Metals Emissions Test Report

PCC Structurals, Inc.
Large Parts Campus
Baghouse 9256
5001 SE Johnson Creek Blvd.
Milwaukie, Oregon 97222
Project No. M232604C Rev. 1
June 28 and 29, 2023

mostardi platt

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Report Submittal Date
September 29, 2023
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December 5, 2023

Project No. M232604C Rev. 1

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

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1.0 EXECUTIVE SUMMARY

Mostardi Platt conducted a metals emissions test program for PCC Structurals, Inc. (PCC) at their Large Parts Campus (LPC) facility located at 5001 SE Johnson Creek Blvd. in Milwaukie, Oregon. Testing was performed to demonstrate removal efficiencies across each baghouse system as well as mass emission rates of several metals, including hexavalent chrome (Cr^{+6}), from the baghouse inlet and HEPA exhaust outlet.

Inlet samples were collected utilizing Teflon coated stainless steel nozzles and a flexible sampling line connection between the filter and impingers. During run 1 at the inlet location, the heated sampling oven shorted out. The test was paused while the train was leaked checked, disassembled, and oven replaced and leaked checked again. Delay time was from approximately 4:35AM-5:40AM. During run two, the dampers closed on the system for approximately 30 seconds. The tests at the inlet and outlet were briefly paused until the dampers re-opened.

The test locations, test dates, and test parameters are summarized below.

TEST INFORMATION		
Test Locations	**Test Dates**	**Test Parameters**
9256 Baghouse Inlet	June 28 and 29, 2023	Aluminum (Al), Arsenic (As), Antimony (Sb), Barium (Ba), Beryllium (Be), Cadmium (Cd), Chromium (Cr), Cobalt (Co), Copper (Cu), Lead (Pb), Manganese (Mn), Mercury (Hg), Nickel (Ni), Phosphorus (P), Selenium (Se), Silver (Ag), Thallium (Tl), Vanadium (V), Zinc (Zn), and Hexavalent Chromium (Cr^{+6})
9256 Baghouse Outlet		

2.0 PROCESS DESCRIPTION

Baghouse/HEPA 9256 (BH9256) controls emissions from both the air casting process and the outfeed of the Master Caster furnace. Air casting emissions controlled include melting, pouring, cooling, and hot top application. Master Caster emissions controlled include cooling and hot top application.

2.1 Project Contact Information

Location	Address	Contact
Test Consultant	Maul Foster & Alongi, Inc. 6 Centerpointe Drive, Suite 360 Lake Oswego, OR 97035	Mr. Brian Eagle Senior Consultant 971.713.3571 beagle@maulfoster.com
Test Facility	PCC Structurals, Inc. 5001 SE Johnson Creek Blvd. Milwaukie, OR 97222	Mr. Brandon Hadzinsky Division Environmental Affairs 503.724.3036 Brandon.hadzinsky@pccstructurals.com
Test Company Representative	Mostardi Platt 888 Industrial Drive Elmhurst, IL 60126	Mr. Eric Ehlers VP, Field Operations (630) 699-7690 eehlers@mp-mail.com

The test crew consisted of Messrs. C. Trezak, K. Addison, N. Colangelo, M. Sather, V. Vang, J. Meade, C. Rock, M. Dolatowski, P. Pradhan, J. Jiminez, F. Diaz, and E. Ehlers of Mostardi Platt.

Mr. Thomas Rhodes of the Oregon Department of Environmental Quality (ODEQ) observed a portion of the test program.

3.0 OVERVIEW OF TEST RESULTS

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 was provided by PCC and is found in Appendix E.

ADL means both fractions of the sample analyses were above the detection limit. DLL means that one of the fractions of the sample analyses were below the detection limit. BDL means both fractions of the sample analyses were below the detection limit.

The filters that were used for the test program had Aluminum and Phosphorus contents exceeding levels specified in Section 7.2.1 of Method 29, and as a result, the Method 29 blank corrections likely overestimate calculated emissions of these constituents. This is particularly true for aluminum - in some instances the blank correction calculated using the methodology outlined in Section 12.6.3 of Method 29 was almost 20 times lower than the Aluminum content of the filter blank. Therefore, the reported emission rates should not be considered valid.

3.1 9256 Baghouse System Run 1

Measured Parameter	Inlet Emission Rate lb/hr	Outlet Emission Rate lb/hr	Inlet Emission Factor lb/ton metal processed	Outlet Emission Factor lb/ton metal processed	Removal Efficiency %
Al	7.48E-02	1.46E-02	7.17E-02	1.40E-02	80.48%
Sb	≤3.91E-05[a]	≤4.15E-05[b]	≤3.75E-05[a]	≤3.98E-05[a]	N/A
As	ND	ND	ND	ND	N/A
Ba	3.46E-04	3.16E-04	3.32E-04	3.03E-04	8.67%
Be	ND	ND	ND	ND	N/A
Cd	5.87E-06	2.07E-05	5.63E-06	1.98E-05	N/A
Cr	2.44E-03	7.93E-05	2.34E-03	7.61E-05	96.74%
Co	6.53E-05	≤5.18E-06[a]	6.26E-05	≤4.97E-06[a]	N/A
Cu	8.50E-03	1.50E-04	8.15E-03	1.44E-04	98.23%
Pb	≤2.31E-04[a]	≤2.13E-05[a]	≤2.22E-04[a]	≤2.04E-05[a]	N/A
Mn	1.97E-02	2.00E-04	1.89E-02	1.92E-04	98.98%
Hg	≤3.51E-05[a]	≤1.99E-05[a]	≤3.36E-05[a]	≤1.91E-05[a]	N/A
Ni	4.50E-03	3.40E-04	4.31E-03	3.26E-04	92.44%
P	2.70E-03	2.82E-03	2.59E-03	2.70E-03	N/A
Se	≤6.23E-05[a]	≤8.69E-05[a]	≤5.97E-05[a]	≤8.33E-05[a]	N/A
Ag	2.69E-05	≤2.07E-05[b]	2.58E-05	≤1.99E-05[b]	N/A
Tl	≤3.35E-05[a]	≤3.53E-05[b]	≤3.21E-05[a]	≤3.39E-05[b]	N/A
V	≤3.26E-05[a]	≤6.72E-06[a]	≤3.12E-05[a]	≤6.45E-06[a]	N/A
Zn	2.88E-03	8.40E-04	2.76E-03	8.05E-04	70.81%
Cr^{+6}	4.20E-05	1.84E-04	4.03E-05	1.76E-04	4.52%

ND – Non-detect. Analyte below detection limit at both inlet and outlet.
N/A – No control efficiency was calculated.
[a] – Value based on data qualified as DLL in the lab report.
[b] – Analyte below detection limit at outlet, but measurable at inlet. Value shown is the detection limit.

3.2 9256 Baghouse System Run 2

Measured Parameter	Inlet Emission Rate lb/hr	Outlet Emission Rate lb/hr	Inlet Emission Factor lb/ton metal processed	Outlet Emission Factor lb/ton metal processed	Removal Efficiency %
Al	7.33E-02	1.52E-02	6.97E-02	1.45E-02	79.26%
Sb	≤3.88E-05[a]	≤4.39E-05[b]	≤3.69E-05[a]	≤4.17E-05[b]	N/A
As	ND	ND	ND	ND	N/A
Ba	6.56E-04	≤1.23E-04[b]	6.23E-04	≤1.17E-04[b]	81.25%
Be	ND	ND	ND	ND	N/A
Cd	1.48E-05	3.00E-05	1.41E-05	2.85E-05	N/A
Cr	2.65E-03	8.85E-04	2.52E-03	8.41E-04	66.56%
Co	8.90E-05	2.06E-04	8.46E-05	1.96E-04	N/A
Cu	1.05E-02	1.79E-04	1.00E-02	1.70E-04	98.30%
Pb	≤1.34E-04[a]	≤3.06E-05[a]	≤1.27E-04[a]	≤2.91E-05[a]	N/A
Mn	1.09E-02	7.15E-04	1.03E-02	6.80E-04	93.43%
Hg	≤1.38E-05[a]	≤1.81E-05[a]	≤1.31E-05[a]	≤1.72E-05[a]	N/A
Ni	5.80E-03	3.70E-03	5.51E-03	3.51E-03	36.24%
P	2.83E-03	2.74E-03	2.69E-03	2.61E-03	3.18%
Se	ND	ND	ND	ND	N/A
Ag	≤3.42E-05[a]	≤3.63E-05[b]	≤3.26E-05[a]	≤3.45E-05[b]	N/A
Tl	ND	ND	ND	ND	N/A
V	≤4.58E-05[a]	≤7.82E-06[a]	≤4.35E-05[a]	≤7.44E-06[a]	N/A
Zn	3.09E-03	4.59E-04	2.94E-03	4.36E-04	85.15%
Cr^{+6}	4.90E-05	2.10E-05	4.66E-05	2.00E-05	5.51%

ND – Non-detect. Analyte below detection limit at both inlet and outlet.
N/A – No control efficiency was calculated.
[a] – Value based on data qualified as DLL in the lab report.
[b] – Analyte below detection limit at outlet, but measurable at inlet. Value shown is the detection limit.

4.0 TEST METHODOLOGY

Emission testing was conducted following the United States Environmental Protection Agency (USEPA) methods specified in 40CFR60 and 40CFR63, Appendix A in addition the Mostardi Platt Quality Manual. Schematics of the test section diagrams and sampling trains used are included in Appendix A and B respectively. Calculation nomenclature are included in Appendix C. Laboratory analysis for each test run are included in Appendix H. The computerized reference method test data is included in Appendix D.

The following methodologies were used during the test program:

4.1 Method 1 Sample and Velocity Traverse Determination

Test measurement points were selected in accordance with Method 1, 40 CFR, Part 60, Appendix A. The characteristics of each measurement location is summarized in the table below. A null-point pitot traverse was performed at the outlet, while site acceptability testing was performed at the inlet to ensure the absence of cyclonic flow.

Sample Point Selection

Test Location	Stack Diameter	Upstream Distance	Downstream Distance	Test Parameters	Number of Sampling Points
BH9256 Inlet	60”	13.3’	6.5’	Cr^{+6} and Metals	40
BH9256 Outlet	60”	20’	30’	Cr^{+6} and Metals	24

4.2 Method 2 Volumetric Flow Rate Determination

Gas velocity was measured following Method 2, 40 CFR, Part 60, Appendix A, for purposes of calculating gas volumetric flow rate and emission rates on a lb/hr and lb/ton metal processed basis. An S-type pitot tube, as a component of the isokinetic sampling train, 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 is presented in Appendix G of this report.

4.3 Method 29 Metals Determination

Metals concentrations and emission rates were determined in accordance with Method 29.

Impingers one and two were loaded with 100 mL each of 5% HNO_3/10% H_2O_2. The third impinger remained empty. The fourth and fifth impinger were loaded with 100mL of 10% H_2SO_4/5% $KMnO_4$. The sixth impinger was filled with silica gel. The impingers were weighed prior to and after each test run in order to determine moisture content of the stack gas. Impingers were recovered as proscribed in the method, with 0.1N HNO_3 used on impingers 1 and 2, 0.1N HNO_3 also used on impinger three (in a separate sample container), and 10% H_2SO_4/5% $KMnO_4$, DI water, and 8N HCl for impingers four and five.

The filter media were Whatman quartz microfiber filters exhibiting a 99.97% efficiency on 0.3-micron DOP smoke particles in accordance with ASTM Standard Method D-2986-71.

Sample analysis was conducted by ChesterNet Labs for particle bound metals from the nozzle, probe, and filter catch, and analyzed for vapor phase metals from the impinger catch.

4.4 Method 0061 Cr^{+6} Determination

Hexavalent chromium (Cr^{+6}) concentrations were determined in accordance with SW-846 Method 0061. The sample was extracted isokinetically from the gas stream and passed through a 0.5N potassium hydroxide (KOH) solution, which was also recirculated through the first impinger to the sample nozzle. The sample train consists of a glass nozzle, and five impingers. The first three impingers contained the KOH solution (150 mL in impinger one, approximately 75mL each in impingers two and three, the fourth impinger remained empty, and the fifth impinger contained silica gel to absorb any remaining moisture). The pH of the first impinger was checked and verified to be greater than 8.5. A post-test nitrogen purge was performed on the impinger train for thirty minutes at 10 liters/minute. Once this purge was complete, samples were filtered and recovered utilizing deionized water and stored in Nalgene sample containers.

5.0 TEST RESULT SUMMARIES

5.1 Baghouse Inlet Method 29 Summary

Client: PCC Structurals, Inc.
Facility: Large Parts Campus Facility - Milwaukie, OR
Test Location: BH9256 Inlet
Test Method: 29

Source Condition			**Batch Process**			
Date		**6/28/23**		**6/29/23**		
Start Time		**3:45**		**3:30**		
End Time		**13:56**		**12:12**		
		Run 1		**Run 2**		**Average**
Stack Conditions						
Average Gas Temperature, °F		95.9		97.7		96.8
Flue Gas Moisture, percent by volume		0.8%		0.7%		0.8%
Average Flue Pressure, in. Hg		29.65		29.55		29.60
Gas Sample Volume, dscf		467.465		473.048		470.257
Average Gas Velocity, ft/sec		80.277		82.162		81.220
Gas Volumetric Flow Rate, acfm		94,574		96,795		95,685
Gas Volumetric Flow Rate, dscfm		88,275		89,909		89,092
Gas Volumetric Flow Rate, scfm		88,999		90,513		89,756
Isokinetic Variance		100.4		99.7		100.1
Sample Duration, hours		8.00		8.00		
Tons of metal processed		8.343		8.415		8.379
Aluminum (Al) Emissions						
Detection Limit Qualifier		**ADL**		**ADL**		
ug of sample collected		2,993.55		2,914.22		2,953.88
ppb		201.46		193.81		197.63
ug/dscm		226.15		217.56		221.86
ug/dscf		6.40E+00		6.16E+00		6.28E+00
lb/hr		7.48E-02		7.33E-02		7.40E-02
lb/ton metal processed		7.17E-02		6.97E-02		7.07E-02
Antimony (Sb) Emissions						
Detection Limit Qualifier		**DLL**		**DLL**		
ug of sample collected	≤	1.57	≤	1.54	≤	1.55
ppb	≤	0.02	≤	0.02	≤	0.02
ug/dscm	≤	0.12	≤	0.12	≤	0.12
ug/dscf	≤	3.40E-03	≤	3.40E-03	≤	3.40E-03
lb/hr	≤	3.91E-05	≤	3.88E-05	≤	3.90E-05
lb/ton metal processed	≤	3.75E-05	≤	3.69E-05	≤	3.72E-05
Arsenic (As) Emissions						
Detection Limit Qualifier		**BDL**		**BDL**		
ug of sample collected	≤	3.37	≤	3.28	≤	3.32
ppb	≤	0.08	≤	0.08	≤	0.08
ug/dscm	≤	0.25	≤	0.24	≤	0.25
ug/dscf	≤	7.08E-03	≤	6.80E-03	≤	6.94E-03
lb/hr	≤	8.41E-05	≤	8.24E-05	≤	8.33E-05
lb/ton metal processed	≤	8.07E-05	≤	7.83E-05	≤	7.95E-05
Barium (Ba) Emissions						
Detection Limit Qualifier		**ADL**		**ADL**		
ug of sample collected		13.85		26.08		19.97
ppb		0.18		0.34		0.26
ug/dscm		1.05		1.95		1.50
ug/dscf		2.97E-02		5.52E-02		4.25E-02
lb/hr		3.46E-04		6.56E-04		5.01E-04
lb/ton metal processed		3.32E-04		6.23E-04		4.78E-04
Beryllium (Be) Emissions						
Detection Limit Qualifier		**BDL**		**BDL**		
ug of sample collected	≤	0.08	≤	0.07	≤	0.07
ppb	≤	0.02	≤	0.01	≤	0.01
ug/dscm	≤	0.01	≤	0.01	≤	0.01
ug/dscf	≤	2.83E-04	≤	2.83E-04	≤	2.83E-04
lb/hr	≤	1.87E-06	≤	1.81E-06	≤	1.84E-06
lb/ton metal processed	≤	1.80E-06	≤	1.72E-06	≤	1.76E-06
Cadmium (Cd) Emissions						
Detection Limit Qualifier		**ADL**		**ADL**		
ug of sample collected		0.24		0.59		0.41
ppb		0.00		0.01		0.01
ug/dscm		0.02		0.04		0.03
ug/dscf		5.66E-04		1.13E-03		8.50E-04
lb/hr		5.87E-06		1.48E-05		1.03E-05
lb/ton metal processed		5.63E-06		1.41E-05		9.85E-06

Client: PCC Structurals, Inc.
Facility: Large Parts Campus Facility - Milwaukie, OR
Test Location: BH9256 Inlet
Test Method: 29

Source Condition	Batch Process		
Date	6/28/23	6/29/23	
Start Time	3:45	3:30	
End Time	13:56	12:12	
	Run 1	Run 2	Average
Stack Conditions			
Average Gas Temperature, °F	95.9	97.7	96.8
Flue Gas Moisture, percent by volume	0.8%	0.7%	0.8%
Average Flue Pressure, in. Hg	29.65	29.55	29.60
Gas Sample Volume, dscf	467.465	473.048	470.257
Average Gas Velocity, ft/sec	80.277	82.162	81.220
Gas Volumetric Flow Rate, acfm	94,574	96,795	95,685
Gas Volumetric Flow Rate, dscfm	88,275	89,909	89,092
Gas Volumetric Flow Rate, scfm	88,999	90,513	89,756
Isokinetic Variance	100.4	99.7	100.1
Sample Duration, hours	8.00	8.00	
Tons of metal processed	8.343	8.415	8.379
Chromium (Cr) Emissions			
Detection Limit Qualifier	ADL	ADL	
ug of sample collected	97.57	105.27	101.42
ppb	3.41	3.63	3.52
ug/dscm	7.37	7.86	7.62
ug/dscf	2.09E-01	2.23E-01	2.16E-01
lb/hr	2.44E-03	2.65E-03	2.54E-03
lb/ton metal processed	2.34E-03	2.52E-03	2.43E-03
Cobalt (Co) Emissions			
Detection Limit Qualifier	ADL	ADL	
ug of sample collected	2.61	3.54	3.08
ppb	0.08	0.11	0.09
ug/dscm	0.20	0.26	0.23
ug/dscf	5.66E-03	7.36E-03	6.51E-03
lb/hr	6.53E-05	8.90E-05	7.71E-05
lb/ton metal processed	6.26E-05	8.46E-05	7.36E-05
Copper (Cu) Emissions			
Detection Limit Qualifier	ADL	ADL	
ug of sample collected	340.40	418.92	379.66
ppb	9.73	11.83	10.78
ug/dscm	25.72	31.27	28.50
ug/dscf	7.28E-01	8.85E-01	8.07E-01
lb/hr	8.50E-03	1.05E-02	9.52E-03
lb/ton metal processed	8.15E-03	1.00E-02	9.08E-03
Lead (Pb) Emissions			
Detection Limit Qualifier	DLL	DLL	
ug of sample collected	≤ 9.26	≤ 5.33	≤ 7.29
ppb	≤ 0.08	≤ 0.05	≤ 0.06
ug/dscm	≤ 0.70	≤ 0.40	≤ 0.55
ug/dscf	≤ 1.98E-02	≤ 1.13E-02	≤ 1.56E-02
lb/hr	≤ 2.31E-04	≤ 1.34E-04	≤ 1.83E-04
lb/ton metal processed	≤ 2.22E-04	≤ 1.27E-04	≤ 1.75E-04
Manganese (Mn) Emissions			
Detection Limit Qualifier	ADL	ADL	
ug of sample collected	789.27	432.97	611.12
ppb	26.08	14.14	20.11
ug/dscm	59.63	32.32	45.98
ug/dscf	1.69E+00	9.15E-01	1.30E+00
lb/hr	1.97E-02	1.09E-02	1.53E-02
lb/ton metal processed	1.89E-02	1.03E-02	1.46E-02
Mercury (Hg) Emissions			
Detection Limit Qualifier	DLL	DLL	
ug of sample collected	≤ 1.40	≤ 0.55	≤ 0.98
ppb	≤ 0.01	≤ 0.01	≤ 0.01
ug/dscm	≤ 0.11	≤ 0.04	≤ 0.08
ug/dscf	≤ 3.11E-03	≤ 1.13E-03	≤ 2.12E-03
lb/hr	≤ 3.51E-05	≤ 1.38E-05	≤ 2.44E-05
lb/ton metal processed	≤ 3.36E-05	≤ 1.31E-05	≤ 2.34E-05

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End Time		**13:56**		**12:12**		
		Run 1		**Run 2**		**Average**
Stack Conditions						
Average Gas Temperature, °F		95.9		97.7		96.8
Flue Gas Moisture, percent by volume		0.8%		0.7%		0.8%
Average Flue Pressure, in. Hg		29.65		29.55		29.60
Gas Sample Volume, dscf		467.465		473.048		470.257
Average Gas Velocity, ft/sec		80.277		82.162		81.220
Gas Volumetric Flow Rate, acfm		94,574		96,795		95,685
Gas Volumetric Flow Rate, dscfm		88,275		89,909		89,092
Gas Volumetric Flow Rate, scfm		88,999		90,513		89,756
Isokinetic Variance		100.4		99.7		100.1
Sample Duration, hours		8.00		8.00		
Tons of metal processed		8.343		8.415		8.379
Nickel (Ni) Emissions						
Detection Limit Qualifier		**ADL**		**ADL**		
ug of sample collected		180.12		230.52		205.32
ppb		5.57		7.05		6.31
ug/dscm		13.61		17.21		15.41
ug/dscf		3.85E-01		4.87E-01		4.36E-01
lb/hr		4.50E-03		5.80E-03		5.15E-03
lb/ton metal processed		4.31E-03		5.51E-03		4.91E-03
Phosphorus (P) Emissions						
Detection Limit Qualifier		**ADL**		**ADL**		
ug of sample collected		108.17		112.39		110.28
ppb		6.34		6.51		6.43
ug/dscm		8.17		8.39		8.28
ug/dscf		2.31E-01		2.38E-01		2.34E-01
lb/hr		2.70E-03		2.83E-03		2.76E-03
lb/ton metal processed		2.59E-03		2.69E-03		2.64E-03
Selenium (Se) Emissions						
Detection Limit Qualifier		**DLL**		**BDL**		
ug of sample collected	≤	2.49	≤	2.16	≤	2.33
ppb	≤	0.06	≤	0.05	≤	0.05
ug/dscm	≤	0.19	≤	0.16	≤	0.18
ug/dscf	≤	5.38E-03	≤	4.53E-03	≤	4.96E-03
lb/hr	≤	6.23E-05	≤	5.43E-05	≤	5.83E-05
lb/ton metal processed	≤	5.97E-05	≤	5.16E-05	≤	5.57E-05
Silver (Ag) Emissions						
Detection Limit Qualifier		**ADL**		**DLL**		
ug of sample collected		1.08	≤	1.36	≤	1.22
ppb		0.01	≤	0.01	≤	0.01
ug/dscm		0.08	≤	0.10	≤	0.09
ug/dscf		2.27E-03	≤	2.83E-03	≤	2.55E-03
lb/hr		2.69E-05	≤	3.42E-05	≤	3.06E-05
lb/ton metal processed		2.58E-05	≤	3.26E-05	≤	2.92E-05
Thallium (Tl) Emissions						
Detection Limit Qualifier		**DLL**		**BDL**		
ug of sample collected	≤	1.34	≤	1.21	≤	1.28
ppb	≤	0.01	≤	0.01	≤	0.01
ug/dscm	≤	0.10	≤	0.09	≤	0.10
ug/dscf	≤	2.83E-03	≤	2.55E-03	≤	2.69E-03
lb/hr	≤	3.35E-05	≤	3.04E-05	≤	3.20E-05
lb/ton metal processed	≤	3.21E-05	≤	2.89E-05	≤	3.05E-05
Vanadium (V) Emissions						
Detection Limit Qualifier		**DLL**		**DLL**		
ug of sample collected	≤	1.30	≤	1.82	≤	1.56
ppb	≤	0.05	≤	0.06	≤	0.06
ug/dscm	≤	0.10	≤	0.14	≤	0.12
ug/dscf	≤	2.83E-03	≤	3.96E-03	≤	3.40E-03
lb/hr	≤	3.26E-05	≤	4.58E-05	≤	3.92E-05
lb/ton metal processed	≤	3.12E-05	≤	4.35E-05	≤	3.74E-05
Zinc (Zn) Emissions						
Detection Limit Qualifier		**ADL**		**ADL**		
ug of sample collected		115.18		122.88		119.03
ppb		3.20		3.37		3.29
ug/dscm		8.70		9.17		8.94
ug/dscf		2.46E-01		2.60E-01		2.53E-01
lb/hr		2.88E-03		3.09E-03		2.98E-03
lb/ton metal processed		2.76E-03		2.94E-03		2.85E-03

5.2 Baghouse Inlet Method 0061 Summary

Client: PCC Structurals, Inc.
Facility: Large Parts Campus Facility - Milwaukie, OR
Test Location: BH9256 Inlet
Test Method: 0061

Source Condition		Batch Process	
Date	6/28/23	6/29/23	
Start Time	3:45	3:30	
End Time	13:56	12:00	
	Run 1	Run 2	Average
Stack Conditions			
Average Gas Temperature, °F	99.5	101.6	100.6
Flue Gas Moisture, percent by volume	0.8%	0.7%	0.8%
Average Flue Pressure, in. Hg	29.65	29.55	29.60
Gas Sample Volume, dscf	439.833	366.552	403.193
Average Gas Velocity, ft/sec	78.768	78.967	78.868
Gas Volumetric Flow Rate, acfm	92,797	93,031	92,914
Gas Volumetric Flow Rate, dscfm	86,075	85,781	85,928
Gas Volumetric Flow Rate, scfm	86,769	86,385	86,577
Isokinetic Variance	99.8	100.1	100.0
Tons of metal processed	8.343	8.415	8.379
Hexavalent Chromium (Cr+6) Emissions			
Detection Limit Qualifier	ADL	ADL	
ug of sample collected	1.63	1.59	1.61
ppb	0.06	0.07	0.07
ug/dscm	1.30E-01	1.50E-01	1.40E-01
ug/dscf	3.68E-03	4.25E-03	3.96E-03
lb/hr	4.20E-05	4.90E-05	4.55E-05
lb/ton metal processed	4.03E-05	4.66E-05	4.34E-05

5.3 Baghouse Outlet Method 29 Summary

Client: PCC Structurals, Inc.
Facility: Large Parts Campus Facility - Milwaukie, OR
Test Location: BH9256 Outlet
Test Method: 29

Source Condition		Batch Process		
Date	6/28/23	6/29/23		
Start Time	3:30	3:30		
End Time	12:10	11:50		
	Run 1	Run 2		Average
Stack Conditions				
Average Gas Temperature, °F	98.9	100.4		99.7
Flue Gas Moisture, percent by volume	1.7%	1.1%		1.4%
Average Flue Pressure, in. Hg	29.90	29.82		29.86
Gas Sample Volume, dscf	368.383	381.422		374.903
Average Gas Velocity, ft/sec	72.582	75.547		74.065
Gas Volumetric Flow Rate, acfm	85,508	89,001		87,255
Gas Volumetric Flow Rate, dscfm	79,325	82,649		80,987
Gas Volumetric Flow Rate, scfm	80,735	83,587		82,161
Isokinetic Variance	99.7	99.0		99.4
Sample Duration, hours	8.00	8.00		
Tons of metal processed	8.343	8.415		8.379
Aluminum (Al) Emissions				
Detection Limit Qualifier	ADL	ADL		
ug of sample collected	511.39	531.81		521.60
ppb	43.67	43.86		43.77
ug/dscm	49.02	49.24		49.13
ug/dscf	1.39E+00	1.39E+00		1.39E+00
lb/hr	1.46E-02	1.52E-02		1.49E-02
lb/ton metal processed	1.40E-02	1.45E-02		1.42E-02
Antimony (Sb) Emissions				
Detection Limit Qualifier	BDL	BDL		
ug of sample collected	≤ 1.46	≤ 1.53	≤	1.49
ppb	≤ 0.03	≤ 0.03	≤	0.03
ug/dscm	≤ 0.14	≤ 0.14	≤	0.14
ug/dscf	≤ 3.96E-03	≤ 3.96E-03	≤	3.96E-03
lb/hr	≤ 4.15E-05	≤ 4.39E-05	≤	4.27E-05
lb/ton metal processed	≤ 3.98E-05	≤ 4.17E-05	≤	4.08E-05
Arsenic (As) Emissions				
Detection Limit Qualifier	BDL	BDL		
ug of sample collected	≤ 3.30	≤ 3.43	≤	3.36
ppb	≤ 0.10	≤ 0.10	≤	0.10
ug/dscm	≤ 0.32	≤ 0.32	≤	0.32
ug/dscf	≤ 9.06E-03	≤ 9.06E-03	≤	9.06E-03
lb/hr	≤ 9.39E-05	≤ 9.83E-05	≤	9.61E-05
lb/ton metal processed	≤ 9.01E-05	≤ 9.35E-05	≤	9.18E-05
Barium (Ba) Emissions				
Detection Limit Qualifier	ADL	BDL		
ug of sample collected	11.08	≤ 4.29	≤	7.69
ppb	0.19	≤ 0.07	≤	0.13
ug/dscm	1.06	≤ 0.40	≤	0.73
ug/dscf	3.00E-02	≤ 1.13E-02	≤	2.07E-02
lb/hr	3.16E-04	≤ 1.23E-04	≤	2.19E-04
lb/ton metal processed	3.03E-04	≤ 1.17E-04	≤	2.10E-04
Beryllium (Be) Emissions				
Detection Limit Qualifier	BDL	BDL		
ug of sample collected	≤ 0.07	≤ 0.08	≤	0.08
ppb	≤ 0.02	≤ 0.02	≤	0.02
ug/dscm	≤ 0.01	≤ 0.01	≤	0.01
ug/dscf	≤ 2.83E-04	≤ 2.83E-04	≤	2.83E-04
lb/hr	≤ 2.08E-06	≤ 2.21E-06	≤	2.14E-06
lb/ton metal processed	≤ 1.99E-06	≤ 2.10E-06	≤	2.05E-06
Cadmium (Cd) Emissions				
Detection Limit Qualifier	ADL	ADL		
ug of sample collected	0.73	1.05		0.89
ppb	0.02	0.02		0.02
ug/dscm	0.07	0.10		0.09
ug/dscf	1.98E-03	2.83E-03		2.41E-03
lb/hr	2.07E-05	3.00E-05		2.53E-05
lb/ton metal processed	1.98E-05	2.85E-05		2.41E-05

Client: PCC Structurals, Inc.
Facility: Large Parts Campus Facility - Milwaukie, OR
Test Location: BH9256 Outlet
Test Method: 29

Source Condition	Batch Process		
Date	6/28/23	6/29/23	
Start Time	3:30	3:30	
End Time	12:10	11:50	
	Run 1	Run 2	Average
Stack Conditions			
Average Gas Temperature, °F	98.9	100.4	99.7
Flue Gas Moisture, percent by volume	1.7%	1.1%	1.4%
Average Flue Pressure, in. Hg	29.90	29.82	29.86
Gas Sample Volume, dscf	368.383	381.422	374.903
Average Gas Velocity, ft/sec	72.582	75.547	74.065
Gas Volumetric Flow Rate, acfm	85,508	89,001	87,255
Gas Volumetric Flow Rate, dscfm	79,325	82,649	80,987
Gas Volumetric Flow Rate, scfm	80,735	83,587	82,161
Isokinetic Variance	99.7	99.0	99.4
Sample Duration, hours	8.00	8.00	
Tons of metal processed	8.343	8.415	8.379
Chromium (Cr) Emissions			
Detection Limit Qualifier	ADL	ADL	
ug of sample collected	2.79	30.88	16.83
ppb	0.12	1.32	0.72
ug/dscm	0.27	2.86	1.57
ug/dscf	7.65E-03	8.10E-02	4.43E-02
lb/hr	7.93E-05	8.85E-04	4.82E-04
lb/ton metal processed	7.61E-05	8.41E-04	4.59E-04
Cobalt (Co) Emissions			
Detection Limit Qualifier	DLL	ADL	
ug of sample collected	≤ 0.18	7.20	≤ 3.69
ppb	≤ 0.01	0.27	≤ 0.14
ug/dscm	≤ 0.02	0.67	≤ 0.35
ug/dscf	≤ 5.66E-04	1.90E-02	≤ 9.77E-03
lb/hr	≤ 5.18E-06	2.06E-04	≤ 1.06E-04
lb/ton metal processed	≤ 4.97E-06	1.96E-04	≤ 1.01E-04
Copper (Cu) Emissions			
Detection Limit Qualifier	ADL	ADL	
ug of sample collected	5.27	6.24	5.76
ppb	0.19	0.22	0.21
ug/dscm	0.51	0.58	0.55
ug/dscf	1.44E-02	1.64E-02	1.54E-02
lb/hr	1.50E-04	1.79E-04	1.65E-04
lb/ton metal processed	1.44E-04	1.70E-04	1.57E-04
Lead (Pb) Emissions			
Detection Limit Qualifier	DLL	DLL	
ug of sample collected	≤ 0.75	≤ 1.07	≤ 0.91
ppb	≤ 0.01	≤ 0.01	≤ 0.01
ug/dscm	≤ 0.07	≤ 0.10	≤ 0.09
ug/dscf	≤ 1.98E-03	≤ 2.83E-03	≤ 2.41E-03
lb/hr	≤ 2.13E-05	≤ 3.06E-05	≤ 2.60E-05
lb/ton metal processed	≤ 2.04E-05	≤ 2.91E-05	≤ 2.48E-05
Manganese (Mn) Emissions			
Detection Limit Qualifier	ADL	ADL	
ug of sample collected	7.03	24.96	15.99
ppb	0.30	1.01	0.65
ug/dscm	0.67	2.31	1.49
ug/dscf	1.90E-02	6.54E-02	4.22E-02
lb/hr	2.00E-04	7.15E-04	4.58E-04
lb/ton metal processed	1.92E-04	6.80E-04	4.36E-04
Mercury (Hg) Emissions			
Detection Limit Qualifier	DLL	DLL	
ug of sample collected	≤ 0.70	≤ 0.63	≤ 0.66
ppb	≤ 0.01	≤ 0.01	≤ 0.01
ug/dscm	≤ 0.07	≤ 0.06	≤ 0.07
ug/dscf	≤ 1.98E-03	≤ 1.70E-03	≤ 1.84E-03
lb/hr	≤ 1.99E-05	≤ 1.81E-05	≤ 1.90E-05
lb/ton metal processed	≤ 1.91E-05	≤ 1.72E-05	≤ 1.81E-05

Client: PCC Structurals, Inc.
Facility: Large Parts Campus Facility - Milwaukie, OR
Test Location: BH9256 Outlet
Test Method: 29

Source Condition			**Batch Process**			
Date		**6/28/23**		**6/29/23**		
Start Time		**3:30**		**3:30**		
End Time		**12:10**		**11:50**		
		Run 1		**Run 2**		**Average**
Stack Conditions						
Average Gas Temperature, °F		98.9		100.4		99.7
Flue Gas Moisture, percent by volume		1.7%		1.1%		1.4%
Average Flue Pressure, in. Hg		29.90		29.82		29.86
Gas Sample Volume, dscf		368.383		381.422		374.903
Average Gas Velocity, ft/sec		72.582		75.547		74.065
Gas Volumetric Flow Rate, acfm		85,508		89,001		87,255
Gas Volumetric Flow Rate, dscfm		79,325		82,649		80,987
Gas Volumetric Flow Rate, scfm		80,735		83,587		82,161
Isokinetic Variance		99.7		99.0		99.4
Sample Duration, hours		8.00		8.00		
Tons of metal processed		8.343		8.415		8.379
Nickel (Ni) Emissions						
Detection Limit Qualifier		**ADL**		**ADL**		
ug of sample collected		11.94		128.92		70.43
ppb		0.47		4.89		2.68
ug/dscm		1.14		11.94		6.54
ug/dscf		3.23E-02		3.38E-01		1.85E-01
lb/hr		3.40E-04		3.70E-03		2.02E-03
lb/ton metal processed		3.26E-04		3.51E-03		1.92E-03
Phosphorus (P) Emissions						
Detection Limit Qualifier		**ADL**		**ADL**		
ug of sample collected		98.84		95.65		97.24
ppb		7.35		6.87		7.11
ug/dscm		9.47		8.86		9.17
ug/dscf		2.68E-01		2.51E-01		2.60E-01
lb/hr		2.82E-03		2.74E-03		2.78E-03
lb/ton metal processed		2.70E-03		2.61E-03		2.65E-03
Selenium (Se) Emissions						
Detection Limit Qualifier		**DLL**		**BDL**		
ug of sample collected	≤	3.05	≤	2.50	≤	2.78
ppb	≤	0.09	≤	0.07	≤	0.08
ug/dscm	≤	0.29	≤	0.23	≤	0.26
ug/dscf	≤	8.21E-03	≤	6.51E-03	≤	7.36E-03
lb/hr	≤	8.69E-05	≤	7.17E-05	≤	7.93E-05
lb/ton metal processed	≤	8.33E-05	≤	6.81E-05	≤	7.57E-05
Silver (Ag) Emissions						
Detection Limit Qualifier		**BDL**		**BDL**		
ug of sample collected	≤	0.73	≤	1.27	≤	1.00
ppb	≤	0.01	≤	0.01	≤	0.01
ug/dscm	≤	0.07	≤	0.12	≤	0.10
ug/dscf	≤	1.98E-03	≤	3.40E-03	≤	2.69E-03
lb/hr	≤	2.07E-05	≤	3.63E-05	≤	2.85E-05
lb/ton metal processed	≤	1.99E-05	≤	3.45E-05	≤	2.72E-05
Thallium (Tl) Emissions						
Detection Limit Qualifier		**BDL**		**BDL**		
ug of sample collected	≤	1.24	≤	1.43	≤	1.34
ppb	≤	0.01	≤	0.02	≤	0.02
ug/dscm	≤	0.12	≤	0.13	≤	0.13
ug/dscf	≤	3.40E-03	≤	3.68E-03	≤	3.54E-03
lb/hr	≤	3.53E-05	≤	4.10E-05	≤	3.82E-05
lb/ton metal processed	≤	3.39E-05	≤	3.90E-05	≤	3.64E-05
Vanadium (V) Emissions						
Detection Limit Qualifier		**DLL**		**DLL**		
ug of sample collected	≤	0.24	≤	0.27	≤	0.25
ppb	≤	0.01	≤	0.01	≤	0.01
ug/dscm	≤	0.02	≤	0.03	≤	0.03
ug/dscf	≤	5.66E-04	≤	8.50E-04	≤	7.08E-04
lb/hr	≤	6.72E-06	≤	7.82E-06	≤	7.27E-06
lb/ton metal processed	≤	6.45E-06	≤	7.44E-06	≤	6.94E-06
Zinc (Zn) Emissions						
Detection Limit Qualifier		**ADL**		**ADL**		
ug of sample collected		29.48		16.00		22.74
ppb		1.04		0.55		0.79
ug/dscm		2.83		1.48		2.16
ug/dscf		8.01E-02		4.19E-02		6.10E-02
lb/hr		8.40E-04		4.59E-04		6.49E-04
lb/ton metal processed		8.05E-04		4.36E-04		6.21E-04

5.4 Baghouse Outlet Method 0061 Summary

Client: PCC Structurals, Inc.
Facility: Large Parts Campus Facility - Milwaukie, OR
Test Location: BH9256 Outlet
Test Method: 0061

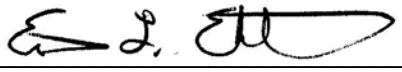
Source Condition		Batch Process	
Date	6/28/23	6/29/23	
Start Time	3:30	3:30	
End Time	12:10	11:50	
	Run 1	Run 2	Average
Stack Conditions			
Average Gas Temperature, °F	97.9	99.1	98.5
Flue Gas Moisture, percent by volume	1.8%	1.1%	1.5%
Average Flue Pressure, in. Hg	29.90	29.82	29.86
Gas Sample Volume, dscf	369.627	378.475	374.051
Average Gas Velocity, ft/sec	74.839	76.434	75.637
Gas Volumetric Flow Rate, acfm	88,168	90,047	89,108
Gas Volumetric Flow Rate, dscfm	81,891	83,822	82,857
Gas Volumetric Flow Rate, scfm	83,392	84,755	84,074
Isokinetic Variance	99.0	99.0	99.0
Tons of metal processed	8.343	8.415	8.379
Hexavalent Chromium (Cr) Emissions			
Detection Limit Qualifier	ADL	ADL	
ug of sample collected	6.27	0.70	3.49
ppb	0.28	0.03	0.15
ug/dscm	0.60	0.07	0.34
ug/dscf	1.70E-02	1.98E-03	9.49E-03
lb/hr	1.84E-04	2.10E-05	1.03E-04
lb/ton metal processed	1.76E-04	2.00E-05	9.82E-05

6.0 CERTIFICATION

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

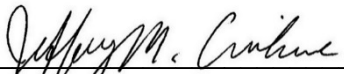
As the program manager, I hereby certify that this test report represents a true and accurate summary of emissions test results and the methodologies employed to obtain those results. The test program was performed in accordance with the test methods and the Mostardi Platt Quality Manual, as applicable.

MOSTARDI PLATT



Program Manager

Eric L. Ehlers



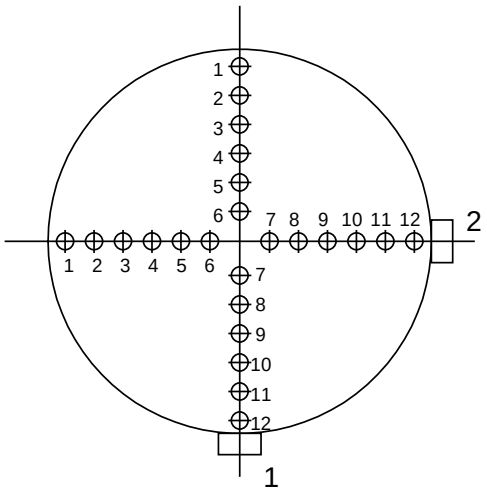
Quality Assurance

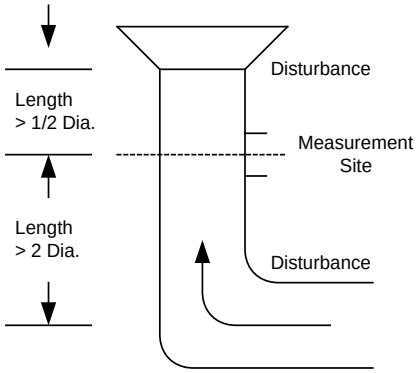
Jeffrey M. Crivlare

APPENDICES

Appendix A - Test Section Diagrams

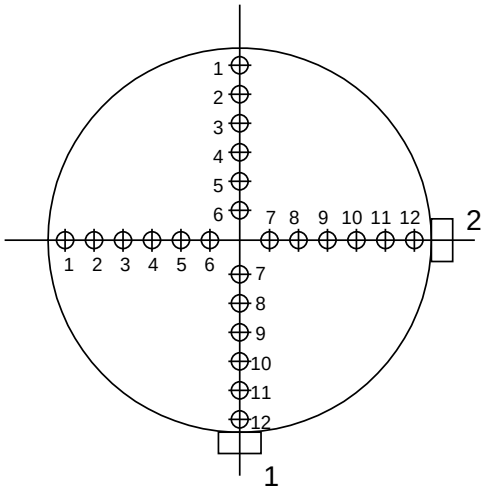
EQUAL AREA TRAVERSE FOR ROUND DUCTS

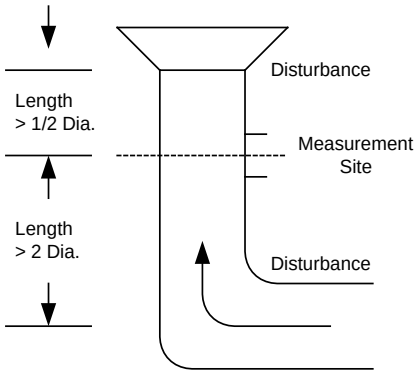




Project:	PCC Structurals, Inc. Large Parts Campus Milwaukie, Oregon
Unit:	BH9256 Inlet
Stack Diameter:	5.0 Feet
Stack Area:	19.635 Square Feet
No. Points Across Diameter:	20
No. of Ports:	2
Port Length:	4.0 inches

EQUAL AREA TRAVERSE FOR ROUND DUCTS

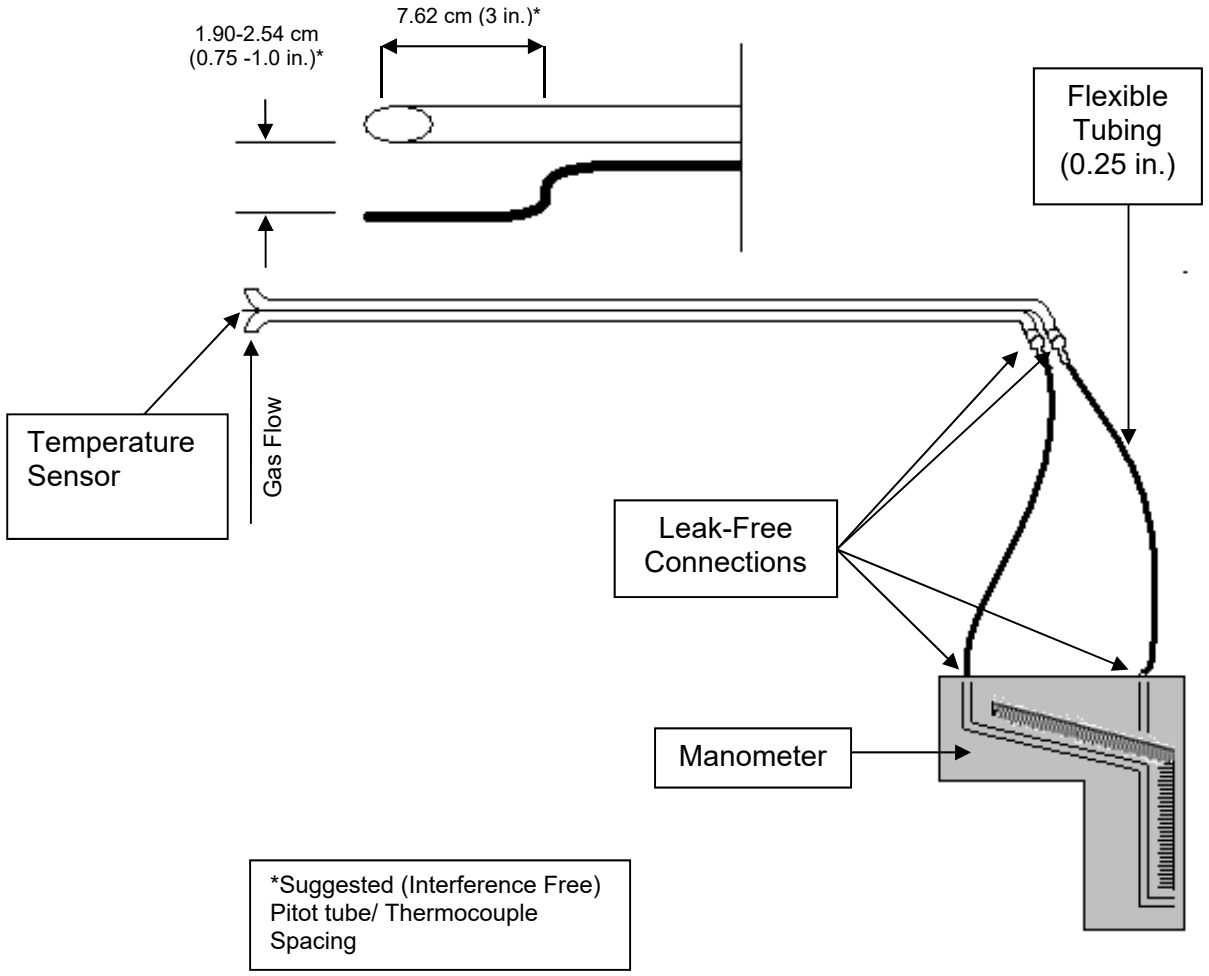




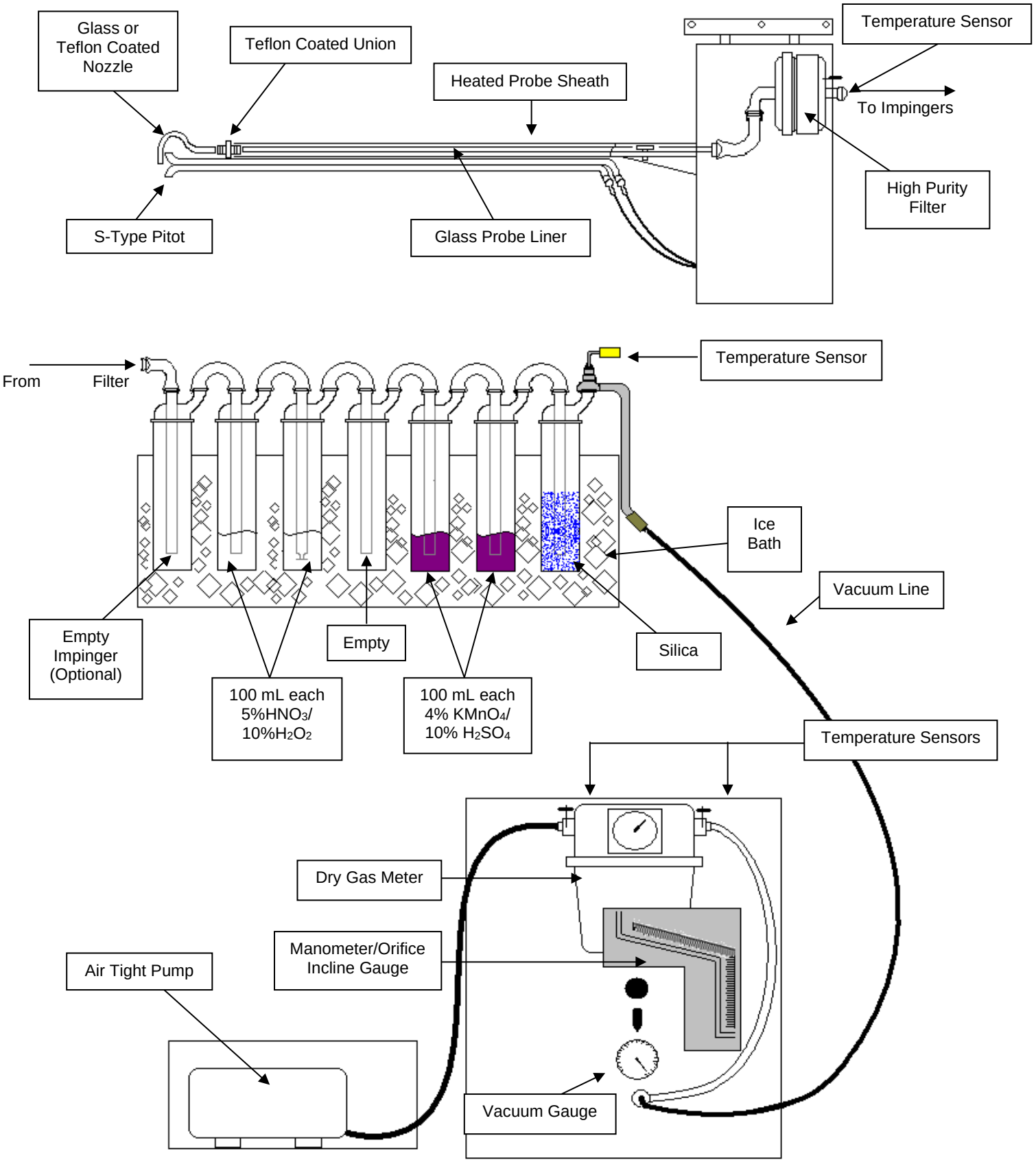
Project:	PCC Structurals, Inc. Large Parts Campus Milwaukie, Oregon
Unit:	BH9256 Outlet
Stack Diameter:	5.0 Feet
Stack Area:	19.635 Square Feet
No. Points Across Diameter:	12
No. of Ports:	2
Port Length:	4.0 inches

Appendix B - Sample Train Diagrams

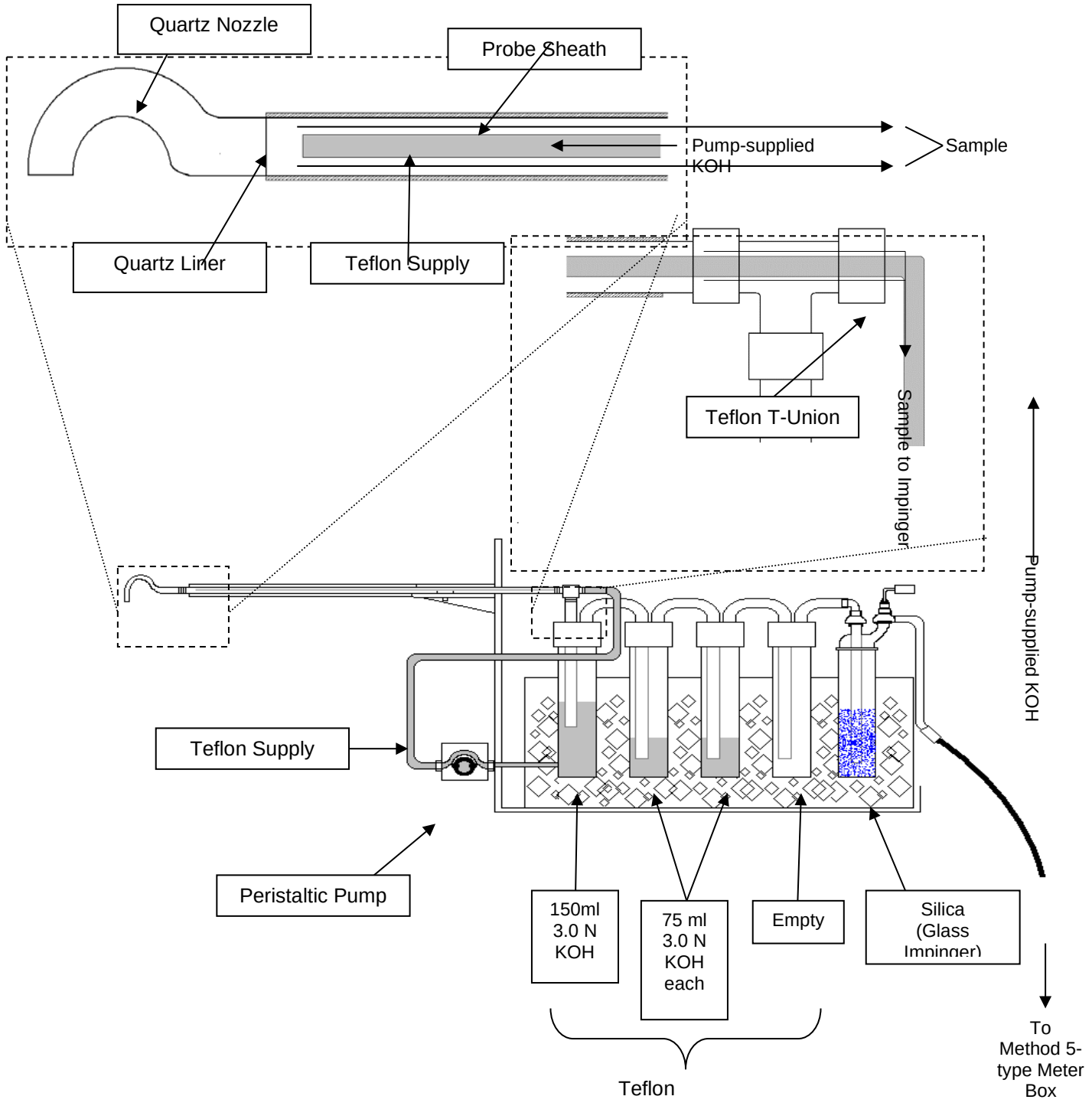
USEPA Method 2 – Type S Pitot Tube Manometer Assembly



USEPA Method 29- Metals Sample Train Diagram



Method 0061- Hexavalent Chromium Sampling Train



Appendix C - Calculation Nomenclature and Formulas

Client: PCC Structurals, Inc.
Facility: Large Parts Campus Facility - Milwaukie, OR
Test Location: BH9256 Inlet
Run: 1
Date: 6/28/2023
Method: 29
Source Condition: Batch

Dry Molecular Weight

Md = 29.000

Wet Molecular Weight

Ms = Md x (1-Bws) + (18.0 x Bws)

Md = 29.000 Bws = 0.008

Ms = 28.911

Meter Volume at Standard Conditions

$$Vm(std) = 17.647 \times Y \times Vm \times \frac{(Pbar + DH/13.6)}{Tm}$$

Y = 0.989 Vm = 469.832 Pbar = 30.1
DH = 3.2 Tm = 531.2

Vm(std) = 467.465

Volume of Water Vapor Condensed

$Vw(std) = 0.0471 \times (\text{net } H_2O \text{ gain})$

Net H_2O = 81.4

Vw(std) = 3.834

Moisture Content

$$Bws = \frac{Vw(std)}{Vw(std) + Vm(std)}$$

Vw(std) = 3.834 Vm(std) = 467.465

Bws = 0.008

Average Duct Velocity

$$Vs = 85.49 \times Cp \times \text{Sqrt DP (avg)} \times (Ts(avg) + 460/(Ps \times Ms))^{1/2}$$

Cp = 0.840 Ts (avg) = 95.9 Sqrt DP (avg): 1.388
Ps = 29.65 Ms = 28.911

Vs = 80.277

Client:	**PCC Structurals, Inc.**
Facility:	**Large Parts Campus Facility - Milwaukie, OR**
Test Location:	**BH9256 Inlet**
Run:	**1**
Date:	**6/28/2023**
Method:	**29**
Source Condition:	**Batch**

Volumetric Flow Rate (Actual Basis)

$$Q = Vs \times A \times 60$$

Vs = 80.277 **A =** 19.635

Q = 94,574

Volumetric Flow Rate (Standard Basis)

$$Qstd = 17.647 \times Q \times \frac{Ps}{Ts\ (avg) + 460}$$

Q = 94,574 **Ps =** 29.65 **Ts (avg) =** 95.9

Qstd = 88,999

Volumetric Flow Rate (Standard Dry Basis)

$$Qstd(dry) = Qstd \times (1-Bws)$$

Qstd = 88,999 **Bws =** 0.008

Qstd(dry) = 88,275

Isokinetic Variation:

$$\%ISO = \frac{0.0945 \times (Ts + 460) \times Vm(std)}{Vs \times \theta \times An \times Ps \times (1-Bws)}$$

Ts = 95.9 **Vm(std) =** 467.465 **Vs =** 80.277
An = 0.0002160 **θ =** 480 **Ps =** 29.65
Bws = 0.008

%ISO = 100.4

Client:	**PCC Structurals, Inc.**
Facility:	**Large Parts Campus Facility - Milwaukie, OR**
Test Location:	**BH9256 Inlet**
Run:	**1**
Date:	**6/28/2023**
Method:	**29**
Source Condition:	**Batch**

Aluminum (Al) Concentration:

$$\mu g/m^3 = \frac{\mu g \text{ of Aluminum (Al)}}{Vm(std) \times 0.02832\ m^3/ft^3}$$

µg= 2644.00 **Vm(std) =** 467.465

µg/m³= 199.74

Aluminum (Al) Emission Rate:

$$\text{lb of Aluminum (Al)} = \frac{\mu g \text{ of sample} \times 10^{-6}\ grams/\mu g}{453.6\ grams/lb}$$

lb of Aluminum (Al) = 5.83E-06 **dscfm =** 88,275

$$\text{Emission Rate lb/hr} = \frac{\text{lb of Aluminum (Al)}}{Vm(std)} \times dscfm \times 60\ min/hr$$

Emission Rate lb/hr = 6.60E-02

MOSTARDI PLATT

Volumetric Flow Nomenclature

A = Cross-sectional area of stack or duct, ft^2

B_{ws} = Water vapor in gas stream, proportion by volume

C_p = Pitot tube coefficient, dimensionless

M_d = Dry molecular weight of gas, lb/lb-mole

M_s = Molecular weight of gas, wet basis, lb/lb-mole

M_w = Molecular weight of water, 18.0 lb/lb-mole

P_{bar} = Barometric pressure at testing site, in. Hg

P_g = Static pressure of gas, in. Hg (in. H_2O/13.6)

P_s = Absolute pressure of gas, in. Hg = $P_{bar} + P_g$

P_{std} = Standard absolute pressure, 29.92 in. Hg

Q_{acfm} = Actual volumetric gas flow rate, acfm

Q_{sd} = Dry volumetric gas flow rate corrected to standard conditions, dscf/hr

R = Ideal gas constant, 21.85 in. Hg-ft^3/°R-lb-mole

T_s = Absolute gas temperature, °R

T_{std} = Standard absolute temperature, 528°R

v_s = Gas velocity, ft/sec

$V_{w(std)}$ = Volume of water vapor in gas sample, corrected to standard conditions, scf

Y = Dry gas meter calibration factor

Δp = Velocity head of gas, in. H_2O

K_1 = 17.647 °R/in. Hg

%EA = Percent excess air

$\%CO_2$ = Percent carbon dioxide by volume, dry basis

$\%O_2$ = Percent oxygen by volume, dry basis

$\%N_2$ = Percent nitrogen by volume, dry basis

0.264 = Ratio of O_2 to N_2 in air, v/v

0.28 = Molecular weight of N_2 or CO, divided by 100

0.32 = Molecular weight of O_2 divided by 100

0.44 = Molecular weight of CO_2 divided by 100

13.6 = Specific gravity of mercury (Hg)

MOSTARDI PLATT

Volumetric Air Flow Calculations

$$Vm\ (std) = 17.647 \times Vm \times \left[\frac{\left(P_{bar} + \left[\frac{DH}{13.6}\right]\right)}{(460 + Tm)}\right] \times Y$$

$$Vw\ (std) = 0.0471 \times Vlc$$

$$Bws = \left[\frac{Vw\ (std)}{Vw\ (std) + Vm\ (std)}\right]$$

$$Md = (0.44 \times \%CO_2) + (0.32 \times \%O_2) + [0.28 \times (100 - \%CO_2 - \%O_2)]$$

$$Ms = Md \times (1 - Bws) + (18 \times Bws)$$

$$Vs = \sqrt{\frac{(Ts + 460)}{Ms \times Ps}} \times \sqrt{DP} \times Cp \times 85.49$$

$$Acfm = Vs \times Area\ (of\ stack\ or\ duct) \times 60$$

$$Scfm = Acfm \times 17.647 \times \left[\frac{Ps}{(460 + Ts)}\right]$$

$$Scfh = Scfm \times 60\frac{min}{hr}$$

$$Dscfm = Scfm \times (1 - Bws)$$

MOSTARDI PLATT

Isokinetic Nomenclature

A = Cross-sectional area of stack or duct, square feet
A_n = Cross-sectional area of nozzle, square feet
B_{ws} = Water vapor in gas stream, by volume
C_a = Acetone blank residue concentration, g/g
C_{acf} = Concentration of particulate matter in gas stream at actual conditions, gr/acf
C_p = Pitot tube coefficient
C_s = Concentration of particulate matter in gas stream, dry basis, corrected to standard conditions, gr/dscf
IKV = Isokinetic sampling variance, must be 90.0 % ≤ IKV ≤ 110.0%
M_d = Dry molecular weight of gas, lb/lb-mole
M_s = Molecular weight of gas, wet basis, lb/lb-mole
M_w = Molecular weight of water, 18.0 lb/lb-mole
m_a = Mass of residue of acetone after evaporation, grams
P_{bar} = Barometric pressure at testing site, inches mercury
P_g = Static pressure of gas, inches mercury (inches water/13.6)
P_s = Absolute pressure of gas, inches mercury = $P_{bar} + P_g$
P_{std} = Standard absolute pressure, 29.92 inches mercury
Q_{acfm} = Actual volumetric gas flow rate, acfm
Q_{sd} = Dry volumetric gas flow rate corrected to standard conditions, dscfh
R = Ideal gas constant, 21.85 inches mercury cubic foot/°R-lb-mole
T_m = Dry gas meter temperature, °R
T_s = Gas temperature, °R
T_{std} = Absolute temperature, 528°R
V_a = Volume of acetone blank, ml
V_{aw} = Volume of acetone used in wash, ml
W_a = Weight of residue in acetone wash, grams
m_n = Total amount of particulate matter collected, grams
V_{1c} = Total volume of liquid collected in impingers and silica gel, ml
V_m = Volume of gas sample as measured by dry gas meter, dcf
$V_{m(std)}$ = Volume of gas sample measured by dry gas meter, corrected to standard conditions, dscf
v_s = Gas velocity, ft/sec
$V_{w(std)}$ = Volume of water vapor in gas sample, corrected to standard conditions, scf
Y = Dry gas meter calibration factor
ΔH = Average pressure differential across the orifice meter, inches water
Δp = Velocity head of gas, inches water
ρ_a = Density of acetone, 0.7855 g/ml (average)
ρ_w = Density of water, 0.002201 lb/ml
θ = Total sampling time, minutes
K_1 = 17.647 °R/in. Hg
K_2 = 0.04707 ft^3/ml
K_4 = 0.09450/100 = 0.000945
K_p = $85.49 \frac{\text{ft}}{\text{sec}} \left[\frac{(\text{lb/lb} - \text{mole})(\text{in. Hg})}{(^\circ\text{R})(\text{in. H}_2\text{O})} \right]^{1/2}$
Pitot tube constant,
%EA = Percent excess air
$\%CO_2$ = Percent carbon dioxide by volume, dry basis
$\%O_2$ = Percent oxygen by volume, dry basis
%CO = Percent carbon monoxide by volume, dry basis
$\%N_2$ = Percent nitrogen by volume, dry basis
0.264 = Ratio of O_2 to N_2 in air, v/v
28 = Molecular weight of N_2 or CO
32 = Molecular weight of O_2
44 = Molecular weight of CO_2
13.6 = Specific gravity of mercury (Hg)

MOSTARDI PLATT

Isokinetic Calculation Formulas

1. $$V_{w(std)} = V_{lc}\left(\frac{\rho_w}{M_w}\right)\left(\frac{RT_{std}}{P_{std}}\right) = K_2 V_{lc}$$

2. $$V_{m(std)} = V_m Y \left(\frac{T_{std}}{T_m}\right)\left(\frac{(P_{bar} + (\frac{\Delta H}{13.6}))}{P_{std}}\right) = K_1 V_m Y \frac{(P_{bar} + (\frac{\Delta H}{13.6}))}{T_m}$$

3. $$B_{ws} = \frac{V_{w(std)}}{(V_{m(std)} + V_{w(std)})}$$

4. $$M_d = 0.44(\%CO_2) + 0.32(\%O_2) + 0.28(\%N_2)$$

5. $$M_s = M_d(1 - B_{ws}) + 18.0(B_{ws})$$

6. $$C_a = \frac{m_a}{V_a \rho_a}$$

7. $$W_a = C_a V_{aw} \rho_a$$

8. $$C_{acf} = 15.43 K_i \left(\frac{m_n P_s}{V_{w(std)} + V_{m(std)}\ T_s}\right)$$

9. $$C_S = (15.43 \text{ grains/gram})\ (m_n / V_{m(std)})$$

10. $$v_s = K_p C_p \sqrt{\frac{\Delta P\ T_s}{P_s M_s}}$$

11. $$Q_{acfm} = v_s A(60_{sec/min})$$

12. $$Q_{sd} = (3600_{sec/hr})(1 - B_{ws})\ v_s\ \left(\frac{T_{std} P_s}{T_s P_{std}}\right)\ A$$

13. $$E \text{ (emission rate, lbs/hr)} = Q_{std}\left(C_s / 7000 \text{ grains/lb}\right)$$

14. $$IKV = \frac{T_s V_{m(std)} P_{std}}{T_{std} v_s \theta A_n P_s 60(1 - B_{ws})} = K_4 \frac{T_s V_{m(std)}}{P_s v_s A_n \theta (1 - B_{ws})}$$

15. $$\%EA = \left(\frac{\%O_2 - (0.5\,\%CO)}{0.264\,\%N_2 - (\%O_2 - 0.5\,\%CO)}\right) \times 100$$

MOSTARDI PLATT

Moisture Calculations

$$V_{wc(std)} = \frac{(V_f - V_i)\rho_w R T_{std}}{P_{std} M_w} = 0.04707(V_f - V_i)$$

$$V_{wsg(std)} = \frac{(W_f - W_i)\rho_w R T_{std}}{P_{std} M_w} = 0.04715(W_f - W_i)$$

$$V_{m(std)} = 17.64\, V_m Y \frac{P_{bar} + \frac{\Delta H}{13.6}}{T_m}$$

$$B_{ws} = \frac{V_{wc(std)} + V_{wsg(std)}}{V_{wc(std)} + V_{wsg(std)} + V_{m(std)}}$$

Where:

B_{ws} = Water vapor in gas stream, proportion by volume
M_w = Molecular weight of water, 18.015 lb/lb-mole
P_{bar} = Barometric pressure at the testing site, in. Hg
P_{std} = Standard absolute pressure, 29.92 in. Hg
R = Ideal gas constant, 0.048137 (in. Hg)(ft^3)/(g-mole)(°R) = [21.8348(in. Hg)(ft^3)/(lb-mole)(°R)]/453.592 g-mole/lb-mole
T_m = Absolute average dry gas meter temperature, °R
T_{std} = Standard absolute temperature, 528 °R
V_f = Final volume of condenser water, ml
V_i = Initial volume of condenser water, ml
V_m = Dry gas volume measured by dry gas meter, dcf
$V_{m(std)}$ = Dry gas volume measured by dry gas meter, corrected to standard conditions, scf
$V_{wc(std)}$ = Volume of condensed water vapor, corrected to standard conditions, scf
$V_{wsg(std)}$ = Volume of water vapor collected in silica gel, corrected to standard conditions, scf
W_f = Final weight of silica gel, g
W_i = Initial weight of silica gel, g
Y = Dry gas meter calibration factor
ΔH = Average pressure exerted on dry gas meter outlet by gas sample bag, in. H_2O
ρ_w = Density of water, 0.9982 g/ml
13.6 = Specific gravity of mercury (Hg)
17.64 = T_{std}/P_{std}
0.04707 = ft^3/ml 0.04715 = ft^3/g

MOSTARDI PLATT

Trace Metal (Including Mercury) Sample Calculations

Concentration

$$\frac{\mu g}{m^3} = \frac{\mu g\ of\ trace\ metal}{dscf\ volume\ sampled \times 0.02832 \frac{m^3}{ft^3}}$$

Emission Rate

$$\frac{\mu g\ of\ sample \times \frac{1 \times 10^{-6} grams}{\mu g}}{453.6\ gr/lb} = lbs\ of\ trace\ metal$$

$$\frac{lbs\ of\ trace\ metal}{V_m(std) sample} \times dscfm \times 60 \frac{min}{hr} = lbs\ of\ trace\ metal/hr$$

Appendix D - Reference Method Test Data

Client:	PCC Structurals, Inc.		
Facility:	Large Parts Campus Facility - Milwaukie, OR		
Test Location:	BH9256 Inlet		
Project #:	M232604		
Test Method:	29		
Test Engineer:	EE		
Test Technician:	PPP/FJD		
	Run 1		**Run 2**
Temp ID:	CM40		CM40
Meter ID:	CM40		CM40
Pitot ID:	297		297
Nozzle Diameter (Inches):	0.199		0.199
Meter Calibration Date:	6/20/2023		6/20/2023
Meter Calibration Factor (Y):	0.989		0.989
Meter Orifice Setting (Delta H):	1.774		1.774
Pitot Tube Coefficient:	0.840		
Probe Length (Feet):	6.0		
Probe Liner Material:	Glass		
Port Length (Inches):	4.00		
Port Size (Diameter, Inches):	4.00		
Port Type:	Nipple		
Duct Shape:	Circular		
Diameter (Feet):	5		
Duct Area (Square Feet):	19.635		
Upstream Distance (Feet):	13.3		
Downstream Distance (Feet):	6.5		
Number of Ports Sampled:	2		
Number of Points per Port:	20		
Minutes per Point:	12.0		
Minutes per Reading:	12.0		
Total Number of Traverse Points:	40		
Test Length (Minutes):	480		
Train Type:	Hot Box		
Source Condition:	Batch Process		
Moisture Balance ID:	S10-35		
# of Runs	2		

Run 1 - Method 29

Client: PCC Structurals, Inc. **Date:** 6/28/23
Facility: Large Parts Campus Facility - Milwaukie, OR **Start Time:** 3:45
Test Location: BH9256 Inlet **End Time:** 13:56
Source Condition: Batch Process

DRY GAS METER CONDITIONS			STACK CONDITIONS		
ΔH:	3.17	in. H_2O	Static Pressure	-5.50	in. H_2O
Meter Temperature, Tm:	71.2	°F	Flue Pressure (Ps):	29.65	in. Hg. abs.
Sqrt ΔP:	1.388	in. H_2O			
Stack Temperature, Ts:	95.9	°F			
Meter Volume, Vm:	469.832	ft^3			
Meter Volume, Vmstd:	467.465	dscf	Gas Weight dry, Md:	29.000	lb/lb mole
Meter Volume, Vwstd:	3.834	wscf	Gas Weight wet, Ms:	28.911	lb/lb mole
Isokinetic Variance:	100.4	%I			
			Gas Velocity, Vs:	80.277	fps
Test Length:	480.00	in mins.	Volumetric Flow:	94,574	acfm
Nozzle Diameter:	0.199	in inches	Volumetric Flow:	88,275	dscfm
Barometric Pressure:	30.05	in Hg	Volumetric Flow:	88,999	scfm

MOISTURE DETERMINATION

Initial Impinger Content:	3700.1	ml	Silica Initial Wt.	816.5	grams
Final Impinger Content:	3725.6	ml	Silica Final Wt.	872.4	grams
Impinger Difference:	25.5	ml	Silica Difference:	55.9	grams

Total Water Gain: 81.4 Moisture, Bws: 0.008 **Supersaturation Value, Bws: 0.058**

Port-Point No.	Clock Time	Velocity Head Δp in. H2O	Orifice ΔH in. H2O	Actual Meter Vol. ft^3	Stack Temp °F	Meter Temp Inlet °F	Meter Temp Outlet °F	Probe Temp °F	Filter Exit Temp °F	Impinger Exit Temp °F	
1-1	3:45:00	3.00	5.00	586.745	91	61	61	233	250	60	
1-2	3:57:00	1.70	2.80	600.700	89	60	60	250	250	60	
1-3	4:09:00	1.80	2.90	612.500	91	60	60	251	250	60	
1-4	4:21:00	1.70	2.80	624.150	92	61	61	236	250	60	
	4:33:00			635.711							
1-5	5:40:00	2.10	3.30	645.733	93	60	60	235	260	54	
1-6	5:52:00	1.60	2.50	658.700	93	62	62	232	251	56	
1-7	6:04:00	1.70	2.70	669.850	92	63	63	250	251	57	
1-8	6:16:00	1.60	2.50	681.030	92	64	64	248	250	55	
1-9	6:28:00	2.50	3.90	692.010	95	65	65	250	264	56	
1-10	6:40:00	2.50	3.90	705.710	96	65	65	250	251	56	
1-11	6:52:00	2.80	4.40	728.050	95	65	65	250	250	56	
1-12	7:04:00	2.60	4.10	728.230	96	66	66	249	250	56	
1-13	7:16:00	2.70	4.30	741.210	94	66	66	247	251	55	
1-14	7:28:00	2.50	3.90	755.410	94	67	67	249	250	54	
1-15	7:40:00	2.60	4.10	767.390	93	67	67	248	251	53	
1-16	7:52:00	2.30	3.60	782.310	94	68	68	250	253	53	
1-17	8:04:00	2.50	2.90	796.330	94	67	67	252	249	53	
1-18	8:16:00	2.40	3.70	809.120	94	66	66	246	250	54	
1-19	8:28:00	2.50	3.90	820.330	93	68	68	247	251	54	
1-20	8:40:00	2.40	3.70	832.330	93	70	70	251	250	54	
	8:52:00			844.569							
2-1	9:35:00	3.30	5.10	844.981	93	74	74	230	249	55	
2-2	9:47:00	3.10	4.80	859.510	94	74	74	248	250	54	
	9:59:00			873.880							
2-3	10:20:00	3.20	5.10	873.880	102	73	73	249	251	54	
2-4	10:32:00	3.20	5.10	888.720	108	74	74	248	251	54	
2-5	10:44:00	2.90	4.60	904.080	106	75	75	249	249	53	
2-6	10:56:00	2.70	4.20	920.130	104	76	76	248	251	50	
2-7	11:08:00	2.60	4.10	933.850	105	77	77	248	251	51	
2-8	11:20:00	2.60	4.10	948.180	102	77	77	250	251	50	
2-9	11:32:00	2.00	3.10	961.890	102	77	77	250	249	50	
2-10	11:44:00	1.80	2.80	974.330	101	78	78	249	251	51	
2-11	11:56:00	1.00	1.60	989.610	100	79	79	246	251	51	
2-12	12:08:00	0.86	1.30	999.000	98	78	78	254	248	53	
2-13	12:20:00	0.81	1.30	1006.050	97	79	79	253	249	55	
2-14	12:32:00	0.90	1.40	1014.000	96	75	75	246	251	54	
2-15	12:44:00	0.85	1.30	1021.270	96	81	81	246	250	55	
2-16	12:56:00	0.81	1.30	1030.190	96	82	82	249	251	55	
2-17	13:08:00	0.77	1.20	1037.810	96	82	82	248	251	55	
2-18	13:20:00	0.80	1.30	1045.510	96	82	82	250	250	55	
2-19	13:32:00	0.70	1.10	1052.840	91	82	82	249	250	56	
2-20	13:44:00	0.65	1.00	1059.770	90	82	82	248	251	56	
	13:56:00			1067.011							
Total	8:00:00			469.832		71.2	71.2				
Average			3.17		95.9	71.2					
Min			1.00		89.0	60.0					
Max			5.10		108.0	82.0					

Impinger Weight Sheet - Run 1

Client:	**PCC Structurals, Inc.**
Facility:	**Large Parts Campus Facility - Milwaukie, OR**
Test Location:	**BH9256 Inlet**
Project #:	**M232604**
Date:	**6/28/2023**
Test Method:	**29**
Weighed/Measured By:	**CST**
Balance ID:	**S10-35**

Scale Calibration Check Date: **6/28/2023**

Scale Calibration Check (see QS-6.05C for procedure)
must be within ± 0.5g of certified mass

Certified Weight, grams	Result, grams
250	250.0
500	500.1
750	750.1

IMPINGER CONTENTS	FINAL MLS / GRAMS	INITIAL MLS / GRAMS	GAIN MLS / GRAMS
HNO3/H2O2	766.7	748.1	18.6
HNO3/H2O2	788.7	771.6	17.1
Empty	648.7	645.5	3.2
KMnO4/H2SO4	739.5	755.5	-16.0
KMnO4/H2SO4	782.0	779.4	2.6
Silica Gel	872.4	816.5	55.9

Liquid Final	Liquid Initial	Liquid Gain
3,725.6	3,700.1	25.5

Silica Final	Silica Initial	Silica Gain
872.4	816.5	55.9

Run 2 - Method 29

Client: PCC Structurals, Inc. | **Date: 6/29/23**

Facility: Large Parts Campus Facility - Milwaukie, OR | **Start Time: 3:30**

Test Location: BH9256 Inlet | **End Time: 12:12**

Source Condition: Batch Process

DRY GAS METER CONDITIONS			STACK CONDITIONS		
ΔH:	3.25	In. H_2O	Static Pressure	-5.70	in. H_2O
Meter Temperature, Tm:	68.8	°F	Flue Pressure (Ps):	29.55	in. Hg. abs.
Sqrt ΔP:	1.417	In. H_2O			
Stack Temperature, Ts:	97.7	°F			
Meter Volume, Vm:	474.465	ft^3			
Meter Volume, Vmstd:	473.048	dscf	Gas Weight dry, Md:	29.000	lb/lb mole
Meter Volume, Vwstd:	3.179	wscf	Gas Weight wet, Ms:	28.927	lb/lb mole
Isokinetic Variance:	99.7	%I	Excess Air:		%
			Gas Velocity, Vs:	82.162	fps
Test Length:	480.00	in mins.	Volumetric Flow:	96,795	acfm
Nozzle Diameter:	0.199	in inches	Volumetric Flow:	89,909	dscfm
Barometric Pressure:	29.97	in Hg	Volumetric Flow:	90,513	scfm

MOISTURE DETERMINATION

Initial Impinger Content:	3647.6	ml	Silica Initial Wt.	826.9	grams
Final Impinger Content:	3657.3	ml	Silica Final Wt.	884.7	grams
Impinger Difference:	9.7	ml	Silica Difference:	57.8	grams

Total Water Gain: 67.5 | Moisture, Bws: 0.007 | **Supersaturation Value, Bws: 0.061**

Port-Point No.	Clock Time	Velocity Head Δp in. H2O	Orifice ΔH in. H2O	Actual Meter Vol. ft^3	Stack Temp °F	Meter Temp Inlet °F	Meter Temp Outlet °F	Probe Temp °F	Filter Exit Temp °F	Impinger Exit Temp °F
1-1	3:30:00	1.90	2.90	107.189	90	66	66	247	250	56
1-2	3:42:00	2.80	4.30	119.880	91	65	65	247	250	51
1-3	3:54:00	3.40	5.20	131.570	92	64	64	248	250	51
1-4	4:06:00	3.40	5.20	145.840	92	64	64	247	250	51
1-5	4:18:00	3.40	5.20	161.990	92	64	64	246	250	51
1-6	4:30:00	3.20	4.90	177.430	91	63	63	249	250	50
1-7	4:42:00	3.20	4.90	192.760	91	64	64	249	250	50
1-8	4:54:00	3.10	4.80	208.120	91	65	65	250	250	51
1-9	5:06:00	2.80	4.30	224.280	91	64	64	250	250	52
1-10	5:18:00	2.40	3.70	238.130	91	63	63	250	250	53
1-11	5:30:00	1.10	1.70	252.269	90	63	63	250	250	53
1-12	5:42:00	0.87	1.30	260.330	90	62	62	252	250	52
1-13	5:54:00	0.81	1.20	268.390	90	62	62	252	250	50
1-14	6:06:00	0.85	1.30	275.620	90	61	61	245	252	48
1-15	6:18:00	0.93	1.40	283.560	91	61	61	248	249	48
1-16	6:30:00	0.92	1.40	291.730	91	62	62	250	251	49
1-17	6:42:00	0.91	1.40	300.190	94	62	62	247	250	49
1-18	6:54:00	0.93	1.40	308.220	95	63	63	251	250	49
1-19	7:06:00	0.91	1.40	315.780	96	62	62	248	250	49
1-20	7:18:00	0.92	1.40	324.420	92	64	64	250	250	50
	7:30:00			332.475						
2-1	8:12:00	1.30	2.00	332.567	98	67	67	251	251	51
2-2	8:24:00	1.10	1.70	340.550	98	68	68	251	250	55
2-3	8:36:00	1.60	2.50	350.710	102	69	69	247	251	55
2-4	8:48:00	1.90	2.90	360.270	100	70	70	241	252	53
2-5	9:00:00	2.00	3.10	372.210	102	72	72	250	250	52
2-6	9:12:00	1.90	2.90	384.150	100	73	73	250	249	54
2-7	9:24:00	1.80	2.80	396.360	103	75	75	249	250	55
2-8	9:36:00	1.90	2.90	408.130	100	76	76	249	251	56
2-9	9:48:00	2.10	3.20	419.970	102	76	76	250	250	59
2-10	10:00:00	2.10	3.20	427.150	108	75	75	250	250	60
2-11	10:12:00	1.50	2.30	439.830	107	76	76	250	251	52
2-12	10:24:00	2.50	3.90	450.990	108	76	76	249	250	50
2-13	10:36:00	2.70	4.20	463.350	106	76	76	250	250	50
2-14	10:48:00	3.30	5.10	476.540	105	76	76	246	251	49
2-15	11:00:00	3.20	4.90	491.990	103	75	76	242	248	49
2-16	11:12:00	3.00	4.60	506.650	104	76	76	244	251	50
2-17	11:24:00	3.10	4.80	522.540	106	77	77	249	250	51
2-18	11:36:00	3.00	4.60	537.840	107	78	78	250	250	51
2-19	11:48:00	3.00	4.60	553.450	110	78	78	249	251	52
2-20	12:00:00	2.90	4.50	567.430	107	79	79	250	250	54
	12:12:00			581.746						
Total	#REF!			474.465		68.8	68.8			
Average			3.25		97.7	68.8				
Min			1.20		90.0	61.0				
Max			5.20		110.0	79.0				

Impinger Weight Sheet - Run 2

Client:	**PCC Structurals, Inc.**
Facility:	**Large Parts Campus Facility - Milwaukie, OR**
Test Location:	**BH9256 Inlet**
Project #:	**M232604**
Date:	**6/29/2023**
Test Method:	**29**
Weighed/Measured By:	**CST**
Balance ID:	**S10-35**

Scale Calibration Check Date: **6/29/2023**

Scale Calibration Check (see QS-6.05C for procedure)
must be within ± 0.5g of certified mass

Certified Weight, grams	Result, grams
250	250.0
500	500.1
750	750.1

IMPINGER CONTENTS	FINAL MLS / GRAMS	INITIAL MLS / GRAMS	GAIN MLS / GRAMS
HNO3/H2O2	779.8	754.1	25.7
HNO3/H2O2	764.2	758.5	5.7
Empty	630.0	629.0	1.0
KMnO4/H2SO4	725.1	741.7	-16.6
KMnO4/H2SO4	758.2	764.3	-6.1
Silica Gel	884.7	826.9	57.8

Liquid Final	Liquid Initial	Liquid Gain
3,657.3	3,647.6	9.7

Silica Final	Silica Initial	Silica Gain
884.7	826.9	57.8

Client:	PCC Structurals, Inc.		
Facility:	Large Parts Campus Facility - Milwaukie, OR		
Test Location:	BH9256 Inlet		
Project #:	M232604		
Test Method:	0061		
Test Engineer:	EE		
Test Technician:	PPP/MTD		
	Run 1		**Run 2**
Temp ID:	CM14		CM14
Meter ID:	CM14		CM14
Pitot ID:	293		293
Nozzle Diameter (Inches):	0.196		0.179
Meter Calibration Date:	6/21/2023		6/21/2023
Meter Calibration Factor (Y):	1.001		1.001
Meter Orifice Setting (Delta H):	1.646		1.646
Pitot Tube Coefficient:	0.840		
Probe Length (Feet):	6.0		
Probe Liner Material:	Glass		
Port Length (Inches):	4.00		
Port Size (Diameter, Inches):	4.00		
Port Type:	Nipple		
Duct Shape:	Circular		
Diameter (Feet):	5		
Duct Area (Square Feet):	19.635		
Upstream Distance (Feet):	13.3		
Downstream Distance (Feet):	6.5		
Number of Ports Sampled:	2		
Number of Points per Port:	20		
Minutes per Point:	12.0		
Minutes per Reading:	12.0		
Total Number of Traverse Points:	40		
Test Length (Minutes):	480		
Train Type:	Hot Box		
Source Condition:	Batch Process		
# of Runs	2		

Run 1 - Method 0061

Client: PCC Structurals, Inc. **Date:** 6/28/23
Facility: Large Parts Campus Facility - Milwaukie, OR **Start Time:** 3:45
Test Location: BH9256 Inlet **End Time:** 13:56
Source Condition: Batch Process

DRY GAS METER CONDITIONS			STACK CONDITIONS		
ΔH:	2.61	in. H_2O	Static Pressure	-5.50	in. H_2O
Meter Temperature, Tm:	74.8	°F	Flue Pressure (Ps):	29.65	in. Hg. abs.
Sqrt ΔP:	1.358	in. H_2O			
Stack Temperature, Ts:	99.5	°F			
Meter Volume, Vm:	440.334	ft^3			
Meter Volume, Vmstd:	439.833	dscf	Gas Weight dry, Md:	29.000	lb/lb mole
Meter Volume, Vwstd:	0.000	wscf	Gas Weight wet, Ms:	28.912	lb/lb mole
Isokinetic Variance:	99.8	%I	Excess Air:		%
			Gas Velocity, Vs:	78.768	fps
Test Length:	480.00	in mins.	Volumetric Flow:	92,797	acfm
Nozzle Diameter:	0.196	in inches	Volumetric Flow:	86,075	dscfm
Barometric Pressure:	30.05	in Hg	Volumetric Flow:	86,769	scfm

Moisture, Bws: 0.008 **Supersaturation Value, Bws:** **0.064**

Port-Point No.	Clock Time	Velocity Head Δp in. H2O	Orifice ΔH in. H2O	Actual Meter Vol. ft^3	Stack Temp °F	Meter Temp Inlet °F	Meter Temp Outlet °F	Impinger Exit Temp °F
1-1	3:45:00	0.70	1.00	404.288	84	61	61	57
1-2	3:57:00	0.88	1.30	411.890	89	62	61	62
1-3	4:09:00	0.80	1.10	418.600	91	64	62	52
1-4	4:21:00	1.00	1.40	419.260	94	66	62	54
	4:33:00			433.797				
1-5	5:40:00	0.87	1.20	433.797	94	60	60	58
1-6	5:52:00	0.89	1.20	441.720	94	62	60	62
1-7	6:04:00	0.81	1.10	449.850	94	64	61	61
1-8	6:16:00	0.95	1.30	457.510	97	67	63	60
1-9	6:28:00	1.40	2.00	464.310	98	67	63	59
1-10	6:40:00	2.80	3.90	474.610	99	67	64	58
1-11	6:52:00	3.20	4.40	487.130	99	66	64	61
1-12	7:04:00	2.70	3.80	500.240	101	65	64	59
1-13	7:16:00	2.70	3.80	512.100	98	66	64	59
1-14	7:28:00	3.00	4.10	524.770	99	68	66	60
1-15	7:40:00	2.50	3.40	538.980	99	68	66	62
1-16	7:52:00	2.20	3.00	551.080	99	68	66	62
1-17	8:04:00	1.80	2.40	561.320	99	68	66	62
1-18	8:16:00	1.40	1.90	571.210	98	68	67	63
1-19	8:28:00	1.30	1.70	580.182	96	70	68	63
1-20	8:40:00	1.30	1.70	591.720	96	70	68	64
	8:52:00			601.240				
2-1	9:35:00	2.50	3.30	602.620	94	84	81	57
2-2	9:47:00	2.10	2.80	615.310	98	84	81	62
	9:59:00			627.710				
2-3	10:20:00	2.30	3.10	628.710	102	85	81	52
2-4	10:32:00	2.60	3.60	638.230	103	85	80	54
2-5	10:44:00	2.60	3.60	651.000	113	86	80	58
2-6	10:56:00	2.50	3.30	664.730	112	86	81	62
2-7	11:08:00	2.30	3.10	677.680	109	87	81	61
2-8	11:20:00	2.20	3.00	691.380	107	87	82	60
2-9	11:32:00	2.00	2.70	703.610	107	87	82	59
2-10	11:44:00	1.90	2.60	715.610	107	87	82	58
2-11	11:56:00	2.10	2.90	728.200	105	88	83	61
2-12	12:08:00	2.00	2.70	741.920	103	88	83	59
2-13	12:20:00	2.10	2.90	753.880	101	88	83	59
2-14	12:32:00	2.30	3.10	765.830	101	90	84	60
2-15	12:44:00	2.00	2.90	777.610	100	89	85	62
2-16	12:56:00	2.00	2.70	788.910	100	89	85	62
2-17	13:08:00	1.90	2.60	800.780	100	88	85	62
2-18	13:20:00	2.00	2.70	812.710	100	87	85	63
2-19	13:32:00	2.00	2.70	824.510	100	87	85	63
2-20	13:44:00	1.80	2.50	835.880	100	87	85	64
	13:56:00			847.002				
Total	8:00:00			440.334		76.4	73.3	
Average			2.61		99.5	74.8		
Min			1.00		84.0	60.0		
Max			4.40		113.0	90.0		

Run 2 - Method 0061

Client: PCC Structurals, Inc. **Date:** 6/29/23
Facility: Large Parts Campus Facility - Milwaukie, OR **Start Time:** 3:30
Test Location: BH9256 Inlet **End Time:** 12:00
Source Condition: Batch Process

DRY GAS METER CONDITIONS			STACK CONDITIONS		
ΔH:	1.81	In. H_2O	Static Pressure	-5.70	in. H_2O
Meter Temperature, Tm:	74.7	°F	Flue Pressure (Ps):	29.55	in. Hg. abs.
Sqrt ΔP:	1.357	In. H_2O			
Stack Temperature, Ts:	101.6	°F			
Meter Volume, Vm:	368.567	ft^3			
Meter Volume, Vmstd:	366.552	dscf	Gas Weight dry, Md:	29.000	lb/lb mole
Meter Volume, Vwstd:	0.000	wscf	Gas Weight wet, Ms:	28.923	lb/lb mole
Isokinetic Variance:	100.1	%I	Excess Air:		%
			Gas Velocity, Vs:	78.967	fps
Test Length:	480.00	in mins.	Volumetric Flow:	93,031	acfm
Nozzle Diameter:	0.179	in inches	Volumetric Flow:	85,781	dscfm
Barometric Pressure:	29.97	in Hg	Volumetric Flow:	86,385	scfm

Moisture, Bws: 0.007 **Supersaturation Value, Bws:** **0.069**

Port-Point No.	Clock Time	Velocity Head Δp in. H2O	Orifice ΔH in. H2O	Actual Meter Vol. ft^3	Stack Temp °F	Meter Temp Inlet °F	Meter Temp Outlet °F	Impinger Exit Temp °F
1-1	3:30:00	1.20	1.60	847.776	92	65	65	58
1-2	3:42:00	2.60	3.30	856.260	92	67	65	61
1-3	3:54:00	2.80	2.60	866.850	94	67	65	54
1-4	4:06:00	2.40	2.20	876.780	94	67	65	54
1-5	4:18:00	2.60	2.40	880.240	95	68	65	
1-6	4:30:00	2.40	2.20	901.520	95	68	65	53
1-7	4:42:00	2.50	2.30	911.000	95	68	66	54
1-8	4:54:00	2.50	2.30	920.490	94	70	66	52
1-9	5:06:00	2.40	2.20	931.120	94	70	67	53
1-10	5:18:00	2.50	2.30	942.450	94	69	66	52
1-11	5:30:00	2.00	1.90	952.130	94	70	66	51
1-12	5:42:00	1.80	1.70	962.350	94	70	66	50
1-13	5:54:00	2.00	1.90	972.420	94	70	66	51
1-14	6:06:00	2.20	2.10	981.360	93	70	66	50
1-15	6:18:00	2.20	2.10	991.760	94	70	66	51
1-16	6:30:00	2.40	2.20	1002.030	96	70	66	51
1-17	6:42:00	2.60	2.40	1012.240	97	70	66	50
1-18	6:54:00	2.50	2.30	1023.420	98	70	66	51
1-19	7:06:00	2.50	2.30	1034.750	101	70	66	52
1-20	7:18:00	2.50	2.30	1045.000	97	70	67	52
	7:30:00			1055.169				
2-1	8:00:00	1.80	1.70	1056.571	103	73	69	63
2-2	8:12:00	2.00	1.90	1066.340	103	74	69	63
2-3	8:24:00	2.00	1.90	1078.310	106	77	71	64
2-4	8:36:00	1.90	1.80	1085.860	104	80	75	64
2-5	8:48:00	2.00	1.90	1093.420	106	83	78	66
2-6	9:00:00	2.00	1.90	1103.540	104	85	80	64
2-7	9:12:00	1.90	1.80	1113.290	109	87	82	61
2-8	9:24:00	1.90	1.80	1123.120	106	88	83	61
2-9	9:36:00	2.50	2.30	1133.150	108	89	85	62
2-10	9:48:00	2.70	2.50	1140.630	113	89	85	63
2-11	10:00:00	0.95	0.90	1152.560	111	89	84	60
2-12	10:12:00	0.85	0.80	1162.230	111	88	83	57
2-13	10:24:00	0.90	0.80	1169.830	111	87	82	60
2-14	10:36:00	0.90	0.80	1174.140	109	85	81	62
2-15	10:48:00	0.94	0.90	1178.750	108	83	81	60
2-16	11:00:00	0.95	0.90	1185.230	108	84	81	59
2-17	11:12:00	0.95	0.90	1191.630	111	84	85	60
2-18	11:24:00	0.85	0.80	1198.820	111	85	82	61
2-19	11:36:00	0.83	0.80	1205.290	114	85	82	62
2-20	11:48:00	0.87	0.80	1212.000	111	85	82	62
	12:00:00			1217.745				
Total	8:00:00			368.567		76.5	72.9	
Average			1.81		101.6	74.7		
Min			0.80		92.0	65.0		
Max			3.30		114.0	89.0		

Location: 9256 Inlet
Date: 6/29/2023
Start Time: 13:00
End Time: 13:30

R_{ADO}:	0	degrees
R_{SLO}:	-1.4	degrees
Bws:	0.007	
Md:	28.84	lb/lb-mole
Ms:	28.76	lb/lb-mole
Pbar:	29.97	in Hg
Pg:	-5.70	in H_2O
Ps:	29.55	in Hg
%CO2:	0.00	%
%O2:	20.90	%
%CO:	0	%
%N2:	79.10	%

Va(avg):	72.66	ft/sec
Qsw:	4,792,591.37	wscf/hr
Qsd:	4,759,043.24	dscf/hr
Airflow	79,317.39	dscfm
Airflow	85,603.41	acfm

Three Dimensional Pitot Traverse

Port/Point	Stack Temp (F)	{Reading} Yaw Angle (deg)	Corrected Yaw Angle Θ_Y (deg)	P1-P2 (in H_20)	P4-P5 (in H_20)	F1	F2	Pitch Angle Θ_p (deg)	Axial Velocity V_a (ft/sec)
A1	105	3	4.4	0.9000	0.0300	0.0333	1.0752	7.35	70.308
A2	105	5	6.4	1.2000	0.0200	0.0167	1.0754	6.31	81.107
A3	104	5	6.4	1.6000	0.0200	0.0125	1.0755	6.05	93.626
A4	104	8	9.4	1.7000	0.0400	0.0235	1.0753	6.74	95.660
A5	105	5	6.4	1.8000	0.0500	0.0278	1.0752	7.01	99.180
A6	104	2	3.4	1.6000	0.0500	0.0313	1.0752	7.22	93.800
A7	103	0	1.4	1.7000	0.0400	0.0235	1.0753	6.74	96.847
A8	102	0	1.4	1.6000	0.0300	0.0188	1.0753	6.44	93.935
A9	102	4	5.4	1.2000	0.0400	0.0333	1.0752	7.35	80.848
A10	102	6	7.4	1.1000	0.0600	0.0545	1.0755	8.67	76.878
A11	101	12	13.4	0.5800	0.0600	0.1034	1.0784	11.65	54.351
A12	101	15	16.4	0.5200	0.0700	0.1346	1.0817	13.49	50.540
A13	101	10	11.4	0.5100	0.0800	0.1569	1.0846	14.78	50.992
A14	101	10	11.4	0.5500	0.0500	0.0909	1.0774	10.89	53.424
A15	100	7	8.4	0.5500	0.0200	0.0364	1.0752	7.54	54.269
A16	100	10	11.4	0.5800	0.0200	0.0345	1.0752	7.43	55.237
A17	100	5	6.4	0.5400	0.0100	0.0185	1.0754	6.43	54.153
A18	100	3	4.4	0.5600	0.0200	0.0357	1.0752	7.50	55.196
A19	100	3	4.4	0.5600	0.0200	0.0357	1.0752	7.50	55.196
A20	100	2	3.4	0.5500	0.0200	0.0364	1.0752	7.54	54.761
B1	100	8	9.4	0.8200	0.0400	0.0488	1.0754	8.31	65.969
B2	99	12	13.4	0.7800	0.0500	0.0641	1.0759	9.26	63.251
B3	99	10	11.4	0.9100	0.0400	0.0440	1.0753	8.01	69.036
B4	99	10	11.4	0.9500	0.0500	0.0526	1.0755	8.55	70.452
B5	99	7	8.4	0.9700	0.0500	0.0515	1.0754	8.48	71.855
B6	99	8	9.4	0.9400	0.0600	0.0638	1.0759	9.24	70.423
B7	98	5	6.4	0.9500	0.0500	0.0526	1.0755	8.55	71.358
B8	98	5	6.4	0.9800	0.0400	0.0408	1.0753	7.82	72.595
B9	97	0	1.4	0.9200	0.0500	0.0543	1.0755	8.66	70.562
B10	97	2	3.4	0.8800	0.0500	0.0568	1.0756	8.81	68.887
B11	97	0	1.4	0.9300	0.0600	0.0645	1.0759	9.28	70.846
B12	95	5	6.4	1.0000	0.0300	0.0300	1.0752	7.15	73.245
B13	94	0	1.4	1.1000	0.0300	0.0273	1.0752	6.98	77.238
B14	93	3	4.4	1.3000	0.0400	0.0308	1.0752	7.19	83.628
B15	93	0	1.4	1.3000	0.0500	0.0385	1.0752	7.67	83.760
B16	93	2	3.4	1.2000	0.0500	0.0417	1.0753	7.87	80.321
B17	92	2	3.4	1.3000	0.0500	0.0385	1.0752	7.67	83.562
B18	92	5	6.4	1.3000	0.0700	0.0538	1.0755	8.63	83.011
B19	91	5	6.4	1.2000	0.0600	0.0500	1.0754	8.39	79.724
B20	90	2	3.4	1.1000	0.0700	0.0636	1.0758	9.23	76.461
Averages	**98.9**	**5.15**	**6.55**	**1.0183**	**0.0435**	**0.0482**	**1.0759**	**8.26**	**72.662**

Average R1 10.119 **Maximum Allowable Average R1=20.0**

Standard Deviation 3.131 **Maximum AllowableStandard Deviation=10.0**

%RMS 17.61

Client:	PCC Structurals, Inc.		
Facility:	Large Parts Campus Facility - Milwaukie, OR		
Test Location:	BH9256 Outlet		
Project #:	M232604		
Test Method:	29		
Test Engineer:	MTD		
Test Technician:	NCC		
	Run 1		**Run 2**
Temp ID:	CM34		CM34
Meter ID:	CM34		CM34
Pitot ID:	292		292
Nozzle Diameter (Inches):	0.187		0.187
Meter Calibration Date:	6/21/2023		6/21/2023
Meter Calibration Factor (Y):	1.003		1.003
Meter Orifice Setting (Delta H):	1.758		1.758
Nozzle Kit ID Number and Material:	Glass		Glass
Pitot Tube Coefficient:	0.840		
Probe Length (Feet):	6.0		
Probe Liner Material:	Glass		
Sample Plane:	Horizontal		
Port Length (Inches):	4.00		
Port Size (Diameter, Inches):	4.00		
Port Type:	Nipple		
Duct Shape:	Circular		
Diameter (Feet):	5		
Duct Area (Square Feet):	19.635		
Upstream Distance (Feet):	20.0		
Downstream Distance (Feet):	30.0		
Number of Ports Sampled:	2		
Number of Points per Port:	12		
Minutes per Point:	20.0		
Minutes per Reading:	10.0		
Total Number of Traverse Points:	24		
Test Length (Minutes):	480		
Train Type:	Anderson Box		
Source Condition:	Batch Process		
Moisture Balance ID:	S10-35		
# of Runs	2		

Run 1 - Method 29

Client: PCC Structurals, Inc. **Date:** 6/28/23
Facility: Large Parts Campus Facility - Milwaukie, OR **Start Time:** 3:30
Test Location: BH9256 Outlet **End Time:** 12:10
Source Condition: Batch Process

DRY GAS METER CONDITIONS			STACK CONDITIONS		
ΔH:	1.89	in. H_2O	Static Pressure	-2.00	in. H_2O
Meter Temperature, Tm:	78.5	°F	Flue Pressure (Ps):	29.90	in. Hg. abs.
Sqrt ΔP:	1.255	in. H_2O	Carbon Dioxide:		%
Stack Temperature, Ts:	98.9	°F	Oxygen:		%
Meter Volume, Vm:	371.239	ft^3	Nitrogen:	#VALUE!	%
Meter Volume, Vmstd:	368.383	dscf	Gas Weight dry, Md:	29.000	lb/lb mole
Meter Volume, Vwstd:	6.547	wscf	Gas Weight wet, Ms:	28.808	lb/lb mole
Isokinetic Variance:	99.7	%I	Excess Air:	#VALUE!	%
			Gas Velocity, Vs:	72.582	fps
Test Length:	480.00	in mins.	Volumetric Flow:	85,508	acfm
Nozzle Diameter:	0.187	in inches	Volumetric Flow:	79,325	dscfm
Barometric Pressure:	30.05	in Hg	Volumetric Flow:	80,735	scfm

MOISTURE DETERMINATION

Initial Impinger Content:	3551.5	ml	Silica Initial Wt.	834.0	grams
Final Impinger Content:	3635.5	ml	Silica Final Wt.	889.0	grams
Impinger Difference:	84.0	ml	Silica Difference:	55.0	grams

Total Water Gain: 139.0 Moisture, Bws: 0.017 **Supersaturation Value, Bws: 0.063**

Port-Point No.	Clock Time	Velocity Head Δp in. H2O	Orifice ΔH in. H2O	Actual Meter Vol. ft^3	Stack Temp °F	Meter Temp Inlet °F	Meter Temp Outlet °F	Probe Temp °F	Filter Exit Temp °F	Impinger Exit Temp °F	
1-1	3:30:00	1.80	2.10	37.087	94	64	63	251	254	61	
1-1	3:40:00	1.80	2.10	45.360	94	66	63	251	254	60	
1-2	3:50:00	1.80	2.10	53.750	95	67	63	251	254	58	
1-2	4:00:00	1.80	2.10	61.900	95	68	63	251	254	57	
1-3	4:10:00	1.80	2.10	70.190	95	68	63	251	254	57	
1-3	4:20:00	1.80	2.10	78.510	94	72	65	251	255	57	
1-4	4:30:00	1.80	2.10	86.850	94	79	69	251	255	57	
1-4	4:40:00	1.90	2.30	94.520	94	80	70	251	252	58	
1-5	4:50:00	2.00	2.40	103.240	92	81	71	251	255	58	
1-5	5:00:00	2.30	2.70	112.910	98	80	72	251	254	58	
1-6	5:10:00	2.30	2.70	121.820	98	80	72	251	253	58	
1-6	5:20:00	2.50	3.00	130.370	98	82	72	251	251	57	
1-7	5:30:00	2.00	2.40	140.650	97	82	73	251	252	57	
1-7	5:40:00	1.80	2.10	149.120	96	83	74	251	253	56	
1-8	5:50:00	1.80	2.10	157.780	96	83	74	251	254	55	
1-8	6:00:00	1.80	2.10	165.250	96	82	74	251	254	54	
1-9	6:10:00	1.80	2.10	174.570	95	80	74	251	254	54	
1-9	6:20:00	1.50	1.80	182.980	96	79	74	251	253	54	
1-10	6:30:00	1.50	1.80	189.570	97	80	74	251	254	53	
1-10	6:40:00	1.40	1.70	197.610	99	81	73	251	251	53	
1-11	6:50:00	1.20	1.40	204.270	98	81	73	251	253	53	
1-11	7:00:00	1.20	1.40	211.830	99	80	72	251	255	53	
1-12	7:10:00	1.20	1.40	218.270	99	80	72	251	254	52	
1-12	7:20:00	1.20	1.40	224.990	99	80	72	251	254	52	
	7:30:00			231.805							
2-1	8:10:00	1.60	1.90	231.919	98	73	71	251	252	53	
2-1	8:20:00	1.60	1.90	239.950	98	79	71	251	254	55	
2-2	8:30:00	1.50	1.80	247.640	97	81	72	251	253	56	
2-2	8:40:00	1.50	1.80	255.680	96	82	73	251	254	56	
2-3	8:50:00	1.50	1.80	262.250	98	82	73	251	252	57	
2-3	9:00:00	1.50	1.80	270.760	98	83	74	251	254	58	
2-4	9:10:00	1.40	1.70	277.940	98	83	74	251	253	61	
2-4	9:20:00	1.50	1.80	284.520	98	82	74	251	251	62	
2-5	9:30:00	1.40	1.70	292.930	98	83	75	251	254	63	
2-5	9:40:00	1.40	1.70	300.230	99	83	75	251	261	58	
2-6	9:50:00	1.40	1.70	306.980	99	83	75	251	252	57	
2-6	10:00:00	1.50	1.80	313.810	99	83	75	251	249	56	
2-7	10:10:00	1.40	1.70	321.510	101	83	76	251	258	55	
2-7	10:20:00	1.30	1.50	328.490	102	86	77	251	252	55	
2-8	10:30:00	1.30	1.50	336.850	102	88	78	251	254	56	
2-8	10:40:00	1.40	1.70	343.970	107	90	82	251	253	56	
2-9	10:50:00	1.40	1.70	350.700	109	91	84	251	253	55	
2-9	11:00:00	1.40	1.70	357.720	108	93	86	251	252	55	
2-10	11:10:00	1.40	1.70	365.540	107	94	87	251	253	55	
2-10	11:20:00	1.30	1.50	371.600	106	95	89	251	252	56	
2-11	11:30:00	1.30	1.50	378.650	106	96	90	251	255	56	
2-11	11:40:00	1.40	1.70	386.450	105	97	91	251	255	56	
2-12	11:50:00	1.40	1.70	393.210	105	97	92	251	254	56	
2-12	12:00:00	1.40	1.70	400.550	105	98	92	251	254	56	
	12:10:00			408.440							
Total	8:00:00			371.239		82.1	74.8				
Average			1.89		98.9	78.5					
Min			1.40		92.0	63.0					
Max			3.00		109.0	98.0					

Impinger Weight Sheet - Run 1

Client:	**PCC Structurals, Inc.**
Facility:	**Large Parts Campus Facility - Milwaukie, OR**
Test Location:	**BH9256 Outlet**
Project #:	**M232604**
Date:	**6/28/2023**
Test Method:	**29**
Weighed/Measured By:	**CT**
Balance ID:	**S10-35**

Scale Calibration Check Date: **6/28/2023**

Scale Calibration Check (see QS-6.05C for procedure)
must be within ± 0.5g of certified mass

Certified Weight, grams	Result, grams
250	250.0
500	500.1
750	750.1

IMPINGER CONTENTS	FINAL MLS / GRAMS	INITIAL MLS / GRAMS	GAIN MLS / GRAMS
HNO3/H2O2	720.3	767.0	-46.7
HNO3/H2O2	742.3	672.5	69.8
Empty	673.6	647.8	25.8
KMnO4/H2SO4	794.9	773.2	21.7
KMnO4/H2SO4	704.4	691.0	13.4
Silica Gel	889.0	834.0	55.0

Liquid Final	Liquid Initial	Liquid Gain
3,635.5	3,551.5	84.0

Silica Final	Silica Initial	Silica Gain
889.0	834.0	55.0

Run 2 - Method 29

Client: PCC Structurals, Inc. **Date:** 6/29/23
Facility: Large Parts Campus Facility - Milwaukie, OR **Start Time:** 3:30
Test Location: BH9256 Outlet **End Time:** 11:50
Source Condition: Batch Process

DRY GAS METER CONDITIONS			STACK CONDITIONS		
ΔH:	2.06	In. H_2O	Static Pressure	-2.00	in. H_2O
Meter Temperature, Tm:	79.7	°F	Flue Pressure (Ps):	29.82	in. Hg. abs.
Sqrt ΔP:	1.304	In. H_2O			
Stack Temperature, Ts:	100.4	°F			
Meter Volume, Vm:	386.087	ft^3			
Meter Volume, Vmstd:	381.422	dscf	Gas Weight dry, Md:	29.000	lb/lb mole
Meter Volume, Vwstd:	4.328	wscf	Gas Weight wet, Ms:	28.877	lb/lb mole
Isokinetic Variance:	99.0	%I			
			Gas Velocity, Vs:	75.547	fps
Test Length:	480.00	in mins.	Volumetric Flow:	89,001	acfm
Nozzle Diameter:	0.187	in inches	Volumetric Flow:	82,649	dscfm
Barometric Pressure:	29.97	in Hg	Volumetric Flow:	83,587	scfm

MOISTURE DETERMINATION

Initial Impinger Content:	3642.0	ml	Silica Initial Wt.	815.0	grams
Final Impinger Content:	3678.1	ml	Silica Final Wt.	870.8	grams
Impinger Difference:	36.1	ml	Silica Difference:	55.8	grams

Total Water Gain: 91.9 Moisture, Bws: 0.011 **Supersaturation Value, Bws: 0.066**

Port-Point No.	Clock Time	Velocity Head Δp in. H2O	Orifice ΔH in. H2O	Actual Meter Vol. ft^3	Stack Temp °F	Meter Temp Inlet °F	Meter Temp Outlet °F	Probe Temp °F	Filter Exit Temp °F	Impinger Exit Temp °F
1-1	3:30:00	2.00	2.40	9.744	92	66	66	250	252	59
1-1	3:40:00	2.00	2.40	18.030	95	69	66	251	255	57
1-2	3:50:00	2.00	2.40	26.670	95	72	67	251	254	57
1-2	4:00:00	2.00	2.40	35.520	95	74	67	251	254	55
1-3	4:10:00	2.00	2.40	43.890	95	76	68	251	254	50
1-3	4:20:00	2.10	2.50	52.630	96	79	69	251	253	53
1-4	4:30:00	2.20	2.60	61.230	95	80	70	251	254	53
1-4	4:40:00	2.20	2.60	71.170	95	80	71	251	254	55
1-5	4:50:00	2.30	2.70	81.040	95	80	72	251	254	56
1-5	5:00:00	2.40	2.80	88.970	94	81	72	251	254	54
1-6	5:10:00	2.40	2.80	98.720	95	84	73	251	254	55
1-6	5:20:00	2.40	2.80	107.640	94	84	73	251	254	55
1-7	5:30:00	2.60	3.10	117.550	94	84	74	251	253	57
1-7	5:40:00	2.60	3.10	127.120	93	82	74	251	253	56
1-8	5:50:00	2.40	2.80	138.230	94	80	73	251	255	59
1-8	6:00:00	2.40	2.80	148.010	94	81	73	251	253	58
1-9	6:10:00	2.40	2.80	156.420	94	82	73	251	255	62
1-9	6:20:00	2.40	2.80	165.820	94	84	73	251	253	63
1-10	6:30:00	2.20	2.60	175.050	95	83	74	251	254	67
1-10	6:40:00	2.20	2.60	185.340	97	83	74	251	255	67
1-11	6:50:00	2.00	2.40	194.390	97	83	74	251	254	56
1-11	7:00:00	2.00	2.40	203.400	99	82	74	251	255	46
1-12	7:10:00	1.90	2.20	212.110	100	83	74	251	254	46
1-12	7:20:00	2.00	2.40	220.580	97	83	74	251	255	45
	7:30:00			228.381						
2-1	7:50:00	1.90	2.30	228.540	95	76	72	250	254	49
2-1	8:00:00	1.50	1.80	237.980	99	81	72	251	254	48
2-2	8:10:00	1.10	1.30	244.880	101	83	73	251	254	51
2-2	8:20:00	1.10	1.30	251.820	101	83	74	251	254	51
2-3	8:30:00	1.20	1.40	258.300	104	84	75	251	254	56
2-3	8:40:00	1.20	1.40	264.910	102	84	75	251	253	60
2-4	8:50:00	1.10	1.30	271.590	103	83	75	251	255	61
2-4	9:00:00	1.20	1.40	278.270	103	82	75	251	254	61
2-5	9:10:00	1.30	1.50	285.210	103	82	75	251	254	64
2-5	9:20:00	1.30	1.50	291.620	105	82	75	251	254	62
2-6	9:30:00	1.30	1.50	298.490	103	83	75	251	254	64
2-6	9:40:00	1.40	1.70	305.150	105	84	76	251	256	43
2-7	9:50:00	1.50	1.80	312.110	110	84	76	251	255	45
2-7	10:00:00	1.50	1.80	319.770	110	85	77	251	253	44
2-8	10:10:00	1.40	1.70	328.850	110	86	78	251	255	45
2-8	10:20:00	1.40	1.70	335.920	110	88	79	251	255	44
2-9	10:30:00	1.20	1.40	343.220	109	91	81	251	254	47
2-9	10:40:00	1.20	1.40	350.130	108	92	83	251	253	47
2-10	10:50:00	1.10	1.30	356.830	107	95	87	251	254	41
2-10	11:00:00	1.10	1.30	363.540	107	96	88	251	254	39
2-11	11:10:00	1.10	1.30	369.870	109	97	90	251	252	42
2-11	11:20:00	1.10	1.30	376.350	109	99	92	251	255	42
2-12	11:30:00	1.10	1.30	382.920	109	100	94	252	256	42
2-12	11:40:00	1.10	1.30	388.770	112	102	96	251	255	42
	11:50:00			395.990						
Total	8:00:00			386.087		83.7	75.6			
Average			2.06		100.4	79.7				
Min			1.30		92.0	66.0				
Max			3.10		112.0	102.0				

Impinger Weight Sheet - Run 2

Client:	**PCC Structurals, Inc.**
Facility:	**Large Parts Campus Facility - Milwaukie, OR**
Test Location:	**BH9256 Outlet**
Project #:	**M232604**
Date:	**6/29/2023**
Test Method:	**29**
Weighed/Measured By:	**CT**
Balance ID:	**S10-35**

Scale Calibration Check Date: **6/29/2023**

Scale Calibration Check (see QS-6.05C for procedure)
must be within ± 0.5g of certified mass

Certified Weight, grams	Result, grams
250	250.0
500	500.1
750	750.1

IMPINGER CONTENTS	FINAL MLS / GRAMS	INITIAL MLS / GRAMS	GAIN MLS / GRAMS
HNO3/H2O2	700.5	753.0	-52.5
HNO3/H2O2	806.7	752.4	54.3
Empty	677.6	656.2	21.4
KMnO4/H2SO4	730.3	727.1	3.2
KMnO4/H2SO4	763.0	753.3	9.7
Silica Gel	870.8	815.0	55.8
	3,678.1 Liquid Final	3,642.0 Liquid Initial	36.1 Liquid Gain
	870.8 Silica Final	815.0 Silica Initial	55.8 Silica Gain

Client:	PCC Structurals, Inc.		
Facility:	Large Parts Campus Facility - Milwaukie, OR		
Test Location:	BH9256 Outlet		
Project #:	M232604		
Test Method:	0061		
Test Engineer:	MTD		
Test Technician:	NCC		
	Run 1		**Run 2**
Temp ID:	CM1		CM1
Meter ID:	CM1		CM1
Pitot ID:	294		294
Nozzle Diameter (Inches):	0.185		0.185
Meter Calibration Date:	6/13/2023		6/13/2023
Meter Calibration Factor (Y):	1.003		1.003
Meter Orifice Setting (Delta H):	1.570		1.570
Nozzle Kit ID Number and Material:	Glass		Glass
Pitot Tube Coefficient:	0.840		
Probe Length (Feet):	6.0		
Probe Liner Material:	Glass		
Sample Plane:	Horizontal		
Port Length (Inches):	4.00		
Port Size (Diameter, Inches):	4.00		
Port Type:	Nipple		
Duct Shape:	Circular		
Diameter (Feet):	5		
Duct Area (Square Feet):	19.635		
Upstream Distance (Feet):	20.0		
Downstream Distance (Feet):	30.0		
Number of Ports Sampled:	2		
Number of Points per Port:	12		
Minutes per Point:	20.0		
Minutes per Reading:	10.0		
Total Number of Traverse Points:	24		
Test Length (Minutes):	480		
Train Type:	Anderson Box		
Source Condition:	Batch Process		
Moisture Balance ID:	S10-35		
# of Runs	2		

Run 1 - Method 0061

Client: PCC Structurals, Inc. | **Date: 6/28/23**

Facility: Large Parts Campus Facility - Milwaukie, OR | **Start Time: 3:30**

Test Location: BH9256 Outlet | **End Time: 12:10**

Source Condition: Batch Process

DRY GAS METER CONDITIONS			STACK CONDITIONS		
ΔH:	1.70	in. H_2O	Static Pressure	-2.00	in. H_2O
Meter Temperature, Tm:	76.1	°F	Flue Pressure (Ps):	29.90	in. Hg. abs.
Sqrt ΔP:	1.295	in. H_2O	Carbon Dioxide:		%
Stack Temperature, Ts:	97.9	°F	Oxygen:		%
Meter Volume, Vm:	370.997	ft^3	Nitrogen:	#VALUE!	%
Meter Volume, Vmstd:	369.627	dscf	Gas Weight dry, Md:	29.000	lb/lb mole
Meter Volume, Vwstd:	0.000	wscf	Gas Weight wet, Ms:	28.802	lb/lb mole
Isokinetic Variance:	99.0	%I	Excess Air:	#VALUE!	%
			Gas Velocity, Vs:	74.839	fps
Test Length:	480.00	in mins.	Volumetric Flow:	88,168	acfm
Nozzle Diameter:	0.185	in inches	Volumetric Flow:	81,891	dscfm
Barometric Pressure:	30.05	in Hg	Volumetric Flow:	83,392	scfm

Moisture, Bws: 0.018 **Supersaturation Value, Bws: 0.061**

Port-Point No.	Clock Time	Velocity Head Δp in. H2O	Orifice ΔH in. H2O	Actual Meter Vol. ft^3	Stack Temp °F	Meter Temp Inlet °F	Meter Temp Outlet °F	Impinger Exit Temp °F
1-1	3:30:00	1.70	1.70	70.800	95	60	60	60
1-1	3:40:00	1.70	1.70	78.680	95	62	60	57
1-2	3:50:00	1.70	1.70	86.440	95	63	61	57
1-2	4:00:00	1.70	1.70	94.250	93	64	61	56
1-3	4:10:00	1.70	1.70	102.050	93	65	61	55
1-3	4:20:00	1.30	1.30	109.850	93	68	62	55
1-4	4:30:00	1.30	1.30	116.080	94	76	65	55
1-4	4:40:00	1.10	1.10	123.370	92	76	66	59
1-5	4:50:00	1.10	1.10	129.070	90	76	66	59
1-5	5:00:00	1.10	1.10	135.420	96	75	67	55
1-6	5:10:00	1.20	1.20	142.240	96	76	68	54
1-6	5:20:00	1.20	1.20	148.250	96	77	68	54
1-7	5:30:00	1.10	1.10	155.410	95	77	68	53
1-7	5:40:00	1.10	1.10	161.300	94	77	68	52
1-8	5:50:00	1.10	1.10	167.130	95	77	69	51
1-8	6:00:00	1.10	1.10	174.520	94	75	69	49
1-9	6:10:00	1.10	1.10	180.730	93	74	69	49
1-9	6:20:00	1.30	1.30	186.250	94	75	69	49
1-10	6:30:00	1.40	1.40	193.330	95	77	69	49
1-10	6:40:00	1.40	1.40	200.780	98	77	70	48
1-11	6:50:00	1.60	1.60	207.480	97	77	70	47
1-11	7:00:00	1.70	1.70	215.150	97	77	71	49
1-12	7:10:00	2.00	2.00	223.120	97	77	71	49
1-12	7:20:00	2.00	2.00	231.540	97	77	71	49
	7:30:00			240.043				
2-1	8:10:00	2.00	2.00	240.436	97	72	70	48
2-1	8:20:00	2.00	2.00	248.240	96	77	70	56
2-2	8:30:00	2.00	2.00	257.440	96	80	72	59
2-2	8:40:00	2.00	2.00	265.310	96	82	73	60
2-3	8:50:00	1.90	1.90	274.980	97	82	73	61
2-3	9:00:00	1.90	1.90	282.110	97	83	74	64
2-4	9:10:00	1.90	1.90	290.440	96	83	74	65
2-4	9:20:00	2.00	2.00	298.320	97	84	75	66
2-5	9:30:00	2.00	2.00	307.170	97	85	75	66
2-5	9:40:00	1.90	1.90	316.640	97	85	76	62
2-6	9:50:00	2.10	2.10	324.900	98	86	76	61
2-6	10:00:00	2.10	2.10	333.710	98	85	76	60
2-7	10:10:00	2.00	2.00	341.970	100	85	76	59
2-7	10:20:00	2.00	2.00	350.230	102	85	77	59
2-8	10:30:00	2.00	2.00	359.020	102	85	78	58
2-8	10:40:00	2.00	2.00	365.920	107	87	78	58
2-9	10:50:00	2.00	2.00	374.890	110	88	80	56
2-9	11:00:00	2.00	2.00	382.780	109	90	82	57
2-10	11:10:00	2.00	2.00	391.880	108	91	83	56
2-10	11:20:00	2.00	2.00	401.080	106	93	84	56
2-11	11:30:00	2.00	2.00	410.020	105	95	86	56
2-11	11:40:00	2.00	2.00	418.340	105	96	88	56
2-12	11:50:00	2.00	2.00	426.120	105	97	89	56
2-12	12:00:00	2.00	2.00	434.160	105	98	90	56
	12:10:00			442.190				
Total	8:00:00			370.997		79.8	72.4	
Average			1.70		97.9	76.1		
Min			1.10		90.0	60.0		
Max			2.10		110.0	98.0		

Run 2 - Method 0061

Client: PCC Structurals, Inc. | **Date: 6/29/23**

Facility: Large Parts Campus Facility - Milwaukie, OR | **Start Time: 3:30**

Test Location: BH9256 Outlet | **End Time: 11:50**

Source Condition: Batch Process

DRY GAS METER CONDITIONS			STACK CONDITIONS		
ΔH:	1.78	In. H_2O	Static Pressure	-2.00	in. H_2O
Meter Temperature, Tm:	79.0	°F	Flue Pressure (Ps):	29.82	in. Hg. abs.
Sqrt ΔP:	1.321	In. H_2O	Carbon Dioxide:		%
Stack Temperature, Ts:	99.1	°F	Oxygen:		%
Meter Volume, Vm:	382.886	ft^3	Nitrogen:	#VALUE!	%
Meter Volume, Vmstd:	378.475	dscf	Gas Weight dry, Md:	29.000	lb/lb mole
Meter Volume, Vwstd:	0.000	wscf	Gas Weight wet, Ms:	28.879	lb/lb mole
Isokinetic Variance:	99.0	%I	Excess Air:	#VALUE!	%
			Gas Velocity, Vs:	76.434	fps
Test Length:	480.00	in mins.	Volumetric Flow:	90,047	acfm
Nozzle Diameter:	0.185	in inches	Volumetric Flow:	83,822	dscfm
Barometric Pressure:	29.97	in Hg	Volumetric Flow:	84,755	scfm

Moisture, Bws: 0.011 **Supersaturation Value, Bws: 0.063**

Port-Point No.	Clock Time	Velocity Head Δp in. H2O	Orifice ΔH in. H2O	Actual Meter Vol. ft^3	Stack Temp °F	Meter Temp Inlet °F	Meter Temp Outlet °F	Impinger Exit Temp °F
1-1	3:30:00	1.20	1.20	44.251	91	65	64	60
1-1	3:40:00	1.20	1.20	50.680	93	67	64	60
1-2	3:50:00	1.20	1.20	57.350	93	71	65	60
1-2	4:00:00	1.20	1.20	64.310	93	73	66	59
1-3	4:10:00	1.20	1.20	70.920	93	75	67	58
1-3	4:20:00	1.20	1.20	77.940	93	77	68	58
1-4	4:30:00	1.30	1.30	84.370	93	78	69	59
1-4	4:40:00	1.30	1.30	90.890	93	79	71	60
1-5	4:50:00	1.40	1.40	97.620	93	80	70	61
1-5	5:00:00	1.50	1.50	104.720	92	81	72	62
1-6	5:10:00	1.50	1.50	111.050	93	82	73	63
1-6	5:20:00	1.50	1.50	118.530	92	82	73	63
1-7	5:30:00	1.70	1.70	126.170	92	83	74	61
1-7	5:40:00	1.70	1.70	133.690	92	83	74	62
1-8	5:50:00	1.50	1.50	141.750	92	83	74	62
1-8	6:00:00	1.50	1.50	149.570	92	83	74	63
1-9	6:10:00	1.40	1.40	157.480	92	83	74	62
1-9	6:20:00	1.30	1.30	164.380	92	83	74	61
1-10	6:30:00	1.20	1.20	171.210	93	83	74	60
1-10	6:40:00	1.20	1.20	177.990	95	82	74	60
1-11	6:50:00	1.20	1.20	184.720	96	82	74	58
1-11	7:00:00	1.20	1.20	190.930	97	81	74	55
1-12	7:10:00	1.20	1.20	198.020	98	82	75	54
1-12	7:20:00	1.30	1.30	204.480	96	81	74	53
	7:30:00			210.542				
2-1	7:50:00	2.00	2.00	210.705	94	75	73	60
2-1	8:00:00	2.00	2.00	219.480	98	80	73	58
2-2	8:10:00	2.10	2.10	226.910	99	81	73	62
2-2	8:20:00	2.10	2.10	236.330	99	83	74	66
2-3	8:30:00	2.10	2.10	244.880	103	84	75	66
2-3	8:40:00	2.10	2.10	253.630	101	85	76	65
2-4	8:50:00	2.20	2.20	262.450	102	83	76	65
2-4	9:00:00	2.20	2.20	272.560	102	83	75	64
2-5	9:10:00	2.30	2.30	281.790	102	83	75	64
2-5	9:20:00	2.30	2.30	290.690	104	84	75	63
2-6	9:30:00	2.40	2.40	299.740	101	85	76	64
2-6	9:40:00	2.40	2.40	309.350	104	86	77	67
2-7	9:50:00	2.60	2.60	318.790	109	87	77	63
2-7	10:00:00	2.60	2.60	326.950	109	88	78	62
2-8	10:10:00	2.50	2.50	337.410	108	88	78	61
2-8	10:20:00	2.50	2.50	346.780	110	88	79	60
2-9	10:30:00	2.30	2.30	355.910	109	87	79	60
2-9	10:40:00	2.30	2.30	365.980	109	87	80	62
2-10	10:50:00	2.10	2.10	375.640	108	89	82	59
2-10	11:00:00	2.10	2.10	384.420	108	92	84	58
2-11	11:10:00	2.00	2.00	393.410	109	94	85	60
2-11	11:20:00	2.00	2.00	401.610	110	95	87	61
2-12	11:30:00	2.00	2.00	409.890	110	98	89	62
2-12	11:40:00	2.00	2.00	418.030	112	101	91	61
	11:50:00			427.300				
Total	8:00:00			382.886		83.0	75.0	
Average			1.78		99.1	79.0		
Min			1.20		91.0	64.0		
Max			2.60		112.0	101.0		

Method 1 and 2 Cyclonic Flow Check Data

Project Number	M232604	**Source Condition:**	Batch Process
Client:	PCC Structurals, Inc.	**Run No.:**	1
Facility:	Large Parts Campus Facility - Milwaukie, OR	**Date:**	6/28/2023
Location:	BH9256 Outlet	**Start Time:**	13:15
Pitot ID:	294	**End Time:**	13:30
Pitot Coefficient:	0.840	**RM Testers:**	MD/NCC
Probe Length:	6	**Port Length:**	4.00

Port	Point	DP (in. H_2O)	Sqrt. DP	Temp (^oF)	Yaw (o)		Velocity (V)	Port	Point	DP (in. H_2O)	Sqrt. DP	Temp (^oF)	Yaw (o)		Velocity (V)
A	1	1.80	1.3416	99.0	5.0	5.0	78.19	B	1	1.90	1.3784	95.0	3.0	3.0	80.04
A	2	1.70	1.3038	98.0	5.0	5.0	75.91	B	2	2.10	1.4491	96.0	7.0	7.0	84.22
A	3	1.90	1.3784	99.0	2.0	2.0	80.33	B	3	2.00	1.4142	96.0	5.0	5.0	82.19
A	4	2.00	1.4142	97.0	2.0	2.0	82.27	B	4	1.80	1.3416	97.0	2.0	2.0	78.05
A	5	2.00	1.4142	97.0	2.0	2.0	82.27	B	5	1.90	1.3784	98.0	3.0	3.0	80.26
A	6	2.10	1.4491	99.0	0.0	0.0	84.45	B	6	2.00	1.4142	99.0	5.0	5.0	82.41
A	7	2.00	1.4142	98.0	3.0	3.0	82.34	B	7	2.10	1.4491	99.0	2.0	2.0	84.45
A	8	1.90	1.3784	100.0	3.0	3.0	80.40	B	8	2.00	1.4142	100.0	0.0	0.0	82.49
A	9	2.00	1.4142	101.0	2.0	2.0	82.56	B	9	1.90	1.3784	100.0	0.0	0.0	80.40
A	10	1.80	1.3416	100.0	3.0	3.0	78.26	B	10	1.80	1.3416	100.0	2.0	2.0	78.26
A	11	1.80	1.3416	99.0	6.0	6.0	78.19	B	11	1.80	1.3416	98.0	3.0	3.0	78.12
A	12	1.70	1.3038	97.0	8.0	8.0	75.85	B	12	1.80	1.3416	96.0	3.0	3.0	77.98

Average Yaw Angle 3.2 ^{o}

Appendix E - Plant Operating Data

BH 9256

Testing Production Data - Air Casting

Pour No.	Pour Weight (lb)		
	Run 1 [1] 6/28/2023		Run 2 [2] 6/29/2023
	Air Cast	Master Caster	Air Cast
1	--	1,555	1,780
2	--	1,555	2,025
3	--	1,555	2,025
4	2,025	--	1,080
5	2,025	--	1,080
6	790	--	1,080
7	790	--	1,080
8	200	--	1,080
9	2,800	--	5,600
10	1,750	--	--
11	1,240	--	--
12	400	--	--
Total Pour Weight (lb)	**12,020**	**4,665**	**16,830**
Total Hot Top Used (lb)	**85**		**93**

(1) For Run 1, inlet sampling equipment was down for a total of 131 minutes (Method 29) and 143 minutes (Method 0061) during periods of melting, and outlet sampling equipment was down for a total of 40 minutes each (Method 29 and Method 0061) during periods of melting.

(2) For Run 2, inlet sampling equipment was down for a total of 42 minutes (Method 29) and 30 minutes (Method 0061) while pouring metal for one 1,080 lb pour, and outlet sampling equipment was down for a total of 20 minutes each (Method 29 and Method 0061) while pouring metal for the same 1,080 lb pour.

Time	Differential Pressure (inches w.c.)				
	Primary	HEPA 1	HEPA 2	HEPA 3	HEPA 4
Run 1 (6/28/2023)					
3:45	1.2	2.4	1.4	1.0	0.4
4:15	1.0	2.0	1.2	1.0	0.4
4:45	1.0	2.0	1.2	1.0	0.4
5:15	1.2	2.4	1.4	1.0	0.4
5:45	1.2	2.4	1.4	1.0	0.4
6:15	1.2	1.5	1.5	1.0	0.4
6:45	1.2	2.2	1.2	1.0	0.4
7:15	1.2	2.4	1.4	1.0	0.4
7:45	1.2	2.4	1.4	1.0	0.4
8:15	1.2	2.4	1.4	1.0	0.4
8:45	1.2	2.4	1.4	1.0	0.4
9:15	1.2	2.4	1.4	1.0	0.4
9:45	1.2	2.4	1.4	1.0	0.4
10:15	1.2	2.4	1.4	1.0	0.4
10:45	1.2	2.4	1.4	1.0	0.4
11:15	1.2	2.4	1.4	1.0	0.4
11:45	1.2	2.4	1.6	1.0	0.4
12:15	1.1	2.4	1.4	1.0	0.4
12:45	1.1	2.4	1.4	1.0	0.4
13:15	1.1	2.4	1.4	1.0	0.4
13:45	0.9	2.0	1.2	0.9	0.4
Run 2 (6/29/2023)					
3:35	1.2	2.4	1.6	1.0	0.4
4:05	1.2	2.4	1.4	1.0	0.4
4:35	1.2	2.4	1.4	1.0	0.4
5:05	1.2	2.4	1.4	1.0	0.4
5:35	1.2	2.4	1.4	1.0	0.4
6:05	1.2	2.4	1.4	1.0	0.4
6:35	1.2	2.4	1.4	1.0	0.4
7:05	1.2	2.4	1.4	1.0	0.4
7:35	1.2	2.4	1.4	1.0	0.4
8:05	1.2	2.4	1.4	0.9	0.4
8:35	1.2	2.4	1.4	0.9	0.4
9:05	1.2	2.4	1.4	0.9	0.4
9:35	0	0	0	0	0
9:40	1.2	2.4	1.4	1.0	0.4
10:05	1.2	2.4	1.5	1.0	0.4
10:35	1.2	2.4	1.6	1.0	0.4
11:05	1.2	2.4	1.6	1.0	0.4
11:35	1.2	2.4	1.6	1.0	0.4
12:05	1.2	2.4	1.4	1.0	0.4

Appendix F - Field Data Sheets

Isokinetic Sampling Cover Sheet

Client:	PCC Structurals Inc	**Pitot Tube Cp:**	.84
Facility:	Large Parts Campus facility, Milwaukie	**Probe Length (Feet):**	6
Test Location:	BH 9256 Outlet	**Probe Liner Material:**	Glass
Project #:	M232604	**Sample Plane:**	(Hrztl) or Vert.
Test Method(s):	29	**Port Length (“):**	4
Test Engineer:	MTD	**Port Diameter (“):**	4
Test Technician:	PCC	**Port Type:**	Nipple
Upstream Diameters:		**Duct Shape:**	(Circ) or Rect.
Downstream Diameters:		**Diameter (Feet):**	5
# of Ports Sampled:	2	**Length (Feet):**	—
# of Points per Port:	12	**Width (Feet):**	—
Source Condition:	Normal	**Duct Area (Sq. Feet):**	19.635
Diluent Model/SN:	—	**Minutes per Point:**	20
Mid Gas ID/concentration:	— /%CO_2 %O_2	**Total Traverse Points:**	24
High Gas ID/concentration:	— /%CO_2 %O_2	**Test Length (Min.):**	480
Moisture Balance ID:		**Train Type:**	Anderson

	R# 1	R# 2	R#
Meter ID:	CM34	CM34	
Pitot ID:	292	292	
Filter ID:			
Filter Pre-Weight (g):			
Nozzle Diameter (“):	.187	.187	
Meter Cal Factor (Y):	1.003	1.003	
Meter Orifice Setting (DH):	1.758	1.758	
Nozzle Kit ID:	Glass #7	Glass #7	
Individual Nozzle ID:	914	914	
Pre Pitot Leak Check:	✓ @ 4.5 “H_2O	✓ @ 4.5 “H_2O	@ “H_2O
Post Pitot Leak Check:	✓ @ 4.5 “H_2O	✓ @ 4.5 “H_2O	@ “H_2O
Pre Nozzle Leak Check:	.000 @ 18 “Hg	.000 @ 17 “Hg	@ “Hg
Post Nozzle Leak Check:	.000 @ 15 “Hg	.000 @ 15 “Hg	@ “Hg
Barometric Pressure,“Hg:	~~29.91~~ 30.05	29.97	
Static Pressure, “H_2O:	-2.0	-2.0	
CO_2 %:	—		
O_2 %:	—		

Comments:

Isokinetic Sampling Field Data Sheet

Project Number: M232604 | Date: 06-28-2023 | Test Number: 1

Client: PCC | Test Location: BH9256 Outlet | Operator: MTD | Test Tech: NCC

Plant: LPCF Milwaukie | Test Method: M29 | Page Number: 1 of 2

Port-Point #	Time	(ΔP)	K'=1.185 Orifice Setting (ΔH)	Meter Volume (V_m) ft^3, Actual	Stack Temp, °F	Meter Temp Inlet, °F	Meter Temp Outlet, °F	Pump Vacuum, "Hg	Probe Temp. °F	Filter Temp. °F	Impinger Outlet Well Temp. °F	K-Calcs (Optional) Square Root, ΔP	K= .616 x 10 Meter Rate, Cubic Feet/ Min.	Theoretical Meter Volume, (V_m) ft^3, per point	Theoretical Meter Volume, (V_m) ft^3, total
1-1	330	1.8	2.0	37.087	94	64	63	5	251	254	61	1.342	.826	8.265	
1	340	1.8	2.0	45.36	94	66	63	5	251	254	60	1.342	.826	8.265	45.352
2	350	1.8	2.1	53.75	95	67	63	5	251	254	58	1.342	.826	8.265	53.617
2	400	1.8	2.1	61.882	95	68	63	5	251	254	57	1.342	.826	8.265	61.882
3	410	1.8	2.1	70.19	95	68	63	5	251	254	57	1.342	.826	8.265	70.147
3	420	1.8	2.1	78.51	94	72	65	5	251	255	57	1.342	.826	8.265	78.412
4	430	1.8	2.1	86.85	94	79	69	5	251	255	57	1.342	.826	8.265	86.677
4	440	1.9	2.3	94.52	94	80	70	5	251	252	58	1.378	.849	8.491	94.942
5	450	2.0	2.4	103.24	92	81	71	5	251	255	58	1.414	.871	8.712	103.433
5	500	2.3	2.7	112.91	98	80	72	5	251	254	58	1.517	.934	9.342	112.145
6	510	2.3	2.7	121.82	98	80	72	5	251	253	58	1.517	.934	9.342	121.487
6	520	2.5	3.0	130.37	98	82	72	5	251	251	57	1.581	.974	9.740	130.829
7	530	2.0	2.4	140.65	97	82	73	5	251	252	57	1.414	.871	8.712	140.569
7	540	1.9	2.1	149.12	96	83	74	5	251	253	56	1.342	.826	8.265	149.281
8	550	1.8	2.1	157.78	96	83	74	5	251	254	55	1.342	.826	8.265	157.546
8	600	1.8	2.1	165.25	96	82	74	5	251	254	54	1.342	.826	8.265	165.811
9	610	1.8	2.1	174.57	95	80	74	5	251	254	54	1.342	.826	9.268	174.076
9	620	1.5	1.8	182.98	96	79	74	5	251	253	54	1.225	.754	7.544	182.349
10	630	1.5	1.8	189.57	97	80	74	5	251	254	53	1.225	.754	7.544	189.888
10	640	1.4	1.7	197.61	99	81	73	5	251	251	53	1.183	.729	7.289	197.432
11	650	1.2	1.4	204.27	98	81	73	5	251	253	53	1.095	.675	6.748	204.721
11	700	1.2	1.4	211.83	99	80	72	5	251	255	53	1.095	.675	6.748	211.469
12	710	1.2	1.4	218.27	99	80	72	5	251	254	52	1.095	.675	6.748	218.217
12	720	1.2	1.4	224.99	99	80	72	5	251	254	52	1.095	.675	6.748	224.965
	730			231.805											231.713

Isokinetic Sampling Field Data Sheet

Project Number: M232604 | Date: 06-28-2023 | Test Number: 1

Client: PCC | Test Location: BH 9256 Outlet | Operator: MTD | Test Tech: NLC

Plant: LPCF Milwaukie | Test Method: M29 | Page Number: 2 of 2

Port-Point #	Time	(ΔP)	K' = 1.185 Orifice Setting (ΔH)	Meter Volume (V_m) ft³, Actual	Stack Temp, °F	Meter Temp Inlet, °F	Meter Temp Outlet, °F	Pump Vacuum, "Hg	Probe Temp. °F	Filter Temp. °F	Impinger Outlet Well Temp. °F	K-Calcs (Optional) Square Root, ΔP	K= .616 Meter Rate, Cubic Feet/ Min.	x 10 Theoretical Meter Volume, (V_m) ft³, per point	Theoretical Meter Volume, (V_m) ft³, total
24	810	1.6	1.9	231.919	98	73	71	5	251	252	53	1.265	.779	7.792	—
1	820	1.6	1.9	239.75	98	79	71	5	251	254	55	1.265	.779	7.792	239.711
2	830	1.5	1.8	247.69	97	81	72	5	251	253	56	1.225	.754	7.544	247.503
2	840	1.5	1.8	255.68	96	82	73	5	251	254	56	1.225	.754	7.544	255.047
3	850	1.5	1.8	262.25	98	82	73	5	251	252	57	1.225	.754	7.544	262.591
3	900	1.5	1.8	270.76	98	83	74	5	251	254	58	1.225	.754	7.544	270.135
4	910	1.4	1.7	277.99	98	83	74	5	251	253	61	1.183	.729	7.289	277.679
4	920	1.5	1.8	284.52	98	82	74	5	251	251	62	1.225	.754	7.544	285.968
5	930	1.4	1.7	292.93	98	83	75	5	251	254	63	1.183	.729	7.289	292.512
5	940	1.4	1.7	300.23	99	83	75	5	251	261	58	1.183	.729	7.289	299.801
6	950	1.4	1.7	306.98	99	83	75	5	251	252	57	1.183	.729	7.289	307.090
6	1000	1.5	1.8	313.81	99	83	75	5	251	249	56	1.225	.754	7.544	314.379
7	1010	1.4	1.7	321.51	101	83	76	5	251	258	55	1.183	.729	7.289	321.923
7	1020	1.3	1.5	328.49	102	86	77	5	251	252	55	1.140	.702	7.023	329.212
8	1030	1.3	1.5	336.85	102	88	78	5	251	254	56	1.140	.702	7.023	336.235
8	1040	1.4	1.7	343.97	107	90	82	5	251	253	56	1.183	.729	7.289	343.258
9	1050	1.4	1.7	350.70	109	91	84	5	251	253	55	1.183	.729	7.289	350.547
9	1100	1.4	1.7	357.72	108	93	86	5	251	252	55	1.183	.729	7.289	357.836
10	1110	1.4	1.7	365.54	107	94	87	5	251	253	55	1.183	.729	7.289	365.125
10	1120	1.3	1.5	371.60	106	95	89	5	251	252	56	1.140	.702	7.023	372.414
11	1130	1.3	1.5	378.65	106	96	90	5	251	255	56	1.140	.702	7.023	379.437
11	1140	1.4	1.7	386.45	105	97	91	5	251	255	56	1.183	.729	7.289	386.460
12	1150	1.4	1.7	393.21	105	97	92	5	251	254	56	1.183	.729	7.289	393.749
12	1200	1.4	1.7	400.55	105	98	92	5	251	254	56	1.183	.729	7.289	401.038
	1210	—	—	408.44	—	—	—	—	—	—	—	—	—	—	408.327

IMPINGER WEIGHT SHEET

PLANT: PCL STRUCTURALS

Scale ID Number S10-35

UNIT NO: BAGHOUSE 9256

Scale Calibration Check Date: 6-28-23

LOCATION: OUTLET

Scale Calibration Check (see QS-6.05C for procedure)
must be within ± 0.5g of certified mass

DATE: 6-28-23

250 grams 250.0

TEST NO: #1

500 grams 500-1

METHOD: M29

750 grams 750-1

WEIGHED/MEASURED BY: BT

	FINAL WEIGHT		INITIAL WEIGHT		IMPINGER		IMPINGER
Circle One:	MLS / GRAMS		MLS / GRAMS		GAIN		CONTENTS
IMPINGER 1	720.3		767.0				HNO_3/H_2O_2
IMPINGER 2	742.3		672.5				HNO_3/H_2O_2
IMPINGER 3	673.6		647.5				EMPTY
IMPINGER 4	794.9		723.2				KMNO4
IMPINGER 5	704.4		691.8				KMNO4
IMPINGER 6	889.0		834.0				SILICA
IMPINGER 7							
IMPINGER 8							

IMPINGERS _____ (FINAL TOTAL) _____ (INITIAL TOTAL) _____ (TOTAL IMPINGER GAIN)

SILICA _____ (FINAL TOTAL) _____ (INITIAL TOTAL) _____ (TOTAL SILICA GAIN)

Isokinetic Sampling Field Data Sheet

Project Number: M232604 | Date: 6/29/23 | Test Number: 2

Client: PCC | Test Location: BH9256 outlet | Operator: MTD | Test Tech: NCL

Plant: LPCF Milwaukie | Test Method: M29 | Page Number: 1 of 2

Port-Point #	Time	X (ΔP)	K'=1.175 Orifice Setting (ΔH)	Meter Volume (V_m) ft³, Actual	Stack Temp, °F	Meter Temp Inlet, °F	Meter Temp Outlet, °F	Pump Vacuum, "Hg	Probe Temp. °F	Filter Temp. °F	Impinger Outlet Well Temp. °F	K-Calcs (Optional) $\sqrt{\Delta P}$ Square Root, ΔP	K=.613 x 10 Meter Rate, Cubic Feet/ Min.	Theoretical Meter Volume, (V_m) ft³, per point	Theoretical Meter Volume, (V_m) ft³, total
1-1	330	2.0	2.4	9.744	92	66	66	5	250	252	59	1.414	.867	8.669	
1	340	2.0	2.4	18.03	95	69	66	5	251	255	54	1.414	.867	8.669	18.413
2	350	2.0	2.4	26.67	95	72	67	5	251	254	57	1.414	.867	8.669	27.082
2	400	2.0	2.4	35.52	95	74	67	5	251	254	55	1.414	.867	8.669	35.751
3	410	2.0	2.4	43.89	95	76	68	5	251	254	50	1.414	.867	8.669	44.420
3	420	2.1	2.5	52.63	96	79	69	5	251	253	53	1.449	.888	8.883	53.089
4	430	2.2	2.6	61.23	95	80	70	5	251	254	53	1.483	.909	9.092	61.972
4	440	2.2	2.6	71.17	95	80	71	5	251	254	55	1.483	.909	9.092	71.064
5	450	2.3	2.7	81.04	95	80	72	5	251	254	56	1.517	.930	9.297	80.156
5	500	2.4	2.8	88.97	94	81	72	5	251	254	54	1.549	.950	9.497	89.453
6	510	2.4	2.8	98.72	95	84	73	5	251	254	55	1.549	.950	9.497	98.950
6	520	2.4	2.8	107.64	94	84	73	5	251	254	55	1.549	.950	9.497	108.447
7	530	2.6	3.1	117.55	94	84	74	6	251	253	57	1.612	.988	9.884	117.944
7	540	2.6	3.1	127.12	93	82	74	6	251	253	56	1.612	.988	9.884	127.828
8	550	2.4	2.8	138.23	94	80	73	5	251	255	59	1.549	.950	9.497	137.712
8	600	2.4	2.8	148.01	94	81	73	5	251	253	58	1.549	.950	9.497	147.209
9	610	2.4	2.8	156.42	94	82	73	5	251	255	62	1.549	.950	9.497	156.706
9	620	2.4	2.8	165.82	94	84	73	5	251	253	63	1.549	.950	9.497	166.203
10	630	2.2	2.6	175.05	95	83	74	5	251	254	67	1.483	.909	9.092	175.700
10	640	2.2	2.6	185.34	97	83	74	5	251	255	67	1.483	.909	9.092	184.792
11	650	2.0	2.4	194.39	97	83	74	5	251	254	56	1.414	.867	8.669	193.884
11	700	2.0	2.4	203.40	99	82	74	5	251	255	46	1.414	.867	8.669	202.553
12	710	1.9	2.2	212.11	100	83	74	5	251	254	46	1.378	.845	8.450	211.222
12	720	2.0	2.4	220.58	97	85	74	5	251	255	45	1.414	.867	8.669	219.672
	730			229.381											228.341

Isokinetic Sampling Field Data Sheet

Project Number: M232604 | Date: 6/29/23 | Test Number: 2

Client: PCC | Test Location: BH9256 Outlet | Operator: MTD | Test Tech: NLC

Plant: LRCF Milwaukie | Test Method: M29 | Page Number: 2 of 2

K'=1.186

Port-Point #	Time	√(ΔP)	Orifice Setting (ΔH)	Meter Volume (V_m) ft³, Actual	Stack Temp, °F	Meter Temp Inlet, °F	Meter Temp Outlet, °F	Pump Vacuum, "Hg	Probe Temp. °F	Filter Temp. °F	Impinger Outlet Well Temp. °F	K-Calcs (Optional) √ΔP Square Root, ΔP	K-Calcs (Optional) K=.619 x 10 Meter Rate, Cubic Feet/ Min.	K-Calcs (Optional) Theoretical Meter Volume, (V_m) ft³, per point	K-Calcs (Optional) Theoretical Meter Volume, (V_m) ft³, total
1-1	750	1.9	2.3	228.540	95	76	72	5	250	254	49	1.378	.853	8.532	—
1	800	1.5	1.8	237.98	99	81	72	5	251	254	48	1.225	.758	7.581	237.072
2	810	1.1	1.3	244.88	101	83	73	5	251	254	51	1.049	.649	6.492	244.653
2	820	1.1	1.3	251.82	101	83	74	5	251	254	51	1.049	.649	6.492	251.145
3	830	1.2	1.4	258.30	104	84	75	5	251	255	56	1.095	.678	6.781	257.637
3	840	1.2	1.4	264.91	102	84	75	5	251	253	60	1.095	.678	6.781	264.418
4	850	1.1	1.3	271.59	103	83	75	5	251	255	61	1.049	.649	6.492	271.199
4	900	1.2	1.4	278.27	103	82	75	5	251	254	61	1.095	.678	6.781	277.691
5	910	1.3	1.5	285.21	103	82	75	5	251	254	64	1.140	.706	7.058	284.422
5	920	1.3	1.5	291.62	105	82	75	5	251	254	62	1.140	.706	7.058	291.530
6	930	1.3	1.5	298.49	103	83	75	5	251	254	64	1.140	.706	7.058	298.588
6	940	1.4	1.7	305.15	105	84	76	5	251	256	93	1.183	.732	7.324	305.646
7	950	1.5	1.8	312.11	110	84	76	5	251	255	45	1.225	.758	7.581	312.970
7	1000	1.5	1.8	319.77	110	85	77	5	251	253	44	1.225	.758	7.581	320.551
8	1010	1.4	1.7	328.95	110	86	78	5	251	255	45	1.183	.732	7.324	328.132
8	1020	1.4	1.7	335.92	110	88	79	5	251	255	44	1.183	.732	7.324	335.456
9	1030	1.2	1.4	343.22	109	91	81	5	251	254	47	1.095	.678	6.781	342.280
9	1040	1.2	1.4	350.13	108	92	83	5	251	253	47	1.095	.678	6.781	349.561
10	1050	1.1	1.3	356.83	107	95	87	5	251	254	41	1.049	.649	6.492	356.342
10	1100	1.1	1.3	363.54	107	96	88	5	251	254	39	1.049	.649	6.492	362.834
11	1110	1.1	1.3	369.87	109	97	90	5	251	252	42	1.049	.649	6.492	369.326
11	1120	1.1	1.3	376.35	109	99	92	5	251	255	42	1.049	.649	6.492	375.818
12	1130	1.1	1.3	382.98	109	100	94	5	252	256	42	1.049	.649	6.492	382.310
12	1140	1.1	1.3	388.77	112	102	96	5	251	255	42	1.049	.649	6.492	388.792
	1150	—	—	395.99	—	—	—	—	—	—	—	—	—	—	395.284

940 → Dampers closed for approx 30 sec

IMPINGER WEIGHT SHEET

PLANT: PCC STRUCTURALS

UNIT NO: BAGHOUSE 9256

LOCATION: OUTLET

DATE: 6-29-23

TEST NO: #2

METHOD: 29

WEIGHED/MEASURED BY: CT

Scale ID Number S10-35

Scale Calibration Check Date: 6-29-23

Scale Calibration Check (see QS-6.05C for procedure)
must be within ± 0.5g of certified mass

250 grams 250.0

500 grams 500.1

750 grams 750.1

Circle One:	FINAL WEIGHT MLS / GRAMS	INITIAL WEIGHT MLS / GRAMS	IMPINGER GAIN	IMPINGER CONTENTS
IMPINGER 1	700.5	753.0		HNO3/H2O2
IMPINGER 2	806.7	752.4		HNO3/H2O2
IMPINGER 3	677.6	656.2		EMPTY
IMPINGER 4	730.3	727.1		KMNO4
IMPINGER 5	763.0	753.3		KMNO4
IMPINGER 6	870.8	815.0		SILICA
IMPINGER 7				
IMPINGER 8				

IMPINGERS _____ (FINAL TOTAL) _____ (INITIAL TOTAL) _____ (TOTAL IMPINGER GAIN)

SILICA _____ (FINAL TOTAL) _____ (INITIAL TOTAL) _____ (TOTAL SILICA GAIN)

Isokinetic Sampling Cover Sheet

Client:	DCC Structurals, Inc.	**Pitot Tube Cp:**	.84
Facility:	Large Parts Campus. facility, Milwaukee	**Probe Length (Feet):**	6
Test Location:	BH9256 outlet	**Probe Liner Material:**	Glass
Project #:	M232604	**Sample Plane:**	(Horz) or Vert.
Test Method(s):	0061	**Port Length (“):**	4
Test Engineer:	MTD	**Port Diameter (“):**	4
Test Technician:	NCC	**Port Type:**	nipple
Upstream Diameters:		**Duct Shape:**	(Circ) or Rect.
Downstream Diameters:		**Diameter (Feet):**	5
# of Ports Sampled:	2	**Length (Feet):**	—
# of Points per Port:	12	**Width (Feet):**	—
Source Condition:	Normal	**Duct Area (Sq. Feet):**	19.635
Diluent Model/SN:	—	**Minutes per Point:**	20
Mid Gas ID/concentration:	— /%CO_2 %O_2	**Total Traverse Points:**	24
High Gas ID/concentration:	— /%CO_2 %O_2	**Test Length (Min.):**	480
Moisture Balance ID:		**Train Type:**	FacePlate

	R# 1	R# 2	R#
Meter ID:	CM1	CM1	
Pitot ID:	294	294	
Filter ID:	—	—	
Filter Pre-Weight (g):	—	—	
Nozzle Diameter (“):	.185	.185	
Meter Cal Factor (Y):	1.003	1.003	
Meter Orifice Setting (DH):	1.570	1.570	
Nozzle Kit ID:	Glass #4	Glass #4	
Individual Nozzle ID:	612	G12	
Pre Pitot Leak Check:	✓ @ 4.5 “H_2O	✓ @ 4.5 “H_2O	@ “H_2O
Post Pitot Leak Check:	✓ @ 4.5 “H_2O	✓ @ 4.5 “H_2O	@ “H_2O
Pre Nozzle Leak Check:	.000 @ 20 “Hg	.000 @ 19 “Hg	@ “Hg
Post Nozzle Leak Check:	.000 @ 16 “Hg	.000 @ 16 “Hg	@ “Hg
Barometric Pressure,“Hg:	~~29.91~~ 30.05	29.97	
Static Pressure, “H_2O:	-2.0	-2.0	
CO_2 %:	—		
O_2 %:	—		

Comments:

Isokinetic Sampling Field Data Sheet

Project Number: M232604 | Date: 06-28-2023 | Test Number: 1

Client: PCC | Test Location: BH 9256 Outlet | Operator: MTD | Test Tech: NCC

Plant: LPCF Milwaukie | Test Method: 0061 | Page Number: 1 of 2

K' = 1.004

Port-Point #	Time	ΔP (X)	Orifice Setting (ΔH)	Meter Volume (V_m) ft³, Actual	Stack Temp, °F	Meter Temp Inlet, °F	Meter Temp Outlet, °F	Pump Vacuum, "Hg	Probe Temp. °F	Filter Temp. °F	Impinger Outlet Well Temp. °F	K-Calcs (Optional) Square Root, ΔP	K=.598 x 10 Meter Rate, Cubic Feet/ Min.	Theoretical Meter Volume, (V_m) ft³, per point	Theoretical Meter Volume, (V_m) ft³, total
H	330	1.7	1.7	70.800	95	60	60	6			60	1.304	.780	7.797	
1	340	1.7	1.7	78.68	95	62	60	6			57	1.304	.780	7.797	78.597
2	350	1.7	1.7	86.44	95	63	61	6			57	1.304	.780	7.797	86.394
2	400	1.7	1.7	94.25	93	64	61	6			56	1.304	.780	7.797	94.191
3	410	1.7	1.7	102.05	93	65	61	6			55	1.304	.780	7.797	101.988
3	420	1.3	1.3	109.85	93	68	62	6			55	1.140	.682	6.818	109.785
4	430	1.3	1.3	116.08	94	76	65	6			55	1.140	.682	6.818	116.603
4	440	1.1	1.1	123.37	92	76	66	5			59	1.048	.627	6.272	123.421
5	450	1.1	1.1	129.07	90	76	66	5			59	1.048	.627	6.272	129.693
5	500	1.1	1.1	135.42	96	75	67	5			55	1.048	.627	6.272	135.965
6	510	1.2	1.2	142.24	96	76	68	5			54	1.095	.655	6.551	142.237
6	520	1.2	1.2	148.15	96	77	68	5			54	1.095	.655	6.551	148.788
7	530	1.1	1.1	155.41	95	77	68	5			53	1.048	.627	6.272	155.339
7	540	1.1	1.1	161.30	94	77	69	5			52	1.049	.627	6.272	161.611
8	550	1.1	1.1	167.13	95	77	69	5			51	1.048	.627	6.272	167.883
8	600	1.1	1.1	174.52	94	75	69	5			49	1.048	.627	6.272	174.155
9	610	1.1	1.1	180.73	93	74	69	5			49	1.048	.627	6.272	180.427
9	620	1.3	1.3	186.25	94	75	69	5			49	1.140	.682	6.818	186.699
10	630	1.4	1.4	193.33	95	77	69	5			49	1.183	.708	7.076	193.517
10	640	1.4	1.4	200.78	98	77	70	5			48	1.183	.708	7.076	200.593
11	650	1.6	1.6	207.48	97	77	70	5			47	1.265	.756	7.564	207.669
11	700	1.7	1.7	215.15	97	77	71	5			49	1.304	.780	7.797	215.233
12	710	2.0	2.0	223.12	97	77	71	5			45	1.414	.846	8.457	223.030
12	720	2.0	2.0	231.54	97	77	71	5			49	1.414	.846	8.457	231.487
	730			240.043											239.944

Isokinetic Sampling Field Data Sheet

Project Number: M232604 | Date: 06-28-2023 | Test Number: 1

Client: PCC | Test Location: BH9256 Outlet | Operator: MTD | Test Tech: NCC

Plant: LPCF Milwaukie | Test Method: 0061 | Page Number: 2 of 2

Port-Point #	Time	(ΔP)	K' = 1.004 Orifice Setting (ΔH)	Meter Volume (V_m) ft³, Actual	Stack Temp, °F	Meter Temp Inlet, °F	Meter Temp Outlet, °F	Pump Vacuum, "Hg	Probe Temp. °F	Filter Temp. °F	Impinger Outlet Well Temp. °F	K-Calcs (Optional) Square Root, ΔP	K= .598 x ___ Meter Rate, Cubic Feet/ Min.	Theoretical Meter Volume, (V_m) ft³, per point	Theoretical Meter Volume, (V_m) ft³, total
2-1	810	2.0	2.0	240.436	97	72	70	5			48	1.414	.846	8.457	
1	820	2.0	2.0	248.24	96	77	70	5			56	1.414	.846	8.457	248.893
2	830	2.0	2.0	257.44	96	80	72	5			59	1.414	.846	8.457	257.350
2	840	2.0	2.0	265.31	96	82	73	5			60	1.414	.846	8.457	265.807
3	850	1.9	1.9	274.98	97	82	73	5			61	1.378	.824	8.243	274.264
3	900	1.9	1.9	282.11	97	83	74	5			64	1.378	.824	8.243	282.507
4	910	1.9	1.9	290.44	96	83	74	5			65	1.378	.824	8.243	290.750
4	920	2.0	2.0	298.32	97	84	75	5			66	1.414	.846	8.457	298.993
5	930	2.0	2.0	307.17	97	85	75	5			66	1.414	.846	8.457	307.450
5	940	1.9	1.9	316.69	97	85	76	5			62	1.378	.824	8.243	315.907
6	950	2.1	2.1	324.90	98	86	76	5			61	1.449	.867	8.667	324.150
6	1000	2.1	2.1	333.71	98	85	76	5			60	1.449	.867	8.667	332.817
7	1010	2.0	2.0	341.97	100	85	76	5			59	1.414	.846	8.457	341.484
7	1020	2.0	2.0	350.23	102	85	77	5			59	1.414	.846	8.457	349.941
8	1030	2.0	2.0	359.02	102	85	78	5			58	1.414	.846	8.457	358.398
8	1040	2.0	2.0	365.92	107	87	78	5			58	1.414	.846	8.457	366.855
9	1050	2.0	2.0	374.89	110	88	80	5			56	1.414	.846	8.457	375.312
9	1100	2.0	2.0	382.78	109	90	82	5			57	1.414	.846	8.457	383.769
10	1110	2.0	2.0	391.88	108	91	83	5			56	1.414	.846	8.457	392.226
10	1120	2.0	2.0	401.08	106	93	84	5			56	1.414	.846	8.457	400.683
11	1130	2.0	2.0	410.02	105	95	86	5			56	1.414	.846	8.457	409.140
11	1140	2.0	2.0	418.34	105	96	88	5			56	1.414	.846	8.457	417.597
12	1150	2.0	2.0	426.12	105	97	89	5			56	1.414	.846	8.457	426.054
12	1200	2.0	2.0	434.16	105	98	90	5			56	1.414	.846	8.457	434.511
	1210			442.19											442.968

Isokinetic Sampling Field Data Sheet

Project Number: M232604 | Date: 6/29/23 | Test Number: 2

Client: PCC | Test Location: BH9256 outlet | Operator: MTD | Test Tech: MCC

Plant: LPCF Milwaukie | Test Method: 0061 | Page Number: 1 of 2

K' = 1.005

K-Calcs (Optional): K = .600 x 10

Port-Point #	Time	K (ΔP)	Orifice Setting (ΔH)	Meter Volume (V_m) ft³, Actual	Stack Temp, °F	Meter Temp Inlet, °F	Meter Temp Outlet, °F	Pump Vacuum, "Hg	Probe Temp. °F	Filter Temp. °F	Impinger Outlet Well Temp. °F	√K Square Root, ΔP	Meter Rate, Cubic Feet/ Min.	Theoretical Meter Volume, (V_m) ft³, per point	Theoretical Meter Volume, (V_m) ft³, total
1-1	330	1.2	1.2	44.251	91	65	64	5			60	1.095	.657	6.573	
1	340	1.2	1.2	50.68	93	67	64	5			60	1.095	.657	6.573	50.824
2	350	1.2	1.2	57.35	93	71	65	5			60	1.095	.657	6.573	57.397
2	400	1.2	1.2	64.31	93	73	66	5			59	1.095	.657	6.573	63.970
3	410	1.2	1.2	70.92	93	75	67	5			58	1.095	.657	6.573	70.543
3	420	1.2	1.2	77.94	93	77	68	5			58	1.095	.657	6.573	77.116
4	430	1.3	1.3	84.37	93	78	69	5			59	1.140	.684	6.841	83.689
4	440	1.3	1.3	90.89	93	79	71	5			60	1.141	.684	6.841	90.530
5	450	1.4	1.4	97.62	93	80	71	5			61	1.183	.710	7.099	97.371
5	500	1.5	1.5	104.72	92	81	72	5			62	1.225	.735	7.348	104.470
6	510	1.5	1.5	111.05	93	82	73	5			63	1.225	.735	7.348	111.818
6	520	1.5	1.5	118.53	93	82	73	5			63	1.225	.735	7.348	119.166
7	530	1.7	1.7	126.17	92	83	74	5			61	1.304	.782	7.823	126.514
7	540	1.7	1.7	133.69	92	83	74	5			62	1.304	.782	7.823	134.337
8	550	1.5	1.5	141.75	92	83	74	5			62	1.225	.735	7.348	142.160
8	600	1.5	1.5	149.57	92	83	74	5			63	1.225	.735	7.348	149.509
9	610	1.4	1.4	157.48	92	83	74	5			62	1.183	.710	7.099	156.852
9	620	1.3	1.3	164.38	92	83	74	5			61	1.141	.684	6.841	163.951
10	630	1.2	1.2	171.21	93	83	74	5			60	1.095	.657	6.573	170.792
10	640	1.2	1.2	177.99	95	82	74	5			60	1.095	.657	6.573	177.365
11	650	1.2	1.2	184.72	96	82	74	5			58	1.095	.657	6.573	183.938
11	700	1.2	1.2	190.93	97	81	74	5			55	1.095	.657	6.573	190.511
12	710	1.2	1.2	198.02	98	82	75	5			54	1.095	.657	6.573	197.084
12	720	1.3	1.3	204.48	96	81	74	5			53	1.141	.684	6.841	203.657
	730			210.542											210.498

Isokinetic Sampling Field Data Sheet

Project Number: M232604 | Date: 6/29/23 | Test Number: 2

Client: PCC | Test Location: BH9236 outlet | Operator: MTD | Test Tech: NLL

Plant: LPCF Milwaukie | Test Method: 0061 | Page Number: 2 of 2

$K'' = 1.014$

Port-Point #	Time	(ΔP)	X Orifice Setting (ΔH)	Meter Volume (V_m) ft³, Actual	Stack Temp, °F	Meter Temp Inlet, °F	Meter Temp Outlet, °F	Pump Vacuum, "Hg	Probe Temp. °F	Filter Temp. °F	Impinger Outlet Well Temp. °F	K-Calcs (Optional) √ x Square Root, ΔP	K-Calcs (Optional) K=.606 Meter Rate, Cubic Feet/ Min.	K-Calcs (Optional) x 10 Theoretical Meter Volume, (V_m) ft³, per point	Theoretical Meter Volume, (V_m) ft³, total
1-1	750	2.0	2.0	210.705	94	75	73	5			60	1.414	.857	8.570	
1	800	2.0	2.0	219.48	98	80	73	5			58	1.414	.857	9.570	219.275
2	810	2.1	2.1	226.91	99	81	73	5			62	1.449	.878	8.782	227.845
2	820	2.1	2.1	236.33	99	83	74	5			66	1.449	.878	8.782	236.627
3	830	2.1	2.1	244.88	103	84	75	5			66	1.449	.878	8.782	245.409
3	840	2.1	2.1	253.63	101	85	76	5			65	1.449	.878	8.782	254.191
4	850	2.2	2.2	262.45	102	83	76	5			65	1.483	.899	8.988	262.973
4	900	2.2	2.2	272.56	102	83	75	5			64	1.483	.899	8.988	271.961
5	910	2.3	2.3	281.79	102	83	75	5			64	1.517	.919	9.190	280.949
5	920	2.3	2.3	290.69	104	84	75	5			63	1.517	.919	9.190	290.139
6	930	2.4	2.4	299.74	101	85	76	5			64	1.549	.939	9.388	299.329
6	940	2.4	2.4	309.35	104	86	77	5			67	1.549	.939	9.388	308.717
7	950	2.6	2.6	318.79	109	87	77	5			63	1.612	.977	9.771	318.105
7	1000	2.6	2.6	326.95	109	88	78	5			62	1.612	.977	9.771	327.876
8	1010	2.5	2.5	338.41	108	88	78	5			61	1.581	.958	9.582	337.647
8	1020	2.5	2.5	346.78	110	88	79	5			60	1.581	.958	9.582	347.229
9	1030	2.3	2.3	355.91	109	87	79	5			60	1.517	.919	9.190	356.811
9	1040	2.3	2.3	365.98	109	87	80	5			62	1.517	.919	9.190	366.001
10	1050	2.1	2.1	375.64	108	89	82	5			59	1.449	.878	8.782	375.191
10	1100	2.1	2.1	384.42	108	92	84	5			58	1.449	.878	8.782	383.973
11	1110	2.0	2.0	393.41	109	94	85	5			60	1.414	.857	8.570	392.755
11	1120	2.0	2.0	401.61	110	95	87	5			61	1.414	.857	8.570	401.325
12	1130	2.0	2.0	409.89	110	98	89	5			62	1.414	.857	8.570	409.895
12	1140	2.0	2.0	418.63	112	101	91	5			61	1.414	.857	8.570	418.465
	1150			427.30											427.035

940 → Dampers closed for Appx 30 sec

Isokinetic Sampling Cover Sheet

Client:	PCC	**Pitot Tube Cp:**	0.840
Facility:	LPC - Milwaukee, WI	**Probe Length (Feet):**	6.0
Test Location:	9256 Baghouse	**Probe Liner Material:**	Glass
Project #:	M2326046	**Sample Plane:**	(Hrzt.) or (Vert.)
Test Method(s):	29	**Port Length (“):**	4
Test Engineer:	CB	**Port Diameter (“):**	4
Test Technician:	PPP/EJP	**Port Type:**	Nipple
Upstream Diameters:		**Duct Shape:**	(Circ.) or Rect.
Downstream Diameters:		**Diameter (Feet):**	5.0
# of Ports Sampled:	2	**Length (Feet):**	—
# of Points per Port:	20	**Width (Feet):**	—
Source Condition:		**Duct Area (Sq. Feet):**	
Diluent Model/SN:	—	**Minutes per Point:**	12
Mid Gas ID/concentration:	— /%CO_2 — %O_2	**Total Traverse Points:**	40
High Gas ID/concentration:	— /%CO_2 — %O_2	**Test Length (Min.):**	480
Moisture Balance ID:		**Train Type:**	Std Box

	R# 1	R# 2	R#
Meter ID:	CM40	CM40	
Pitot ID:	297	297	
Filter ID:	—	—	
Filter Pre-Weight (g):	—	—	
Nozzle Diameter (“):	0.199	0.199	
Meter Cal Factor (Y):	0.989	0.989	
Meter Orifice Setting (DH):	1.774	1.774	
Nozzle Kit ID:			
Individual Nozzle ID:	T29		
Pre Pitot Leak Check:	~~3.8~~ 0.0 @ 3.8 “H_2O	0.0 @ 3.3 “H_2O	@ “H_2O
Post Pitot Leak Check:	0.0 @ 3.3 “H_2O	0.0 @ 3.5 “H_2O	@ “H_2O
Pre Nozzle Leak Check:	0.000 @ 15 “Hg	0.000 @ 10 “Hg	@ “Hg
Post Nozzle Leak Check:	0.002 @ 15 “Hg	0.004 @ 12 “Hg	@ “Hg
Barometric Pressure,“Hg:	30.05	29.97	
Static Pressure, “H_2O:	-5.5	-5.7	
CO_2 %:	—	—	
O_2 %:	—	—	

Comments: Run 1 Port 1 ~435Acfm. Oven shorted out. Replaced oven, found grounding problem w/ scaffold. Fixed @ ~530Acfm. Test restarted @ 540Acfm

Run 2 Port 2 ~530Acfm. Dampers closed for approx 30 seconds, test paused briefly then restarted when dampers were reopened

Isokinetic Sampling Field Data Sheet

Project Number: M234604 | Date: 6/28/23 | Test Number: 1

Client: PCC | Test Location: 9256 Inlet | Operator: ES | Test Tech: MM/PSD

Plant: LRC Mt. Hawke, OR | Test Method: 29 | Page Number: 1 of 2

Port-Point #	Time	(ΔP)	Orifice Setting (ΔH)	Meter Volume (V_m) ft³, Actual	Stack Temp, °F	Meter Temp Inlet, °F	Meter Temp Outlet, °F	Pump Vacuum, "Hg	Probe Temp. °F	Filter Temp. °F	Impinger Outlet Well Temp. °F	K-Calcs (Optional) Square Root, ΔP	K= 0.246 Meter Rate, Cubic Feet/ Min.	x 12 Theoretical Meter Volume, (V_m) ft³, per point	Theoretical Meter Volume, (V_m) ft³, total
1-1	345	3.0	3.0	556.745	91	61		9	233	260	60	1.732	1.259	15.110	
2	357	1.7	2.8	600.770	89	60		6	230	280	66	1.304	0.931	11.171	601.855
3	409	1.8	2.9	612.580	91	60		7	251	250	63	1.33	1.03	12.000	613.026
4	421	1.7	2.8	624.180	92	61		7	236	250	60	1.304	0.931	11.171	625.026
5	435			635.711											636.726
5	445 540	2.1	3.3	645.733	93	60		7	235	260	54	1.449	1.035	12.416	
6	457 552	1.6	2.5	658.700	93	62		6	232	257	56	1.265	0.903	10.835	658.147
7	509 604	1.7	2.7	669.850	92	63		5	250	258	59	1.304	0.926	11.109	668.980
8	521 616	1.6	2.4	681.030	93	64		5	248	250	57	1.265	0.901	10.838	679.088
9	533 628	2.5	3.9	692.310	95	65		8	260	264	56	1.581	1.123	13.471	692.526
10	545 640	2.5	3.9	705.710	96	65		8	258	257	56	1.581	1.123	13.471	706.397
11	557 652	2.8	4.4	718.050	95	65		9	261	260	56	1.673	1.188	14.257	720.868
12	609 704	2.6	4.1	728.230	96	66		8	249	258	57	1.612	1.145	13.738	726.125
13	621 716	2.7	4.3	741.210	94	66		9	242	257	58	1.643	1.166	14.000	739.862
14	633 728	2.5	3.9	755.41	94	67		8	249	260	59	1.581	1.123	13.471	753.867
15	645 740	2.6	4.1	767.390	93	67		9	248	257	53	1.612	1.140	13.734	764.338
16	657 752	2.3	3.6	782.310	94	68		7	250	253	53	1.517	1.077	12.921	778.070
17	709 804	2.5	3.9	796.330	94	67		7	252	249	53	1.581	1.123	13.471	791.991
18	721 816	2.4	3.7	809.120	94	66		6	246	260	54	1.549	1.024	13.125	804.462
19	733 828	2.5	3.9	820.330	93	68		5	247	257	54	1.581	1.123	13.471	817.587
20	745 840	2.4	3.7	833.330	93	70		5	251	250	54	1.549	1.024	13.125	831.058
	852			844.569											844.183

Isokinetic Sampling Field Data Sheet

Project Number: M232604 Date: 6/28/24 Test Number: 1

Client: PCC Test Location: 9256 baghouse Operator: CF Test Tech: PP/EP

Plant: LPC - milwaukie, OR Test Method: 29 Page Number: 2 of 3

Port-Point #	Time	(ΔP)	Orifice Setting (ΔH)	Meter Volume (V_m) ft³, Actual	Stack Temp, °F	Meter Temp Inlet, °F	Meter Temp Outlet, °F	Pump Vacuum, "Hg	Probe Temp. °F	Filter Temp. °F	Impinger Outlet Well Temp. °F	K-Calcs (Optional) Square Root, ΔP	K= 0.726 Meter Rate, Cubic Feet/ Min.	x 12 Theoretical Meter Volume, (V_m) ft³, per point	Theoretical Meter Volume, (V_m) ft³, total
1	935	3.3	5.1	844.981	93	74		9	250	249	55	1.817	1.283	15.396	—
2	947	3.1	4.8	859.610	94	79		9	248	250	54	1.761	1.243	14.916	860.377
~~3~~	959	~~3.1~~	~~4.8~~	875.880	~~98~~	~~78~~		9	~~248~~	~~251~~	~~53~~	~~1.761~~	~~1.243~~	~~14.916~~	875.287
3	~~1044~~ 1020	3.2	5.1	889.726	102	73		10	249	251	54	1.789	1.299	15.584	890.003
4	~~1033~~ 1032	3.3	5.1	904.050	108	74		10	248	251	54	1.789	1.299	15.584	905.587
5	1035 1044	2.9	4.6	920.130	106	75		9	249	249	53	1.703	1.236	14.836	921.171
6	1047 1056	2.7	4.2	933.850	104	76		8	248	251	50	1.643	1.183	14.197	936.007
7	1059 1108	2.6	4.1	948.180	105	77		8	248	251	51	1.612	1.161	13.932	950.204
8	1111 1120	2.6	4.1	~~961.89~~	102	77		9	250	251	50	1.612	1.161	13.932	964.136
9	1123 1132	2.0	3.1	961.89	102	77		7	250	249	50	1.414	1.018	12.219	978.068
10	1135 1144	1.8	2.8	974.33	101	78		6	249	251	51	1.342	0.966	11.591	989.660
11	1147 1156	1.0	1.6	989.610	100	79		4	248	251	51	1.000	0.720	8.640	998.300
12	1159 1208	0.86	1.3	999.00	98	78		3	254	248	53	0.930	0.668	8.012	1006.312
13	1211 1220	0.81	1.3	1006.660	97	79		3	253	249	55	0.900	0.648	7.776	1014.088
14	1223 1232	0.90	1.4	1014.000	96	75		3	246	251	54	0.849	0.683	8.197	1022.285
15	1235 1244	0.85	1.3	1021.270	96	81		3	246	250	55	0.921	0.664	7.966	1030.251
16	1244 1256	0.81	1.3	1030.19	96	82		3	249	251	58	0.900	0.648	7.776	1038.027
17	1308	0.77	1.2	1037.810	96	82		3	248	251	55	0.877	0.632	7.582	1045.609
18	1320	0.80	1.3	1045.870	96	83		3	250	250	55	0.894	0.644	7.728	1053.341
19	1332	0.70	1.1	1052.840	91	82		3	249	250	57	0.837	0.602	7.229	1060.570
20	1344	0.65	1.0	1059.720	90	82		3	248	251	56	0.806	0.580	6.966	1067.536
	1356			1067.211											

IMPINGER WEIGHT SHEET

PLANT: PCC STRUCTURALS

UNIT NO: BAGHOUSE 9801 9256

LOCATION: INLET

DATE: 6-28-23

TEST NO: #1

METHOD: M29

WEIGHED/MEASURED BY: [signature]

Scale ID Number S10-35

Scale Calibration Check Date: 6-28-23

Scale Calibration Check (see QS-6.05C for procedure)
must be within ± 0.5g of certified mass

250 grams 250.0

500 grams 500.1

750 grams 750.1

	FINAL WEIGHT		INITIAL WEIGHT		IMPINGER		IMPINGER
Circle One:	MLS / GRAMS		MLS / GRAMS		GAIN		CONTENTS
IMPINGER 1	766.7		748.1				HNO3/H2O2
IMPINGER 2	788.7		771.6				HNO3/H2O2
IMPINGER 3	648.7		645.5				EMPTY
IMPINGER 4	759.5		755.5				KMNO4
IMPINGER 5	782.0		779.4				KMNO4
IMPINGER 6	872.4		816.5				SILICA
IMPINGER 7							
IMPINGER 8							

IMPINGERS _____ FINAL TOTAL _____ INITIAL TOTAL _____ TOTAL IMPINGER GAIN

SILICA _____ FINAL TOTAL _____ INITIAL TOTAL _____ TOTAL SILICA GAIN

Isokinetic Sampling Field Data Sheet

Project Number: M232604 | Date: 6/29/23 | Test Number: 2

Client: PCC | Test Location: 9256 Inlet | Operator: PPP | Test Tech: CAF/BSP

Plant: LPC- Milwaukie OR | Test Method: 29 | Page Number: 1 of 2

Port-Point #	Time	(ΔP)	Orifice Setting (ΔH) 1.542	Meter Volume (V_m) ft³, Actual	Stack Temp, °F	Meter Temp Inlet, °F	Meter Temp Outlet, °F	Pump Vacuum, "Hg	Probe Temp. °F	Filter Temp. °F	Impinger Outlet Well Temp. °F	K-Calcs (Optional) Square Root, ΔP	K= 0.709 Meter Rate, Cubic Feet/ Min.	x 12 Theoretical Meter Volume, (V_m) ft³, per point	Theoretical Meter Volume, (V_m) ft³, total
1-1	3:30	1.9	2.9	107.159	90	66	66	6	241	250	56	1.378	0.969	11.628	118.817
2	3:42	2.8	4.2	119.680	91	65	65	9	247	250	51	1.673	1.176	14.116	132.933
3	3:54	3.4	5.2	131.570	92	64	64	11	248	250	51	1.844	1.230	15.555	148.488
4	4:06	3.4	5.2	145.840	92	64	64	13	247	250	51	1.844	1.230	15.555	164.043
5	4:18	3.4	5.2	161.990	92	64	64	13	246	250	51	1.844	1.230	15.555	179.598
6	4:30	3.2	4.9	177.430	91	63	63	13	249	250	50	1.789	1.258	15.091	194.689
7	4:42	3.2	4.9	192.760	91	64	64	13	249	250	50	1.789	1.258	15.091	209.78
8	4:54	3.1	4.8	208.120	91	65	65	13	250	250	51	1.761	1.238	14.856	224.636
9	5:06	2.8	4.2	224.280	91	64	64	10	250	250	52	1.673	1.176	14.116	238.752
10	5:18	2.4	3.7	238.130	91	63	63	10	250	250	53	1.549	1.089	13.069	251.821
11	5:30	1.1	1.7	252.260	90	63	63	4	250	250	53	1.049	0.737	8.848	260.669
12	5:42	0.87	1.3	260.330	90	62	62	3	252	252	52	0.933	0.656	7.869	268.538
13	5:54	0.81	1.2	268.390	90	62	62	3	252	249	50	0.900	0.633	7.592	276.130
14	6:06	0.85	1.3	275.620	90	61	61	4	245	251	48	0.922	0.648	7.778	283.908
15	6:18	0.93	1.4	283.560	91	61	61	4	248	250	48	0.964	0.678	8.135	292.043
16	6:30	0.92	1.4	291.730	91	62	62	4	250	250	49	0.959	0.674	8.092	300.135
17	6:42	0.91	1.4	300.190	94	62	62	4	247	250	49	0.953	0.671	8.047	308.182
18	6:54	0.93	1.4	308.270	95	63	63	3	251	250	49	0.964	0.678	8.135	316.317
19	7:06	0.91	1.4	315.780	96	62	62	4	248	250	49	0.953	0.671	8.047	324.364
20	7:18	0.92	1.4	324.420	92	64	64	4	250	250	50	0.959	0.674	8.092	332.456
	7:30			332.475											

Isokinetic Sampling Field Data Sheet

Project Number: M232604 | Date: 6/29/23 | Test Number: 2

Client: PCC | Test Location: 9256 Inlet | Operator: PPP | Test Tech: LBR/KJB

Plant: LPC-Milwaukee, OR | Test Method: 29 | Page Number: 2 of 2

Port-Point #	Time	(ΔP)	Orifice Setting (ΔH) 1.542	Meter Volume (V_m) ft³, Actual	Stack Temp, °F	Meter Temp Inlet, °F	Meter Temp Outlet, °F	Pump Vacuum, "Hg	Probe Temp. °F	Filter Temp. °F	Impinger Outlet Well Temp. °F	K-Calcs (Optional) Square Root, ΔP	K=0.703 x 12 Meter Rate, Cubic Feet/ Min.	Theoretical Meter Volume, (V_m) ft³, per point	Theoretical Meter Volume, (V_m) ft³, total
2-1	8:09	1.3	2.0	332.567	98	67	67	11	251	251	51	1.14	0.802	9.619	~~342.186~~
2	8:12	1.1	1.7	340.550	98	68	68	3	251	250	55	1.049	0.737	8.848	342.186
3	8:24	1.6	2.4	350.710	102	69	69	5	247	251	55	1.265	0.889	10.671	351.034
4	8:36	1.9	2.9	360.270	100	70	70	7	241	252	53	1.378	0.969	11.628	361.705
5	8:48	2.0	3.1	372.210	102	72	72	7	250	250	52	1.414	0.994	11.930	373.333
6	9:00	1.9	2.9	384.150	100	73	73	7	250	249	54	1.378	0.969	11.628	385.263
7	9:12	1.8	2.8	396.360	103	75	75	7	249	250	55	1.342	0.943	11.318	396.581
8	9:24	1.9	2.9	408.130	100	76	76	6	249	251	56	1.378	0.969	11.628	407.899
9	9:36	2.1	3.2	419.970	102	76	76	7	250	250	59	1.140	0.802	9.619	419.527
10	9:48	2.1	3.2	427.159	108	75	75	8	250	250	60	1.140	0.802	9.619	429.146
11	10:00	1.9	2.9	439.830	107	76	76	6	250	251	52	1.378	0.969	11.63	438.765
12	10:12	2.5	3.9	450.994	108	76	76	7	249	250	50	1.581	1.112	13.338	450.695
13	10:24	2.7	4.2	463.350	106	76	76	10	250	250	50	1.643	1.155	13.862	464.033
14	10:36	3.3	5.1	476.540	105	76	76	8	246	251	49	1.817	1.277	15.325	477.895
15	10:48	3.2	4.9	491.990	108	~~76~~ 75		12	242	248	49	1.789	1.258	15.091	493.22
16	11:00	3.0	4.6	506.650	104	76	76	12	244	251	50	1.732	1.218	14.611	508.311
17	11:12	3.1	4.7	522.540	106	77	77	13	249	250	51	1.761	1.238	14.853	522.922
18	11:24	3.0	4.6	537.840	107	78	78	13	250	250	51	1.732	1.218	14.611	537.775
19	11:36	3.0	4.6	553.450	110	78	78	11	249	251	52	1.732	1.218	14.611	552.386
20	11:48	2.9	4.5	567.730	107	79	79	10	250	250	54	1.703	1.197	14.364	566.997
	12:00			581.746											581.361

IMPINGER WEIGHT SHEET

PLANT: PCC STRUCTURALS

UNIT NO: BAGHOUSE 9256

LOCATION: INLET

DATE: 6-29-23

TEST NO: #2

METHOD: 29

WEIGHED/MEASURED BY: [illegible]

Scale ID Number 510-35

Scale Calibration Check Date: 6-25-23

Scale Calibration Check (see QS-6.05C for procedure)
must be within ± 0.5g of certified mass

250 grams 250.0

500 grams 500.1

750 grams 750.1

	FINAL WEIGHT		INITIAL WEIGHT		IMPINGER		IMPINGER
Circle One:	MLS / GRAMS		MLS / GRAMS		GAIN		CONTENTS
IMPINGER 1	779.8		754.1				HNO_3/H_2O_2
IMPINGER 2	764.2		758.5				HNO_3/H_2O_2
IMPINGER 3	630.0		629.0				EMPTY
IMPINGER 4	725.1		741.7				$KMnO_4$
IMPINGER 5	758.2		764.3				$KMnO_4$
IMPINGER 6	884.7		826.9				SILICA
IMPINGER 7							
IMPINGER 8							

IMPINGERS _____ FINAL TOTAL _____ INITIAL TOTAL _____ TOTAL IMPINGER GAIN

SILICA _____ FINAL TOTAL _____ INITIAL TOTAL _____ TOTAL SILICA GAIN

Isokinetic Sampling Cover Sheet

Client:	PLC	**Pitot Tube Cp:**	0.840
Facility:	LPC - Milwaukie, OR	**Probe Length (Feet):**	6.0
Test Location:	9256 Inlet	**Probe Liner Material:**	Glass
Project #:	M232604	**Sample Plane:**	(Hrzt.) or (Vert.)
Test Method(s):	0061	**Port Length (“):**	4
Test Engineer:	EL	**Port Diameter (“):**	4
Test Technician:	PPR / FJO	**Port Type:**	Nipple
Upstream Diameters:		**Duct Shape:**	(Circ) or Rect.
Downstream Diameters:		**Diameter (Feet):**	5.0
# of Ports Sampled:	2	**Length (Feet):**	—
# of Points per Port:	20	**Width (Feet):**	—
Source Condition:		**Duct Area (Sq. Feet):**	
Diluent Model/SN:	—	**Minutes per Point:**	12
Mid Gas ID/concentration:	— /%CO2 — %O2	**Total Traverse Points:**	40
High Gas ID/concentration:	— /%CO2 — %O2	**Test Length (Min.):**	480
Moisture Balance ID:		**Train Type:**	other

	R# ~~1~~	R# 2	R#
Meter ID:	CM14	CM14	
Pitot ID:	293	293	
Filter ID:	—	—	
Filter Pre-Weight (g):	—	—	
Nozzle Diameter (“):	0.196	~~0.196~~ 0.179	
Meter Cal Factor (Y):	~~1.00~~ 1.001	1.001	
Meter Orifice Setting (DH):	1.646	1.646	
Nozzle Kit ID:			
Individual Nozzle ID:			
Pre Pitot Leak Check:	~~3.200~~ @ 3.2 “H2O	0.0 @ 3.7 “H2O	@ “H2O
Post Pitot Leak Check:	0.0 @ 3.8 “H2O	0.0 @ 3.3 “H2O	@ “H2O
Pre Nozzle Leak Check:	0.000 @ 15 “Hg	0.004 @ 12 “Hg	@ “Hg
Post Nozzle Leak Check:	0.002 @ 15 “Hg	0.000 @ 12 “Hg	@ “Hg
Barometric Pressure,“Hg:	30.05	29.99	
Static Pressure, “H2O:	-5.8	-5.7	
CO2 %:	—	—	
O2 %:	—	—	

Comments: Run 1 - Bd 2, 1st Imp KOH exhausted @ 89 test paused. Added 150mL, ~~added~~
Run 2 - THC dampers closed for appx 30 seconds, test paused briefly then restarted when dampers were reopened

Isokinetic Sampling Field Data Sheet

Project Number: M232604 | Date: 6/28/23 | Test Number: 1

Client: PBC | Test Location: 9256 Inlet | Operator: [illegible] | Test Tech: [illegible]

Plant: LPC - Milwaukee, OH | Test Method: 0061 | Page Number: 1 of 2

Port-Point #	Time	(ΔP)	Orifice Setting (ΔH)	Meter Volume (V_m) ft³, Actual	Stack Temp, °F	Meter Temp Inlet, °F	Meter Temp Outlet, °F	Pump Vacuum, "Hg	Probe Temp. °F	Filter Temp. °F	Impinger Outlet Well Temp. °F	K-Calcs (Optional) Square Root, ΔP	K=0.647 Meter Rate, Cubic Feet/ Min.	x 12 Theoretical Meter Volume, (V_m) ft³, per point	Theoretical Meter Volume, (V_m) ft³, total
1-1	345	0.7	1.2	404.288	84	61	61	5			58	0.837	0.583	6.998	
2	357	0.88	1.3	411.890	89	62	61	5			65	0.938	0.642	7.700	421.286
3	409	0.80	1.1	418.60	91	61	62	4			66	0.894	0.612	7.341	418.996
4	421	1.60	1.4	426.260	94	66	67	4			66	1.080	0.691	8.268	426.337
5	~~433~~			433.797											434.595
5	445 570	0.87	1.2	433.797	94	60	60	4			60	0.938	0.638	7.666	
6	457 582	0.89	1.2	441.720	94	62	60	4			55	0.943	0.645	7.743	442.257
7	509 604	0.89	1.1	449.550	94	64	61	4			59	0.894	0.612	7.344	449.994
8	521 616	0.95	1.3	457.510	97	67	63	6			62	1.080	0.740	8.880	457.338
9	533 628	1.2	2.0	466.310	98	67	63	7			62	1.183	0.805	9.658	466.996
10	545 640	2.8	3.9	474.610	99	67	64	11			64	1.673	1.138	13.654	475.153
11	557 652	3.2	4.4	485.130	99	66	64	11			64	1.789	1.216	14.597	488.807
12	609 704	2.7	3.8	500.240	101	65	64	11			63	1.643	1.117	13.408	503.464
13	621 716	2.7	3.8	512.100	98	66	64	11			59	1.643	1.117	13.408	516.872
14	633 728	3.0	4.1	524.770	99	68	66	11			58	1.732	1.178	14.137	530.220
15	645 740	2.5	3.4	538.58	99	68	66	11			58	1.581	1.075	12.902	543.353
16	657 752	2.2	3.0	551.080	99	68	66	11			58	1.483	1.009	12.109	555.232
17	709 809	1.8	2.4	561.320	99	68	66	11			59	1.341	0.926	10.867	569.358
18	721 816	1.4	1.9	571.210	98	68	67	11			59	1.183	0.793	9.513	580.229
19	733 828	1.3	1.7	580.180	96	70	68	10			60	1.140	0.764	9.167	589.738
20	745 840	1.3	1.7	591.720	96	70	68	10			61	1.140	0.764	9.167	598.905
	850			601.246											608.072

Isokinetic Sampling Field Data Sheet

Project Number: M232604 Date: 6/28/23 Test Number: 1

Client: PCC Test Location: 9256 In Operator: CE Test Tech: BW/ESO

Plant: LPC - Milwaukie, OR Test Method: 0061 Page Number: 2 of 2

Port-Point #	Time	(ΔP)	Orifice Setting (ΔH)	Meter Volume (V_m) ft³, Actual	Stack Temp, °F	Meter Temp Inlet, °F	Meter Temp Outlet, °F	Pump Vacuum, "Hg	Probe Temp. °F	Filter Temp. °F	Impinger Outlet Well Temp. °F	K-Calcs (Optional) Square Root, ΔP	Meter Rate, Cubic Feet/ Min.	Theoretical Meter Volume, (V_m) ft³, per point	Theoretical Meter Volume, (V_m) ft³, total
			1.362									K=	x 12		
2-1	935	2.5	3.3	602.620	94	84	81	5			57	1.581	1.059	12.708	
2	947	2.1	2.8	611.310	98	84	81	4			62	1.489	0.971	11.652	626.982
3	959	2.3	3.1	623.760											
4	1009 1020	2.3	3.1	635.710	102	85	81	4			52	1.612	1.080	12.964	
5	1027 1032	2.6	3.6	638.230	103	85	80	6			57	1.642	1.082	12.984	641.746
6	1035 1044	2.6	3.6	651.600	113	86	80	6			58	1.612	1.102	13.462	655.208
7	1049 1056	2.5	3.3	664.730	112	86	81	6			62	1.581	1.100	13.206	668.825
8	1059 1108	2.3	3.1	677.650	109	87	81	6			61	1.516	1.046	12.552	681.881
9	1121 1130	2.2	3.0	691.580	107	87	82	6			60	1.483	1.023	12.281	694.938
10	1123 1132	2.0	2.7	703.210	107	87	82	5			59	1.414	0.976	11.710	706.719
11	1131 1141	1.9	2.6	717.610	107	87	82	5			58	1.378	0.951	11.413	718.129
12	1147 1156	2.1	2.9	728.200	105	88	83	5			61	1.449	1.000	12.000	729.834
13	1159 1208	2.0	2.7	741.920	103	88	83	5			59	1.414	0.976	11.710	741.883
14	1211 1220	2.1	2.9	753.880	101	88	83	5			59	1.449	1.000	12.002	753.573
15	1223 1232	2.3	3.1	765.830	101	90	84	5			60	1.516	1.046	12.552	765.563
16	1235 1244	2.0	2.9	777.610	100	89	85	6			62	1.414	0.976	11.710	778.12
17	1247 1256	2.0	2.9	788.910	100	89	85	6			62	1.414	0.976	11.710	789.83
18	1259 1308	1.9	2.6	800.780	100	88	85	6			62	1.378	0.951	11.413	801.54
19	1311 1320	2.0	2.7	812.710	100	87	85	6			63	1.414	0.976	11.710	812.953
20	1323 1333	2.0	2.7	824.51	100	87	85	6			63	1.414	0.976	11.710	824.663
	1335 1344	1.8	2.5	835.880	100	87	85	6			64	1.342	0.926	11.109	836.373
	1356			847.002											847.482

Isokinetic Sampling Field Data Sheet

Project Number: M232604 | Date: 6/29/23 | Test Number: 2

Client: PCC | Test Location: 9256 Inlet | Operator: [illegible] Test Tech: CE/BSD

Plant: LRC-Milwaukie, OR | Test Method: 0061 | Page Number: 1 of 2

0.562

Port-Point #	Time	(ΔP)	0.937 1.34 Orifice Setting (ΔH)	Meter Volume (V_m) ft³, Actual	Stack Temp, °F	Meter Temp Inlet, °F	Meter Temp Outlet, °F	Pump Vacuum, "Hg	Probe Temp. °F	Filter Temp. °F	Impinger Outlet Well Temp. °F	K-Calcs (Optional) Square Root, ΔP	K= 0.[illegible] x 12 Meter Rate, Cubic Feet/ Min.	Theoretical Meter Volume, (V_m) ft³, per point	Theoretical Meter Volume, (V_m) ft³, total
1-1	330	1.2	1.6	847.776	92	65	65	2			58	1.095	0.[illegible]	[illegible]184	955.955
2	342	2.6	3.5	856.260	92	67	65	8			61	1.612	1.004	12.055	868.021
3	354	2.8	2.6	866.850	94	67	65	9			57	1.673	0.940	11.285	878.134
4	406	2.4	2.2	876.780	94	67	65	10			54	1.549	0.870	10.448	888.582
5	418	2.6	2.4	889.240	95	68	65	7			54	1.612	0.906	10.874	899.456
6	430	2.4	2.2	901.520	95	68	65	6			53	1.579	0.870	10.448	909.904
7	442	2.5	2.3	911.000	95	68	66	5			54	1.581	0.889	10.663	920.567
8	454	2.5	2.3	920.490	94	70	66	8			52	1.581	0.889	10.663	931.23
9	506	2.4	2.2	931.120	94	70	67	7			53	1.549	0.870	10.448	941.678
10	518	2.5	2.3	942.450	94	69	66	7			52	1.581	0.889	10.663	952.341
11	530	2.0	1.9	952.130	94	70	66	6			51	1.414	0.795	9.537	961.878
12	542	1.8	1.7	962.350	94	70	66	6			50	1.342	0.754	9.048	970.926
13	554	2.0	1.9	972.420	94	70	66	6			51	1.414	0.889	10.663	981.589
14	606	2.2	2.1	981.360	93	70	66	5			50	1.483	0.834	10.003	991.592
15	618	2.2	2.1	991.760	94	70	66	5			51	1.483	0.834	10.003	1001.595
16	630	2.4	2.2	1002.050	96	70	66	5			51	1.549	0.870	10.448	1012.043
17	642	2.6	2.4	1012.240	97	70	66	5			50	1.612	0.906	10.874	1022.917
18	654	2.5	2.3	1023.420	98	70	66	6			51	1.581	0.889	10.663	1033.58
19	706	2.5	2.3	1034.750	101	70	66	5			52	1.581	0.889	10.663	1044.243
20	718	2.5	2.3	1045.800	97	70	67	6			52	1.581	0.889	10.663	1054.906
	730			1055.169											

Isokinetic Sampling Field Data Sheet

Project Number: M232604 | Date: 6/29/23 | Test Number: 2

Client: PCC | Test Location: 9216 Inlet | Operator: PPP | Test Tech: SS/FJO

Plant: LPC-milwaukee, OR | Test Method: 0061 | Page Number: 2 of 2

0.931

Port-Point #	Time	(ΔP)	Orifice Setting (ΔH)	Meter Volume (V_m) ft³, Actual (Thousands)	Stack Temp, °F	Meter Temp Inlet, °F	Meter Temp Outlet, °F	Pump Vacuum, "Hg	Probe Temp. °F	Filter Temp. °F	Impinger Outlet Well Temp. °F	K-Calcs (Optional) K= 0.562 x 12 Square Root, ΔP	Meter Rate, Cubic Feet/ Min.	Theoretical Meter Volume, (V_m) ft³, per point	Theoretical Meter Volume, (V_m) ft³, total
2-1	8:00	1.8	1.7	56.571	103	73	69	2			63	1.342	0.754	9.048	
2	8:12	2.0	1.8	66.340	103	74	69	2			63	1.414	0.795	9.537	65.619
3	8:24	2.0	1.8	78.310	106	77	71	2			64	1.414	0.795	9.537	75.156
4	8:36	1.9	1.8	85.860	104	80	75	2			64	1.378	0.775	9.296	84.693
5	8:48	2.0	1.8	93.420	106	83	78	3			66	1.414	0.795	9.537	93.989
6	9:00	2.0	1.8	103.540	104	85	80	3			64	1.414	0.795	9.537	103.526
7	9:12	1.9	1.8	113.290	109	87	82	3			61	1.378	0.775	9.296	113.063
8	9:24	1.9	1.8	123.120	106	88	83	3			61	1.378	0.775	9.296	122.359
9	9:36	2.5	2.3	133.050	108	89	85	3			62	1.581	0.889	10.663	131.655
10	9:48	2.7	2.5	140.630	113	89	85	5			63	1.643	0.923	11.082	142.318
11	10:00	0.95	0.89	152.560	111	89	84	3			60	0.977	0.549	6.573	153.340
12	10:12	0.85	0.8	162.230	111	88	83	2			57	0.922	0.518	6.218	159.913
13	10:24	0.90	0.8	169.830	111	87	83	1			60	0.949	0.533	6.398	166.131
14	10:36	0.90	0.8	176.140	109	85	82	1			62	0.949	0.533	6.398	172.529
15	10:48	0.94	0.8	178.750	108	83	81	1			60	0.969	0.545	6.539	178.927
16	11:00	0.95	0.8	185.230	109	84	81	1			59	0.975	0.548	6.573	185.466
17	11:12	0.95	0.8	191.630	111	84	81	1			60	0.975	0.548	6.573	192.089
18	11:24	0.85	0.8	198.820	111	85	85	1			61	0.922	0.518	6.218	198.612
19	11:36	0.83	0.8	205.290	114	85	82	1			62	0.922	0.518	6.218	204.830
20	11:48	0.87	0.8	212.000	111	85	82	1			62	0.933	0.524	6.290	211.048
	12:00			217.715											217.335

Appendix G - Calibration and Response Time Data

Procedures for Isokentic Calibration

Nozzles

The nozzles are measured according to Method 5, Section 10.1

Dry Gas Meters

The test meters are calibrated according to Method 5, Section 10.3 and 16.1. and “Procedures for Calibrating and Using Dry Gas Volume Meters as Calibration Standards” by P.R. Westlin and R.T. Shigehara, March 10, 1978.

Analytical Balance

The accuracy of the analytical balance is checked with Class S, Stainless Steel Type 303 weights manufactured by F. Hopken and Son, Jersey City, New Jersey.

Temperature Sensing Devices

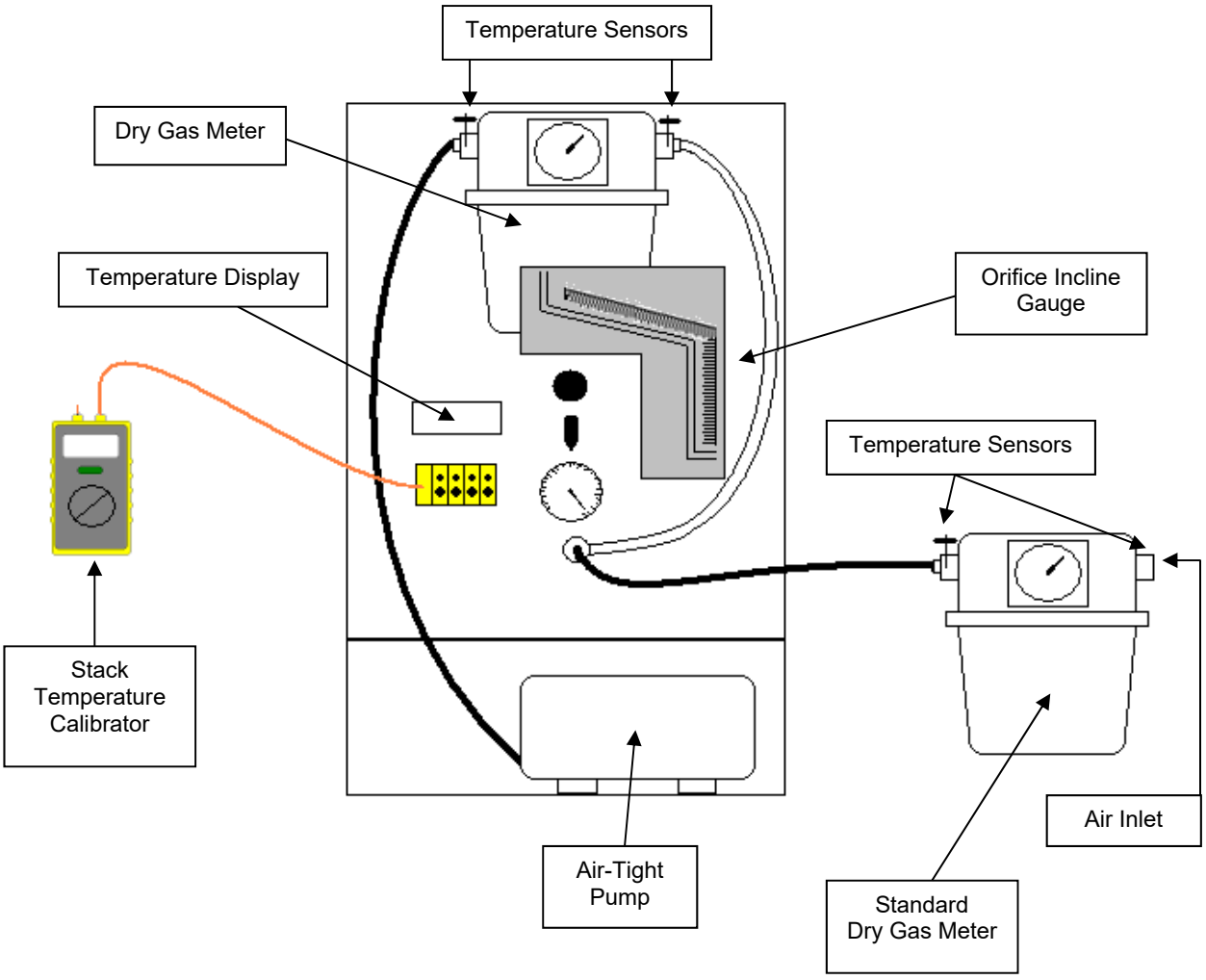
The potentiometer and thermocouples are calibrated utilizing a NIST traceable millivolt source.

Pitot Tubes

The “S” type pitot tubes utilized during this test program are manufactured according to the specification described and illustrated in the *Code of Federal Regulations*, Title 40, Part 60, Appendix A, Methods 1 and 2. The pitot tubes comply with the alignment specifications in Method 2, Section 10.1; and the pitot tube assemblies are in compliance with specifications in the same section.

These pitot tubes will have a wind tunnel calibrated CP calibrated as referenced to a standard type pitot.

Dry Gas Meter/Control Module Calibration Diagram



Dry Gas Meter Calibration Data

Dry Gas Meter No.	*CM14*	*Date:*	*June 21, 2023*
Standard Meter No.	*18654530*	*Calibrated By:*	*FB*
Standard Meter (Y)	*0.99520*	*Barometric Pressure:*	*29.41*

Run Number		Orifice Setting in H_2O Chg (H)	Standard Meter Gas Volume vr	Dry Gas Meter Gas Volume vd	Standard Meter Temp. F° tr	Dry Gas Meter Inlet Temp. F° tdi	Dry Gas Meter Outlet Temp. F° tdo	Dry Gas Meter Avg. Temp. F° td	Time Min	Time Sec	Y	Chg (H)
Final			*126.550*	*71.373*	*76*	*82*	*81*					
Initial			*120.024*	*64.888*	*75*	*82*	*79*					
Difference	*1*	*0.20*	*6.526*	*6.485*	*76*	*82*	*80*	*81*	*23*	*31*	*1.011*	*1.505*
Final			*134.342*	*78.794*	*76*	*83*	*82*					
Initial			*126.788*	*71.322*	*76*	*82*	*81*					
Difference	*2*	*0.50*	*7.554*	*7.472*	*76*	*83*	*82*	*82*	*17*	*24*	*1.016*	*1.538*
Final			*141.132*	*86.470*	*76*	*84*	*82*					
Initial			*134.650*	*79.910*	*76*	*83*	*81*					
Difference	*3*	*0.70*	*6.482*	*6.560*	*76*	*84*	*82*	*83*	*13*	*30*	*0.994*	*1.758*
Final			*148.346*	*101.290*	*76*	*85*	*83*					
Initial			*141.240*	*94.083*	*77*	*84*	*83*					
Difference	*4*	*0.90*	*7.106*	*7.207*	*77*	*85*	*83*	*84*	*12*	*30*	*0.992*	*1.612*
Final			*155.782*	*101.290*	*76*	*84*	*84*					
Initial			*148.654*	*94.083*	*77*	*85*	*83*					
Difference	*5*	*1.20*	*7.128*	*7.207*	*77*	*85*	*84*	*84*	*11*	*4*	*0.995*	*1.674*
Final			*119.974*	*64.612*	*75*	*82*	*79*					
Initial			*113.905*	*58.535*	*75*	*81*	*79*					
Difference	*6*	*2.00*	*6.069*	*6.077*	*75*	*82*	*79*	*80*	*7*	*32*	*0.999*	*1.785*
								Average			***1.001***	***1.646***

Stack Temperature Sensor Calibration			
Temperature ID :	CM14	Name :	FB
Ambient Temperature, °F :	79	Date :	6/21/2023

Temperature Calibrator			
Model # :	CL23A	Certification Date:	May 18, 2022
Serial # :	T-285668	Expiration Date:	May 18, 2023

Primary Standards Directly Traceable National Institute of Standards and Technology (NIST)

Reference Source Temperature (°F)	Test Thermometer Temperature (°F)	Temperature Difference %
0	-1	0.2
250	249	0.1
600	599	0.1
1200	1201	0.1

$$\frac{(\text{Ref. Temp., °F} + 460) - (\text{Test Therm. Temp., °F} + 460)}{\text{Ref. Temp., °F} + 460} * 100 <= 1.5\ \%$$

Dry Gas Meter Calibration Data

Dry Gas Meter No.	*CM14*	*Date:*	*July 14, 2023*
Standard Meter No.	*1654*	*Calibrated By:*	*JVC*
Standard Meter (Y)	*1.00440*	*Barometric Pressure:*	*29.15*

Run Number		Orifice Setting in H_2O Chg (H)	Standard Meter Gas Volume vr	Dry Gas Meter Gas Volume vd	Standard Meter Temp. F° tr	Dry Gas Meter Inlet Temp. F° tdi	Dry Gas Meter Outlet Temp. F° tdo	Dry Gas Meter Avg. Temp. F° td	Time Min	Time Sec	Y	Chg (H)
Final			*22.411*	*74.444*	*77*	*83*	*82*					
Initial			*16.287*	*68.146*	*77*	*79*	*79*					
Difference	*1*	*0.20*	*6.124*	*6.298*	*77*	*81*	*81*	*81*	*22*	*49*	*0.983*	*1.604*
Final			*29.781*	*81.849*	*78*	*80*	*80*					
Initial			*22.695*	*74.719*	*77*	*81*	*80*					
Difference	*2*	*0.50*	*7.086*	*7.130*	*78*	*81*	*80*	*80*	*17*	*0*	*1.002*	*1.667*
Final			*40.223*	*92.582*	*78*	*82*	*81*					
Initial			*30.000*	*82.162*	*78*	*82*	*80*					
Difference	*3*	*0.70*	*10.223*	*10.420*	*78*	*82*	*81*	*81*	*20*	*45*	*0.990*	*1.671*
Final			*49.623*	*102.210*	*78*	*83*	*82*					
Initial			*40.529*	*92.878*	*78*	*81*	*81*					
Difference	*4*	*0.90*	*9.094*	*9.332*	*78*	*82*	*82*	*82*	*16*	*16*	*0.983*	*1.667*
Final			*57.745*	*10.492*	*79*	*84*	*82*					
Initial			*49.803*	*2.395*	*78*	*82*	*82*					
Difference	*5*	*1.20*	*7.942*	*8.097*	*79*	*83*	*82*	*83*	*11*	*47*	*0.989*	*1.530*
Final			*16.038*	*67.892*	*76*	*79*	*80*					
Initial			*9.307*	*61.113*	*76*	*79*	*79*					
Difference	*6*	*2.00*	*6.731*	*6.779*	*76*	*79*	*80*	*79*	*8*	*4*	*0.998*	*1.658*
								Average			***0.991***	***1.633***

Stack Temperature Sensor Calibration			
Temperature ID :	CM14	Name :	JVC
Ambient Temperature, °F :	79.2	Date :	July 14, 2023

Temperature Calibrator			
Model # :	CL23A	Certification Date:	May 2, 2023
Serial # :	T-265688	Expiration Date:	May 1, 2024

Primary Standards Directly Traceable National Institute of Standards and Technology (NIST)

Reference Source Temperature (°F)	Test Thermometer Temperature (°F)	Temperature Difference %
0	1	0.2
250	253	0.4
600	604	0.4
1200	1202	0.1

$$\frac{(\text{Ref. Temp., }^{o}\text{F} + 460) - (\text{Test Therm. Temp., }^{o}\text{F} + 460)}{\text{Ref. Temp., }^{o}\text{F} + 460} * 100 <= 1.5\ \%$$

Dry Gas Meter Calibration Data

Dry Gas Meter No.	*CM40*	*Date:*	*June 20, 2023*
Standard Meter No.	*18654530*	*Calibrated By:*	*JVC*
Standard Meter (Y)	*1.00440*	*Barometric Pressure:*	*29.36*

Run Number		Orifice Setting in H_2O Chg (H)	Standard Meter Gas Volume vr	Dry Gas Meter Gas Volume vd	Standard Meter Temp. F° tr	Dry Gas Meter Inlet Temp. F° tdi	Dry Gas Meter Outlet Temp. F° tdo	Dry Gas Meter Avg. Temp. F° td	Time Min	Time Sec	Y	Chg (H)
Final			31.217	10.058	76	77	77					
Initial			26.449	5.227	75	76	76					
Difference	1	0.20	4.768	4.831	76	77	77	77	18	25	0.993	1.715
Final			48.468	127.820	76	74	74					
Initial			41.330	120.616	75	74	74					
Difference	2	0.50	7.138	7.204	76	74	74	74	17	30	0.991	1.736
Final			55.477	134.914	76	74	74					
Initial			48.668	128.032	76	74	74					
Difference	3	0.70	6.809	6.882	76	74	74	74	14	15	0.988	1.774
Final			61.845	141.665	76	74	74					
Initial			55.530	135.270	76	74	74					
Difference	4	0.90	6.315	6.395	76	74	74	74	12	0	0.986	1.880
Final			69.006	149.030	76	74	74					
Initial			62.045	141.986	76	74	74					
Difference	5	1.20	6.961	7.044	76	74	74	74	11	15	0.986	1.814
Final			26.370	105.069	75	76	76					
Initial			17.673	96.264	75	77	77					
Difference	6	2.00	8.697	8.805	75	77	77	77	10	40	0.990	1.726
										Average	***0.989***	***1.774***

Stack Temperature Sensor Calibration			
Temperature ID :	CM40	Name :	FB
Ambient Temperature, °F :	76.9	Date :	6/20/2023

Temperature Calibrator			
Model # :	CL23A	Certification Date:	May 18, 2022
Serial # :	T-285668	Expiration Date:	May 18, 2023

Primary Standards Directly Traceable National Institute of Standards and Technology (NIST)

Reference Source Temperature (°F)	Test Thermometer Temperature (°F)	Temperature Difference %
0	0	0.0
250	250	0.0
600	599	0.1
1200	1204	0.4

$$\frac{(\text{Ref. Temp., °F} + 460) - (\text{Test Therm. Temp., °F} + 460)}{\text{Ref. Temp., °F} + 460} * 100 <= 1.5\ \%$$

Dry Gas Meter Calibration Data

Dry Gas Meter No.	*CM40*	*Date:*	*July 14, 2023*
Standard Meter No.	*366118*	*Calibrated By:*	*DEJ*
Standard Meter (Y)	*1.00880*	*Barometric Pressure:*	*29.15*

Run Number		Orifice Setting in H_2O Chg (H)	Standard Meter Gas Volume vr	Dry Gas Meter Gas Volume vd	Standard Meter Temp. F° tr	Dry Gas Meter Inlet Temp. F° tdi	Dry Gas Meter Outlet Temp. F° tdo	Dry Gas Meter Avg. Temp. F° td	Time Min	Time Sec	Y	Chg (H)
Final			39.235	91.582	74	74	74					
Initial			33.060	85.286	75	73	73					
Difference	1	0.20	6.175	6.296	75	74	74	74	22	18	0.987	1.500
Final			46.321	98.781	76	74	74					
Initial			39.571	91.919	74	74	74					
Difference	2	0.50	6.750	6.862	75	74	74	74	16	5	0.989	1.634
Final			62.771	15.525	78	75	75					
Initial			56.460	9.103	78	75	75					
Difference	3	0.70	6.311	6.422	78	75	75	75	12	54	0.984	1.699
Final			71.124	24.026	79	76	76					
Initial			63.073	15.835	78	75	75					
Difference	4	0.90	8.051	8.191	79	76	76	76	14	54	0.984	1.793
Final			78.535	31.538	76	77	77					
Initial			71.377	24.280	76	77	77					
Difference	5	1.20	7.158	7.258	76	77	77	77	11	13	0.994	1.693
Final			24.406	76.077	75	73	73					
Initial			18.008	69.775	74	72	72					
Difference	6	2.00	6.398	6.302	75	73	73	73	8	10	1.015	1.877
								Average			***0.992***	***1.699***

Stack Temperature Sensor Calibration			
Temperature ID :	CM40	Name :	DEJ
Ambient Temperature, °F :	78.5	Date :	July 14, 2023

Temperature Calibrator			
Model # :	CL23A	Certification Date:	May 2, 2023
Serial # :	T-285668	Expiration Date:	May 1, 2024

Primary Standards Directly Traceable National Institute of Standards and Technology (NIST)

Reference Source Temperature (°F)	Test Thermometer Temperature (°F)	Temperature Difference %
0	1	0.2
250	253	0.4
600	602	0.2
1200	1205	0.3

$$\frac{(\text{Ref. Temp., °F} + 460) - (\text{Test Therm. Temp., °F} + 460)}{\text{Ref. Temp., °F} + 460} * 100 <= 1.5\ \%$$

Dry Gas Meter Calibration Data

Dry Gas Meter No.	*CM1*	*Date:*	*June 13, 2023*
Standard Meter No.	*16541852*	*Calibrated By:*	*JKM*
Standard Meter (Y)	*1.00440*	*Barometric Pressure:*	*28.96*

Run Number		Orifice Setting in H_2O Chg (H)	Standard Meter Gas Volume vr	Dry Gas Meter Gas Volume vd	Standard Meter Temp. F° tr	Dry Gas Meter Inlet Temp. F° tdi	Dry Gas Meter Outlet Temp. F° tdo	Dry Gas Meter Avg. Temp. F° td	Time Min	Time Sec	Y	Chg (H)
Final			36.438	109.068	66	71	70					
Initial			30.632	103.166	65	71	69					
Difference	1	0.20	5.806	5.902	66	71	70	70	20	59	0.996	1.483
Final			45.771	118.501	66	71	70					
Initial			36.552	109.189	66	71	70					
Difference	2	0.50	9.219	9.312	66	71	70	71	22	12	1.002	1.649
Final			54.535	127.309	67	72	70					
Initial			46.012	118.741	66	71	70					
Difference	3	0.70	8.523	8.568	67	72	70	71	16	30	1.005	1.494
Final			63.063	135.849	67	73	71					
Initial			54.788	127.564	67	72	70					
Difference	4	0.90	8.275	8.285	67	73	71	72	14	12	1.009	1.510
Final			70.832	143.664	67	74	71					
Initial			63.516	136.388	67	72	71					
Difference	5	1.20	7.316	7.276	67	73	71	72	11	35	1.016	1.712
Final			10.124	82.798	66	71	71					
Initial			4.584	77.151	66	71	70					
Difference	6	2.00	5.540	5.647	66	71	71	71	6	31	0.989	1.573
								Average			***1.003***	***1.570***

Stack Temperature Sensor Calibration			
Temperature ID :	100769 CM1	Name :	JKM
Ambient Temperature, °F :	69.6	Date :	June 13, 2023

Temperature Calibrator			
Model # :	CL23A	Certification Date:	May 2, 2023
Serial # :	T-285668	Expiration Date:	May 2, 2024

Primary Standards Directly Traceable National Institute of Standards and Technology (NIST)

Reference Source Temperature (°F)	Test Thermometer Temperature (°F)	Temperature Difference %
0	0	0.0
250	249	0.1
600	598	0.2
1200	1200	0.0

$$\frac{(\text{Ref. Temp., }^{o}\text{F} + 460) - (\text{Test Therm. Temp., }^{o}\text{F} + 460)}{\text{Ref. Temp., }^{o}\text{F} + 460} * 100 <= 1.5\ \%$$

Dry Gas Meter Calibration Data

Dry Gas Meter No.	CM1	Date:	July 11, 2023
Standard Meter No.	16541852	Calibrated By:	BJE
Standard Meter (Y)	1.00440	Barometric Pressure:	29.16

Run Number		Orifice Setting in H_2O Chg (H)	Standard Meter Gas Volume vr	Dry Gas Meter Gas Volume vd	Standard Meter Temp. F^o tr	Dry Gas Meter Inlet Temp. F^o tdi	Dry Gas Meter Outlet Temp. F^o tdo	Dry Gas Meter Avg. Temp. F^o td	Time Min	Time Sec	Y	Chg (H)
Final			19.768	9.219	75	84	81					
Initial			12.035	1.302	74	81	80					
Difference	1	0.20	7.733	7.917	75	83	81	82	27	15	0.993	1.419
Final			46.870	37.564	75	90	86					
Initial			39.348	29.720	76	86	84					
Difference	2	0.50	7.522	7.844	76	88	85	87	16	40	0.982	1.395
Final			62.327	53.702	77	92	87					
Initial			47.057	37.775	76	87	85					
Difference	3	0.70	15.270	15.927	77	90	86	88	29	27	0.981	1.482
Final			72.157	63.992	76	92	89					
Initial			62.537	53.927	76	89	87					
Difference	4	0.90	9.620	10.065	76	91	88	89	16	18	0.982	1.464
Final			83.608	75.938	77	93	87					
Initial			72.397	64.246	77	88	87					
Difference	5	1.20	11.211	11.692	77	91	87	89	17	2	0.981	1.576
Final			111.832	101.098	73	86	79					
Initial			103.787	92.981	73	79	78					
Difference	6	2.00	8.045	8.117	73	83	79	81	9	51	1.004	1.706

Average	**0.987**	**1.507**

Stack Temperature Sensor Calibration			
Temperature ID :	100769	Name :	JVC
Ambient Temperature, °F :	81.9	Date :	July 11, 2023

Temperature Calibrator			
Model # :	CL23A	Certification Date:	May 2, 2023
Serial # :	T-285688	Expiration Date:	May 1, 2024

Primary Standards Directly Traceable National Institute of Standards and Technology (NIST)

Reference Source Temperature (°F)	Test Thermometer Temperature (°F)	Temperature Difference %
0	2	0.4
250	248	0.3
600	603	0.3
1200	1206	0.4

$$\frac{(\text{Ref. Temp., }^{o}\text{F} + 460) - (\text{Test Therm. Temp., }^{o}\text{F} + 460)}{\text{Ref. Temp., }^{o}\text{F} + 460} * 100 <= 1.5\ \%$$

Dry Gas Meter Calibration Data

Dry Gas Meter No.	*CM34*	*Date:*	*June 21, 2023*
Standard Meter No.		*Calibrated By:*	*MJD*
Standard Meter (Y)	*1.00880*	*Barometric Pressure:*	*29.42*

Run Number		Orifice Setting in H_2O Chg (H)	Standard Meter Gas Volume vr	Dry Gas Meter Gas Volume vd	Standard Meter Temp. F° tr	Dry Gas Meter Inlet Temp. F° tdi	Dry Gas Meter Outlet Temp. F° tdo	Dry Gas Meter Avg. Temp. F° td	Time Min	Time Sec	Y	Chg (H)
Final			91.552	42.169	72	80	72					
Initial			86.255	36.871	73	81	76					
Difference	1	0.20	5.297	5.298	73	81	74	77	20	25	1.017	1.669
Final			98.512	49.276	72	81	79					
Initial			92.011	42.645	72	80	77					
Difference	2	0.50	6.501	6.631	72	81	78	79	16	21	1.001	1.766
Final			105.074	56.090	72	84	80					
Initial			98.856	49.638	72	81	79					
Difference	3	0.70	6.218	6.452	72	83	80	81	13	24	0.987	1.809
Final			12.175	63.249	72	86	81					
Initial			5.240	56.151	72	84	80					
Difference	4	0.90	6.935	7.098	72	85	81	83	12	45	1.003	1.688
Final			18.048	69.248	73	87	82					
Initial			12.369	63.440	72	86	81					
Difference	5	1.20	5.679	5.808	73	87	82	84	9	9	1.005	1.728
Final			86.092	36.619	73	81	76					
Initial			80.260	30.740	73	77	75					
Difference	6	2.00	5.832	5.879	73	79	76	77	7	33	1.004	1.886
										Average	***1.003***	***1.758***

Stack Temperature Sensor Calibration			
Temperature ID :	CM34	Name :	MJD
Ambient Temperature, °F :	78.2	Date :	June 21, 2023

Temperature Calibrator			
Model # :	CL23A	Certification Date:	May 18, 2023
Serial # :	T-285668	Expiration Date:	May 17, 2024

Primary Standards Directly Traceable National Institute of Standards and Technology (NIST)

Reference Source Temperature (°F)	Test Thermometer Temperature (°F)	Temperature Difference %
0	-1	0.2
250	248	0.3
600	597	0.3
1200	1199	0.1

$$\frac{(\text{Ref. Temp., }^{o}\text{F} + 460) - (\text{Test Therm. Temp., }^{o}\text{F} + 460)}{\text{Ref. Temp., }^{o}\text{F} + 460} * 100 <= 1.5\ \%$$

Dry Gas Meter Calibration Data

Dry Gas Meter No.	*CM 34*	*Date:*	*July 18, 2023*
Standard Meter No.	*18654530*	*Calibrated By:*	*BJE*
Standard Meter (Y)	*0.99520*	*Barometric Pressure:*	*29.30*

Run Number		Orifice Setting in H_2O Chg (H)	Standard Meter Gas Volume vr	Dry Gas Meter Gas Volume vd	Standard Meter Temp. F^o tr	Dry Gas Meter Inlet Temp. F^o tdi	Dry Gas Meter Outlet Temp. F^o tdo	Dry Gas Meter Avg. Temp. F^o td	Time Min	Time Sec	Y	Chg (H)
Final			*14.994*	*89.243*	*73*	*77*	*76*					
Initial			*9.816*	*84.068*	*73*	*75*	*75*					
Difference	*1*	*0.20*	*5.178*	*5.175*	*73*	*76*	*76*	*76*	*21*	*19*	*1.000*	*1.973*
Final			*21.493*	*95.663*	*73*	*78*	*77*					
Initial			*15.188*	*89.412*	*74*	*77*	*76*					
Difference	*2*	*0.50*	*6.305*	*6.251*	*74*	*78*	*77*	*77*	*16*	*9*	*1.009*	*1.909*
Final			*28.118*	*102.244*	*74*	*78*	*78*					
Initial			*22.015*	*96.178*	*74*	*78*	*77*					
Difference	*3*	*0.70*	*6.103*	*6.066*	*74*	*78*	*78*	*78*	*13*	*10*	*1.007*	*1.897*
Final			*36.864*	*10.901*	*74*	*78*	*78*					
Initial			*29.035*	*3.144*	*74*	*78*	*78*					
Difference	*4*	*0.90*	*7.829*	*7.757*	*74*	*78*	*78*	*78*	*14*	*47*	*1.010*	*1.867*
Final			*42.722*	*16.720*	*74*	*79*	*78*					
Initial			*37.303*	*11.324*	*74*	*78*	*78*					
Difference	*5*	*1.20*	*5.419*	*5.396*	*74*	*79*	*78*	*78*	*9*	*0*	*1.004*	*1.925*
Final			*9.687*	*83.943*	*72*	*77*	*74*					
Initial			*3.196*	*77.583*	*73*	*74*	*74*					
Difference	*6*	*2.00*	*6.491*	*6.360*	*73*	*76*	*74*	*75*	*8*	*20*	*1.015*	*1.919*

Average	***1.008***	***1.915***

Stack Temperature Sensor Calibration			
Temperature ID :	100769	Name :	
Ambient Temperature, °F :	76.9	Date :	July 18, 2023

Temperature Calibrator			
Model # :	CL23A	Certification Date:	May 18, 2023
Serial # :	T-285668	Expiration Date:	May 17, 2024

Primary Standards Directly Traceable National Institute of Standards and Technology (NIST)

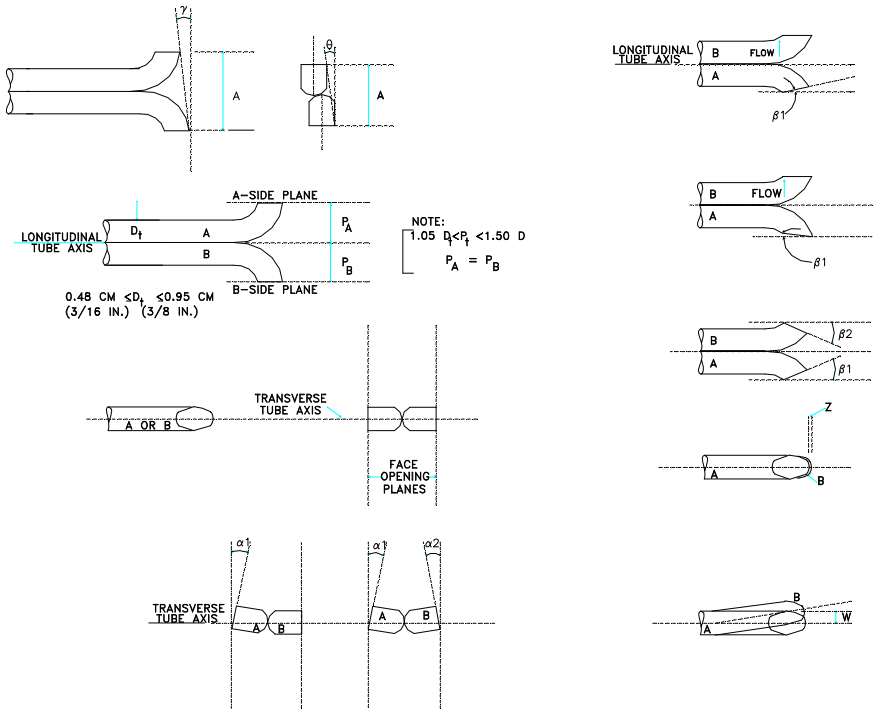
Reference Source Temperature (°F)	Test Thermometer Temperature (°F)	Temperature Difference %
0	-1	0.2
250	248	0.3
600	597	0.3
1200	1199	0.1

$$\frac{(\text{Ref. Temp., }^{o}\text{F} + 460) - (\text{Test Therm. Temp., }^{o}\text{F} + 460)}{\text{Ref. Temp., }^{o}\text{F} + 460} * 100 <= 1.5\ \%$$

S TYPE PITOT TUBE INSPECTION WORKSHEET

Pitot Tube No: 293 Date: 6/13/2023 Inspectors Name: EC

Type of Probe: (circle one) M2 M5 M17 Probe Length: 6 ft.



Pitot tube assembly level? x yes ____ no

Pitot tube openings damaged? ____ yes (explain below) x no

a_1 = 1 ° (<10°), a_2 = 1 ° (<10°) z = A sin g = 0.032 (in.); (<0.125 in.)

b_1 = 2 ° (<5°), b_2 = 2 ° (<5°) w = A sin q = 0.000 (in.); (<0.03125 in.)

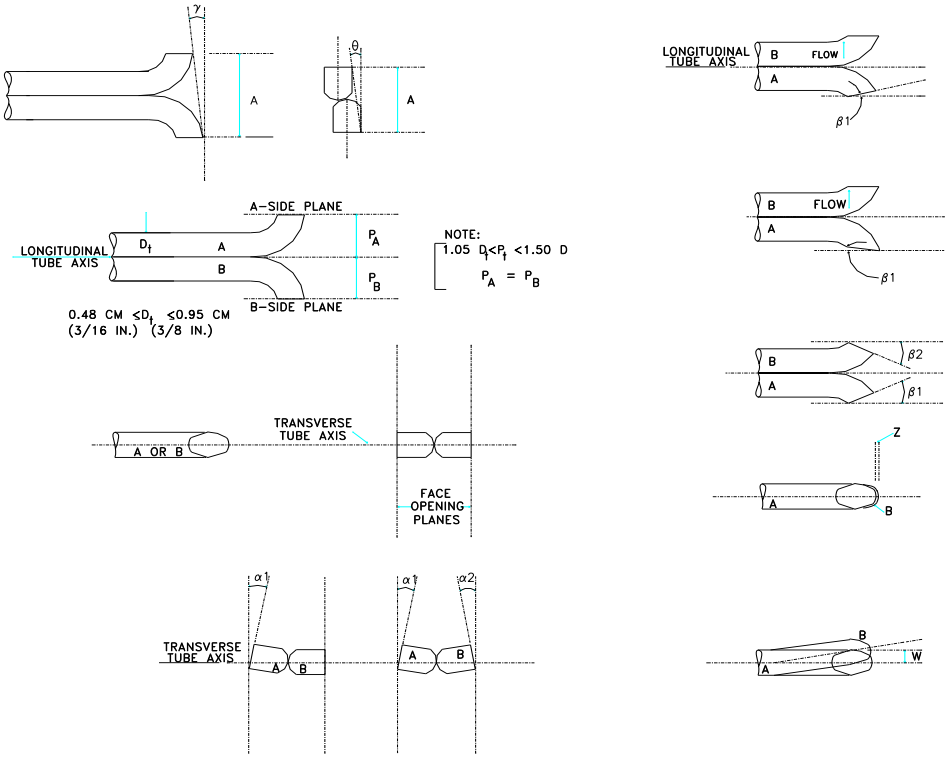
γ = 2 °, θ = 0 °, A = 0.930 (in.) P_A = 0.465 (in.), P_B = 0.465 (in.), D_t = 0.375 (in.)

Calibration required? ____ yes x no

S TYPE PITOT TUBE INSPECTION WORKSHEET

Pitot Tube No: 293 Date: 7/14/2023 Inspectors Name: EC

Type of Probe: (circle one) M2 M5 M17 Probe Length: 6 ft.



Pitot tube assembly level? x yes ____ no

Pitot tube openings damaged? ____ yes (explain below) x no

a_1 = 0.5 ° (<10°), a_2 = 0.5 ° (<10°) z = A sin g = 0.032 (in.); (<0.125 in.)

b_1 = 2.5 ° (<5°), b_2 = 2 ° (<5°) w = A sin q = 0.000 (in.); (<0.03125 in.)

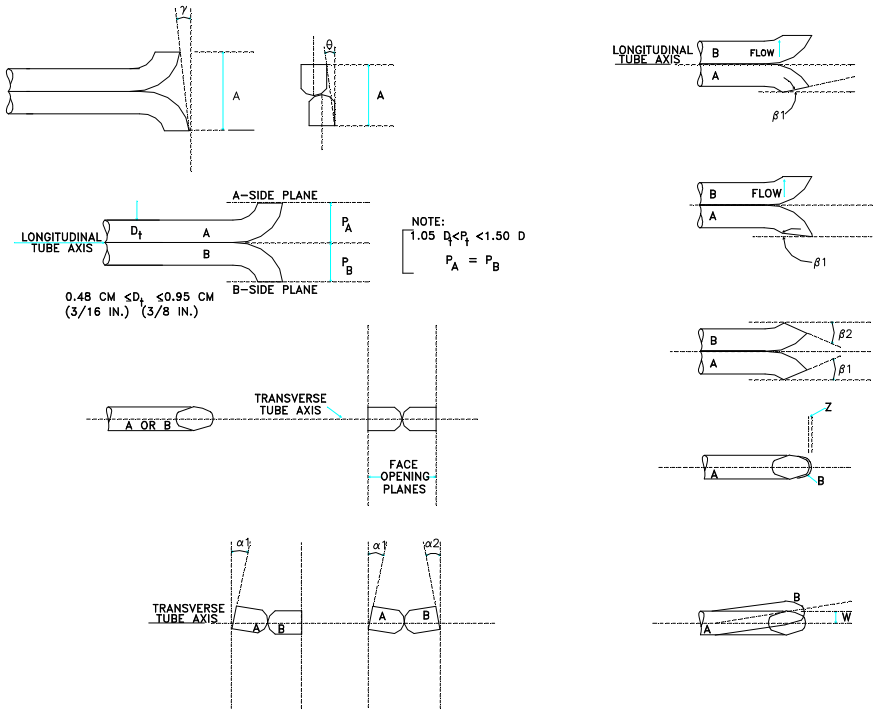
γ = 2 °, θ = 0 °, A = 0.930 (in.) P_A = 0.465 (in.), P_B = 0.465 (in.), D_t = 0.375 (in.)

Calibration required? ____ yes x no

S TYPE PITOT TUBE INSPECTION WORKSHEET

Pitot Tube No: 297 Date: 6/13/2023 Inspectors Name: EC

Type of Probe: (circle one) M2 **M5** M17 Probe Length: 6 ft.



Pitot tube assembly level? x yes ____ no

Pitot tube openings damaged? ____ yes (explain below) x no

a_1 = 1 ° (<10°), a_2 = 1 ° (<10°) z = A sin g = 0.017 (in.); (<0.125 in.)

b_1 = 1 ° (<5°), b_2 = 1 ° (<5°) w = A sin q = 0.000 (in.); (<0.03125 in.)

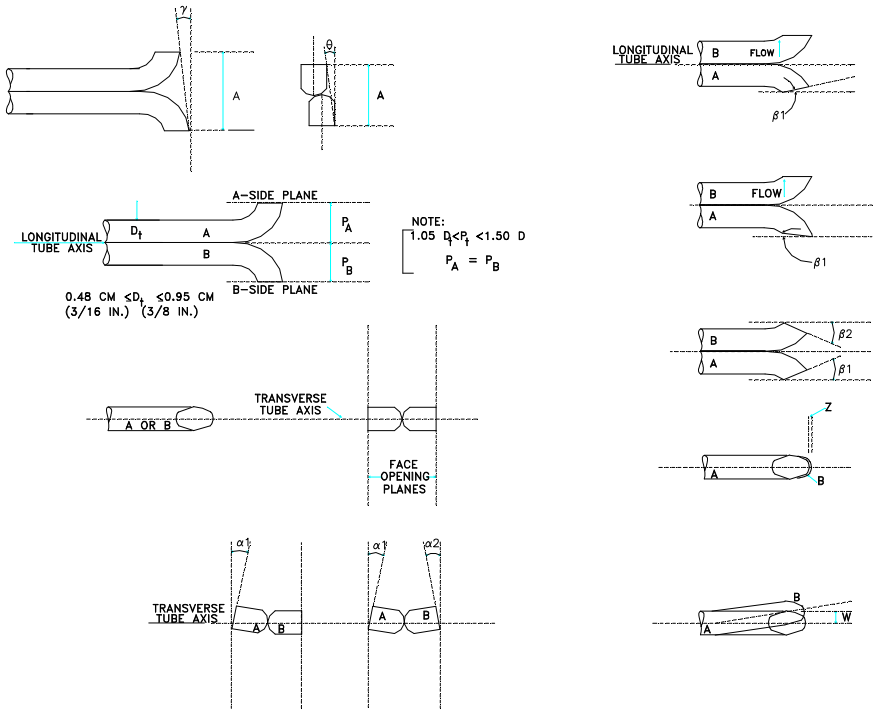
γ = 1 °, θ = 0 °, A = 0.950 (in.) P_A = 0.475 (in.), P_B = 0.475 (in.), D_t = 0.375 (in.)

Calibration required? ____ yes x no

S TYPE PITOT TUBE INSPECTION WORKSHEET

Pitot Tube No: 297 Date: 7/14/2023 Inspectors Name: EC

Type of Probe: (circle one) M2 M5 M17 Probe Length: 6 ft.



Pitot tube assembly level? x yes _____ no

Pitot tube openings damaged? _____ yes (explain below) x no

a_1 = 2 ° (<10°), a_2 = 2 ° (<10°) z = A sin g = 0.017 (in.); (<0.125 in.)

b_1 = 1 ° (<5°), b_2 = 1 ° (<5°) w = A sin q = 0.000 (in.); (<0.03125 in.)

γ = 1 °, θ = 0 °, A = 0.955 (in.) P_A = 0.478 (in.), P_B = 0.478 (in.), D_t = 0.375 (in.)

Calibration required? _____ yes x no

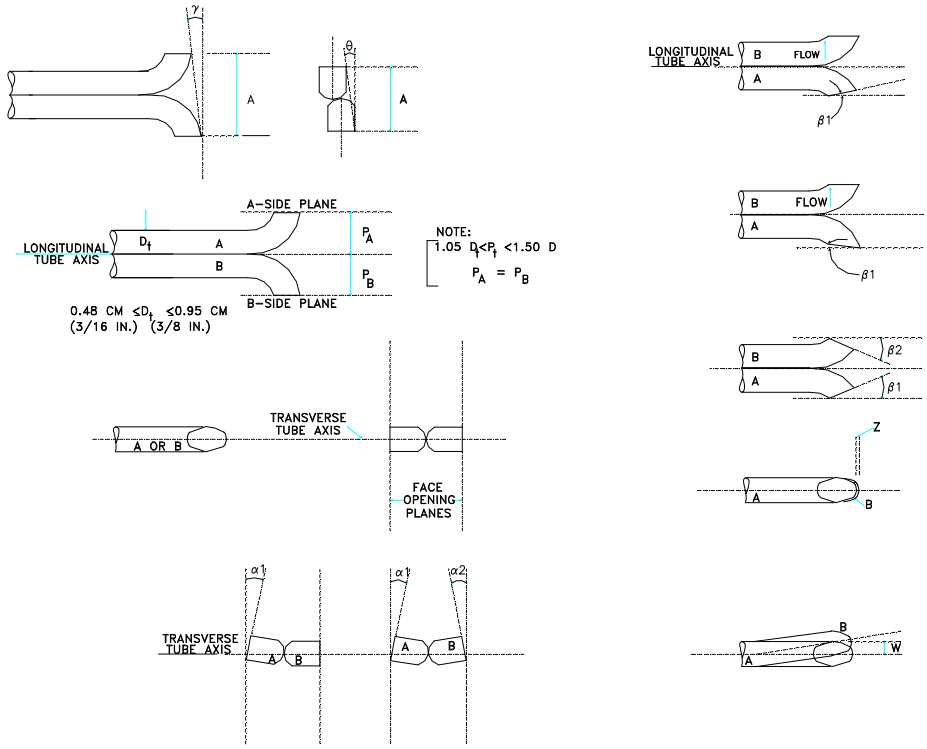
S TYPE PITOT TUBE INSPECTION WORKSHEET

Pitot Tube No: 294 Date: 6/14/2023 Inspectors Name: JLH

Type of Probe: (mark one)

M2	M5	M17
	X	

Probe Length: 6 ft.



Pitot tube assembly level? X yes _____ no

Pitot tube openings damaged? _____ yes (explain below) X no

a_1 = 0 ° (≤10°) a_2 = 0 ° (≤10°) z = A sin γ = **0.000** (in.); (≤0.125 in.)

b_1 = 0 ° (≤5°) b_2 = 0 ° (≤5°) w = A sin θ = **0.00000** (in.); (≤0.03125 in.)

γ = 0 ° θ = 0 ° A = 0.955 (in.) P_A = 0.487 (in.), P_B = 0.487 (in.), D_t = 0.375 (in.)

Calibration required? _____ yes **X** no

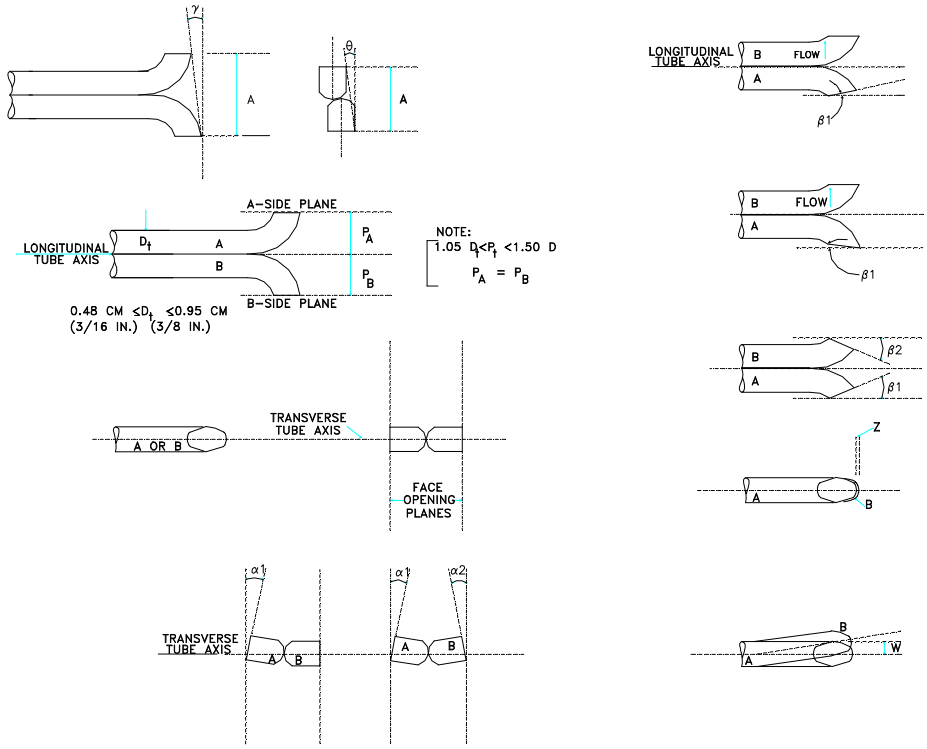
S TYPE PITOT TUBE INSPECTION WORKSHEET

Pitot Tube No: 294 Date: 7/14/2023 Inspectors Name: EC

Type of Probe: (mark one)

M2	M5	M17
	X	

Probe Length: 6 ft.



Pitot tube assembly level? X yes _____ no

Pitot tube openings damaged? _____ yes (explain below) X no

a_1 = 0 ° (≤10°) a_2 = 0 ° (≤10°) z = A sin γ = **0.000** (in.); (≤0.125 in.)

b_1 = 0 ° (≤5°) b_2 = 0 ° (≤5°) w = A sin θ = **0.00000** (in.); (≤0.03125 in.)

γ = 0 ° θ = 0 ° A = 0.950 (in.) P_A = 0.475 (in.), P_B = 0.475 (in.), D_t = 0.375 (in.)

Calibration required? _____ yes **X** no

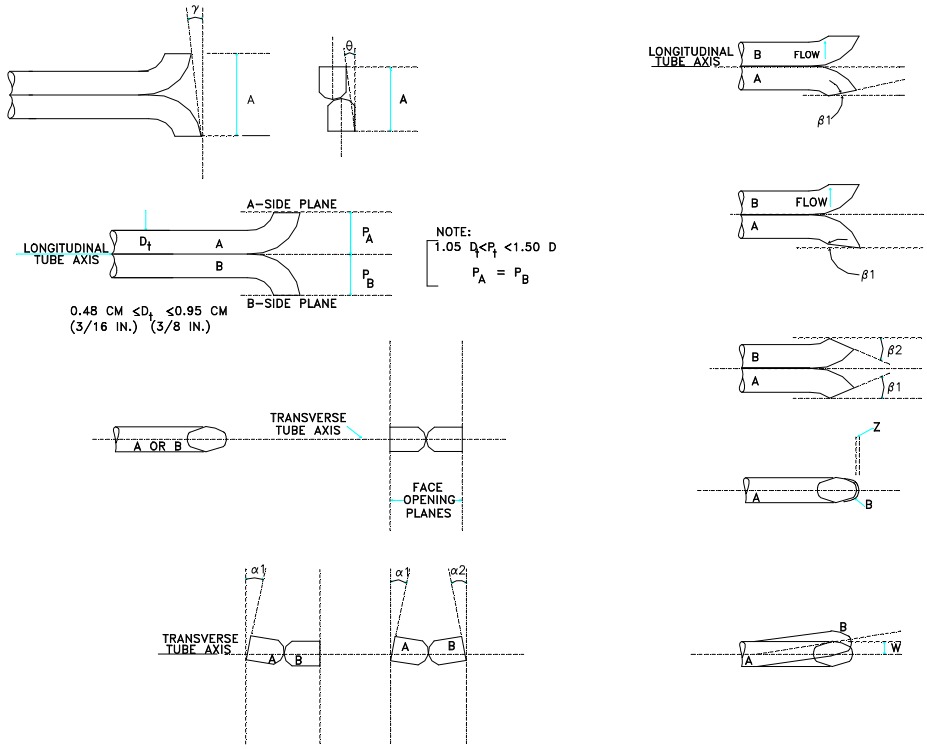
S TYPE PITOT TUBE INSPECTION WORKSHEET

Pitot Tube No: 292 Date: 6/14/2023 Inspectors Name: JLH

Type of Probe: (mark one)

M2	M5	M17
	X	

Probe Length: 6 ft.



Pitot tube assembly level? X yes _____ no

Pitot tube openings damaged? _____ yes (explain below) X no

a_1 = 0 ° (≤10°) a_2 = 0 ° (≤10°) z = A sin γ = **0.000** (in.); (≤0.125 in.)

b_1 = 0 ° (≤5°) b_2 = 0 ° (≤5°) w = A sin θ = **0.00000** (in.); (≤0.03125 in.)

γ = 0 ° θ = 0 ° A = 0.955 (in.) P_A = 0.487 (in.), P_B = 0.487 (in.), D_t = 0.375 (in.)

Calibration required? _____ yes **X** no

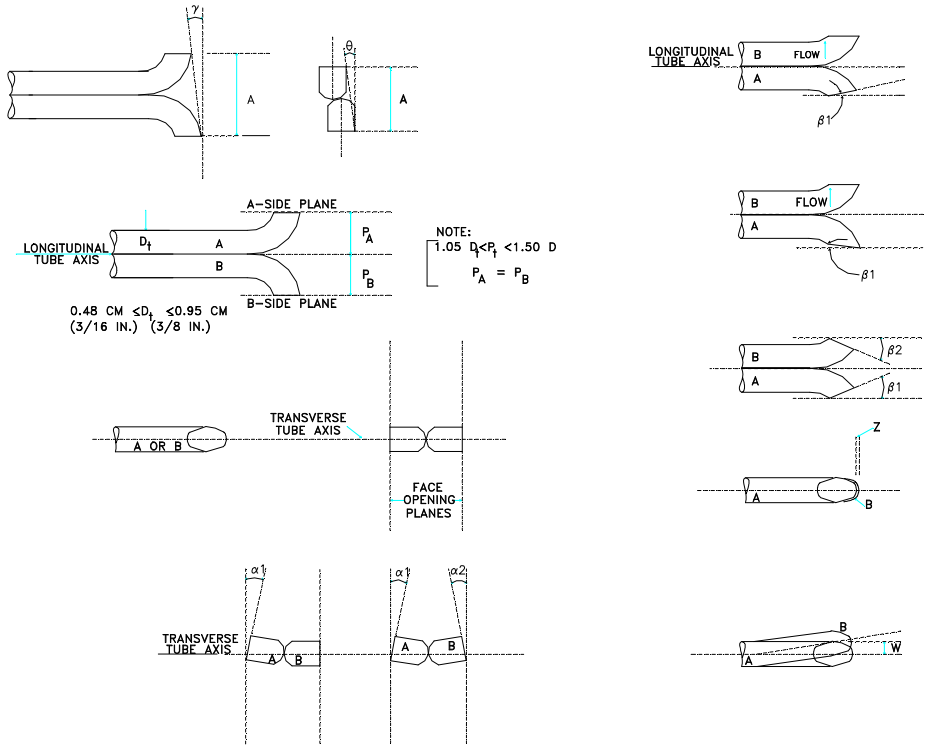
S TYPE PITOT TUBE INSPECTION WORKSHEET

Pitot Tube No: 292 Date: 7/14/2023 Inspectors Name: EC

Type of Probe: (mark one)

M2	M5	M17
	X	

Probe Length: 6 ft.



Pitot tube assembly level? X yes _____ no

Pitot tube openings damaged? _____ yes (explain below) X no

a_1 = 1 ° (≤10°) a_2 = 0 ° (≤10°) z = A sin γ = **0.017** (in.); (≤0.125 in.)

b_1 = 0 ° (≤5°) b_2 = 0 ° (≤5°) w = A sin θ = **0.00000** (in.); (≤0.03125 in.)

γ = 1 ° θ = 0 ° A = 0.955 (in.) P_A = 0.487 (in.), P_B = 0.487 (in.), D_t = 0.375 (in.)

Calibration required? _____ yes **X** no

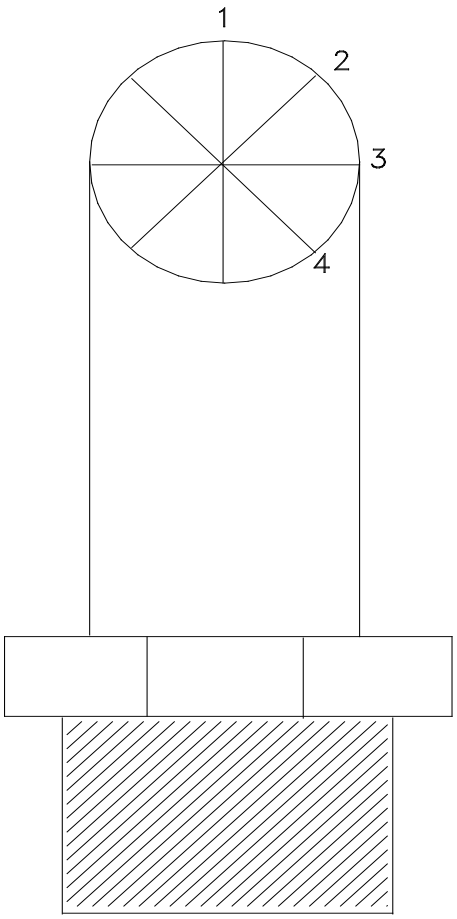
Nozzle Calibration

Date: 1/5/2020

Nozzle ID No.: 935

Analyst: RNS

Material/Type: Glass



0.196	1
0.196	2
0.196	3
0.195	4

Valid Data

Average
0.196

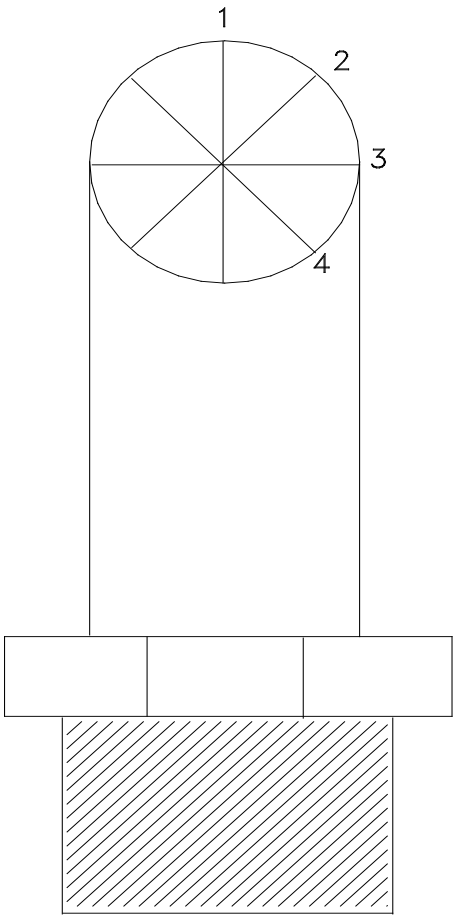
Nozzle Calibration

Date: 1/27/2020

Nozzle ID No.: 888

Analyst: DPP

Material/Type: Glass



0.200	1
0.199	2
0.199	3
0.198	4

Valid Data

Average
0.199

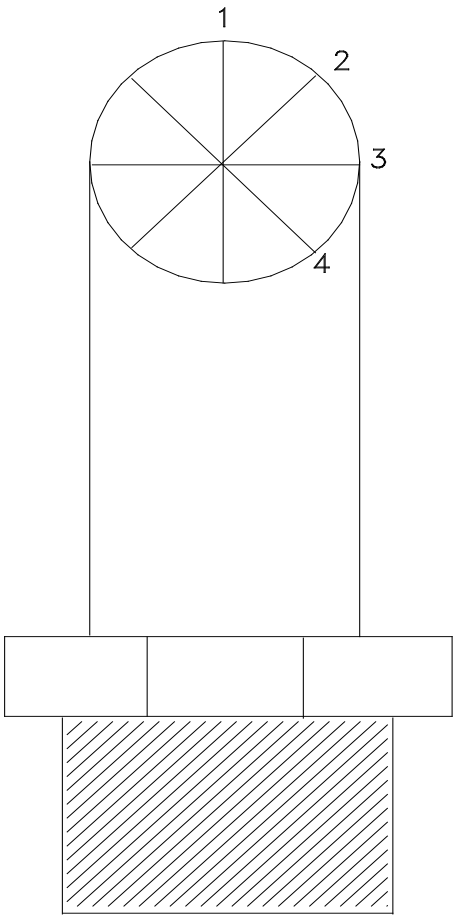
Nozzle Calibration

Date: 12/11/2020

Nozzle ID No.: 902

Analyst: EWB

Material/Type: Glass



0.185	1
0.185	2
0.185	3
0.185	4

Average
0.185

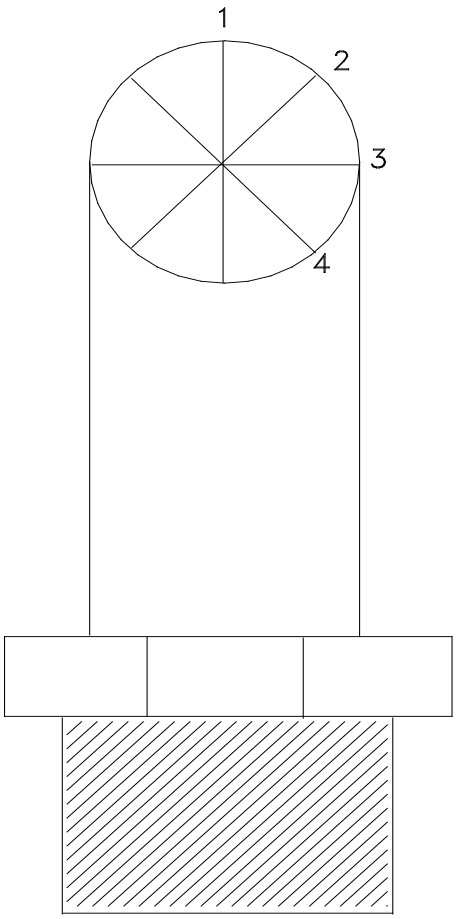
Nozzle Calibration

Date: 2/20/2020

Nozzle ID No.: 327

Analyst: JAP

Material/Type: glass



0.187	1
0.188	2
0.187	3
0.187	4

Valid Data

Average
0.187

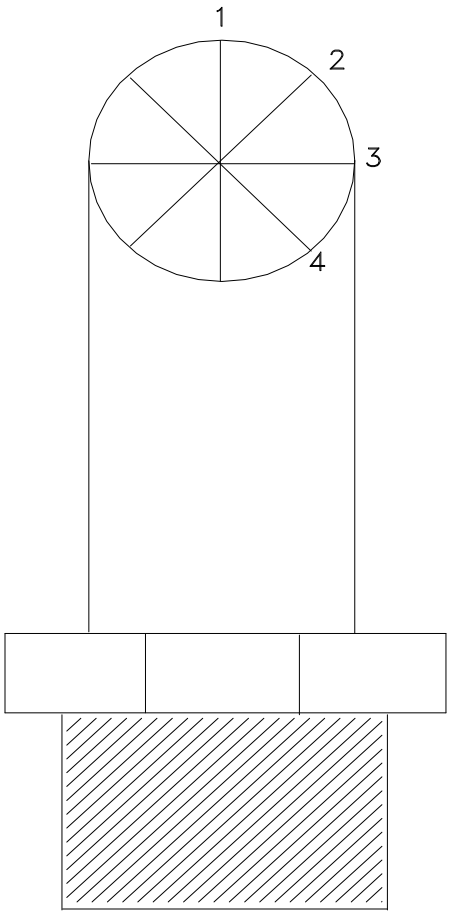
Nozzle Calibration

Date: 2/23/2015

Nozzle ID No.: 3T-5

Analyst: KJC

Material/Type: Teflon Coated



0.179	1
0.179	2
0.179	3
0.180	4

Average
0.179

Appendix H - Laboratory Sample Analysis

MOSTARDI PLATT

PROJECT: M232604
PCC STRUCTURALS
LPC – MILWAUKIE, OR

CLIENT # M050
REPORT # 23-351

SUBMITTED BY:
CHESTER LabNet
12242 S.W. GARDEN PLACE
TIGARD, OR 97223
(503)624-2183/FAX (503)624-2653
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CHESTER LabNet

12242 SW Garden Place ❖ Tigard, OR 97223-8246 ❖ USA
Telephone 503-624-2183 ❖ Fax 503-624-2653 ❖ www.chesterlab.net

Case Narrative

Date: August 24, 2023

General Information

Client:	Mostardi Platt
Client Number:	M050
Report Number:	23-351
Sample Description:	Impinger Trains
Sample Numbers:	23-S1834 – 23-S1949

Analysis

Analytes:	Al, Sb, As, Ba, Be, Cd, Cr, Co, Cu, Pb, Mn, Hg, Ni, P, Se, Ag, Tl, V, Zn, Hexavalent Chromium
Analytical Protocols:	EPA Method 29 (8/2/17 version) SW-846 Method 0061 (revision 0, December 1996)
Analytical Notes:	The petri dish for 23-S1904 contained a large amount of loose deposit. The filter and loose particulate were digested in separate vessels and then combined as one sample. That sample has more acid than the rest of the front half samples. The Co result for that samples was overscale using ICP-MS, but it matched the results as measured on the ICP-OES. The results for 23-S1904 may not be the most reliable because of the nature of the sample. A low level LCS on one mercury run wasn't spiked because of an analyst error. The samples that were analyzed with that LL-LCS were the front half fractions for the second half samples starting with 23-S1874. No problems were encountered during the Cr VI analysis. Results are not blank corrected.
QA/QC Review:	All the data have been reviewed by the analysts performing the analyses and the project manager. All of the quality control and sample-specific information in this package is complete and meets or exceeds t. minimum requirements for acceptability.
Comments:	If you have any questions or concerns regarding this analysis, please feel free to contact the project manager.

Disclaimer: This report shall not be reproduced, except in full, without the written approval of the laboratory. The results only represent that of the samples as received into the laboratory. All data are reported to the detection limit. Results <5x DL must be considered to have a higher degree of uncertainty associated with them. Due to the statistical process of detection limit determination, data in this report should not be used for statistical analysis as the data has been censored in such a manner as to bias statistical analyses high.

Paul Duda 8/24/23

Project Manager Date
Paul Duda

Client: M050 - Mostardi Platt
Report Number: 23-351

Lab ID: 23-S1834
Client ID: 9203 N Inlet #1 Filter & Probe
Site: PCC Structurals: LPC-Milwaukie
Source: 9203 North Inlet
Sample Date: 6/27/23

Analyte	Result	DL	Units
Aluminum, ICP	736.	7.50	µg/sample
Antimony, ICP-MS	< DL	1.00	µg/sample
Arsenic, ICP-MS	< DL	2.50	µg/sample
Barium, ICP	21.4	0.125	µg/sample
Beryllium, ICP-MS	< DL	0.050	µg/sample
Cadmium, ICP-MS	1.26	0.050	µg/sample
Chromium, ICP	892.	0.200	µg/sample
Cobalt, ICP-MS	208.	0.125	µg/sample
Copper, ICP-MS	320.	0.250	µg/sample
Lead, ICP-MS	2.47	0.125	µg/sample
Manganese, ICP	16.5	0.075	µg/sample
Mercury, CVAA	< DL	0.0219	µg/sample
Nickel, ICP	6,520	0.750	µg/sample
Phosphorus, ICP	110.	5.00	µg/sample
Selenium, ICP-MS	1.05	0.500	µg/sample
Silver, ICP	1.14	0.500	µg/sample
Thallium, ICP-MS	< DL	0.100	µg/sample
Vanadium, ICP-MS	2.53	0.075	µg/sample
Zinc, ICP	109.	0.750	µg/sample

Lab ID: 23-S1835
Client ID: 9203 N Inlet #1 HNO3/H2O2
Site: PCC Structurals: LPC-Milwaukie
Source: 9203 North Inlet
Sample Date: 6/27/23

Analyte	Result	DL	Units
Aluminum, ICP	55.8	4.71	µg/sample
Antimony, ICP-MS	< DL	0.628	µg/sample
Arsenic, ICP	< DL	1.10	µg/sample
Barium, ICP	4.45	0.078	µg/sample
Beryllium, ICP	< DL	0.031	µg/sample
Cadmium, ICP-MS	0.413	0.031	µg/sample
Chromium, ICP	12.6	0.126	µg/sample
Cobalt, ICP-MS	0.571	0.078	µg/sample
Copper, ICP	18.2	0.785	µg/sample
Lead, ICP	< DL	0.785	µg/sample
Manganese, ICP	13.3	0.047	µg/sample
Mercury, CVAA	0.336	0.0444	µg/sample
Nickel, ICP	18.0	0.471	µg/sample
Phosphorus, ICP	19.4	3.14	µg/sample
Selenium, ICP	11.7	2.36	µg/sample
Silver, ICP	0.812	0.314	µg/sample
Thallium, ICP	< DL	1.57	µg/sample
Vanadium, ICP	0.282	0.157	µg/sample
Zinc, ICP	44.0	0.471	µg/sample

Lab ID: 23-S1836
Client ID: 9203 N Inlet #1 Empty Imp
Site: PCC Structurals: LPC-Milwaukie
Source: 9203 North Inlet
Sample Date: 6/27/23

Analyte	Result	DL	Units
Mercury, CVAA	< DL	0.00805	µg/sample

Lab ID: 23-S1837
Client ID: 9203 N Inlet #1 KMnO4
Site: PCC Structurals: LPC-Milwaukie
Source: 9203 North Inlet
Sample Date: 6/27/23

Analyte	Result	DL	Units
Mercury, CVAA	0.196	0.0233	µg/sample

Lab ID: 23-S1838
Client ID: 9203 N Inlet #1 HCl Rinse
Site: PCC Structurals: LPC-Milwaukie
Source: 9203 North Inlet
Sample Date: 6/27/23

Analyte	Result	DL	Units
Mercury, CVAA	0.102	0.0192	µg/sample

Lab ID: 23-S1839
Client ID: 9203 N Inlet #2 Filter & Probe
Site: PCC Structurals: LPC-Milwaukie
Source: 9203 North Inlet
Sample Date: 6/30/23

Analyte	Result	DL	Units
Aluminum, ICP	764.	7.50	µg/sample
Antimony, ICP-MS	< DL	1.00	µg/sample
Arsenic, ICP-MS	< DL	2.50	µg/sample
Barium, ICP	6.66	0.125	µg/sample
Beryllium, ICP-MS	< DL	0.050	µg/sample
Cadmium, ICP-MS	0.265	0.050	µg/sample
Chromium, ICP	1,290	0.200	µg/sample
Cobalt, ICP-MS	315.	0.125	µg/sample
Copper, ICP-MS	396.	0.250	µg/sample
Lead, ICP-MS	1.15	0.125	µg/sample
Manganese, ICP	17.7	0.075	µg/sample
Mercury, CVAA	< DL	0.0219	µg/sample
Nickel, ICP	10,100	0.750	µg/sample
Phosphorus, ICP	109.	5.00	µg/sample
Selenium, ICP-MS	< DL	0.500	µg/sample
Silver, ICP	0.845	0.500	µg/sample
Thallium, ICP-MS	< DL	0.100	µg/sample
Vanadium, ICP-MS	2.07	0.075	µg/sample
Zinc, ICP	141.	0.750	µg/sample

Lab ID: 23-S1840
Client ID: 9203 N Inlet #2 HNO3/H2O2
Site: PCC Structurals: LPC-Milwaukie
Source: 9203 North Inlet
Sample Date: 6/30/23

Analyte	Result	DL	Units
Aluminum, ICP	42.2	4.14	µg/sample
Antimony, ICP-MS	< DL	0.552	µg/sample
Arsenic, ICP	< DL	0.966	µg/sample
Barium, ICP	4.29	0.069	µg/sample
Beryllium, ICP	< DL	0.028	µg/sample
Cadmium, ICP-MS	0.328	0.028	µg/sample
Chromium, ICP	4.44	0.110	µg/sample
Cobalt, ICP-MS	0.600	0.069	µg/sample
Copper, ICP	2.99	0.690	µg/sample
Lead, ICP	0.882	0.690	µg/sample
Manganese, ICP	30.5	0.041	µg/sample
Mercury, CVAA	0.392	0.0315	µg/sample
Nickel, ICP	14.6	0.414	µg/sample
Phosphorus, ICP	19.4	2.76	µg/sample
Selenium, ICP	< DL	2.07	µg/sample
Silver, ICP	0.391	0.276	µg/sample
Thallium, ICP	< DL	1.38	µg/sample
Vanadium, ICP	0.161	0.138	µg/sample
Zinc, ICP	26.2	0.414	µg/sample

Lab ID: 23-S1841
Client ID: 9203 N Inlet #2 Empty Imp
Site: PCC Structurals: LPC-Milwaukie
Source: 9203 North Inlet
Sample Date: 6/30/23

Analyte	Result	DL	Units
Mercury, CVAA	< DL	0.00814	µg/sample

Lab ID: 23-S1842
Client ID: 9204 N Inlet #2 KMnO4
Site: PCC Structurals: LPC-Milwaukie
Source: 9203 North Inlet
Sample Date: 6/30/23

Analyte	Result	DL	Units
Mercury, CVAA	0.104	0.0214	µg/sample

Lab ID: 23-S1843
Client ID: 9203 N Inlet #2 HCl Rinse
Site: PCC Structurals: LPC-Milwaukie
Source: 9203 North Inlet
Sample Date: 6/30/23

Analyte	Result	DL	Units
Mercury, CVAA	< DL	0.0194	µg/sample

Lab ID: 23-S1844
Client ID: 9203 C Inlet #1 Filter & Probe
Site: PCC Structurals: LPC-Milwaukie
Source: 9203 Center Inlet
Sample Date: 6/27/23

Analyte	Result	DL	Units
Aluminum, ICP	783.	7.50	µg/sample
Antimony, ICP-MS	< DL	1.00	µg/sample
Arsenic, ICP-MS	< DL	2.50	µg/sample
Barium, ICP	53.4	0.125	µg/sample
Beryllium, ICP-MS	< DL	0.050	µg/sample
Cadmium, ICP-MS	2.75	0.050	µg/sample
Chromium, ICP	670.	0.200	µg/sample
Cobalt, ICP-MS	136.	0.125	µg/sample
Copper, ICP-MS	324.	0.250	µg/sample
Lead, ICP-MS	1.94	0.125	µg/sample
Manganese, ICP	49.5	0.075	µg/sample
Mercury, CVAA	< DL	0.0219	µg/sample
Nickel, ICP	4,650	0.750	µg/sample
Phosphorus, ICP	147.	5.00	µg/sample
Selenium, ICP-MS	< DL	0.500	µg/sample
Silver, ICP	5.87	0.500	µg/sample
Thallium, ICP-MS	< DL	0.100	µg/sample
Vanadium, ICP-MS	2.35	0.075	µg/sample
Zinc, ICP	642.	0.750	µg/sample

Lab ID: 23-S1845
Client ID: 9203 C Inlet #1 HNO3/H2O2
Site: PCC Structurals: LPC-Milwaukie
Source: 9203 Center Inlet
Sample Date: 6/27/23

Analyte	Result	DL	Units
Aluminum, ICP	42.6	3.39	µg/sample
Antimony, ICP-MS	< DL	0.452	µg/sample
Arsenic, ICP	< DL	0.791	µg/sample
Barium, ICP	4.41	0.056	µg/sample
Beryllium, ICP	< DL	0.023	µg/sample
Cadmium, ICP-MS	0.130	0.023	µg/sample
Chromium, ICP	73.4	0.090	µg/sample
Cobalt, ICP-MS	1.94	0.056	µg/sample
Copper, ICP	85.1	0.565	µg/sample
Lead, ICP	1.65	0.565	µg/sample
Manganese, ICP	69.1	0.034	µg/sample
Mercury, CVAA	0.217	0.0298	µg/sample
Nickel, ICP	211.	0.339	µg/sample
Phosphorus, ICP	22.6	2.26	µg/sample
Selenium, ICP	< DL	1.70	µg/sample
Silver, ICP	0.406	0.226	µg/sample
Thallium, ICP	< DL	1.13	µg/sample
Vanadium, ICP	0.526	0.113	µg/sample
Zinc, ICP	22.2	0.339	µg/sample

Lab ID: 23-S1846
Client ID: 9203 C Inlet #1 Empty Imp
Site: PCC Structurals: LPC-Milwaukie
Source: 9203 Center Inlet
Sample Date: 6/27/23

Analyte	Result	DL	Units
Mercury, CVAA	< DL	0.00827	µg/sample

Lab ID: 23-S1847
Client ID: 9203 C Inlet #1 KMnO4
Site: PCC Structurals: LPC-Milwaukie
Source: 9203 Center Inlet
Sample Date: 6/27/23

Analyte	Result	DL	Units
Mercury, CVAA	0.163	0.0248	µg/sample

Lab ID: 23-S1848
Client ID: 9203 C Inlet #1 HCl Rinse
Site: PCC Structurals: LPC-Milwaukie
Source: 9203 Center Inlet
Sample Date: 6/27/23

Analyte	Result	DL	Units
Mercury, CVAA	< DL	0.0192	µg/sample

Lab ID: 23-S1849
Client ID: 9203 C Inlet #2 Filter & Probe
Site: PCC Structurals: LPC-Milwaukie
Source: 9203 Center Inlet
Sample Date: 6/30/23

Analyte	Result	DL	Units
Aluminum, ICP	899.	7.50	µg/sample
Antimony, ICP-MS	< DL	1.00	µg/sample
Arsenic, ICP-MS	< DL	2.50	µg/sample
Barium, ICP	7.10	0.125	µg/sample
Beryllium, ICP-MS	< DL	0.050	µg/sample
Cadmium, ICP-MS	0.994	0.050	µg/sample
Chromium, ICP	1,360	0.200	µg/sample
Cobalt, ICP-MS	44.6	0.125	µg/sample
Copper, ICP-MS	776.	0.250	µg/sample
Lead, ICP-MS	1.33	0.125	µg/sample
Manganese, ICP	80.3	0.075	µg/sample
Mercury, CVAA	< DL	0.0219	µg/sample
Nickel, ICP	7,850	0.750	µg/sample
Phosphorus, ICP	112.	5.00	µg/sample
Selenium, ICP-MS	< DL	0.500	µg/sample
Silver, ICP	1.23	0.500	µg/sample
Thallium, ICP-MS	< DL	0.100	µg/sample
Vanadium, ICP-MS	3.87	0.075	µg/sample
Zinc, ICP	155.	0.750	µg/sample

Lab ID: 23-S1850
Client ID: 9203 C Inlet #2 HNO3/H2O2
Site: PCC Structurals: LPC-Milwaukie
Source: 9203 Center Inlet
Sample Date: 6/30/23

Analyte	Result	DL	Units
Aluminum, ICP	37.5	4.32	µg/sample
Antimony, ICP-MS	< DL	0.576	µg/sample
Arsenic, ICP	< DL	1.01	µg/sample
Barium, ICP	5.55	0.072	µg/sample
Beryllium, ICP	< DL	0.029	µg/sample
Cadmium, ICP-MS	0.177	0.029	µg/sample
Chromium, ICP	2.33	0.115	µg/sample
Cobalt, ICP-MS	0.763	0.072	µg/sample
Copper, ICP	3.37	0.720	µg/sample
Lead, ICP	< DL	0.720	µg/sample
Manganese, ICP	49.9	0.043	µg/sample
Mercury, CVAA	0.570	0.0341	µg/sample
Nickel, ICP	11.1	0.432	µg/sample
Phosphorus, ICP	19.0	2.88	µg/sample
Selenium, ICP	< DL	2.16	µg/sample
Silver, ICP	1.35	0.288	µg/sample
Thallium, ICP	< DL	1.44	µg/sample
Vanadium, ICP	0.184	0.144	µg/sample
Zinc, ICP	34.4	0.432	µg/sample

Lab ID: 23-S1851
Client ID: 9203 C Inlet #2 Empty Imp
Site: PCC Structurals: LPC-Milwaukie
Source: 9203 Center Inlet
Sample Date: 6/30/23

Analyte	Result	DL	Units
Mercury, CVAA	< DL	0.00866	µg/sample

Lab ID: 23-S1852
Client ID: 9203 C Inlet #2 KMnO4
Site: PCC Structurals: LPC-Milwaukie
Source: 9203 Center Inlet
Sample Date: 6/30/23

Analyte	Result	DL	Units
Mercury, CVAA	0.236	0.0240	µg/sample

Lab ID: 23-S1853
Client ID: 9203 C Inlet #2 HCl Rinse
Site: PCC Structurals: LPC-Milwaukie
Source: 9203 Center Inlet
Sample Date: 6/30/23

Analyte	Result	DL	Units
Mercury, CVAA	< DL	0.0196	µg/sample

Client: M050 - Mostardi Platt
Report Number: 23-351

Lab ID: 23-S1854
Client ID: 9203 S Inlet #1 Filter & Probe
Site: PCC Structurals: LPC-Milwaukie
Source: 9203 South Inlet
Sample Date: 6/27/23

Analyte	Result	DL	Units
Aluminum, ICP	828.	7.50	µg/sample
Antimony, ICP-MS	< DL	1.00	µg/sample
Arsenic, ICP-MS	3.61	2.50	µg/sample
Barium, ICP	43.4	0.125	µg/sample
Beryllium, ICP-MS	< DL	0.050	µg/sample
Cadmium, ICP-MS	5.84	0.050	µg/sample
Chromium, ICP	2,640	0.200	µg/sample
Cobalt, ICP-MS	44.4	0.125	µg/sample
Copper, ICP-MS	292.	0.250	µg/sample
Lead, ICP-MS	1.18	0.125	µg/sample
Manganese, ICP	30.2	0.075	µg/sample
Mercury, CVAA	< DL	0.0219	µg/sample
Nickel, ICP	8,120	0.750	µg/sample
Phosphorus, ICP	108.	5.00	µg/sample
Selenium, ICP-MS	< DL	0.500	µg/sample
Silver, ICP	3.77	0.500	µg/sample
Thallium, ICP-MS	< DL	0.100	µg/sample
Vanadium, ICP-MS	5.46	0.075	µg/sample
Zinc, ICP	109.	0.750	µg/sample

Lab ID: 23-S1855
Client ID: 9203 S Inlet #1 HNO3/H2O2
Site: PCC Structurals: LPC-Milwaukie
Source: 9203 South Inlet
Sample Date: 6/27/23

Analyte	Result	DL	Units
Aluminum, ICP	31.6	3.81	µg/sample
Antimony, ICP-MS	< DL	0.508	µg/sample
Arsenic, ICP	< DL	0.889	µg/sample
Barium, ICP	3.74	0.064	µg/sample
Beryllium, ICP	< DL	0.025	µg/sample
Cadmium, ICP-MS	0.241	0.025	µg/sample
Chromium, ICP	1.25	0.102	µg/sample
Cobalt, ICP-MS	0.234	0.064	µg/sample
Copper, ICP	1.23	0.635	µg/sample
Lead, ICP	< DL	0.635	µg/sample
Manganese, ICP	22.3	0.038	µg/sample
Mercury, CVAA	0.305	0.0328	µg/sample
Nickel, ICP	1.41	0.381	µg/sample
Phosphorus, ICP	19.2	2.54	µg/sample
Selenium, ICP	< DL	1.90	µg/sample
Silver, ICP	0.269	0.254	µg/sample
Thallium, ICP	< DL	1.27	µg/sample
Vanadium, ICP	< DL	0.127	µg/sample
Zinc, ICP	79.1	0.381	µg/sample

Lab ID: 23-S1856
Client ID: 9203 S Inlet #1 Empty Imp
Site: PCC Structurals: LPC-Milwaukie
Source: 9203 South Inlet
Sample Date: 6/27/23

Analyte	Result	DL	Units
Mercury, CVAA	< DL	0.00814	µg/sample

Lab ID: 23-S1857
Client ID: 9203 S Inlet #1 KMnO4
Site: PCC Structurals: LPC-Milwaukie
Source: 9203 South Inlet
Sample Date: 6/27/23

Analyte	Result	DL	Units
Mercury, CVAA	0.106	0.0232	µg/sample

Lab ID: 23-S1858
Client ID: 9203 S Inlet #1 HCl Rinse
Site: PCC Structurals: LPC-Milwaukie
Source: 9203 South Inlet
Sample Date: 6/27/23

Analyte	Result	DL	Units
Mercury, CVAA	< DL	0.0191	µg/sample

Lab ID: 23-S1859
Client ID: 9203 S Inlet #2 Filter & Probe
Site: PCC Structurals: LPC-Milwaukie
Source: 9203 South Inlet
Sample Date: 6/30/23

Analyte	Result	DL	Units
Aluminum, ICP	1,160	7.50	µg/sample
Antimony, ICP-MS	< DL	1.00	µg/sample
Arsenic, ICP-MS	< DL	2.50	µg/sample
Barium, ICP	10.5	0.125	µg/sample
Beryllium, ICP-MS	< DL	0.050	µg/sample
Cadmium, ICP-MS	6.72	0.050	µg/sample
Chromium, ICP	4,890	0.200	µg/sample
Cobalt, ICP-MS	54.9	0.125	µg/sample
Copper, ICP-MS	680.	0.250	µg/sample
Lead, ICP-MS	1.14	0.125	µg/sample
Manganese, ICP	106.	0.075	µg/sample
Mercury, CVAA	< DL	0.0219	µg/sample
Nickel, ICP	20,400	0.750	µg/sample
Phosphorus, ICP	124.	5.00	µg/sample
Selenium, ICP-MS	< DL	0.500	µg/sample
Silver, ICP	2.69	0.500	µg/sample
Thallium, ICP-MS	< DL	0.100	µg/sample
Vanadium, ICP-MS	6.64	0.075	µg/sample
Zinc, ICP	275.	0.750	µg/sample

Lab ID: 23-S1860
Client ID: 9203 S Inlet #2 HNO3/H2O2
Site: PCC Structurals: LPC-Milwaukie
Source: 9203 South Inlet
Sample Date: 6/30/23

Analyte	Result	DL	Units
Aluminum, ICP	34.2	3.36	µg/sample
Antimony, ICP-MS	0.636	0.448	µg/sample
Arsenic, ICP	< DL	0.784	µg/sample
Barium, ICP	5.13	0.056	µg/sample
Beryllium, ICP	< DL	0.022	µg/sample
Cadmium, ICP-MS	0.093	0.022	µg/sample
Chromium, ICP	3.37	0.090	µg/sample
Cobalt, ICP-MS	0.881	0.056	µg/sample
Copper, ICP	1.99	0.560	µg/sample
Lead, ICP	0.968	0.560	µg/sample
Manganese, ICP	167.	0.034	µg/sample
Mercury, CVAA	0.318	0.0332	µg/sample
Nickel, ICP	15.8	0.336	µg/sample
Phosphorus, ICP	20.2	2.24	µg/sample
Selenium, ICP	< DL	1.68	µg/sample
Silver, ICP	< DL	0.224	µg/sample
Thallium, ICP	< DL	1.12	µg/sample
Vanadium, ICP	0.395	0.112	µg/sample
Zinc, ICP	26.7	0.336	µg/sample

Lab ID: 23-S1861
Client ID: 9203 S Inlet #2 Empty Imp
Site: PCC Structurals: LPC-Milwaukie
Source: 9203 South Inlet
Sample Date: 6/30/23

Analyte	Result	DL	Units
Mercury, CVAA	< DL	0.00792	µg/sample

Lab ID: 23-S1862
Client ID: 9203 S Inlet #2 KMnO4
Site: PCC Structurals: LPC-Milwaukie
Source: 9203 South Inlet
Sample Date: 6/30/23

Analyte	Result	DL	Units
Mercury, CVAA	0.167	0.0156	µg/sample

Lab ID: 23-S1863
Client ID: 9203 S Inlet #2 HCl Rinse
Site: PCC Structurals: LPC-Milwaukie
Source: 9203 South Inlet
Sample Date: 6/30/23

Analyte	Result	DL	Units
Mercury, CVAA	< DL	0.0196	µg/sample

Client: M050 - Mostardi Platt
Report Number: 23-351

Lab ID: 23-S1864
Client ID: 9203 N Outlet #1 Filter & Probe
Site: PCC Structurals: LPC-Milwaukie
Source: 9203 North Outlet
Sample Date: 6/27/23

Analyte	Result	DL	Units
Aluminum, ICP	506.	7.50	µg/sample
Antimony, ICP-MS	< DL	1.00	µg/sample
Arsenic, ICP-MS	< DL	2.50	µg/sample
Barium, ICP	5.52	0.125	µg/sample
Beryllium, ICP-MS	< DL	0.050	µg/sample
Cadmium, ICP-MS	0.270	0.050	µg/sample
Chromium, ICP	5.57	0.200	µg/sample
Cobalt, ICP-MS	0.689	0.125	µg/sample
Copper, ICP-MS	1.54	0.250	µg/sample
Lead, ICP-MS	0.328	0.125	µg/sample
Manganese, ICP	4.80	0.075	µg/sample
Mercury, CVAA	< DL	0.0219	µg/sample
Nickel, ICP	33.4	0.750	µg/sample
Phosphorus, ICP	86.4	5.00	µg/sample
Selenium, ICP-MS	< DL	0.500	µg/sample
Silver, ICP	< DL	0.500	µg/sample
Thallium, ICP-MS	< DL	0.100	µg/sample
Vanadium, ICP-MS	0.110	0.075	µg/sample
Zinc, ICP	10.6	0.750	µg/sample

Lab ID: 23-S1865
Client ID: 9203 N Outlet #1 HNO3/H2O2
Site: PCC Structurals: LPC-Milwaukie
Source: 9203 North Outlet
Sample Date: 6/27/23

Analyte	Result	DL	Units
Aluminum, ICP	61.1	3.48	µg/sample
Antimony, ICP-MS	< DL	0.464	µg/sample
Arsenic, ICP	< DL	0.812	µg/sample
Barium, ICP	4.45	0.058	µg/sample
Beryllium, ICP	< DL	0.023	µg/sample
Cadmium, ICP-MS	0.126	0.023	µg/sample
Chromium, ICP	0.945	0.093	µg/sample
Cobalt, ICP-MS	0.201	0.058	µg/sample
Copper, ICP	2.15	0.580	µg/sample
Lead, ICP	1.53	0.580	µg/sample
Manganese, ICP	47.2	0.035	µg/sample
Mercury, CVAA	0.712	0.0258	µg/sample
Nickel, ICP	1.01	0.348	µg/sample
Phosphorus, ICP	18.6	2.32	µg/sample
Selenium, ICP	< DL	1.74	µg/sample
Silver, ICP	< DL	0.232	µg/sample
Thallium, ICP	< DL	1.16	µg/sample
Vanadium, ICP	< DL	0.116	µg/sample
Zinc, ICP	12.7	0.348	µg/sample

Lab ID: 23-S1866
Client ID: 9203 N Outlet #1 Empty Imp
Site: PCC Structurals: LPC-Milwaukie
Source: 9203 North Outlet
Sample Date: 6/27/23

Analyte	Result	DL	Units
Mercury, CVAA	< DL	0.00790	µg/sample

Lab ID: 23-S1867
Client ID: 9203 N Outlet #1 KMnO4
Site: PCC Structurals: LPC-Milwaukie
Source: 9203 North Outlet
Sample Date: 6/27/23

Analyte	Result	DL	Units
Mercury, CVAA	0.816	0.0237	µg/sample

Lab ID: 23-S1868
Client ID: 9203 N Outlet #1 HCl Rinse
Site: PCC Structurals: LPC-Milwaukie
Source: 9203 North Outlet
Sample Date: 6/27/23

Analyte	Result	DL	Units
Mercury, CVAA	0.0801	0.0193	µg/sample

Lab ID: 23-S1869
Client ID: 9203 N Outlet #2 Filter & Probe
Site: PCC Structurals: LPC-Milwaukie
Source: 9203 North Outlet
Sample Date: 6/30/23

Analyte	Result	DL	Units
Aluminum, ICP	508.	7.50	µg/sample
Antimony, ICP-MS	< DL	1.00	µg/sample
Arsenic, ICP-MS	< DL	2.50	µg/sample
Barium, ICP	2.92	0.125	µg/sample
Beryllium, ICP-MS	< DL	0.050	µg/sample
Cadmium, ICP-MS	0.210	0.050	µg/sample
Chromium, ICP	13.8	0.200	µg/sample
Cobalt, ICP-MS	6.87	0.125	µg/sample
Copper, ICP-MS	1.50	0.250	µg/sample
Lead, ICP-MS	0.318	0.125	µg/sample
Manganese, ICP	2.74	0.075	µg/sample
Mercury, CVAA	< DL	0.0219	µg/sample
Nickel, ICP	43.8	0.750	µg/sample
Phosphorus, ICP	80.0	5.00	µg/sample
Selenium, ICP-MS	< DL	0.500	µg/sample
Silver, ICP	< DL	0.500	µg/sample
Thallium, ICP-MS	< DL	0.100	µg/sample
Vanadium, ICP-MS	0.090	0.075	µg/sample
Zinc, ICP	11.4	0.750	µg/sample

Lab ID: 23-S1870
Client ID: 9203 N Outlet #2 HNO3/H2O2
Site: PCC Structurals: LPC-Milwaukie
Source: 9203 North Outlet
Sample Date: 6/30/23

Analyte	Result	DL	Units
Aluminum, ICP	24.2	3.54	µg/sample
Antimony, ICP-MS	< DL	0.472	µg/sample
Arsenic, ICP	< DL	0.826	µg/sample
Barium, ICP	3.49	0.059	µg/sample
Beryllium, ICP	< DL	0.024	µg/sample
Cadmium, ICP-MS	0.028	0.024	µg/sample
Chromium, ICP	1.62	0.094	µg/sample
Cobalt, ICP-MS	0.696	0.059	µg/sample
Copper, ICP	< DL	0.590	µg/sample
Lead, ICP	< DL	0.590	µg/sample
Manganese, ICP	19.2	0.035	µg/sample
Mercury, CVAA	0.535	0.0233	µg/sample
Nickel, ICP	4.09	0.354	µg/sample
Phosphorus, ICP	21.4	2.36	µg/sample
Selenium, ICP	< DL	1.77	µg/sample
Silver, ICP	< DL	0.236	µg/sample
Thallium, ICP	< DL	1.18	µg/sample
Vanadium, ICP	< DL	0.118	µg/sample
Zinc, ICP	5.06	0.354	µg/sample

Lab ID: 23-S1871
Client ID: 9203 N Outlet #2 Empty Imp
Site: PCC Structurals: LPC-Milwaukie
Source: 9203 North Outlet
Sample Date: 6/30/23

Analyte	Result	DL	Units
Mercury, CVAA	0.0222	0.00971	µg/sample

Lab ID: 23-S1872
Client ID: 9203 N Outlet #2 KMnO4
Site: PCC Structurals: LPC-Milwaukie
Source: 9203 North Outlet
Sample Date: 6/30/23

Analyte	Result	DL	Units
Mercury, CVAA	0.275	0.0256	µg/sample

Lab ID: 23-S1873
Client ID: 9203 N Outlet #2 HCl Rinse
Site: PCC Structurals: LPC-Milwaukie
Source: 9203 North Outlet
Sample Date: 6/30/23

Analyte	Result	DL	Units
Mercury, CVAA	< DL	0.0200	µg/sample

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Lab ID: 23-S1874
Client ID: 9203 S Outlet #1 Filter & Probe
Site: PCC Structurals: LPC-Milwaukie
Source: 9203 South Outlet
Sample Date: 6/27/23

Analyte	Result	DL	Units
Aluminum, ICP	535.	7.50	µg/sample
Antimony, ICP-MS	< DL	1.00	µg/sample
Arsenic, ICP-MS	< DL	2.50	µg/sample
Barium, ICP	12.2	0.125	µg/sample
Beryllium, ICP-MS	< DL	0.050	µg/sample
Cadmium, ICP-MS	0.474	0.050	µg/sample
Chromium, ICP	3.02	0.200	µg/sample
Cobalt, ICP-MS	0.322	0.125	µg/sample
Copper, ICP-MS	1.58	0.250	µg/sample
Lead, ICP-MS	0.494	0.125	µg/sample
Manganese, ICP	2.64	0.075	µg/sample
Mercury, CVAA	< DL	0.0219	µg/sample
Nickel, ICP	6.35	0.750	µg/sample
Phosphorus, ICP	84.0	5.00	µg/sample
Selenium, ICP-MS	< DL	0.500	µg/sample
Silver, ICP	< DL	0.500	µg/sample
Thallium, ICP-MS	< DL	0.100	µg/sample
Vanadium, ICP-MS	0.142	0.075	µg/sample
Zinc, ICP	15.6	0.750	µg/sample

Lab ID: 23-S1875
Client ID: 9203 S Outlet #1 HNO3/H2O2
Site: PCC Structurals: LPC-Milwaukie
Source: 9203 South Outlet
Sample Date: 6/27/23

Analyte	Result	DL	Units
Aluminum, ICP	17.4	4.29	µg/sample
Antimony, ICP-MS	< DL	0.572	µg/sample
Arsenic, ICP	< DL	1.00	µg/sample
Barium, ICP	4.13	0.072	µg/sample
Beryllium, ICP	< DL	0.029	µg/sample
Cadmium, ICP-MS	0.089	0.029	µg/sample
Chromium, ICP	1.23	0.114	µg/sample
Cobalt, ICP-MS	0.172	0.072	µg/sample
Copper, ICP	13.6	0.715	µg/sample
Lead, ICP	< DL	0.715	µg/sample
Manganese, ICP	1.62	0.043	µg/sample
Mercury, CVAA	0.283	0.0233	µg/sample
Nickel, ICP	0.593	0.429	µg/sample
Phosphorus, ICP	17.6	2.86	µg/sample
Selenium, ICP	3.51	2.14	µg/sample
Silver, ICP	< DL	0.286	µg/sample
Thallium, ICP	< DL	1.43	µg/sample
Vanadium, ICP	< DL	0.143	µg/sample
Zinc, ICP	16.7	0.429	µg/sample

Lab ID: 23-S1876
Client ID: 9203 S Outlet #1 Empty Imp
Site: PCC Structurals: LPC-Milwaukie
Source: 9203 South Outlet
Sample Date: 6/27/23

Analyte	Result	DL	Units
Mercury, CVAA	< DL	0.00828	µg/sample

Lab ID: 23-S1877
Client ID: 9203 S Outlet #1 KMnO4
Site: PCC Structurals: LPC-Milwaukie
Source: 9203 South Outlet
Sample Date: 6/27/23

Analyte	Result	DL	Units
Mercury, CVAA	0.145	0.0275	µg/sample

Lab ID: 23-S1878
Client ID: 9203 S Outlet #1 HCl Rinse
Site: PCC Structurals: LPC-Milwaukie
Source: 9203 South Outlet
Sample Date: 6/27/23

Analyte	Result	DL	Units
Mercury, CVAA	< DL	0.0192	µg/sample

Lab ID: 23-S1879
Client ID: 9203 S Outlet #2 Filter & Probe
Site: PCC Structurals: LPC-Milwaukie
Source: 9203 South Outlet
Sample Date: 6/30/23

Analyte	Result	DL	Units
Aluminum, ICP	521.	7.50	µg/sample
Antimony, ICP-MS	< DL	1.00	µg/sample
Arsenic, ICP-MS	< DL	2.50	µg/sample
Barium, ICP	4.11	0.125	µg/sample
Beryllium, ICP-MS	< DL	0.050	µg/sample
Cadmium, ICP-MS	0.076	0.050	µg/sample
Chromium, ICP	32.3	0.200	µg/sample
Cobalt, ICP-MS	13.4	0.125	µg/sample
Copper, ICP-MS	1.66	0.250	µg/sample
Lead, ICP-MS	0.328	0.125	µg/sample
Manganese, ICP	2.59	0.075	µg/sample
Mercury, CVAA	< DL	0.0219	µg/sample
Nickel, ICP	82.1	0.750	µg/sample
Phosphorus, ICP	88.8	5.00	µg/sample
Selenium, ICP-MS	< DL	0.500	µg/sample
Silver, ICP	< DL	0.500	µg/sample
Thallium, ICP-MS	< DL	0.100	µg/sample
Vanadium, ICP-MS	0.121	0.075	µg/sample
Zinc, ICP	14.8	0.750	µg/sample

Lab ID: 23-S1880
Client ID: 9203 S Outlet #2 HNO3/H2O2
Site: PCC Structurals: LPC-Milwaukie
Source: 9203 South Outlet
Sample Date: 6/30/23

Analyte	Result	DL	Units
Aluminum, ICP	27.7	3.78	µg/sample
Antimony, ICP-MS	0.540	0.504	µg/sample
Arsenic, ICP	< DL	0.882	µg/sample
Barium, ICP	4.03	0.063	µg/sample
Beryllium, ICP	< DL	0.025	µg/sample
Cadmium, ICP-MS	0.077	0.025	µg/sample
Chromium, ICP	1.32	0.101	µg/sample
Cobalt, ICP-MS	0.315	0.063	µg/sample
Copper, ICP	0.841	0.630	µg/sample
Lead, ICP	< DL	0.630	µg/sample
Manganese, ICP	90.6	0.038	µg/sample
Mercury, CVAA	0.489	0.0257	µg/sample
Nickel, ICP	2.31	0.378	µg/sample
Phosphorus, ICP	20.6	2.52	µg/sample
Selenium, ICP	2.60	1.89	µg/sample
Silver, ICP	< DL	0.252	µg/sample
Thallium, ICP	< DL	1.26	µg/sample
Vanadium, ICP	< DL	0.126	µg/sample
Zinc, ICP	14.7	0.378	µg/sample

Lab ID: 23-S1881
Client ID: 9203 S Outlet #2 Empty Imp
Site: PCC Structurals: LPC-Milwaukie
Source: 9203 South Outlet
Sample Date: 6/30/23

Analyte	Result	DL	Units
Mercury, CVAA	< DL	0.0107	µg/sample

Lab ID: 23-S1882
Client ID: 9203 S Outlet #2 KMnO4
Site: PCC Structurals: LPC-Milwaukie
Source: 9203 South Outlet
Sample Date: 6/30/23

Analyte	Result	DL	Units
Mercury, CVAA	0.110	0.0154	µg/sample

Lab ID: 23-S1883
Client ID: 9203 S Outlet #2 HCl Rinse
Site: PCC Structurals: LPC-Milwaukie
Source: 9203 South Outlet
Sample Date: 6/30/23

Analyte	Result	DL	Units
Mercury, CVAA	< DL	0.0161	µg/sample

Client: M050 - Mostardi Platt
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Lab ID: 23-S1884
Client ID: 9256 Inlet #1 Filter & Probe
Site: PCC Structurals: LPC-Milwaukie
Source: 9256 Inlet
Sample Date: 6/28/23

Analyte	Result	DL	Units
Aluminum, ICP	3,090	7.50	µg/sample
Antimony, ICP-MS	1.07	1.00	µg/sample
Arsenic, ICP-MS	< DL	2.50	µg/sample
Barium, ICP	7.90	0.125	µg/sample
Beryllium, ICP-MS	< DL	0.050	µg/sample
Cadmium, ICP-MS	0.111	0.050	µg/sample
Chromium, ICP	88.7	0.200	µg/sample
Cobalt, ICP-MS	2.60	0.125	µg/sample
Copper, ICP-MS	329.	0.250	µg/sample
Lead, ICP-MS	8.79	0.125	µg/sample
Manganese, ICP	748.	0.075	µg/sample
Mercury, CVAA	< DL	0.0219	µg/sample
Nickel, ICP	121.	0.750	µg/sample
Phosphorus, ICP	93.5	5.00	µg/sample
Selenium, ICP-MS	0.634	0.500	µg/sample
Silver, ICP	0.733	0.500	µg/sample
Thallium, ICP-MS	0.102	0.100	µg/sample
Vanadium, ICP-MS	1.18	0.075	µg/sample
Zinc, ICP	109.	0.750	µg/sample

Lab ID: 23-S1885
Client ID: 9256 Inlet #1 HNO3/H2O2
Site: PCC Structurals: LPC-Milwaukie
Source: 9256 Inlet
Sample Date: 6/28/23

Analyte	Result	DL	Units
Aluminum, ICP	61.1	3.72	µg/sample
Antimony, ICP-MS	< DL	0.496	µg/sample
Arsenic, ICP	< DL	0.868	µg/sample
Barium, ICP	10.7	0.062	µg/sample
Beryllium, ICP	< DL	0.025	µg/sample
Cadmium, ICP-MS	0.124	0.025	µg/sample
Chromium, ICP	10.3	0.099	µg/sample
Cobalt, ICP-MS	0.956	0.062	µg/sample
Copper, ICP	11.4	0.620	µg/sample
Lead, ICP	< DL	0.620	µg/sample
Manganese, ICP	43.3	0.037	µg/sample
Mercury, CVAA	0.543	0.0359	µg/sample
Nickel, ICP	60.7	0.372	µg/sample
Phosphorus, ICP	27.7	2.48	µg/sample
Selenium, ICP	< DL	1.86	µg/sample
Silver, ICP	0.345	0.248	µg/sample
Thallium, ICP	< DL	1.24	µg/sample
Vanadium, ICP	< DL	0.124	µg/sample
Zinc, ICP	11.4	0.372	µg/sample

Client: M050 - Mostardi Platt
Report Number: 23-351

Lab ID: 23-S1886
Client ID: 9256 Inlet #1 Empty Imp
Site: PCC Structurals: LPC-Milwaukie
Source: 9256 Inlet
Sample Date: 6/28/23

Analyte	Result	DL	Units
Mercury, CVAA	< DL	0.00818	µg/sample

Lab ID: 23-S1887
Client ID: 9256 Inlet #1 KMnO4
Site: PCC Structurals: LPC-Milwaukie
Source: 9256 Inlet
Sample Date: 6/28/23

Analyte	Result	DL	Units
Mercury, CVAA	0.778	0.0234	µg/sample

Lab ID: 23-S1888
Client ID: 9256 Inlet #1 HCl Rinse
Site: PCC Structurals: LPC-Milwaukie
Source: 9256 Inlet
Sample Date: 6/28/23

Analyte	Result	DL	Units
Mercury, CVAA	0.0532	0.0196	µg/sample

Lab ID: 23-S1889
Client ID: 9256 Inlet #2 Filter & Probe
Site: PCC Structurals: LPC-Milwaukie
Source: 9256 Inlet
Sample Date: 6/29/23

Analyte	Result	DL	Units
Aluminum, ICP	3,010	7.50	µg/sample
Antimony, ICP-MS	< DL	1.00	µg/sample
Arsenic, ICP-MS	< DL	2.50	µg/sample
Barium, ICP	21.0	0.125	µg/sample
Beryllium, ICP-MS	< DL	0.050	µg/sample
Cadmium, ICP-MS	0.484	0.050	µg/sample
Chromium, ICP	103.	0.200	µg/sample
Cobalt, ICP-MS	4.02	0.125	µg/sample
Copper, ICP-MS	417.	0.250	µg/sample
Lead, ICP-MS	4.92	0.125	µg/sample
Manganese, ICP	411.	0.075	µg/sample
Mercury, CVAA	< DL	0.0219	µg/sample
Nickel, ICP	211.	0.750	µg/sample
Phosphorus, ICP	102.	5.00	µg/sample
Selenium, ICP-MS	< DL	0.500	µg/sample
Silver, ICP	1.14	0.500	µg/sample
Thallium, ICP-MS	< DL	0.100	µg/sample
Vanadium, ICP-MS	1.71	0.075	µg/sample
Zinc, ICP	96.8	0.750	µg/sample

Client: M050 - Mostardi Platt
Report Number: 23-351

Lab ID: 23-S1890
Client ID: 9256 Inlet #2 HNO3/H2O2
Site: PCC Structurals: LPC-Milwaukie
Source: 9256 Inlet
Sample Date: 6/29/23

Analyte	Result	DL	Units
Aluminum, ICP	57.6	3.33	µg/sample
Antimony, ICP-MS	0.543	0.444	µg/sample
Arsenic, ICP	< DL	0.777	µg/sample
Barium, ICP	9.83	0.056	µg/sample
Beryllium, ICP	< DL	0.022	µg/sample
Cadmium, ICP-MS	0.105	0.022	µg/sample
Chromium, ICP	3.70	0.089	µg/sample
Cobalt, ICP-MS	0.463	0.056	µg/sample
Copper, ICP	1.92	0.555	µg/sample
Lead, ICP	< DL	0.555	µg/sample
Manganese, ICP	24.0	0.033	µg/sample
Mercury, CVAA	0.334	0.0354	µg/sample
Nickel, ICP	21.1	0.333	µg/sample
Phosphorus, ICP	23.2	2.22	µg/sample
Selenium, ICP	< DL	1.66	µg/sample
Silver, ICP	< DL	0.222	µg/sample
Thallium, ICP	< DL	1.11	µg/sample
Vanadium, ICP	< DL	0.111	µg/sample
Zinc, ICP	31.3	0.333	µg/sample

Lab ID: 23-S1891
Client ID: 9256 Inlet #2 Empty Imp
Site: PCC Structurals: LPC-Milwaukie
Source: 9256 Inlet
Sample Date: 6/29/23

Analyte	Result	DL	Units
Mercury, CVAA	< DL	0.00809	µg/sample

Lab ID: 23-S1892
Client ID: 9256 Inlet #2 KMnO4
Site: PCC Structurals: LPC-Milwaukie
Source: 9256 Inlet
Sample Date: 6/29/23

Analyte	Result	DL	Units
Mercury, CVAA	0.164	0.0229	µg/sample

Lab ID: 23-S1893
Client ID: 9256 Inlet #2 HCl Rinse
Site: PCC Structurals: LPC-Milwaukie
Source: 9256 Inlet
Sample Date: 6/29/23

Analyte	Result	DL	Units
Mercury, CVAA	< DL	0.0198	µg/sample

Client: M050 - Mostardi Platt
Report Number: 23-351

Lab ID: 23-S1894
Client ID: 9256 Outlet #1 Filter & Probe
Site: PCC Structurals: LPC-Milwaukie
Source: 9256 Outlet
Sample Date: 6/28/23

Analyte	Result	DL	Units
Aluminum, ICP	516.	7.50	µg/sample
Antimony, ICP-MS	< DL	1.00	µg/sample
Arsenic, ICP-MS	< DL	2.50	µg/sample
Barium, ICP	10.3	0.125	µg/sample
Beryllium, ICP-MS	< DL	0.050	µg/sample
Cadmium, ICP-MS	0.620	0.050	µg/sample
Chromium, ICP	1.92	0.200	µg/sample
Cobalt, ICP-MS	0.566	0.125	µg/sample
Copper, ICP-MS	0.994	0.250	µg/sample
Lead, ICP-MS	0.328	0.125	µg/sample
Manganese, ICP	1.57	0.075	µg/sample
Mercury, CVAA	< DL	0.0219	µg/sample
Nickel, ICP	12.1	0.750	µg/sample
Phosphorus, ICP	83.6	5.00	µg/sample
Selenium, ICP-MS	< DL	0.500	µg/sample
Silver, ICP	< DL	0.500	µg/sample
Thallium, ICP-MS	< DL	0.100	µg/sample
Vanadium, ICP-MS	0.122	0.075	µg/sample
Zinc, ICP	13.5	0.750	µg/sample

Lab ID: 23-S1895
Client ID: 9256 Outlet #1 HNO3/H2O2
Site: PCC Structurals: LPC-Milwaukie
Source: 9256 Outlet
Sample Date: 6/28/23

Analyte	Result	DL	Units
Aluminum, ICP	22.3	3.42	µg/sample
Antimony, ICP-MS	< DL	0.456	µg/sample
Arsenic, ICP	< DL	0.798	µg/sample
Barium, ICP	5.53	0.057	µg/sample
Beryllium, ICP	< DL	0.023	µg/sample
Cadmium, ICP-MS	0.105	0.023	µg/sample
Chromium, ICP	2.30	0.091	µg/sample
Cobalt, ICP-MS	0.145	0.057	µg/sample
Copper, ICP	4.28	0.570	µg/sample
Lead, ICP	< DL	0.570	µg/sample
Manganese, ICP	7.49	0.034	µg/sample
Mercury, CVAA	0.488	0.0284	µg/sample
Nickel, ICP	1.42	0.342	µg/sample
Phosphorus, ICP	28.3	2.28	µg/sample
Selenium, ICP	2.55	1.71	µg/sample
Silver, ICP	< DL	0.228	µg/sample
Thallium, ICP	< DL	1.14	µg/sample
Vanadium, ICP	< DL	0.114	µg/sample
Zinc, ICP	21.2	0.342	µg/sample

Lab ID: 23-S1896
Client ID: 9256 Outlet #1 Empty Imp
Site: PCC Structurals: LPC-Milwaukie
Source: 9256 Outlet
Sample Date: 6/28/23

Analyte	Result	DL	Units
Mercury, CVAA	< DL	0.00822	µg/sample

Lab ID: 23-S1897
Client ID: 9256 Outlet #1 KMnO4
Site: PCC Structurals: LPC-Milwaukie
Source: 9256 Outlet
Sample Date: 6/28/23

Analyte	Result	DL	Units
Mercury, CVAA	0.160	0.0267	µg/sample

Lab ID: 23-S1898
Client ID: 9256 Outlet #1 HCl Rinse
Site: PCC Structurals: LPC-Milwaukie
Source: 9256 Outlet
Sample Date: 6/28/23

Analyte	Result	DL	Units
Mercury, CVAA	< DL	0.0196	µg/sample

Lab ID: 23-S1899
Client ID: 9256 Outlet #2 Filter & Probe
Site: PCC Structurals: LPC-Milwaukie
Source: 9256 Outlet
Sample Date: 6/29/23

Analyte	Result	DL	Units
Aluminum, ICP	528.	7.50	µg/sample
Antimony, ICP-MS	< DL	1.00	µg/sample
Arsenic, ICP-MS	< DL	2.50	µg/sample
Barium, ICP	4.61	0.125	µg/sample
Beryllium, ICP-MS	< DL	0.050	µg/sample
Cadmium, ICP-MS	1.01	0.050	µg/sample
Chromium, ICP	26.9	0.200	µg/sample
Cobalt, ICP-MS	7.77	0.125	µg/sample
Copper, ICP-MS	1.95	0.250	µg/sample
Lead, ICP-MS	0.553	0.125	µg/sample
Manganese, ICP	2.29	0.075	µg/sample
Mercury, CVAA	< DL	0.0219	µg/sample
Nickel, ICP	99.5	0.750	µg/sample
Phosphorus, ICP	86.3	5.00	µg/sample
Selenium, ICP-MS	< DL	0.500	µg/sample
Silver, ICP	< DL	1.00	µg/sample
Thallium, ICP-MS	< DL	0.100	µg/sample
Vanadium, ICP-MS	0.140	0.075	µg/sample
Zinc, ICP	8.92	0.750	µg/sample

Lab ID: 23-S1900
Client ID: 9256 Outlet #2 HNO3/H2O2
Site: PCC Structurals: LPC-Milwaukie
Source: 9256 Outlet
Sample Date: 6/29/23

Analyte	Result	DL	Units
Aluminum, ICP	31.8	3.99	µg/sample
Antimony, ICP-MS	< DL	0.532	µg/sample
Arsenic, ICP	< DL	0.931	µg/sample
Barium, ICP	4.43	0.066	µg/sample
Beryllium, ICP	< DL	0.027	µg/sample
Cadmium, ICP-MS	0.035	0.027	µg/sample
Chromium, ICP	5.41	0.106	µg/sample
Cobalt, ICP-MS	0.374	0.066	µg/sample
Copper, ICP	4.29	0.665	µg/sample
Lead, ICP	< DL	0.665	µg/sample
Manganese, ICP	24.7	0.040	µg/sample
Mercury, CVAA	0.424	0.0280	µg/sample
Nickel, ICP	31.0	0.399	µg/sample
Phosphorus, ICP	22.1	2.66	µg/sample
Selenium, ICP	< DL	2.00	µg/sample
Silver, ICP	< DL	0.266	µg/sample
Thallium, ICP	< DL	1.33	µg/sample
Vanadium, ICP	< DL	0.133	µg/sample
Zinc, ICP	12.3	0.399	µg/sample

Lab ID: 23-S1901
Client ID: 9256 Outlet #2 Empty Imp
Site: PCC Structurals: LPC-Milwaukie
Source: 9256 Outlet
Sample Date: 6/29/23

Analyte	Result	DL	Units
Mercury, CVAA	< DL	0.00836	µg/sample

Lab ID: 23-S1902
Client ID: 9256 Outlet #2 KMnO4
Site: PCC Structurals: LPC-Milwaukie
Source: 9256 Outlet
Sample Date: 6/29/23

Analyte	Result	DL	Units
Mercury, CVAA	0.158	0.0251	µg/sample

Lab ID: 23-S1903
Client ID: 9256 Outlet #2 HCl Rinse
Site: PCC Structurals: LPC-Milwaukie
Source: 9256 Outlet
Sample Date: 6/29/23

Analyte	Result	DL	Units
Mercury, CVAA	< DL	0.0194	µg/sample

Lab ID: 23-S1904
Client ID: 8901 Inlet #1 Filter & Probe
Site: PCC Structurals: LPC-Milwaukie
Source: 8901 Inlet
Sample Date: 6/28/23

Analyte	Result	DL	Units
Aluminum, ICP	9,940	7.50	µg/sample
Antimony, ICP-MS	< DL	1.00	µg/sample
Arsenic, ICP-MS	8.92	2.50	µg/sample
Barium, ICP	50.9	0.125	µg/sample
Beryllium, ICP-MS	0.226	0.050	µg/sample
Cadmium, ICP-MS	2.68	0.050	µg/sample
Chromium, ICP	145,000	0.200	µg/sample
Cobalt, ICP-MS	80,800	0.125	µg/sample
Copper, ICP-MS	48.8	0.250	µg/sample
Lead, ICP-MS	7.13	0.125	µg/sample
Manganese, ICP	78.6	0.075	µg/sample
Mercury, CVAA	0.0281	0.0219	µg/sample
Nickel, ICP	341,000	0.750	µg/sample
Phosphorus, ICP	368.	5.00	µg/sample
Selenium, ICP-MS	2.07	0.500	µg/sample
Silver, ICP	85.8	1.00	µg/sample
Thallium, ICP-MS	0.101	0.100	µg/sample
Vanadium, ICP-MS	70.6	0.075	µg/sample
Zinc, ICP	2,470	0.750	µg/sample

Lab ID: 23-S1905
Client ID: 8901 Inlet #1 HNO3/H2O2
Site: PCC Structurals: LPC-Milwaukie
Source: 8901 Inlet
Sample Date: 6/28/23

Analyte	Result	DL	Units
Aluminum, ICP	58.3	3.30	µg/sample
Antimony, ICP-MS	< DL	0.440	µg/sample
Arsenic, ICP	< DL	0.770	µg/sample
Barium, ICP	5.54	0.055	µg/sample
Beryllium, ICP	< DL	0.022	µg/sample
Cadmium, ICP-MS	0.114	0.022	µg/sample
Chromium, ICP	5.86	0.088	µg/sample
Cobalt, ICP-MS	2.90	0.055	µg/sample
Copper, ICP	2.01	0.550	µg/sample
Lead, ICP	1.14	0.550	µg/sample
Manganese, ICP	59.5	0.033	µg/sample
Mercury, CVAA	0.407	0.0385	µg/sample
Nickel, ICP	20.1	0.330	µg/sample
Phosphorus, ICP	24.8	2.20	µg/sample
Selenium, ICP	1.97	1.65	µg/sample
Silver, ICP	0.426	0.220	µg/sample
Thallium, ICP	< DL	1.10	µg/sample
Vanadium, ICP	< DL	0.110	µg/sample
Zinc, ICP	28.8	0.330	µg/sample

Lab ID: 23-S1906
Client ID: 8901 Inlet #1 Empty Imp
Site: PCC Structurals: LPC-Milwaukie
Source: 8901 Inlet
Sample Date: 6/28/23

Analyte	Result	DL	Units
Mercury, CVAA	< DL	0.00853	µg/sample

Lab ID: 23-S1907
Client ID: 8901 Inlet #1 KMnO4
Site: PCC Structurals: LPC-Milwaukie
Source: 8901 Inlet
Sample Date: 6/28/23

Analyte	Result	DL	Units
Mercury, CVAA	0.191	0.0178	µg/sample

Lab ID: 23-S1908
Client ID: 8901 Inlet #1 HCl Rinse
Site: PCC Structurals: LPC-Milwaukie
Source: 8901 Inlet
Sample Date: 6/28/23

Analyte	Result	DL	Units
Mercury, CVAA	< DL	0.0196	µg/sample

Lab ID: 23-S1909
Client ID: 8901 Inlet #2 Filter & Probe
Site: PCC Structurals: LPC-Milwaukie
Source: 8901 Inlet
Sample Date: 6/29/23

Analyte	Result	DL	Units
Aluminum, ICP	1,370	7.50	µg/sample
Antimony, ICP-MS	< DL	1.00	µg/sample
Arsenic, ICP-MS	< DL	2.50	µg/sample
Barium, ICP	10.5	0.125	µg/sample
Beryllium, ICP-MS	< DL	0.050	µg/sample
Cadmium, ICP-MS	0.348	0.050	µg/sample
Chromium, ICP	2,840	0.200	µg/sample
Cobalt, ICP-MS	1,150	0.125	µg/sample
Copper, ICP-MS	4.94	0.250	µg/sample
Lead, ICP-MS	1.21	0.125	µg/sample
Manganese, ICP	25.8	0.075	µg/sample
Mercury, CVAA	< DL	0.0219	µg/sample
Nickel, ICP	8,120	0.750	µg/sample
Phosphorus, ICP	98.1	5.00	µg/sample
Selenium, ICP-MS	< DL	0.500	µg/sample
Silver, ICP	4.77	1.00	µg/sample
Thallium, ICP-MS	< DL	0.100	µg/sample
Vanadium, ICP-MS	3.84	0.075	µg/sample
Zinc, ICP	83.1	0.750	µg/sample

Lab ID: 23-S1910
Client ID: 8901 Inlet #2 HNO3/H2O2
Site: PCC Structurals: LPC-Milwaukie
Source: 8901 Inlet
Sample Date: 6/29/23

Analyte	Result	DL	Units
Aluminum, ICP	27.9	3.33	µg/sample
Antimony, ICP-MS	< DL	0.444	µg/sample
Arsenic, ICP	< DL	0.777	µg/sample
Barium, ICP	6.58	0.056	µg/sample
Beryllium, ICP	< DL	0.022	µg/sample
Cadmium, ICP-MS	0.068	0.022	µg/sample
Chromium, ICP	3.43	0.089	µg/sample
Cobalt, ICP-MS	1.20	0.056	µg/sample
Copper, ICP	1.05	0.555	µg/sample
Lead, ICP	1.25	0.555	µg/sample
Manganese, ICP	296.	0.033	µg/sample
Mercury, CVAA	0.332	0.0341	µg/sample
Nickel, ICP	8.23	0.333	µg/sample
Phosphorus, ICP	22.2	2.22	µg/sample
Selenium, ICP	< DL	1.66	µg/sample
Silver, ICP	< DL	0.222	µg/sample
Thallium, ICP	< DL	1.11	µg/sample
Vanadium, ICP	< DL	0.111	µg/sample
Zinc, ICP	16.2	0.333	µg/sample

Lab ID: 23-S1911
Client ID: 8901 Inlet #2 Empty Imp
Site: PCC Structurals: LPC-Milwaukie
Source: 8901 Inlet
Sample Date: 6/29/23

Analyte	Result	DL	Units
Mercury, CVAA	< DL	0.00814	µg/sample

Lab ID: 23-S1912
Client ID: 8901 Inlet #2 KMnO4
Site: PCC Structurals: LPC-Milwaukie
Source: 8901 Inlet
Sample Date: 6/29/23

Analyte	Result	DL	Units
Mercury, CVAA	0.210	0.0258	µg/sample

Lab ID: 23-S1913
Client ID: 8901 Inlet #2 HCl Rinse
Site: PCC Structurals: LPC-Milwaukie
Source: 8901 Inlet
Sample Date: 6/29/23

Analyte	Result	DL	Units
Mercury, CVAA	< DL	0.0195	µg/sample

Client: M050 - Mostardi Platt
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Lab ID: 23-S1914
Client ID: 8901 Outlet #1 Filter & Probe
Site: PCC Structurals: LPC-Milwaukie
Source: 8901 Outlet
Sample Date: 6/28/23

Analyte	Result	DL	Units
Aluminum, ICP	555.	7.50	µg/sample
Antimony, ICP-MS	< DL	1.00	µg/sample
Arsenic, ICP-MS	< DL	2.50	µg/sample
Barium, ICP	6.83	0.125	µg/sample
Beryllium, ICP-MS	< DL	0.050	µg/sample
Cadmium, ICP-MS	1.03	0.050	µg/sample
Chromium, ICP	117.	0.200	µg/sample
Cobalt, ICP-MS	3.55	0.125	µg/sample
Copper, ICP-MS	5.01	0.250	µg/sample
Lead, ICP-MS	0.822	0.125	µg/sample
Manganese, ICP	9.89	0.075	µg/sample
Mercury, CVAA	< DL	0.0219	µg/sample
Nickel, ICP	104.	0.750	µg/sample
Phosphorus, ICP	88.4	5.00	µg/sample
Selenium, ICP-MS	2.17	0.500	µg/sample
Silver, ICP	13.1	1.00	µg/sample
Thallium, ICP-MS	< DL	0.100	µg/sample
Vanadium, ICP-MS	0.812	0.075	µg/sample
Zinc, ICP	16.2	0.750	µg/sample

Lab ID: 23-S1915
Client ID: 8901 Outlet #1 HNO3/H2O2
Site: PCC Structurals: LPC-Milwaukie
Source: 8901 Outlet
Sample Date: 6/28/23

Analyte	Result	DL	Units
Aluminum, ICP	21.5	4.05	µg/sample
Antimony, ICP-MS	< DL	0.540	µg/sample
Arsenic, ICP	< DL	0.945	µg/sample
Barium, ICP	3.51	0.068	µg/sample
Beryllium, ICP	< DL	0.027	µg/sample
Cadmium, ICP-MS	0.071	0.027	µg/sample
Chromium, ICP	1.82	0.108	µg/sample
Cobalt, ICP-MS	0.276	0.068	µg/sample
Copper, ICP	1.36	0.675	µg/sample
Lead, ICP	0.709	0.675	µg/sample
Manganese, ICP	25.8	0.040	µg/sample
Mercury, CVAA	0.240	0.0271	µg/sample
Nickel, ICP	2.14	0.405	µg/sample
Phosphorus, ICP	26.5	2.70	µg/sample
Selenium, ICP	< DL	2.02	µg/sample
Silver, ICP	< DL	0.270	µg/sample
Thallium, ICP	< DL	1.35	µg/sample
Vanadium, ICP	< DL	0.135	µg/sample
Zinc, ICP	22.1	0.405	µg/sample

Lab ID: 23-S1916
Client ID: 8901 Outlet #1 Empty Imp
Site: PCC Structurals: LPC-Milwaukie
Source: 8901 Outlet
Sample Date: 6/28/23

Analyte	Result	DL	Units
Mercury, CVAA	< DL	0.00822	µg/sample

Lab ID: 23-S1917
Client ID: 8901 Outlet #1 KMnO4
Site: PCC Structurals: LPC-Milwaukie
Source: 8901 Outlet
Sample Date: 6/28/23

Analyte	Result	DL	Units
Mercury, CVAA	0.160	0.0254	µg/sample

Lab ID: 23-S1918
Client ID: 8901 Outlet #1 HCl Rinse
Site: PCC Structurals: LPC-Milwaukie
Source: 8901 Outlet
Sample Date: 6/28/23

Analyte	Result	DL	Units
Mercury, CVAA	< DL	0.0194	µg/sample

Lab ID: 23-S1919
Client ID: 8901 Outlet #2 Filter & Probe
Site: PCC Structurals: LPC-Milwaukie
Source: 8901 Outlet
Sample Date: 6/29/23

Analyte	Result	DL	Units
Aluminum, ICP	534.	7.50	µg/sample
Antimony, ICP-MS	< DL	1.00	µg/sample
Arsenic, ICP-MS	< DL	2.50	µg/sample
Barium, ICP	4.18	0.125	µg/sample
Beryllium, ICP-MS	< DL	0.050	µg/sample
Cadmium, ICP-MS	0.068	0.050	µg/sample
Chromium, ICP	8.93	0.200	µg/sample
Cobalt, ICP-MS	1.53	0.125	µg/sample
Copper, ICP-MS	3.14	0.250	µg/sample
Lead, ICP-MS	0.369	0.125	µg/sample
Manganese, ICP	4.18	0.075	µg/sample
Mercury, CVAA	< DL	0.0219	µg/sample
Nickel, ICP	26.7	0.750	µg/sample
Phosphorus, ICP	86.8	5.00	µg/sample
Selenium, ICP-MS	< DL	0.500	µg/sample
Silver, ICP	< DL	1.00	µg/sample
Thallium, ICP-MS	< DL	0.100	µg/sample
Vanadium, ICP-MS	0.104	0.075	µg/sample
Zinc, ICP	14.2	0.750	µg/sample

Lab ID: 23-S1920
Client ID: 8901 Outlet #2 HNO3/H2O2
Site: PCC Structurals: LPC-Milwaukie
Source: 8901 Outlet
Sample Date: 6/29/23

Analyte	Result	DL	Units
Aluminum, ICP	36.0	3.99	µg/sample
Antimony, ICP-MS	< DL	0.532	µg/sample
Arsenic, ICP	< DL	0.931	µg/sample
Barium, ICP	3.37	0.066	µg/sample
Beryllium, ICP	< DL	0.027	µg/sample
Cadmium, ICP-MS	0.093	0.027	µg/sample
Chromium, ICP	2.03	0.106	µg/sample
Cobalt, ICP-MS	0.530	0.066	µg/sample
Copper, ICP	1.96	0.665	µg/sample
Lead, ICP	< DL	0.665	µg/sample
Manganese, ICP	31.4	0.040	µg/sample
Mercury, CVAA	0.266	0.0282	µg/sample
Nickel, ICP	2.36	0.399	µg/sample
Phosphorus, ICP	21.0	2.66	µg/sample
Selenium, ICP	< DL	2.00	µg/sample
Silver, ICP	< DL	0.266	µg/sample
Thallium, ICP	< DL	1.33	µg/sample
Vanadium, ICP	< DL	0.133	µg/sample
Zinc, ICP	21.3	0.399	µg/sample

Lab ID: 23-S1921
Client ID: 8901 Outlet #2 Empty Imp
Site: PCC Structurals: LPC-Milwaukie
Source: 8901 Outlet
Sample Date: 6/29/23

Analyte	Result	DL	Units
Mercury, CVAA	< DL	0.00814	µg/sample

Lab ID: 23-S1922
Client ID: 8901 Outlet #2 KMnO4
Site: PCC Structurals: LPC-Milwaukie
Source: 8901 Outlet
Sample Date: 6/29/23

Analyte	Result	DL	Units
Mercury, CVAA	0.173	0.0253	µg/sample

Lab ID: 23-S1923
Client ID: 8901 Outlet #2 HCl Rinse
Site: PCC Structurals: LPC-Milwaukie
Source: 8901 Outlet
Sample Date: 6/29/23

Analyte	Result	DL	Units
Mercury, CVAA	< DL	0.0194	µg/sample

Client: M050 - Mostardi Platt
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Lab ID: 23-S1924
Client ID: Filter Blank
Site: PCC Structurals: LPC-Milwaukie
Sample Date: 6/30/23

Analyte	Result	DL	Units
Aluminum, ICP	495.	7.50	µg/sample
Antimony, ICP-MS	< DL	1.00	µg/sample
Arsenic, ICP-MS	< DL	2.50	µg/sample
Barium, ICP	3.75	0.125	µg/sample
Beryllium, ICP-MS	< DL	0.050	µg/sample
Cadmium, ICP-MS	< DL	0.050	µg/sample
Chromium, ICP	1.06	0.200	µg/sample
Cobalt, ICP-MS	0.445	0.125	µg/sample
Copper, ICP-MS	< DL	0.250	µg/sample
Lead, ICP-MS	0.150	0.125	µg/sample
Manganese, ICP	0.870	0.075	µg/sample
Mercury, CVAA	< DL	0.0219	µg/sample
Nickel, ICP	1.58	0.750	µg/sample
Phosphorus, ICP	79.2	5.00	µg/sample
Selenium, ICP-MS	< DL	0.500	µg/sample
Silver, ICP	< DL	1.00	µg/sample
Thallium, ICP-MS	< DL	0.100	µg/sample
Vanadium, ICP-MS	< DL	0.075	µg/sample
Zinc, ICP	4.29	0.750	µg/sample

Lab ID: 23-S1925
Client ID: 0.1N HNO3 Blank
Site: PCC Structurals: LPC-Milwaukie
Sample Date: 6/30/23

Analyte	Result	DL	Units
Aluminum, ICP	< DL	7.50	µg/sample
Antimony, ICP-MS	< DL	1.00	µg/sample
Arsenic, ICP-MS	< DL	2.50	µg/sample
Barium, ICP	1.09	0.125	µg/sample
Beryllium, ICP-MS	< DL	0.050	µg/sample
Cadmium, ICP-MS	< DL	0.050	µg/sample
Chromium, ICP	< DL	0.200	µg/sample
Cobalt, ICP-MS	0.412	0.125	µg/sample
Copper, ICP-MS	< DL	0.250	µg/sample
Lead, ICP-MS	< DL	0.125	µg/sample
Manganese, ICP	0.428	0.075	µg/sample
Mercury, CVAA	< DL	0.0219	µg/sample
Nickel, ICP	< DL	0.750	µg/sample
Phosphorus, ICP	< DL	5.00	µg/sample
Selenium, ICP-MS	< DL	0.500	µg/sample
Silver, ICP	< DL	1.00	µg/sample
Thallium, ICP-MS	< DL	0.100	µg/sample
Vanadium, ICP-MS	< DL	0.075	µg/sample
Zinc, ICP	< DL	0.750	µg/sample

Lab ID: 23-S1926
Client ID: HNO3/H2O2 Blank
Site: PCC Structurals: LPC-Milwaukie
Sample Date: 6/30/23

Analyte	Result	DL	Units
Aluminum, ICP	12.1	3.78	µg/sample
Antimony, ICP-MS	< DL	0.504	µg/sample
Arsenic, ICP	< DL	0.882	µg/sample
Barium, ICP	4.59	0.063	µg/sample
Beryllium, ICP	< DL	0.025	µg/sample
Cadmium, ICP-MS	< DL	0.025	µg/sample
Chromium, ICP	0.375	0.101	µg/sample
Cobalt, ICP-MS	0.086	0.063	µg/sample
Copper, ICP	< DL	0.630	µg/sample
Lead, ICP	< DL	0.630	µg/sample
Manganese, ICP	0.735	0.038	µg/sample
Mercury, CVAA	0.274	0.0172	µg/sample
Nickel, ICP	< DL	0.378	µg/sample
Phosphorus, ICP	21.3	2.52	µg/sample
Selenium, ICP	< DL	1.89	µg/sample
Silver, ICP	< DL	0.252	µg/sample
Thallium, ICP	< DL	1.26	µg/sample
Vanadium, ICP	< DL	0.126	µg/sample
Zinc, ICP	0.929	0.378	µg/sample

Lab ID: 23-S1927
Client ID: DI Water Blank
Site: PCC Structurals: LPC-Milwaukie
Sample Date: 6/30/23

Analyte	Result	DL	Units
Mercury, CVAA	< DL	0.00849	µg/sample

Lab ID: 23-S1928
Client ID: KMnO4/H2SO4 Blank
Site: PCC Structurals: LPC-Milwaukie
Sample Date: 6/30/23

Analyte	Result	DL	Units
Mercury, CVAA	0.0430	0.00836	µg/sample

Lab ID: 23-S1929
Client ID: 8N HCl Blank
Site: PCC Structurals: LPC-Milwaukie
Sample Date: 6/30/23

Analyte	Result	DL	Units
Mercury, CVAA	< DL	0.0192	µg/sample

Client: M050 - Mostardi Platt
Report Number: 23-351

Lab ID: 23-S1930
Client ID: 9203 N Inlet #1 0061
Site: PCC Structurals: LPC - Milwaukie
Source: 9203 North Inlet
Sample Date: 6/27/23
Sample Volume: 315. mL

Analyte	µg/L Conc.	DL	µg/sample Conc.	DL
Cr VI	261.	0.010	82.3	0.0032

Lab ID: 23-S1931
Client ID: 9203 N Inlet #2 0061
Site: PCC Structurals: LPC - Milwaukie
Source: 9203 North Inlet
Sample Date: 6/30/23
Sample Volume: 285. mL

Analyte	µg/L Conc.	DL	µg/sample Conc.	DL
Cr VI	348.	0.010	99.2	0.0028

Lab ID: 23-S1932
Client ID: 9203 C Inlet #1 0061
Site: PCC Structurals: LPC - Milwaukie
Source: 9203 Center Inlet
Sample Date: 6/27/23
Sample Volume: 320. mL

Analyte	µg/L Conc.	DL	µg/sample Conc.	DL
Cr VI	638.	0.010	204.	0.0032

Lab ID: 23-S1933
Client ID: 9203 C Inlet #2 0061
Site: PCC Structurals: LPC - Milwaukie
Source: 9203 Center Inlet
Sample Date: 6/30/23
Sample Volume: 310. mL

Analyte	µg/L Conc.	DL	µg/sample Conc.	DL
Cr VI	303.	0.010	94.0	0.0031

Lab ID: 23-S1934
Client ID: 9203 S Inlet #1 0061
Site: PCC Structurals: LPC - Milwaukie
Source: 9203 South Inlet
Sample Date: 6/27/23
Sample Volume: 360. mL

Analyte	µg/L Conc.	DL	µg/sample Conc.	DL
Cr VI	136.	0.010	49.1	0.0036

Client: M050 - Mostardi Platt
Report Number: 23-351

Lab ID: 23-S1935
Client ID: 9203 S Inlet #2 0061
Site: PCC Structurals: LPC - Milwaukie
Source: 9203 South Inlet
Sample Date: 6/30/23
Sample Volume: 275. mL

	µg/L		µg/sample	
Analyte	Conc.	DL	Conc.	DL
Cr VI	97.1	0.010	26.7	0.0028

Lab ID: 23-S1936
Client ID: 9203 N Outlet #1 0061
Site: PCC Structurals: LPC - Milwaukie
Source: 9203 North Outlet
Sample Date: 6/27/23
Sample Volume: 430. mL

	µg/L		µg/sample	
Analyte	Conc.	DL	Conc.	DL
Cr VI	2.19	0.010	0.941	0.0043

Lab ID: 23-S1937
Client ID: 9203 N Outlet #2 0061
Site: PCC Structurals: LPC - Milwaukie
Source: 9203 North Outlet
Sample Date: 6/30/23
Sample Volume: 590. mL

	µg/L		µg/sample	
Analyte	Conc.	DL	Conc.	DL
Cr VI	7.82	0.010	4.61	0.0059

Lab ID: 23-S1938
Client ID: 9203 S Outlet #1 0061
Site: PCC Structurals: LPC - Milwaukie
Source: 9203 South Outlet
Sample Date: 6/27/23
Sample Volume: 520. mL

	µg/L		µg/sample	
Analyte	Conc.	DL	Conc.	DL
Cr VI	3.79	0.010	1.97	0.0052

Lab ID: 23-S1939
Client ID: 9203 S Outlet #2 0061
Site: PCC Structurals: LPC - Milwaukie
Source: 9203 South Outlet
Sample Date: 6/30/23
Sample Volume: 445. mL

	µg/L		µg/sample	
Analyte	Conc.	DL	Conc.	DL
Cr VI	5.14	0.010	2.29	0.0044

Client: M050 - Mostardi Platt
Report Number: 23-351

Lab ID: 23-S1940
Client ID: 9256 Inlet #1 0061
Site: PCC Structurals: LPC - Milwaukie
Source: 9256 Inlet
Sample Date: 6/28/23
Sample Volume: 300. mL

	µg/L		µg/sample	
Analyte	Conc.	DL	Conc.	DL
Cr VI	5.87	0.010	1.76	0.0030

Lab ID: 23-S1941
Client ID: 9256 Inlet #2 0061
Site: PCC Structurals: LPC - Milwaukie
Source: 9256 Inlet
Sample Date: 6/29/23
Sample Volume: 365. mL

	µg/L		µg/sample	
Analyte	Conc.	DL	Conc.	DL
Cr VI	4.72	0.010	1.72	0.0036

Lab ID: 23-S1942
Client ID: 9256 Outlet #1 0061
Site: PCC Structurals: LPC - Milwaukie
Source: 9256 Outlet
Sample Date: 6/28/23
Sample Volume: 375. mL

	µg/L		µg/sample	
Analyte	Conc.	DL	Conc.	DL
Cr VI	17.1	0.010	6.40	0.0038

Lab ID: 23-S1943
Client ID: 9256 Outlet #2 0061
Site: PCC Structurals: LPC - Milwaukie
Source: 9256 Outlet
Sample Date: 6/29/23
Sample Volume: 335. mL

	µg/L		µg/sample	
Analyte	Conc.	DL	Conc.	DL
Cr VI	2.49	0.010	0.834	0.0034

Lab ID: 23-S1944
Client ID: 8901 Inlet #1 0061
Site: PCC Structurals: LPC - Milwaukie
Source: 8901 Inlet
Sample Date: 6/28/23
Sample Volume: 350. mL

	µg/L		µg/sample	
Analyte	Conc.	DL	Conc.	DL
Cr VI	43.2	0.010	15.1	0.0035

Client: M050 - Mostardi Platt
Report Number: 23-351

Lab ID: 23-S1945
Client ID: 8901 Inlet #2 0061
Site: PCC Structurals: LPC - Milwaukie
Source: 8901 Inlet
Sample Date: 6/29/23
Sample Volume: 290. mL

	µg/L		µg/sample	
Analyte	Conc.	DL	Conc.	DL
Cr VI	4.40	0.010	1.28	0.0029

Lab ID: 23-S1946
Client ID: 8901 Outlet #1 0061
Site: PCC Structurals: LPC - Milwaukie
Source: 8901 Outlet
Sample Date: 6/28/23
Sample Volume: 355. mL

	µg/L		µg/sample	
Analyte	Conc.	DL	Conc.	DL
Cr VI	20.0	0.010	7.11	0.0036

Lab ID: 23-S1947
Client ID: 8901 Outlet #2 0061
Site: PCC Structurals: LPC - Milwaukie
Source: 8901 Outlet
Sample Date: 6/29/23
Sample Volume: 325. mL

	µg/L		µg/sample	
Analyte	Conc.	DL	Conc.	DL
Cr VI	9.50	0.010	3.09	0.0032

Lab ID: 23-S1948
Client ID: 0.5M KOH Reagent Blank
Site: PCC Structurals: LPC - Milwaukie
Sample Date: 6/30/23
Sample Volume: 295. mL

	µg/L		µg/sample	
Analyte	Conc.	DL	Conc.	DL
Cr VI	0.432	0.010	0.127	0.0030

Lab ID: 23-S1949
Client ID: DI Reagent Blank
Site: PCC Structurals: LPC - Milwaukie
Sample Date: 6/30/23
Sample Volume: 103. mL

	µg/L		µg/sample	
Analyte	Conc.	DL	Conc.	DL
Cr VI	0.0250	0.010	0.0026	0.0010

QA/QC Report

Client Name: Mostardi Platt
Project Number: M050
Analytical Technique: ICP-OES
Instrument: Perkin Elmer Optima 8300
Sample Description: EPA Method 29 Front Half
Report Number: 23-351

Blank Data

Analyte	Sample ID	Measured Conc. µg/L	DL Conc. µg/L
Ag	ICB	< DL	2.00
Ag	Meth_Blk	< DL	2.00
Ag	CCB	< DL	2.00
Ag	CCB	< DL	2.00
Ag	ICB	< DL	2.00
Ag	CCB	< DL	2.00
Al	ICB	< DL	30.0
Al	Meth_Blk	< DL	30.0
Al	CCB	< DL	30.0
Al	CCB	< DL	30.0
Al	CCB	< DL	30.0
Al	CCB	< DL	30.0
Ba	ICB	< DL	0.500
Ba	Meth_Blk	< DL	0.500
Ba	CCB	< DL	0.500
Ba	CCB	< DL	0.500
Ba	CCB	< DL	0.500
Cr	ICB	< DL	0.800
Cr	Meth_Blk	< DL	0.800
Cr	CCB	< DL	0.800
Cr	CCB	< DL	0.800
Cr	CCB	< DL	0.800
Cr	ICB	< DL	0.800
Cr	CCB	< DL	0.800
Cr	CCB	< DL	0.800
Cr	CCB	< DL	0.800
Mn	ICB	< DL	0.300
Mn	Meth_Blk	< DL	0.300
Mn	CCB	< DL	0.300
Mn	CCB	< DL	0.300
Mn	CCB	< DL	0.300
Ni	ICB	< DL	3.00
Ni	Meth_Blk	< DL	3.00
Ni	CCB	< DL	3.00
Ni	CCB	< DL	3.00
Ni	CCB	< DL	3.00
Ni	ICB	< DL	3.00
Ni	CCB	< DL	3.00
Ni	CCB	< DL	3.00

ICB: Initial Calibration Blank CCB: Continuing Calibration Blank
Sample Media Blank (SM_Blk) concentration in µg/filter
Method Blank is in control if Method Blank results are < 10% of sample results

Client Name: Mostardi Platt
Project Number: M050
Analytical Technique: ICP-OES
Instrument: Perkin Elmer Optima 8300
Sample Description: EPA Method 29 Front Half
Report Number: 23-351

Blank Data (continued)

Analyte	Sample ID	Measured Conc. µg/L	DL Conc. µg/L
Ni	CCB	< DL	3.00
P	ICB	< DL	20.0
P	Meth_Blk	< DL	20.0
P	CCB	< DL	20.0
P	CCB	< DL	20.0
P	CCB	< DL	20.0
Zn	ICB	< DL	3.00
Zn	Meth_Blk	< DL	3.00
Zn	CCB	< DL	3.00
Zn	CCB	< DL	3.00
Zn	CCB	< DL	3.00
Zn	ICB	< DL	3.00
Zn	CCB	< DL	3.00
Zn	CCB	< DL	3.00
Zn	CCB	< DL	3.00

ICB: Initial Calibration Blank CCB: Continuing Calibration Blank
*: Sample Media Blank (SM_Blk) concentration in µg/filter
Method Blank is in control if Method Blank results are <10% of sample results

Calibration QC

Analyte	Sample ID	Standard Conc. µg/L	Measured Conc. µg/L	Percent Recovery
Ag	ICV	2500.	2518.	100.7
Ag	LL-CCV	10.00	9.283	92.8
Ag	LL-LCS	9.000	9.376	104.2
Ag	CCV	2500.	2363.	94.5
Ag	CCV	2500.	2292.	91.7
Ag	ICV	2500.	2516.	100.6
Ag	LL-CCV	10.00	7.793	77.9
Ag	CCV	2500.	2472.	98.9
Al	ICV	2500.	2501.	100.0
Al	LL-CCV	150.0	149.3	99.5
Al	LL-LCS	75.00	87.87	117.2
Al	CCV	2500.	2609.	104.4
Al	CCV	2500.	2616.	104.6
Al	CCV	2500.	2589.	103.6

ICV: Initial Calibration Verification CCV: Continuing Calibration Verification
Calibration Verification Limits: 90% - 110% Recovery
Low Level-CCV Limits: 60% - 140% Recovery
Low Level-LCS Limits: 50% - 150% Recovery
LL-LCS results are insignificant if sample results are >10x LL-LCS concentration

QA/QC Report

Client Name: Mostardi Platt
Project Number: M050
Analytical Technique: ICP-OES
Instrument: Perkin Elmer Optima 8300
Sample Description: EPA Method 29 Front Half
Report Number: 23-351

Calibration QC (continued)

Analyte	Sample ID	Standard Conc. µg/L	Measured Conc. µg/L	Percent Recovery
Al	CCV	2500.	2581.	103.2
Ba	ICV	2500.	2529.	101.2
Ba	LL-CCV	2.500	2.871	114.8
Ba	LL-LCS	1.500	1.725	115.0
Ba	CCV	2500.	2600.	104.0
Ba	CCV	2500.	2607.	104.3
Ba	CCV	2500.	2572.	102.9
Cr	ICV	2500.	2476.	99.0
Cr	LL-CCV	4.000	4.566	114.2
Cr	LL-LCS	2.000	2.208	110.4
Cr	CCV	2500.	2542.	101.7
Cr	CCV	2500.	2509.	100.4
Cr	CCV	2500.	2499.	100.0
Cr	ICV	2500.	2459.	98.4
Cr	LL-CCV	4.000	4.661	116.5
Cr	CCV	2500.	2449.	98.0
Cr	CCV	2500.	2449.	98.0
Cr	CCV	2500.	2469.	98.8
Mn	ICV	2500.	2552.	102.1
Mn	LL-CCV	1.500	1.698	113.2
Mn	LL-LCS	1.000	1.114	111.4
Mn	CCV	2500.	2623.	104.9
Mn	CCV	2500.	2591.	103.6
Mn	CCV	2500.	2572.	102.9
Ni	ICV	2500.	2426.	97.0
Ni	LL-CCV	15.00	15.34	102.3
Ni	LL-LCS	6.000	5.478	91.3
Ni	CCV	2500.	2476.	99.0
Ni	CCV	2500.	2430.	97.2
Ni	CCV	2500.	2435.	97.4
Ni	ICV	2500.	2396.	95.8
Ni	LL-CCV	15.00	14.94	99.6
Ni	CCV	2500.	2419.	96.8
Ni	CCV	2500.	2419.	96.8
Ni	CCV	2500.	2419.	96.8
P	ICV	2500.	2508.	100.3
P	LL-CCV	100.0	108.7	108.7

ICV: Initial Calibration Verification CCV: Continuing Calibration Verification
Calibration Verification Limits: 90% - 110% Recovery
Low Level-CCV Limits: 60% - 140% Recovery
Low Level-LCS Limits: 50% - 150% Recovery
LL-LCS Limits are significant if sample results are >10X LL-LCS concentration

QA/QC Report

Client Name: Mostardi Platt
Project Number: M050
Analytical Technique: ICP-OES
Instrument: Perkin Elmer Optima 8300
Sample Description: EPA Method 29 Front Half
Report Number: 23-351

Calibration QC (continued)

Analyte	Sample ID	Standard Conc. µg/L	Measured Conc. µg/L	Percent Recovery
P	LL-LCS	75.00	70.68	94.2
P	CCV	2500.	2548.	101.9
P	CCV	2500.	2550.	102.0
P	CCV	2500.	2569.	102.8
Zn	ICV	2500.	2517.	100.7
Zn	LL-CCV	15.00	16.53	110.2
Zn	LL-LCS	6.000	6.847	114.1
Zn	CCV	2500.	2582.	103.3
Zn	CCV	2500.	2545.	101.8
Zn	CCV	2500.	2537.	101.5
Zn	ICV	2500.	2501.	100.0
Zn	LL-CCV	15.00	17.60	117.3
Zn	CCV	2500.	2482.	99.3
Zn	CCV	2500.	2484.	99.4
Zn	CCV	2500.	2509.	100.4

ICV: Initial Calibration Verification CCV: Continuing Calibration Verification
Calibration Verification Limits: 90% - 110% Recovery
Low Level-CCV Limits: 60% - 140% Recovery
Low Level-LCS Limits: 50% - 150% Recovery
LL-LCS results are insignificant if sample results are >10x LL-LCS concentration

Replicate Data

Analyte	Sample ID	Sample Conc. µg/L	Replicate Conc. µg/L	RPD
Ag	23-S1834	4.58	3.13	37.6 *
Al	23-S1834	2940	3020	2.65
Ba	23-S1834	85.4	85.1	0.43
Cr	23-S1834	3570	3560	0.28
Mn	23-S1834	65.9	65.6	0.46
Ni	23-S1834	26100	26200	0.42
P	23-S1834	441.	440.	0.16
Zn	23-S1834	435.	434.	0.07

RPD = {(sample-replicate)/[(sample+replicate)/2]}x100
N/C: RPD is not calculated when sample or replicate is below detection limit
Replicate Limit: 20% RPD
*: per EPA CLP protocol, control limits do not apply if sample and/or replicate concentration is less than 5x the detection limit

QA/QC Report

Client Name: Mostardi Platt
Project Number: M050
Analytical Technique: ICP-OES
Instrument: Perkin Elmer Optima 8300
Sample Description: EPA Method 29 Front Half
Report Number: 23-351

Laboratory Control Sample/Matrix Post Spike Analysis

Analyte	Sample ID	Sample Conc. µg/L	Spike Conc. µg/L	Spike Amount µg/L	Percent Recovery
Ag	LCS	< 2	2550.	2500	102.
Ag	LCS-Duplicate	< 2	2579.	2500	103.
Ag	23-S1839	3.379	2536.	2500	101.
Al	kv:LL-CCV	149.3	2677.	2500	101.
Al	kv:LL-CCV	149.3	2697.	2500	102.
Al	23-S1839	3054.	8240.	5000	104.
Ba	LCS	< 0.5	2506.	2500	100.
Ba	LCS-Duplicate	< 0.5	2532.	2500	101.
Ba	23-S1839	26.65	2493.	2500	98.7
Cr	LCS	< 0.8	2572.	2500	103.
Cr	LCS-Duplicate	< 0.8	2562.	2500	102.
Cr	23-S1839	5172.	9513.	5000	86.8
Mn	LCS	< 0.3	2640.	2500	106.
Mn	LCS-Duplicate	< 0.3	2629.	2500	105.
Mn	23-S1839	70.99	2550.	2500	99.2
Ni	LCS	< 3	2575.	2500	103.
Ni	LCS-Duplicate	< 3	2597.	2500	104.
Ni	23-S1839	40250	84290	50000	88.1
P	LCS	< 20	2693.	2500	108.
P	LCS-Duplicate	< 20	2678.	2500	107.
P	23-S1839	437.3	3008.	2500	103.
Zn	LCS	< 3	2746.	2500	110.
Zn	LCS-Duplicate	< 3	2726.	2500	109.
Zn	23-S1839	565.9	3120.	2500	102.

LCS Limit: 80% - 120% Recovery Spike Limit: 75% - 125% Recovery

LCS Duplicate Data

Analyte	Sample ID	Original Conc. µg/L	Replicate Conc. µg/L	RPD
Ag	LCS-Duplicate	2550.	2579.	1.13
Al	LCS-Duplicate	2677.	2697.	0.74
Ba	LCS-Duplicate	2506.	2532.	1.03
Cr	LCS-Duplicate	2572.	2562.	0.39
Mn	LCS-Duplicate	2640.	2629.	0.42
Ni	LCS-Duplicate	2575.	2597.	0.85
P	LCS-Duplicate	2693.	2678.	0.56
Zn	LCS-Duplicate	2746.	2726.	0.73

RPD = {(sample-duplicate)/[(sample+duplicate)/2]}x100 Duplicate Limit: 20% RPD

QA/QC Report

Client Name: Mostardi Platt
Project Number: M050
Analytical Technique: ICP-MS
Instrument: Agilent 7850
Sample Description: EPA Method 29 Front Half
Report Number: 23-351

Blank Data

Analyte	Sample ID	Measured Conc. µg/L	DL Conc. µg/L
As	ICB	< DL	1.00
As	CCB	< DL	1.00
As	Meth_Blk	< 10	1.00
As	CCB	< DL	1.00
As	CCB	< DL	1.00
As	CCB	< DL	1.00
As	CCB	< DL	1.00
Be	ICB	< DL	0.020
Be	CCB	< DL	0.020
Be	Meth_Blk	< 0.2	0.020
Be	CCB	< DL	0.020
Be	CCB	< DL	0.020
Be	CCB	< DL	0.020
Be	CCB	< DL	0.020
Cd	ICB	< DL	0.020
Cd	CCB	< DL	0.020
Cd	Meth_Blk	< 0.2	0.020
Cd	CCB	< DL	0.020
Cd	CCB	< DL	0.020
Cd	CCB	< DL	0.020
Cd	CCB	< DL	0.020
Co	ICB	< DL	0.050
Co	CCB	< DL	0.050
Co	Meth_Blk	0.923	0.050
Co	CCB	< DL	0.050
Co	CCB	< DL	0.050
Co	CCB	< DL	0.050
Co	CCB	< DL	0.050
Cu	ICB	< DL	0.100
Cu	CCB	< DL	0.100
Cu	Meth_Blk	< 1	0.100
Cu	CCB	< DL	0.100
Cu	CCB	< DL	0.100
Cu	CCB	< DL	0.100
Cu	CCB	< DL	0.100
Pb	ICB	< DL	0.050
Pb	CCB	< DL	0.050
Pb	Meth_Blk	< 0.5	0.050
Pb	CCB	< DL	0.050

ICB: Initial Calibration Blank CCB: Continuing Calibration Blank
Sample Media Blank (SM_Blk) concentration in µg/filter
Method Blank is in control if Method Blank results are < 10% of sample results

Client Name: Mostardi Platt
Project Number: M050
Analytical Technique: ICP-MS
Instrument: Agilent 7850
Sample Description: EPA Method 29 Front Half
Report Number: 23-351

Blank Data (continued)

Analyte	Sample ID	Measured Conc. µg/L	DL Conc. µg/L
Pb	CCB	< DL	0.050
Pb	CCB	< DL	0.050
Pb	CCB	< DL	0.050
Sb	ICB	< DL	0.400
Sb	CCB	< DL	0.400
Sb	Meth_Blk	< 4	0.400
Sb	CCB	< DL	0.400
Sb	CCB	< DL	0.400
Sb	CCB	< DL	0.400
Sb	CCB	< DL	0.400
Se	ICB	< DL	0.200
Se	CCB	< DL	0.200
Se	Meth_Blk	< 2	0.200
Se	CCB	< DL	0.200
Se	CCB	< DL	0.200
Se	CCB	< DL	0.200
Se	CCB	< DL	0.200
Tl	ICB	< DL	0.040
Tl	CCB	< DL	0.040
Tl	Meth_Blk	< 0.4	0.040
Tl	CCB	< DL	0.040
Tl	CCB	< DL	0.040
Tl	CCB	< DL	0.040
Tl	CCB	< DL	0.040
V	ICB	< DL	0.030
V	CCB	< DL	0.030
V	Meth_Blk	< 0.3	0.030
V	CCB	< DL	0.030
V	CCB	< DL	0.030
V	CCB	< DL	0.030
V	CCB	< DL	0.030

ICB: Initial Calibration Blank CCB: Continuing Calibration Blank
*: Sample Media Blank (SM_Blk) concentration in µg/filter
Method Blank is in control if Method Blank results are <10% of sample results

QA/QC Report

Client Name: Mostardi Platt
Project Number: M050
Analytical Technique: ICP-MS
Instrument: Agilent 7850
Sample Description: EPA Method 29 Front Half
Report Number: 23-351

Calibration QC

Analyte	Sample ID	Standard Conc. µg/L	Measured Conc. µg/L	Percent Recovery
As	ICV	100.0	100.3	100.3
As	CCV	100.0	97.45	97.4
As	LL-LCS	20.00	25.02	125.1
As	CCV	100.0	95.55	95.6
As	CCV	100.0	94.68	94.7
As	CCV	100.0	95.66	95.7
As	CCV	100.0	95.83	95.8
Be	ICV	100.0	98.34	98.3
Be	CCV	100.0	95.78	95.8
Be	LL-LCS	0.500	0.505	101.0
Be	CCV	100.0	100.3	100.3
Be	CCV	100.0	102.2	102.2
Be	CCV	100.0	103.6	103.6
Be	CCV	100.0	101.1	101.1
Cd	ICV	100.0	98.99	99.0
Cd	CCV	100.0	96.14	96.1
Cd	LL-LCS	1.500	1.411	94.1
Cd	CCV	100.0	96.66	96.7
Cd	CCV	100.0	98.84	98.8
Cd	CCV	100.0	97.83	97.8
Cd	CCV	100.0	96.16	96.2
Co	ICV	100.0	99.22	99.2
Co	CCV	100.0	97.70	97.7
Co	LL-LCS	1.500	2.519	167.9
Co	CCV	100.0	99.13	99.1
Co	CCV	100.0	100.1	100.1
Co	CCV	100.0	100.1	100.1
Co	CCV	100.0	97.19	97.2
Cu	ICV	100.0	101.9	101.9
Cu	CCV	100.0	99.80	99.8
Cu	LL-LCS	15.00	15.26	101.7
Cu	CCV	100.0	100.2	100.2
Cu	CCV	100.0	101.4	101.4
Cu	CCV	100.0	102.1	102.1
Cu	CCV	100.0	98.39	98.4
Pb	ICV	100.0	100.8	100.8
Pb	CCV	100.0	98.03	98.0

ICV: Initial Calibration Verification CCV: Continuing Calibration Verification
Calibration Verification Limits: 90% - 110% Recovery
Low Level-CCV Limits: 60% - 140% Recovery
Low Level-LCS Limits: 50% - 150% Recovery
LL-LCS Values are significant if sample results are >10X LL-LCS concentration

Client Name: Mostardi Platt
Project Number: M050
Analytical Technique: ICP-MS
Instrument: Agilent 7850
Sample Description: EPA Method 29 Front Half
Report Number: 23-351

Calibration QC (continued)

Analyte	Sample ID	Standard Conc. µg/L	Measured Conc. µg/L	Percent Recovery
Pb	LL-LCS	15.00	14.19	94.6
Pb	CCV	100.0	96.09	96.1
Pb	CCV	100.0	97.32	97.3
Pb	CCV	100.0	95.65	95.6
Pb	CCV	100.0	95.43	95.4
Sb	ICV	100.0	99.17	99.2
Sb	CCV	100.0	95.90	95.9
Sb	LL-LCS	15.00	14.77	98.5
Sb	CCV	100.0	94.52	94.5
Sb	CCV	100.0	94.60	94.6
Sb	CCV	100.0	94.14	94.1
Sb	CCV	100.0	93.52	93.5
Se	ICV	100.0	99.65	99.6
Se	CCV	100.0	94.86	94.9
Se	LL-LCS	25.00	26.62	106.5
Se	CCV	100.0	93.45	93.4
Se	CCV	100.0	91.20	91.2
Se	CCV	100.0	91.73	91.7
Se	CCV	100.0	93.50	93.5
Tl	ICV	100.0	100.8	100.8
Tl	CCV	100.0	98.70	98.7
Tl	LL-LCS	30.00	28.87	96.2
Tl	CCV	100.0	96.86	96.9
Tl	CCV	100.0	99.48	99.5
Tl	CCV	100.0	97.49	97.5
Tl	CCV	100.0	97.72	97.7
V	ICV	100.0	100.3	100.3
V	CCV	100.0	98.62	98.6
V	LL-LCS	3.000	3.019	100.6
V	CCV	100.0	97.61	97.6
V	CCV	100.0	98.39	98.4
V	CCV	100.0	98.43	98.4
V	CCV	100.0	97.36	97.4

ICV: Initial Calibration Verification CCV: Continuing Calibration Verification
Calibration Verification Limits: 90% - 110% Recovery
Low Level-CCV Limits: 60% - 140% Recovery
Low Level-LCS Limits: 50% - 150% Recovery
LL-LCS results are insignificant if sample results are >10x LL-LCS concentration

QA/QC Report

Client Name: Mostardi Platt
Project Number: M050
Analytical Technique: ICP-MS
Instrument: Agilent 7850
Sample Description: EPA Method 29 Front Half
Report Number: 23-351

Replicate Data

Analyte	Sample ID	Sample Conc. µg/L	Replicate Conc. µg/L	RPD
As	23-S1834	< 10	< 10	N/C *
Be	23-S1834	< 0.2	< 0.2	N/C *
Cd	23-S1834	5.03	4.84	3.83
Co	23-S1834	834.	813.	2.48
Cu	23-S1834	1280	1260	1.81
Pb	23-S1834	9.87	9.78	0.97
Sb	23-S1834	< 4	< 4	N/C *
Se	23-S1834	4.18	3.88	7.39
Tl	23-S1834	< 0.4	< 0.4	N/C *
V	23-S1834	10.1	9.69	4.20

RPD = {(sample-replicate)/[(sample+replicate)/2]}x100
N/C: RPD is not calculated when sample or replicate is below detection limit
Replicate Limit: 20% RPD
*: per EPA CLP protocol, control limits do not apply if sample and/or replicate concentration is less than 5x the detection limit

Laboratory Control Sample/Matrix Post Spike Analysis

Analyte	Sample ID	Sample Conc. µg/L	Spike Conc. µg/L	Spike Amount µg/L	Percent Recovery
As	LCS	< 10	2339.	2500	93.6
As	LCS-Duplicate	< 10	2353.	2500	94.1
As	23-S1839	< 10	904.5	1000	90.4
Be	LCS	< 0.2	2422.	2500	96.9
Be	LCS-Duplicate	< 0.2	2418.	2500	96.7
Be	23-S1839	< 0.2	932.9	1000	93.3
Cd	LCS	< 0.2	2401.	2500	96.0
Cd	LCS-Duplicate	< 0.2	2396.	2500	95.8
Cd	23-S1839	1.060	941.9	1000	94.1
Co	LCS	0.923	2531.	2500	101.
Co	LCS-Duplicate	0.923	2497.	2500	99.8
Co	23-S1839	1259.	2208.	1000	94.9
Cu	LCS	< 1	2557.	2500	102.
Cu	LCS-Duplicate	< 1	2514.	2500	101.
Cu	23-S1839	1582.	2539.	1000	95.7
Pb	LCS	< 0.5	2436.	2500	97.4
Pb	LCS-Duplicate	< 0.5	2432.	2500	97.3
Pb	23-S1839	4.594	930.3	1000	92.6

LCS Limit: 80% - 120% Recovery Spike Limit: 75% - 125% Recovery

Client Name: Mostardi Platt
Project Number: M050
Analytical Technique: ICP-MS
Instrument: Agilent 7850
Sample Description: EPA Method 29 Front Half
Report Number: 23-351

Laboratory Control Sample/Matrix Post Spike Analysis (continued)

Analyte	Sample ID	Sample Conc. µg/L	Spike Conc. µg/L	Spike Amount µg/L	Percent Recovery
Sb	LCS	< 4	2333.	2500	93.3
Sb	LCS-Duplicate	< 4	2331.	2500	93.2
Sb	23-S1839	< 4	900.3	1000	90.0
Se	LCS	< 2	2337.	2500	93.5
Se	LCS-Duplicate	< 2	2328.	2500	93.1
Se	23-S1839	< 2	872.8	1000	87.3
Tl	LCS	< 0.4	2445.	2500	97.8
Tl	LCS-Duplicate	< 0.4	2430.	2500	97.2
Tl	23-S1839	< 0.4	945.1	1000	94.5
V	LCS	< 0.3	2417.	2500	96.7
V	LCS-Duplicate	< 0.3	2408.	2500	96.3
V	23-S1839	8.290	958.2	1000	95.0

LCS Limit: 80% - 120% Recovery Spike Limit: 75% - 125% Recovery

LCS Duplicate Data

Analyte	Sample ID	Original Conc. µg/L	Replicate Conc. µg/L	RPD
As	LCS-Duplicate	2339.	2353.	0.60
Be	LCS-Duplicate	2422.	2418.	0.17
Cd	LCS-Duplicate	2401.	2396.	0.21
Co	LCS-Duplicate	2531.	2497.	1.35
Cu	LCS-Duplicate	2557.	2514.	1.70
Pb	LCS-Duplicate	2436.	2432.	0.16
Sb	LCS-Duplicate	2333.	2331.	0.09
Se	LCS-Duplicate	2337.	2328.	0.39
Tl	LCS-Duplicate	2445.	2430.	0.62
V	LCS-Duplicate	2417.	2408.	0.37

RPD = {(sample-duplicate)/[(sample+duplicate)/2]}x100 Duplicate Limit: 20% RPD

QA/QC Report

Client Name: Mostardi Platt
Project Number: M050
Analytical Technique: ICP-OES
Instrument: Perkin Elmer Optima 8300
Sample Description: EPA Method 29 Back Half
Report Number: 23-351

Blank Data

Analyte	Sample ID	Measured Conc. µg/L	DL Conc. µg/L
Ag	ICB	< DL	2.00
Ag	Meth_Blk	< DL	2.00
Ag	CCB	< DL	2.00
Ag	CCB	< DL	2.00
Ag	CCB	< DL	2.00
Al	ICB	< DL	30.0
Al	Meth_Blk	< DL	30.0
Al	CCB	< DL	30.0
Al	CCB	< DL	30.0
Al	CCB	< DL	30.0
As	ICB	< DL	7.00
As	Meth_Blk	< DL	7.00
As	CCB	< DL	7.00
As	CCB	< DL	7.00
As	CCB	< DL	7.00
Ba	ICB	< DL	0.500
Ba	Meth_Blk	< DL	0.500
Ba	CCB	< DL	0.500
Ba	CCB	< DL	0.500
Ba	CCB	< DL	0.500
Be	ICB	< DL	0.200
Be	Meth_Blk	< DL	0.200
Be	CCB	< DL	0.200
Be	CCB	< DL	0.200
Be	CCB	< DL	0.200
Cr	ICB	< DL	0.800
Cr	Meth_Blk	< DL	0.800
Cr	CCB	< DL	0.800
Cr	CCB	< DL	0.800
Cr	CCB	< DL	0.800
Cu	ICB	< DL	5.00
Cu	Meth_Blk	< DL	5.00
Cu	CCB	< DL	5.00
Cu	CCB	< DL	5.00
Cu	CCB	< DL	5.00
Mn	ICB	< DL	0.300
Mn	Meth_Blk	< DL	0.300
Mn	CCB	< DL	0.300
Mn	CCB	< DL	0.300

ICB: Initial Calibration Blank CCB: Continuing Calibration Blank
Sample Media Blank (SM_Blk) concentration in µg/filter
Method Blank is in control if Method Blank results are < 10% of sample results

Client Name: Mostardi Platt
Project Number: M050
Analytical Technique: ICP-OES
Instrument: Perkin Elmer Optima 8300
Sample Description: EPA Method 29 Back Half
Report Number: 23-351

Blank Data (continued)

Analyte	Sample ID	Measured Conc. µg/L	DL Conc. µg/L
Mn	CCB	< DL	0.300
Ni	ICB	< DL	3.00
Ni	Meth_Blk	< DL	3.00
Ni	CCB	< DL	3.00
Ni	CCB	< DL	3.00
Ni	CCB	< DL	3.00
P	ICB	< DL	20.0
P	Meth_Blk	< DL	20.0
P	CCB	< DL	20.0
P	CCB	< DL	20.0
P	CCB	< DL	20.0
Pb	ICB	< DL	5.00
Pb	Meth_Blk	< DL	5.00
Pb	CCB	< DL	5.00
Pb	CCB	< DL	5.00
Pb	CCB	< DL	5.00
Se	ICB	< DL	15.0
Se	Meth_Blk	< DL	15.0
Se	CCB	< DL	15.0
Se	CCB	< DL	15.0
Se	CCB	< DL	15.0
Tl	ICB	< DL	10.0
Tl	Meth_Blk	< DL	10.0
Tl	CCB	< DL	10.0
Tl	CCB	< DL	10.0
Tl	CCB	< DL	10.0
V	ICB	< DL	1.00
V	Meth_Blk	< DL	1.00
V	CCB	< DL	1.00
V	CCB	< DL	1.00
V	CCB	< DL	1.00
Zn	ICB	< DL	3.00
Zn	Meth_Blk	3.39	3.00
Zn	CCB	< DL	3.00
Zn	CCB	< DL	3.00
Zn	CCB	< DL	3.00

ICB: Initial Calibration Blank CCB: Continuing Calibration Blank
*: Sample Media Blank (SM_Blk) concentration in µg/filter
Method Blank is in control if Method Blank results are <10% of sample results

QA/QC Report

Client Name: Mostardi Platt
Project Number: M050
Analytical Technique: ICP-OES
Instrument: Perkin Elmer Optima 8300
Sample Description: EPA Method 29 Back Half
Report Number: 23-351

Calibration QC

Analyte	Sample ID	Standard Conc. µg/L	Measured Conc. µg/L	Percent Recovery
Ag	ICV	2500.	2496.	99.8
Ag	LL-CCV	10.00	9.577	95.8
Ag	LL-LCS	9.000	8.402	93.4
Ag	CCV	2500.	2469.	98.8
Ag	CCV	2500.	2416.	96.6
Ag	CCV	2500.	2277.	91.1
Al	ICV	2500.	2555.	102.2
Al	LL-CCV	150.0	152.2	101.5
Al	LL-LCS	75.00	142.9	190.5
Al	CCV	2500.	2550.	102.0
Al	CCV	2500.	2511.	100.4
Al	CCV	2500.	2515.	100.6
As	ICV	2500.	2513.	100.5
As	LL-CCV	35.00	32.90	94.0
As	LL-LCS	20.00	17.68	88.4
As	CCV	2500.	2525.	101.0
As	CCV	2500.	2546.	101.8
As	CCV	2500.	2550.	102.0
Ba	ICV	2500.	2557.	102.3
Ba	LL-CCV	2.500	2.669	106.8
Ba	LL-LCS	1.500	1.598	106.5
Ba	CCV	2500.	2540.	101.6
Ba	CCV	2500.	2531.	101.2
Ba	CCV	2500.	2552.	102.1
Be	ICV	2500.	2527.	101.1
Be	LL-CCV	1.000	1.006	100.6
Be	LL-LCS	0.500	0.372	74.4
Be	CCV	2500.	2523.	100.9
Be	CCV	2500.	2509.	100.4
Be	CCV	2500.	2498.	99.9
Cr	ICV	2500.	2488.	99.5
Cr	LL-CCV	4.000	4.593	114.8
Cr	LL-LCS	2.000	1.992	99.6
Cr	CCV	2500.	2505.	100.2
Cr	CCV	2500.	2508.	100.3
Cr	CCV	2500.	2538.	101.5
Cu	ICV	2500.	2392.	95.7

ICV: Initial Calibration Verification CCV: Continuing Calibration Verification
Calibration Verification Limits: 90% - 110% Recovery
Low Level-CCV Limits: 60% - 140% Recovery
Low Level-LCS Limits: 50% - 150% Recovery
LL-LCS Limits are insignificant if sample results are >10X LL-LCS concentration

QA/QC Report

Client Name: Mostardi Platt
Project Number: M050
Analytical Technique: ICP-OES
Instrument: Perkin Elmer Optima 8300
Sample Description: EPA Method 29 Back Half
Report Number: 23-351

Calibration QC (continued)

Analyte	Sample ID	Standard Conc. µg/L	Measured Conc. µg/L	Percent Recovery
Cu	LL-CCV	25.00	27.31	109.2
Cu	LL-LCS	15.00	15.24	101.6
Cu	CCV	2500.	2416.	96.6
Cu	CCV	2500.	2416.	96.6
Cu	CCV	2500.	2457.	98.3
Mn	ICV	2500.	2566.	102.6
Mn	LL-CCV	1.500	1.721	114.7
Mn	LL-LCS	1.000	1.383	138.3
Mn	CCV	2500.	2586.	103.4
Mn	CCV	2500.	2586.	103.4
Mn	CCV	2500.	2621.	104.8
Ni	ICV	2500.	2443.	97.7
Ni	LL-CCV	15.00	15.68	104.5
Ni	LL-LCS	6.000	5.931	98.8
Ni	CCV	2500.	2450.	98.0
Ni	CCV	2500.	2456.	98.2
Ni	CCV	2500.	2461.	98.4
P	ICV	2500.	2527.	101.1
P	LL-CCV	100.0	105.7	105.7
P	LL-LCS	75.00	66.59	88.8
P	CCV	2500.	2510.	100.4
P	CCV	2500.	2462.	98.5
P	CCV	2500.	2460.	98.4
Pb	ICV	2500.	2455.	98.2
Pb	LL-CCV	25.00	26.88	107.5
Pb	LL-LCS	15.00	14.07	93.8
Pb	CCV	2500.	2415.	96.6
Pb	CCV	2500.	2418.	96.7
Pb	CCV	2500.	2415.	96.6
Se	ICV	2500.	2475.	99.0
Se	LL-CCV	75.00	81.05	108.1
Se	LL-LCS	30.00	32.14	107.1
Se	CCV	2500.	2460.	98.4
Se	CCV	2500.	2427.	97.1
Se	CCV	2500.	2400.	96.0
Tl	ICV	2500.	2472.	98.9
Tl	LL-CCV	50.00	53.14	106.3

ICV: Initial Calibration Verification CCV: Continuing Calibration Verification
Calibration Verification Limits: 90% - 110% Recovery
Low Level-CCV Limits: 60% - 140% Recovery
Low Level-LCS Limits: 50% - 150% Recovery
LL-LCS Limits are insignificant if sample results are >10X LL-LCS concentration

Client Name: Mostardi Platt
Project Number: M050
Analytical Technique: ICP-OES
Instrument: Perkin Elmer Optima 8300
Sample Description: EPA Method 29 Back Half
Report Number: 23-351

Calibration QC (continued)

Analyte	Sample ID	Standard Conc. µg/L	Measured Conc. µg/L	Percent Recovery
Tl	LL-LCS	30.00	29.80	99.3
Tl	CCV	2500.	2491.	99.6
Tl	CCV	2500.	2498.	99.9
Tl	CCV	2500.	2498.	99.9
V	ICV	2500.	2465.	98.6
V	LL-CCV	5.000	4.878	97.6
V	LL-LCS	3.000	2.567	85.6
V	CCV	2500.	2417.	96.7
V	CCV	2500.	2417.	96.7
V	CCV	2500.	2442.	97.7
Zn	ICV	2500.	2530.	101.2
Zn	LL-CCV	15.00	16.58	110.5
Zn	LL-LCS	6.000	8.323	138.7
Zn	CCV	2500.	2551.	102.0
Zn	CCV	2500.	2546.	101.8
Zn	CCV	2500.	2582.	103.3

ICV: Initial Calibration Verification CCV: Continuing Calibration Verification
Calibration Verification Limits: 90% - 110% Recovery
Low Level-CCV Limits: 60% - 140% Recovery
Low Level-LCS Limits: 50% - 150% Recovery
LL-LCS results are insignificant if sample results are >10x LL-LCS concentration

Replicate Data

Analyte	Sample ID	Sample Conc. µg/L	Replicate Conc. µg/L	RPD
Ag	23-S1835	5.17	4.54	13.0 *
Al	23-S1835	355.	362.	1.95
As	23-S1835	< 7	< 7	N/C *
Ba	23-S1835	28.3	28.4	0.11
Be	23-S1835	< 0.2	< 0.2	N/C *
Cr	23-S1835	80.0	80.6	0.73
Cu	23-S1835	116.	115.	0.78
Mn	23-S1835	84.4	84.8	0.50
Ni	23-S1835	115.	114.	0.79
P	23-S1835	123.	126.	1.93
Pb	23-S1835	< 5	< 5	N/C *
Se	23-S1835	74.3	82.9	10.9 *
Tl	23-S1835	< 10	< 10	N/C *

RPD = {(sample-replicate)/[(sample+replicate)/2]}x100
N/C: RPD is not calculated when sample or replicate is below detection limit
Replicate Limit: 20% RPD
*: per EPA CLP protocol, control limits do not apply if sample and/or replicate concentration is less than 5x the detection limit

QA/QC Report

Client Name: Mostardi Platt
Project Number: M050
Analytical Technique: ICP-OES
Instrument: Perkin Elmer Optima 8300
Sample Description: EPA Method 29 Back Half
Report Number: 23-351

Replicate Data (continued)

Analyte	Sample ID	Sample Conc. µg/L	Replicate Conc. µg/L	RPD
V	23-S1835	1.80	1.80	0.28 *
Zn	23-S1835	280.	266.	5.13

RPD = {(sample-replicate)/[(sample+replicate)/2]}x100
N/C: RPD is not calculated when sample or replicate is below detection limit
Replicate Limit: 20% RPD
*: per EPA CLP protocol, control limits do not apply if sample and/or replicate concentration is less than 5x the detection limit

Laboratory Control Sample/Matrix Post Spike Analysis

Analyte	Sample ID	Sample Conc. µg/L	Spike Conc. µg/L	Spike Amount µg/L	Percent Recovery
Ag	LCS	< 2	2285.	2500	91.4
Ag	LCS-Duplicate	< 2	2285.	2500	91.4
Ag	23-S1840	2.831	2214.	2500	88.4
Al	kv:LL-CCV	152.2	2566.	2500	96.6
Al	kv:LL-CCV	152.2	2395.	2500	89.7
Al	23-S1840	305.7	2536.	2500	89.2
As	LCS	< 7	2377.	2500	95.1
As	LCS-Duplicate	< 7	2403.	2500	96.1
As	23-S1840	< 7	2274.	2500	91.0
Ba	LCS	< 0.5	2462.	2500	98.5
Ba	LCS-Duplicate	< 0.5	2461.	2500	98.4
Ba	23-S1840	31.12	2373.	2500	93.7
Be	LCS	< 0.2	2398.	2500	95.9
Be	LCS-Duplicate	< 0.2	2449.	2500	98.0
Be	23-S1840	< 0.2	2290.	2500	91.6
Cr	LCS	< 0.8	2419.	2500	96.8
Cr	LCS-Duplicate	< 0.8	2428.	2500	97.1
Cr	23-S1840	32.21	2354.	2500	92.9
Cu	LCS	< 5	2322.	2500	92.9
Cu	LCS-Duplicate	< 5	2324.	2500	93.0
Cu	23-S1840	21.66	2253.	2500	89.3
Mn	LCS	< 0.3	2479.	2500	99.2
Mn	LCS-Duplicate	< 0.3	2488.	2500	99.5
Mn	23-S1840	221.1	2584.	2500	94.5
Ni	LCS	< 3	2352.	2500	94.1
Ni	LCS-Duplicate	< 3	2385.	2500	95.4

LCS Limit: 80% - 120% Recovery Spike Limit: 75% - 125% Recovery

Client Name: Mostardi Platt
Project Number: M050
Analytical Technique: ICP-OES
Instrument: Perkin Elmer Optima 8300
Sample Description: EPA Method 29 Back Half
Report Number: 23-351

Laboratory Control Sample/Matrix Post Spike Analysis (continued)

Analyte	Sample ID	Sample Conc. µg/L	Spike Conc. µg/L	Spike Amount µg/L	Percent Recovery
Ni	23-S1840	105.8	2362.	2500	90.2
P	LCS	< 20	2367.	2500	94.7
P	LCS-Duplicate	< 20	2382.	2500	95.3
P	23-S1840	140.6	2378.	2500	89.5
Pb	LCS	< 5	2314.	2500	92.6
Pb	LCS-Duplicate	< 5	2361.	2500	94.4
Pb	23-S1840	6.394	2208.	2500	88.1
Se	LCS	< 15	2385.	2500	95.4
Se	LCS-Duplicate	< 15	2420.	2500	96.8
Se	23-S1840	< 15	2238.	2500	89.5
Tl	LCS	< 10	2354.	2500	94.2
Tl	LCS-Duplicate	< 10	2395.	2500	95.8
Tl	23-S1840	< 10	2233.	2500	89.3
V	LCS	< 1	2366.	2500	94.6
V	LCS-Duplicate	< 1	2423.	2500	96.9
V	23-S1840	1.165	2313.	2500	92.5
Zn	LCS	3.387	2414.	2500	96.4
Zn	LCS-Duplicate	3.387	2452.	2500	97.9
Zn	23-S1840	190.1	2477.	2500	91.5

LCS Limit: 80% - 120% Recovery Spike Limit: 75% - 125% Recovery

LCS Duplicate Data

Analyte	Sample ID	Original Conc. µg/L	Replicate Conc. µg/L	RPD
Ag	LCS-Duplicate	2285.	2285.	0.00
Al	LCS-Duplicate	2566.	2395.	6.89
As	LCS-Duplicate	2377.	2403.	1.09
Ba	LCS-Duplicate	2462.	2461.	0.04
Be	LCS-Duplicate	2398.	2449.	2.10
Cr	LCS-Duplicate	2419.	2428.	0.37
Cu	LCS-Duplicate	2322.	2324.	0.09
Mn	LCS-Duplicate	2479.	2488.	0.36
Ni	LCS-Duplicate	2352.	2385.	1.39
P	LCS-Duplicate	2367.	2382.	0.63
Pb	LCS-Duplicate	2314.	2361.	2.01
Se	LCS-Duplicate	2385.	2420.	1.46
Tl	LCS-Duplicate	2354.	2395.	1.73
V	LCS-Duplicate	2366.	2423.	2.38
Zn	LCS-Duplicate	2414.	2452.	1.56

RPD = {(sample-duplicate)/[(sample+duplicate)/2]}x100 Duplicate Limit: 20% RPD

QA/QC Report

Client Name: Mostardi Platt
Project Number: M050
Analytical Technique: ICP-MS
Instrument: Agilent 7850
Sample Description: EPA Method 29 Back Half
Report Number: 23-351

Blank Data

Analyte	Sample ID	Measured Conc. µg/L	DL Conc. µg/L
Cd	ICB	< DL	0.020
Cd	Meth_Blk	< 0.2	0.020
Cd	CCB	< DL	0.020
Cd	CCB	< DL	0.020
Cd	CCB	< DL	0.020
Co	ICB	< DL	0.050
Co	Meth_Blk	1.51	0.050
Co	CCB	< DL	0.050
Co	CCB	< DL	0.050
Co	CCB	< DL	0.050
Sb	ICB	< DL	0.400
Sb	Meth_Blk	< 4	0.400
Sb	CCB	< DL	0.400
Sb	CCB	< DL	0.400
Sb	CCB	< DL	0.400

ICB: Initial Calibration Blank CCB: Continuing Calibration Blank
*: Sample Media Blank (SM_Blk) concentration in µg/filter
Method Blank is in control if Method Blank results are <10% of sample results

Calibration QC

Analyte	Sample ID	Standard Conc. µg/L	Measured Conc. µg/L	Percent Recovery
Cd	ICV	100.0	98.99	99.0
Cd	LL-LCS	1.500	1.393	92.9
Cd	CCV	100.0	97.69	97.7
Cd	CCV	100.0	96.14	96.1
Cd	CCV	100.0	96.66	96.7
Co	ICV	100.0	99.22	99.2
Co	LL-LCS	1.500	2.933	195.5
Co	CCV	100.0	98.79	98.8
Co	CCV	100.0	97.70	97.7
Co	CCV	100.0	99.13	99.1
Sb	ICV	100.0	99.17	99.2
Sb	LL-LCS	15.00	13.90	92.7
Sb	CCV	100.0	97.78	97.8
Sb	CCV	100.0	95.90	95.9

ICV: Initial Calibration Verification CCV: Continuing Calibration Verification
Calibration Verification Limits: 90% - 110% Recovery
Low Level-CCV Limits: 60% - 140% Recovery
Low Level-LCS Limits: 50% - 150% Recovery
LL-LCS results are insignificant if sample results are >10x LL-LCS concentration

Client Name: Mostardi Platt
Project Number: M050
Analytical Technique: ICP-MS
Instrument: Agilent 7850
Sample Description: EPA Method 29 Back Half
Report Number: 23-351

Calibration QC (continued)

Analyte	Sample ID	Standard Conc. µg/L	Measured Conc. µg/L	Percent Recovery
Sb	CCV	100.0	94.52	94.5

ICV: Initial Calibration Verification CCV: Continuing Calibration Verification
Calibration Verification Limits: 90% - 110% Recovery
Low Level-CCV Limits: 60% - 140% Recovery
Low Level-LCS Limits: 50% - 150% Recovery
LL-LCS results are insignificant if sample results are >10x LL-LCS concentration

Replicate Data

Analyte	Sample ID	Sample Conc. µg/L	Replicate Conc. µg/L	RPD
Cd	23-S1835	2.63	2.44	7.45
Co	23-S1835	3.64	3.55	2.53
Sb	23-S1835	< 4	< 4	N/C *

RPD = {(sample-replicate)/[(sample+replicate)/2]}x100
N/C: RPD is not calculated when sample or replicate is below detection limit
Replicate Limit: 20% RPD
*: per EPA CLP protocol, control limits do not apply if sample and/or replicate concentration is less than 5x the detection limit

Laboratory Control Sample/Matrix Post Spike Analysis

Analyte	Sample ID	Sample Conc. µg/L	Spike Conc. µg/L	Spike Amount µg/L	Percent Recovery
Cd	LCS	< 0.2	2422.	2500	96.9
Cd	LCS-Duplicate	< 0.2	2415.	2500	96.6
Cd	23-S1840	2.380	912.9	1000	91.1
Co	LCS	1.506	2430.	2500	97.1
Co	LCS-Duplicate	1.506	2455.	2500	98.1
Co	23-S1840	4.348	929.6	1000	92.5
Sb	LCS	< 4	2404.	2500	96.2
Sb	LCS-Duplicate	< 4	2338.	2500	93.5
Sb	23-S1840	< 4	916.5	1000	91.6

LCS Limit: 80% - 120% Recovery Spike Limit: 75% - 125% Recovery

LCS Duplicate Data

Analyte	Sample ID	Original Conc. µg/L	Replicate Conc. µg/L	RPD
Cd	LCS-Duplicate	2422.	2415.	0.29
Co	LCS-Duplicate	2430.	2455.	1.02
Sb	LCS-Duplicate	2404.	2338.	2.78

RPD = {(sample-duplicate)/[(sample+duplicate)/2]}x100 Duplicate Limit: 20% RPD

QA/QC Report

Client Name: Mostardi Platt
Project Number: M050
Analytical Technique: Cold Vapor Atomic Absorption
Instrument: Nippon 3320A CVAA
Sample Description: EPA Method 29
Report Number: 23-351

Blank Data

Analyte	Sample ID	Measured Conc. µg/L	DL Conc. µg/L
Hg	ICB	< DL	0.007
Hg	MB_FH	< DL	0.007
Hg	CCB	< DL	0.007
Hg	CCB	< DL	0.007
Hg	CCB	< DL	0.007
Hg	CCB	< DL	0.007
Hg	CCB	< DL	0.007
Hg	CCB	< DL	0.007

ICB: Initial Calibration Blank CCB: Continuing Calibration Blank
*: Sample Media Blank (SM_Blk) concentration in µg/filter
Method Blank is in control if Method Blank results are <10% of sample results

Calibration QC

Analyte	Sample ID	Standard Conc. µg/L	Measured Conc. µg/L	Percent Recovery
Hg	ICV	5.00	5.06	101.1
Hg	LL-LCS	0.020	0.023	115.0
Hg	LL-LCS	0.020	0.021	105.0
Hg	CCV	5.00	5.06	101.2
Hg	CCV	5.00	5.13	102.6
Hg	CCV	5.00	5.05	101.0
Hg	CCV	5.00	5.10	102.0
Hg	CCV	5.00	5.18	103.7
Hg	CCV	5.00	5.14	102.8

ICV: Initial Calibration Verification CCV: Continuing Calibration Verification
Calibration Verification Limits: 90% - 110% Recovery
Low Level-LCS Limits: 50% - 150% Recovery
LL-LCS results are insignificant if sample results are >10x LL-LCS concentration

Duplicate Data

All samples analyzed in duplicate. The reported concentrations are the average of the two measurements.

Laboratory Control Sample/Matrix Spike Analysis

Analyte	Sample ID	Sample Conc. µg/L	Spike Conc. µg/L	Spike Amount µg/L	Percent Recovery
Hg	23-S1343	< 0.007	5.03	5.00	101.

LCS Limit: 80% - 120% Recovery Spike Limit: 75% - 125% Recovery

QA/QC Report

Client Name: Mostardi Platt
Project Number: M050
Analytical Technique: Cold Vapor Atomic Absorption
Instrument: Nippon 3320A CVAA
Sample Description: EPA Method 29
Report Number: 23-351

Blank Data

Analyte	Sample ID	Measured Conc. µg/L	DL Conc. µg/L
Hg	ICB	< DL	0.007
Hg	CCB	< DL	0.007
Hg	CCB	< DL	0.007
Hg	CCB	< DL	0.007
Hg	CCB	< DL	0.007
Hg	CCB	< DL	0.007
Hg	CCB	< DL	0.007

ICB: Initial Calibration Blank CCB: Continuing Calibration Blank
*: Sample Media Blank (SM_Blk) concentration in µg/filter
Method Blank is in control if Method Blank results are <10% of sample results

Calibration QC

Analyte	Sample ID	Standard Conc. µg/L	Measured Conc. µg/L	Percent Recovery
Hg	ICV	5.00	5.23	104.6
Hg	LL-LCS	0.020	0.022	110.0
Hg	CCV	5.00	5.40	108.0
Hg	CCV	5.00	5.21	104.3
Hg	CCV	5.00	5.22	104.3
Hg	CCV	5.00	5.19	103.7
Hg	CCV	5.00	5.19	103.8
Hg	CCV	5.00	5.16	103.2

ICV: Initial Calibration Verification CCV: Continuing Calibration Verification
Calibration Verification Limits: 90% - 110% Recovery
Low Level-LCS Limits: 50% - 150% Recovery
LL-LCS results are insignificant if sample results are >10x LL-LCS concentration

Duplicate Data

All samples analyzed in duplicate. The reported concentrations are the average of the two measurements.

Laboratory Control Sample/Matrix Spike Analysis

Analyte	Sample ID	Sample Conc. µg/L	Spike Conc. µg/L	Spike Amount µg/L	Percent Recovery
Hg	23-S1840	0.087	5.28	5.00	104.
Hg	23-S1880	0.133	5.24	5.00	102.

LCS Limit: 80% - 120% Recovery Spike Limit: 75% - 125% Recovery

QA/QC Report

Client Name: Mostardi Platt
Project Number: M050
Analytical Technique: Cold Vapor Atomic Absorption
Instrument: Nippon 3320A CVAA
Sample Description: EPA Method 29
Report Number: 23-351

Blank Data

Analyte	Sample ID	Measured Conc. µg/L	DL Conc. µg/L
Hg	ICB	< DL	0.007
Hg	CCB	< DL	0.007
Hg	CCB	< DL	0.007
Hg	CCB	< DL	0.007
Hg	CCB	< DL	0.007
Hg	CCB	< DL	0.007

ICB: Initial Calibration Blank CCB: Continuing Calibration Blank
*: Sample Media Blank (SM_Blk) concentration in µg/filter
Method Blank is in control if Method Blank results are <10% of sample results

Calibration QC

Analyte	Sample ID	Standard Conc. µg/L	Measured Conc. µg/L	Percent Recovery
Hg	ICV	5.00	5.08	101.7
Hg	LL-LCS	0.020	0.018	90.0
Hg	CCV	5.00	5.02	100.5
Hg	CCV	5.00	5.02	100.4
Hg	CCV	5.00	5.05	101.0
Hg	CCV	5.00	5.22	104.3
Hg	CCV	5.00	5.05	101.0

ICV: Initial Calibration Verification CCV: Continuing Calibration Verification
Calibration Verification Limits: 90% - 110% Recovery
Low Level-LCS Limits: 50% - 150% Recovery
LL-LCS results are insignificant if sample results are >10x LL-LCS concentration

Duplicate Data

All samples analyzed in duplicate. The reported concentrations are the average of the two measurements.

QA/QC Report

Client Name: Mostardi Platt
Project Number: M050
Analytical Technique: Cold Vapor Atomic Absorption
Instrument: Nippon 3320A CVAA
Sample Description: EPA Method 29
Report Number: 23-351

Blank Data

Analyte	Sample ID	Measured Conc. µg/L	DL Conc. µg/L
Hg	ICB	< DL	0.007
Hg	CCB	< DL	0.007
Hg	CCB	< DL	0.007
Hg	CCB	< DL	0.007

ICB: Initial Calibration Blank CCB: Continuing Calibration Blank
*: Sample Media Blank (SM_Blk) concentration in µg/filter
Method Blank is in control if Method Blank results are <10% of sample results

Calibration QC

Analyte	Sample ID	Standard Conc. µg/L	Measured Conc. µg/L	Percent Recovery
Hg	ICV	5.00	5.09	101.7
Hg	LL-LCS	0.020	0.023	115.0
Hg	CCV	5.00	5.07	101.4
Hg	CCV	5.00	5.06	101.1
Hg	CCV	5.00	5.06	101.3

ICV: Initial Calibration Verification CCV: Continuing Calibration Verification
Calibration Verification Limits: 90% - 110% Recovery
Low Level-LCS Limits: 50% - 150% Recovery
LL-LCS results are insignificant if sample results are >10x LL-LCS concentration

Duplicate Data

All samples analyzed in duplicate. The reported concentrations are the average of the two measurements.

Laboratory Control Sample/Matrix Spike Analysis

Analyte	Sample ID	Sample Conc. µg/L	Spike Conc. µg/L	Spike Amount µg/L	Percent Recovery
Hg	23-S1872	0.075	5.20	5.00	103.

LCS Limit: 80% - 120% Recovery Spike Limit: 75% - 125% Recovery

QA/QC Report

Client Name: Mostardi Platt
Project Number: M050
Analytical Technique: Cold Vapor Atomic Absorption
Instrument: Nippon 3320A CVAA
Sample Description: EPA Method 29
Report Number: 23-351

Blank Data

Analyte	Sample ID	Measured Conc. µg/L	DL Conc. µg/L
Hg	ICB	< DL	0.007
Hg	CCB	< DL	0.007
Hg	CCB	< DL	0.007

ICB: Initial Calibration Blank CCB: Continuing Calibration Blank
*: Sample Media Blank (SM_Blk) concentration in µg/filter
Method Blank is in control if Method Blank results are <10% of sample results

Calibration QC

Analyte	Sample ID	Standard Conc. µg/L	Measured Conc. µg/L	Percent Recovery
Hg	ICV	5.00	5.08	101.7
Hg	LL-LCS	0.020	0.018	90.0
Hg	CCV	5.00	5.16	103.1
Hg	CCV	5.00	5.15	103.0

ICV: Initial Calibration Verification CCV: Continuing Calibration Verification
Calibration Verification Limits: 90% - 110% Recovery
Low Level-LCS Limits: 50% - 150% Recovery
LL-LCS results are insignificant if sample results are >10x LL-LCS concentration

Duplicate Data

All samples analyzed in duplicate. The reported concentrations are the average of the two measurements.

Laboratory Control Sample/Matrix Spike Analysis

Analyte	Sample ID	Sample Conc. µg/L	Spike Conc. µg/L	Spike Amount µg/L	Percent Recovery
Hg	23-S1907	0.075	5.13	5.00	101.

LCS Limit: 80% - 120% Recovery Spike Limit: 75% - 125% Recovery

QA/QC Report

Client Name: Mostardi Platt
Project Number: M050
Analytical Technique: Cold Vapor Atomic Absorption
Instrument: Nippon 3320A CVAA
Sample Description: EPA Method 29
Report Number: 23-351

Blank Data

Analyte	Sample ID	Measured Conc. µg/L	DL Conc. µg/L
Hg	ICB	< DL	0.007
Hg	CCB	< DL	0.007
Hg	CCB	< DL	0.007
Hg	CCB	< DL	0.007

ICB: Initial Calibration Blank CCB: Continuing Calibration Blank
*: Sample Media Blank (SM_Blk) concentration in µg/filter
Method Blank is in control if Method Blank results are <10% of sample results

Calibration QC

Analyte	Sample ID	Standard Conc. µg/L	Measured Conc. µg/L	Percent Recovery
Hg	ICV	5.00	5.05	101.0
Hg	LL-LCS	0.020	0.021	105.0
Hg	CCV	5.00	4.97	99.4
Hg	CCV	5.00	4.94	98.8
Hg	CCV	5.00	4.97	99.4

ICV: Initial Calibration Verification CCV: Continuing Calibration Verification
Calibration Verification Limits: 90% - 110% Recovery
Low Level-LCS Limits: 50% - 150% Recovery
LL-LCS results are insignificant if sample results are >10x LL-LCS concentration

Duplicate Data

All samples analyzed in duplicate. The reported concentrations are the average of the two measurements.

Laboratory Control Sample/Matrix Spike Analysis

Analyte	Sample ID	Sample Conc. µg/L	Spike Conc. µg/L	Spike Amount µg/L	Percent Recovery
Hg	23-S1886	< 0.007	4.99	5.00	99.8

LCS Limit: 80% - 120% Recovery Spike Limit: 75% - 125% Recovery

QA/QC Report

Client Name: Mostardi Platt
Project Number: M050
Analytical Technique: Cold Vapor Atomic Absorption
Instrument: Nippon 3320A CVAA
Sample Description: EPA Method 29
Report Number: 23-351

Blank Data

Analyte	Sample ID	Measured Conc. µg/L	DL Conc. µg/L
Hg	ICB	< DL	0.007
Hg	CCB	< DL	0.007
Hg	CCB	< DL	0.007

ICB: Initial Calibration Blank CCB: Continuing Calibration Blank
*: Sample Media Blank (SM_Blk) concentration in µg/filter
Method Blank is in control if Method Blank results are <10% of sample results

Calibration QC

Analyte	Sample ID	Standard Conc. µg/L	Measured Conc. µg/L	Percent Recovery
Hg	ICV	5.00	5.01	100.3
Hg	LL-LCS	0.020	0.021	105.0
Hg	CCV	5.00	5.07	101.5
Hg	CCV	5.00	5.07	101.4

ICV: Initial Calibration Verification CCV: Continuing Calibration Verification
Calibration Verification Limits: 90% - 110% Recovery
Low Level-LCS Limits: 50% - 150% Recovery
LL-LCS results are insignificant if sample results are >10x LL-LCS concentration

Duplicate Data

All samples analyzed in duplicate. The reported concentrations are the average of the two measurements.

Laboratory Control Sample/Matrix Spike Analysis

Analyte	Sample ID	Sample Conc. µg/L	Spike Conc. µg/L	Spike Amount µg/L	Percent Recovery
Hg	23-S1838	0.037	5.10	5.00	101.

LCS Limit: 80% - 120% Recovery Spike Limit: 75% - 125% Recovery

QA/QC Report

Client Name: Mostardi Platt
Project Number: M050
Analytical Technique: Cold Vapor Atomic Absorption
Instrument: Nippon 3320A CVAA
Sample Description: EPA Method 29
Report Number: 23-351

Blank Data

Analyte	Sample ID	Measured Conc. µg/L	DL Conc. µg/L
Hg	ICB	< DL	0.007
Hg	CCB	< DL	0.007
Hg	CCB	< DL	0.007
Hg	CCB	< DL	0.007

ICB: Initial Calibration Blank CCB: Continuing Calibration Blank
*: Sample Media Blank (SM_Blk) concentration in µg/filter
Method Blank is in control if Method Blank results are <10% of sample results

Calibration QC

Analyte	Sample ID	Standard Conc. µg/L	Measured Conc. µg/L	Percent Recovery
Hg	ICV	5.00	5.33	106.6
Hg	LL-LCS	0.020	0.024	120.0
Hg	CCV	5.00	5.27	105.4
Hg	CCV	5.00	5.31	106.2
Hg	CCV	5.00	5.20	104.0

ICV: Initial Calibration Verification CCV: Continuing Calibration Verification
Calibration Verification Limits: 90% - 110% Recovery
Low Level-LCS Limits: 50% - 150% Recovery
LL-LCS results are insignificant if sample results are >10x LL-LCS concentration

Duplicate Data

All samples analyzed in duplicate. The reported concentrations are the average of the two measurements.

Laboratory Control Sample/Matrix Spike Analysis

Analyte	Sample ID	Sample Conc. µg/L	Spike Conc. µg/L	Spike Amount µg/L	Percent Recovery
Hg	23-S1888	0.019	5.31	5.00	106.

LCS Limit: 80% - 120% Recovery Spike Limit: 75% - 125% Recovery

QA/QC Report

Client Name: Mostardi Platt
Project Number: M050
Analytical Technique: Cold Vapor Atomic Absorption
Instrument: Nippon 3320A CVAA
Sample Description: EPA Method 29
Report Number: 23-351

Blank Data

Analyte	Sample ID	Measured Conc. µg/L	DL Conc. µg/L
Hg	ICB	< DL	0.007
Hg	MB_FH	< DL	0.007
Hg	CCB	< DL	0.007
Hg	CCB	< DL	0.007

ICB: Initial Calibration Blank CCB: Continuing Calibration Blank
*: Sample Media Blank (SM_Blk) concentration in µg/filter
Method Blank is in control if Method Blank results are <10% of sample results

Calibration QC

Analyte	Sample ID	Standard Conc. µg/L	Measured Conc. µg/L	Percent Recovery
Hg	ICV	5.00	5.03	100.5
Hg	LL-LCS	0.020	0.014	70.0
Hg	CCV	5.00	5.08	101.5
Hg	CCV	5.00	5.08	101.7

ICV: Initial Calibration Verification CCV: Continuing Calibration Verification
Calibration Verification Limits: 90% - 110% Recovery
Low Level-LCS Limits: 50% - 150% Recovery
LL-LCS results are insignificant if sample results are >10x LL-LCS concentration

Duplicate Data

All samples analyzed in duplicate. The reported concentrations are the average of the two measurements.

Laboratory Control Sample/Matrix Spike Analysis

Analyte	Sample ID	Sample Conc. µg/L	Spike Conc. µg/L	Spike Amount µg/L	Percent Recovery
Hg	LCS	< 0.007	4.61	5.00	92.2
Hg	LCS-Duplicate	< 0.007	4.58	5.00	91.6
Hg	23-S1834	< 0.007	5.11	5.00	102.

LCS Limit: 80% - 120% Recovery Spike Limit: 75% - 125% Recovery

LCS Duplicate Data

Analyte	Sample ID	Original Conc. µg/L	Replicate Conc. µg/L	RPD
Hg	LCS-Duplicate	4.61	4.58	0.70

RPD = {(sample-duplicate)/[(sample+duplicate)/2]}x100 Duplicate Limit: 20% RPD

QA/QC Report

Client Name: Mostardi Platt
Project Number: M050
Analytical Technique: Cold Vapor Atomic Absorption
Instrument: Nippon 3320A CVAA
Sample Description: EPA Method 29
Report Number: 23-351

Blank Data

Analyte	Sample ID	Measured Conc. µg/L	DL Conc. µg/L
Hg	ICB	< DL	0.007
Hg	CCB	< DL	0.007
Hg	CCB	< DL	0.007
Hg	CCB	< DL	0.007

ICB: Initial Calibration Blank CCB: Continuing Calibration Blank
*: Sample Media Blank (SM_Blk) concentration in µg/filter
Method Blank is in control if Method Blank results are <10% of sample results

Calibration QC

Analyte	Sample ID	Standard Conc. µg/L	Measured Conc. µg/L	Percent Recovery
Hg	ICV	5.00	5.05	100.9
Hg	LL-LCS	0.020	< 0.007	N/C
Hg	CCV	5.00	5.06	101.2
Hg	CCV	5.00	5.06	101.3
Hg	CCV	5.00	5.39	107.8

ICV: Initial Calibration Verification CCV: Continuing Calibration Verification
Calibration Verification Limits: 90% - 110% Recovery
Low Level-LCS Limits: 50% - 150% Recovery
LL-LCS results are insignificant if sample results are >10x LL-LCS concentration

Duplicate Data

All samples analyzed in duplicate. The reported concentrations are the average of the two measurements.

Laboratory Control Sample/Matrix Spike Analysis

Analyte	Sample ID	Sample Conc. µg/L	Spike Conc. µg/L	Spike Amount µg/L	Percent Recovery
Hg	23-S1874	< 0.007	5.17	5.00	103.

LCS Limit: 80% - 120% Recovery Spike Limit: 75% - 125% Recovery

QA/QC Report

Client Name: Mostardi Platt
Project Number: M050
Analytical Technique: Ion Chromatography-PCR
Instrument: Aquion Cr VI IC (1)
Sample Description: SW-846 Method 0061
Report Number: 23-351

Blank Data

Analyte	Sample ID	Measured Conc. µg/L	DL Conc. µg/L
Cr VI	ICB	< DL	0.010
Cr VI	CCB	< DL	0.010
Cr VI	CCB	< DL	0.010
Cr VI	CCB	< DL	0.010
Cr VI	CCB	< DL	0.010

ICB: Initial Calibration Blank CCB: Continuing Calibration Blank

Calibration QC

Analyte	Sample ID	Standard Conc. µg/L	Measured Conc. µg/L	Percent Recovery
Cr VI	ICV	0.500	0.529	105.8
Cr VI	LL-LCS	0.030	0.048	160.0
Cr VI	CCV	0.500	0.527	105.4
Cr VI	CCV	0.500	0.528	105.6
Cr VI	CCV	0.500	0.537	107.4
Cr VI	CCV	0.500	0.533	106.6

ICV: Initial Calibration Verification CCV: Continuing Calibration Verification
Calibration Verification Limits: 90% - 110% Recovery
Low Level-LCS Limits: 50% - 150% Recovery
LL-LCS results are insignificant if sample results are >10x LL-LCS concentration

Duplicate Data

Analyte	Sample ID	Sample Conc. µg/L	Duplicate Conc. µg/L	RPD
Cr VI	23-S1930	261.	266.	1.71

RPD = {(sample-duplicate)/[(sample+duplicate)/2]}x100 Duplicate Limit: 20% RPD
N/C: RPD is not calculated when sample or duplicate is below detection limit
*: per EPA CLP protocol, control limits do not apply if sample and/or duplicate concentration is less than 5x the detection limit

Laboratory Control Sample/Matrix Spike Analysis

Analyte	Sample ID	Sample Conc. µg/L	Spike Conc. µg/L	Spike Amount µg/L	Percent Recovery
Cr VI	23-S1931	348.	620.	250.	109.

LCS Limit: 80% - 120% Recovery Spike Limit: 75% - 125% Recovery
*: per EPA CLP protocol, control limits do not apply if spike concentration is less than 25% of the sample concentration

CHESTER LABNET

SOURCE SAMPLE RECEIPT CHECKLIST

Client	Mostardi Platt	Date	6/30/2023
# Runs	18 + blanks	Report #	23-351

Package intact?	hand delivered	
Chain-of-Custody form inspected	✓	
CoC present with samples?	✓	
CoC indicates analytical methodology to be used? (eg M29, etc.)	EPA 29, 0061	!!
Has CoC been signed by client?	No	
Custody release date and time noted on CoC?	✓	
All sample containers inspected	✓	
Does number of samples match number on CoC form?	✓	!!
Do all sample ID numbers match those on the CoC form?	✓	!!
Did client mark sample volumes prior to shipment?	No	
Sample temperature recorded?	✓ for 0061	
Are the sample containers intact?	✓	!!
If present, Audit Sample intact?	n/a	!!
Are signs of leakage present?	No	*
Chain-of-Custody form signed and dated by CLN	✓	
Corrective actions		
Client contacted due to mismatching sample ID numbers	—	
Client contacted due to broken sample container(s)	—	
Client contacted due to leaking sample container(s)	—	
Client contacted for verification of methodology?	✓	
Corrective actions documented?	✓	
Corrective actions accomplished?	✓	

Items marked !! shall be addressed ***prior to any analytical work being started****.*
*Items marked * shall be* ***noted in case narrative*** *upon reporting of results to client.*

Signed PAD

Notes Called Eric to confirm analytes. CrVI only for 0061 samples. Cu should be on M29 list of metals.

Chain-of-Custody Form						
Project Number: M232604			Date Results Required:			
Client: PCC Structurals			TAT Required:			
Plant/Test Location: LPC – Milwaukie, OR			Project Supervisor: EE			
Sample Number	Sample Date	Sample Point Identification	# of Conts	Sub Lab	Analysis Required	Volume, mls
001	6/27/23	9203 North Inlet #1 M29 – Filter and 0.1N HNO3 probe wash	2		M29*	
002	6/27/23	9203 North Inlet #1 M29 – HNO3/H2O2 imps, 0.1N Rinse of empty imp, KMnO4/H2SO4 Imps, HCl Rinse	4		M29*	
003	6/30/23	9203 North Inlet #2 M29 – Filter and 0.1N HNO3 probe wash	2		M29*	
004	6/30/23	9203 North Inlet #2 M29 – HNO3/H2O2 imps, 0.1N Rinse of empty imp, KMnO4/H2SO4 Imps, HCl Rinse	4		M29*	
005	6/27/23	9203 Center Inlet #1 M29 – Filter and 0.1N HNO3 probe wash	2		M29*	
006	6/27/23	9203 Center Inlet #1 M29 – HNO3/H2O2 imps, 0.1N Rinse of empty imp, KMnO4/H2SO4 Imps, HCl Rinse	4		M29*	
007	6/30/23	9203 Center Inlet #2 M29 – Filter and 0.1N HNO3 probe wash	2		M29*	
008	6/30/23	9203 Center Inlet #2 M29 – HNO3/H2O2 imps, 0.1N Rinse of empty imp, KMnO4/H2SO4 Imps, HCl Rinse	4		M29*	
009	6/27/23	9203 South Inlet #1 M29 – Filter and 0.1N HNO3 probe wash	2		M29*	
010	6/27/23	9203 South Inlet #1 M29 – HNO3/H2O2 imps, 0.1N Rinse of empty imp, KMnO4/H2SO4 Imps, HCl Rinse	4		M29*	
011	6/30/23	9203 South Inlet #2 M29 – Filter and 0.1N HNO3 probe wash	2		M29*	
012	6/30/23	9203 South Inlet #2 M29 – HNO3/H2O2 imps, 0.1N Rinse of empty imp, KMnO4/H2SO4 Imps, HCl Rinse	4		M29*	
013	6/27/23	9203 North Outlet #1 M29 – Filter and 0.1N HNO3 probe wash	2		M29*	

014	6/27/23	9203 North Outlet #1 M29 – HNO3/H2O2 imps, 0.1N Rinse of empty imp, KMnO4/H2SO4 Imps, HCl Rinse	4		M29*	
015	6/30/23	9203 North Outlet #2 M29 – Filter and 0.1N HNO3 probe wash	2		M29*	
016	6/30/23	9203 North Outlet #2 M29 – HNO3/H2O2 imps, 0.1N Rinse of empty imp, KMnO4/H2SO4 Imps, HCl Rinse	4		M29*	
017	6/27/23	9203 South Outlet #1 M29 – Filter and 0.1N HNO3 probe wash	2		M29*	
018	6/27/23	9203 South Outlet #1 M29 – HNO3/H2O2 imps, 0.1N Rinse of empty imp, KMnO4/H2SO4 Imps, HCl Rinse	4		M29*	
019	6/30/23	9203 South Outlet #2 M29 – Filter and 0.1N HNO3 probe wash	2		M29*	
020	6/30/23	9203 South Outlet #2 M29 – HNO3/H2O2 imps, 0.1N Rinse of empty imp, KMnO4/H2SO4 Imps, HCl Rinse	4		M29*	
021	6/28/23	9256 Inlet #1 M29 – Filter and 0.1N HNO3 probe wash	2		M29*	
022	6/28/23	9256 Inlet #1 M29 – HNO3/H2O2 imps, 0.1N Rinse of empty imp, KMnO4/H2SO4 Imps, HCl Rinse	4		M29*	
023	6/29/23	9256 Inlet #2 M29 – Filter and 0.1N HNO3 probe wash	2		M29*	
024	6/29/23	9256 Outlet #2 M29 – HNO3/H2O2 imps, 0.1N Rinse of empty imp, KMnO4/H2SO4 Imps, HCl Rinse	4		M29*	
025	6/28/23	9256 Outlet #1 M29 – Filter and 0.1N HNO3 probe wash	2		M29*	
026	6/28/23	9256 Outlet #1 M29 – HNO3/H2O2 imps, 0.1N Rinse of empty imp, KMnO4/H2SO4 Imps, HCl Rinse	4		M29*	
027	6/29/23	9256 Outlet #2 M29 – Filter and 0.1N HNO3 probe wash	2		M29*	
028	6/29/23	9256 Outlet #2 M29 – HNO3/H2O2 imps, 0.1N Rinse of empty imp, KMnO4/H2SO4 Imps, HCl Rinse	4		M29*	
029	6/28/23	8901 Inlet #1 M29 – Filter and 0.1N HNO3 probe wash	2		M29*	

030	6/28/23	8901 Inlet #1 M29 – HNO3/H2O2 imps, 0.1N Rinse of empty imp, KMnO4/H2SO4 Imps, HCl Rinse	4		M29*	
031	6/29/23	8901 Inlet #2 M29 – Filter and 0.1N HNO3 probe wash	2		M29*	
032	6/29/23	8901 Outlet #2 M29 – HNO3/H2O2 imps, 0.1N Rinse of empty imp, KMnO4/H2SO4 Imps, HCl Rinse	4		M29*	
033	6/28/23	8901 Outlet #1 M29 – Filter and 0.1N HNO3 probe wash	2		M29*	
034	6/28/23	8901 Outlet #1 M29 – HNO3/H2O2 imps, 0.1N Rinse of empty imp, KMnO4/H2SO4 Imps, HCl Rinse	4		M29*	
035	6/29/23	8901 Outlet #2 M29 – Filter and 0.1N HNO3 probe wash	2		M29*	
036	6/29/23	8901 Outlet #2 M29 – HNO3/H2O2 imps, 0.1N Rinse of empty imp, KMnO4/H2SO4 Imps, HCl Rinse	4		M29*	
037	6/27/23	9203 North Inlet #1 0061 0.5M KOH	1		0061 23-5	1930
038	6/30/23	9203 North Inlet #2 0061 0.5M KOH	1		0061	1931
039	6/27/23	9203 Center Inlet #1 0061 0.5M KOH	1		0061	1932
040	6/30/23	9203 Center Inlet #2 0061 0.5M KOH	1		0061	1933
041	6/27/23	9203 South Inlet #1 0061 0.5M KOH	1		0061	1934
042	6/30/23	9203 South Inlet #2 0061 0.5M KOH	1		0061	1935
043	6/27/23	9203 North Outlet #1 0061 0.5M KOH	1		0061	1936
044	6/30/23	9203 North Outlet #2 0061 0.5M KOH	1		0061	1937
045	6/27/23	9203 South Outlet #1 0061 0.5M KOH	1		0061	1938
046	6/30/23	9203 South Outlet #2 0061 0.5M KOH	1		0061	1939
047	6/28/23	9256 Inlet #1 0061 0.5M KOH	1		0061	1940
048	6/29/23	9256 Inlet #2 0061 0.5M KOH	1		0061	1941
049	6/28/23	9256 Outlet #1 0061 0.5M KOH	1		0061	1942
050	6/29/23	9256 Outlet #2 0061 0.5M KOH	1		0061	1943
051	6/28/23	8901 Inlet #1 0061 0.5M KOH	1		0061	1944
052	6/29/23	8901 Inlet #2 0061 0.5M KOH	1		0061	1945

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053	6/28/23	8901 Outlet #1 0061 0.5M KOH	1		0061	23-S1946
054	6/29/23	8901 Outlet #2 0061 0.5M OKH	1		0061	1947
055	6/30/23	0.1N HNO3 Reagent Blank	1		M29*	
056	6/30/23	DI Water Reagent Blank	1		M29*	
057	6/30/23	HNO3/H2O2 Reagent Blank	1		M29*	
058	6/30/23	KMnO4/H2SO4 Reagent Blank	1		M29*	
059	6/30/23	8N HCl Reagent Blank	1		M29*	
060	6/30/23	Filter Blank	3		M29*	
061	6/30/23	0.5M KOH Reagent Blank	1		0061	23-S1948
062	6/30/23	DI Reagent Blank	1		0061	1949

Delivered to Lab by: Date/Time:	Received by: Date/Time: 6.30.23 @1815	Processed by: Date/Time:

Laboratory Notes: *M29 target metals include: Aluminum, Arsenic, Antimony, Barium, Beryllium, Cadmium, Chromium, Cobalt, Lead, Manganese, Mercury, Nickel, Phosphorous, Selenium, Silver, Thallium, Vanadium, Zinc.

0061 recd temp 6°C

23-S1834	9203 N Inlet #1 Filter & Probe
23-S1835	9203 N Inlet #1 HNO3/H2O2
23-S1836	9203 N Inlet #1 Empty Imp
23-S1837	9203 N Inlet #1 KMnO4
23-S1838	9203 N Inlet #1 HCl Rinse
23-S1839	9203 N Inlet #2 Filter & Probe
23-S1840	9203 N Inlet #2 HNO3/H2O2
23-S1841	9203 N Inlet #2 Empty Imp
23-S1842	9204 N Inlet #2 KMnO4
23-S1843	9203 N Inlet #2 HCl Rinse
23-S1844	9203 C Inlet #1 Filter & Probe
23-S1845	9203 C Inlet #1 HNO3/H2O2
23-S1846	9203 C Inlet #1 Empty Imp
23-S1847	9203 C Inlet #1 KMnO4
23-S1848	9203 C Inlet #1 HCl Rinse
23-S1849	9203 C Inlet #2 Filter & Probe
23-S1850	9203 C Inlet #2 HNO3/H2O2
23-S1851	9203 C Inlet #2 Empty Imp
23-S1852	9203 C Inlet #2 KMnO4
23-S1853	9203 C Inlet #2 HCl Rinse
23-S1854	9203 S Inlet #1 Filter & Probe
23-S1855	9203 S Inlet #1 HNO3/H2O2
23-S1856	9203 S Inlet #1 Empty Imp
23-S1857	9203 S Inlet #1 KMnO4
23-S1858	9203 S Inlet #1 HCl Rinse
23-S1859	9203 S Inlet #2 Filter & Probe
23-S1860	9203 S Inlet #2 HNO3/H2O2
23-S1861	9203 S Inlet #2 Empty Imp
23-S1862	9203 S Inlet #2 KMnO4
23-S1863	9203 S Inlet #2 HCl Rinse
23-S1864	9203 N Outlet #1 Filter & Probe
23-S1865	9203 N Outlet #1 HNO3/H2O2
23-S1866	9203 N Outlet #1 Empty Imp
23-S1867	9203 N Outlet #1 KMnO4
23-S1868	9203 N Outlet #1 HCl Rinse
23-S1869	9203 N Outlet #2 Filter & Probe
23-S1870	9203 N Outlet #2 HNO3/H2O2
23-S1871	9203 N Outlet #2 Empty Imp
23-S1872	9203 N Outlet #2 KMnO4
23-S1873	9203 N Outlet #2 HCl Rinse
23-S1874	9203 S Outlet #1 Filter & Probe
23-S1875	9203 S Outlet #1 HNO3/H2O2
23-S1876	9203 S Outlet #1 Empty Imp
23-S1877	9203 S Outlet #1 KMnO4
23-S1878	9203 S Outlet #1 HCl Rinse
23-S1879	9203 S Outlet #2 Filter & Probe
23-S1880	9203 S Outlet #2 HNO3/H2O2
23-S1881	9203 S Outlet #2 Empty Imp
23-S1882	9203 S Outlet #2 KMnO4
23-S1883	9203 S Outlet #2 HCl Rinse
23-S1884	9256 Inlet #1 Filter & Probe
23-S1885	9256 Inlet #1 HNO3/H2O2
23-S1886	9256 Inlet #1 Empty Imp
23-S1887	9256 Inlet #1 KMnO4
23-S1888	9256 Inlet #1 HCl Rinse
23-S1889	9256 Inlet #2 Filter & Probe
23-S1890	9256 Inlet #2 HNO3/H2O2
23-S1891	9256 Inlet #2 Empty Imp
23-S1892	9256 Inlet #2 KMnO4
23-S1893	9256 Inlet #2 HCl Rinse
23-S1894	9256 Outlet #1 Filter & Probe
23-S1895	9256 Outlet #1 HNO3/H2O2
23-S1896	9256 Outlet #1 Empty Imp
23-S1897	9256 Outlet #1 KMnO4
23-S1898	9256 Outlet #1 HCl Rinse
23-S1899	9256 Outlet #2 Filter & Probe
23-S1900	9256 Outlet #2 HNO3/H2O2
23-S1901	9256 Outlet #2 Empty Imp
23-S1902	9256 Outlet #2 KMnO4
23-S1903	9256 Outlet #2 HCl Rinse
23-S1904	8901 Inlet #1 Filter & Probe
23-S1905	8901 Inlet #1 HNO3/H2O2
23-S1906	8901 Inlet #1 Empty Imp
23-S1907	8901 Inlet #1 KMnO4
23-S1908	8901 Inlet #1 HCl Rinse
23-S1909	8901 Inlet #2 Filter & Probe
23-S1910	8901 Inlet #2 HNO3/H2O2
23-S1911	8901 Inlet #2 Empty Imp
23-S1912	8901 Inlet #2 KMnO4
23-S1913	8901 Inlet #2 HCl Rinse
23-S1914	8901 Outlet #1 Filter & Probe
23-S1915	8901 Outlet #1 HNO3/H2O2
23-S1916	8901 Outlet #1 Empty Imp
23-S1917	8901 Outlet #1 KMnO4
23-S1918	8901 Outlet #1 HCl Rinse
23-S1919	8901 Outlet #2 Filter & Probe
23-S1920	8901 Outlet #2 HNO3/H2O2
23-S1921	8901 Outlet #2 Empty Imp
23-S1922	8901 Outlet #2 KMnO4
23-S1923	8901 Outlet #2 HCl Rinse
23-S1924	Filter Blank
23-S1925	0.1N HNO3 Blank
23-S1926	HNO3/H2O2 Blank
23-S1927	DI Water Blank
23-S1928	KMnO4/H2SO4 Blank
23-S1929	8N HCl Blank

RAW DATA

Available upon request

Client:	**PCC Structurals, Inc.**		
Facility:	**Large Parts Campus Facility - Milwaukie, OR**		
Test Location:	**BH9256 Inlet**		
Test Method:	**29**		
Source Condition:		**Batch Process**	
		Run 1	**Run 2**
Identify Analyte:	Aluminum (Al)		
Molecular Weight:	26.98	ADL	ADL
ug (net) collected:		2993.545	2914.22
Identify Analyte:	Antimony (Sb)		
Molecular Weight:	121.76	DLL	DLL
ug (net) collected:		1.566	1.543
Identify Analyte:	Arsenic (As)		
Molecular Weight:	74.92	BDL	BDL
ug (net) collected:		3.368	3.277
Identify Analyte:	Barium (Ba)		
Molecular Weight:	137.33	ADL	ADL
ug (net) collected:		13.85	26.08
Identify Analyte:	Beryllium (Be)		
Molecular Weight:	9.01	BDL	BDL
ug (net) collected:		0.075	0.072
Identify Analyte:	Cadmium (Cd)		
Molecular Weight:	112.41	ADL	ADL
ug (net) collected:		0.235	0.589
Identify Analyte:	Chromium (Cr)		
Molecular Weight:	52	ADL	ADL
ug (net) collected:		97.565	105.265
Identify Analyte:	Cobalt (Co)		
Molecular Weight:	58.93	ADL	ADL
ug (net) collected:		2.613	3.54
Identify Analyte:	Copper (Cu)		
Molecular Weight:	63.55	ADL	ADL
ug (net) collected:		340.4	418.92

Client:	**PCC Structurals, Inc.**		
Facility:	**Large Parts Campus Facility - Milwaukie, OR**		
Test Location:	**BH9256 Inlet**		
Test Method:	**29**		
Source Condition:		**Batch Process**	
		Run 1	**Run 2**
Identify Analyte:	Lead (Pb)		
Molecular Weight:	207.2	DLL	DLL
ug (net) collected:		9.26	5.325
Identify Analyte:	Manganese (Mn)		
Molecular Weight:	54.94	ADL	ADL
ug (net) collected:		789.267	432.967
Identify Analyte:	Mercury (Hg)		
Molecular Weight:	200.59	DLL	DLL
ug (net) collected:		1.40428	0.54779
Identify Analyte:	Nickel (Ni)		
Molecular Weight:	58.69	ADL	ADL
ug (net) collected:		180.12	230.52
Identify Analyte:	Phosphorus (P)		
Molecular Weight:	30.97	ADL	ADL
ug (net) collected:		108.165	112.39
Identify Analyte:	Selenium (Se)		
Molecular Weight:	78.96	DLL	BDL
ug (net) collected:		2.494	2.16
Identify Analyte:	Silver (Ag)		
Molecular Weight:	107.87	ADL	DLL
ug (net) collected:		1.078	1.362
Identify Analyte:	Thallium (Tl)		
Molecular Weight:	204.38	DLL	BDL
ug (net) collected:		1.342	1.21
Identify Analyte:	Vanadium (V)		
Molecular Weight:	50.94	DLL	DLL
ug (net) collected:		1.304	1.821
Identify Analyte:	Zinc (Zn)		
Molecular Weight:	65.38	ADL	ADL
ug (net) collected:		115.181	122.881

Client:	**PCC Structurals, Inc.**		
Facility:	**Large Parts Campus Facility - Milwaukie, OR**		
Test Location:	**BH9256 Outlet**		
Test Method:	**29**		
Source Condition:		**Batch Process**	
		Run 1	**Run 2**
Identify Analyte:	Aluminum (Al)		
Molecular Weight:	26.98	ADL	ADL
ug (net) collected:		511.385	531.81
Identify Analyte:	Antimony (Sb)		
Molecular Weight:	121.76	BDL	BDL
ug (net) collected:		1.456	1.532
Identify Analyte:	Arsenic (As)		
Molecular Weight:	74.92	BDL	BDL
ug (net) collected:		3.298	3.431
Identify Analyte:	Barium (Ba)		
Molecular Weight:	137.33	ADL	DDL
ug (net) collected:		11.08	4.29
Identify Analyte:	Beryllium (Be)		
Molecular Weight:	9.01	BDL	BDL
ug (net) collected:		0.073	0.077
Identify Analyte:	Cadmium (Cd)		
Molecular Weight:	112.41	ADL	ADL
ug (net) collected:		0.725	1.045
Identify Analyte:	Chromium (Cr)		
Molecular Weight:	52	ADL	ADL
ug (net) collected:		2.785	30.875
Identify Analyte:	Cobalt (Co)		
Molecular Weight:	58.93	DLL	ADL
ug (net) collected:		0.182	7.201
Identify Analyte:	Copper (Cu)		
Molecular Weight:	63.55	ADL	ADL
ug (net) collected:		5.274	6.24

Client:	**PCC Structurals, Inc.**		
Facility:	**Large Parts Campus Facility - Milwaukie, OR**		
Test Location:	**BH9256 Outlet**		
Test Method:	**29**		
Source Condition:		**Batch Process**	
		Run 1	**Run 2**
Identify Analyte:	Lead (Pb)		
Molecular Weight:	207.2	DLL	DLL
ug (net) collected:		0.748	1.068
Identify Analyte:	Manganese (Mn)		
Molecular Weight:	54.94	ADL	ADL
ug (net) collected:		7.027	24.957
Identify Analyte:	Mercury (Hg)		
Molecular Weight:	200.59	DLL	DLL
ug (net) collected:		0.69772	0.63166
Identify Analyte:	Nickel (Ni)		
Molecular Weight:	58.69	ADL	ADL
ug (net) collected:		11.94	128.92
Identify Analyte:	Phosphorus (P)		
Molecular Weight:	30.97	ADL	ADL
ug (net) collected:		98.835	95.645
Identify Analyte:	Selenium (Se)		
Molecular Weight:	78.96	DLL	BDL
ug (net) collected:		3.05	2.5
Identify Analyte:	Silver (Ag)		
Molecular Weight:	107.87	BDL	BDL
ug (net) collected:		0.728	1.266
Identify Analyte:	Thallium (Tl)		
Molecular Weight:	204.38	BDL	BDL
ug (net) collected:		1.24	1.43
Identify Analyte:	Vanadium (V)		
Molecular Weight:	50.94	DLL	DLL
ug (net) collected:		0.236	0.273
Identify Analyte:	Zinc (Zn)		
Molecular Weight:	65.38	ADL	ADL
ug (net) collected:		29.481	16.001

Client:	**PCC Structurals, Inc.**		
Facility:	**Large Parts Campus Facility - Milwaukie, OR**		
Test Location:	**BH9256 Inlet**		
Test Method:	**0061**		
Source Condition:		**Batch Process**	
		Run 1	**Run 2**
Identify Analyte:	Hexavalent Chromium (Cr+6)		
Molecular Weight:	52	ADL	ADL
ug (net) collected:		1.6304	1.5904

Client:	**PCC Structurals, Inc.**		
Facility:	**Large Parts Campus Facility - Milwaukie, OR**		
Test Location:	**BH9256 Outlet**		
Test Method:	**0061**		
Source Condition:		**Batch Process**	
		Run 1	**Run 2**
Identify Analyte:	Hexavalent Chromium (Cr)		
Molecular Weight:	52	ADL	ADL
ug (net) collected:		6.2704	0.7044

END OF THE REPORT