mostardi platt

NESHAP Chlorine Compliance Emissions Test Report

Verso Corporation
Quinnesec Mill
Bleach Plant D100 and D1D2 ClO_2 Scrubber Systems
Quinnesec, Michigan
August 18, 2015

Report Submittal Date
September 9, 2015

Project No. M153105

888 Industrial Drive
Elmhurst, Illinois 60126
630-993-2100

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
AIR QUALITY DIVISION

RENEWABLE OPERATING PERMIT
REPORT CERTIFICATION

Authorized by 1994 P.A. 451, as amended. Failure to provide this information may result in civil and/or criminal penalties.

Reports submitted pursuant to R 336.1213 (Rule 213), subrules (3)(c) and/or (4)(c), of Michigan's Renewable Operating (RO) Permit program must be certified by a responsible official. Additional information regarding the reports and documentation listed below must be kept on file for at least 5 years, as described in General Condition No. 22 in the RO Permit and be made available to the Department of Environmental Quality, Air Quality Division upon request.

Source Name VERSO Quinnesec LLC County DICKINSON

Source Address W-6791 U.S. HIGHWAY 2 City NORWAY

AQD Source ID (SRN) B7192 RO Permit No. MI-ROP-B7192-2013 RO Permit Section No. 01 *

Please check the appropriate box(es):

☐ **Annual Compliance Certification (General Condition No. 28 and No. 29 of the RO Permit)**

Reporting period (provide inclusive dates): From _____ To _____

☐ 1. During the entire reporting period, this source was in compliance with **ALL** terms and conditions contained in the RO Permit, each term and condition of which is identified and included by this reference. The method(s) used to determine compliance is/are the method(s) specified in the RO Permit.

☐ 2. During the entire reporting period this source was in compliance with all terms and conditions contained in the RO Permit, each term and condition of which is identified and included by this reference, **EXCEPT** for the deviations identified on the enclosed deviation report(s). The method used to determine compliance for each term and condition is the method specified in the RO Permit, unless otherwise indicated and described on the enclosed deviation report(s).

☐ **Semi-Annual (or More Frequent) Report Certification (General Condition No. 23 of the RO Permit)**

Reporting period (provide inclusive dates): From _____ To _____

☐ 1. During the entire reporting period, **ALL** monitoring and associated recordkeeping requirements in the RO Permit were met and no deviations from these requirements or any other terms or conditions occurred.

☐ 2. During the entire reporting period, all monitoring and associated recordkeeping requirements in the RO Permit were met and no deviations from these requirements or any other terms or conditions occurred, **EXCEPT** for the deviations identified on the enclosed deviation report(s).

☒ **Other Report Certification**

Reporting period (provide inclusive dates): From _____ To _____

Additional monitoring reports or other applicable documents required by the RO Permit are attached as described:

NESHAP - Bleach Plant Performance Test Report.

I certify that, based on information and belief formed after reasonable inquiry, the statements and information in this report and the supporting enclosures are true, accurate and complete.

Michael LaVerdiere	Mill Manager	906 779-3200
Name of Responsible Official (print or type)	Title	Phone Number
Signature of Responsible Official		Date 9/10/15

* Photocopy this form as needed.

EQP 5736 (Rev 9/01)

1.0 EXECUTIVE SUMMARY

MOSTARDI PLATT conducted a NESHAP chlorine emission compliance test program for Verso Corporation at the Quinnesec Mill on the Bleach Plant D100 and D1D2 ClO_2 Scrubber Systems on August 18, 2015. This report summarizes the results of the test program and test methods used.

The test location, test date, and test parameter are summarized below.

TEST INFORMATION		
Test Location	**Test Date**	**Test Parameter**
Bleach Plant D100 and D1D2 ClO_2 Scrubber Systems	August 18, 2015	Chlorine (Cl_2)

The purpose of the test program was to demonstrate compliance with the NESHAP emission standards. Selected results of the test program are summarized below. A complete summary of emission test results follows the narrative portion of this report.

TEST RESULTS			
Test Location	**Test Parameter**	**NESHAP Emission Standards**	**Emission Rates**
Bleach Plant D100 Inlet	Cl_2	N/A	1.76 ppm
			0.04 lb/hr
Bleach Plant D1D2 ClO_2 Scrubber Inlets (A and B)		N/A	17.79 ppm
			1.06 lb/hr
Bleach Plant D100 and D1D2 ClO_2 Scrubber Outlet		< 10 ppmvd at the scrubber outlet	0.00 ppmvd*
		N/A	0.00 lb/hr*
Bleach Plant D100 and D1D2 ClO_2 Scrubber Systems		99% Removal Efficiency by weight (lb/hr)	100 %*

*The ClO_2 fraction was non-detect and therefore the Cl_2 fraction results are not applicable. However, results are reported as zero above.

Operating data as provided by Verso Corporation are included in Appendix A.

The identifications of individuals associated with the test program are summarized below.

TEST PERSONNEL INFORMATION		
Location	**Address**	**Contact**
Test Facility	Verso Corporation U.S. Highway 2 Quinnesec, Michigan 49876	Mr. Rich Menard (906) 779-3642 Rich.menard@versopaper.com
Testing Company Representative	Mostardi Platt 888 Industrial Drive Elmhurst, Illinois 60126	Mr. Timothy Mei Project Manager (630) 993-2100 (phone) tmei@mp-mail.com

The test crew consisted of Ms. J. Schlesinger and Messrs. C. Eldridge, S. Van Daal, and T. Mei of Mostardi Platt.

2.0 TEST METHODOLOGY

Emissions testing were conducted following the methods specified in 40 CFR Part 60, Appendix A. Drawings depicting the test location and sampling trains are found in Appendices B and C, respectively. Explanations of nomenclature and calculations are found in Appendix D. Sample analysis data are found in Appendix E. Reference method data and field data sheets for each run are found in Appendices F and G, respectively.

The following methodologies were used during the test program:

Method 1 Traverse Point Determination

Test measurement points were selected in accordance with Method 1. The characteristics of the measurement locations are summarized below.

TEST POINT INFORMATION						
Location	Diameter (Feet)	Area (Square Feet)	Upstream Diameters	Downstream Diameters	Test Parameter	Number of Sampling Points
D100 Scrubber Stack	1.3	1.33	>0.5	>2.0	Volumetric Flow	16
D1D2 Scrubber Stack	2.0	3.14	>0.5	>2.0	Volumetric Flow	16

Method 2 Volumetric Flow Rate Determination

Gas velocity was measured following Method 2, 40 CFR, Part 60, Appendix A, for purposes of calculating stack gas volumetric flow rate at the outlets. An S-type pitot tube, as a component of the isokinetic sampling trains, differential pressure gauge, thermocouple and temperature readout were used to determine gas velocity at each sample point. All of the equipment used was calibrated in accordance with the specifications of the method. Calibration data are presented in Appendix H.

Method 3 Oxygen (O_2)/Carbon Dioxide (CO_2) Determination

Stack gas molecular weight was determined in accordance with Method 3. A Fyrite gas analyzer was used to determine stack gas oxygen and carbon dioxide content and, by difference, nitrogen content. All of the equipment used was calibrated in accordance with the specifications of the Method.

Moisture Determination

The moisture content of the flue gas was determined utilizing the Modified Method 26A sampling train. This was performed for the purposes of determining volumetric flow at the outlets. The impingers were placed in an ice bath to maintain the sampled gas passed through the silica gel impinger outlet below 68°F in order to increase the accuracy of the sampled dry gas volume measurement. The test train was weighed prior to and after each test run to determine the mass of moisture condensed.

After each run, a leak check of the sampling train was performed at a vacuum greater than the sampling vacuum to determine if any leakage had occurred during sampling. Following the leak check, the impingers were removed from the ice bath and weighed.

All of the equipment used was calibrated in accordance with the specifications of the Method. Calibration data are presented in Appendix H.

Method 26A Chlorine (Cl_2) Determination

Cl_2 concentrations were determined in accordance with Method 26A, 40CFR60, Appendix Awith modifications from the Pulp and Paper NESHAP Subpart S. An Environmental Supply Company, Inc. sampling train was used to collect the sample. Each gas sample was extracted from a single point in the gas stream. The samples were collected in a series of 30 ml Greenburg-Smith impingers containing potassium iodide (KI) and analyzed by an iodometric method. The first two impingers contained 20 mls each of potassium iodide. The pH of the KI was checked to verify it is 7.5 prior to sampling. Prior to and after sampling, each sample train was leak checked and weighed to determine the moisture content of the gas stream. The gas sample was extracted through a Teflon probe at a constant sampling rate of 0.2 liters per minute for 60 minutes or until the second impinger had a slight yellow color. After the leak check, the Teflon line was rinsed with deionized water into the impinger solutions. The combined contents of the first two impingers were then titrated immediately. Sample was performed by the test crew at the test site.

After sampling the solution, was titrated on site with a standardized 0.01 N solution of sodium thiosulfate until the pale yellow color disappears. This endpoint was the neutral endpoint and was recorded. Ten ml of 10% sulfuric acid was then added. The solution was mixed and allowed to sit for one minute. The titration was then continued until the yellow color disappeared again. Several drops of starch solution were added and the titrations continue until the blue color disappeared. The total volume of titrant required to achieve the second endpoint plus the first endpoint was recorded. This was the total acid endpoint. All of the equipment used was calibrated in accordance with the specifications of the method. Calibration data are found in Appendix H.

3.0 TEST RESULTS SUMMARIES

Chlorine (Cl_2) & Chlorine Dioxide (ClO_2) Test Results Summary
Verso Corporation
Quinnesec, MI Facility
D100 Inlet & Outlet Ducts

Run No.	Location	Date	Time		Meter Volume, dscf	ClO_2 ppm	Cl_2 ppm If ClO_2 ppm is not Zero (6a)	DSCFM	ClO_2 lbs/hr	Cl_2 lbs/hr
1	D100 Inlet Duct	8/18/2015	11:07:00 AM	12:07:00 PM	0.59	6.48	2.90	2761	0.19	0.04
2	D100 Inlet Duct	8/18/2015	12:30:00 PM	1:30:00 PM	0.62	14.99	1.07	2766	0.44	0.03
3	D100 Inlet Duct	8/18/2015	1:45:00 PM	2:45:00 PM	0.57	12.31	1.31	2733	0.36	0.04
Average						11.26	1.76	2753	0.33	0.04

Run No.	Location	Date	Time		Meter Volume, dscf	ClO_2 ppm	Cl_2 ppm If ClO_2 ppm is not Zero (6a)	DSCFM	ClO_2 lbs/hr	Cl_2 lbs/hr
1	D100 Outlet Duct	8/18/2015	11:07:00 AM	12:07:00 PM	0.47	0.00	NA	2761	0.00	N/A
2	D100 Outlet Duct	8/18/2015	12:30:00 PM	1:30:00 PM	0.36	0.00	NA	2766	0.00	N/A
3	D100 Outlet Duct	8/18/2015	1:45:00 PM	2:45:00 PM	0.42	0.00	NA	2733	0.00	N/A
Average						0.00	NA	2753	0.00	N/A

Chlorine (Cl_2) & Chlorine Dioxide (ClO_2) Test Results Summary
Verso Corporation
Quinnesec, MI Facility
D1D2 Inlet Ducts

Run No.	Location	Date	Time		Meter Volume, dscf	ClO_2 ppm	Cl2 ppm If ClO2 ppm is not Zero (6a)	DSCFM	ClO_2 lbs/hr	Cl_2 lbs/hr
1A	D1D2 Inlet Duct	8/18/2015	7:00:00 AM	7:10:00 AM	0.11	326.15	26.17	0	0.00	0.00
2A	D1D2 Inlet Duct	8/18/2015	8:12:00 AM	8:22:00 AM	0.12	355.50	21.47	0	0.00	0.00
3A	D1D2 Inlet Duct	8/18/2015	9:25:00 AM	9:35:00 AM	0.11	418.86	20.14	0	0.00	0.00
Average						366.84	22.59	0.00	0.00	0.00

Run No.	Location	Date	Time		Meter Volume, dscf	ClO_2 ppm	Cl_2 ppm If ClO_2 ppm is not Zero (6a)	DSCFM	ClO_2 lbs/hr	Cl2 lbs/hr
1B	D1D2 Inlet Duct	8/18/2015	7:30:00 AM	7:40:00 AM	0.11	360.70	15.03	0	0.00	0.00
2B	D1D2 Inlet Duct	8/18/2015	8:42:00 AM	8:52:00 AM	0.11	488.97	8.63	0	0.00	0.00
3B	D1D2 Inlet Duct	8/18/2015	9:55:00 AM	10:05:00 AM	0.11	374.02	15.27	0	0.00	0.00
Average						407.90	12.98	0.00	0.00	0.00

Average Of A & B D1D2 Inlet Duct Runs

Run No.	Location	Date	Time		Meter Volume, dscf	ClO_2 ppm	Cl_2 ppm If ClO_2 ppm is not Zero (6a)	DSCFM	ClO_2 lbs/hr	Cl_2 lbs/hr
1A + 1B	D1D2 Inlet Duct	8/18/2015	7:00:00 AM	7:40:00 AM	0.11	343.43	20.60	5320	19.36	1.21
2A + 2B	D1D2 Inlet Duct	8/18/2015	8:12:00 AM	8:52:00 AM	0.12	422.24	15.05	5397	24.15	0.90
3A + 3B	D1D2 Inlet Duct	8/18/2015	9:25:00 AM	10:05:00 AM	0.11	396.44	17.71	5522	23.20	1.08
Average						387.37	17.79	5413	22.24	1.06

Chlorine (Cl2) & Chlorine Dioxide (ClO2) Test Results Summary
Verso Paper

Quinnesec, MI Facility

D1D2 Outlet Ducts

Run No.	Location	Date	Time		Meter Volume, dscf	ClO_2 ppm	Cl_2 ppm If ClO_2 ppm is not Zero (6a)	DSCFM	ClO_2 lbs/hr	Cl_2 lbs/hr
1	D1D2 Outlet Duct	8/18/2015	7:00:00 AM	8:00:00 AM	0.62	0.00	NA	5320	0.00	N/A
2	D1D2 Outlet Duct	8/18/2015	8:12:00 AM	9:12:00 AM	0.59	0.00	NA	5397	0.00	N/A
3	D1D2 Outlet Duct	8/18/2015	9:25:00 AM	10:25:00 AM	0.52	0.00	NA	5522	0.00	N/A
Average						0.00	NA	5413	0.00	N/A

4.0 CERTIFICATION

MOSTARDI PLATT is pleased to have been of service to Verso Corporation. If you have any questions regarding this test report, please do not hesitate to contact us at 630-993-2100.

CERTIFICATION

As program manager, I hereby certify that this test report represents a true and accurate summary of emissions test results and the methodologies employed to obtain those results, and the test program was performed in accordance with the methods specified in this test report.

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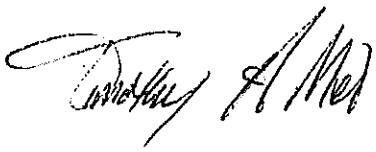
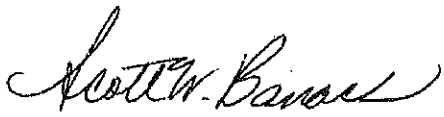


Program Manager

Timothy A. Mei



Quality Assurance

Scott Banach