

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 23, 2021. 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 23, 2021	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	0.0012 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. Christopher S. Trezak Project Manager (630) 993-2100 (phone) ctrezak@mp-mail.com

The test crew consisted of Messrs. C. Buglio, J. Kukla, and C. Trezak 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	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 (O₂)/Carbon Dioxide (CO₂) 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	2/23/21	2/23/21	2/23/21	
	Start Time	8:30	11:05	13:20	
	End Time	10:30	12:59	15:12	
	Run 1	Run 2	Run 3	Average	
Stack Conditions					
Average Gas Temperature, °F		319.7	321.5	322.2	321.1
Flue Gas Moisture, percent by volume		11.5%	11.5%	11.9%	11.6%
Average Flue Pressure, in. Hg		28.29	28.29	28.29	28.29
Gas Sample Volume, dscf		64.303	64.047	65.824	64.725
Average Gas Velocity, ft/sec		47.542	47.596	48.112	47.750
Gas Volumetric Flow Rate, acfm		647,460	648,202	655,227	650,296
Gas Volumetric Flow Rate, dscfm		366,977	366,392	368,299	367,223
Gas Volumetric Flow Rate, scfm		414,528	414,029	418,160	415,572
Average %CO ₂ by volume, dry basis		14.2	13.8	13.9	14.0
Average %O ₂ by volume, dry basis		5.7	5.7	7.0	6.1
Isokinetic Variance		102.0	101.7	104.0	102.6
Standard Fuel Factor Fd, dscf/mmBtu		9,820.0	9,820.0	9,820.0	9,820.0
Hydrogen Chloride (HCl) Emissions					
ug of sample collected		3031	2504	2130	2555
ppm		1.10	0.91	0.75	0.92
mg/dscm		1.66	1.38	1.14	1.39
lb/hr		2.2881	1.8948	1.5764	1.9198
lb/mmBtu (Standard Fd Factor)		0.0014	0.0012	0.0011	0.0012

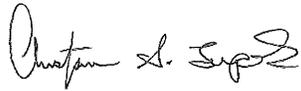
4.0 CERTIFICATION

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



Christopher S. Trezak

Program Manager



Jeffrey M. Crivlare

Quality Assurance

APPENDICES

Appendix A - Plant Operating Data

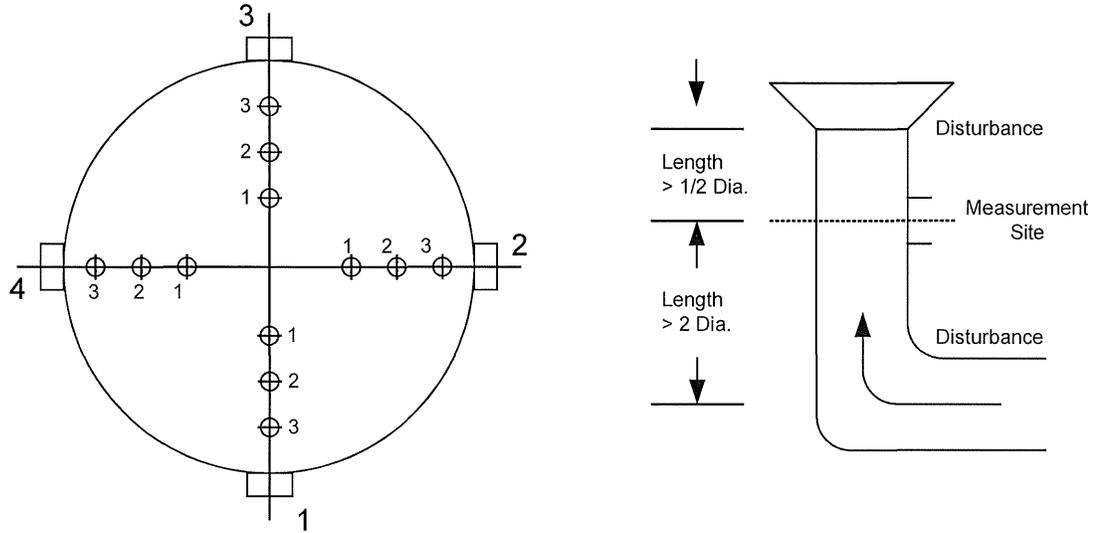
Erickson 2021 Q1 MATS HCl Testing Operating Load

Date/Time	UNIT01 MW Value
02/23/2021 08:30	155
02/23/2021 08:45	156
02/23/2021 09:00	156
02/23/2021 09:15	156
02/23/2021 09:30	156
02/23/2021 09:45	157
02/23/2021 10:00	157
02/23/2021 10:15	157
02/23/2021 10:30	157
02/23/2021 10:45	157
02/23/2021 11:00	157
02/23/2021 11:15	156
02/23/2021 11:30	156
02/23/2021 11:45	156
02/23/2021 12:00	156
02/23/2021 12:15	156
02/23/2021 12:30	156

Date/Time	UNIT01 MW Value
02/23/2021 12:45	157
02/23/2021 13:00	156
02/23/2021 13:15	154
02/23/2021 13:30	153
02/23/2021 13:45	153
02/23/2021 14:00	152
02/23/2021 14:15	155
02/23/2021 14:30	155
02/23/2021 14:45	155
02/23/2021 15:00	154
02/23/2021 15:15	154
02/23/2021 15:30	153
02/23/2021 15:45	153
02/23/2021 16:00	154
02/23/2021 16:15	154
02/23/2021 16:30	154
02/23/2021 16:45	154

Appendix B - Test Section Diagram

EQUAL AREA TRAVERSE FOR ROUND DUCTS



Job: Lansing Board of Water and Light

Date: February 23, 2021

Test Location: Unit 1 Stack

Stack Diameter: 17.0 feet

Stack Area: 226.980 feet squared

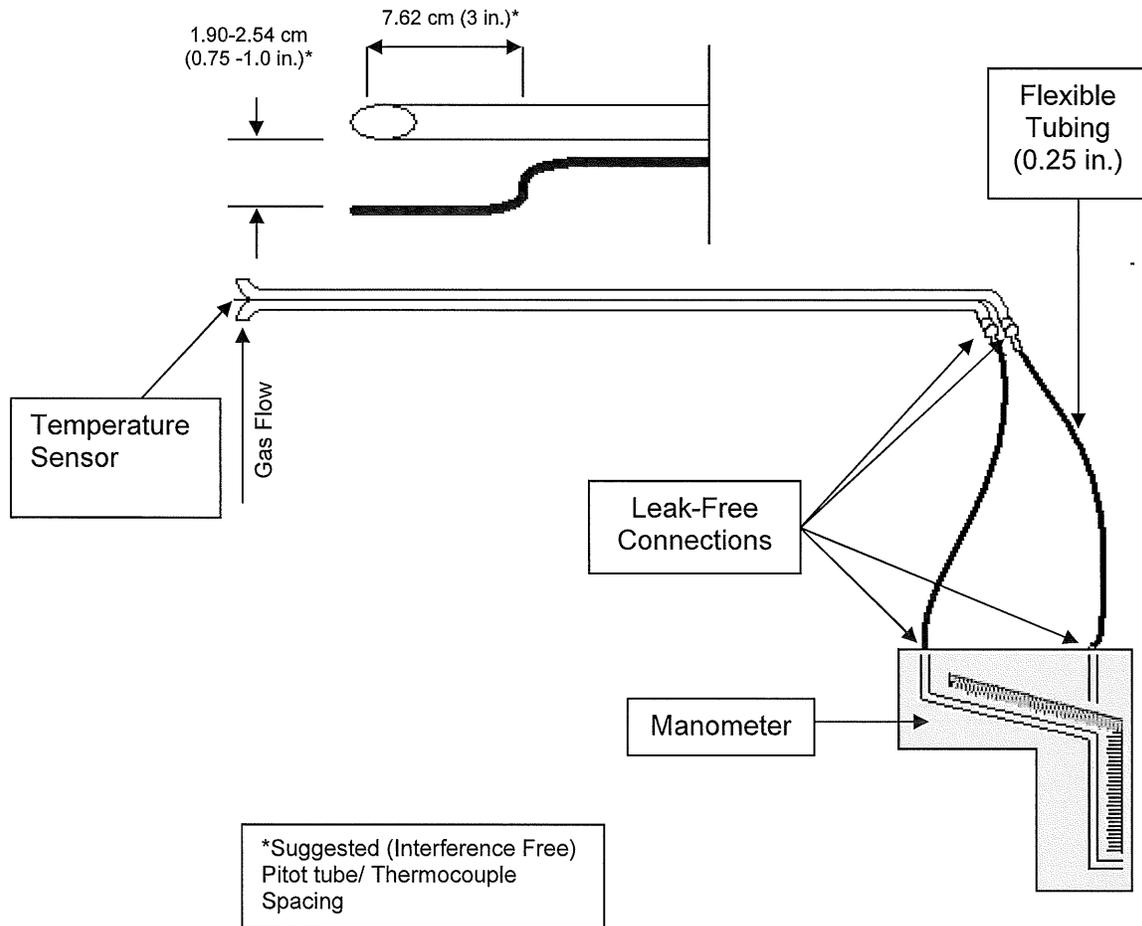
No. Points Across Diameter: 6

No. of Ports: 4

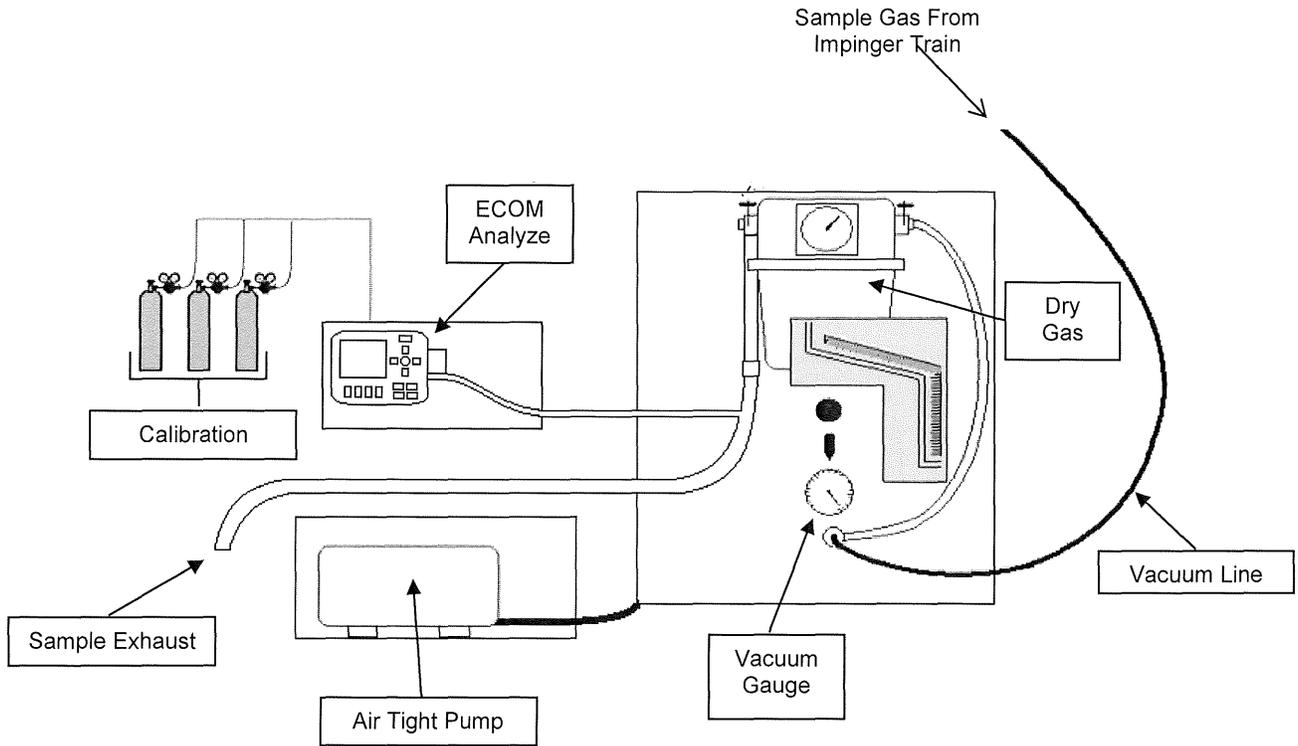
Port Length: 78 inches

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

