



MIT

GenOn Mid-Atlantic, LLC
Dickerson Generating Station
21200 Martinsburg Road
Dickerson, Md 20842

Certified Mail/Return Receipt Requested
7016 3560 0000 7263 4095

Mr. Ed Dexter
Maryland Department of the Environment
Land Management Administration
1800 Washington Boulevard, Suite 605
Baltimore MD 21230-1719

February 27, 2019

Re: 2018 CCB Tonnage Report for GenOn Mid-Atlantic, LLC's Dickerson Generating Station.

Dear Mr. Dexter,

Pursuant to COMAR 26.04.10.08, enclosed please find the 2018 CCB Tonnage Report for GenOn Mid-Atlantic, LLC's Dickerson Generating Station.

If you have any questions regarding this report, please contact me at 301-601-6515, or at Bruce.Heimlicher@genon.com.

Regards,

Peter Heimlicher
Environmental Specialist
GenOn Mid-Atlantic, LLC

RECEIVED

MAR 01 2019

LAND MANAGEMENT ADMIN
SOLID WASTE PROGRAM

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

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MAR 01 2019

LAND MANAGEMENT ADMIN
SOLID WASTE PROGRAM

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

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.

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: Dickerson Generating Station

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: Dickerson Generating Station

Name of Permit Holder: GenOn MidAtlantic, LLC

Facility Address: 21200 Martinsburg Road
Street

Facility Address: Dickerson Maryland 20842
City State Zip

County: Montgomery

Contact Information (Person filing report or Environmental Manager)

Facility Telephone No.: 301-601-6500 Facility Fax No.: 301-601-6556

Contact Name: Peter Heimlicher

Contact Title: Environmental Specialist

Contact Address: 21200 Martinsburg Road
Street

Contact Address: Dickerson Maryland 20842
City State Zip

Contact Email: Bruce.Heimlicher@genon.com

Contact Telephone No.: 301-601-6515 Contact Fax No.: _____

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:

See Attachment A.

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 the change to this table from previous years, to include both the volume and weight of the types of CCBs your facility produces.

Volume and Weight of CCBs Generated for Calendar Year 2018			
<u>Fly Ash</u> Type of CCB	<u>Bottom Ash</u> Type of CCB	<u>On Spec Gypsum</u> Type of CCB	<u>WWTP Fines</u> Type of CCB
6,621	1,100	6,873	76
Volume of CCB, in Cubic Yards	Volume of CCB, in Cubic Yards	Volume of CCB, in Cubic Yards	Volume of CCB, in Cubic Yards
6,621	1,100	13,426	149
Weight of CCB, in Tons	Weight of CCB, in Tons	Weight of CCB, in Tons	Weight of CCB, in Tons

Additional notes:

CCB Tonnages are reported in dry short tons. CCB volumes are reported in dry Cubic Yards.

WWTP Tons represent fines from the Flue Gas Desulfurization's Waste Water Treatment

Volumes of Flyash in Dry Cubic Yards are calculated from dry short tons using a density of 1.0 Tons/Dry CY.

Volumes of Bottom Ash in Dry Cubic Yards are calculated from dry short tons using a density of 1.0 Tons/Dry CY.

Volumes of On-Spec Gypsum and WWTP Fines are calculated from dry short tons using a density of 1.95 Tons/Dry CY.

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:

All of the 6,621 tons of dry **flyash** generated at Dickerson in 2018 were disposed of at the Westland Ash Site, located in Montgomery Co., Md.

All of the 1,100 tons of **bottom ash** generated at Dickerson in 2018 were sent to the Westland Ash Site, located in Montgomery Co., Md for disposal.

On-Spec Gypsum generated at Dickerson in 2018 was 13,426 tons. Of this total, 1,544 tons were stored on-site at the end of 2017, and 1,190 tons were stored on-site at the end of 2018, and 13,780 tons were transported by barge to Continental, located in Buchanan, NY.

WWTP Fines produced in 2018 was 149 tons, all of which was disposed of at Waste Management's Amelia Landfill, located in Jetersville, Va.

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

On-Spec Gypsum:

Volume: 13,780 tons sold

Use: Wallboard

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:

FlyAsh: Approximately 6,600 tons/year to be generated and sent for beneficial re-use as input to portland cement at either Heidelburg - Lehigh in Union Bridge, MD or Argos Cement in Martinsburg, WV.

Bottom Ash: Anticipate 1,100 tons/year to be generated and sent for beneficial re-use as input to portland cement at either Heidelburg - Lehigh in Union Bridge, MD or Argos Cement in Martinsburg, WV.

On-Spec Gypsum: Anticipate 13,500 tons/year to be generated, with approximately 1,500 tons stored on site at the Dickerson Generating Station and approximately 12,000 tons/year being transported by barge to Continental, located in Buchanan, NY.

WWTP Fines: Approximately 150 tons/year to be generated and disposed of at Waste Management's Amelia Landfill located in Jetersville, Va.

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

On-Spec Gypsum: Volume: 12,000 tons/year to be sold.

Use: Wallboard

FlyAsh and BottomAsh: Volume: 7,700 tons per year to be sold

Use: Input to cement.

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

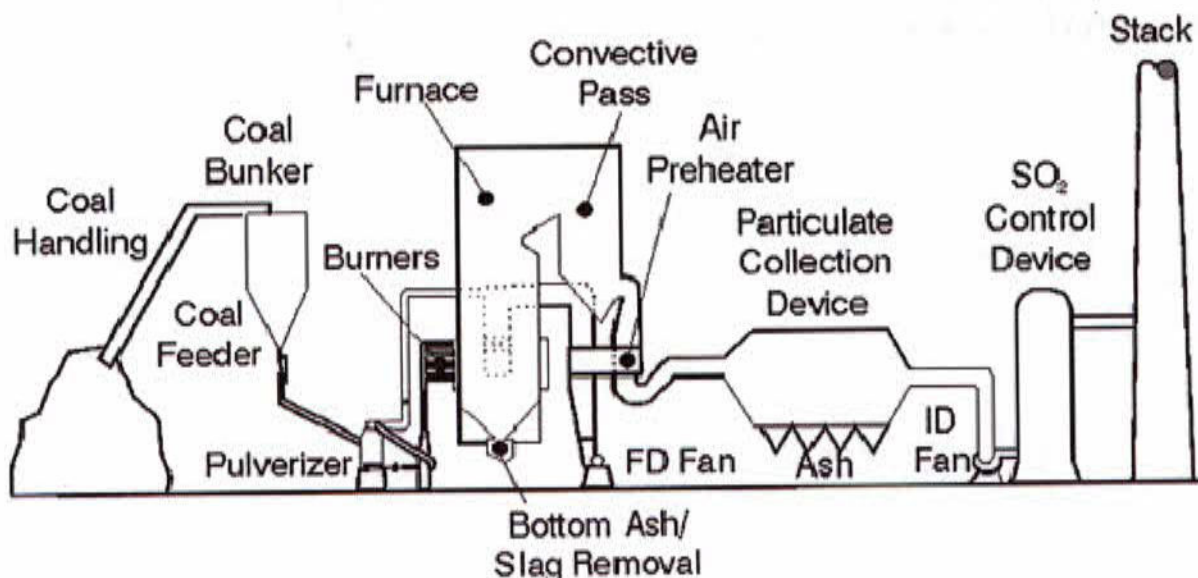
Attachment A

Dickerson Generating Station
21200 Martinsburg Road,
Dickerson, Montgomery County, MD. 20842
301-601-6500

The Dickerson Generating Station is located on the Potomac River, south of the Monocacy River in upper Montgomery County, near Dickerson, MD. The facility is engaged in the generation of electric energy for sale. The primary SIC code for this facility is 4911. The facility consists of three steam units, each rated at 173 MWs (base loaded), firing bituminous coal. Each unit is tangentially fired, with a superheater, reheat and economizer. Electrostatic precipitators (ESPs) and a baghouse are installed for particulate control. Low NOx burners, Separated Over-Fired Air (SOFA), Selective Non Catalytic Reduction (SNCR) along with an advanced combustion control system are installed on each unit to reduce and control emissions of oxides of nitrogen (NOx). A Wet Scrubber (FGD) was installed and went in service on the three units in late 2009. The units exhaust through the scrubber stack or, when the FGD is not in service, through a common 700 ft. stack.

Coal is delivered to the Dickerson facility by rail. The rail cars are emptied using a rotary dumper, then transferred by conveyor to either a storage pile or fed directly to a unit's bunker.

The illustration below shows a simple schematic diagram for a typical pulverized coal combustion system. The coal is prepared by grinding to a very fine consistency for combustion.



Attachment A

The CCBs currently produced and used are a result of the combustion of pulverized coal.

Ash is formed in the boiler while coal combusts. In general, pulverized coal combustion results in approximately 10 % ash, of which 65%–85% is fly ash, and the remainder is coarser bottom ash. Bottom ash is a coarse material and falls to the bottom of the boiler. Fly ash is finer than bottom ash and is carried along the combustion process with flue gas. Particulate collection devices remove fly ash from the flue gas and the collected ash is transferred to two ash silos. Fly ash that is not marketed is sent to the Westland Ash Site, whose property is separated from the Dickerson facility by a public road, and is also located in Montgomery County. The bottom ash is conveyed out of the bottom of the boiler via a wet sluice system to hydrobins, where the water is then decanted and the bottom ash sent to the Westland Ash Site, where it is often used in the construction of flyash disposal cells.

Gypsum is a byproduct of SO₂ removal by the Flue Gas Desulfurization (FGD) system, commonly known as a scrubber. Dickerson uses wet scrubbers for SO₂ removal. *Wet scrubbing* utilizes a chemical reaction with limestone alkaline sorbent to remove SO₂ from the air stream. The byproduct - gypsum - is sent by rail to the Morgantown Generating Station where it is then conveyed to a barge and transported to Continental located in Buchanan, New York where it is made into wallboard. Gypsum that doesn't meet the specifications for wallboard production is transported for disposal to Waste Management's Amelia Landfill in Virginia. Waste Water Treatment Plant Fines (WWTP Fines) are removed from the Scrubber's WWTP as needed and transported to Waste Management's Amelia Landfill in Virginia for disposal.



GEOCHEMICAL TESTING

Environmental and Energy Analysis

2005 N. Center Ave.
Somerset, PA 15501

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

Tuesday, September 4, 2018

Andrew Mcculloch
NRG - DICKERSON GENERATING STATION
21200 MARTINSBURG ROAD
DICKERSON, MD 20842

Order No.: G1808E00

Dear Andrew Mcculloch:

Geochemical Testing received 4 sample(s) on 8/23/2018 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



Geochemical Testing

Date: 04-Sep-18

CLIENT: NRG - DICKERSON GENERATING STA
Project:
Lab Order: G1808E00

CASE NARRATIVE

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

Legend: ND - Not Detected S - Spike Recovery outside accepted recovery limits
J - Indicates an estimated value R - RPD outside accepted recovery limits
U - The analyte was not detected at or above the listed concentration, which is below the laboratory quantitation limit E - Value above quantitation range
B - Analyte detected in the associated Method Blank ** - Value exceeds Action Limit
Q - Qualifier QL - Quantitation Limit DF - Dilution Factor H - Method Hold Time Exceeded
MCL - Contaminant Limit



Laboratory Results

Date: 04-Sep-18

Geochemical Testing

CLIENT:	NRG - DICKERSON GENERATING STATION	Client Sample ID:	Fly Ash
Lab Order:	G1808E00	Sampled By:	GenOn
Project:		Collection Date:	8/5/2018 12:00:00 PM
Lab ID:	G1808E00-001	Received Date:	8/23/2018 10:19:04 AM
Matrix:	ASH		

Analyses	Result	QL	Q	Units	DF	Date Prepared	Date Analyzed
FORMS OF SULFUR						Analyst: BAB	
Sulfate Sulfur	0.45	0.01		%-dry	1		ASTM 2492 08/27/18 9:00 AM
COLORIMETRIC SOLID ANIONS						Analyst: CML	
Sulfate	12000	130		mg/Kg	50.4	EPA 9038 08/31/18 1:32 PM	ASTM D516-02 () 09/01/18 12:23 PM
PHYSICAL TESTS						Analyst: ALD	
Paint Filter Test	NO Free Liquid	1.0			1		EPA 9095 08/23/18 6:05 PM
SOLID PH						Analyst: ALD	
Solid pH	4.17	1.00		S.U.	-1		EPA 9045 08/23/18 6:05 PM
Temperature	21.20			S.U.	1		08/23/18 6:05 PM



Laboratory Results

Geochemical Testing

Date: 04-Sep-18

CLIENT:	NRG - DICKERSON GENERATING STATION	Client Sample ID:	Bottom Ash
Lab Order:	G1808E00		
Project:		Sampled By:	GenOn
Lab ID:	G1808E00-002	Collection Date:	8/16/2018 12:30:00 PM
Matrix:	ASH	Received Date:	8/23/2018 10:19:04 AM

Analyses	Result	QL	Q	Units	DF	Date Prepared	Date Analyzed
FORMS OF SULFUR							
Sulfate Sulfur	< 0.01	0.01		% dry	1		ASTM 2492 08/27/18 9:00 AM
COLORIMETRIC SOLID ANIONS							
Sulfate	140	5.0		mg/Kg	1	EPA 9038 08/27/18 12:38 PM	ASTM D516-02 () 08/31/18 1:18 PM
PHYSICAL TESTS							
Paint Filter Test	NO Free Liquid	1.0			1		EPA 9095 08/23/18 6:05 PM
SOLID PH							
Solid pH	7.98	1.00		S.U.	1		EPA 9045 08/23/18 6:05 PM
Temperature	21.20			S.U.	1		08/23/18 6:05 PM

Laboratory Results

Date: 04-Sep-18

Geochemical Testing

CLIENT:	NRG - DICKERSON GENERATING STATION	Client Sample ID:	Gypsum
Lab Order:	G1808E00	Sampled By:	GenOn
Project:		Collection Date:	8/15/2018 1:00:00 PM
Lab ID:	G1808E00-003	Received Date:	8/23/2018 10:19:04 AM
Matrix:	SOLID		

Analyses	Result	QL	Q	Units	DF	Date Prepared	Date Analyzed
FORMS OF SULFUR		Analyst: BAB					ASTM 2492
Sulfate Sulfur	21.9	0.01		%-dry	1		08/27/18 9:00 AM
COLORIMETRIC SOLID ANIONS		Analyst: CML				EPA 9038	ASTM D516-02 (
Sulfate	29000	250		mg/Kg	50.1	08/27/18 12:38 PM	08/31/18 1:18 PM
PHYSICAL TESTS		Analyst: ALD					EPA 9095
Paint Filter Test	NO Free Liquid	1.0			1		08/23/18 6:05 PM
SOLID PH		Analyst: ALD					EPA 9045
Solid pH	7.70	1.00		S.U.	1		08/23/18 6:05 PM
Temperature	21.20			S.U.	1		08/23/18 6:05 PM



Laboratory Results

Geochemical Testing

Date: 04-Sep-18

CLIENT:	NRG - DICKERSON GENERATING STATION	Client Sample ID:	FGDWT Fines
Lab Order:	G1808E00		
Project:		Sampled By:	GenOn
Lab ID:	G1808E00-004	Collection Date:	8/15/2018 1:30:00 PM
Matrix:	SOLID	Received Date:	8/23/2018 10:19:04 AM

Analyses	Result	QL	Q	Units	DF	Date Prepared	Date Analyzed
FORMS OF SULFUR		Analyst: BAB					
Sulfate Sulfur	3.73	0.01		%-dry	1		ASTM 2492 08/27/18 9:00 AM
COLORIMETRIC SOLID ANIONS		Analyst: CML					
Sulfate	350	5.0		mg/Kg	1	08/27/18 12:38 PM	EPA 9038 ASTM D516-02 (08/31/18 1:18 PM
PHYSICAL TESTS		Analyst: ALD					
Paint Filter Test	NO Free Liquid	1.0			1		EPA 9095 08/23/18 6:05 PM
SOLID PH		Analyst: ALD					
Solid pH	8.09	1.00		S.U.	1		EPA 9045 08/23/18 6:05 PM
Temperature	21.20			S.U.	1		08/23/18 6:05 PM



Microbac Laboratories, Inc. - Baltimore

CERTIFICATE OF ANALYSIS

18H1346

NRG Energy - Dickerson

Project Name: Coal Combustion By Products

Andrew McCulloch
21200 Martinsburg Rd.
Dickerson, MD 20842

Project / PO Number: N/A
Received: 08/24/2018
Reported: 09/21/2018

Analytical Testing Parameters

Client Sample ID:	Fly Ash	Collected By:	a Letitner
Sample Matrix:	Solid	Collection Date:	08/15/2018 12:00
Lab Sample ID:	18H1346-01		

Wet Chemistry	Result	Limit(s)	RL	Units	Note	Prepared	Analyzed	Analyst
Method: SM 2540 G-11								
% Solids	100.0		0.05	% by Weight		08/28/18 1347	08/29/18 1040	LCR
Mercury, Total by EPA 7000 Series Methods								
Method: EPA 7471A								
Mercury	2.4		0.12	mg/kg dry		09/06/18 1158	09/07/18 1757	APS
Metals, Total by EPA 6000/7000 Series Methods								
Method: EPA 3050B/EPA 6010B								
Calcium	8700		400	mg/kg dry		08/28/18 0746	09/06/18 1851	APS
Iron	43000		40	mg/kg dry		08/28/18 0746	09/06/18 1651	APS
Lithium	56		40	mg/kg dry		08/28/18 0746	09/06/18 1651	APS
Potassium	3800		400	mg/kg dry		08/28/18 0746	09/06/18 1651	APS
Sodium	1200		400	mg/kg dry		08/28/18 0746	09/06/18 1651	APS
Method: EPA 3050B/EPA 6020								
Aluminum	26800		39.7	mg/kg dry		08/28/18 0926	09/06/18 1155	GHW
Antimony	<19.9		19.9	mg/kg dry		08/28/18 0926	09/06/18 1155	GHW
Arsenic	167		19.9	mg/kg dry		08/28/18 0926	09/06/18 1155	GHW
Barium	251		3.97	mg/kg dry		08/28/18 0926	09/06/18 1155	GHW
Beryllium	7.56		3.97	mg/kg dry		08/28/18 0926	09/06/18 1155	GHW
Cadmium	<1.99		1.99	mg/kg dry		08/28/18 0926	09/06/18 1155	GHW
Chromium	<79.4		79.4	mg/kg dry		08/28/18 0926	09/06/18 1155	GHW
Cobalt	17.3		3.97	mg/kg dry		08/28/18 0926	09/06/18 1155	GHW
Copper	51.7		3.97	mg/kg dry		08/28/18 0926	09/06/18 1155	GHW
Magnesium	1160		79.4	mg/kg dry		08/28/18 0926	09/06/18 1155	GHW
Molybdenum	30.7		19.9	mg/kg dry		08/28/18 0926	09/06/18 1155	GHW
Nickel	49.7		19.9	mg/kg dry		08/28/18 0926	09/06/18 1155	GHW
Nickel	37.2		19.9	mg/kg dry		08/28/18 0926	09/12/18 1010	LMH
Selenium	<3.97		3.97	mg/kg dry	B13	08/28/18 0926	09/06/18 1155	GHW
Silver	9.93		3.97	mg/kg dry		08/28/18 0926	09/06/18 1155	GHW
Thallium	<159		159	mg/kg dry		08/28/18 0926	09/06/18 1155	GHW
Vanadium	51.7		3.97	mg/kg dry		08/28/18 0926	09/06/18 1155	GHW
Lead								

Microbac Laboratories, Inc.

2101 Van Deman Street | Baltimore, MD 21224 | 410.633.1800 p | www.microbac.com



Microbac Laboratories, Inc. - Baltimore

CERTIFICATE OF ANALYSIS

18H1346

Client Sample ID: Fly Ash	Collected By: a Letitner
Sample Matrix: Solid	Collection Date: 08/15/2018 12:00
Lab Sample ID: 18H1346-01	

Metals, Total by EPA 6000/7000 Series Methods	Result	Limit(s)	RL	Units	Note	Prepared	Analyzed	Analyst
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Zinc	79.6		39.7	mg/kg dry		08/28/18 0926	09/06/18 1155	GHW
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TCLP Extraction by EPA 1311	Result	Limit(s)	RL	Units	Note	Prepared	Analyzed	Analyst
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Method: EPA 1311								
TCLP Extraction	COMPLETE D			N/A	H5, Q25	09/13/18 1630	09/14/18 1030	APS

TCLP Metals by 6000/7000 Series Methods	Result	Limit(s)	RL	Units	Note	Prepared	Analyzed	Analyst
---	--------	----------	----	-------	------	----------	----------	---------

Method: EPA 6010B								
Arsenic	<0.20		0.20	mg/L		09/17/18 1100	09/20/18 1716	APS
Barium	<0.20		0.20	mg/L		09/17/18 1100	09/20/18 1716	APS
Cadmium	<0.10		0.10	mg/L		09/17/18 1100	09/20/18 1716	APS
Chromium	<0.20		0.20	mg/L		09/17/18 1100	09/20/18 1716	APS
Lead	<0.20		0.20	mg/L		09/17/18 1100	09/20/18 1716	APS
Selenium	<0.40		0.40	mg/L		09/17/18 1100	09/20/18 1716	APS
Silver	<0.040		0.040	mg/L		09/17/18 1100	09/20/18 1716	APS

Method: EPA 7470A								
Mercury	0.0020	0.20	0.0020	mg/L		09/18/18 1230	09/18/18 1810	APS



Microbac Laboratories, Inc. - Baltimore

CERTIFICATE OF ANALYSIS

18H1346

Client Sample ID: Bottom Ash	Collected By: a Lettner
Sample Matrix: Solid	Collection Date: 08/15/2018 12:30
Lab Sample ID: 18H1346-02	

Wet Chemistry	Result	Limit(s)	RL	Units	Note	Prepared	Analyzed	Analyst
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Method: SM 2540 G-11								
% Solids	54.89		0.05	% by Weight		08/28/18 1347	08/29/18 1040	LCR

Mercury, Total by EPA 7000 Series Methods	Result	Limit(s)	RL	Units	Note	Prepared	Analyzed	Analyst
---	--------	----------	----	-------	------	----------	----------	---------

Method: EPA 7471A								
Mercury	<0.036		0.036	mg/kg dry		09/06/18 1158	09/07/18 1730	APS

Metals, Total by EPA 6000/7000 Series Methods	Result	Limit(s)	RL	Units	Note	Prepared	Analyzed	Analyst
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Method: EPA 3050B/EPA 6010B								
Calcium	3400		170	mg/kg dry		08/28/18 0746	09/06/18 1654	APS
Iron	54000		17	mg/kg dry		08/28/18 0746	09/06/18 1654	APS
Lithium	<17		17	mg/kg dry		08/28/18 0746	09/06/18 1654	APS
Potassium	940		170	mg/kg dry		08/28/18 0746	09/06/18 1654	APS
Sodium	290		170	mg/kg dry		08/28/18 0746	09/06/18 1654	APS

Method: EPA 3050B/EPA 6020								
Aluminum	8190		16.6	mg/kg dry		08/28/18 0926	09/06/18 1159	GHW
Antimony	<8.32		8.32	mg/kg dry		08/28/18 0926	09/06/18 1159	GHW
Arsenic	43.8		8.32	mg/kg dry		08/28/18 0926	09/06/18 1159	GHW
Barium	54.5		1.66	mg/kg dry		08/28/18 0926	09/06/18 1159	GHW
Beryllium	<1.66		1.66	mg/kg dry		08/28/18 0926	09/06/18 1159	GHW
Cadmium	<0.832		0.832	mg/kg dry		08/28/18 0926	09/06/18 1159	GHW
Chromium	<33.3		33.3	mg/kg dry		08/28/18 0926	09/06/18 1159	GHW
Cobalt	6.72		1.66	mg/kg dry		08/28/18 0926	09/06/18 1159	GHW
Copper	19.7		1.66	mg/kg dry		08/28/18 0926	09/06/18 1159	GHW
Magnesium	346		33.3	mg/kg dry		08/28/18 0926	09/06/18 1159	GHW
Molybdenum	<8.32		8.32	mg/kg dry		08/28/18 0926	09/06/18 1159	GHW
Nickel	25.5		8.32	mg/kg dry		08/28/18 0926	09/06/18 1159	GHW
Selenium	<8.32		8.32	mg/kg dry		08/28/18 0926	09/12/18 1014	LMH
Silver	<1.66		1.66	mg/kg dry	B13	08/28/18 0926	09/06/18 1159	GHW
Thallium	<1.66		1.66	mg/kg dry		08/28/18 0926	09/06/18 1159	GHW
Vanadium	<66.5		66.5	mg/kg dry		08/28/18 0926	09/06/18 1159	GHW
Lead	8.91		1.66	mg/kg dry		08/28/18 0926	09/06/18 1159	GHW
Zinc	21.4		16.6	mg/kg dry		08/28/18 0926	09/06/18 1159	GHW

TCLP Extraction by EPA 1311	Result	Limit(s)	RL	Units	Note	Prepared	Analyzed	Analyst
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Method: EPA 1311								
TCLP Extraction	COMPLETE D			N/A	H5, Q25	09/13/18 1630	09/14/18 1030	APS

Microbac Laboratories, Inc.



Microbac Laboratories, Inc. - Baltimore

CERTIFICATE OF ANALYSIS

18H1346

Client Sample ID: Bottom Ash	Collected By: a Letitner
Sample Matrix: Solid	Collection Date: 08/15/2018 12:30
Lab Sample ID: 18H1346-02	

TCLP Extraction by EPA 1311	Result	Limit(s)	RL	Units	Note	Prepared	Analyzed	Analyst
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TCLP Metals by 6000/7000 Series Methods	Result	Limit(s)	RL	Units	Note	Prepared	Analyzed	Analyst
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Method: EPA 6010B								
Arsenic	<0.20		0.20	mg/L		09/17/18 1100	09/20/18 1730	APS
Barium	0.29		0.20	mg/L		09/17/18 1100	09/20/18 1730	APS
Cadmium	<0.10		0.10	mg/L		09/17/18 1100	09/20/18 1730	APS
Chromium	<0.20		0.20	mg/L		09/17/18 1100	09/20/18 1730	APS
Lead	<0.20		0.20	mg/L		09/17/18 1100	09/20/18 1730	APS
Selenium	<0.40		0.40	mg/L		09/17/18 1100	09/20/18 1730	APS
Silver	<0.040		0.040	mg/L		09/17/18 1100	09/20/18 1730	APS

Method: EPA 7470A								
Mercury	<0.0020	0.20	0.0020	mg/L		09/18/18 1230	09/18/18 1821	APS



Microbac Laboratories, Inc. - Baltimore
 CERTIFICATE OF ANALYSIS
 18H1346

Client Sample ID:	Gypsum	Collected By:	a Letitner
Sample Matrix:	Solid	Collection Date:	08/15/2018 13:00
Lab Sample ID:	18H1346-03		

Wet Chemistry	Result	Limit(s)	RL	Units	Note	Prepared	Analyzed	Analyst
Method: SM 2540 G-11								
% Solids	80.59		0.05	% by Weight		08/28/18 1347	08/29/18 1040	LCR
Mercury, Total by EPA 7000 Series Methods								
Method: EPA 7471A								
Mercury	0.30		0.031	mg/kg dry		09/06/18 1158	09/07/18 1732	APS
Metals, Total by EPA 6000/7000 Series Methods								
Method: EPA 3050B/EPA 6010B								
Calcium	270000		1200	mg/kg dry		08/28/18 0746	09/11/18 1404	APS
Iron	1200		24	mg/kg dry		08/28/18 0746	09/06/18 1658	APS
Lithium	<24		24	mg/kg dry		08/28/18 0746	09/06/18 1658	APS
Potassium	<240		240	mg/kg dry		08/28/18 0746	09/06/18 1658	APS
Sodium	<240		240	mg/kg dry		08/28/18 0746	09/06/18 1658	APS
Method: EPA 3050B/EPA 6020								
Aluminum	349		24.0	mg/kg dry		08/28/18 0926	09/06/18 1203	GHW
Antimony	<12.0		12.0	mg/kg dry		08/28/18 0926	09/06/18 1203	GHW
Arsenic	<12.0		12.0	mg/kg dry		08/28/18 0926	09/06/18 1203	GHW
Barium	40.3		2.40	mg/kg dry		08/28/18 0926	09/06/18 1203	GHW
Beryllium	<2.40		2.40	mg/kg dry		08/28/18 0926	09/06/18 1203	GHW
Cadmium	<1.20		1.20	mg/kg dry		08/28/18 0926	09/06/18 1203	GHW
Chromium	<47.9		47.9	mg/kg dry		08/28/18 0926	09/06/18 1203	GHW
Cobalt	<2.40		2.40	mg/kg dry		08/28/18 0926	09/06/18 1203	GHW
Copper	3.91		2.40	mg/kg dry		08/28/18 0926	09/06/18 1203	GHW
Magnesium	323		47.9	mg/kg dry		08/28/18 0926	09/06/18 1203	GHW
Molybdenum	<12.0		12.0	mg/kg dry		08/28/18 0926	09/06/18 1203	GHW
Nickel	<12.0		12.0	mg/kg dry		08/28/18 0926	09/06/18 1203	GHW
Selenium	<12.0		12.0	mg/kg dry		08/28/18 0926	09/12/18 1018	LMH
Silver	<2.40		2.40	mg/kg dry	B13	08/28/18 0926	09/06/18 1203	GHW
Thallium	<2.40		2.40	mg/kg dry		08/28/18 0926	09/06/18 1203	GHW
Vanadium	<95.9		95.9	mg/kg dry		08/28/18 0926	09/06/18 1203	GHW
Lead	<2.40		2.40	mg/kg dry		08/28/18 0926	09/06/18 1203	GHW
Zinc	<24.0		24.0	mg/kg dry		08/28/18 0926	09/06/18 1203	GHW
TCLP Extraction by EPA 1311								
Method: EPA 1311								
TCLP Extraction	COMPLETE D			N/A	H5, Q25	09/13/18 1630	09/14/18 1030	APS

Microbac Laboratories, Inc.



Microbac Laboratories, Inc. - Baltimore

CERTIFICATE OF ANALYSIS

18H1346

Client Sample ID: Gypsum	Collected By: a Letitner
Sample Matrix: Solid	Collection Date: 08/15/2018 13:00
Lab Sample ID: 18H1346-03	

TCLP Extraction by EPA 1311	Result	Limit(s)	RL	Units	Note	Prepared	Analyzed	Analyst
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TCLP Metals by 6000/7000 Series Methods	Result	Limit(s)	RL	Units	Note	Prepared	Analyzed	Analyst
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Method: EPA 6010B

Arsenic	<0.20	0.20		mg/L		09/17/18 1100	09/20/18 1733	APS
Barium	<0.20	0.20		mg/L		09/17/18 1100	09/20/18 1733	APS
Cadmium	<0.10	0.10		mg/L		09/17/18 1100	09/20/18 1733	APS
Chromium	<0.20	0.20		mg/L		09/17/18 1100	09/20/18 1733	APS
Lead	<0.20	0.20		mg/L		09/17/18 1100	09/20/18 1733	APS
Selenium	<0.40	0.40		mg/L		09/17/18 1100	09/20/18 1733	APS
Silver	<0.040	0.040		mg/L		09/17/18 1100	09/20/18 1733	APS

Method: EPA 7470A

Mercury	<0.0020	0.20	0.0020	mg/L		09/18/18 1230	09/18/18 1823	APS
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Microbac Laboratories, Inc. - Baltimore

CERTIFICATE OF ANALYSIS

18H1346

Client Sample ID: FGDWT Fines	Collected By: a Lettner
Sample Matrix: Solid	Collection Date: 08/15/2018 13:30
Lab Sample ID: 18H1346-04	

Wet Chemistry	Result	Limit(s)	RL	Units	Note	Prepared	Analyzed	Analyst
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Method: SM 2540 G-11								
% Solids	46.08		0.05	% by Weight		08/28/18 1347	08/29/18 1040	LCR

Mercury, Total by EPA 7000 Series Methods	Result	Limit(s)	RL	Units	Note	Prepared	Analyzed	Analyst
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Method: EPA 7471A								
Mercury	18		1.1	mg/kg dry		09/06/18 1158	09/07/18 1752	APS

Metals, Total by EPA 6000/7000 Series Methods	Result	Limit(s)	RL	Units	Note	Prepared	Analyzed	Analyst
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Method: EPA 3050B/EPA 6010B								
Calcium	200000		1100	mg/kg dry		08/28/18 0746	09/06/18 1705	APS
Iron	27000		22	mg/kg dry		08/28/18 0746	09/06/18 1701	APS
Lithium	<22		22	mg/kg dry		08/28/18 0746	09/06/18 1701	APS
Potassium	4600		220	mg/kg dry		08/28/18 0746	09/06/18 1701	APS
Sodium	430		220	mg/kg dry		08/28/18 0746	09/06/18 1701	APS

Method: EPA 3050B/EPA 6020								
Aluminum	11200		21.7	mg/kg dry		08/28/18 0926	09/06/18 1206	GHW
Antimony	<10.8		10.8	mg/kg dry		08/28/18 0926	09/06/18 1206	GHW
Arsenic	55.4		10.8	mg/kg dry		08/28/18 0926	09/06/18 1206	GHW
Barium	731		2.17	mg/kg dry		08/28/18 0926	09/06/18 1206	GHW
Beryllium	<2.17		2.17	mg/kg dry		08/28/18 0926	09/06/18 1206	GHW
Cadmium	1.54		1.08	mg/kg dry		08/28/18 0926	09/06/18 1206	GHW
Chromium	59.1		43.4	mg/kg dry		08/28/18 0926	09/06/18 1206	GHW
Cobalt	12.0		2.17	mg/kg dry		08/28/18 0926	09/06/18 1206	GHW
Copper	38.3		2.17	mg/kg dry		08/28/18 0926	09/06/18 1206	GHW
Magnesium	9570		43.4	mg/kg dry		08/28/18 0926	09/06/18 1206	GHW
Molybdenum	<10.8		10.8	mg/kg dry		08/28/18 0926	09/06/18 1206	GHW
Nickel	77.2		10.8	mg/kg dry		08/28/18 0926	09/06/18 1206	GHW
Selenium	115		10.8	mg/kg dry		08/28/18 0926	09/06/18 1206	GHW
Silver	<2.17		2.17	mg/kg dry	B13	08/28/18 0926	09/06/18 1206	GHW
Thallium	<2.17		2.17	mg/kg dry		08/28/18 0926	09/06/18 1206	GHW
Vanadium	<86.8		86.8	mg/kg dry		08/28/18 0926	09/06/18 1206	GHW
Lead	18.9		2.17	mg/kg dry		08/28/18 0926	09/06/18 1206	GHW
Zinc	168		21.7	mg/kg dry		08/28/18 0926	09/06/18 1206	GHW

TCLP Extraction by EPA 1311	Result	Limit(s)	RL	Units	Note	Prepared	Analyzed	Analyst
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Method: EPA 1311								
TCLP Extraction	COMPLETE D			N/A	H5, Q25	09/13/18 1630	09/14/18 1030	APS

Microbac Laboratories, Inc.



Microbac Laboratories, Inc. - Baltimore

CERTIFICATE OF ANALYSIS

18H1346

Client Sample ID: FGDWT Fines	Collected By: a Letitner
Sample Matrix: Solid	Collection Date: 08/15/2018 13:30
Lab Sample ID: 18H1346-04	

TCLP Extraction by EPA 1311

Result	Limit(s)	RL	Units	Note	Prepared	Analyzed	Analyst
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TCLP Metals by 6000/7000 Series Methods	Result	Limit(s)	RL	Units	Note	Prepared	Analyzed	Analyst
Method: EPA 6010B								
Arsenic	<0.20		0.20	mg/L		09/17/18 1100	09/20/18 1737	APS
Barium	<0.20		0.20	mg/L		09/17/18 1100	09/20/18 1737	APS
Cadmium	<0.10		0.10	mg/L		09/17/18 1100	09/20/18 1737	APS
Chromium	<0.20		0.20	mg/L		09/17/18 1100	09/20/18 1737	APS
Lead	<0.20		0.20	mg/L		09/17/18 1100	09/20/18 1737	APS
Selenium	<0.40		0.40	mg/L		09/17/18 1100	09/20/18 1737	APS
Silver	<0.040		0.040	mg/L		09/17/18 1100	09/20/18 1737	APS

Method: EPA 7470A	Result	Limit(s)	RL	Units	Note	Prepared	Analyzed	Analyst
Mercury	<0.0020	0.20	0.0020	mg/L		09/18/18 1230	09/18/18 1826	APS

Results in bold have exceeded a limit defined for this project. Limits are provided for reference but as regulatory limits change frequently, Microbac Laboratories, Inc. advises the recipient of this report to confirm such limits and units of concentration with the appropriate Federal, state or local authorities before acting on the data.

Definitions

- B13:** Target analyte detected in initial calibration blank >2.2 times the MDL but less than the reporting limit. Sample result was less than the reporting limit. No impact on data.
- H5:** Sample was extracted past required extraction holding time but was analyzed within analysis holding time.
- Q25:** TCLP extract temperature was not in 21-25°C ranged during the entire extraction period.
- RL:** Reporting Limit

Project Requested Certification(s)

Microbac Laboratories, Inc. - Baltimore E871126 Florida - NELAC

Report Comments

Samples were received in proper condition and the reported results conform to applicable accreditation standard unless otherwise noted.

The data and information on this, and other accompanying documents, represents only the sample(s) analyzed. This report is incomplete unless all pages indicated in the footnote are present and an authorized signature is included.

Reviewed and Approved By:

Jake Mason Client Relations Reported: 09/21/2018 13:02

MICROBAC

GenOn Dickerson Generating Station
 Annual CCB Analysis List
 (CCB - Fly Ash, Bottom Ash, FGD WWTP Fines & Synthetic Gypsum)

Analysis	Test Method	
Chloride	USGS I-1187-85	Geochemical Testing @ 814-443-1671 Elwood L. Kennell (Woody) ekennell@geo-ces.com
Sulfate as SO4	ASTM D516-02 (M)	Geochemical Testing
pH (as received)	EPA 9045	Geochemical Testing
Paint Filter Test	EPA 8096	Geochemical Testing
Sulfate / Sulfur	ASTM D 2492	Geochemical Testing
TCLP Metals	EPA 6010B	Microbac
Silver	EPA 6010B	Microbac
Arsenic	EPA 6010B	Microbac
Barium	EPA 6010B	Microbac
Cadmium	EPA 6010B	Microbac
Chromium	EPA 6010B	Microbac
Mercury	SW846 7471A	Microbac
Lead	EPA 6010B	Microbac
Selenium	EPA 6010B	Microbac
		Microbac
Total Metals		Microbac
Silver	EPA 6010B	Microbac
Aluminum	EPA 6010B	Microbac
Arsenic	EPA 6010B	Microbac
Antimony	EPA 6010B	Microbac
Barium	EPA 6010B	Microbac
Beryllium	EPA 6010B	Microbac
Calcium	EPA 6010B	Microbac
Cadmium	EPA 6010B	Microbac
Cobalt	EPA 6010B	Microbac
Copper	EPA 6010B	Microbac
Chromium	EPA 6010B	Microbac
Iron	EPA 6010B	Microbac
Lead	EPA 6010B	Microbac
Lithium	EPA 6010B	Microbac
Potassium	EPA 6010B	Microbac
Magnesium	EPA 6010B	Microbac
Mercury	SW846 7471A	Microbac
Molybdenum	EPA 6010B	Microbac
Nickel	EPA 6010B	Microbac
Selenium	EPA 6010B	Microbac
Sodium	EPA 6010B	Microbac
Sulfur	EPA 6010B	Microbac
Thallium	EPA 6010B	Microbac
Vanadium	EPA 6010B	Microbac
Zinc	EPA 6010B	Microbac



2 of 2

Cooler Receipt Form / Sample Acceptance & Noncompliance Form

Microbac Laboratories, Inc., Baltimore Division
Control # 606-03
Effective Date: 11/30/2016
Page 1 of 1

Number of Coolers Received: 1
Client: NRG - Dickerson
Form Completed By: Tiffy Bach
Shipper:
Custody Tape Intact:
Containers Intact:
Sample Received on Ice or refrigerated:

Chain of Custody Present with shipment:
Sample Bottle IDs agree with COC:
Preservation requirements met:
Correct Number of Containers / Sample Volume:
Headspace in container:
Type of Sample:

Receipt Date / Time: 8/23/18/
Work Order # _____

Microbac Client UPS FedEx

YES / NO / NA

YES / NO

YES / NO / NA

Infrared (IR) Temperature: 3.4 °C

YES / NO

YES / NO

YES / NO / Not Checked

YES / NO (If No, contact client immediately)

YES / NO / NA

Water Soil Wipes Oil Filter Solid

Sludge Food Swab Other

Container Type / Quantity:

A -	Unpreserved	H2SO4	HNO3	HCl	NaOH	NaOH/Ascorbic Acid:	If preserved pH <2, pH >10
B -	Unpreserved	H2SO4	HNO3	HCl	NaOH	NaOH/Ascorbic Acid	If preserved pH <2, pH >10
C -	Unpreserved	H2SO4	HNO3	HCl	NaOH	NaOH/Ascorbic Acid	If preserved pH <2, pH >10
D -	Unpreserved	H2SO4	HNO3	HCl	NaOH	NaOH/Ascorbic Acid	If preserved pH <2, pH >10
E -	Unpreserved	H2SO4	HNO3	HCl	NaOH	NaOH/Ascorbic Acid	If preserved pH <2, pH >10
H -	Unpreserved	H2SO4	HNO3	HCl	NaOH	NaOH/Ascorbic Acid	If preserved pH <2, pH >10
K -	Unpreserved	H2SO4	HNO3	HCl	NaOH	NaOH/Ascorbic Acid	If preserved pH <2, pH >10
L -	Unpreserved	H2SO4	HNO3	HCl	NaOH	NaOH/Ascorbic Acid	If preserved pH <2, pH >10
M -	Unpreserved	H2SO4	HNO3	HCl	NaOH	NaOH/Ascorbic Acid	If preserved pH <2, pH >10
P -	Unpreserved	H2SO4	HNO3	HCl	NaOH	NaOH/Ascorbic Acid	If preserved pH <2, pH >10
W -	Unpreserved	H2SO4	HNO3	HCl	NaOH	NaOH/Ascorbic Acid	If preserved pH <2, pH >10
V -	Unpreserved	HCl	HCl / Ascorbic Acid	HCl / NaTHIO	(Checked at time of Analysis)		
F -	Unpreserved	NaTHIO (Checked at time of Analysis)					
S -	Unpreserved	NaTHIO (Checked at time of Analysis)					
SN -	Unpreserved	NaTHIO / EDTA (Checked at time of Analysis)					
4	Unpreserved	H2SO4	HNO3	HCl	NaOH	NaOH/Ascorbic Acid	If preserved pH <2, pH >10
2	Unpreserved	H2SO4	HNO3	HCl	NaOH	NaOH/Ascorbic Acid	If preserved pH <2, pH >10
1	Unpreserved	H2SO4	HNO3	HCl	NaOH	NaOH/Ascorbic Acid	If preserved pH <2, pH >10

Bags
1 bag 2 bags
0 bottles

Describe preservation requirements not met:

All Acid preserved <2 pH NaOH preserved >12 pH All others >2 and <10 (usually 4-8)

Sample ID: _____ H₂SO₄ HNO₃ NaOH _____ mls added
Sample ID: _____ H₂SO₄ HNO₃ NaOH _____ mls added
Sample ID: _____ H₂SO₄ HNO₃ NaOH _____ mls added
Sample ID: _____ H₂SO₄ HNO₃ NaOH _____ mls added

H₂SO₄ - Sulfuric Acid, HNO₃ - Nitric Acid, NaOH - Sodium Hydroxide, ASC - Ascorbic Acid, NaTHIO - Sodium Thiosulfate

Describe Anomalies: _____

Contact information / Summary of Actions:

Date / Time: _____ Contact: _____ Contact By: _____
Comments: _____
