



**Mercury and Air Toxics Standard  
Hydrogen Chloride Emissions Test Report**

**Lansing Board of Water and Light  
Erickson Station  
Unit 1 Stack  
Lansing, Michigan  
February 25, 2020**

**Report Submittal Date  
March 18, 2020**



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**Project No. M200908**



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## 1.0 EXECUTIVE SUMMARY

MOSTARDI PLATT conducted a Mercury and Air Toxics Standards (MATS) hydrogen chloride emissions test program for the Lansing Board of Water and Light at the Erickson Station on the Unit 1 Stack in Lansing, Michigan on February 25, 2020. 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
Unit 1 Stack	February 25, 2020	Hydrogen Chloride (HCl)

The purpose of the test program was to document 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	LEE Emission Limits	Emission Rates
Unit 1 Stack	HCl	≤0.002 lb/mmBtu	≤0.001 lb/mmBtu	0.001 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 Lansing Board of Water and Light is included in Appendix A.

The Stationary Source Audit Sample Program audit sample was obtained from ERA and analyzed by Mostardi Platt. The results of the audit sample were 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 the individuals associated with the test program are summarized below.

TEST PERSONNEL INFORMATION		
Location	Address	Contact
Test Coordinator	Lansing Board of Water and Light 1232 Haco Drive P.O. Box 13007 Lansing, Michigan 48912	Mr. Nathan Hude Environmental Regulatory Compliance (517) 490-3069 (cell phone) nathan.hude@lbwl.com
Test Facility	Lansing Board of Water and Light Erickson Station 1201 S. Washington Ave. Lansing, Michigan 48910	
Testing Company Representative	Mostardi Platt 888 Industrial Drive Elmhurst, Illinois 60126	Mr. Chris Eldridge Project Manager (630) 993-2100 (phone) celdridge@mp-mail.com

The test crew consisted of Messrs. C. Buglio, R. Simon and C. Eldridge 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	11.3	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<sub>2</sub>)/Carbon Dioxide (CO<sub>2</sub>) 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 26A Hydrogen Chloride (HCl) Determination

Stack gas HCl concentrations and emission rates were determined in accordance with Method 26A, 40CFR60, Appendix A. An Environmental Supply Company sampling train was used to sample stack gas, in the manner specified in the Method. Analyses of the samples collected were conducted at the Elmhurst, Illinois laboratory of Mostardi Platt. 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: 26A MATS

	Source Condition	Normal	Normal	Normal	
	Date	2/25/20	2/25/20	2/25/20	
	Start Time	8:15	10:40	12:35	
	End Time	10:23	12:22	2:17	
	Run 1	Run 2	Run 3	Average	
<b>Stack Conditions</b>					
Average Gas Temperature, °F	327.0	328.3	331.5	328.9	
Flue Gas Moisture, percent by volume	9.8%	11.8%	11.8%	11.1%	
Average Flue Pressure, in. Hg	28.60	28.60	28.60	28.60	
Gas Sample Volume, dscf	85.008	84.277	84.459	84.581	
Average Gas Velocity, ft/sec	45.433	45.159	45.570	45.387	
Gas Volumetric Flow Rate, acfm	618,747	615,015	620,611	618,124	
Gas Volumetric Flow Rate, dscfm	357,781	347,461	348,860	351,367	
Gas Volumetric Flow Rate, scfm	396,754	393,736	395,687	395,392	
Average %CO <sub>2</sub> by volume, dry basis	13.1	13.6	12.4	13.0	
Average %O <sub>2</sub> by volume, dry basis	5.9	4.8	4.3	5.0	
Isokinetic Variance	100.6	102.7	102.6	102.0	
Standard Fuel Factor Fd, dscf/mmBtu	9,820.0	9,820.0	9,820.0	9,820.0	
<b>Hydrogen Chloride (HCl) Emissions</b>					
ug of sample collected	2785	3803	3938	3509	
ppm	0.76	1.05	1.09	0.97	
mg/dscm	1.16	1.59	1.65	1.47	
lb/hr	1.551	2.074	2.152	1.925	
lb/mmBtu (Standard Fd Factor)	0.001	0.001	0.001	0.001	



## 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



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Chris S. Eldridge

Program Manager



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Jeffrey M. Crivlare

Quality Assurance



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## APPENDICES

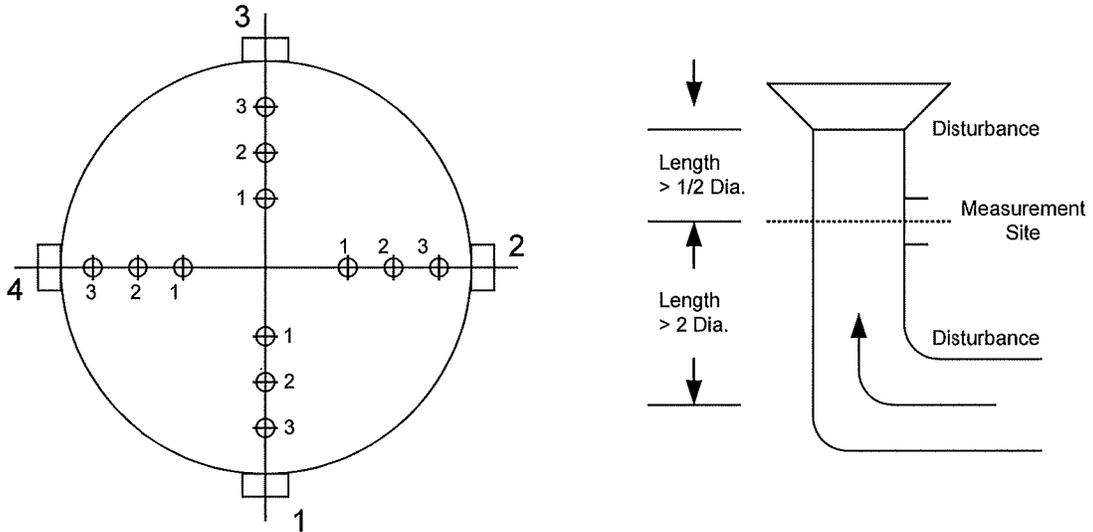


## Appendix A - Plant Operating Data

Date/Time	UNIT01 MW Value	$\Sigma$
02/25/2020 08:15		164
02/25/2020 08:30		164
02/25/2020 08:45		164
02/25/2020 09:00		164
02/25/2020 09:15		164
02/25/2020 09:30		164
02/25/2020 09:45		164
02/25/2020 10:00		164
02/25/2020 10:15		164
02/25/2020 10:30		164
02/25/2020 10:45		164
02/25/2020 11:00		164
02/25/2020 11:15		164
02/25/2020 11:30		164
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02/25/2020 12:15		164
02/25/2020 12:30		164
02/25/2020 12:45		164
02/25/2020 13:00		164
02/25/2020 13:15		164
02/25/2020 13:30		164
02/25/2020 13:45		164
02/25/2020 14:00		164
02/25/2020 14:15		164
02/25/2020 14:30		156

## Appendix B - Test Section Diagram

## EQUAL AREA TRAVERSE FOR ROUND DUCTS



Job: Lansing Board of Water and Light  
Erickson Station  
Lansing, Michigan

Date: February 25, 2020

Test Location: Unit 1 Stack

Stack Diameter: 17.0 feet

Stack Area: 226.980 feet squared

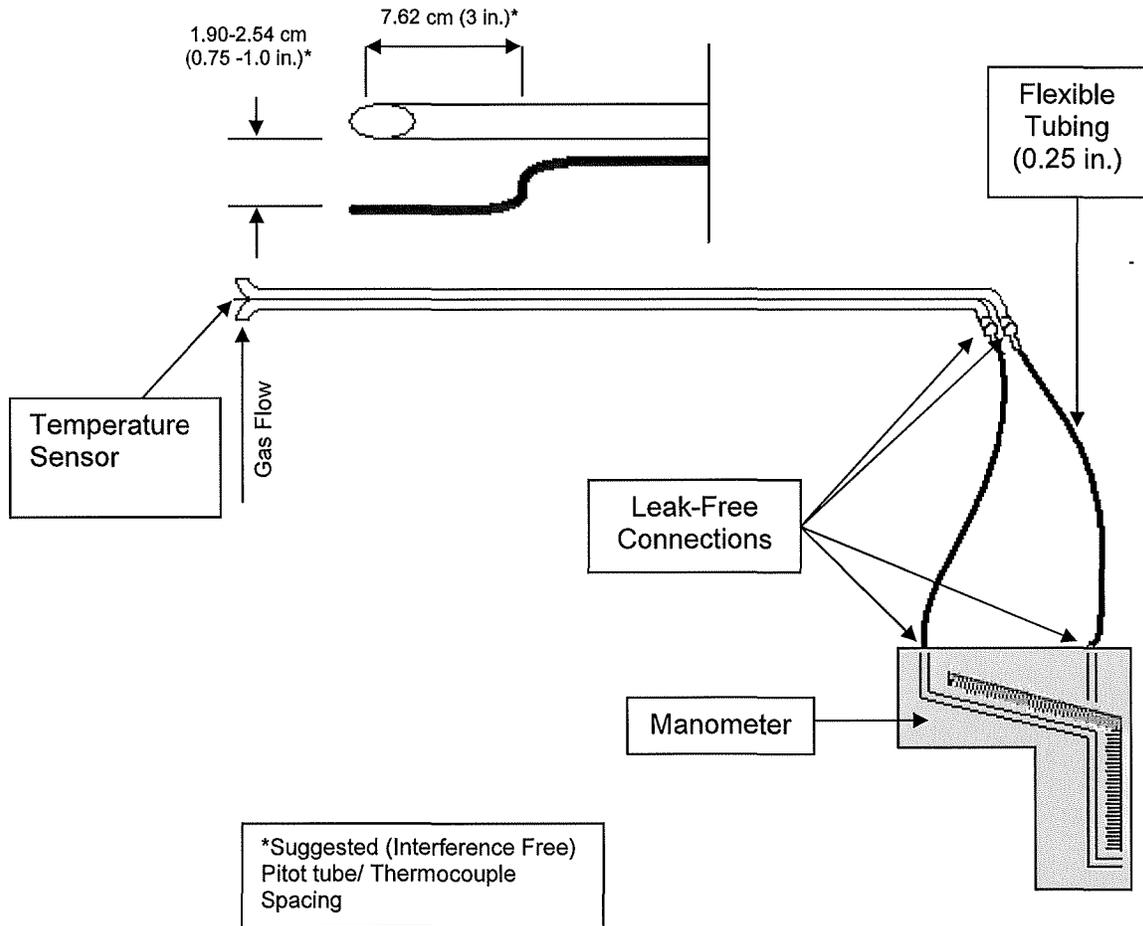
No. Points Across Diameter: 3

No. of Ports: 4

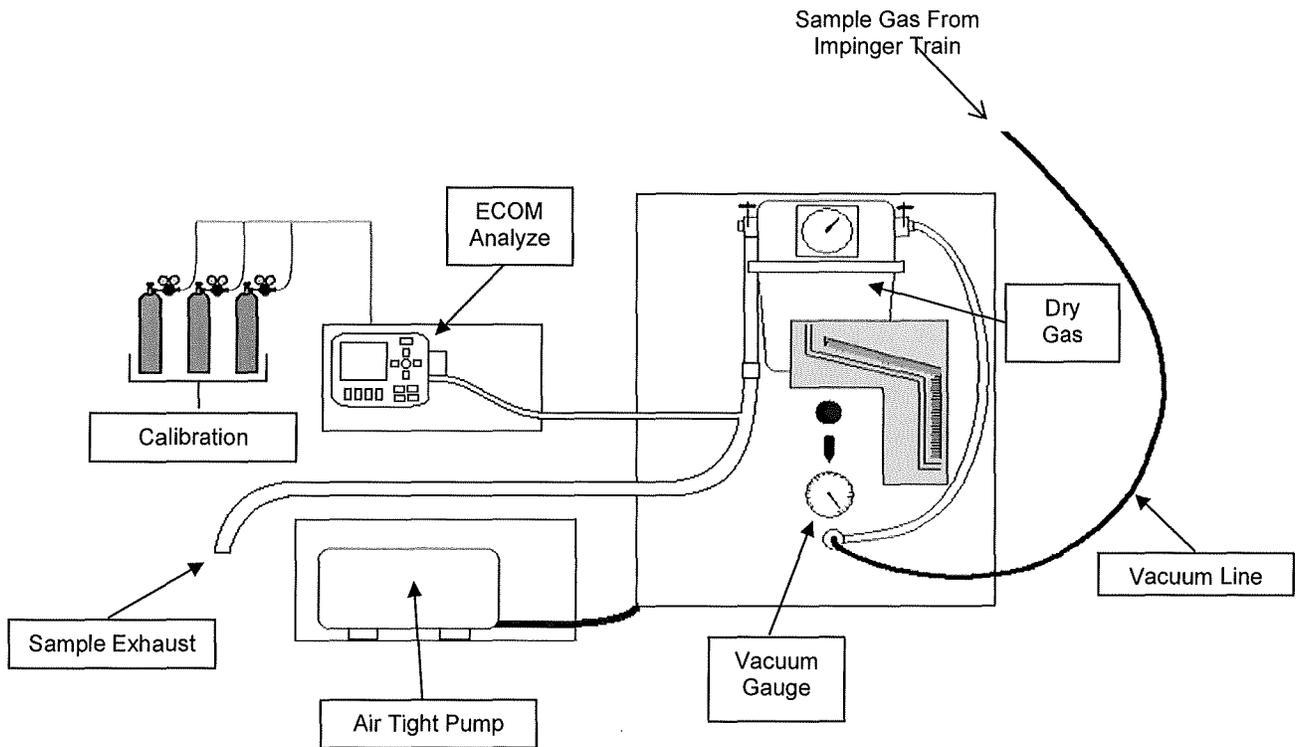
Port Length: 78 inches

## Appendix C - Sample Train Diagrams

## USEPA Method 2 – Type S Pitot Tube Manometer Assembly



# USEPA Method 3A - Integrated Oxygen/Carbon Dioxide Sample Train Diagram Utilizing ECOM To Measure from Sample Exhaust



## USEPA Method 26A – HCl Sample Train Diagram

