mostardi platt

Compliance Emission Test Report

Lasing Board of Water and Light
Delta Energy Park Facility
EUCTGHRSG1
Lansing, Michigan
September 20, 2022

Report Submittal Date
October 26, 2022

© Copyright 2022
All rights reserved in
Mostardi Platt

Project No. M223707B

RECEIVED
NOV 10 2022
AIR QUALITY DIVISION

Crown Point, IN | Mendota Heights, MN | Denver, CO | Henderson, NV

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

TABLE OF CONTENTS

©Mostardi Platt

1.0 EXECUTIVE SUMMARY

Mostardi Platt conducted a compliance emission test program for Lansing Board of Water and Light at the Delta Energy Park Facility in Lansing, Michigan on the EUCTGHRSG1 on September 20, 2022This 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 Locations	**Test Date**	**Test Parameters**
EUCTGHRSG1	September 20, 2022	Total Particulate Matter (TPM)

The purpose of this test program was to determine the TPM emissions for the EUCTGHRSG1 at normal operating conditions. Selected results of the test program are summarized below. A complete summary of emission test results follows the narrative portion of this report. Operating data provided by Lansing Board of Water and Light is included in Appendix A.

Test Location	Test Dates	Test Parameter	Emission Limit	Average Test Result
EUCTGHRSG1	9/20/22	TPM	$PM_{2.5}$ 4.5 lb/hr	1.329 lb/hr
			PM_{10} 4.5 lb/hr	1.329 lb/hr

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 PO Box 13007 Lansing, Michigan 48912-1610	Nathan Hude Environmental Compliance Specialist (517) 702-6170 (phone) nathan.hude@lbwl.com
Test Facility	Lansing Board of Water and Light Delta Energy Park Facility 3725 South Canal Road Lansing, MI 48917 Permit to Install 74-18C	
Testing Company Representative	Mostardi Platt 888 Industrial Drive Elmhurst, Illinois 60126	Tim Russ Senior Project Manager 630-993-2100 (phone) truss@mp-mail.com

The test crew consisted of J. Kukla, J. Jimenez, R. Spoolstra, S. McGough, T. Long, and T. Russ of Mostardi Platt.

©Mostardi Platt

2.0 TEST METHODOLOGY

Emissions testing was conducted following the methods specified in Title 40 Code of Federal Regulations Part 60 (40CFR60), Method 5, Appendix A, and Method 202, 40CFR51, and Appendix M. Schematics depicting the test locations and sampling trains used 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 are found in Appendices F and G, respectively.

The following methodologies were used during the test program:

Method 1 Sample and Velocity Traverse 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
EUCTGHRSG1	11.901	111.239	1.7	8.3	TPM	24

Method 2 Volumetric Flow Rate Determination

Gas velocity was measured following Method 2, for purposes of calculating the gas volumetric flow rate and emission rates on a lb/ton basis. An S-type pitot tube, incline manometer, thermocouple and temperature readout were used to determine gas velocity at each sample point at both test locations. 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) and Carbon Dioxide (CO_2) Determination

Gas samples were collected for the duration of the TPM sampling runs utilizing Tedlar bags. A Servomex analyzer was used to analyze the gas bags on site during testing. Linearity calibrations were performed prior to sample analysis, and mid-range calibration checks will be performed after each run. Final O_2 and CO_2 concentrations were corrected for calibration error of the instrument. Calibration data are presented in Appendix H.

Method 5 Filterable Particulate Matter Determination

Exhaust gas FPM concentrations and emission rates were determined in accordance with Method 5. An Environmental Supply Company 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 wash. The probe wash and filter catch were analyzed by Mostardi Platt in accordance with the Method. Laboratory analysis data are included 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.

©Mostardi Platt

Method 202 Condensable Particulate Determination

Stack gas condensable particulate matter concentrations and emission rates were determined in accordance with USEPA Method 202, in conjunction with Method 5B or 5 filterable particulate sampling. This method applies to the determination of condensable particulate matter (CPM) emissions from stationary sources. It is intended to represent condensable matter as material that condenses after passing through a filter and as measured by this method.

The CPM was collected in the impinger portion of the Method 5 (Appendix A, 40CFR60) type sampling trains. The impinger contents were immediately purged after each run with nitrogen (N_2) to remove dissolved sulfur dioxide (SO_2) gases from the impinger contents. The impinger solution was then extracted with hexane. The organic and aqueous fractions were then taken to dryness and the residues weighed. A correction was made for any ammonia present due to laboratory analysis procedures. The total of both fractions represents the CPM.

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

©Mostardi Platt

3.0 TEST RESULT SUMMARIES

Client: Lansing Board of Water & Light
Facility: Delta Energy Park
Test Location: EUCTGSC1
Test Method: 5/202

Source Condition	Normal	Normal	Normal	
Date	9/20/22	9/20/22	9/20/22	
Start Time	8:00	11:30	14:30	
End Time	10:20	13:45	8:10	
	Run 1	Run 2	Run 3	Average
Stack Conditions				
Average Gas Temperature, °F	1052.8	1055.9	1053.7	1054.1
Flue Gas Moisture, percent by volume	8.5%	8.2%	8.9%	8.5%
Average Flue Pressure, in. Hg	29.05	29.05	29.05	29.05
Gas Sample Volume, dscf	72.306	72.189	72.628	72.374
Average Gas Velocity, ft/sec	103.823	103.705	104.334	103.954
Gas Volumetric Flow Rate, acfm	692,950	692,159	696,360	693,823
Gas Volumetric Flow Rate, dscfm	214,853	214,810	214,917	214,860
Gas Volumetric Flow Rate, scfm	234,853	234,095	235,866	234,938
Average $\%CO_2$ by volume, dry basis	3.8	4.1	4.1	4.0
Average $\%O_2$ by volume, dry basis	13.5	13.9	13.7	13.7
Isokinetic Variance	99.4	99.2	99.8	99.5
Standard Fuel Factor Fd, dscf/mmBtu	8,710.0	8,710.0	8,710.0	8,710.0
Yearly Operating Hours	8760.0	8760.0	8760.0	8,760.0
Filterable Particulate Matter (Method 5)				
grams collected	0.00282	0.00051	0.00074	0.00136
mg/dscm	1.377	0.249	0.360	0.6622
grains/acf	0.0002	0.0000	0.0000	0.0001
grains/dscf	0.0006	0.0001	0.0002	0.0003
lb/hr	1.108	0.201	0.290	0.533
lb/1000 lb of stack gas	0.001	0.000	0.000	0.001
lb/mmBtu (Standard Fd Factor)	0.0021	0.0004	0.0006	0.0010
Condensable Particulate Matter (Method 202)				
grams collected	0.00295	0.00218	0.00095	0.00203
grains/acf	0.0002	0.0001	0.0001	0.0001
grains/dscf	0.0006	0.0005	0.0002	0.0004
lb/hr	1.159	0.858	0.372	0.796
lb/1000 lb of stack gas	0.001	0.001	0.000	0.001
lb/mmBtu (Standard Fd Factor)	0.0022	0.0017	0.0007	0.0015
Total Particulate Matter (5/202)				
grams collected	0.00577	0.00269	0.00169	0.00338
grains/acf	0.0004	0.0001	0.0001	0.0002
grains/dscf	0.0012	0.0006	0.0004	0.0007
lb/hr	2.267	1.059	0.662	1.329
lb/1000 lb of stack gas	0.002	0.001	0.001	0.001
lb/mmBtu (Standard Fd Factor)	0.0043	0.0021	0.0013	0.0026

©Mostardi Platt

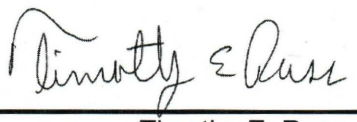
4.0 CERTIFICATION

Mostardi Platt is pleased to have been of service to Ardagh Glass Inc. If you have any questions regarding this test report, please do not hesitate to contact us at 630-993-2100.

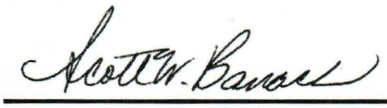
CERTIFICATION

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



Timothy E. Russ — Program Manager



Scott W. Banach — Quality Assurance

©Mostardi Platt

APPENDICES

©Mostardi Platt

Appendix A- Plant Operating Data

©Mostardi Platt

EUCTGSC1 Operational Data

Date/Time	CTGSC1 GASFLOW (HSCFH) Value	CTGSC1 HEATINP (MMBTU/HR) Value	CTGSC1 LOADCTMW (MW) Value
Run1			
09/20/2022 08:00	4902.5	514.8	54
09/20/2022 08:15	4895.1	514	54
09/20/2022 08:30	4892.4	513.7	54
09/20/2022 08:45	4882.3	512.6	54
09/20/2022 09:00	4871.4	511.5	54
09/20/2022 09:15	4866.6	511	54
09/20/2022 09:30	4872.4	511.6	54
09/20/2022 09:45	4866.3	511	54
09/20/2022 10:00	4865.6	510.9	54
09/20/2022 10:15	4851.9	509.4	53
09/20/2022 10:30	4857.5	510	53
Averages:	4874.9	511.9	53.8
Run2			
09/20/2022 11:30	4843	508.5	53
09/20/2022 11:45	4849.3	509.2	53
09/20/2022 12:00	4848.2	509.1	53
09/20/2022 12:15	4851.1	509.4	53
09/20/2022 12:30	4851.6	509.4	53
09/20/2022 12:45	4844.9	508.7	53
09/20/2022 13:00	4833.3	507.5	53
09/20/2022 13:15	4828.7	507	53
09/20/2022 13:30	4846.6	508.9	53
09/20/2022 13:45	4829.8	507.1	53
Averages:	4842.7	508.5	53.0
Run3			
09/20/2022 14:30	4832.2	507.4	53
09/20/2022 14:45	4829.2	507.1	53
09/20/2022 15:00	4827.2	506.9	53
09/20/2022 15:15	4824.8	506.6	53
09/20/2022 15:30	4831.8	507.3	53
09/20/2022 15:45	4839.7	508.2	53
Pause in test due to thunderstorms, test continued morning of 9/21 after successful leak check. Discussed with L. Wells of EGLE to continue with run on the morning of 9/21.			
9/21/2022 7:15	4760.6	499.9	52
9/21/2022 7:30	4762.6	500.1	52
9/21/2022 7:45	4750.7	498.8	52
9/21/2022 8:00	4744.6	498.2	52
9/21/2022 8:15	4742.4	498	52
Averages:	4795.1	503.5	52.5

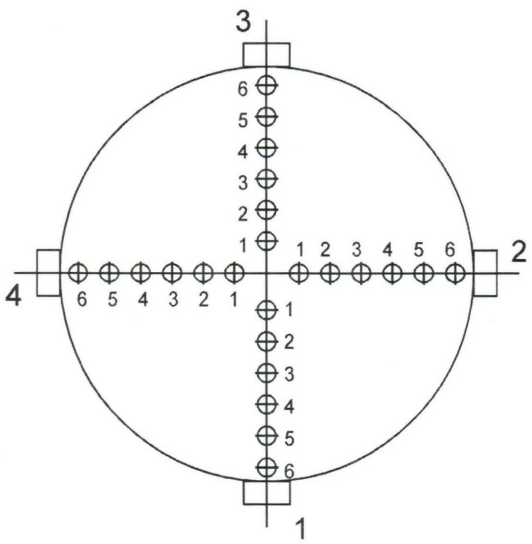
©Mostardi Platt

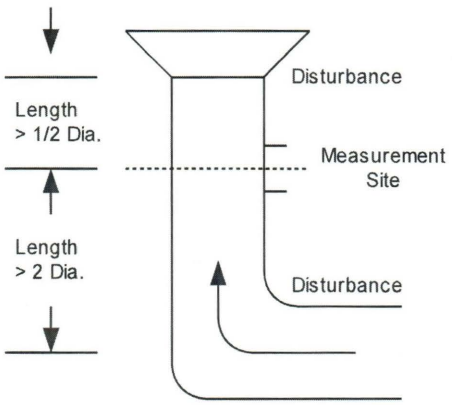
Appendix B- Test Section Diagrams

RECEIVED
NOV 10 2022
AIR QUALITY DIVISION

©Mostardi Platt

EQUAL AREA TRAVERSE FOR ROUND DUCTS





Job: Lansing Board of Water & Light

Delta Energy Park

Lansing, MI

Date: September 20, 2022

Test Location: EUCTGSC1

Duct Diameter: 11.901 Feet

Duct Area: 111.24 Square Feet

No. Points Across Diameter: 12

No. of Ports: 4

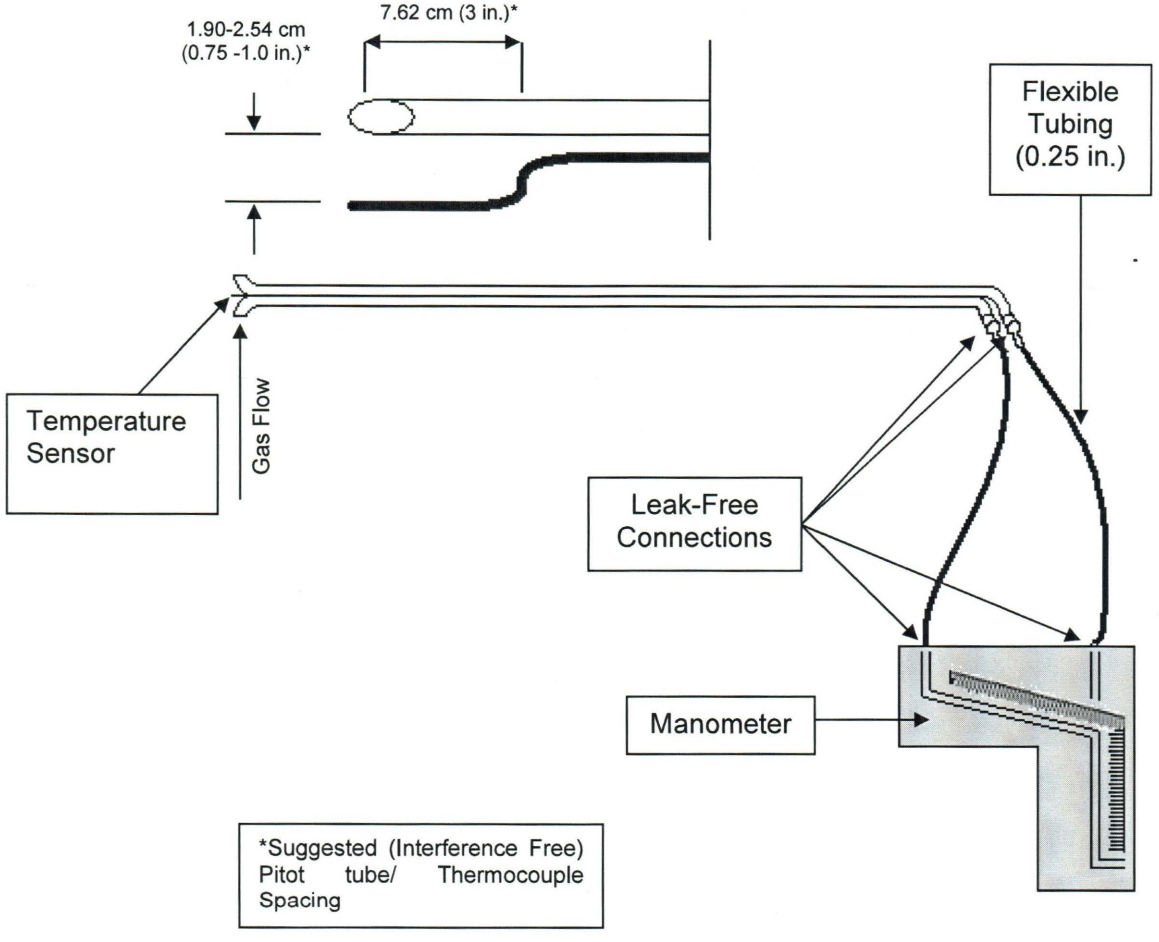
Port Length: 6 Inches

©Mostardi Platt

Appendix C- Sample Train Diagrams

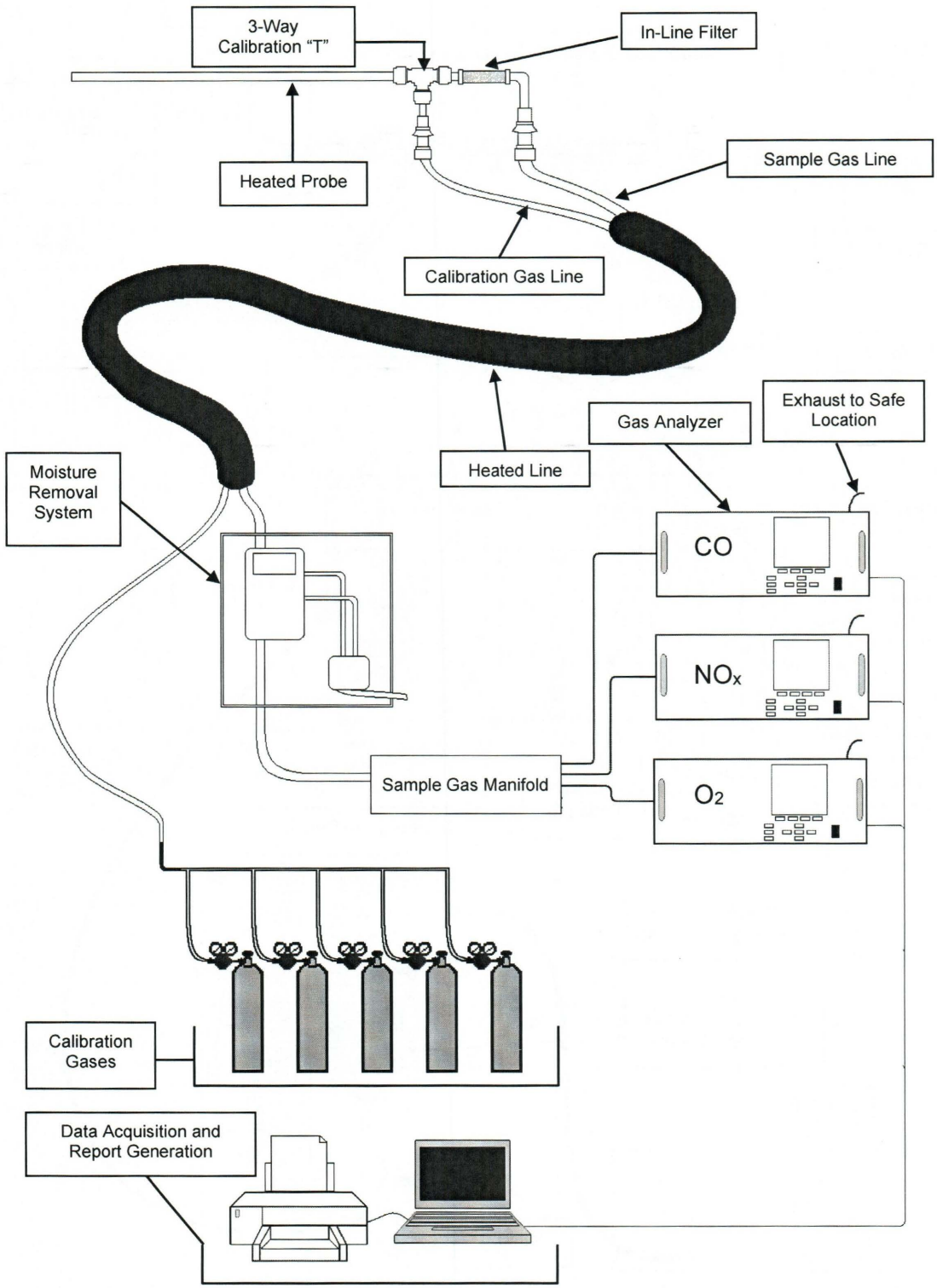
©Mostardi Platt

USEPA Method 2 – Type S Pitot Tube Manometer Assembly



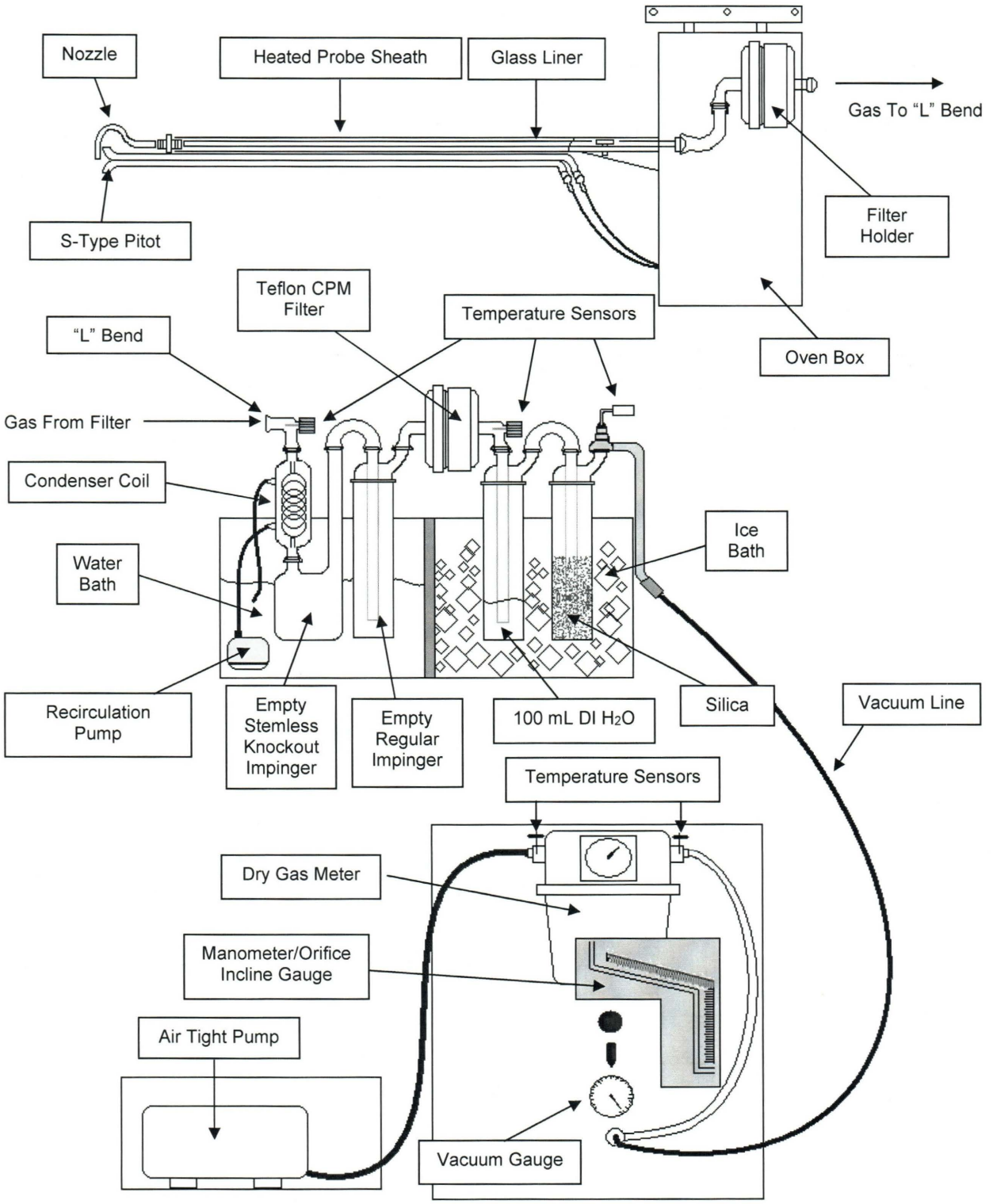
©Mostardi Platt

USEPA Method 3A Extractive Gaseous Sampling Diagram



©Mostardi Platt

USEPA Method 5/202- Filterable/Condensable Particulate Matter



©Mostardi Platt