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Mercury and Air Toxics Standard Particulate Matter and Hydrogen Chloride Emissions Test Report

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We Energies
Presque Isle Power Plant
Flue 5 Stack
Marquette, Michigan
Project No. M161902F
May 16, 2016

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We Energies
Presque Isle Power Plant
Flue 5 Stack
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May 16, 2016

Report Submittal Date
July 20, 2016

Project No. M161902F

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

1.0 EXECUTIVE SUMMARY

MOSTARDI PLATT conducted a Mercury and Air Toxics Standards (MATS) filterable particulate matter and hydrogen chloride emissions test program for the We Energies at the Presque Isle Power Plant on the Flue 5 Stack in Marquette, Michigan on May 16, 2016. This report summarizes the results of the test program and test methods used.

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

TEST INFORMATION		
Test Location	**Test Date**	**Test Parameters**
Flue 5 Stack	May 16, 2016	Filterable Particulate Matter (FPM) and Hydrogen Chloride (HCl)

The purpose of the test program was to document FPM and HCl emissions to qualify for the LEE designation as required by 40 CFR Part 63, Subpart UUUUU. 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**	**Emission Limits**	**Emission Rates**
Flue 5 Stack	FPM	≤0.030 lb/mmBtu	0.0014 lb/mmBtu
	HCl	≤0.002 lb/mmBtu	0.0002 lb/mmBtu

Emissions on lb/mmBtu basis were determined using a standard F_d-Factor of 9,820 dscf/mmBtu for sub-bituminous coal. Plant operating data as provided by We Energies is included in Appendix A.

One of the test ports was obstructed and Mostardi Platt sampled at two ports, six points each instead of the four ports, three points as outlined in the test protocol. Mostardi Platt does not believe that this impacted the data that was collected.

The Stationary Source Audit Sample Program audit sample was obtained from ERA and submitted for analysis to Maxxam Analytical. The results of the audit sample was compared to the assigned value by ERA and found to be acceptable. The audit sample result and evaluation are appended to this report.

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

TEST PERSONNEL INFORMATION		
Location	**Address**	**Contact**
Test Coordinator	We Energies 333 West Everett Street Environmental Department A231 Milwaukee, Wisconsin 53203	Mr. Rob Bregger (414) 221-2772 (phone) rob.bregger@we-energies.com
Test Facility	We Energies Presque Isle Power Plant 2701 Lakeshore Boulevard, North Marquette, Michigan 49885	Ms. Brenda Bergemann (414) 221-2453 (phone) brenda.bergemann@we-energies.com
Testing Company Representative	Mostardi Platt 888 Industrial Drive Elmhurst, Illinois 60126	Mr. Rich Sollars Project Manager (630) 993-2100 (phone) rsollars@mp-mail.com

The test crew consisted of Messrs. M. Lind, P. Lyons, P. Repuyan, S. Cronin, and R. Sollars of Mostardi Platt.

2.0 TEST METHODOLOGY

Emissions testing was conducted following the methods specified in 40CFR60, Appendix A. A schematic of the test section diagram is found in Appendix B and schematics of the sampling trains used are included in Appendix C. Calculation nomenclature and sample calculations are included in Appendix D. Laboratory analysis data are found in Appendix E. Copies of analyzer print-outs for each test run are included in Appendix F and field data sheets are found in Appendix G.

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 location are summarized below.

TEST POINT INFORMATION				
Location	**Upstream Diameters**	**Downstream Diameters**	**Test Parameter**	**Number of Sampling Points**
Flue 5 Stack	>2.0	>8.0	FPM, HCl	12

Method 2 Volumetric Flowrate Determination

Gas velocity was measured following Method 2, for purposes of calculating stack gas volumetric flow rate. An S-type pitot tube, 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 3A Oxygen (O_2)/Carbon Dioxide (CO_2) Determination

Stack gas molecular weight was determined in accordance with Method 3A. An ECOM 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. Calibration data are presented in Appendix H and copies of the gas cylinder certifications are found in Appendix I.

Method 5 Filterable Particulate Matter (FPM) Determination

Stack gas filterable particulate concentrations and emission rates were determined in accordance with Method 5 with filter and probe temperatures between 248 and 273 degrees Fahrenheit in accordance with the USEPA letter which is appended. An Environmental Supply Company, Inc. sampling train was used to sample stack gas at an isokinetic rate, as specified in the Method utilizing Pallflex TX40HI45 filters. Particulate matter in the sample probe was recovered using an acetone wash. The probe wash and filter catch were analyzed by Mostardi Platt personnel. Laboratory analysis data are found in Appendix E. Calibration data are presented in Appendix H.

Method 26A Hydrogen Chloride (HCl) Determination

Stack gas HCl concentrations and emission rates were determined in accordance with Method 26A, 40CFR60, Appendix A in conjunction with the USEPA Method 5 sampling. An Environmental Supply Company sampling train was used to sample stack gas, in the manner specified in the Method utilizing Pallflex TX40HI45 filters. Analyses of the samples collected were conducted by Maxxam Analytics, Inc. of Mississauga, Ontario. Sample analysis data are found in Appendix E. All of the equipment used was calibrated in accordance with the specifications of the Method. Calibration data are presented in Appendix H.

3.0 TEST RESULT SUMMARIES

Client: We Energies
Facility: Presque Isle Power Plant
Test Location: Flue 5 Stack
Test Method: 5

Source Condition	Normal	Normal	Normal	
Date	5/16/16	5/16/16	5/16/16	
Start Time	8:22	10:55	13:15	
End Time	10:30	13:03	15:23	
	Run 1	Run 2	Run 3	Average
Stack Conditions				
Average Gas Temperature, °F	321.5	327.0	327.8	325.4
Flue Gas Moisture, percent by volume	11.0%	11.7%	10.3%	11.0%
Average Flue Pressure, in. Hg	28.90	28.90	28.90	28.90
Gas Sample Volume, dscf	86.542	85.528	85.643	85.904
Average Gas Velocity, ft/sec	64.955	64.497	64.467	64.640
Gas Volumetric Flow Rate, acfm	247,934	246,187	246,074	246,732
Gas Volumetric Flow Rate, dscfm	143,939	140,844	142,851	142,545
Gas Volumetric Flow Rate, scfm	161,808	159,536	159,294	160,213
Average $\%CO_2$ by volume, dry basis	13.8	14.5	14.7	14.3
Average $\%O_2$ by volume, dry basis	5.7	5.7	5.4	5.6
Isokinetic Variance	102.4	103.4	102.1	102.6
Fd Factor, dscf/mmBtu	9,820.0	9,820.0	9,820.0	9,820.0
Filterable Particulate Matter (Method 5)				
grams collected	0.0047	0.0037	0.0037	0.0040
grains/acf	0.0005	0.0004	0.0004	0.0004
grains/dscf	0.0008	0.0007	0.0007	0.0007
lb/hr	1.034	0.806	0.816	0.885
lb/mmBtu (Standard Fd Factor)	0.0016	0.0013	0.0013	0.0014

Client: We Energies
Facility: Presque Isle Power Plant
Test Location: Flue 5 Stack
Test Method: 26A

Source Condition	Normal	Normal	Normal	
Date	5/16/16	5/16/16	5/16/16	
Start Time	8:22	10:55	13:15	
End Time	10:30	13:03	15:23	
	Run 1	Run 2	Run 3	Average
Stack Conditions				
Average Gas Temperature, °F	321.5	327.0	327.8	325.4
Flue Gas Moisture, percent by volume	11.0%	11.7%	10.3%	11.0%
Average Flue Pressure, in. Hg	28.90	28.90	28.90	28.90
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Average $\%O_2$ by volume, dry basis	5.7	5.7	5.4	5.6
Isokinetic Variance	102.4	103.4	102.1	102.6
Fd Factor, dscf/mmBtu	9,820.0	9,820.0	9,820.0	9,820.0
Hydrogen Chloride (HCl) Emissions				
ug of sample collected	630.00	520.00	880.00	676.67
ppm	0.17	0.14	0.24	0.18
mg/dscm	0.26	0.21	0.36	0.28
lb/hr	0.139	0.113	0.194	0.149
lb/mmBtu (Standard Fd Factor)	0.0002	0.0002	0.0003	0.0002

4.0 CERTIFICATION

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

CERTIFICATION

As project 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.

MOSTARDI PLATT

Program Manager

Rich Sollars

Quality Assurance

Scott W. Banach