03/26/18 9:00 AM	03/26/18 6:43 PM
Chromium	39.4	1.0		mg/Kg-dry	1	03/26/18 9:00 AM	03/26/18 6:43 PM
Cobalt	9.3	0.6		mg/Kg-dry	1	03/26/18 9:00 AM	03/26/18 6:43 PM
Copper	19.8	1.0		mg/Kg-dry	1	03/26/18 9:00 AM	03/26/18 6:43 PM
Lead	6.2	2.0		mg/Kg-dry	1	03/26/18 9:00 AM	03/26/18 6:43 PM
Lithium	38.9	1.0		mg/Kg-dry	1	03/26/18 9:00 AM	03/26/18 6:43 PM
Manganese	92.2	1.0		mg/Kg-dry	1	03/26/18 9:00 AM	03/26/18 6:43 PM
Molybdenum	4.6	2.0		mg/Kg-dry	1	03/26/18 9:00 AM	03/26/18 6:43 PM
Nickel	23.0	1.0		mg/Kg-dry	1	03/26/18 9:00 AM	03/26/18 6:43 PM
Selenium	< 2.0	2.0		mg/Kg-dry	1	03/26/18 9:00 AM	03/26/18 6:43 PM
Silver	< 0.5	0.6		mg/Kg-dry	1	03/26/18 9:00 AM	03/26/18 6:43 PM
Vanadium	66.6	0.5		mg/Kg-dry	1	03/26/18 9:00 AM	03/27/18 1:42 PM
Zinc	39.1	1.0		mg/Kg-dry	1	03/26/18 9:00 AM	03/26/18 6:43 PM
<b>TCLP METALS</b>							
		Analyst: LNG				SM 3112 B	EPA 7470
Mercury	< 0.0002	0.0002		mg/L	1	03/27/18 10:35 AM	03/27/18 12:57 PM
<b>CARBONATE RESULTS</b>							
		Analyst: LNG					CALCULATED
Calcium Carbonate	45.9			%	1		03/26/18 12:00 AM
Calcium Carbonate Equivalent	52.5			%	1		03/26/18 12:00 AM
Magnesium Carbonate	5.6			%	1		03/26/18 12:00 AM
<b>MAJOR / MINOR ELEMENTS IN ASH</b>							
		Analyst: LNG				ASTM D 6349	EPA 6010
Calcium Oxide	25.76	0.02		% Dry	2	03/24/18 1:40 AM	03/26/18 11:40 AM
Magnesium Oxide	2.67	0.02		% Dry	2	03/24/18 1:40 AM	03/26/18 11:40 AM
<b>TCLP METALS</b>							
		Analyst: LNG				EPA 200.2	EPA 6010
Aluminum	< 0.1	0.1		mg/L	1	03/26/18 9:00 AM	03/26/18 5:33 PM
Antimony	< 0.02	0.02		mg/L	1	03/26/18 9:00 AM	03/26/18 5:33 PM
Arsenic	< 0.02	0.02		mg/L	1	03/26/18 9:00 AM	03/26/18 5:33 PM
Barium	0.8	0.3		mg/L	1	03/26/18 9:00 AM	03/26/18 5:33 PM
Beryllium	< 0.001	0.001		mg/L	1	03/26/18 9:00 AM	03/26/18 5:33 PM



## Laboratory Results

### Geochemical Testing

Date: 28-Mar-18

**CLIENT:** AES - WARRIOR RUN INC  
**Lab Order:** G1803D00  
**Project:**  
**Lab ID:** G1803D00-003  
**Matrix:** ASH

**Client Sample ID:** Bes Ash South

C88708

**Sampled By:** AES Warrior Run

**Collection Date:** 3/16/2018

**Received Date:** 3/23/2018 12:25:41 PM

Analyses	Result	QL	Q	Units	DF	Date Prepared	Date Analyzed
<b>TCLP METALS</b>		<b>Analyst: LNG</b>				<b>EPA 200.2</b>	<b>EPA 6010</b>
Boron	0.15	0.05		mg/L	1	03/26/18 9:00 AM	03/27/18 1:31 PM
Cadmium	< 0.002	0.002		mg/L	1	03/26/18 9:00 AM	03/28/18 5:33 PM
Chromium	< 0.01	0.01		mg/L	1	03/26/18 9:00 AM	03/28/18 5:33 PM
Cobalt	< 0.005	0.005		mg/L	1	03/26/18 9:00 AM	03/28/18 5:33 PM
Copper	< 0.01	0.01		mg/L	1	03/26/18 9:00 AM	03/28/18 5:33 PM
Lead	< 0.02	0.02		mg/L	1	03/26/18 9:00 AM	03/28/18 5:33 PM
Lithium	0.11	0.01		mg/L	1	03/26/18 9:00 AM	03/28/18 5:33 PM
Manganese	< 0.01	0.01		mg/L	1	03/26/18 9:00 AM	03/28/18 5:33 PM
Molybdenum	0.11	0.02		mg/L	1	03/26/18 9:00 AM	03/28/18 5:33 PM
Nickel	< 0.01	0.01		mg/L	1	03/26/18 9:00 AM	03/28/18 5:33 PM
Selenium	< 0.02	0.02		mg/L	1	03/26/18 9:00 AM	03/28/18 5:33 PM
Silver	< 0.005	0.005		mg/L	1	03/26/18 9:00 AM	03/28/18 5:33 PM
Vanadium	0.013	0.005		mg/L	1	03/26/18 9:00 AM	03/28/18 5:33 PM
Zinc	< 0.01	0.01		mg/L	1	03/26/18 9:00 AM	03/28/18 5:33 PM
<b>TCLP EXTRACTION</b>		<b>Analyst: ALD</b>					<b>EPA 1311</b>
Extraction Fluid Used	1.0				1		03/25/18 10:00 AM
Final pH	12.6	1.0			1		03/25/18 10:00 AM
Initial pH	11.4	1.0			1		03/25/18 10:00 AM
pH with HCl	2.1				1		03/25/18 10:00 AM
TCLP, non-volatile	NA				1		03/25/18 10:00 AM







# GEOCHEMICAL TESTING

Environmental and Energy Analysis

2005 N. Center Ave.  
Somerset, PA 15501

814/443-1671  
814/445-6666  
FAX: 814/445-6729

Friday, June 29, 2018

Mel Sines  
AES - WARRIOR RUN INC  
11600 MEXICO FARMS SE  
CUMBERLAND, MD 21502

Order No.: G1806E40

Dear Mel Sines:

Geochemical Testing received 3 sample(s) on 6/25/2018 for the analyses presented in the following report.

There were no problems with the analyses and all QC data met NELAC, EPA, and laboratory specifications except where noted in the Case Narrative or Laboratory Results.

If you have any questions regarding these tests results, please feel free to call.

Sincerely,

Timothy W. Bergstresser  
Director of Technical Services



**Geochemical Testing**

Date: 29-Jun-18

CLIENT: AES - WARRIOR RUN INC  
Project:  
Lab Order: G1806E40

**CASE NARRATIVE**

No problems were encountered during analysis of this workorder, except if noted in this report.

Results are reported on a dry and on a non-ashed basis.

**Legend:**  
ND - Not Detected  
J - Indicates an estimated value.  
U - The analyte was not detected at or above the listed concentration, which is below the laboratory quantitation limit.  
B - Analyte detected in the associated Method Blank  
Q - Qualifier    QL -Quantitation Limit    DF - Dilution Factor

S - Spike Recovery outside accepted recovery limits  
R - RPD outside accepted recovery limits  
E - Value above quantitation range  
\*\* - Value exceeds Action Limit  
H - Method Hold Time Exceeded  
MCL - Contaminant Limit



# Laboratory Results

Date: 29-Jun-18

## Geochemical Testing

CLIENT:	AES - WARRIOR RUN INC	Client Sample ID:	Fly Ash
Lab Order:	G1806E40		C89745 / O45605
Project:		Sampled By:	AES Warrior Run
Lab ID:	G1806E40-001	Collection Date:	6/21/2018
Matrix:	ASH	Received Date:	6/25/2018 1:03:00 PM

Analyses	Result	QL	Q	Units	DF	Date Prepared	Date Analyzed
<b>TOTAL METALS</b>		Analyst: JEK				<b>EPA 3050</b>	<b>EPA 6010</b>
Aluminum	35000		10	mg/Kg-dry	1	06/26/18 12:05 PM	06/27/18 2:48 AM
Antimony	< 2.0		2.0	mg/Kg-dry	1	06/26/18 12:05 PM	06/27/18 2:48 AM
Arsenic	60.3		2.0	mg/Kg-dry	1	06/26/18 12:05 PM	06/27/18 2:48 AM
Barium	389		1.0	mg/Kg-dry	1	06/26/18 12:05 PM	06/27/18 2:48 AM
Beryllium	4.59		0.10	mg/Kg-dry	1	06/26/18 12:05 PM	06/27/18 2:48 AM
Boron	27.8		5.0	mg/Kg-dry	1	06/26/18 12:05 PM	06/27/18 2:48 AM
Cadmium	< 0.2		0.2	mg/Kg-dry	1	06/26/18 12:05 PM	06/27/18 2:48 AM
Chromium	46.5		1.0	mg/Kg-dry	1	06/26/18 12:05 PM	06/27/18 2:48 AM
Cobalt	16.2		0.5	mg/Kg-dry	1	06/26/18 12:05 PM	06/27/18 2:48 AM
Copper	38.9		1.0	mg/Kg-dry	1	06/26/18 12:05 PM	06/27/18 2:48 AM
Lead	23.5		2.0	mg/Kg-dry	1	06/26/18 12:05 PM	06/27/18 2:48 AM
Lithium	62.7		1.0	mg/Kg-dry	1	06/26/18 12:05 PM	06/27/18 2:48 AM
Manganese	175		1.0	mg/Kg-dry	1	06/26/18 12:05 PM	06/27/18 2:48 AM
Molybdenum	9.2		2.0	mg/Kg-dry	1	06/26/18 12:05 PM	06/27/18 2:48 AM
Nickel	42.7		1.0	mg/Kg-dry	1	06/26/18 12:05 PM	06/27/18 2:48 AM
Selenium	6.5		2.0	mg/Kg-dry	1	06/26/18 12:05 PM	06/27/18 5:08 PM
Silver	< 0.6		0.5	mg/Kg-dry	1	06/26/18 12:05 PM	06/27/18 2:48 AM
Vanadium	97.6		0.5	mg/Kg-dry	1	06/26/18 12:05 PM	06/27/18 2:48 AM
Zinc	76.6		1.0	mg/Kg-dry	1	06/26/18 12:05 PM	06/27/18 2:48 AM
<b>MERCURY</b>		Analyst: RLL					<b>ASTM D 6722</b>
Mercury	1.09		0.010	mg/Kg-dry	1		06/26/18 8:01 AM
<b>CARBONATE RESULTS</b>		Analyst: JEK					<b>Calculated</b>
Calcium Carbonate	27.7			%	1		06/26/18 12:00 AM
Calcium Carbonate Equivalent	32.6			%	1		06/26/18 12:00 AM
Magnesium Carbonate	4.1			%	1		06/26/18 12:00 AM
<b>MAJOR / MINOR ELEMENTS IN ASH</b>		Analyst: JEK				<b>ASTM D 6349</b>	<b>EPA 6010</b>
Calcium Oxide	16.53		0.02	% Dry	2	06/26/18 2:15 AM	06/26/18 9:43 AM
Magnesium Oxide	1.94		0.02	% Dry	2	06/26/18 2:15 AM	06/26/18 9:43 AM
<b>TCLP EXTRACTION</b>		Analyst: JXM					<b>EPA 1311</b>
Extraction Fluid Used	2.0				1		06/26/18 6:10 PM
Final pH	7.5		1.0		1		06/25/18 6:10 PM
Initial pH	12.4		1.0		1		06/25/18 6:10 PM
pH with HCl	11.4				1		06/25/18 6:10 PM



# Laboratory Results

Date: 29-Jun-18

## Geochemical Testing

**CLIENT:** AES - WARRIOR RUN INC  
**Lab Order:** G1806E40  
**Project:**  
**Lab ID:** G1806E40-001  
**Matrix:** ASH

**Client Sample ID:** Fly Ash  
 C89745 / O45605  
**Sampled By:** AES Warrior Run  
**Collection Date:** 6/21/2018  
**Received Date:** 6/25/2018 1:03:00 PM

Analyses	Result	QL	Q	Units	DF	Date Prepared	Date Analyzed
TCLP, non-volatile	NA				1		06/25/18 8:10 PM
<b>TCLP METALS</b>		<b>Analyst: LNG</b>				<b>SM 3112 B</b>	<b>EPA 7470</b>
Mercury	< 0.0002	0.0002		mg/L	1	06/27/18 10:10 AM	06/27/18 1:53 PM
<b>TCLP METALS</b>		<b>Analyst: JEK</b>				<b>EPA 200.2</b>	<b>EPA 6010</b>
Aluminum	0.2	0.1		mg/L	1	06/27/18 8:50 AM	06/27/18 5:59 PM
Antimony	< 0.02	0.02		mg/L	1	06/27/18 8:50 AM	06/27/18 5:59 PM
Arsenic	0.05	0.02		mg/L	1	06/27/18 8:50 AM	06/27/18 5:59 PM
Barium	0.5	0.3		mg/L	1	06/27/18 8:50 AM	06/27/18 5:59 PM
Beryllium	< 0.001	0.001		mg/L	1	06/27/18 8:50 AM	06/27/18 5:59 PM
Boron	0.97	0.05		mg/L	1	06/27/18 8:50 AM	06/27/18 5:59 PM
Cadmium	< 0.002	0.002		mg/L	1	06/27/18 8:50 AM	06/27/18 5:59 PM
Chromium	0.04	0.01		mg/L	1	06/27/18 8:50 AM	06/27/18 5:59 PM
Cobalt	< 0.005	0.005		mg/L	1	06/27/18 8:50 AM	06/27/18 5:59 PM
Copper	< 0.01	0.01		mg/L	1	06/27/18 8:50 AM	06/27/18 10:37 PM
Lead	< 0.02	0.02		mg/L	1	06/27/18 8:50 AM	06/27/18 10:37 PM
Lithium	0.28	0.01		mg/L	1	06/27/18 8:50 AM	06/27/18 5:59 PM
Manganese	< 0.01	0.01		mg/L	1	06/27/18 8:50 AM	06/27/18 5:59 PM
Molybdenum	0.24	0.02		mg/L	1	06/27/18 8:50 AM	06/27/18 5:59 PM
Nickel	< 0.01	0.01		mg/L	1	06/27/18 8:50 AM	06/27/18 5:59 PM
Selenium	0.08	0.02		mg/L	1	06/27/18 8:50 AM	06/27/18 5:59 PM
Silver	< 0.005	0.005		mg/L	1	06/27/18 8:50 AM	06/27/18 5:59 PM
Vanadium	0.43	0.005		mg/L	1	06/27/18 8:50 AM	06/27/18 5:59 PM
Zinc	0.03	0.01		mg/L	1	06/27/18 8:50 AM	06/27/18 5:59 PM



# Laboratory Results

## Geochemical Testing

Date: 29-Jun-18

CLIENT:	AES - WARRIOR RUN INC	Client Sample ID:	Bed Ash North
Lab Order:	G1806E40		C89746 / O45606
Project:		Sampled By:	AES Warrior Run
Lab ID:	G1806E40-002	Collection Date:	6/21/2018
Matrix:	ASH	Received Date:	6/25/2018 1:03:00 PM

Analyses	Result	QL	Q	Units	DF	Date Prepared	Date Analyzed
<b>TOTAL METALS</b>							
		Analyst: JEK				EPA 3050	EPA 6010
Aluminum	24100	10		mg/Kg-dry	1	06/26/18 12:05 PM	08/27/18 2:52 AM
Antimony	< 2.0	2.0		mg/Kg-dry	1	06/26/18 12:05 PM	08/27/18 2:52 AM
Arsenic	49.5	2.0		mg/Kg-dry	1	06/26/18 12:05 PM	08/27/18 2:52 AM
Barium	212	1.0		mg/Kg-dry	1	06/26/18 12:05 PM	08/27/18 2:52 AM
Beryllium	2.36	0.10		mg/Kg-dry	1	06/26/18 12:05 PM	08/27/18 2:52 AM
Boron	28.4	5.0		mg/Kg-dry	1	06/26/18 12:05 PM	08/27/18 2:52 AM
Cadmium	< 0.2	0.2		mg/Kg-dry	1	06/26/18 12:05 PM	08/27/18 2:52 AM
Chromium	34.1	1.0		mg/Kg-dry	1	06/26/18 12:05 PM	08/27/18 2:52 AM
Cobalt	9.7	0.5		mg/Kg-dry	1	06/26/18 12:05 PM	08/27/18 2:52 AM
Copper	26.9	1.0		mg/Kg-dry	1	06/26/18 12:05 PM	08/27/18 2:52 AM
Lead	8.0	2.0		mg/Kg-dry	1	06/26/18 12:05 PM	08/27/18 2:52 AM
Lithium	42.2	1.0		mg/Kg-dry	1	06/26/18 12:05 PM	08/27/18 2:52 AM
Manganese	111	1.0		mg/Kg-dry	1	06/26/18 12:05 PM	08/27/18 2:52 AM
Molybdenum	5.2	2.0		mg/Kg-dry	1	06/26/18 12:05 PM	08/27/18 2:52 AM
Nickel	25.7	1.0		mg/Kg-dry	1	06/26/18 12:05 PM	08/27/18 2:52 AM
Selenium	< 2.0	2.0		mg/Kg-dry	1	06/26/18 12:05 PM	08/27/18 5:12 PM
Silver	< 0.5	0.5		mg/Kg-dry	1	06/26/18 12:05 PM	08/27/18 2:52 AM
Vanadium	64.9	0.5		mg/Kg-dry	1	06/26/18 12:05 PM	08/27/18 2:52 AM
Zinc	43.9	1.0		mg/Kg-dry	1	06/26/18 12:05 PM	08/27/18 2:52 AM
<b>MERCURY</b>							
		Analyst: RLL					ASTM D 6722
Mercury	< 0.010	0.010		mg/Kg-dry	1		06/26/18 8:01 AM
<b>CARBONATE RESULTS</b>							
		Analyst: JEK					Calculated
Calcium Carbonate	43.8			%	1		06/26/18 12:00 AM
Calcium Carbonate Equivalent	49.8			%	1		06/26/18 12:00 AM
Magnesium Carbonate	5.1			%	1		06/26/18 12:00 AM
<b>MAJOR / MINOR ELEMENTS IN ASH</b>							
		Analyst: JEK				ASTM D 6349	EPA 6010
Calcium Oxide	24.51	0.02		% Dry	2	06/26/18 2:15 AM	06/26/18 10:06 AM
Magnesium Oxide	2.43	0.02		% Dry	2	06/26/18 2:15 AM	06/26/18 10:06 AM
<b>TCLP EXTRACTION</b>							
		Analyst: JXM					EPA 1311
Extraction Fluid Used	1.0				1		06/25/18 8:10 PM
Final pH	12.5	1.0			1		06/25/18 6:10 PM
Initial pH	12.2	1.0			1		06/25/18 6:10 PM
pH with HCl	2.5				1		06/25/18 8:10 PM



# Laboratory Results

Date: 29-Jun-18

## Geochemical Testing

**CLIENT:** AES - WARRIOR RUN INC  
**Lab Order:** G1806E40  
**Project:**  
**Lab ID:** G1806E40-002  
**Matrix:** ASH

**Client Sample ID:** Bed Ash North  
**C89746 / O45606**  
**Sampled By:** AES Warrior Run  
**Collection Date:** 6/21/2018  
**Received Date:** 6/25/2018 1:03:00 PM

Analyses	Result	QL	Q	Units	DF	Date Prepared	Date Analyzed
TCLP, non-volatile	NA				1		06/25/18 6:10 PM
<b>TCLP METALS</b>		Analyst: LNG				<b>SM 3112 B</b>	<b>EPA 7470</b>
Mercury	< 0.0002	0.0002		mg/L	1	06/27/18 10:10 AM	06/27/18 1:56 PM
<b>TCLP METALS</b>		Analyst: JEK				<b>EPA 200.2</b>	<b>EPA 6010</b>
Aluminum	0.1	0.1		mg/L	1	06/27/18 8:50 AM	06/27/18 6:03 PM
Antimony	< 0.02	0.02		mg/L	1	06/27/18 8:50 AM	06/27/18 6:03 PM
Arsenic	< 0.02	0.02		mg/L	1	06/27/18 8:50 AM	06/27/18 6:03 PM
Barium	0.6	0.3		mg/L	1	06/27/18 8:50 AM	06/27/18 6:03 PM
Beryllium	< 0.001	0.001		mg/L	1	06/27/18 8:50 AM	06/27/18 6:03 PM
Boron	0.16	0.05		mg/L	1	06/27/18 8:50 AM	06/27/18 6:03 PM
Cadmium	< 0.002	0.002		mg/L	1	06/27/18 8:50 AM	06/27/18 6:03 PM
Chromium	< 0.01	0.01		mg/L	1	06/27/18 8:50 AM	06/27/18 6:03 PM
Cobalt	< 0.005	0.005		mg/L	1	06/27/18 8:50 AM	06/27/18 6:03 PM
Copper	< 0.01	0.01		mg/L	1	06/27/18 8:50 AM	06/27/18 10:42 PM
Lead	< 0.02	0.02		mg/L	1	06/27/18 8:50 AM	06/27/18 10:42 PM
Lithium	0.17	0.01		mg/L	1	06/27/18 8:50 AM	06/27/18 6:03 PM
Manganese	< 0.01	0.01		mg/L	1	06/27/18 8:50 AM	06/27/18 6:03 PM
Molybdenum	0.09	0.02		mg/L	1	06/27/18 8:50 AM	06/27/18 6:03 PM
Nickel	< 0.01	0.01		mg/L	1	06/27/18 8:50 AM	06/27/18 6:03 PM
Selenium	< 0.02	0.02		mg/L	1	06/27/18 8:50 AM	06/27/18 6:03 PM
Silver	< 0.005	0.005		mg/L	1	06/27/18 8:50 AM	06/27/18 6:03 PM
Vanadium	0.012	0.005		mg/L	1	06/27/18 8:50 AM	06/27/18 6:03 PM
Zinc	0.01	0.01		mg/L	1	06/27/18 8:50 AM	06/27/18 6:03 PM



# Laboratory Results

Date: 29-Jun-18

## Geochemical Testing

CLIENT: AES - WARRIOR RUN INC	Client Sample ID: Bes Ash South
Lab Order: G1806E40	C89747 / O45607
Project:	Sampled By: AES Warrior Run
Lab ID: G1806E40-003	Collection Date: 6/21/2018
Matrix: ASH	Received Date: 6/25/2018 1:03:00 PM

Analyses	Result	QL	Q	Units	DF	Date Prepared	Date Analyzed
<b>TOTAL METALS</b>		Analyst: JEK				<b>EPA 3050</b>	<b>EPA 6010</b>
Aluminum	24200	10		mg/Kg-dry	1	06/26/18 12:05 PM	06/27/18 2:57 AM
Antimony	< 2.0	2.0		mg/Kg-dry	1	06/26/18 12:05 PM	06/27/18 2:57 AM
Arsenic	65.0	2.0		mg/Kg-dry	1	06/26/18 12:05 PM	06/27/18 2:57 AM
Barium	190	1.0		mg/Kg-dry	1	06/26/18 12:05 PM	06/27/18 2:57 AM
Beryllium	1.51	0.10		mg/Kg-dry	1	06/26/18 12:05 PM	06/27/18 2:57 AM
Boron	19.6	5.0		mg/Kg-dry	1	06/26/18 12:05 PM	06/27/18 2:57 AM
Cadmium	< 0.2	0.2		mg/Kg-dry	1	06/26/18 12:05 PM	06/27/18 2:57 AM
Chromium	31.9	1.0		mg/Kg-dry	1	06/26/18 12:05 PM	06/27/18 2:57 AM
Cobalt	9.3	0.5		mg/Kg-dry	1	06/26/18 12:05 PM	06/27/18 2:57 AM
Copper	23.7	1.0		mg/Kg-dry	1	06/26/18 12:05 PM	06/27/18 2:57 AM
Lead	9.7	2.0		mg/Kg-dry	1	06/26/18 12:05 PM	06/27/18 2:57 AM
Lithium	42.4	1.0		mg/Kg-dry	1	06/26/18 12:05 PM	06/27/18 2:57 AM
Manganese	103	1.0		mg/Kg-dry	1	06/26/18 12:05 PM	06/27/18 2:57 AM
Molybdenum	5.8	2.0		mg/Kg-dry	1	06/26/18 12:05 PM	06/27/18 2:57 AM
Nickel	23.2	1.0		mg/Kg-dry	1	06/26/18 12:05 PM	06/27/18 2:57 AM
Selenium	< 2.0	2.0		mg/Kg-dry	1	06/26/18 12:05 PM	06/27/18 5:16 PM
Silver	< 0.5	0.5		mg/Kg-dry	1	06/26/18 12:05 PM	06/27/18 2:57 AM
Vanadium	48.6	0.5		mg/Kg-dry	1	06/26/18 12:05 PM	06/27/18 2:57 AM
Zinc	62.3	1.0		mg/Kg-dry	1	06/26/18 12:05 PM	06/27/18 2:57 AM
<b>MERCURY</b>		Analyst: RLL					<b>ASTM D 6722</b>
Mercury	0.012	0.010		mg/Kg-dry	1		06/26/18 8:01 AM
<b>CARBONATE RESULTS</b>		Analyst: JEK					<b>Calculated</b>
Calcium Carbonate	41.8			%	1		06/26/18 12:00 AM
Calcium Carbonate Equivalent	49.2			%	1		06/26/18 12:00 AM
Magnesium Carbonate	6.2			%	1		06/26/18 12:00 AM
<b>MAJOR / MINOR ELEMENTS IN ASH</b>		Analyst: JEK				<b>ASTM D 6349</b>	<b>EPA 6010</b>
Calcium Oxide	23.39	0.02		% Dry	2	06/26/18 2:15 AM	06/26/18 10:11 AM
Magnesium Oxide	2.97	0.02		% Dry	2	06/26/18 2:15 AM	06/26/18 10:11 AM
<b>TCLP EXTRACTION</b>		Analyst: JXM					<b>EPA 1311</b>
Extraction Fluid Used	2.0				1		06/26/18 6:10 PM
Final pH	12.3	1.0			1		06/25/18 6:10 PM
Initial pH	12.5	1.0			1		06/25/18 6:10 PM
pH with HCl	11.7				1		06/25/18 6:10 PM



# Laboratory Results

## Geochemical Testing

Date: 29-Jun-18

**CLIENT:** AES - WARRIOR RUN INC  
**Lab Order:** G1806E40  
**Project:**  
**Lab ID:** G1806E40-003  
**Matrix:** ASH

**Client Sample ID:** Bes Ash South  
 C89747 / O45607  
**Sampled By:** AES Warrior Run  
**Collection Date:** 6/21/2018  
**Received Date:** 6/25/2018 1:03:00 PM

Analyses	Result	QL	Q	Units	DF	Date Prepared	Date Analyzed
TCLP, non-volatile	NA				1		06/25/18 6:10 PM
<b>TCLP METALS</b>		Analyst: LNG				SM 3112 B	EPA 7470
Mercury	< 0.0002	0.0002		mg/L	1	06/27/18 10:10 AM	06/27/18 1:58 PM
<b>TCLP METALS</b>		Analyst: JEK				EPA 200.2	EPA 6010
Aluminum	< 0.1	0.1		mg/L	1	06/27/18 8:50 AM	06/27/18 6:07 PM
Antimony	< 0.02	0.02		mg/L	1	06/27/18 8:50 AM	06/27/18 6:07 PM
Arsenic	< 0.02	0.02		mg/L	1	06/27/18 8:50 AM	06/27/18 6:07 PM
Barium	0.5	0.3		mg/L	1	06/27/18 8:50 AM	06/27/18 6:07 PM
Beryllium	< 0.001	0.001		mg/L	1	06/27/18 8:50 AM	06/27/18 6:07 PM
Boron	0.19	0.05		mg/L	1	06/27/18 8:50 AM	06/27/18 6:07 PM
Cadmium	< 0.002	0.002		mg/L	1	06/27/18 8:50 AM	06/27/18 6:07 PM
Chromium	< 0.01	0.01		mg/L	1	06/27/18 8:50 AM	06/27/18 6:07 PM
Cobalt	< 0.005	0.005		mg/L	1	06/27/18 8:50 AM	06/27/18 6:07 PM
Copper	< 0.01	0.01		mg/L	1	06/27/18 8:50 AM	06/27/18 10:47 PM
Lead	< 0.02	0.02		mg/L	1	06/27/18 8:50 AM	06/27/18 10:47 PM
Lithium	0.17	0.01		mg/L	1	06/27/18 8:50 AM	06/27/18 6:07 PM
Manganese	< 0.01	0.01		mg/L	1	06/27/18 8:50 AM	06/27/18 6:07 PM
Molybdenum	0.10	0.02		mg/L	1	06/27/18 8:50 AM	06/27/18 6:07 PM
Nickel	< 0.01	0.01		mg/L	1	06/27/18 8:50 AM	06/27/18 6:07 PM
Selenium	< 0.02	0.02		mg/L	1	06/27/18 8:50 AM	06/27/18 6:07 PM
Silver	< 0.005	0.005		mg/L	1	06/27/18 8:50 AM	06/27/18 6:07 PM
Vanadium	0.010	0.005		mg/L	1	06/27/18 8:50 AM	06/27/18 6:07 PM
Zinc	0.01	0.01		mg/L	1	06/27/18 8:50 AM	06/27/18 6:07 PM





# GEOCHEMICAL TESTING

Environmental and Energy Analysis

2005 N. Center Ave.  
Somerset, PA 15501

814/443-1671  
814/445-6666  
FAX: 814/445-6729

Thursday, September 27, 2018

Mel Sines  
AES - WARRIOR RUN INC  
11600 MEXICO FARMS SE  
CUMBERLAND, MD 21502

Order No.: G1809781

Dear Mel Sines:

Geochemical Testing received 3 sample(s) on 9/14/2018 for the analyses presented in the following report.

There were no problems with the analyses and all QC data met NELAC, EPA, and laboratory specifications except where noted in the Case Narrative or Laboratory Results.

If you have any questions regarding these tests results, please feel free to call.

Sincerely,

Timothy W. Bergstresser  
Director of Technical Services

**Geochemical Testing**

Date: 27-Sep-18

CLIENT: AES - WARRIOR RUN INC  
Project:  
Lab Order: G1809781

**CASE NARRATIVE**

No problems were encountered during analysis of this workorder, except if noted in this report.

Results are reported on a dry and on a non-ashed basis.

**Legend:**

ND - Not Detected

J - Indicates an estimated value.

U - The analyte was not detected at or above the listed concentration, which is below the laboratory quantitation limit.

B - Analyte detected in the associated Method Blank

Q - Qualifier    QL - Quantitation Limit    DF - Dilution Factor

S - Spike Recovery outside accepted recovery limits

R - RPD outside accepted recovery limits

E - Value above quantitation range

\*\* - Value exceeds Action Limit

H - Method Hold Time Exceeded

MCL - Contaminant Limit



# Laboratory Results

## Geochemical Testing

Date: 27-Sep-18

CLIENT: AES - WARRIOR RUN INC  
 Lab Order: G1809781  
 Project:  
 Lab ID: G1809781-001  
 Matrix: ASH

Client Sample ID: Fly Ash  
 C90799  
 Sampled By: AES Warrior Run  
 Collection Date: 9/12/2018  
 Received Date: 9/14/2018 11:26:00 AM

Analyses	Result	QL	Q	Units	DF	Date Prepared	Date Analyzed
<b>MERCURY</b>							
				Analyst: RLL		ASTM D 6722	
Mercury	1.17	0.010		mg/Kg-dry	1		09/17/18 11:37 AM
<b>TOTAL METALS</b>							
				Analyst: KXY		EPA 3050 EPA 6010	
Aluminum	37800	10		mg/Kg-dry	1	09/17/18 9:30 AM	09/21/18 3:39 AM
Antimony	< 2.0	2.0		mg/Kg-dry	1	09/17/18 9:30 AM	09/19/18 7:04 AM
Arsenic	53.2	2.0		mg/Kg-dry	1	09/17/18 9:30 AM	09/19/18 7:04 AM
Barium	439	1.0		mg/Kg-dry	1	09/17/18 9:30 AM	09/19/18 7:04 AM
Beryllium	3.28	0.10		mg/Kg-dry	1	09/17/18 9:30 AM	09/19/18 7:04 AM
Boron	40.9	10		mg/Kg-dry	1	09/17/18 9:30 AM	09/20/18 7:19 PM
Cadmium	< 2.0	2.0		mg/Kg-dry	10	09/17/18 9:30 AM	09/20/18 5:27 PM
Chromium	45.3	1.0		mg/Kg-dry	1	09/17/18 9:30 AM	09/19/18 7:04 AM
Cobalt	15.5	0.5		mg/Kg-dry	1	09/17/18 9:30 AM	09/19/18 7:04 AM
Copper	43.9	1.0		mg/Kg-dry	1	09/17/18 9:30 AM	09/19/18 7:04 AM
Lead	22.2	2.0		mg/Kg-dry	1	09/17/18 9:30 AM	09/19/18 7:04 AM
Lithium	65.8	1.0		mg/Kg-dry	1	09/17/18 9:30 AM	09/19/18 7:04 AM
Manganese	132	1.0		mg/Kg-dry	1	09/17/18 9:30 AM	09/19/18 7:04 AM
Molybdenum	7.6	2.0		mg/Kg-dry	1	09/17/18 9:30 AM	09/19/18 7:04 AM
Nickel	41.2	1.0		mg/Kg-dry	1	09/17/18 9:30 AM	09/19/18 7:04 AM
Selenium	7.2	2.0		mg/Kg-dry	1	09/17/18 9:30 AM	09/19/18 7:04 AM
Silver	< 0.5	0.5		mg/Kg-dry	1	09/17/18 9:30 AM	09/19/18 7:04 AM
Vanadium	89.3	0.5		mg/Kg-dry	1	09/17/18 9:30 AM	09/19/18 7:04 AM
Zinc	73.6	1.0		mg/Kg-dry	1	09/17/18 9:30 AM	09/19/18 7:04 AM
<b>TCLP METALS</b>							
				Analyst: GXI		SM 3112 B EPA 7470	
Mercury	< 0.0020	0.0020		mg/L	1	09/17/18 1:35 PM	09/18/18 10:07 AM
<b>CARBONATE RESULTS</b>							
				Analyst: KXY		ASTM D 6349 CALCULATED	
Calcium Carbonate	29.7			%	2	09/15/18 2:30 AM	09/17/18 1:47 AM
Calcium Carbonate Equivalent	33.9			%	2	09/15/18 2:30 AM	09/17/18 1:47 AM
Magnesium Carbonate	3.5			%	2	09/15/18 2:30 AM	09/17/18 1:47 AM
<b>MAJOR / MINOR ELEMENTS IN ASH</b>							
				Analyst: KXY		ASTM D 6349 EPA 6010	
Calcium Oxide	16.66	0.02		% Dry	2	09/15/18 2:30 AM	09/17/18 1:46 PM
Magnesium Oxide	1.65	0.02		% Dry	2	09/15/18 2:30 AM	09/17/18 1:46 PM
<b>TCLP METALS</b>							
				Analyst: KXY		EPA 200.2 EPA 6010	
Aluminum	< 0.1	0.1		mg/L	1	09/18/18 9:00 AM	09/19/18 12:56 PM
Antimony	< 0.02	0.02		mg/L	1	09/18/18 9:00 AM	09/19/18 12:56 PM
Arsenic	0.05	0.02		mg/L	1	09/18/18 8:00 AM	09/19/18 12:56 PM
Barium	0.6	0.3		mg/L	1	09/18/18 9:00 AM	09/19/18 12:56 PM
Beryllium	< 0.001	0.001		mg/L	1	09/18/18 9:00 AM	09/19/18 12:56 PM



# Laboratory Results

Date: 27-Sep-18

## Geochemical Testing

CLIENT: AES - WARRIOR RUN INC

Client Sample ID: Fly Ash

Lab Order: G1809781

C90799

Project:

Sampled By: AES Warrior Run

Lab ID: G1809781-001

Collection Date: 9/12/2018

Matrix: ASH

Received Date: 9/14/2018 11:26:00 AM

Analyses	Result	QL	Q	Units	DF	Date Prepared	Date Analyzed
<b>TCLP METALS</b>		Analyst: KXY				<b>EPA 200.2</b>	<b>EPA 6010</b>
Boron	0.99	0.05		mg/L	1	09/18/18 9:00 AM	09/20/18 7:51 PM
Cadmium	< 0.002	0.002		mg/L	1	09/18/18 9:00 AM	09/19/18 12:56 PM
Chromium	0.05	0.01		mg/L	1	09/18/18 9:00 AM	09/19/18 12:56 PM
Cobalt	< 0.005	0.005		mg/L	1	09/18/18 9:00 AM	09/19/18 12:56 PM
Copper	< 0.01	0.01		mg/L	1	09/18/18 9:00 AM	09/20/18 7:51 PM
Lead	< 0.02	0.02		mg/L	1	09/18/18 9:00 AM	09/19/18 12:56 PM
Lithium	0.32	0.01		mg/L	1	09/18/18 9:00 AM	09/19/18 12:56 PM
Manganese	< 0.01	0.01		mg/L	1	09/18/18 9:00 AM	09/19/18 12:56 PM
Molybdenum	0.20	0.02		mg/L	1	09/18/18 9:00 AM	09/19/18 12:56 PM
Nickel	< 0.01	0.01		mg/L	1	09/18/18 9:00 AM	09/19/18 12:56 PM
Selenium	0.10	0.02		mg/L	1	09/18/18 9:00 AM	09/20/18 7:51 PM
Silver	< 0.005	0.005		mg/L	1	09/18/18 9:00 AM	09/19/18 12:56 PM
Vanadium	0.37	0.005		mg/L	1	09/18/18 9:00 AM	09/19/18 12:56 PM
Zinc	0.02	0.01		mg/L	1	09/18/18 9:00 AM	09/19/18 12:56 PM
<b>TCLP EXTRACTION</b>		Analyst: ALD					<b>EPA 1311</b>
Extraction Fluid Used	2.0				1		09/15/18 3:00 PM
Final pH	9.2	1.0			1		09/15/18 3:00 PM
Initial pH	12.6	1.0			1		09/15/18 3:00 PM
pH with HCl	12.2				1		09/15/18 3:00 PM
TCLP, non-volatile	NA				1		09/15/18 3:00 PM



# Laboratory Results

## Geochemical Testing

Date: 27-Sep-18

CLIENT: AES - WARRIOR RUN INC  
 Lab Order: G1809781  
 Project:  
 Lab ID: G1809781-002  
 Matrix: ASH

Client Sample ID: Bed Ash North  
 C90800  
 Sampled By: AES Warrior Run  
 Collection Date: 9/12/2018  
 Received Date: 9/14/2018 11:26:00 AM

Analyses	Result	QL	Q	Units	DF	Date Prepared	Date Analyzed
<b>MERCURY</b>		Analyst: RLL					ASTM D 6722
Mercury	0.022	0.010		mg/Kg-dry	1	09/17/18 9:30 AM	09/17/18 11:37 AM
<b>TOTAL METALS</b>		Analyst: KXY				EPA 3050	EPA 6010
Aluminum	23000	10		mg/Kg-dry	1	09/17/18 9:30 AM	09/21/18 3:57 AM
Antimony	< 2.0	2.0		mg/Kg-dry	1	09/17/18 9:30 AM	09/21/18 3:57 AM
Arsenic	54.8	2.0		mg/Kg-dry	1	09/17/18 9:30 AM	09/19/18 7:50 AM
Barium	179	1.0		mg/Kg-dry	1	09/17/18 9:30 AM	09/21/18 3:57 AM
Beryllium	1.38	0.10		mg/Kg-dry	1	09/17/18 9:30 AM	09/21/18 3:57 AM
Boron	43.2	10		mg/Kg-dry	1	09/17/18 9:30 AM	09/20/18 7:37 PM
Cadmium	< 0.2	0.2		mg/Kg-dry	1	09/17/18 9:30 AM	09/20/18 5:45 PM
Chromium	31.2	1.0		mg/Kg-dry	1	09/17/18 9:30 AM	09/19/18 7:50 AM
Cobalt	7.3	0.5		mg/Kg-dry	1	09/17/18 9:30 AM	09/19/18 7:50 AM
Copper	28.0	1.0		mg/Kg-dry	1	09/17/18 9:30 AM	09/19/18 7:50 AM
Lead	6.0	2.0		mg/Kg-dry	1	09/17/18 9:30 AM	09/19/18 7:50 AM
Lithium	41.1	1.0		mg/Kg-dry	1	09/17/18 9:30 AM	09/19/18 7:50 AM
Manganese	152	1.0		mg/Kg-dry	1	09/17/18 9:30 AM	09/21/18 3:57 AM
Molybdenum	5.3	2.0		mg/Kg-dry	1	09/17/18 9:30 AM	09/19/18 7:50 AM
Nickel	19.2	1.0		mg/Kg-dry	1	09/17/18 9:30 AM	09/19/18 7:50 AM
Selenium	< 2.0	2.0		mg/Kg-dry	1	09/17/18 9:30 AM	09/19/18 7:50 AM
Silver	< 0.5	0.5		mg/Kg-dry	1	09/17/18 9:30 AM	09/19/18 7:50 AM
Vanadium	61.9	0.5		mg/Kg-dry	1	09/17/18 9:30 AM	09/21/18 3:57 AM
Zinc	37.6	1.0		mg/Kg-dry	1	09/17/18 9:30 AM	09/19/18 7:50 AM
<b>TCLP METALS</b>		Analyst: GXI				SM 3112 B	EPA 7470
Mercury	< 0.0020	0.0020		mg/L	1	09/17/18 1:35 PM	09/18/18 10:08 AM
<b>CARBONATE RESULTS</b>		Analyst: KXY				ASTM D 6349	CALCULATED
Calcium Carbonate	51.1			%	2	09/15/18 2:30 AM	09/17/18 1:51 PM
Calcium Carbonate Equivalent	58.4			%	2	09/15/18 2:30 AM	09/17/18 1:51 PM
Magnesium Carbonate	4.5			%	2	09/15/18 2:30 AM	09/17/18 1:51 PM
<b>MAJOR / MINOR ELEMENTS IN ASH</b>		Analyst: KXY				ASTM D 6349	EPA 6010
Calcium Oxide	28.60	0.02		% Dry	2	09/15/18 2:30 AM	09/17/18 1:51 PM
Magnesium Oxide	2.12	0.02		% Dry	2	09/15/18 2:30 AM	09/17/18 1:51 PM
<b>TCLP METALS</b>		Analyst: KXY				EPA 200.2	EPA 6010
Aluminum	< 0.1	0.1		mg/L	1	09/18/18 9:00 AM	09/19/18 1:01 PM
Antimony	< 0.02	0.02		mg/L	1	09/18/18 9:00 AM	09/19/18 1:01 PM
Arsenic	< 0.02	0.02		mg/L	1	09/18/18 9:00 AM	09/19/18 1:01 PM
Barium	0.8	0.3		mg/L	1	09/18/18 9:00 AM	09/19/18 1:01 PM
Beryllium	< 0.001	0.001		mg/L	1	09/18/18 9:00 AM	09/19/18 1:01 PM



# Laboratory Results

Date: 27-Sep-18

## Geochemical Testing

CLIENT: AES - WARRIOR RUN INC

Client Sample ID: Bed Ash North

Lab Order: G1809781

C90800

Project:

Sampled By: AES Warrior Run

Lab ID: G1809781-002

Collection Date: 9/12/2018

Matrix: ASH

Received Date: 9/14/2018 11:26:00 AM

Analyses	Result	QL	Q	Units	DF	Date Prepared	Date Analyzed
<b>TCLP METALS</b>		Analyst: KXY				<b>EPA 200.2</b>	<b>EPA 6010</b>
Boron	0.38	0.05		mg/L	1	09/18/18 9:00 AM	09/20/18 7:55 PM
Cadmium	< 0.002	0.002		mg/L	1	09/18/18 9:00 AM	09/19/18 1:01 PM
Chromium	< 0.01	0.01		mg/L	1	09/18/18 9:00 AM	09/19/18 1:01 PM
Cobalt	< 0.005	0.005		mg/L	1	09/18/18 9:00 AM	09/19/18 1:01 PM
Copper	< 0.01	0.01		mg/L	1	09/18/18 9:00 AM	09/20/18 7:55 PM
Lead	< 0.02	0.02		mg/L	1	09/18/18 9:00 AM	09/19/18 1:01 PM
Lithium	0.12	0.01		mg/L	1	09/18/18 9:00 AM	09/19/18 1:01 PM
Manganese	< 0.01	0.01		mg/L	1	09/18/18 9:00 AM	09/19/18 1:01 PM
Molybdenum	0.08	0.02		mg/L	1	09/18/18 9:00 AM	09/19/18 1:01 PM
Nickel	< 0.01	0.01		mg/L	1	09/18/18 9:00 AM	09/19/18 1:01 PM
Selenium	< 0.02	0.02		mg/L	1	09/18/18 9:00 AM	09/20/18 7:55 PM
Silver	< 0.005	0.005		mg/L	1	09/18/18 9:00 AM	09/19/18 1:01 PM
Vanadium	< 0.005	0.005		mg/L	1	09/18/18 9:00 AM	09/19/18 1:01 PM
Zinc	0.03	0.01		mg/L	1	09/18/18 9:00 AM	09/19/18 1:01 PM
<b>TCLP EXTRACTION</b>		Analyst: ALD					<b>EPA 1311</b>
Extraction Fluid Used	1.0				1		09/16/18 9:00 AM
Final pH	12.5	1.0			1		09/16/18 9:00 AM
Initial pH	12.0	1.0			1		09/16/18 9:00 AM
pH with HCl	2.6				1		09/16/18 9:00 AM
TCLP, non-volatile	NA				1		09/16/18 9:00 AM



# Laboratory Results

## Geochemical Testing

Date: 27-Sep-18

CLIENT: AES - WARRIOR RUN INC  
 Lab Order: G1809781  
 Project:  
 Lab ID: G1809781-003  
 Matrix: ASH

Client Sample ID: Bed Ash South  
 C90801  
 Sampled By: AES Warrior Run  
 Collection Date: 9/12/2018  
 Received Date: 9/14/2018 11:26:00 AM

Analyses	Result	QL	Q	Units	DF	Date Prepared	Date Analyzed
<b>MERCURY</b>							
				Analyst: RLL		ASTM D 6722	
Mercury	< 0.010	0.010		mg/Kg-dry	1		09/17/18 11:37 AM
<b>TOTAL METALS</b>							
				Analyst: KXY		EPA 3050 EPA 6010	
Aluminum	20500	10		mg/Kg-dry	1	09/17/18 9:30 AM	09/21/18 4:01 AM
Antimony	< 2.0	2.0		mg/Kg-dry	1	09/17/18 9:30 AM	09/21/18 4:01 AM
Arsenic	65.3	2.0		mg/Kg-dry	1	09/17/18 9:30 AM	09/19/18 7:55 AM
Barium	185	1.0		mg/Kg-dry	1	09/17/18 9:30 AM	09/21/18 4:01 AM
Beryllium	1.47	0.10		mg/Kg-dry	1	09/17/18 9:30 AM	09/21/18 4:01 AM
Boron	45.2	10		mg/Kg-dry	1	09/17/18 9:30 AM	09/20/18 7:41 PM
Cadmium	< 0.2	0.2		mg/Kg-dry	1	09/17/18 9:30 AM	09/20/18 5:50 PM
Chromium	33.6	1.0		mg/Kg-dry	1	09/17/18 9:30 AM	09/19/18 7:55 AM
Cobalt	7.4	0.5		mg/Kg-dry	1	09/17/18 9:30 AM	09/19/18 7:55 AM
Copper	26.3	1.0		mg/Kg-dry	1	09/17/18 9:30 AM	09/19/18 7:55 AM
Lead	5.6	2.0		mg/Kg-dry	1	09/17/18 9:30 AM	09/19/18 7:55 AM
Lithium	27.2	1.0		mg/Kg-dry	1	09/17/18 9:30 AM	09/19/18 7:55 AM
Manganese	119	1.0		mg/Kg-dry	1	09/17/18 9:30 AM	09/21/18 4:01 AM
Molybdenum	5.8	2.0		mg/Kg-dry	1	09/17/18 9:30 AM	09/18/18 7:55 AM
Nickel	19.8	1.0		mg/Kg-dry	1	09/17/18 9:30 AM	09/18/18 7:55 AM
Selenium	< 2.0	2.0		mg/Kg-dry	1	09/17/18 9:30 AM	09/19/18 7:55 AM
Silver	< 0.5	0.5		mg/Kg-dry	1	09/17/18 9:30 AM	09/19/18 7:55 AM
Vanadium	69.2	0.5		mg/Kg-dry	1	09/17/18 9:30 AM	09/21/18 4:01 AM
Zinc	49.9	1.0		mg/Kg-dry	1	09/17/18 9:30 AM	09/19/18 7:55 AM
<b>TCLP METALS</b>							
				Analyst: GXI		SM 3112 B EPA 7470	
Mercury	< 0.0020	0.0020		mg/L	1	09/17/18 1:35 PM	09/18/18 10:10 AM
<b>CARBONATE RESULTS</b>							
				Analyst: KXY		ASTM D 6349 CALCULATED	
Calcium Carbonate	56.1			%	2	09/15/18 2:30 AM	09/17/18 1:55 PM
Calcium Carbonate Equivalent	61.8			%	2	09/15/18 2:30 AM	09/17/18 1:55 PM
Magnesium Carbonate	4.7			%	2	09/15/18 2:30 AM	09/17/18 1:55 PM
<b>MAJOR / MINOR ELEMENTS IN ASH</b>							
				Analyst: KXY		ASTM D 6349 EPA 6010	
Calcium Oxide	31.45	0.02		% Dry	2	09/15/18 2:30 AM	09/17/18 1:55 PM
Magnesium Oxide	2.24	0.02		% Dry	2	09/15/18 2:30 AM	09/17/18 1:55 PM
<b>TCLP METALS</b>							
				Analyst: KXY		EPA 200.2 EPA 6010	
Aluminum	< 0.1	0.1		mg/L	1	09/18/18 9:00 AM	09/19/18 1:24 PM
Antimony	< 0.02	0.02		mg/L	1	09/18/18 9:00 AM	09/19/18 1:24 PM
Arsenic	< 0.02	0.02		mg/L	1	09/18/18 9:00 AM	09/19/18 1:24 PM
Barium	0.8	0.3		mg/L	1	09/18/18 9:00 AM	09/19/18 1:24 PM
Beryllium	< 0.001	0.001		mg/L	1	09/18/18 9:00 AM	09/19/18 1:24 PM



## Laboratory Results

### Geochemical Testing

Date: 27-Sep-18

CLIENT: AES - WARRIOR RUN INC

Client Sample ID: Bed Ash South

Lab Order: G1809781

C90801

Project:

Sampled By: AES Warrior Run

Lab ID: G1809781-003

Collection Date: 9/12/2018

Matrix: ASH

Received Date: 9/14/2018 11:26:00 AM

Analyses	Result	QL	Q	Units	DF	Date Prepared	Date Analyzed
<b>TCLP METALS</b>		Analyst: KXY				EPA 200.2	EPA 6010
Boron	0.35	0.05		mg/L	1	09/18/18 9:00 AM	09/20/18 8:00 PM
Cadmium	< 0.002	0.002		mg/L	1	09/18/18 9:00 AM	09/19/18 1:24 PM
Chromium	< 0.01	0.01		mg/L	1	09/18/18 9:00 AM	09/19/18 1:24 PM
Cobalt	< 0.005	0.005		mg/L	1	09/18/18 9:00 AM	09/19/18 1:24 PM
Copper	< 0.01	0.01		mg/L	1	09/18/18 9:00 AM	09/20/18 8:00 PM
Lead	< 0.02	0.02		mg/L	1	09/18/18 9:00 AM	09/19/18 1:24 PM
Lithium	0.13	0.01		mg/L	1	09/18/18 9:00 AM	09/19/18 1:24 PM
Manganese	< 0.01	0.01		mg/L	1	09/18/18 9:00 AM	09/19/18 1:24 PM
Molybdenum	0.10	0.02		mg/L	1	09/18/18 9:00 AM	09/19/18 1:24 PM
Nickel	< 0.01	0.01		mg/L	1	09/18/18 9:00 AM	09/19/18 1:24 PM
Selenium	< 0.02	0.02		mg/L	1	09/18/18 9:00 AM	09/20/18 8:00 PM
Silver	< 0.005	0.005		mg/L	1	09/18/18 9:00 AM	09/19/18 1:24 PM
Vanadium	0.006	0.005		mg/L	1	09/18/18 9:00 AM	09/19/18 1:24 PM
Zinc	0.03	0.01		mg/L	1	09/18/18 9:00 AM	09/19/18 1:24 PM
<b>TCLP EXTRACTION</b>		Analyst: ALD					EPA 1311
Extraction Fluid Used	1.0				1		09/16/18 9:00 AM
Final pH	12.5	1.0			1		09/16/18 9:00 AM
Initial pH	12.0	1.0			1		09/16/18 9:00 AM
pH with HCl	2.5				1		09/16/18 9:00 AM
TCLP, non-volatile	NA				1		09/16/18 9:00 AM







# GEOCHEMICAL TESTING

Environmental and Energy Analysis

2005 N. Center Ave.  
Somerset, PA 15501

814/443-1671  
814/445-6666  
FAX: 814/445-6729

Monday, January 14, 2019

Michelle Stahlman  
AES Warrior Run Inc.  
11600 Mexico Farms SE  
Cumberland, MD 21502

RE: TCLP Ash Analysis

Order No.: G1901240

Dear Michelle Stahlman:

Geochemical Testing received 3 sample(s) on 1/4/2019 for the analyses presented in the following report.

There were no problems with the analyses and all QC data met NELAC, EPA, and laboratory specifications except where noted in the Case Narrative or Laboratory Results.

If you have any questions regarding these tests results, please feel free to call.

Sincerely,

Timothy W. Bergstresser  
Director of Technical Services

## Geochemical Testing

Date: 14-Jan-19

CLIENT: AES Warrior Run Inc.  
Project: TCLP Ash Analysis  
Lab Order: G1901240

## CASE NARRATIVE

No problems were encountered during analysis of this workorder, except if noted in this report.

Results are reported on a dry and on a non-ashed basis.

### Legend:

ND - Not Detected

J - Indicates an estimated value.

U - The analyte was not detected at or above the listed concentration, which is below the laboratory quantitation limit.

B - Analyte detected in the associated Method Blank

Q - Qualifier QL - Quantitation Limit DF - Dilution Factor

S - Spike Recovery outside accepted recovery limits

R - RPD outside accepted recovery limits

E - Value above quantitation range

\*\* - Value exceeds Action Limit

H - Method Hold Time Exceeded

MCL - Contaminant Limit



# Laboratory Results

## Geochemical Testing

Date: 14-Jan-19

CLIENT: AES Warrior Run Inc.  
 Lab Order: G1901240  
 Project: TCLP Ash Analysis  
 Lab ID: G1901240-001  
 Matrix: ASH

Client Sample ID: Fly Ash  
 C91809/O45795  
 Sampled By: AES Warrior Run  
 Collection Date: 12/27/2018  
 Received Date: 1/4/2019 2:59:51 PM

Analyses	Result	QL	Q	Units	DF	Date Prepared	Date Analyzed
<b>TOTAL METALS</b>							
		Analyst: LXM				EPA 3050	EPA 6010
Aluminum	42400	20.0		mg/Kg-dry	1	01/07/19 11:45 AM	01/07/19 11:23 PM
Antimony	< 10	10		mg/Kg-dry	1	01/07/19 11:45 AM	01/07/19 11:23 PM
Arsenic	35.1	2.0		mg/Kg-dry	1	01/07/19 11:45 AM	01/07/19 11:23 PM
Barium	525	1.0		mg/Kg-dry	1	01/07/19 11:45 AM	01/09/19 5:27 AM
Beryllium	3.50	0.10		mg/Kg-dry	1	01/07/19 11:45 AM	01/07/19 11:23 PM
Boron	34.0	2.0		mg/Kg-dry	1	01/07/19 11:45 AM	01/09/19 10:15 AM
Cadmium	< 5.0	5.0		mg/Kg-dry	1	01/07/19 11:45 AM	01/07/19 11:23 PM
Chromium	52.8	5.0		mg/Kg-dry	1	01/07/19 11:45 AM	01/07/19 11:23 PM
Cobalt	16.1	0.5		mg/Kg-dry	1	01/07/19 11:45 AM	01/07/19 11:23 PM
Copper	39.0	10		mg/Kg-dry	1	01/07/19 11:45 AM	01/09/19 10:15 AM
Lead	28.6	2.0		mg/Kg-dry	1	01/07/19 11:45 AM	01/07/19 11:23 PM
Lithium	85.5	1.0		mg/Kg-dry	1	01/07/19 11:45 AM	01/07/19 11:23 PM
Manganese	119	1.0		mg/Kg-dry	1	01/07/19 11:45 AM	01/09/19 5:27 AM
Molybdenum	6.3	2.0		mg/Kg-dry	1	01/07/19 11:45 AM	01/07/19 11:23 PM
Nickel	44.9	1.0		mg/Kg-dry	1	01/07/19 11:45 AM	01/07/19 11:23 PM
Selenium	8.0	2.0		mg/Kg-dry	1	01/07/19 11:45 AM	01/07/19 11:23 PM
Silver	< 0.5	0.5		mg/Kg-dry	1	01/07/19 11:45 AM	01/09/19 5:27 AM
Vanadium	88.0	0.5		mg/Kg-dry	1	01/07/19 11:45 AM	01/07/19 11:23 PM
Zinc	77.5	10		mg/Kg-dry	1	01/07/19 11:45 AM	01/09/19 6:27 AM
<b>MERCURY</b>							
		Analyst: RLL					ASTM D 6722
Mercury	0.853	0.010		mg/Kg-dry	1		01/07/19 12:45 PM
<b>CARBONATE RESULTS</b>							
		Analyst: LXM					Calculated
Calcium Carbonate	26.2			%	1		01/07/19 11:21 AM
Calcium Carbonate Equivalent	29.9			%	1		01/07/19 11:21 AM
Magnesium Carbonate	3.1			%	1		01/07/19 11:21 AM
<b>MAJOR / MINOR ELEMENTS IN ASH</b>							
		Analyst: LXM				ASTM D 6349	EPA 6010
Calcium Oxide	14.71	0.02		% Dry	2	01/05/19 4:25 AM	01/07/19 11:21 AM
Magnesium Oxide	1.47	0.02		% Dry	2	01/05/19 4:25 AM	01/07/19 11:21 AM
<b>TCLP EXTRACTION</b>							
		Analyst: ALD					EPA 1311
Extraction Fluid Used	2.0				1		01/06/19 12:07 PM
Final pH	7.1	1.0			1		01/06/19 12:07 PM
Initial pH	12.5	1.0			1		01/06/19 12:07 PM
pH with HCl	11.7	1.0			1		01/06/19 12:07 PM



# Laboratory Results

## Geochemical Testing

Date: 14-Jan-19

CLIENT: AES Warrior Run Inc.  
 Lab Order: G1901240  
 Project: TCLP Ash Analysis  
 Lab ID: G1901240-001  
 Matrix: ASH

Client Sample ID: Fly Ash  
 C91809/O45795  
 Sampled By: AES Warrior Run  
 Collection Date: 12/27/2018  
 Received Date: 1/4/2019 2:59:51 PM

Analyses	Result	QL	Q	Units	DF	Date Prepared	Date Analyzed
TCLP, non-volatile	NA				1		01/06/19 12:07 PM
<b>TCLP METALS</b>		Analyst: GXI				SM 3112 B	EPA 7470
Mercury	< 0.0020	0.0020		mg/L	1	01/08/19 9:10 AM	01/08/19 1:57 PM
<b>TCLP METALS</b>		Analyst: LXM				EPA 200.2	EPA 6010
Aluminum	0.2	0.1		mg/L	1	01/07/19 12:45 PM	01/10/19 10:37 PM
Antimony	< 0.10	0.10		mg/L	1	01/07/19 12:45 PM	01/09/19 8:21 PM
Arsenic	0.04	0.02		mg/L	1	01/07/19 12:45 PM	01/09/19 8:21 PM
Barium	0.6	0.3		mg/L	1	01/07/19 12:45 PM	01/09/19 8:21 PM
Beryllium	< 0.001	0.001		mg/L	1	01/07/19 12:45 PM	01/09/19 8:21 PM
Boron	0.82	0.05		mg/L	1	01/07/19 12:45 PM	01/10/19 10:37 PM
Cadmium	< 0.002	0.002		mg/L	1	01/07/19 12:45 PM	01/09/19 8:21 PM
Chromium	0.08	0.01		mg/L	1	01/07/19 12:45 PM	01/09/19 8:21 PM
Cobalt	< 0.005	0.005		mg/L	1	01/07/19 12:45 PM	01/09/19 8:21 PM
Copper	< 0.01	0.01		mg/L	1	01/07/19 12:45 PM	01/09/19 8:21 PM
Lead	< 0.02	0.02		mg/L	1	01/07/19 12:45 PM	01/09/19 8:21 PM
Lithium	0.39	0.01		mg/L	1	01/07/19 12:45 PM	01/09/19 8:21 PM
Manganese	< 0.01	0.01		mg/L	1	01/07/19 12:45 PM	01/10/19 10:37 PM
Molybdenum	0.17	0.02		mg/L	1	01/07/19 12:45 PM	01/10/19 10:37 PM
Nickel	< 0.01	0.01		mg/L	1	01/07/19 12:45 PM	01/09/19 8:21 PM
Selenium	0.10	0.02		mg/L	1	01/07/19 12:45 PM	01/10/19 10:37 PM
Silver	< 0.005	0.005		mg/L	1	01/07/19 12:45 PM	01/09/19 8:21 PM
Vanadium	0.46	0.005		mg/L	1	01/07/19 12:45 PM	01/10/19 10:37 PM
Zinc	0.08	0.01		mg/L	1	01/07/19 12:45 PM	01/09/19 8:21 PM



# Laboratory Results

## Geochemical Testing

Date: 14-Jan-19

CLIENT: AES Warrior Run Inc.  
 Lab Order: G1901240  
 Project: TCLP Ash Analysis  
 Lab ID: G1901240-002  
 Matrix: ASH

Client Sample ID: Bed Ash North  
 C91810/O45796  
 Sampled By: AES Warrior Run  
 Collection Date: 12/27/2018  
 Received Date: 1/4/2019 2:59:51 PM

Analyses	Result	QL	Q	Units	DF	Date Prepared	Date Analyzed
<b>TOTAL METALS</b>							
		Analyst: LXM			EPA 3050		EPA 6010
Aluminum	29200	20.0		mg/Kg-dry	1	01/07/19 11:45 AM	01/07/19 11:27 PM
Antimony	< 10	10		mg/Kg-dry	1	01/07/19 11:45 AM	01/07/19 11:27 PM
Arsenic	31.4	2.0		mg/Kg-dry	1	01/07/19 11:45 AM	01/07/19 11:27 PM
Barium	240	1.0		mg/Kg-dry	1	01/07/19 11:45 AM	01/09/19 5:50 AM
Beryllium	2.16	0.10		mg/Kg-dry	1	01/07/19 11:45 AM	01/07/19 11:27 PM
Boron	32.8	2.0		mg/Kg-dry	1	01/07/19 11:45 AM	01/09/19 10:19 AM
Cadmium	< 5.0	5.0		mg/Kg-dry	1	01/07/19 11:45 AM	01/07/19 11:27 PM
Chromium	47.2	5.0		mg/Kg-dry	1	01/07/19 11:45 AM	01/07/19 11:27 PM
Cobalt	9.1	0.5		mg/Kg-dry	1	01/07/19 11:45 AM	01/07/19 11:27 PM
Copper	22.7	10		mg/Kg-dry	1	01/07/19 11:45 AM	01/09/19 10:19 AM
Lead	9.1	2.0		mg/Kg-dry	1	01/07/19 11:45 AM	01/07/19 11:27 PM
Lithium	70.7	1.0		mg/Kg-dry	1	01/07/19 11:45 AM	01/07/19 11:27 PM
Manganese	106	1.0		mg/Kg-dry	1	01/07/19 11:45 AM	01/09/19 5:50 AM
Molybdenum	4.3	2.0		mg/Kg-dry	1	01/07/19 11:45 AM	01/07/19 11:27 PM
Nickel	29.0	1.0		mg/Kg-dry	1	01/07/19 11:45 AM	01/07/19 11:27 PM
Selenium	< 2.0	2.0		mg/Kg-dry	1	01/07/19 11:45 AM	01/07/19 11:27 PM
Silver	< 0.5	0.5		mg/Kg-dry	1	01/07/19 11:45 AM	01/09/19 5:50 AM
Vanadium	64.9	0.5		mg/Kg-dry	1	01/07/19 11:45 AM	01/07/19 11:27 PM
Zinc	35.6	10		mg/Kg-dry	1	01/07/19 11:45 AM	01/09/19 5:50 AM
<b>MERCURY</b>							
		Analyst: RLL					ASTM D 6722
Mercury	< 0.010	0.010		mg/Kg-dry	1		01/07/19 12:45 PM
<b>CARBONATE RESULTS</b>							
		Analyst: LXM					Calculated
Calcium Carbonate	41.9			%	1		01/07/19 11:25 AM
Calcium Carbonate Equivalent	47.5			%	1		01/07/19 11:25 AM
Magnesium Carbonate	4.7			%	1		01/07/19 11:25 AM
<b>MAJOR / MINOR ELEMENTS IN ASH</b>							
		Analyst: LXM			ASTM D 6349		EPA 6010
Calcium Oxide	23.48	0.02		% Dry	2	01/05/19 4:25 AM	01/07/19 11:25 AM
Magnesium Oxide	2.26	0.02		% Dry	2	01/05/19 4:25 AM	01/07/19 11:25 AM
<b>TCLP EXTRACTION</b>							
		Analyst: ALD					EPA 1311
Extraction Fluid Used	1.0				1		01/06/19 12:07 PM
Final pH	12.5	1.0			1		01/06/19 12:07 PM
Initial pH	11.3	1.0			1		01/06/19 12:07 PM
pH with HCl	1.9	1.0			1		01/06/19 12:07 PM



## Laboratory Results

### Geochemical Testing

Date: 14-Jan-19

**CLIENT:** AES Warrior Run Inc.  
**Lab Order:** G1901240  
**Project:** TCLP Ash Analysis  
**Lab ID:** G1901240-002  
**Matrix:** ASH

**Client Sample ID:** Bed Ash North  
 C91810/O45796  
**Sampled By:** AES Warrior Run  
**Collection Date:** 12/27/2018  
**Received Date:** 1/4/2019 2:59:51 PM

Analyses	Result	QL	Q	Units	DF	Date Prepared	Date Analyzed
TCLP, non-volatile	NA				1		01/06/19 12:07 PM
<b>TCLP METALS</b>		<b>Analyst: GXI</b>				<b>SM 3112 B</b>	<b>EPA 7470</b>
Mercury	< 0.0020	0.0020		mg/L	1	01/08/19 9:10 AM	01/08/19 2:04 PM
<b>TCLP METALS</b>		<b>Analyst: LXM</b>				<b>EPA 200.2</b>	<b>EPA 6010</b>
Aluminum	0.2	0.1		mg/L	1	01/07/19 12:45 PM	01/10/19 10:42 PM
Antimony	< 0.10	0.10		mg/L	1	01/07/19 12:45 PM	01/09/19 8:26 PM
Arsenic	< 0.02	0.02		mg/L	1	01/07/19 12:45 PM	01/09/19 8:26 PM
Barium	0.7	0.3		mg/L	1	01/07/19 12:45 PM	01/09/19 8:26 PM
Beryllium	< 0.001	0.001		mg/L	1	01/07/19 12:45 PM	01/09/19 8:26 PM
Boron	0.32	0.05		mg/L	1	01/07/19 12:45 PM	01/10/19 10:42 PM
Cadmium	< 0.002	0.002		mg/L	1	01/07/19 12:45 PM	01/09/19 8:26 PM
Chromium	< 0.01	0.01		mg/L	1	01/07/19 12:45 PM	01/09/19 8:26 PM
Cobalt	< 0.005	0.005		mg/L	1	01/07/19 12:45 PM	01/09/19 8:26 PM
Copper	< 0.01	0.01		mg/L	1	01/07/19 12:45 PM	01/09/19 8:26 PM
Lead	< 0.02	0.02		mg/L	1	01/07/19 12:45 PM	01/09/19 8:26 PM
Lithium	0.28	0.01		mg/L	1	01/07/19 12:45 PM	01/09/19 8:26 PM
Manganese	< 0.01	0.01		mg/L	1	01/07/19 12:45 PM	01/10/19 10:42 PM
Molybdenum	0.09	0.02		mg/L	1	01/07/19 12:45 PM	01/10/19 10:42 PM
Nickel	< 0.01	0.01		mg/L	1	01/07/19 12:45 PM	01/09/19 8:26 PM
Selenium	< 0.02	0.02		mg/L	1	01/07/19 12:45 PM	01/10/19 10:42 PM
Silver	< 0.005	0.005		mg/L	1	01/07/19 12:45 PM	01/09/19 8:26 PM
Vanadium	0.012	0.005		mg/L	1	01/07/19 12:45 PM	01/10/19 10:42 PM
Zinc	0.08	0.01		mg/L	1	01/07/19 12:45 PM	01/09/19 8:26 PM



## Laboratory Results

### Geochemical Testing

Date: 14-Jan-19

CLIENT: AES Warrior Run Inc.  
 Lab Order: G1901240  
 Project: TCLP Ash Analysis  
 Lab ID: G1901240-003  
 Matrix: ASH

Client Sample ID: Bed Ash South  
 C91811/O45797  
 Sampled By: AES Warrior Run  
 Collection Date: 12/27/2018  
 Received Date: 1/4/2019 2:59:51 PM

Analyses	Result	QL	Q	Units	DF	Date Prepared	Date Analyzed
<b>TOTAL METALS</b>		Analyst: LXM				EPA 3050	EPA 6010
Aluminum	28700	20.0		mg/Kg-dry	1	01/07/19 11:45 AM	01/07/19 11:50 PM
Antimony	< 10	10		mg/Kg-dry	1	01/07/19 11:45 AM	01/07/19 11:50 PM
Arsenic	31.7	2.0		mg/Kg-dry	1	01/07/19 11:45 AM	01/07/19 11:50 PM
Barium	254	1.0		mg/Kg-dry	1	01/07/19 11:45 AM	01/09/19 5:54 AM
Beryllium	2.12	0.10		mg/Kg-dry	1	01/07/19 11:45 AM	01/07/19 11:50 PM
Boron	34.4	2.0		mg/Kg-dry	1	01/07/19 11:45 AM	01/09/19 10:23 AM
Cadmium	< 5.0	5.0		mg/Kg-dry	1	01/07/19 11:45 AM	01/07/19 11:50 PM
Chromium	46.8	5.0		mg/Kg-dry	1	01/07/19 11:45 AM	01/07/19 11:50 PM
Cobalt	8.8	0.5		mg/Kg-dry	1	01/07/19 11:45 AM	01/07/19 11:50 PM
Copper	21.4	10		mg/Kg-dry	1	01/07/19 11:45 AM	01/09/19 10:23 AM
Lead	8.6	2.0		mg/Kg-dry	1	01/07/19 11:45 AM	01/07/19 11:50 PM
Lithium	66.0	1.0		mg/Kg-dry	1	01/07/19 11:45 AM	01/07/19 11:50 PM
Manganese	111	1.0		mg/Kg-dry	1	01/07/19 11:45 AM	01/09/19 5:54 AM
Molybdenum	4.0	2.0		mg/Kg-dry	1	01/07/19 11:45 AM	01/07/19 11:50 PM
Nickel	27.4	1.0		mg/Kg-dry	1	01/07/19 11:45 AM	01/07/19 11:50 PM
Selenium	< 2.0	2.0		mg/Kg-dry	1	01/07/19 11:45 AM	01/07/19 11:50 PM
Silver	< 0.5	0.5		mg/Kg-dry	1	01/07/19 11:45 AM	01/09/19 5:54 AM
Vanadium	65.7	0.5		mg/Kg-dry	1	01/07/19 11:45 AM	01/07/19 11:50 PM
Zinc	34.5	10		mg/Kg-dry	1	01/07/19 11:45 AM	01/09/19 5:54 AM
<b>MERCURY</b>		Analyst: RLL					ASTM D 6722
Mercury	< 0.010	0.010		mg/Kg-dry	1		01/07/19 12:45 PM
<b>CARBONATE RESULTS</b>		Analyst: LXM					Calculated
Calcium Carbonate	44.9			%	1		01/07/19 11:30 AM
Calcium Carbonate Equivalent	50.9			%	1		01/07/19 11:30 AM
Magnesium Carbonate	5.0			%	1		01/07/19 11:30 AM
<b>MAJOR / MINOR ELEMENTS IN ASH</b>		Analyst: LXM				ASTM D 6349	EPA 6010
Calcium Oxide	25.14	0.02		% Dry	2	01/05/19 4:25 AM	01/07/19 11:30 AM
Magnesium Oxide	2.39	0.02		% Dry	2	01/05/19 4:25 AM	01/07/19 11:30 AM
<b>TCLP EXTRACTION</b>		Analyst: ALD					EPA 1311
Extraction Fluid Used	1.0				1		01/06/19 12:07 PM
Final pH	12.5	1.0			1		01/06/19 12:07 PM
Initial pH	11.1	1.0			1		01/06/19 12:07 PM
pH with HCl	1.9	1.0			1		01/06/19 12:07 PM



# Laboratory Results

## Geochemical Testing

Date: 14-Jan-19

CLIENT: AES Warrior Run Inc.  
 Lab Order: G1901240  
 Project: TCLP Ash Analysis  
 Lab ID: G1901240-003  
 Matrix: ASH

Client Sample ID: Bed Ash South  
 C91811/O45797  
 Sampled By: AES Warrior Run  
 Collection Date: 12/27/2018  
 Received Date: 1/4/2019 2:59:51 PM

Analyses	Result	QL	Q	Units	DF	Date Prepared	Date Analyzed
TCLP, non-volatile	NA				1		01/06/19 12:07 PM
<b>TCLP METALS</b>		Analyst: GXI				SM 3112 B	EPA 7470
Mercury	< 0.0020	0.0020		mg/L	1	01/08/19 9:10 AM	01/08/19 2:06 PM
<b>TCLP METALS</b>		Analyst: LXM				EPA 200.2	EPA 6010
Aluminum	0.2	0.1		mg/L	1	01/07/19 12:45 PM	01/10/19 10:47 PM
Antimony	< 0.10	0.10		mg/L	1	01/07/19 12:45 PM	01/09/19 8:31 PM
Arsenic	< 0.02	0.02		mg/L	1	01/07/19 12:45 PM	01/09/19 8:31 PM
Barium	0.7	0.3		mg/L	1	01/07/19 12:45 PM	01/09/19 8:31 PM
Beryllium	< 0.001	0.001		mg/L	1	01/07/19 12:45 PM	01/09/19 8:31 PM
Boron	0.28	0.05		mg/L	1	01/07/19 12:45 PM	01/10/19 10:47 PM
Cadmium	< 0.002	0.002		mg/L	1	01/07/19 12:45 PM	01/09/19 8:31 PM
Chromium	0.02	0.01		mg/L	1	01/07/19 12:45 PM	01/09/19 8:31 PM
Cobalt	< 0.005	0.005		mg/L	1	01/07/19 12:45 PM	01/09/19 8:31 PM
Copper	< 0.01	0.01		mg/L	1	01/07/19 12:45 PM	01/09/19 8:31 PM
Lead	< 0.02	0.02		mg/L	1	01/07/19 12:45 PM	01/09/19 8:31 PM
Lithium	0.32	0.01		mg/L	1	01/07/19 12:45 PM	01/09/19 8:31 PM
Manganese	< 0.01	0.01		mg/L	1	01/07/19 12:45 PM	01/10/19 10:47 PM
Molybdenum	0.08	0.02		mg/L	1	01/07/19 12:45 PM	01/10/19 10:47 PM
Nickel	< 0.01	0.01		mg/L	1	01/07/19 12:45 PM	01/09/19 8:31 PM
Selenium	< 0.02	0.02		mg/L	1	01/07/19 12:45 PM	01/10/19 10:47 PM
Silver	< 0.005	0.005		mg/L	1	01/07/19 12:45 PM	01/09/19 8:31 PM
Vanadium	0.009	0.005		mg/L	1	01/07/19 12:45 PM	01/10/19 10:47 PM
Zinc	0.08	0.01		mg/L	1	01/07/19 12:45 PM	01/09/19 8:31 PM

