



**Filterable Particulate Matter Compliance Emissions Test  
Report**

**Lansing Board of Water and Light  
Erickson Station  
Unit 1 Stack  
Lansing, Michigan  
August 4, 2016**

**Report Submittal Date  
September 13, 2016**

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**Project No. M163105D**

**1.0 EXECUTIVE SUMMARY**

MOSTARDI PLATT conducted a filterable particulate matter compliance emissions test program for the Lansing Board of Water and Light at the Erickson Station on the Unit 1 Stack in Lansing, Michigan on August 4, 2016. This report summarizes the results of the test program and test methods used.

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

<b>TEST INFORMATION</b>		
<b>Test Location</b>	<b>Test Date</b>	<b>Test Parameter</b>
Unit 1 Stack	August 4, 2016	Filterable Particulate Matter (FPM)

The purpose of the test program was to document FPM emissions to meet permitted limits. Selected results of the test program are summarized below. A complete summary of emission test results follows the narrative portion of this report.

<b>TEST RESULTS</b>			
<b>Test Location</b>	<b>Test Parameter</b>	<b>Emission Limits</b>	<b>Emission Rate</b>
Unit 1 Stack	FPM	0.17 lb per 1000 lbs of boiler exhaust gasses corrected to 50% excess air	0.0113 lb per 1000 lbs of boiler exhaust gasses corrected to 50% excess air

Emissions on lb/mmBtu basis were determined using a standard F<sub>d</sub>-Factor of 9,820 dscf/mmBtu for sub-bituminous coal. Plant operating data as provided by Lansing Board of Water and Light is included in Appendix A.

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

<b>TEST PERSONNEL INFORMATION</b>		
<b>Location</b>	<b>Address</b>	<b>Contact</b>
Test Coordinator	Lansing Board of Water and Light 1232 Haco Drive P.O. Box 13007 Lansing, Michigan 48912	Ms. Trista Gregorski Environmental Engineer (517) 702-6865 (phone) tmg@lbwl.com
Test Facility	Lansing Board of Water and Light Erickson Station 3725 South Canal Road Lansing, Michigan 48917	
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. C. Eldridge, B. Garcia, D. Dixon, J. Keable, 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
Unit 1 Stack	7.9	11.8	FPM	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<sub>2</sub>)/Carbon Dioxide (CO<sub>2</sub>) Determination

Stack gas molecular weight was determined in accordance with Method 3A. A Servomex 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 FPM concentrations and emission rates were determined in accordance with USEPA Method 5, 40CFR60, Appendix A. An Environmental Supply Company, Inc. sampling train was used to sample stack gas at an isokinetic rate, as specified in the Method. Particulate matter in the sample probe was recovered using an acetone rinse. The probe wash and filter catch were analyzed by Mostardi Platt in accordance with the Method in the Elmhurst, Illinois laboratory. 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:** Lansing Board of Water and Light  
**Facility:** Erickson Station  
**Test Location:** Unit 1 Stack  
**Test Method:** 5

	Source Condition	High Load	High Load	High Load	
	Date	8/4/16	8/4/16	8/4/16	
	Start Time	8:10	11:00	13:05	
	End Time	9:22	12:09	14:15	
	Run 1	Run 2	Run 3	Average	
<b>Stack Conditions</b>					
Average Gas Temperature, °F	322.1	330.0	332.5	328.2	
Flue Gas Moisture, percent by volume	10.9%	11.6%	11.1%	11.2%	
Average Flue Pressure, in. Hg	28.93	28.93	28.93	28.93	
Gas Sample Volume, dscf	36.226	35.041	35.027	35.431	
Average Gas Velocity, ft/sec	52.686	53.036	52.980	52.901	
Gas Volumetric Flow Rate, acfm	717,521	722,285	721,526	720,444	
Gas Volumetric Flow Rate, dscfm	417,468	412,633	413,387	414,496	
Gas Volumetric Flow Rate, scfm	468,325	466,711	464,750	466,595	
Average %CO <sub>2</sub> by volume, dry basis	14.2	14.2	14.2	14.2	
Average %O <sub>2</sub> by volume, dry basis	5.6	5.6	5.6	5.6	
Isokinetic Variance	102.8	100.6	100.4	101.3	
Standard Fuel Factor Fd, dscf/mmBtu	9,820.0	9,820.0	9,820.0	9,820.0	
<b>Filterable Particulate Matter (Method 5)</b>					
grams collected	0.0122	0.0127	0.0149	0.0133	
grains/acf	0.0030	0.0032	0.0038	0.0033	
grains/dscf	0.0052	0.0056	0.0066	0.0058	
lb/hr	18.594	19.780	23.257	20.544	
lb/1000 lbs of gas corrected to 50% O <sub>2</sub>	0.0101	0.0109	0.0128	0.0113	
lb/mmBtu (Standard Fd Factor)	0.0100	0.0107	0.0126	0.0111	

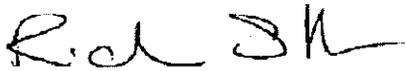
## 4.0 CERTIFICATION

MOSTARDI PLATT is pleased to have been of service to Lansing Board of Water and Light. 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



Rich Sollars

Program Manager



Scott W. Banach

Quality Assurance