Compliance Emissions Test Report

General Iron Industries, Inc.
Chicago Facility
RTO Inlet and Scrubber Stack
Chicago, Illinois
Project No. M193103B
November 14, 15, and 18, 2019

R 011553

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Report Submittal Date
January 13, 2020

Project No. M193103B

Corporate Headquarters
888 Industrial Drive
Elmhurst, Illinois 60126
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1.0 EXECUTIVE SUMMARY

MOSTARDI PLATT conducted a compliance emissions test program for General Iron Industries, Inc. at the Chicago Facility in Chicago, Illinois on the Regenerative Thermal Oxidizer (RTO) Inlet and Scrubber Stack on November 14, 15, and 18, 2019. This report summarizes the results of the test program and test methods used.

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

TEST INFORMATION		
Test Locations	**Test Dates**	**Test Parameters**
RTO Inlet and Scrubber Stack	November 14, 15, and 18, 2019	Filterable Particulate Matter (FPM), Condensable Particulate Matter (CPM), Total Particulate Matter (TPM), Visual Emissions (VE), Volatile Organic Compounds (VOC), Hydrogen Chloride (HCl), Hydrogen Fluoride (HF), Carbon Monoxide (CO), Sulfur Dioxide (SO_2), and Total Selected Metals (TSM) including: Antimony (Sb), Arsenic (As), 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), and Zinc (Zn).

The purpose of this test program was to determine concentrations and emission rates of the above listed parameters. A complete summary of emission test results follows the narrative portion of this report.

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

TEST PERSONNEL INFORMATION		
Location	**Address**	**Contact**
Test Facility	General Iron Industries, Inc. 1909 N. Clifton Avenue Chicago, IL 60614	Mr. Jim Kallas jim@general-iron.com
Testing Company Representative	Mostardi Platt 888 Industrial Drive Elmhurst, Illinois 60126	Mr. Richard J. Sollars II Senior Project Manager (630) 993-2666 (phone) rsollars@mp-mail.com

The test crew consisted of Messrs. T. Russ, C. Jensen, S. Burton, R. Simon, R. Spoolstra, B. Garcia, C. Menet, C. Buglio, K. Beckham, M. Keator, L. Sorce, J. Kukla, and R. Sollars of Mostardi Platt. Scott Connolly of the US EPA was on site to observe testing.

	TEST RESULTS					
Test Location	**Test Date**	**Test Parameter**	**RTO Inlet**	**Scrubber Stack**	**Permit Requirement**	**Destruction Efficiency %**
RTO System	11/15/19 and 11/18/19	VOC	227.3 lb/hr	2.2 lb/hr	98.0%	99.0%

TEST RESULTS				
Test Location	**Test Date**	**Test Parameter**	**Concentration**	**Emission Rate**
Scrubber Stack	11/15/19 and 11/18/19	FPM	0.0031 grains/dscf	1.440 lb/hr
		CPM	0.0023 grains/dscf	1.069 lb/hr
		TPM	0.0054 grains/dscf	2.509 lb/hr
		VE	N/A	0%
	11/14/19	SO_2	0.03 ppmvd	0.02 lb/hr
	11/14/19	CO	19.1 ppmvd	4.94 lb/hr
	11/14/19	HCl	0.85 ppmvd	0.294 lb/hr
	11/14/19	HF	0.67 ppmvd	0.121 lb/hr
	11/14/19	Sb	≤ 1.96 ug/dscm	≤ 4.33E-04 lb/hr
	11/14/19	As	≤ 0.69 ug/dscm	≤ 1.53E-04 lb/hr
	11/14/19	Ba	≤ 6.81 ug/dscm	≤ 1.48E-03 lb/hr
	11/14/19	Be	≤ 0.15 ug/dscm	≤ 3.43E-05 lb/hr
	11/14/19	Cd	≤ 0.76 ug/dscm	≤ 1.64E-04 lb/hr
	11/14/19	Cr	≤ 6.01 ug/dscm	≤1.33E-03 lb/hr
	11/14/19	Co	≤ 0.19 ug/dscm	≤ 4.10E-05 lb/hr
	11/14/19	Cu	6.85 ug/dscm	1.50E-03 lb/hr
	11/14/19	Pb	2.44 ug/dscm	5.33E-04 lb/hr
	11/14/19	Mn	3.53 ug/dscm	7.67E-04 lb/hr
	11/14/19	Hg	≤ 74.03 ug/dscm	≤ 1.72E-02 lb/hr
	11/14/19	Ni	5.71 ug/dscm	1.27E-03 lb/hr
	11/14/19	P	≤ 211.79 ug/dscm	≤ 4.68E-02 lb/hr
	11/14/19	Se	≤ 9.90 ug/dscm	≤2.33E-03 lb/hr
	11/14/19	Ag	≤ 1.64 ug/dscm	≤ 3,86E-04 lb/hr
	11/14/19	Tl	≤ 0.21 ug/dscm	≤ 4.60E-05 lb/hr
	11/14/19	Zn	≤ 46.85 ug/dscm	≤ 1.03E-02 lb/hr

Operating data as provided by General Iron Industries, Inc. are included in Appendix A.

2.0 TEST METHODOLOGY

Emission testing was conducted following the methods specified in 40 CFR, Part 60, Appendix A. Schematics depicting the test location and sampling trains are found in Appendices B and C, respectively. Explanations of nomenclature and calculations are found in Appendix D. Sample analysis data are found in Appendix E. Reference method data and field data sheets for each test run are found in Appendices F and G, respectively.

The following methodologies were used during the test program:

Method 1 Sample and Velocity Traverse Determination

Test measurement points were selected in accordance with Method 1. The characteristics of the measurement location are summarized below.

TEST POINT INFORMATION					
Location	**Duct Diameter (Inches)**	**Upstream Diameters**	**Downstream Diameters**	**Test Parameter**	**Number of Sampling Points**
RTO Inlet	50.0	8.15	2.63	VOC	1
				Volumetric Flow	16
Scrubber Stack	74.0	1.40	2.00	VOC, HCl and HF	1
				SO_2 and CO	3
				TSM and TPM	24

Method 2 Volumetric Flow Rate Determination

Stack gas velocity was measured following Method 2, for purposes of calculating the gas volumetric flow rate and emission rates on a lb/hr and basis. The Scrubber Stack Method 2 sampling train was part of the combined Method 5/202 sample train or the Method 29 sample train, depending on the test date. An S-type pitot tube, incline manometer, thermocouple and temperature readout were used to determine gas velocity at each sample point at the test location. All of the equipment used was calibrated in accordance with the specifications of the Method. Calibration data are presented in Appendix H.

Method 3 Oxygen (O_2)/Carbon Dioxide (CO_2) Determination

RTO Inlet gas molecular weight was determined in accordance with Method 3. A Fyrite gas analyzer was used to determine stack gas oxygen and carbon dioxide content and, by difference, nitrogen content. All of the equipment used was calibrated in accordance with the specifications of the Method.

Method 3A Oxygen (O_2)/ Carbon Dioxide (CO_2) Determination

Scrubber Stack gas O_2 and CO_2 concentrations were determined in accordance with USEPA Method 3A, 40CFR60, Appendix A. Ecom and Servomex analyzers were used to determine the O_2 and CO_2 concentrations in the manner specified in the Method. Zero nitrogen (a low ppm pollutant in balance nitrogen calibration gases) was introduced during other instrument calibrations to check instrument zero. High- and a mid-range % O_2 and CO_2 levels in balance nitrogen were also introduced. Zero and mid-range calibrations were performed using USEPA Protocol gas after each test run. A list of calibration gases used and the results of all calibration and other required quality assurance checks are found in Appendix H. Copies of the gas cylinder certifications are found in Appendix I. This testing met the performance specifications as outlined in the Method.

Method 4 Moisture Determination

Stack gas moisture content was determined using a Method 4 sampling train at each of the two test locations. The Scrubber Stack Method 4 sampling train was part of the combined Method 5/202 sample train or the Method 29 sample train. In this technique, flue gas is drawn through a probe after which moisture is condensed through a series of four impingers. The first two impingers were charged with approximately 100 mls of deionized, distilled water. Impinger three was left empty and impinger four was charged with clean, dried silica gel. The water volumes of the impinger train were measured and the silica gel was weighed before and after each test run to determine the mass of moisture condensed.

During testing, the sample train was operated in the manner specified in USEPA Method 4. All of the data specified in Method 4 (gas volume, delta H, impinger outlet well temperature, etc.) was recorded on field data sheets.

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

Method 5 Filterable Particulate Matter (FPM) Determination

Stack gas FPM concentrations and emission rates were determined in accordance with USEPA Method 5. An Environmental Supply Company, Inc. sampling train was used to sample Stack gas at an isokinetic rate, as specified in the Method. Filter and probe temperatures were operated at 248°F +/- 25°F as described in the Method. Particulate matter in the sample probe was recovered using an acetone wash, a minimum of three passes were made with the brush, after which time the acetone wash was determined to be clean. The probe wash and filter catch were analyzed by Mostardi Platt in accordance with the Method in the Elmhurst, Illinois laboratory. Sample analysis data are found in Appendix E. All of the equipment used was calibrated in accordance with the specifications of the Method. Calibration data are presented in Appendix H.

Method 6C Sulfur Dioxide (SO_2) Determination

Stack gas SO_2 concentrations and emission rates were determined in accordance with USEPA Method 6C, 40CFR60, Appendix A. A Thermo Scientific Model 43i Pulsed Fluorescence Sulfur Dioxide Analyzer was used to determine sulfur dioxide concentrations, in the manner specified in the Method. The instrument operated in the nominal range of 0 ppm to 200 ppm with the specific range determined by the high-level span calibration gas.

The Model 43i operates on the principle that SO_2 molecules absorb ultraviolet (UV) light and become excited at one wavelength, then decay to a lower energy state emitting UV light at a different wavelength. Specifically,

$$SO_2 + hv_1 \rightarrow SO_2^* \rightarrow SO_2 + hv_2$$

The sample is drawn into the Model 43*i* through the sample bulkhead. The sample flows through a hydrocarbon "kicker", which removes hydrocarbons from the sample by forcing the hydrocarbon molecules to permeate through the tube wall. The SO_2 molecules pass through the hydrocarbon "kicker" unaffected.

The sample flows into the fluorescence chamber, where pulsating UV light excites the SO_2 molecules. The condensing lens focuses the pulsating UV light into the mirror assembly. The mirror assembly contains four selective mirrors that reflect only the wavelengths which excite SO_2 molecules.

As the excited SO_2 molecules decay to lower energy states, they emit UV light that is proportional to the SO_2 concentration. The bandpass filter allows only the wavelengths emitted by the excited SO_2 molecules to reach the photomultiplier tube (PMT). The PMT detects the UV light emission from the decaying SO_2 molecules. The photodetector, located at the back of the fluorescence chamber, continuously monitors the pulsating UV light source and is connected to a circuit that compensates for fluctuations in the lamp intensity.

As the sample leaves the optical chamber, it passes through a flow sensor, a capillary, and the "shell" side of the hydrocarbon kicker. The Model 43*i* outputs the SO_2 concentration to the front panel display, the analog outputs, and also makes the data available over the serial or Ethernet connection.

Stack gas was delivered to the analyzer via a Teflon® sampling line, heated to a minimum temperature of 250°F. Excess moisture in the stack gas was removed using a refrigerated condenser. The entire system was calibrated in accordance with the Method, using certified calibration gases introduced at the probe, before and after each test run.

A list of calibration gases used and the results of all calibration and other required quality assurance checks are found in Appendix G. Copies of the gas cylinder certifications are found in Appendix H. This testing met the performance specifications as outlined in the Method.

Method 9 Visible Emissions Determination

Visible emissions were determined in accordance with U.S. EPA Reference Test Method 9. The observer stood at a distance providing a clear view of the emissions with the sun oriented in the 140° sector to his back. As much as possible, the line of vision was approximately perpendicular to the plume direction.

Visible emissions observations were made at the point of greatest opacity in the portion of the plume where condensed water vapor was not present. Observations were made at 15-second intervals for the duration of the test run.

Visible emissions observations were conducted and recorded by Mr. Sorce, who is a certified visual emissions observer. Visible emissions data and the reader's certification are found in Appendix J.

Method 10 Carbon Monoxide (CO) Determination

Stack gas carbon monoxide concentrations and emission rates were determined in accordance with Method 10 at both test locations. A Thermo Scientific carbon monoxide analyzer was used to determine carbon monoxide concentrations, in the manner specified in the Method.

Stack gas was delivered to the analyzer via a Teflon® sampling line, heated to a minimum temperature of 250°F. Excess moisture in the Stack gas was removed using a refrigerated condenser. The entire system was calibrated in accordance with the Method, using certified calibration gases introduced at the probe, before and after each test run.

A list of calibration gases used and the results of all calibration and other required quality assurance checks can be found in Appendix G. Copies of calibration gas certifications can be found in Appendix H.

Method 18 Methane (CH_4) and Ethane (C_2H_6) Determination

CH_4 and C_2H_6 concentrations were determined in accordance with USEPA Method 18. An SRI 8610C Gas Chromatograph/Flame Ionization Detector (GC/FID) was used to separate and quantify C_2H_6 and CH_4 concentrations present in the source effluent. Effluent gas was captured using an integrated tedlar bag sampling system.

The system was calibrated in accordance with the method. A 3-point calibration was conducted by triplicate injection of certified CH_4 and C_2H_6 cylinders. The mid-level calibration was injected at the end of the sample analysis. All C_2H_6 values were below the detection limit of the GC/FID so zeroes were used for C_2H_6 values in all VOC calculations. Calibration and run data are presented in Appendix E and copies of gas certifications are presented in Appendix I.

Method 25A Volatile Organic Compounds (VOC) Determination

The Method 25A sampling and measurement system meets the requirements for stack sampling of VOC set forth by the United States Environmental Protection Agency (USEPA). In particular, it meets the requirements of USEPA Reference Method 25A, "Determination of Total Gaseous Organic Concentration Using a Flame Ionization Analyzer," 40CFR60, Appendix A. This method applies to the measurement of total gaseous organic concentration of hydrocarbons. With this method, the gas sample was extracted from the sample location through a heated Teflon sample line to the flame ionization detector (FID) analyzer.

The flame ionization detectors (FID) used during this program were Thermo 51i High-Temperature Hydrocarbon Analyzer. They are highly sensitive FID that provides a direct reading of organic vapor concentrations with linear ranges between 0-10 and 0-10,000 ppm by volume. The instrument was calibrated using ultra-zero air and propane in air EPA Protocol standards for the total hydrocarbon (THC) determination. The calibrations were performed before and after sampling with calibration checks performed between each test run. Sample times and locations were logged simultaneously on data loggers.

The calibration data are found in Appendix H and copies of the calibration gas cylinder certifications are found in Appendix I.

Modified Method 26 Hydrogen Chloride (HCl) and Hydrogen Fluoride (HF) Determination

Stack gas hydrogen chloride and hydrogen fluoride concentrations and emission rates were determined in accordance with a modified Method 26, 40CFR60, Appendix A. An Environmental Supply Company sampling train was used to sample stack gas, in the manner specified in the Method at one sample point modified to use large impingers. Analyses of the samples collected were conducted by ion chromatography at the Mostardi Platt laboratory located in Elmhurst, Illinois. Analysis results are found in Appendix E. Field data sheets are included in Appendix G. All of the equipment used was calibrated in accordance with the specifications of the Method. Calibration data are presented in Appendix H.

Method 29 Trace Metals Determination

Stack gas metals concentrations and emission rates were determined in accordance with Method 29. An Environmental Supply Company sampling train was used to sample stack gas, in the manner specified in the Method. Analyses of the samples collected were conducted by Maxxam Analytics of Mississauga, Ontario. Laboratory analysis data are found in Appendix E. All of the equipment used was calibrated in accordance with the specifications of the Method. Calibration data are presented in Appendix H.

Method 202 Condensable Particulate Matter Determination

Stack gas condensable particulate matter (CPM) concentrations and emission rates were determined in accordance with U.S. EPA Test Method 202, 40 CFR Part 51, Appendix M, in conjunction with Method 5 filterable particulate matter sampling. This method applies to the determination of CPM emissions from stationary sources. It is intended to represent condensable matter as material that condenses after passing through a filter and as measured by this method.

CPM was collected in the water dropout, modified Greenburg Smith impinger and ambient filter portion of the sampling train as described in this Method. The impinger contents was purged with nitrogen (N_2) immediately after sample collection to remove dissolved sulfur dioxide (SO_2) gases from the impingers. The impinger solution was then extracted with DI water, acetone, and hexane. The organic and aqueous fractions were dried and the residues weighed. The total of the aqueous, organic, and ambient filter fractions represents the CPM.

All sample recovery was performed at the test site by the test crew. Mostardi Platt personnel at the laboratory in Elmhurst, Illinois, performed all final particulate matter sample analyses. Sample data are found in Appendix E. All of the equipment used was calibrated in accordance with the specifications of the Method. Calibration data are presented in Appendix H.

3.0 TEST RESULT SUMMARIES

General Iron Industries, Inc.
Chicago, IL
RTO Inlet and Scrubber Stack
VOC Summary

Test No.	Date	Start Time	End Time	RTO Inlet THC ppm as C_3H_8 (wet)	RTO Inlet CH_4 ppm as C_3H_8 (wet)	RTO Inlet C_2H_6 ppm as C_3H_8 (wet)	RTO Inlet VOC ppm as C_3H_8 (wet)	Scrubber Stack THC ppm as C_3H_8 (wet)	Scrubber Stack CH_4 ppm as C_3H_8 (wet)	Scrubber Stack C_2H_6 ppm as C_3H_8 (wet)	Scrubber Stack VOC ppm as C_3H_8 (wet)
1	11/15/19	10:33	13:17	497.2	1.2	0.0	496.0	7.9	0.4	0.0	7.5
2	11/18/19	8:51	10:11	599.1	1.2	0.0	597.9	5.8	0.8	0.0	5.0
3	11/18/19	11:22	12:45	523.8	1.2	0.0	522.6	5.5	0.4	0.0	5.1
4	11/18/19	14:40	17:55	642.4	1.4	0.0	641.0	6.8	0.4	0.0	6.4
Average[1]				**588.4**	**1.3**	**0.0**	**587.2**	**6.0**	**0.5**	**0.0**	**5.5**

Test No.	Date	Start Time	End Time	RTO Inlet Flowrate, SCFM	RTO Inlet THC lb/hr	Scrubber Stack Flowrate, SCFM	Scrubber Stack THC lb/hr	VOC Destruction Efficiency, %
1	11/15/19	10:33	13:17	66,309	225.4	66,498	3.4	98.5
2	11/18/19	8:51	10:11	56,334	230.8	56,660	1.9	99.2
3	11/18/19	11:22	12:45	56,422	202.0	57,063	2.0	99.0
4	11/18/19	14:40	17:55	56,677	248.9	57,958	2.6	99.0
Average[1]				**56,478**	**227.3**	**57,227**	**2.2**	**99.0**

[1]Averages exclude Run 1 due to abnormal RTO operations

Client:	**General Iron Industries, Inc.**
Facility:	**Chicago, IL**
Test Location:	**Scrubber Stack**
Test Method:	**5/202**

Source Condition	**Normal**	**Normal**	**Normal**	**Normal**	
Date	**11/15/19**	**11/18/19**	**11/18/19**	**11/18/19**	
Start Time	**10:33**	**8:51**	**11:22**	**16:40**	
End Time	**13:18**	**10:12**	**12:46**	**17:56**	
	Run 1*	**Run 2**	**Run 3**	**Run 4**	**Average**
Stack Conditions					
Average Gas Temperature, °F	100.7	100.6	103.3	104.1	102.7
Flue Gas Moisture, percent by volume	6.7%	6.7%	7.2%	5.4%	6.4%
Average Flue Pressure, in. Hg	29.69	29.18	29.18	29.18	29.18
Gas Sample Volume, dscf	44.464	35.358	35.553	36.253	35.721
Average Gas Velocity, ft/sec	39.707	34.414	34.827	35.423	34.888
Gas Volumetric Flow Rate, acfm	71,164	61,678	62,417	63,485	62,527
Gas Volumetric Flow Rate, dscfm	62,043	52,864	52,959	54,837	53,553
Gas Volumetric Flow Rate, scfm	66,498	56,660	57,063	57,958	57,227
Average %CO_2 by volume, dry basis	0.4	0.5	0.3	0.4	0.4
Average %O_2 by volume, dry basis	20.2	20.2	20.2	20.4	20.3
Isokinetic Variance	108.2	100.9	101.3	99.8	100.7
Opacity %	0.0	0.0	0.0	NA	0.0
Filterable Particulate Matter (Method 5)					
grams collected	0.00223	0.00308	0.01141	0.00732	0.00727
grains/acf	0.0007	0.0012	0.0042	0.0027	0.0027
grains/dscf	0.0008	0.0013	0.0050	0.0031	0.0031
lb/hr	0.412	0.609	2.248	1.464	1.440
Condensable Particulate Matter (Method 202)					
grams collected	0.00659	0.00462	0.00676	0.00480	0.00539
grains/acf	0.0020	0.0017	0.0025	0.0018	0.0020
grains/dscf	0.0023	0.0020	0.0029	0.0020	0.0023
lb/hr	1.216	0.914	1.332	0.960	1.069
Total Particulate Matter (5/202)					
grams collected	0.00882	0.00770	0.01817	0.01210	0.01266
grains/acf	0.0027	0.0029	0.0067	0.0045	0.0047
grains/dscf	0.0031	0.0033	0.0079	0.0051	0.0054
lb/hr	1.628	1.523	3.580	2.424	2.509

General Iron Industries, Inc. Chicago, IL Scrubber Stack Sulfur Dioxide and Carbon Monoxide Summary										
Test No.	Date	Start Time	End Time	CO ppmvd	SO_2 ppmvd	CO_2 % (dry)	O_2 % (dry)	Flowrate, DSCFM	CO lb/hr	SO_2 lb/hr
1	11/14/19	8:45	10:42	19.1	0.00	0.4	20.1	56,670	4.72	0.00
2	11/14/19	12:00	14:10	18.6	0.00	0.4	20.5	57,575	4.67	0.00
3	11/14/19	15:30	17:36	19.7	0.10	0.4	20.3	63,280	5.43	0.06
Average				19.1	0.03	0.4	20.3	59,175	4.94	0.02

General Iron Industries, Inc. Scrubber Stack HCl and HF Test Results Summary								
Run No.	Date	Time	O_2, % dry	DSCFM	HCl Concentration ppmvd	HCl lb/hr	HF Concentration ppmvd	HF lb/hr
1	11/14/2019	9:02 - 10:35	20.10	56,670	1.36	0.438	1.05	0.186
2	11/14/2019	12:13 - 13:50	20.50	57,575	0.67	0.203	0.49	0.088
3	11/14/2019	15:45 - 17:20	20.30	63,280	0.51	0.240	0.45	0.089
Average			**20.30**	**59,175**	**0.85**	**0.294**	**0.67**	**0.121**

Client: General Iron Industries, Inc.
Facility: Chicago, IL
Test Location: Scrubber Stack
Test Method: 29

Source Condition		**Normal**		**Normal**		**Normal**		
Date		**11/14/19**		**11/14/19**		**11/14/19**		
Start Time		**8:45**		**12:00**		**15:30**		
End Time		**10:43**		**14:11**		**17:37**		
		Run 1		**Run 2**		**Run 3**		**Average**
Stack Conditions								
Average Gas Temperature, °F		101.6		100.1		100.3		100.7
Flue Gas Moisture, percent by volume		6.9%		6.5%		6.6%		6.7%
Average Flue Pressure, in. Hg		29.58		29.58		29.58		29.58
Gas Sample Volume, dscf		59.740		58.537		66.119		61.465
Average Gas Velocity, ft/sec		36.540		36.862		40.576		37.993
Gas Volumetric Flow Rate, acfm		65,488		66,065		72,720		68,091
Gas Volumetric Flow Rate, dscfm		56,670		57,575		63,280		59,175
Gas Volumetric Flow Rate, scfm		60,870		61,577		67,751		63,399
Average %CO_2 by volume, dry basis		0.4		0.4		0.4		0.4
Average %O_2 by volume, dry basis		20.1		20.5		20.3		20.3
Isokinetic Variance		102.8		99.1		101.8		101.2
Antimony (Sb) Emissions								
ug of sample collected	≤	3.40	≤	3.40	≤	3.40	≤	3.40
ppb	≤	0.40	≤	0.41	≤	0.36	≤	0.39
ug/dscm	≤	2.01	≤	2.05	≤	1.82	≤	1.96
lb/hr	≤	4.27E-04	≤	4.42E-04	≤	4.30E-04	≤	4.33E-04
Arsenic (As) Emissions								
ug of sample collected	≤	1.20	≤	1.20	≤	1.20	≤	1.20
ppb	≤	0.23	≤	0.23	≤	0.21	≤	0.22
ug/dscm	≤	0.71	≤	0.72	≤	0.64	≤	0.69
lb/hr	≤	1.51E-04	≤	1.56E-04	≤	1.52E-04	≤	1.53E-04
Barium (Ba) Emissions								
ug of sample collected		21.61	≤	7.57	≤	5.81	≤	11.66
ppb		2.24	≤	0.80	≤	0.54	≤	1.19
ug/dscm		12.77	≤	4.57	≤	3.10	≤	6.81
lb/hr		2.71E-03	≤	9.85E-04	≤	7.36E-04	≤	1.48E-03
Beryllium (Be) Emissions								
ug of sample collected	≤	0.27	≤	0.27	≤	0.27	≤	0.27
ppb	≤	0.43	≤	0.44	≤	0.39	≤	0.42
ug/dscm	≤	0.16	≤	0.16	≤	0.14	≤	0.15
lb/hr	≤	3.40E-05	≤	3.50E-05	≤	3.40E-05	≤	3.43E-05
Cadmium (Cd) Emissions								
ug of sample collected		2.87		0.61	≤	0.41	≤	1.30
ppb		0.36		0.08	≤	0.05	≤	0.16
ug/dscm		1.70		0.37	≤	0.22	≤	0.76
lb/hr		3.60E-04		8.00E-05	≤	5.20E-05	≤	1.64E-04

Client: General Iron Industries, Inc.
Facility: Chicago, IL
Test Location: Scrubber Stack
Test Method: 29

Source Condition	Normal	Normal	Normal	
Date	11/14/19	11/14/19	11/14/19	
Start Time	8:45	12:00	15:30	
End Time	10:43	14:11	17:37	
	Run 1	Run 2	Run 3	Average
Stack Conditions				
Average Gas Temperature, °F	101.6	100.1	100.3	100.7
Flue Gas Moisture, percent by volume	6.9%	6.5%	6.6%	6.7%
Average Flue Pressure, in. Hg	29.58	29.58	29.58	29.58
Gas Sample Volume, dscf	59.740	58.537	66.119	61.465
Average Gas Velocity, ft/sec	36.540	36.862	40.576	37.993
Gas Volumetric Flow Rate, acfm	65,488	66,065	72,720	68,091
Gas Volumetric Flow Rate, dscfm	56,670	57,575	63,280	59,175
Gas Volumetric Flow Rate, scfm	60,870	61,577	67,751	63,399
Average %CO_2 by volume, dry basis	0.4	0.4	0.4	0.4
Average %O_2 by volume, dry basis	20.1	20.5	20.3	20.3
Isokinetic Variance	102.8	99.1	101.8	101.2
Chromium (Cr) Emissions				
ug of sample collected	11.30	≤ 4.90	≤ 15.70	≤ 10.63
ppb	3.09	≤ 1.37	≤ 3.88	≤ 2.78
ug/dscm	6.68	≤ 2.96	≤ 8.39	≤ 6.01
lb/hr	1.40E-03	≤ 6.00E-04	≤ 2.00E-03	≤ 1.33E-03
Cobalt (Co) Emissions				
ug of sample collected	0.37	≤ 0.27	≤ 0.33	≤ 0.32
ppb	0.09	≤ 0.07	≤ 0.07	≤ 0.08
ug/dscm	0.22	≤ 0.16	≤ 0.18	≤ 0.19
lb/hr	4.60E-05	≤ 3.50E-05	≤ 4.20E-05	≤ 4.10E-05
Copper (Cu) Emissions				
ug of sample collected	17.90	7.54	10.17	11.87
ppb	4.00	1.72	2.05	2.59
ug/dscm	10.58	4.55	5.43	6.85
lb/hr	2.20E-03	1.00E-03	1.30E-03	1.50E-03
Lead (Pb) Emissions				
ug of sample collected	6.32	3.60	2.63	4.18
ppb	0.43	0.25	0.16	0.28
ug/dscm	3.74	2.17	1.40	2.44
lb/hr	8.00E-04	5.00E-04	3.00E-04	5.33E-04
Manganese (Mn) Emissions				
ug of sample collected	8.65	3.96	5.78	6.13
ppb	2.24	1.05	1.35	1.54
ug/dscm	5.11	2.39	3.09	3.53
lb/hr	1.10E-03	5.00E-04	7.00E-04	7.67E-04
Mercury (Hg) Emissions				
ug of sample collected	≤ 49.79	≤ 29.31	≤ 327.63	≤ 135.57
ppb	≤ 12.88	≤ 7.73	≤ 76.55	≤ 32.39
ug/dscm	≤ 29.43	≤ 17.68	≤ 174.99	≤ 74.03
lb/hr	≤ 6.20E-03	≤ 3.80E-03	≤ 4.15E-02	≤ 1.72E-02

Client: General Iron Industries, Inc.
Facility: Chicago, IL
Test Location: Scrubber Stack
Test Method: 29

Source Condition		Normal		Normal		Normal		
Date		11/14/19		11/14/19		11/14/19		
Start Time		8:45		12:00		15:30		
End Time		10:43		14:11		17:37		
		Run 1		Run 2		Run 3		Average
Stack Conditions								
Average Gas Temperature, °F		101.6		100.1		100.3		100.7
Flue Gas Moisture, percent by volume		6.9%		6.5%		6.6%		6.7%
Average Flue Pressure, in. Hg		29.58		29.58		29.58		29.58
Gas Sample Volume, dscf		59.740		58.537		66.119		61.465
Average Gas Velocity, ft/sec		36.540		36.862		40.576		37.993
Gas Volumetric Flow Rate, acfm		65,488		66,065		72,720		68,091
Gas Volumetric Flow Rate, dscfm		56,670		57,575		63,280		59,175
Gas Volumetric Flow Rate, scfm		60,870		61,577		67,751		63,399
Average %CO_2 by volume, dry basis		0.4		0.4		0.4		0.4
Average %O_2 by volume, dry basis		20.1		20.5		20.3		20.3
Isokinetic Variance		102.8		99.1		101.8		101.2
Nickel (Ni) Emissions								
ug of sample collected		11.04		6.09		12.98		10.04
ppb		2.67		1.51		2.84		2.34
ug/dscm		6.53		3.67		6.93		5.71
lb/hr		1.40E-03		8.00E-04		1.60E-03		1.27E-03
Phosphorus (P) Emissions								
ug of sample collected	≤	380.00	≤	363.00	≤	359.00	≤	367.33
ppb	≤	174.33	≤	169.95	≤	148.81	≤	164.36
ug/dscm	≤	224.63	≤	218.99	≤	191.74	≤	211.79
lb/hr	≤	4.77E-02	≤	4.72E-02	≤	4.54E-02	≤	4.68E-02
Selenium (Se) Emissions								
ug of sample collected	≤	2.30	≤	2.10		50.70	≤	18.37
ppb	≤	0.41	≤	0.39		8.24	≤	3.01
ug/dscm	≤	1.36	≤	1.27		27.08	≤	9.90
lb/hr	≤	3.00E-04	≤	3.00E-04		6.40E-03	≤	2.33E-03
Silver (Ag) Emissions								
ug of sample collected	≤	0.36	≤	0.36	≤	8.41	≤	3.04
ppb	≤	0.05	≤	0.05	≤	1.00	≤	0.37
ug/dscm	≤	0.21	≤	0.22	≤	4.49	≤	1.64
lb/hr	≤	4.50E-05	≤	4.70E-05	≤	1.07E-03	≤	3.86E-04
Thallium (Tl) Emissions								
ug of sample collected	≤	0.36	≤	0.36	≤	0.36	≤	0.36
ppb	≤	0.03	≤	0.03	≤	0.02	≤	0.02
ug/dscm	≤	0.21	≤	0.22	≤	0.19	≤	0.21
lb/hr	≤	4.50E-05	≤	4.70E-05	≤	4.60E-05	≤	4.60E-05
Zinc (Zn) Emissions								
ug of sample collected	≤	118.90	≤	57.50	≤	66.60	≤	81.00
ppb	≤	25.84	≤	12.75	≤	13.08	≤	17.22
ug/dscm	≤	70.29	≤	34.69	≤	35.57	≤	46.85
lb/hr	≤	1.49E-02	≤	7.48E-03	≤	8.43E-03	≤	1.03E-02

4.0 CERTIFICATION

MOSTARDI PLATT is pleased to have been of service to General Iron Industries, Inc. If you have any questions regarding this test report, please do not hesitate to contact us at 630-993-2100.

CERTIFICATION

As project manager, I hereby certify that this test report represents a true and accurate summary of emissions test results and the methodologies employed to obtain those results, and the test program was performed in accordance with the methods specified in this test report.

MOSTARDI PLATT

Richard J. Sollars II — Project Manager

Eric L. Ehlers — Quality Assurance

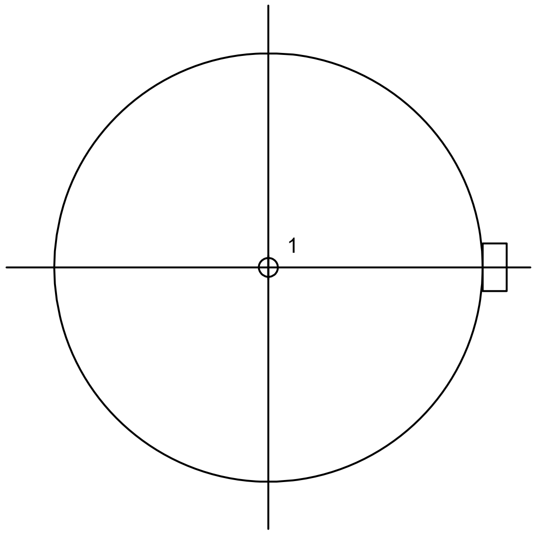
APPENDICES

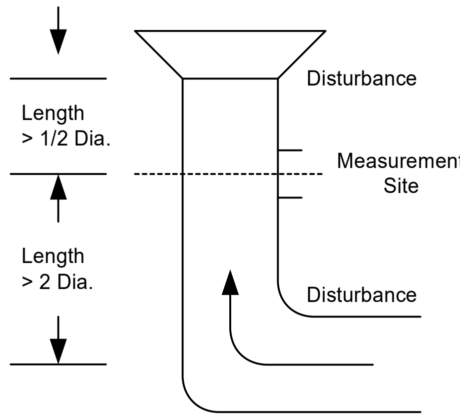
Appendix A- Plant Operating Data

General Iron Industries, Inc. will provide operating data prior to submittal.

Appendix B- Test Section Diagrams

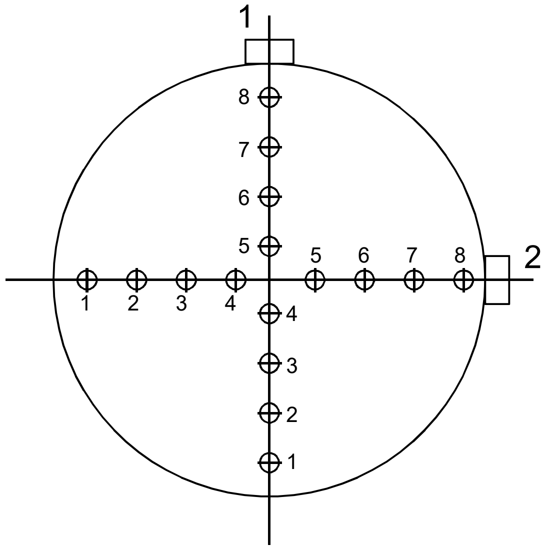
VOC TRAVERSE FOR ROUND DUCTS

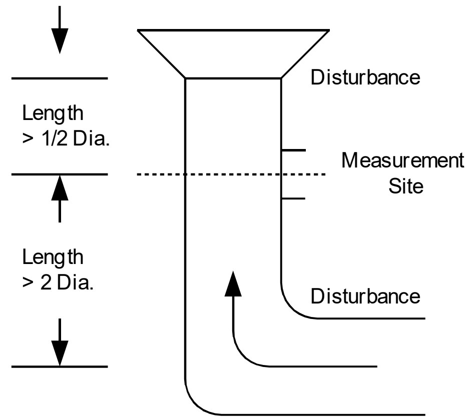




Job:	General Iron Industries, Inc. Chicago, IL
Date:	November 15 and 18, 2019
Test Location:	RTO Inlet
Duct Diameter:	4.167 Feet
Duct Area:	13.64 Square Feet
No. Points Across Diameter:	1
No. of Ports:	1
Port Length:	6.0 Inches

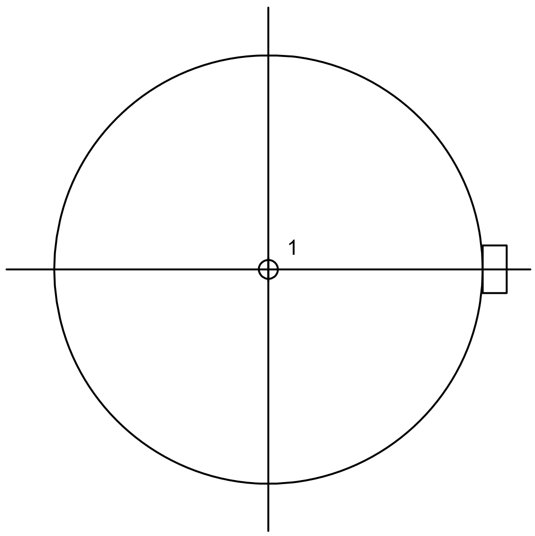
VOLUMETRIC FLOW TRAVERSE FOR ROUND DUCTS

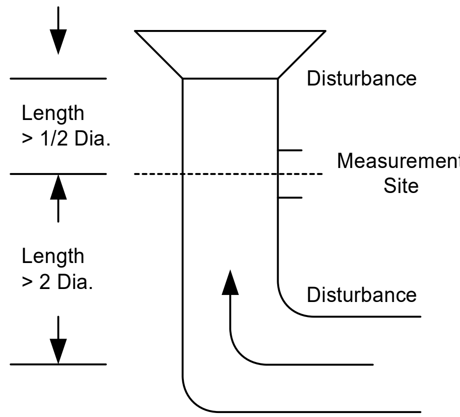




Job:	General Iron Industries, Inc. Chicago, IL
Date:	November 15 and 18, 2019
Test Location:	RTO Inlet
Stack Diameter (Feet):	4.167
Stack Area (Square Feet):	13.64
No. Sample Points Across Diameter:	8
No. of Ports:	2
Port Length (Inches):	6.0

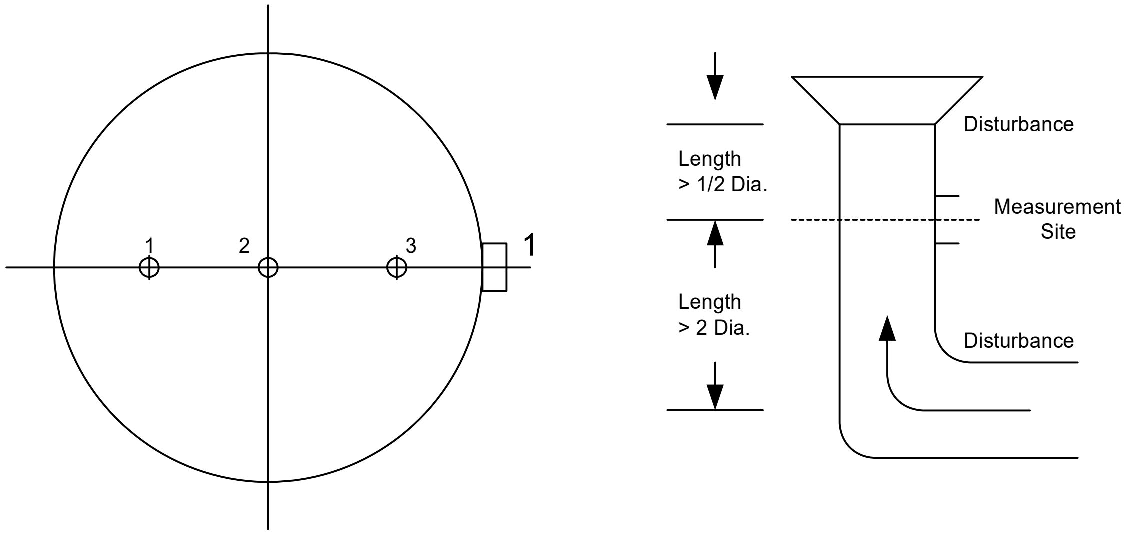
VOC TRAVERSE FOR ROUND DUCTS





Job:	General Iron Industries, Inc. Chicago, IL
Date:	November 15 and 18, 2019
Test Location:	Scrubber Stack
Duct Diameter:	6.167 Feet
Duct Area:	29.87 Square Feet
No. Points Across Diameter:	1
No. of Ports:	1
Port Length:	6.0 Inches

GASEOUS TRAVERSE FOR ROUND DUCTS

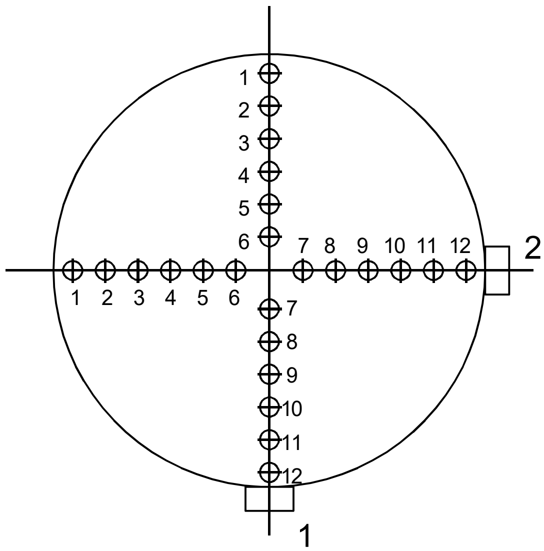


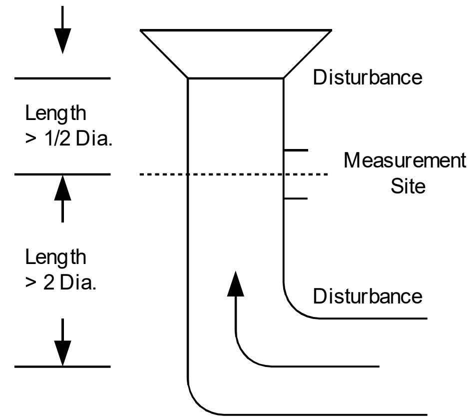
Job:	General Iron Industries, Inc. Chicago, IL
Date:	November 14, 2019
Test Location:	Scrubber Stack
Stack Diameter:	6.167 Feet
Stack Area:	29.87 Square Feet
No. Sample Points:	3

Distance from Inside Wall
To Traverse Point:

1. 83.3 % of diameter
2. 50.0 % of diameter
3. 16.7 % of diameter

ISOKINETIC TRAVERSE FOR ROUND DUCTS

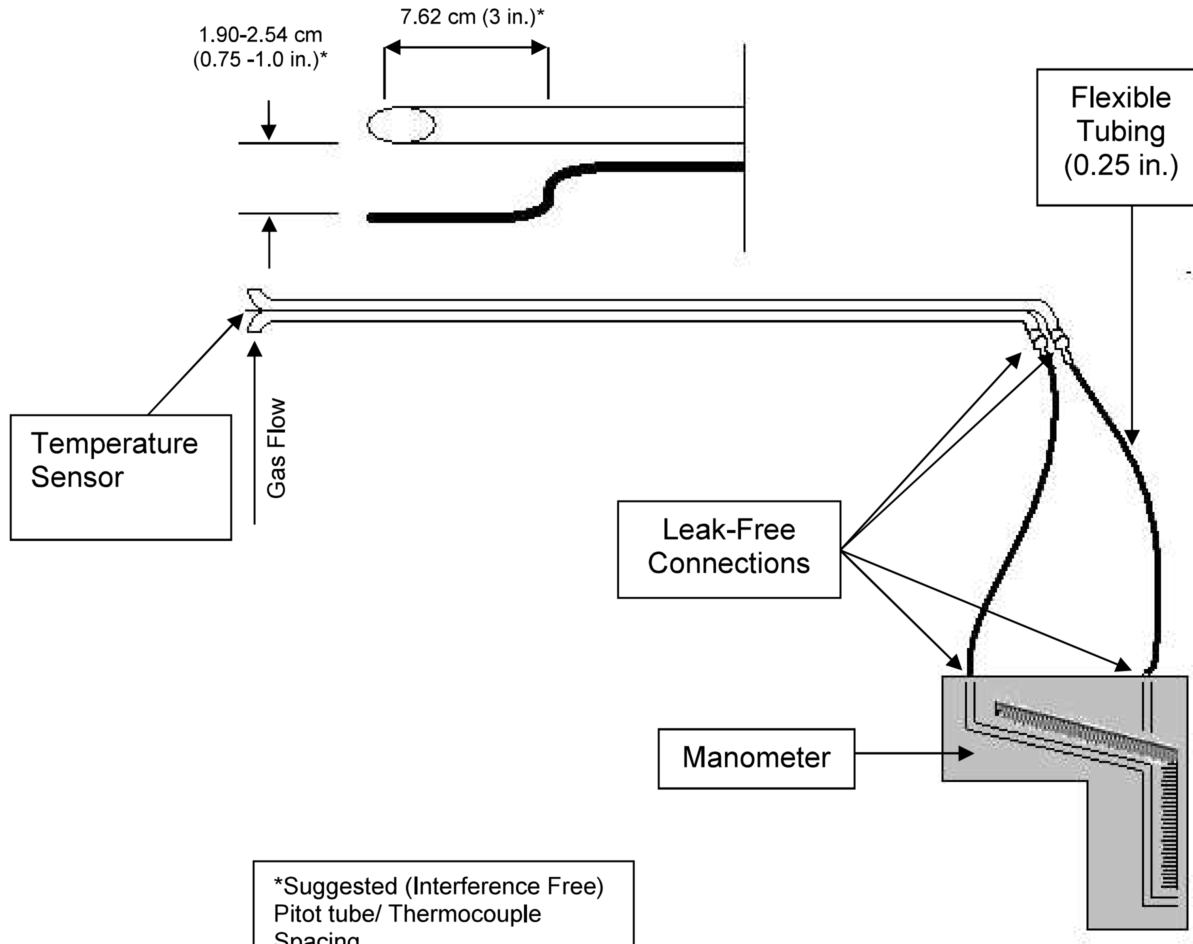




Job:	General Iron Industries, Inc. Chicago, IL
Date:	November 14, 15, and 18, 2019
Test Location:	Scrubber Stack
Duct Diameter:	6.167 Feet
Duct Area:	29.87 Square Feet
No. Points Across Diameter:	12
No. of Ports:	2
Port Length:	6.0 Inches

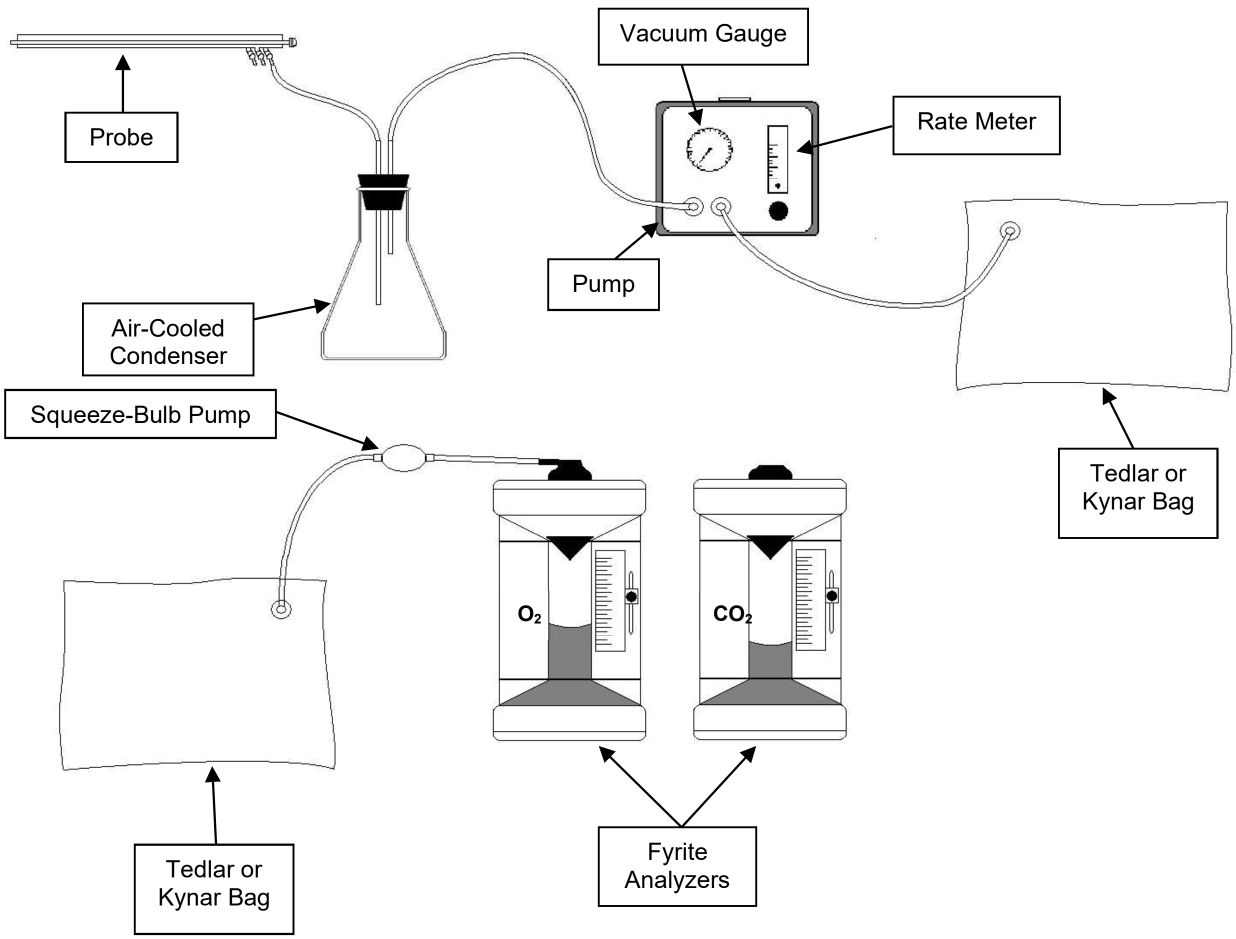
Appendix C - Sample Train Diagrams

USEPA Method 2 – Type S Pitot Tube Manometer Assembly

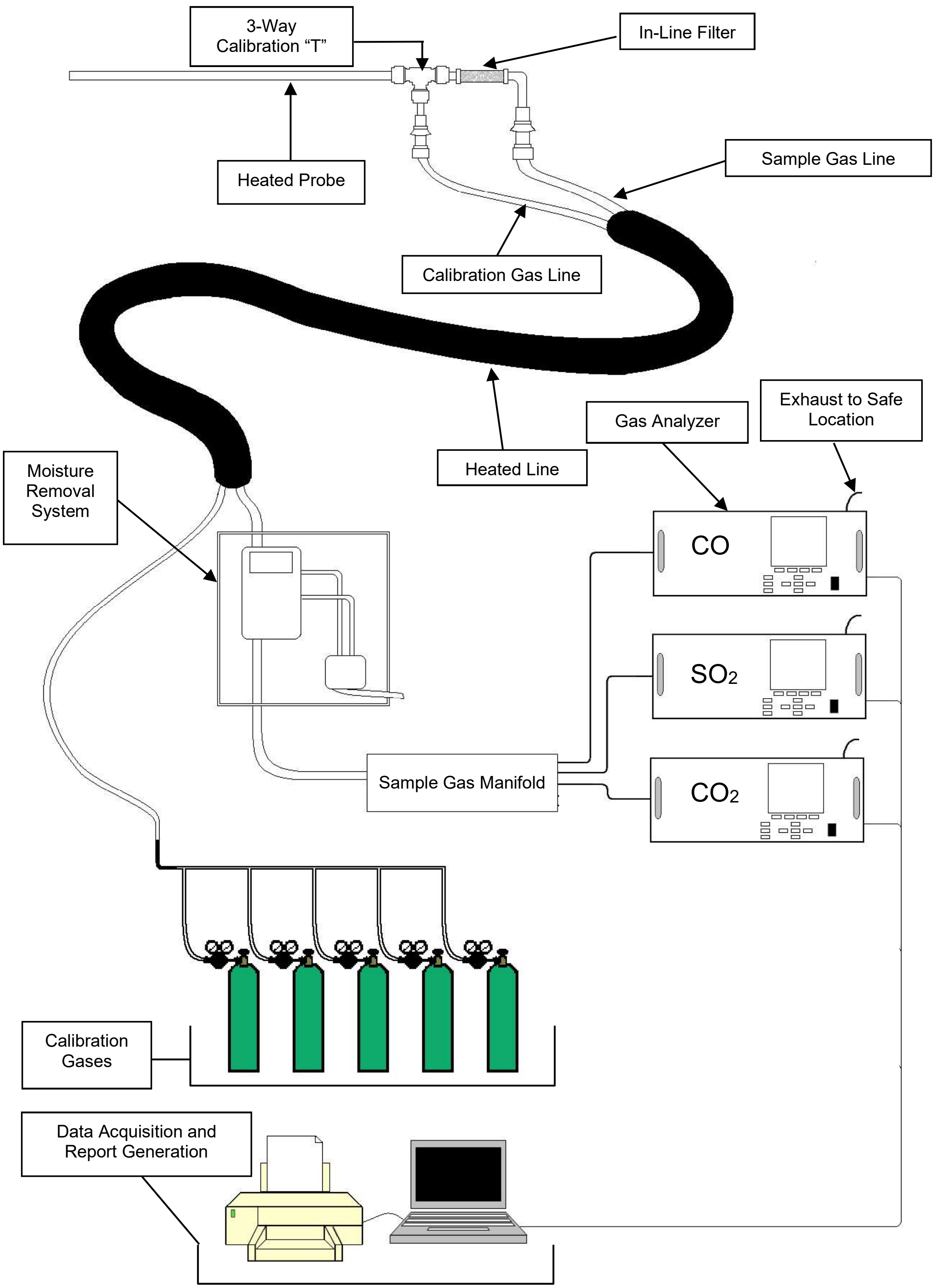


*Suggested (Interference Free) Pitot tube/ Thermocouple Spacing

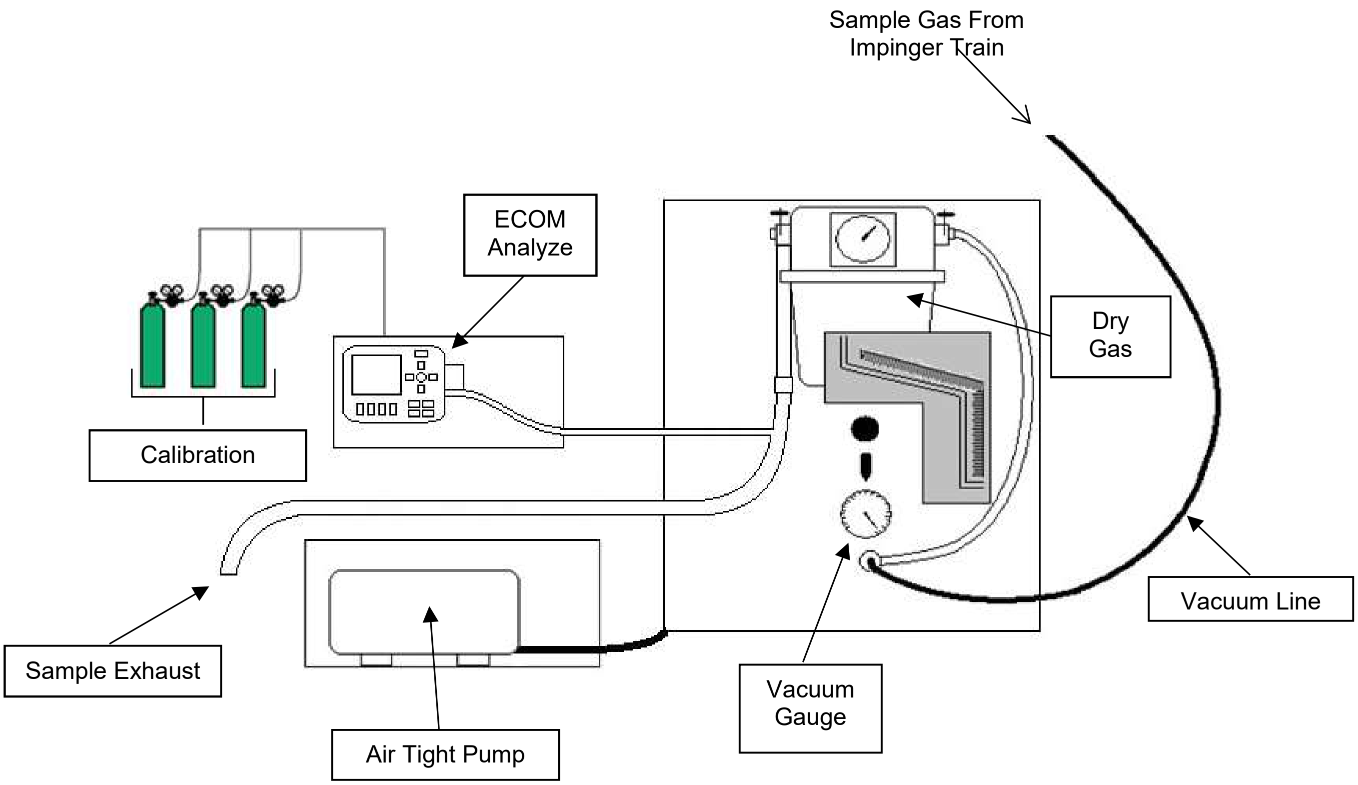
USEPA Method 3 - Integrated Oxygen/Carbon Dioxide Sample Train Diagram Utilizing Fyrite Gas Analyzer



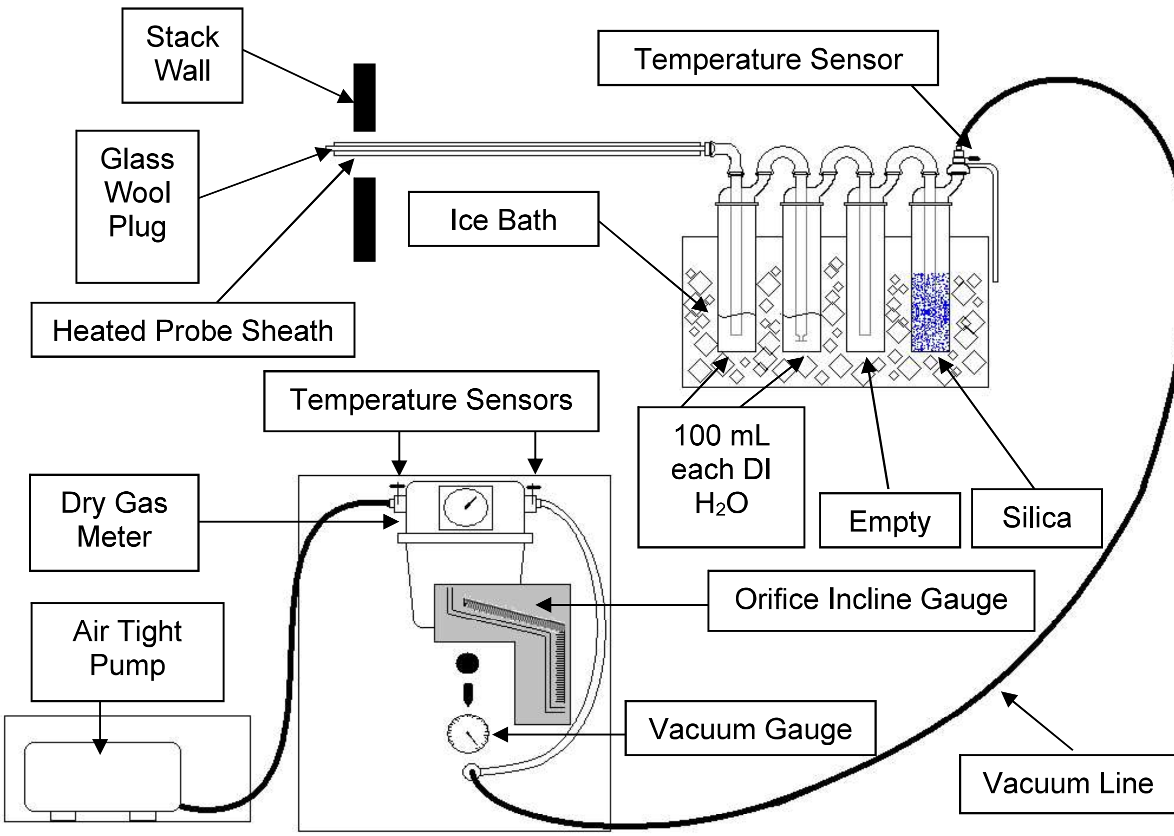
USEPA Methods 3A, 6C, and 10 Extractive Gaseous Sampling Diagram



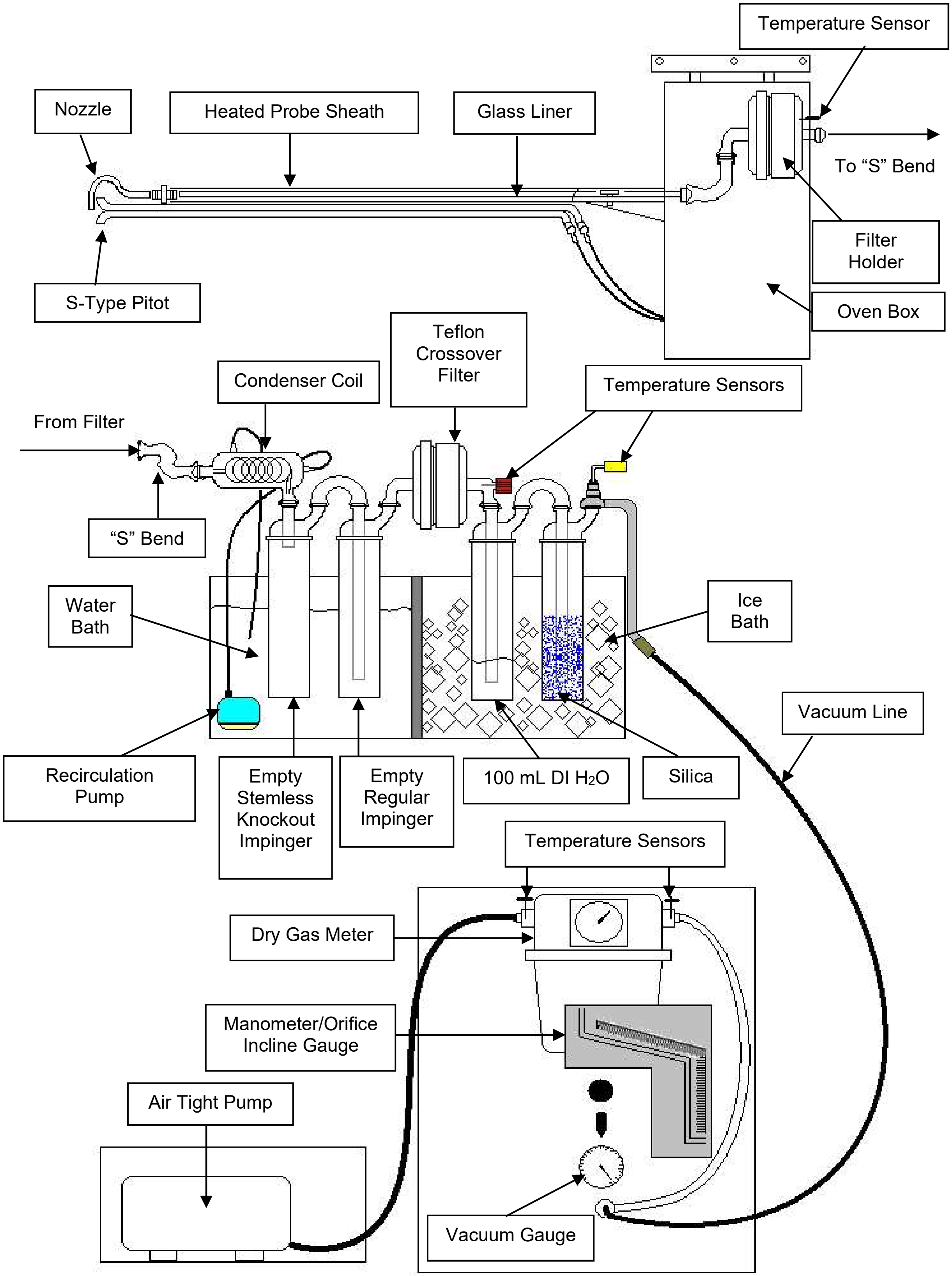
USEPA Method 3A - Integrated Oxygen/Carbon Dioxide Sample Train Diagram Utilizing ECOM To Measure from Sample Exhaust



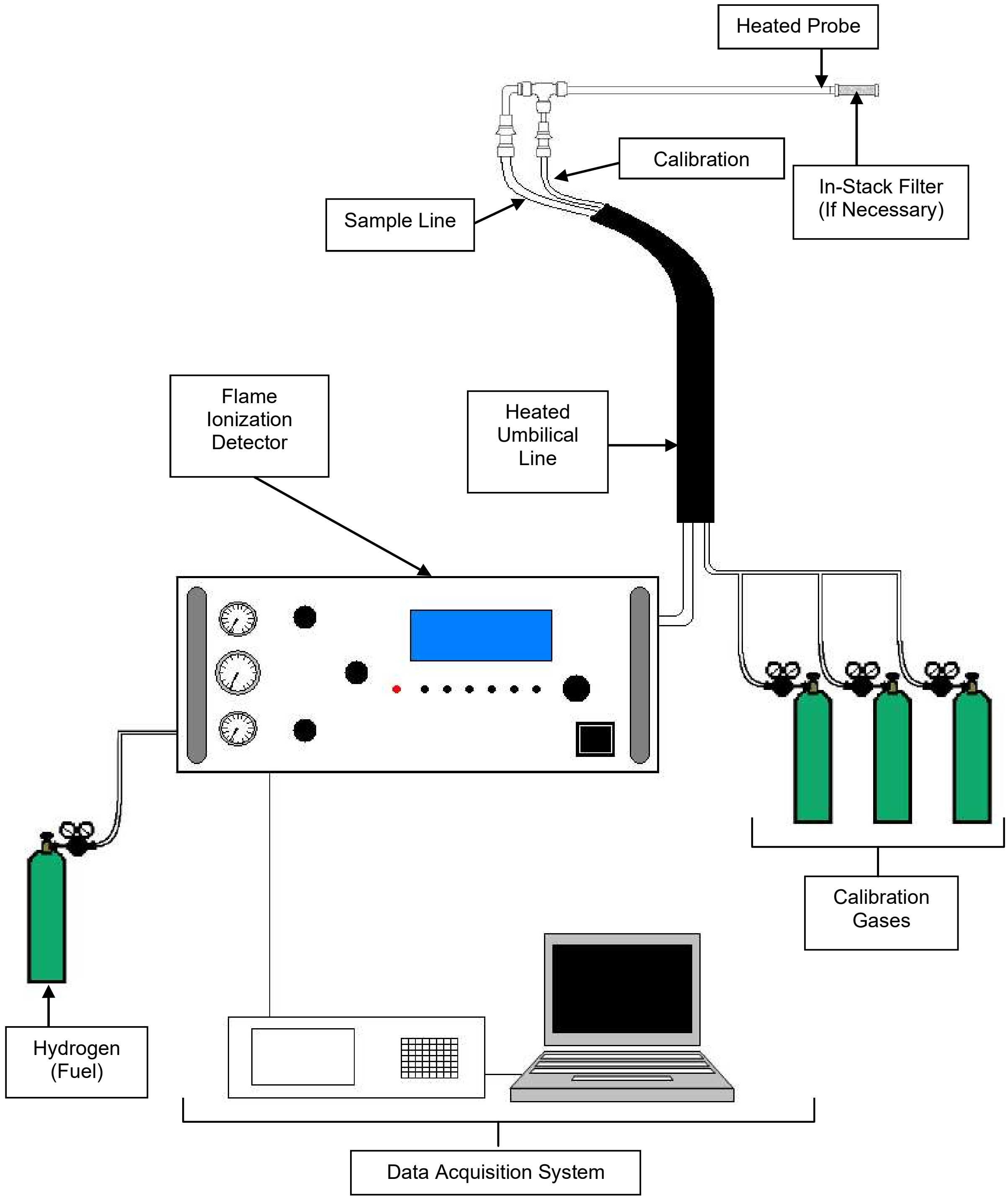
USEPA Method 4- Moisture Content Sample Train Diagram



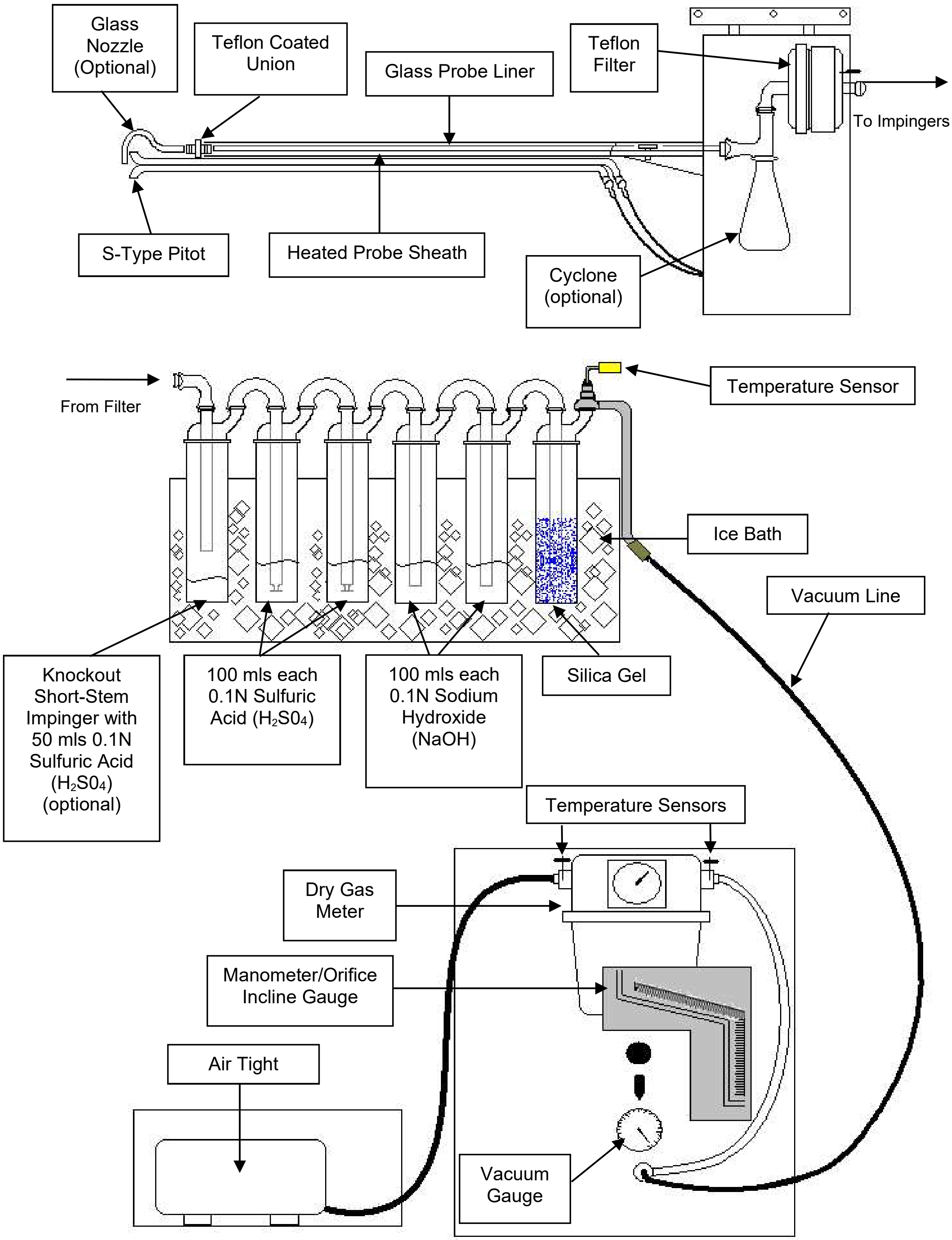
USEPA Method 5/202- Condensable Particulate Matter



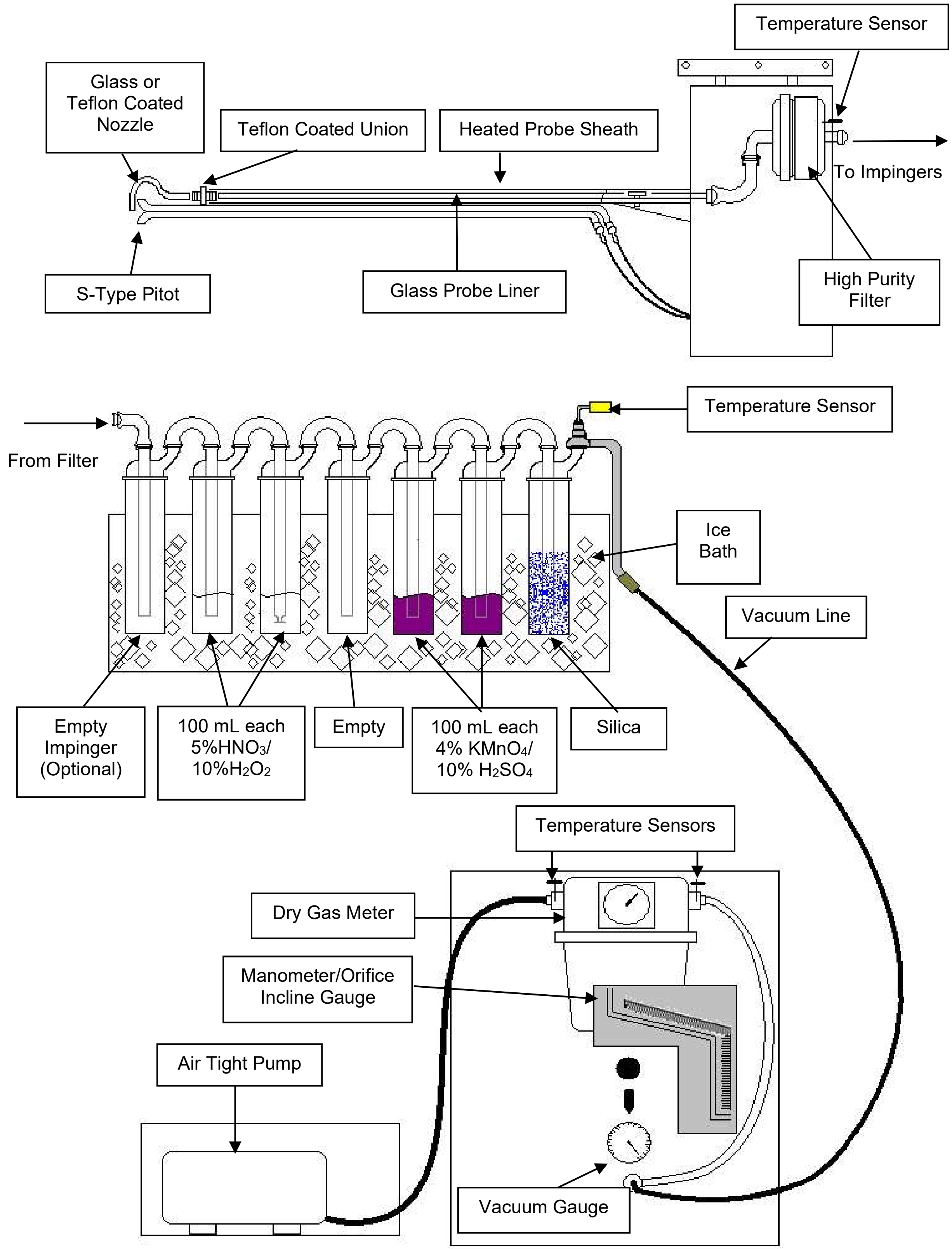
USEPA Method 25A – Total Gaseous Organic Compound Sample Train



USEPA Modified Method 26 – HCl and HF Sample Train Diagram



USEPA Method 29- Metals Sample Train Diagram (with Hg)



Appendix D- Calculation Nomenclature and Formulas

Client: General Iron Industries, Inc.
Facility: Chicago, IL
Project #: Scrubber Stack

Test Location: Scrubber Stack
Date: 11/15/19

Sample Calculations

O_2 % (dry)

$$20.16\ \% - 0.00\ \% \times \frac{9.993\ \%}{10.05\ \% - 0.00\ \%} = 20.0\ \%$$

CO_2 % (dry)

$$0.36\ \% - 0.00\ \% \times \frac{9.936\ \%}{10.05\ \% - 0.00\ \%} = 0.4\ \%$$

$$C_{gas} = (C - C_o) \times \frac{C_{ma}}{C_m - C_o}$$

where:
C_{gas} = Effluent gas concentration, dry basis, %
C = Average gas concentration indicated by gas analyzer, dry basis, %
C_o = Average of initial and final system calibration bias check responses for the zero gas, %
C_m = Average of initital and final system calibration bias check responses for the upscale calibration gas, %
C_{ma} = Actual concentration of the upscale calibration gas, %

Client: General Iron Industries, Inc.
Facility: Chicago, IL
Test Location: Scrubber Stack
Run: 2
Date: 11/18/2019
Method: 5/202
Source Condition: Normal

Dry Molecular Weight

$$Md = 0.44 \times (\%CO_2) + 0.32 \times (\%O_2) + 0.28 \times \%N_2$$

$\%CO_2$ = 0.5 $\%O_2$ = 20.2 $\%N_2$ = 79.3

Md = 28.888

Wet Molecular Weight

$$Ms = Md \times (1-Bws) + (18.0 \times Bws)$$

Md = 28.888 Bws = 0.072

Ms = 28.159

Meter Volume at Standard Conditions

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

Y = 1.011 Vm = 34.903 Pbar = 29.16
DH = 1.15 Tm = 515.0

Vm(std) = 35.358

Volume of Water Vapor Condensed

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

Net H_2O = 58.0

Vw(std) = 2.732

Moisture Content

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

Vw(std) = 2.732 Vm(std) = 35.358

Bws = 0.072

Client: General Iron Industries, Inc.
Facility: Chicago, IL
Test Location: Scrubber Stack
Run: 2
Date: 11/18/2019
Method: 5/202
Source Condition: Normal

Average Duct Velocity

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

Cp = 0.000 Ts (avg) = 100.6 Sqrt DP (avg): 0.580
Ps = 29.18 Ms = 28.159

Vs = 34.414

Volumetric Flow Rate (Actual Basis)

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

Vs = 34.414 A = 29.870

Q = 61,678

Volumetric Flow Rate (Standard Basis)

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

Q = 61,678 Ps = 29.18 Ts (avg) = 100.6

Qstd = 56,660

Volumetric Flow Rate (Standard Dry Basis)

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

Qstd = 56,660 Bws = 0.072

Qstd(dry) = 52,864

Isokinetic Variation:

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

Ts = 100.6 Vm(std) = 35.358 Vs = 34.414
An = 0.0003301 θ = 60 Ps = 29.18
Bws = 0.072

%ISO = 100.9

Client:	**General Iron Industries, Inc.**
Facility:	**Chicago, IL**
Test Location:	**Scrubber Stack**
Run:	**2**
Date:	**11/18/2019**
Method:	**5/202**
Source Condition:	**Normal**

PM Concentration:

This example represents the filterable fraction. For other fractions, use the obtained mn for that particulate fraction.

$$Co = \frac{m_n \times 15.43}{Vm(std)}$$

m_n (g) = 0.00308 Vm(std) = 35.358

Co = 0.0013 gr/dscf

PM Emission Rate:

$$\text{Emission Rate lb/hr} = \frac{Co}{7{,}000} \times Qstd(dry) \times 60$$

Co = 0.0013 Qstd(dry) = 52,864

Emission Rate lb/hr = 0.609 lb/hr

Client: General Iron Industries, Inc.
Facility: Chicago, IL
Project #: M193103

Location: Scrubber Stack
Date: 11/14/19

Sample Calculations

CO ppmvd

$$(19.4 \text{ ppm} - 0.1 \text{ ppm}) \times \frac{90.6 \text{ ppm}}{91.7 \text{ ppm} - 0.1 \text{ ppm}} = 19.1 \text{ ppm}$$

SO2 ppmvd

$$(0.1 \text{ ppm} - 0.4 \text{ ppm}) \times \frac{25.7 \text{ ppm}}{25.9 \text{ ppm} - 0.4 \text{ ppm}} = -0.3 \text{ ppm}$$

CO2 % (dry)

$$(0.43\ \% - -0.01\ \%) \times \frac{9.88\ \%}{9.81\ \% - -0.01\ \%} = 0.40\ \%$$

O2 % (dry)

$$(19.75\ \% - 0.02\ \%) \times \frac{10.09\ \%}{9.94\ \% - 0.02\ \%} = 20.10\ \%$$

$$C_{gas} = (C - C_o) \times \frac{C_{ma}}{C_m - C_o}$$

where:
C_{gas} = Effluent gas concentration, dry basis, ppm
C = Average gas concentration indicated by gas analyzer, dry basis, ppm
C_o = Average of initial and final system calibration bias check responses for the zero gas, ppm
C_m = Average of initital and final system calibration bias check responses for the upscale calibration gas, ppm
C_{ma} = Actual concentration of the upscale calibration gas, ppm

Company: Scrubber Stack
Plant: General Iron Industries, Inc.
Test Location: Stack
Run: 1
Date: 11/14/2019
Test Method: 26

Dry Molecular Weight

$$Md = 0.44 \times (\%CO_2) + 0.32 \times (\%O_2) + 0.28 \times \%N_2$$

$\%CO_2$ = 0.4 $\%O_2$ = 20.1 $\%N_2$ = 79.5

Md = 28.87

Wet Molecular Weight

$$Ms = Md \times (1-Bws) + (18.0 \times Bws)$$

Md = 28.87 Bws = 0.071

Ms = 28.09

Meter Volume at Standard Conditions

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

Y = 0.993 Vm = 43.360 Pbar = 29.56
DH = 1.76 Tm = 506.5

Vm(std) = 44.542

Volume of Water Vapor Condensed

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

Net H_2O = 72.6

Vw(std) = 3.419

Moisture Content

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

Vw(std) = 3.419 Vm(std) = 44.542

Bws = 0.071

HCl Concentration lbs/dscf:

$$\frac{0.0026 \text{ grams}}{453.6 \times 45.918 \text{ dscf}} = 5.30 \times 10^{-8} \text{ lbs HCl/dscf}$$

453.6 = g/lb
dscf = Volume of gas sampled

Parts per Million:

$$\frac{5.30 \times 10^{-8} \text{ lbs of HCl/dscf} \times 385 \times 10^{6}}{36.453} = 1.36 \text{ ppm HCl}$$

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Volumetric Air Flow Calculations

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

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

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

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

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

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

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

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

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

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

Client: General Iron Industries, Inc.
Facility: Chicago, IL
Test Location: Scrubber Stack
Run: 1
Date: 11/14/2019
Method: 29
Source Condition: Normal

Dry Molecular Weight

$$Md = 0.44 \times (\%CO_2) + 0.32 \times (\%O_2) + 0.28 \times \%N_2$$

$\%CO_2$ = 0.4 $\%O_2$ = 20.1 $\%N_2$ = 79.5

Md = 28.868

Wet Molecular Weight

$$Ms = Md \times (1-Bws) + (18.0 \times Bws)$$

Md = 28.868 Bws = 0.075

Ms = 28.118

Meter Volume at Standard Conditions

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

Y = 1.011 Vm = 56.698 Pbar = 29.6
DH = 1.2 Tm = 502.0

Vm(std) = 59.740

Volume of Water Vapor Condensed

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

Net H_2O = 102.9

Vw(std) = 4.847

Moisture Content

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

Vw(std) = 4.847 Vm(std) = 59.740

Bws = 0.075

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) = 101.6 Sqrt DP (avg): 0.619
Ps = 29.58 Ms = 28.118

Vs = 36.540

Client:	**General Iron Industries, Inc.**
Facility:	**Chicago, IL**
Test Location:	**Scrubber Stack**
Run:	**1**
Date:	**11/14/2019**
Method:	**29**
Source Condition:	**Normal**

Volumetric Flow Rate (Actual Basis)

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

Vs = 36.540 A = 29.870

Q = 65,488

Volumetric Flow Rate (Standard Basis)

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

Q = 65,488 Ps = 29.58 Ts (avg) = 101.6

Qstd = 60,870

Volumetric Flow Rate (Standard Dry Basis)

$$Qstd(dry) = Qstd \times (1\text{-}Bws)$$

Qstd = 60,870 Bws = 0.075

Qstd(dry) = 56,670

Isokinetic Variation:

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

Ts = 101.6 Vm(std) = 59.740 Vs = 36.540

An = 0.0003194 θ = 96 Ps = 29.58

Bws = 0.075

%ISO = 102.8

Client:	**General Iron Industries, Inc.**
Facility:	**Chicago, IL**
Test Location:	**Scrubber Stack**
Run:	**1**
Date:	**11/14/2019**
Method:	**29**
Source Condition:	**Normal**

Antimony (Sb) Concentration:

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

µg= 3.40 **Vm(std) =** 59.740

µg/m³= 2.01

Antimony (Sb) Emission Rate:

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

lb of Antimony (Sb) = 7.50E-09 **dscfm =** 56,670

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

Emission Rate lb/hr = 4.27E-04

MOSTARDI PLATT

Volumetric Flow Nomenclature

A =	Cross-sectional area of stack or duct, ft2
Bws =	Water vapor in gas stream, proportion by volume
Cp =	Pitot tube coefficient, dimensionless
Md =	Dry molecular weight of gas, lb/lb-mole
Ms =	Molecular weight of gas, wet basis, lb/lb-mole
Mw =	Molecular weight of water, 18.0 lb/lb-mole
Pbar =	Barometric pressure at testing site, in. Hg
Pg =	Static pressure of gas, in. Hg (in. H2O/13.6)
DH=	Static pressure of gas, in.H2O
Ps =	Absolute pressure of gas, in. Hg = Pbar + Pg
Pstd =	Standard absolute pressure, 29.92 in. Hg
Acfm =	Actual volumetric gas flow rate
Scfm=	Volumetric gas flow rate, corrected to standard conditions
Dscfm =	Standard volumetric flow rate, corrected to dry conditions
R =	Ideal gas constant, 21.85 in. Hg-ft3/°R-lb-mole
Ts =	Average stack gas temperature, °F
Tm =	Average dry gas meter temperature, oF
Tstd =	Standard absolute temperature, 528°R
vs =	Gas velocity, ft/sec
Vm(std)=	Volume of gas sampled, corrected to standard conditions, scf
Vw(std) =	Volume of water vapor in gas sample, corrected to standard conditions, scf
Vlc=	Volume of liquid collected
Y =	Dry gas meter calibration factor
Δp =	Velocity head of gas, in. H2O
K1 =	17.647 °R/in. Hg
%EA =	Percent excess air
%CO2 =	Percent carbon dioxide by volume, dry basis
%O2 =	Percent oxygen by volume, dry basis
%N2 =	Percent nitrogen by volume, dry basis
0.264 =	Ratio of O2 to N2 in air, v/v
0.28 =	Molecular weight of N2 or CO, divided by 100
0.32 =	Molecular weight of O2 divided by 100
0.44 =	Molecular weight of CO2 divided by 100
13.6 =	Specific gravity of mercury (Hg)

MOSTARDI PLATT

Moisture Calculations

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

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

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

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

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

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

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 % $\leq$ IKV $\leq$ 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 =	Pitot tube constant, $85.49 \frac{ft}{sec}\left[\frac{(lb/lb{-}mole)(in.\ Hg)}{(°R)(in.\ H_2O)}\right]^{1/2}$
%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

Derivation of Factors Used in Carbon Monoxide and Sulfur Dioxide Calculations

Factors for calculating from lb/dscf to parts per million:

Using 22.414 liters of gas per gram-mole at 0°C and 1 atmosphere pressure,

One pound-mole of gas is contained in 359.04765 ft^3 at 32°F and 29.92 in. Hg, or 385.31943 ft^3 at 68°F and 29.92 in. Hg.

$$ppm = \frac{M\ lb/lb\text{-}mole}{385.31943\ dscf/lb\text{-}mole \times 10^6} = 2.595294\ \times\ 10^{-9}\ M\ lb/dscf$$

Where M = pollutant molecular weight; SO2 = 64.0628 lb/lb-mole; and NO_2 = 46.0055 lb/lb-mole

$$Factor\ for\ ppm\ SO_2 = \frac{1}{64.06 \times 2.59552 \times 10^{-9}} = 6.0151 \times 10^6\ dscf/lb$$

Use 6.0151 x 10^6

$$Factor\ for\ ppm\ NO_x = \frac{1}{46.0055 \times 2.5952494 \times 10^{-9}} = 8.3755 \times 10^6\ dscf/lb$$

Use 8.3755 x 10^6

Factors for calculating concentration as pounds per dry standard cubic feet:

$$Factor\ for\ C_{SO_2} = \frac{64.0628\ grams/gram\text{-}mole}{2\,\frac{gram - equivalent}{gram\text{-}mole} \times 1000\,\frac{gram\text{-}milliquivalents}{gram\text{-}equivalent} \times 453.592\,\frac{grams}{lb}}$$

$$= 7.061721 \times 10^{-5}\ lb/g\text{-}meq$$

Use 7.0617 x 10^{-5}

$$Factor\ for\ C_{NO_2}\ as\ NO_2 = \frac{28316.84\ ml/scf}{4.53592 \times 10^8\ \mu g/lb} = 6.242801 \times 10^{-5}\,\frac{lb/scf}{\mu g/ml}$$

Use 6.2428 x 10^{-5}

MOSTARDI PLATT

Calculations for Hydrogen Chloride by Method 26 or 26A

Concentration

$$\frac{\text{lb HCl}}{\text{dscf}} = \frac{\mu\text{g HCl in sample}}{4.536 \times 10^{8} \times \text{dscf}}$$

where:

$4.536 \times 10^{8} = \mu\text{g/lb}$
dscf = Volume of gas sampled

$$\mu g\text{/lb HCl} = \mu\text{g Cl} \times \frac{36.453}{35.453}$$

Parts Per Million

$$\text{ppm HCl} = \frac{\text{lb HCl}}{\text{dscf}} \div \frac{36.453}{385 \times 10^{6}}$$

where:

385 = Volume of 1 lb mole of gas at 68°F and 29.92 in. Hg
10^{6} = Conversion of ppm v/v

Emission Rate

lb HCl/dscf × dscfm × 60 min/hr = lb/hr HCl

MOSTARDI PLATT

Calculations for Hydrogen Fluoride By Method 26 or 26A

Concentration

$$\frac{\text{lbs HF}}{\text{dscf}} = \frac{\mu\text{g HF in sample}}{4.536 \times 10^{8} \times \text{dscf}}$$

where:

$4.536 \times 10^{8} = \mu g/lb$

dscf = Volume of gas sampled

$$\mu g/\text{lb HF} = \mu\text{g F} \times \frac{20.008}{19.000}$$

Parts Per Million

$$\text{ppm HF} = \frac{\text{lbs HF}}{\text{dscf}} \div \frac{20.008}{385 \times 10^{6}}$$

where:

385 = Volume of 1 lb mole of gas at 68°F and 29.92 in. Hg

106 = Conversion of ppm v/v

Emission Rate

lbs HF /dscf $\times$ dscfm $\times$ 60 min/hr = lbs/hr HF

MOSTARDI PLATT

ppmv to lb/hr Conversion Calculations

1. $$ppm\ SO_2 \times 1.660 \times 10^{-7} = \frac{lbs/SO_2}{scf}$$

$$\frac{lbs\ SO_2}{scf} \times \frac{scf}{min} \times \frac{60\ min}{hr} = \frac{lbs\ SO_2}{hr}$$

2. $$ppm\ NO_x \times 1.194 \times 10^{-7} = \frac{lbs/NO_{x2}}{scf}$$

$$\frac{lbs\ NO_x}{scf} \times \frac{scf}{min} \times \frac{60\ min}{hr} = \frac{lbs\ NO_x}{hr}$$

3. $$ppm\ CO \times 7.266 \times 10^{-8} = \frac{lbs/CO}{scf}$$

$$\frac{lbs\ CO}{scf} \times \frac{scf}{min} \times \frac{60\ min}{hr} = \frac{lbs\ CO}{hr}$$

4. $$ppm\ C_3H_8 \times 1.142 \times 10^{-7} = \frac{lbsC_3H_8}{scf}$$

$$\frac{lbs\ C_3H_8}{scf} \times \frac{scf}{min} \times \frac{60\ min}{hr} = \frac{lbs\ C_3H_8}{hr}$$

5. $$ppm\ CH_4 \times 4.164 \times 10^{-8} = \frac{lbs/CH_4}{scf}$$

$$\frac{lbs\ CH_4}{scf} \times \frac{scf}{min} \times \frac{60\ min}{hr} = \frac{lbs\ CH_4}{hr}$$

6. $$ppm\ NMHC\ as\ C_3H_8 \times 9.3427 \times 10^{-8} = \frac{lbs\ C}{scf}$$

$$\frac{lbs\ C}{scf} \times \frac{lbsscf}{min} \times \frac{60\ min}{hr} = \frac{lbs\ C}{hr}$$

Appendix E- Laboratory Sample Analysis

Mostardi Platt

Chain-of-Custody Form

Project Number: M193103	Date Results Required: CH4 and C2H6
Client: General Iron Industries, Inc.	TAT Required:
Plant/Test Location: RTO Inlet and Scrubber Stack	Project Supervisor: R. Sollars
P.O. # for Lab Work:	

Sample Number	Sample Date	Sample Point Identification	# of Conts	Sub Lab	Analysis Required	Volume, mls
001	11/15/19	Run 1 Inlet Bag	1	N/A	M18	
002	11/15/19	Run 1 Stack Bag	1	N/A	M18	
003	11/18/19	Run 2 Inlet Bag	1	N/A	M18	
004	11/18/19	Run 2 Stack Bag	1	N/A	M18	
005	11/18/19	Run 3 Inlet Bag	1	N/A	M18	
006	11/18/19	Run 3 Stack Bag	1	N/A	M18	
007	11/18/19	Run 4 Inlet Bag	1	N/A	M18	
008	11/18/19	Run 4 Stack Bag	1	N/A	M18	

Delivered to Lab by: R. Sollars Date/Time: 11/18/19 8:00 p.m. Rich Sollars	Received by: Date/Time: Benjamin W Hand 11/19/19	Processed by: Date/Time: Benjamin W Hand 11/21/19

Laboratory Notes:

Client:	General Iron Industries, Inc.	Analysis Date:	11/21/2019
Facility:	Chicago, IL	Analysis Location:	Elmhurst
Test Location:	RTO Inlet and Scrubber Stack	Analyst:	BWH
Project Number:	M193103		
Method:	18		
Date Samples Received:	11/21/2019		

Sampling Date		11/15/2019	11/18/2019	11/18/2019	11/18/2019
COC Number		001	003	005	007
	UNITS	**Inlet Run 1**	**Inlet Run 2**	**Inlet Run 3**	**Inlet Run 4**
Methane	ppmv	3.65	3.59	3.68	4.25
Ethane	ppmv	0.00	0.00	0.00	0.00

Sampling Date		11/15/2019	11/18/2019	11/18/2019	11/18/2019
COC Number		002	004	006	008
	UNITS	**Stack Run 1**	**Stack Run 2**	**Stack Run 3**	**Stack Run 4**
Methane	ppmv	1.10	2.49	1.11	1.13
Ethane	ppmv	0.00	0.00	0.00	0.00

Client:	General Iron Industries, Inc.	Analysis Date:	11/21/2019		
Facility:	Chicago, IL	Analysis Location:	Elmhurst		
Test Location:	RTO Inlet and Scrubber Stack	Analyst:	BWH		
Project Number:	M193103				
Method:	18				
Date Samples Received:	11/21/2019				

Standard ppmv CH_4	Area	Response Factor	Calculated Value ppmv	Calibration Average	Slope of Least Square Regression Curve
2.93	4.8599	1.6587	**2.91**		
2.93	4.9208	1.6795	**2.94**	**2.92**	**1.6714**
2.93	4.8749	1.6638	**2.92**		
5.934	9.8272	1.6561	**5.88**		**Response Factor Ave**
5.934	9.8662	1.6627	**5.90**	**5.93**	**1.6698**
5.934	10.0231	1.6891	**6.00**		
8.779	14.4004	1.6403	**8.62**		**R^2**
8.779	14.8414	1.6906	**8.88**	**8.79**	**0.9990**
8.779	14.8156	1.6876	**8.86**		

COC Number	Sample Date	Sample ID	Sample Area	ppmv CH_4	Run Average ppmv CH_4
001	11/15/2019	Inlet Run 1	6.0946	3.65	
001	11/15/2019	Inlet Run 1	6.1524	3.68	**3.65**
001	11/15/2019	Inlet Run 1	6.0780	3.64	
003	11/18/2019	Inlet Run 2	6.0564	3.62	
003	11/18/2019	Inlet Run 2	6.0314	3.61	**3.59**
003	11/18/2019	Inlet Run 2	5.9262	3.55	
005	11/18/2019	Inlet Run 3	6.1524	3.68	
005	11/18/2019	Inlet Run 3	6.0842	3.64	**3.68**
005	11/18/2019	Inlet Run 3	6.2208	3.72	
007	11/18/2019	Inlet Run 4	7.0920	4.24	
007	11/18/2019	Inlet Run 4	7.1428	4.27	**4.25**
007	11/18/2019	Inlet Run 4	7.0826	4.24	
002	11/15/2019	Stack Run 1	1.8518	1.11	
002	11/15/2019	Stack Run 1	1.8190	1.09	**1.10**
002	11/15/2019	Stack Run 1	1.8330	1.10	
004	11/18/2019	Stack Run 2	4.1170	2.46	
004	11/18/2019	Stack Run 2	4.1009	2.45	**2.49**
004	11/18/2019	Stack Run 2	4.2470	2.54	
006	11/18/2019	Stack Run 3	1.8456	1.10	
006	11/18/2019	Stack Run 3	1.9222	1.15	**1.11**
006	11/18/2019	Stack Run 3	1.7771	1.06	
008	11/18/2019	Stack Run 4	1.8456	1.10	
008	11/18/2019	Stack Run 4	1.9222	1.15	**1.13**
008	11/18/2019	Stack Run 4	1.8756	1.12	

Standard ppm CH_4	Area	Calculated Value	Average	Pre-Post Agreement
	10.0195	5.99		
5.93	10.0502	6.01	6.03	1.72%
	10.1572	6.08		

Client:	General Iron Industries, Inc.	**Analysis Date:**	11/21/2019		
Facility:	Chicago, IL	**Analysis Location:**	Elmhurst		
Test Location:	RTO Inlet and Scrubber Stack	**Analyst:**	BWH		
Project Number:	M193103				
Method:	18				
Date Samples Received:	11/21/2019				
Standard ppmv C_2H_6	**Area**	**Response Factor**	**Calculated Value**	**Calibration Average**	**Slope of Least Square Regression Curve**
16.29	48.4579	2.9747	**15.46**		
16.29	47.9782	2.9453	**15.30**	**15.44**	**3.1350**
16.29	48.7933	2.9953	**15.56**		
25.74	79.9337	3.1054	**25.50**		**Response Factor Ave**
25.74	79.4434	3.0864	**25.34**	**25.45**	**3.0810**
25.74	79.9672	3.1067	**25.51**		
42.67	134.3394	3.1483	**42.85**		**R^2**
42.67	136.0931	3.1894	**43.41**	**43.17**	**0.9998**
42.67	135.5771	3.1773	**43.25**		
COC Number	**Sample Date**	**Sample ID**	**Sample Area**	**ppmv C_2H_6**	**Run Average ppmv C_2H_6**
001	11/15/2019	Inlet Run 1	0.0000	0.00	
001	11/15/2019	Inlet Run 1	0.0000	0.00	**0.00**
001	11/15/2019	Inlet Run 1	0.0000	0.00	
003	11/18/2019	Inlet Run 2	0.0000	0.00	
003	11/18/2019	Inlet Run 2	0.0000	0.00	**0.00**
003	11/18/2019	Inlet Run 2	0.0000	0.00	
005	11/18/2019	Inlet Run 3	0.0000	0.00	
005	11/18/2019	Inlet Run 3	0.0000	0.00	**0.00**
005	11/18/2019	Inlet Run 3	0.0000	0.00	
007	11/18/2019	Inlet Run 4	0.0000	0.00	
007	11/18/2019	Inlet Run 4	0.0000	0.00	**0.00**
007	11/18/2019	Inlet Run 4	0.0000	0.00	
002	11/15/2019	Stack Run 1	0.0000	0.00	
002	11/15/2019	Stack Run 1	0.0000	0.00	**0.00**
002	11/15/2019	Stack Run 1	0.0000	0.00	
004	11/18/2019	Stack Run 2	0.0000	0.00	
004	11/18/2019	Stack Run 2	0.0000	0.00	**0.00**
004	11/18/2019	Stack Run 2	0.0000	0.00	
006	11/18/2019	Stack Run 3	0.0000	0.00	
006	11/18/2019	Stack Run 3	0.0000	0.00	**0.00**
006	11/18/2019	Stack Run 3	0.0000	0.00	
008	11/18/2019	Stack Run 4	0.0000	0.00	
008	11/18/2019	Stack Run 4	0.0000	0.00	**0.00**
008	11/18/2019	Stack Run 4	0.0000	0.00	
Standard ppm C_2H_6	**Area**	**Calculated Value**	**Average**	**Pre-Post Agreement**	
	79.7794	25.448			
25.74	81.9408	26.137	25.81	1.43%	
	81.0566	25.855			

Mostardi Platt

Chain-of-Custody Form

Project Number: M193103	Date Results Required:
Client: General Iron Industries, Inc.	TAT Required:
Plant/Test Location: RTO Inlet and Scrubber Stack	Project Supervisor: R. Sollars
P.O. # for Lab Work:	

Sample Number	Sample Date	Sample Point Identification	# of Conts	Sub Lab	Analysis Required	Volume, mls
001	11/15/19	Run 1 Stack-Filter and Acetone PW	2	In-House	M5	
002	11/15/19	Run 1 Stack- CPM filter, Ace/Hex Rinse, DI Imps	3	In-House	M202	
003	11/18/19	Run 2 Stack-Filter and Acetone PW	2	In-House	M5	
004	11/18/19	Run 2 Stack- CPM filter, Ace/Hex Rinse, DI Imps	3	In-House	M202	
005	11/18/19	Run 3 Stack-Filter and Acetone PW	2	In-House	M5	
006	11/18/19	Run 3 Stack- CPM filter, Ace/Hex Rinse, DI Imps	3	In-House	M202	
007	11/18/19	Acetone Reagent Blank	1	In-House	M5/202	
008	11/18/19	Hexane Reagent Blank	1	In-House	M202	
009	11/18/19	DI Reagent Blank	1	In-House	M202	
010	11/18/19	Field Blank-CPM Filter, Ace/Hex Rinse, DI Imps	3	In-House	M202	
011	11/18/19	Proof Blank-Ace/Hex Rinse, DI Rinse	2	In-House	M5	
012	11/14/19	Run 1 Stack-H2SO4 Imps and Rinse	1	In-House	M26 HCl, HF	
013	11/14/19	Run 1 Stack-NaOH Imps and Rinse	1	In-House	Hold	
014	11/14/19	Run 2 Stack-H2SO4 Imps and Rinse	1	In-House	M26 HCl, HF	
015	11/14/19	Run 2 Stack-NaOH Imps and Rinse	1	In-House	Hold	
016	11/14/19	Run 3 Stack-H2SO4 Imps and Rinse	1	In-House	M26 HCl, HF	
017	11/14/19	Run 3 Stack-NaOH Imps and Rinse	1	In-House	Hold	
018	11/14/19	0.1N NaOH Reagent Blank	1	In-House	Hold	
019	11/14/19	DI Reagent Blank	1	In-House	M26 HCl, HF	
020	11/14/19	0.1N H2SO4 Reagent Blank	1	In-House	M26 HCl, HF	
021	11/14/19	Audit	1	In-House	M26 HCl, HF	

Delivered to Lab by: R. Sollars Date/Time: 11/18/19 22:00 p.m. Rich Sll	Received by: Date/Time: Benjamin W. Hed	Processed by: Date/Time: Benjamin W. Hed

Laboratory Notes:

mostardi platt

Chain-of-Custody Form

Project Number: M193103	Date Results Required:
Client: General Iron Industries, Inc.	TAT Required:
Plant/Test Location: Chicago, IL / Scrubber Stack	Project Supervisor: R. Sollars

Sample Number	Sample Date	Sample Point Identification	# of Conts	Sub Lab	Analysis Required	Volume, mls
001	11/14/19	Stack R1 0.1N HNO3 PW and Filter	2	BV	M29*	
002	11/14/19	Stack R1 HNO3/H2O2 Imps and Rinses	1	BV	M29*	
003	11/14/19	Stack R1 0.1N HNO3 Blank Imp, KMnO4 Imp, HCl Rinse	3	BV	M29-Hg	
004	11/14/19	Stack R2 0.1N HNO3 PW and Filter	2	BV	M29*	
005	11/14/19	Stack R2 HNO3/H2O2 Imps and Rinses	1	BV	M29*	
006	11/14/19	Stack R2 0.1N HNO3 Blank Imp, KMnO4 Imp, HCl Rinse	3	BV	M29-Hg	
007	11/14/19	Stack R3 0.1N HNO3 PW and Filter	2	BV	M29*	
008	11/14/19	Stack R3 HNO3/H2O2 Imps and Rinses	1	BV	M29*	
009	11/14/19	Stack R3 0.1N HNO3 Blank Imp, KMnO4 Imp, HCl Rinse	3	BV	M29-Hg	
010	11/14/19	Filter Reagent Blanks	3	BV	M29*	
011	11/14/19	0.1N HNO3 Reagent Blanks	1	BV	M29*	
012	11/14/19	DI Water Reagent Blank	1	BV	M29*	
013	11/14/19	HNO3/H2O2 Reagent Blank	1	BV	M29*	
014	11/14/19	H2SO4/KMnO4 Reagent Blank	1	BV	M29*	
015	11/14/19	HCl Reagent Blank	1	BV	M29*	
016		Audit	1	BV	M29*	

Delivered to Lab by: R. Sollars Date/Time: 11/14/19 19:30	Received by: Date/Time:	Processed by: Date/Time:

Laboratory Notes: M29*- The trace metals are Antimony (Sb), Arsenic (As), 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), and Zinc (Zn).

Front and back half fractions analyzed separately.

Client:	**General Iron Industries, Inc.**
Facility:	**Chicago, IL**
Project Number:	**M193103**
Test Location:	**Scrubber Stack**
Test Method:	**5/202**
Filterable Analysis Date:	**11/21/2019**
Condensable Analysis Date:	**11/27/2019**

Filter Drying Temp ^{o}F:	**220**
Analyst:	**BWH**
Analyst:	**JMG**

Description		Sample Date	ID#	vol. (ml)	Initial Weight (grams)	Final Weight (grams)	Net Weight Gain (grams)
			Filterable Particulate				
Test No. 1		11/15/2019					
Source Condition:	Normal						
M5 Filter			14068		0.45702	0.45704	0.00015
Acetone Wash (M5 Pans)			14797	55 mL	5.13048	5.13256	0.00208
Acetone Blank							0.00000
Total Front Half Weight							**0.00223**
			Condensable Particulate				
Acetone/Hexane Wash			2076	180 mL	20.36221	20.36512	0.00291
DI Wash			2124	149 mL	20.30389	20.30957	0.00568
NH_4OH Correction				0 mL			0.00000
Field Blank							0.00200
Total Back Half Weight							**0.00659**
Total Particulate Weight							**0.00882**
			Filterable Particulate				
Test No. 2		11/18/2019					
Source Condition:	Normal						
M5 Filter			14015		0.46113	0.46071	0.00015
Acetone Wash (M5 Pans)			14798	85 mL	5.06962	5.07643	0.00681
Acetone Blank							0.00388
Total Front Half Weight							**0.00308**
			Condensable Particulate				
Acetone/Hexane Wash			2077	260 mL	20.52442	20.52739	0.00297
DI Wash			2125	301 mL	20.40153	20.40518	0.00365
NH_4OH Correction				0 mL			0.00000
Field Blank							0.00200
Total Back Half Weight							**0.00462**
Total Particulate Weight							**0.00770**
			Filterable Particulate				
Test No. 3		11/18/2019					
Source Condition:	Normal						
M5 Filter			14338		0.46407	0.46294	0.00015
Acetone Wash (M5 Pans)			14799	75 mL	5.09518	5.10986	0.01468
Acetone Blank							0.00342
Total Front Half Weight							**0.01141**
			Condensable Particulate				
Acetone/Hexane Wash			2078	225 mL	20.36062	20.36297	0.00235
DI Wash			2126	249 mL	20.28673	20.29314	0.00641
NH_4OH Correction				0 mL			0.00000
Field Blank							0.00200
Total Back Half Weight							**0.00676**
Total Particulate Weight							**0.01817**
			Filterable Particulate				
Test No. 4		11/18/2019					
Source Condition:	Normal						
M5 Filter			14016		0.45472	0.45389	0.00015
Acetone Wash (M5 Pans)			14800	75 mL	5.04222	5.05281	0.01059
Acetone Blank							0.00342
Total Front Half Weight							**0.00732**
			Condensable Particulate				
Acetone/Hexane Wash			2079	225 mL	20.34230	20.34502	0.00272
DI Wash			2127	238 mL	20.35473	20.35882	0.00409
NH_4OH Correction				0 mL			0.00000
Field Blank							0.00200
Total Back Half Weight							**0.00481**
Total Particulate Weight							**0.01213**
			Field Train Blank Summary				
Acetone/Hexane Wash			2096	155 mL	20.24534	20.24953	0.00419
DI Wash			2098	125 mL	20.40581	20.40714	0.00133
NH_4OH Correction				0 mL			0.00000
Total Field Train Blank							0.00552
			Field Proof Blank Summary				
Acetone/Hexane Wash			2097	150 mL	20.51635	20.51931	0.00296
DI Wash			2099	170 mL	20.42925	20.43045	0.00120
			Reagent Blank Summary				
DI Wash			15133	100 mL	5.08944	5.08966	0.00022
Acetone Wash (condensable)			15135	100 mL	5.06214	5.06670	0.00456
Hexane Wash			15134	100 mL	5.04996	5.05027	0.00031
Acetone Wash (M5 Pans)			15135	100 mL	5.06214	5.06670	0.00456

Your Project #: M193103-05
Site#: GENERAL IRON
Site Location: CHICAGO- STACK

Attention: Data Reporting

Mostardi Platt
888 Industrial Rd
Elmhurst, IL
USA 60126-1121

Your C.O.C. #: 010-015, 001-003, 004-006, 007-009, 016

Report Date: 2019/12/10
Report #: R5999051
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BV LABS JOB #: B9X5374
Received: 2019/11/22, 21:45

Sample Matrix: Stack Sampling Train
Samples Received: 8

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Mercury 3C in HCl Rinse	4	2019/12/05	2019/12/09	BRL SOP-00104	EPA M29/M0060 m
Mercury 2B in HNO3/H2O2 Imp.	5	2019/12/06	2019/12/09	BRL SOP-00104	EPA M29/M0060 m
Mercury 3A in HNO3 Rinse	4	2019/12/05	2019/12/06	BRL SOP-00104	EPA M29/M0060 m
Mercury 3B in KMnO4/H2SO4 Imp.	4	2019/12/03	2019/12/05	BRL SOP-00104	EPA M29/M0060 m
Mercury 1B in Filter + Rinse (M29)	5	2019/12/09	2019/12/10	BRL SOP-00104	EPA 29 m
Metals B.H. in H2O2/HNO3 Imp.(6020B m)	5	2019/12/03	2019/12/03	BRL SOP-00103 / BRL SOP-00102	EPA M29/CARB 436 m
Metals F.H. in Filter + Rinses (6020B m)	5	2019/12/05	2019/12/09	BRL SOP-00103/ BRL SOP-00102	EPA M29/CARB 436 m

Remarks:

Bureau Veritas Laboratories are accredited to ISO/IEC 17025 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by BV Labs are based upon recognized Provincial, Federal or US method compendia such as CCME, MELCC, EPA, APHA.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in BV Labs profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and BV Labs in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported; unless indicated otherwise, associated sample data are not blank corrected. Where applicable, unless otherwise noted, Measurement Uncertainty has not been accounted for when stating conformity to the referenced standard.

BV Labs liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. BV Labs has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by BV Labs, unless otherwise agreed in writing. BV Labs is not responsible for the accuracy or any data impacts, that result from the information provided by the customer or their agent.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.
Results relate to samples tested. When sampling is not conducted by BV Labs, results relate to the supplied samples tested.
This Certificate shall not be reproduced except in full, without the written approval of the laboratory.
Reference Method suffix “m” indicates test methods incorporate validated modifications from specific reference methods to improve performance.
* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

Your Project #: M193103-05
Site#: GENERAL IRON
Site Location: CHICAGO- STACK

Attention: Data Reporting
Mostardi Platt
888 Industrial Rd
Elmhurst, IL
USA 60126-1121

Your C.O.C. #: 010-015, 001-003, 004-006, 007-009, 016

Report Date: 2019/12/10
Report #: R5999051
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BV LABS JOB #: B9X5374
Received: 2019/11/22, 21:45

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Clayton Johnson, Project Manager - Air Toxics, Source Evaluation
Email: Clayton.Johnson@bvlabs.com
Phone# (905)817-5769
==
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BV Labs Job #: B9X5374
Report Date: 2019/12/10

Mostardi Platt
Client Project #: M193103-05
Site Location: CHICAGO- STACK

EPA M29 METALS (FRONT & BACK SEPARATE)

BV Labs ID		LKU784	LKU785	LKU785	LKU786	LKU787		
Sampling Date		2019/11/14	2019/11/14	2019/11/14	2019/11/14	2019/11/14		
COC Number		010-015	001-003	001-003	004-006	007-009		
	UNITS	M29- BLANK	M29- STACK- R1	M29- STACK- R1 Lab-Dup	M29- STACK- R2	M29- STACK- R3	RDL	QC Batch
Front Half Antimony (Sb)	ug	<3.0	<3.0	<3.0	<3.0	<3.0	3.0	6480548
Front Half Arsenic (As)	ug	<0.80	<0.80	<0.80	<0.80	<0.80	0.80	6480548
Front Half Barium (Ba)	ug	7.1	18.8	18.7	6.6	8.2	1.2	6480548
Front Half Beryllium (Be)	ug	<0.18	<0.18	<0.18	<0.18	<0.18	0.18	6480548
Front Half Cadmium (Cd)	ug	<0.18	2.67	2.67	0.28	0.32	0.18	6480548
Front Half Chromium (Cr)	ug	<3.0	9.8	9.8	3.4	14.2	3.0	6480548
Front Half Cobalt (Co)	ug	<0.18	0.26	0.26	<0.18	0.24	0.18	6480548
Front Half Copper (Cu)	ug	<1.8	6.2	6.1	2.1	2.5	1.8	6480548
Front Half Lead (Pb)	ug	<0.60	4.59	4.62	2.21	1.71	0.60	6480548
Front Half Manganese (Mn)	ug	<1.2	6.4	6.3	2.3	3.6	1.2	6480548
Front Half Nickel (Ni)	ug	2.4	9.4	9.3	2.9	11.8	1.0	6480548
Front Half Phosphorus (P)	ug	113	335	327	318	314	90	6480548
Front Half Selenium (Se)	ug	<2.0	<2.0	<2.0	<2.0	18.2	2.0	6480548
Front Half Silver (Ag)	ug	<0.24	<0.24	<0.24	<0.24	8.29	0.24	6480548
Front Half Thallium (Tl)	ug	<0.24	<0.24	<0.24	<0.24	<0.24	0.24	6480548
Front Half Zinc (Zn)	ug	<10	94	92	47	49	10	6480548
Back Half Antimony (Sb)	ug	<0.40	<0.40	<0.40	<0.40	<0.40	0.40	6475591
Back Half Arsenic (As)	ug	<0.40	<0.40	<0.40	<0.40	<0.40	0.40	6475591
Back Half Barium (Ba)	ug	3.39	13.3	13.5	9.76	8.00	0.60	6475591
Back Half Beryllium (Be)	ug	<0.090	<0.090	<0.090	<0.090	<0.090	0.090	6475591
Back Half Cadmium (Cd)	ug	<0.090	0.193	0.189	0.333	<0.090	0.090	6475591
Back Half Chromium (Cr)	ug	<1.5	1.5	1.5	<1.5	<1.5	1.5	6475591
Back Half Cobalt (Co)	ug	<0.090	0.109	0.096	<0.090	<0.090	0.090	6475591
Back Half Copper (Cu)	ug	<0.75	11.7	11.5	5.44	7.67	0.75	6475591
Back Half Lead (Pb)	ug	<0.30	1.73	1.71	1.39	0.92	0.30	6475591
Back Half Manganese (Mn)	ug	<0.60	2.25	2.20	1.66	2.18	0.60	6475591
Back Half Nickel (Ni)	ug	<0.50	1.64	1.70	3.19	1.18	0.50	6475591
Back Half Phosphorus (P)	ug	<45	<45	<45	<45	<45	45	6475591
Back Half Selenium (Se)	ug	<1.0	1.3	1.3	1.1	32.5	1.0	6475591
Back Half Silver (Ag)	ug	<0.12	<0.12	<0.12	<0.12	<0.12	0.12	6475591
Back Half Thallium (Tl)	ug	<0.12	<0.12	<0.12	<0.12	<0.12	0.12	6475591
Back Half Zinc (Zn)	ug	<5.0	24.9	24.9	10.5	17.6	5.0	6475591

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate

Bureau Veritas Laboratories 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvlabs.com

Microbiology testing is conducted at 6660 Campobello Rd. Chemistry testing is conducted at 6740 Campobello Rd.

BV Labs Job #: B9X5374
Report Date: 2019/12/10

Mostardi Platt
Client Project #: M193103-05
Site Location: CHICAGO- STACK

EPA M29 METALS (FRONT & BACK SEPARATE)

BV Labs ID		LKU788		LKU899		
Sampling Date						
COC Number		016		016		
	UNITS	AUDIT- 110419K-1425	RDL	AUDIT- 110419K-1426	RDL	QC Batch
Front Half Antimony (Sb)	ug	38.0	3.0	N/A	3.0	6480548
Front Half Arsenic (As)	ug	54.5	0.80	N/A	0.80	6480548
Front Half Barium (Ba)	ug	41.7	1.2	N/A	1.2	6480548
Front Half Beryllium (Be)	ug	43.8	0.18	N/A	0.18	6480548
Front Half Cadmium (Cd)	ug	32.1	0.18	N/A	0.18	6480548
Front Half Chromium (Cr)	ug	35.9	3.0	N/A	3.0	6480548
Front Half Cobalt (Co)	ug	57.5	0.18	N/A	0.18	6480548
Front Half Copper (Cu)	ug	34.7	1.8	N/A	1.8	6480548
Front Half Lead (Pb)	ug	47.7	0.60	N/A	0.60	6480548
Front Half Manganese (Mn)	ug	29.6	1.2	N/A	1.2	6480548
Front Half Nickel (Ni)	ug	37.5	1.0	N/A	1.0	6480548
Front Half Phosphorus (P)	ug	<90	90	N/A	90	6480548
Front Half Selenium (Se)	ug	32.5	2.0	N/A	2.0	6480548
Front Half Silver (Ag)	ug	30.3	0.24	N/A	0.24	6480548
Front Half Thallium (Tl)	ug	43.5	0.24	N/A	0.24	6480548
Front Half Zinc (Zn)	ug	38	10	N/A	10	6480548
Back Half Antimony (Sb)	ug	N/A	0.40	0.351	0.0027	6475591
Back Half Arsenic (As)	ug	N/A	0.40	0.935	0.0027	6475591
Back Half Barium (Ba)	ug	N/A	0.60	0.912	0.0040	6475591
Back Half Beryllium (Be)	ug	N/A	0.090	0.0789	0.00060	6475591
Back Half Cadmium (Cd)	ug	N/A	0.090	0.138	0.00060	6475591
Back Half Chromium (Cr)	ug	N/A	1.5	0.560	0.010	6475591
Back Half Cobalt (Co)	ug	N/A	0.090	0.839	0.00060	6475591
Back Half Copper (Cu)	ug	N/A	0.75	0.685	0.0050	6475591
Back Half Lead (Pb)	ug	N/A	0.30	0.940	0.0020	6475591
Back Half Manganese (Mn)	ug	N/A	0.60	0.370	0.0040	6475591
Back Half Nickel (Ni)	ug	N/A	0.50	0.667	0.0034	6475591
Back Half Phosphorus (P)	ug	N/A	45	<0.30	0.30	6475591
Back Half Selenium (Se)	ug	N/A	1.0	0.737	0.0067	6475591
Back Half Silver (Ag)	ug	N/A	0.12	0.718	0.00080	6475591
Back Half Thallium (Tl)	ug	N/A	0.12	0.471	0.00080	6475591
Back Half Zinc (Zn)	ug	N/A	5.0	0.898	0.034	6475591

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable

BV Labs Job #: B9X5374
Report Date: 2019/12/10

Mostardi Platt
Client Project #: M193103-05
Site Location: CHICAGO- STACK

EPA M29 MERCURY (STACK SAMPLING TRAIN)

BV Labs ID		LKU784		LKU785	LKU785		LKU786		
Sampling Date		2019/11/14		2019/11/14	2019/11/14		2019/11/14		
COC Number		010-015		001-003	001-003		004-006		
	UNITS	**M29- BLANK**	**RDL**	**M29- STACK-R1**	**M29- STACK-R1 Lab-Dup**	**RDL**	**M29- STACK-R2**	**RDL**	**QC Batch**
1B Mercury (Hg)	ug	<0.015	0.015	<0.015	N/A	0.015	<0.015	0.015	6480567
2B Mercury (Hg)	ug	<0.15	0.15	0.6	0.6	0.2	<0.17	0.17	6480201
3A Mercury (Hg)	ug	<0.005	0.005	<0.0053	N/A	0.0053	<0.0049	0.0049	6480049
3B Mercury (Hg)	ug	<0.02	0.02	0.372	N/A	0.025	0.516	0.018	6475618
3C Mercury (Hg)	ug	<0.013	0.013	48.8	N/A	0.63	28.6	0.63	6480047

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
N/A = Not Applicable

BV Labs ID		LKU786		LKU787	LKU787		LKU905		
Sampling Date		2019/11/14		2019/11/14	2019/11/14				
COC Number		004-006		007-009	007-009		016		
	UNITS	**M29- STACK-R2 Lab-Dup**	**RDL**	**M29- STACK-R3**	**M29- STACK-R3 Lab-Dup**	**RDL**	**AUDIT- 110419K-1427**	**RDL**	**QC Batch**
1B Mercury (Hg)	ug	N/A	0.015	0.030	0.031	0.015	25.8	0.3	6480567
2B Mercury (Hg)	ug	N/A	0.17	1.39	N/A	0.19	N/A	0.05	6480201
3A Mercury (Hg)	ug	N/A	0.0049	<0.0054	<0.0054	0.0054	N/A	N/A	6480049
3B Mercury (Hg)	ug	0.509	0.018	90.2	N/A	0.45	N/A	N/A	6475618
3C Mercury (Hg)	ug	28.7	0.63	236	N/A	1.3	N/A	N/A	6480047

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
N/A = Not Applicable

BV Labs ID		LKU910		
Sampling Date				
COC Number		016		
	UNITS	**AUDIT- 110419K-1428**	**RDL**	**QC Batch**
2B Mercury (Hg)	ug	0.93 (1)	0.05	6480201

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
(1) The Audit result is reported in ng/ml

BV Labs Job #: B9X5374
Report Date: 2019/12/10

Mostardi Platt
Client Project #: M193103-05
Site Location: CHICAGO- STACK

TEST SUMMARY

BV Labs ID: LKU784
Sample ID: M29- BLANK
Matrix: Stack Sampling Train

Collected: 2019/11/14
Shipped:
Received: 2019/11/22

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Mercury 3C in HCl Rinse	CV/AA	6480047	2019/12/05	2019/12/09	Meghaben Patel
Mercury 2B in HNO3/H2O2 Imp.	CV/AA	6480201	2019/12/06	2019/12/09	Meghaben Patel
Mercury 3A in HNO3 Rinse	CV/AA	6480049	2019/12/05	2019/12/06	Meghaben Patel
Mercury 3B in KMnO4/H2SO4 Imp.	CV/AA	6475618	2019/12/03	2019/12/05	Meghaben Patel
Mercury 1B in Filter + Rinse (M29)	CV/AA	6480567	2019/12/09	2019/12/10	Meghaben Patel
Metals B.H. in H2O2/HNO3 Imp.(6020B m)	ICP1/MS	6475591	2019/12/03	2019/12/03	Matthew Ritenburg
Metals F.H. in Filter + Rinses (6020B m)	ICP1/MS	6480548	2019/12/05	2019/12/09	Nan Raykha

BV Labs ID: LKU785
Sample ID: M29- STACK- R1
Matrix: Stack Sampling Train

Collected: 2019/11/14
Shipped:
Received: 2019/11/22

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Mercury 3C in HCl Rinse	CV/AA	6480047	2019/12/05	2019/12/09	Meghaben Patel
Mercury 2B in HNO3/H2O2 Imp.	CV/AA	6480201	2019/12/06	2019/12/09	Meghaben Patel
Mercury 3A in HNO3 Rinse	CV/AA	6480049	2019/12/05	2019/12/06	Meghaben Patel
Mercury 3B in KMnO4/H2SO4 Imp.	CV/AA	6475618	2019/12/03	2019/12/05	Meghaben Patel
Mercury 1B in Filter + Rinse (M29)	CV/AA	6480567	2019/12/09	2019/12/10	Meghaben Patel
Metals B.H. in H2O2/HNO3 Imp.(6020B m)	ICP1/MS	6475591	2019/12/03	2019/12/03	Matthew Ritenburg
Metals F.H. in Filter + Rinses (6020B m)	ICP1/MS	6480548	2019/12/05	2019/12/09	Nan Raykha

BV Labs ID: LKU785 Dup
Sample ID: M29- STACK- R1
Matrix: Stack Sampling Train

Collected: 2019/11/14
Shipped:
Received: 2019/11/22

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Mercury 2B in HNO3/H2O2 Imp.	CV/AA	6480201	2019/12/06	2019/12/09	Meghaben Patel
Metals B.H. in H2O2/HNO3 Imp.(6020B m)	ICP1/MS	6475591	2019/12/03	2019/12/03	Matthew Ritenburg
Metals F.H. in Filter + Rinses (6020B m)	ICP1/MS	6480548	2019/12/05	2019/12/09	Nan Raykha

BV Labs ID: LKU786
Sample ID: M29- STACK- R2
Matrix: Stack Sampling Train

Collected: 2019/11/14
Shipped:
Received: 2019/11/22

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Mercury 3C in HCl Rinse	CV/AA	6480047	2019/12/05	2019/12/09	Meghaben Patel
Mercury 2B in HNO3/H2O2 Imp.	CV/AA	6480201	2019/12/06	2019/12/09	Meghaben Patel
Mercury 3A in HNO3 Rinse	CV/AA	6480049	2019/12/05	2019/12/06	Meghaben Patel
Mercury 3B in KMnO4/H2SO4 Imp.	CV/AA	6475618	2019/12/03	2019/12/05	Meghaben Patel
Mercury 1B in Filter + Rinse (M29)	CV/AA	6480567	2019/12/09	2019/12/10	Meghaben Patel
Metals B.H. in H2O2/HNO3 Imp.(6020B m)	ICP1/MS	6475591	2019/12/03	2019/12/03	Matthew Ritenburg
Metals F.H. in Filter + Rinses (6020B m)	ICP1/MS	6480548	2019/12/05	2019/12/09	Nan Raykha

BV Labs Job #: B9X5374
Report Date: 2019/12/10

Mostardi Platt
Client Project #: M193103-05
Site Location: CHICAGO- STACK

TEST SUMMARY

BV Labs ID: LKU786 Dup
Sample ID: M29- STACK- R2
Matrix: Stack Sampling Train

Collected: 2019/11/14
Shipped:
Received: 2019/11/22

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Mercury 3C in HCl Rinse	CV/AA	6480047	2019/12/05	2019/12/09	Meghaben Patel
Mercury 3B in KMnO4/H2SO4 Imp.	CV/AA	6475618	2019/12/03	2019/12/05	Meghaben Patel

BV Labs ID: LKU787
Sample ID: M29- STACK- R3
Matrix: Stack Sampling Train

Collected: 2019/11/14
Shipped:
Received: 2019/11/22

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Mercury 3C in HCl Rinse	CV/AA	6480047	2019/12/05	2019/12/09	Meghaben Patel
Mercury 2B in HNO3/H2O2 Imp.	CV/AA	6480201	2019/12/06	2019/12/09	Meghaben Patel
Mercury 3A in HNO3 Rinse	CV/AA	6480049	2019/12/05	2019/12/06	Meghaben Patel
Mercury 3B in KMnO4/H2SO4 Imp.	CV/AA	6475618	2019/12/03	2019/12/05	Meghaben Patel
Mercury 1B in Filter + Rinse (M29)	CV/AA	6480567	2019/12/09	2019/12/10	Meghaben Patel
Metals B.H. in H2O2/HNO3 Imp.(6020B m)	ICP1/MS	6475591	2019/12/03	2019/12/03	Matthew Ritenburg
Metals F.H. in Filter + Rinses (6020B m)	ICP1/MS	6480548	2019/12/05	2019/12/09	Nan Raykha

BV Labs ID: LKU787 Dup
Sample ID: M29- STACK- R3
Matrix: Stack Sampling Train

Collected: 2019/11/14
Shipped:
Received: 2019/11/22

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Mercury 3A in HNO3 Rinse	CV/AA	6480049	2019/12/05	2019/12/06	Meghaben Patel
Mercury 1B in Filter + Rinse (M29)	CV/AA	6480567	2019/12/09	2019/12/10	Meghaben Patel

BV Labs ID: LKU788
Sample ID: AUDIT- 110419K- 1425
Matrix: Stack Sampling Train

Collected:
Shipped:
Received: 2019/11/22

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals F.H. in Filter + Rinses (6020B m)	ICP1/MS	6480548	2019/12/05	2019/12/09	Nan Raykha

BV Labs ID: LKU899
Sample ID: AUDIT- 110419K- 1426
Matrix: Stack Sampling Train

Collected:
Shipped:
Received: 2019/11/22

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals B.H. in H2O2/HNO3 Imp.(6020B m)	ICP1/MS	6475591	2019/12/03	2019/12/03	Matthew Ritenburg

BV Labs ID: LKU905
Sample ID: AUDIT- 110419K- 1427
Matrix: Stack Sampling Train

Collected:
Shipped:
Received: 2019/11/22

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Mercury 1B in Filter + Rinse (M29)	CV/AA	6480567	2019/12/09	2019/12/10	Meghaben Patel

BV Labs Job #: B9X5374
Report Date: 2019/12/10

Mostardi Platt
Client Project #: M193103-05
Site Location: CHICAGO- STACK

TEST SUMMARY

BV Labs ID: LKU910
Sample ID: AUDIT- 110419K- 1428
Matrix: Stack Sampling Train

Collected:
Shipped:
Received: 2019/11/22

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Mercury 2B in HNO3/H2O2 Imp.	CV/AA	6480201	2019/12/06	2019/12/09	Meghaben Patel

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BV Labs Job #: B9X5374
Report Date: 2019/12/10

Mostardi Platt
Client Project #: M193103-05
Site Location: CHICAGO- STACK

GENERAL COMMENTS

Sample LKU899 [AUDIT- 110419K- 1426] : Data for this sample is reported in ug/ml

EPA M29 METALS (FRONT & BACK SEPARATE)

Metals F.H. in Filter + Rinses (6020B m): Post digestion duplicate and spike were done on sample LKU785.
Metals B.H. in H2O2/HNO3 Imp.(6020B m): Post digestion duplicate and spike were done on sample LKU785.

Results relate only to the items tested.

BV Labs Job #: B9X5374
Report Date: 2019/12/10

Mostardi Platt
Client Project #: M193103-05
Site Location: CHICAGO- STACK

QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	% Recovery	UNITS	QC Limits
6475591	MRG	Matrix Spike(LKU785)	Back Half Antimony (Sb)	2019/12/03		90	%	75 - 125
			Back Half Arsenic (As)	2019/12/03		91	%	75 - 125
			Back Half Barium (Ba)	2019/12/03		93	%	75 - 125
			Back Half Beryllium (Be)	2019/12/03		101	%	75 - 125
			Back Half Cadmium (Cd)	2019/12/03		91	%	75 - 125
			Back Half Chromium (Cr)	2019/12/03		92	%	75 - 125
			Back Half Cobalt (Co)	2019/12/03		93	%	75 - 125
			Back Half Copper (Cu)	2019/12/03		90	%	75 - 125
			Back Half Lead (Pb)	2019/12/03		94	%	75 - 125
			Back Half Manganese (Mn)	2019/12/03		97	%	75 - 125
			Back Half Nickel (Ni)	2019/12/03		96	%	75 - 125
			Back Half Phosphorus (P)	2019/12/03		92	%	75 - 125
			Back Half Selenium (Se)	2019/12/03		89	%	75 - 125
			Back Half Silver (Ag)	2019/12/03		95	%	75 - 125
			Back Half Thallium (Tl)	2019/12/03		96	%	75 - 125
			Back Half Zinc (Zn)	2019/12/03		91	%	75 - 125
6475591	MRG	Matrix Spike DUP(LKU785)	Back Half Antimony (Sb)	2019/12/03		92	%	75 - 125
			Back Half Arsenic (As)	2019/12/03		93	%	75 - 125
			Back Half Barium (Ba)	2019/12/03		94	%	75 - 125
			Back Half Beryllium (Be)	2019/12/03		101	%	75 - 125
			Back Half Cadmium (Cd)	2019/12/03		93	%	75 - 125
			Back Half Chromium (Cr)	2019/12/03		94	%	75 - 125
			Back Half Cobalt (Co)	2019/12/03		95	%	75 - 125
			Back Half Copper (Cu)	2019/12/03		91	%	75 - 125
			Back Half Lead (Pb)	2019/12/03		96	%	75 - 125
			Back Half Manganese (Mn)	2019/12/03		99	%	75 - 125
			Back Half Nickel (Ni)	2019/12/03		97	%	75 - 125
			Back Half Phosphorus (P)	2019/12/03		92	%	75 - 125
			Back Half Selenium (Se)	2019/12/03		91	%	75 - 125
			Back Half Silver (Ag)	2019/12/03		97	%	75 - 125
			Back Half Thallium (Tl)	2019/12/03		97	%	75 - 125
			Back Half Zinc (Zn)	2019/12/03		93	%	75 - 125
6475591	MRG	MS/MSD RPD	Back Half Antimony (Sb)	2019/12/03	2.4		%	20
			Back Half Arsenic (As)	2019/12/03	2.2		%	20
			Back Half Barium (Ba)	2019/12/03	1.4		%	20
			Back Half Beryllium (Be)	2019/12/03	0.68		%	20
			Back Half Cadmium (Cd)	2019/12/03	2.3		%	20
			Back Half Chromium (Cr)	2019/12/03	1.8		%	20
			Back Half Cobalt (Co)	2019/12/03	2.2		%	20
			Back Half Copper (Cu)	2019/12/03	1.2		%	20
			Back Half Lead (Pb)	2019/12/03	2.1		%	20
			Back Half Manganese (Mn)	2019/12/03	1.7		%	20
			Back Half Nickel (Ni)	2019/12/03	1.4		%	20
			Back Half Phosphorus (P)	2019/12/03	0.61		%	20
			Back Half Selenium (Se)	2019/12/03	1.8		%	20
			Back Half Silver (Ag)	2019/12/03	2.0		%	20
			Back Half Thallium (Tl)	2019/12/03	1.1		%	20
			Back Half Zinc (Zn)	2019/12/03	1.9		%	20
6475591	MRG	Spiked Blank	Back Half Antimony (Sb)	2019/12/03		95	%	85 - 115
			Back Half Arsenic (As)	2019/12/03		96	%	85 - 115
			Back Half Barium (Ba)	2019/12/03		97	%	85 - 115
			Back Half Beryllium (Be)	2019/12/03		104	%	85 - 115

BV Labs Job #: B9X5374
Report Date: 2019/12/10

Mostardi Platt
Client Project #: M193103-05
Site Location: CHICAGO- STACK

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	% Recovery	UNITS	QC Limits
			Back Half Cadmium (Cd)	2019/12/03		95	%	85 - 115
			Back Half Chromium (Cr)	2019/12/03		96	%	85 - 115
			Back Half Cobalt (Co)	2019/12/03		98	%	85 - 115
			Back Half Copper (Cu)	2019/12/03		97	%	85 - 115
			Back Half Lead (Pb)	2019/12/03		95	%	85 - 115
			Back Half Manganese (Mn)	2019/12/03		98	%	85 - 115
			Back Half Nickel (Ni)	2019/12/03		100	%	85 - 115
			Back Half Phosphorus (P)	2019/12/03		102	%	85 - 115
			Back Half Selenium (Se)	2019/12/03		94	%	85 - 115
			Back Half Silver (Ag)	2019/12/03		97	%	85 - 115
			Back Half Thallium (Tl)	2019/12/03		100	%	85 - 115
			Back Half Zinc (Zn)	2019/12/03		96	%	85 - 115
6475591	MRG	Spiked Blank DUP	Back Half Antimony (Sb)	2019/12/03		97	%	85 - 115
			Back Half Arsenic (As)	2019/12/03		96	%	85 - 115
			Back Half Barium (Ba)	2019/12/03		100	%	85 - 115
			Back Half Beryllium (Be)	2019/12/03		105	%	85 - 115
			Back Half Cadmium (Cd)	2019/12/03		98	%	85 - 115
			Back Half Chromium (Cr)	2019/12/03		97	%	85 - 115
			Back Half Cobalt (Co)	2019/12/03		99	%	85 - 115
			Back Half Copper (Cu)	2019/12/03		100	%	85 - 115
			Back Half Lead (Pb)	2019/12/03		100	%	85 - 115
			Back Half Manganese (Mn)	2019/12/03		99	%	85 - 115
			Back Half Nickel (Ni)	2019/12/03		101	%	85 - 115
			Back Half Phosphorus (P)	2019/12/03		105	%	85 - 115
			Back Half Selenium (Se)	2019/12/03		97	%	85 - 115
			Back Half Silver (Ag)	2019/12/03		100	%	85 - 115
			Back Half Thallium (Tl)	2019/12/03		103	%	85 - 115
			Back Half Zinc (Zn)	2019/12/03		97	%	85 - 115
6475591	MRG	RPD	Back Half Antimony (Sb)	2019/12/03	2.5		%	20
			Back Half Arsenic (As)	2019/12/03	0.45		%	20
			Back Half Barium (Ba)	2019/12/03	2.9		%	20
			Back Half Beryllium (Be)	2019/12/03	1.3		%	20
			Back Half Cadmium (Cd)	2019/12/03	2.7		%	20
			Back Half Chromium (Cr)	2019/12/03	0.82		%	20
			Back Half Cobalt (Co)	2019/12/03	1.3		%	20
			Back Half Copper (Cu)	2019/12/03	2.8		%	20
			Back Half Lead (Pb)	2019/12/03	5.1		%	20
			Back Half Manganese (Mn)	2019/12/03	0.95		%	20
			Back Half Nickel (Ni)	2019/12/03	1.0		%	20
			Back Half Phosphorus (P)	2019/12/03	3.6		%	20
			Back Half Selenium (Se)	2019/12/03	3.1		%	20
			Back Half Silver (Ag)	2019/12/03	2.6		%	20
			Back Half Thallium (Tl)	2019/12/03	2.7		%	20
			Back Half Zinc (Zn)	2019/12/03	1.0		%	20
6475591	MRG	Method Blank	Back Half Antimony (Sb)	2019/12/03	<0.40		ug	
			Back Half Arsenic (As)	2019/12/03	<0.40		ug	
			Back Half Barium (Ba)	2019/12/03	<0.60		ug	
			Back Half Beryllium (Be)	2019/12/03	<0.090		ug	
			Back Half Cadmium (Cd)	2019/12/03	<0.090		ug	
			Back Half Chromium (Cr)	2019/12/03	<1.5		ug	
			Back Half Cobalt (Co)	2019/12/03	<0.090		ug	
			Back Half Copper (Cu)	2019/12/03	<0.75		ug	

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	% Recovery	UNITS	QC Limits
			Back Half Lead (Pb)	2019/12/03	<0.30		ug	
			Back Half Manganese (Mn)	2019/12/03	<0.60		ug	
			Back Half Nickel (Ni)	2019/12/03	<0.50		ug	
			Back Half Phosphorus (P)	2019/12/03	<45		ug	
			Back Half Selenium (Se)	2019/12/03	<1.0		ug	
			Back Half Silver (Ag)	2019/12/03	<0.12		ug	
			Back Half Thallium (Tl)	2019/12/03	<0.12		ug	
			Back Half Zinc (Zn)	2019/12/03	<5.0		ug	
6475591	MRG	RPD - Sample/Sample Dup	Back Half Antimony (Sb)	2019/12/03	NC		%	20
			Back Half Arsenic (As)	2019/12/03	NC		%	20
			Back Half Barium (Ba)	2019/12/03	1.3		%	20
			Back Half Beryllium (Be)	2019/12/03	NC		%	20
			Back Half Cadmium (Cd)	2019/12/03	2.0		%	20
			Back Half Chromium (Cr)	2019/12/03	0.14		%	20
			Back Half Cobalt (Co)	2019/12/03	12		%	20
			Back Half Copper (Cu)	2019/12/03	1.5		%	20
			Back Half Lead (Pb)	2019/12/03	1.5		%	20
			Back Half Manganese (Mn)	2019/12/03	2.3		%	20
			Back Half Nickel (Ni)	2019/12/03	3.5		%	20
			Back Half Phosphorus (P)	2019/12/03	NC		%	20
			Back Half Selenium (Se)	2019/12/03	0.87		%	20
			Back Half Silver (Ag)	2019/12/03	NC		%	20
			Back Half Thallium (Tl)	2019/12/03	NC		%	20
			Back Half Zinc (Zn)	2019/12/03	0.19		%	20
6475618	MPD	Reagent Blank	3B Mercury (Hg)	2019/12/05	<0.013		ug	
6475618	MPD	Matrix Spike(LKU786)	3B Mercury (Hg)	2019/12/05		98	%	85 - 115
6475618	MPD	Matrix Spike DUP(LKU786)	3B Mercury (Hg)	2019/12/05		93	%	85 - 115
6475618	MPD	MS/MSD RPD	3B Mercury (Hg)	2019/12/05	6.0		%	20
6475618	MPD	Spiked Blank	3B Mercury (Hg)	2019/12/05		98	%	90 - 110
6475618	MPD	Spiked Blank DUP	3B Mercury (Hg)	2019/12/05		98	%	90 - 110
6475618	MPD	RPD	3B Mercury (Hg)	2019/12/05	0.41		%	20
6475618	MPD	Method Blank	3B Mercury (Hg)	2019/12/05	<0.013		ug	
6475618	MPD	RPD - Sample/Sample Dup	3B Mercury (Hg)	2019/12/05	1.5		%	20
6480047	MPD	Reagent Blank	3C Mercury (Hg)	2019/12/09	<0.013		ug	
6480047	MPD	Matrix Spike(LKU786)	3C Mercury (Hg)	2019/12/09		97	%	85 - 115
6480047	MPD	Matrix Spike DUP(LKU786)	3C Mercury (Hg)	2019/12/09		100	%	85 - 115
6480047	MPD	MS/MSD RPD	3C Mercury (Hg)	2019/12/09	3.3		%	20
6480047	MPD	Spiked Blank	3C Mercury (Hg)	2019/12/09		99	%	90 - 110
6480047	MPD	Spiked Blank DUP	3C Mercury (Hg)	2019/12/09		97	%	90 - 110
6480047	MPD	RPD	3C Mercury (Hg)	2019/12/09	2.2		%	20
6480047	MPD	Method Blank	3C Mercury (Hg)	2019/12/09	<0.013		ug	
6480047	MPD	RPD - Sample/Sample Dup	3C Mercury (Hg)	2019/12/09	0.35		%	20
6480049	MPD	Matrix Spike(LKU787)	3A Mercury (Hg)	2019/12/06		96	%	85 - 115
6480049	MPD	Matrix Spike DUP(LKU787)	3A Mercury (Hg)	2019/12/06		95	%	85 - 115
6480049	MPD	MS/MSD RPD	3A Mercury (Hg)	2019/12/06	0.73		%	20
6480049	MPD	Spiked Blank	3A Mercury (Hg)	2019/12/06		96	%	90 - 110
6480049	MPD	Spiked Blank DUP	3A Mercury (Hg)	2019/12/06		94	%	90 - 110
6480049	MPD	RPD	3A Mercury (Hg)	2019/12/06	2.4		%	20
6480049	MPD	Method Blank	3A Mercury (Hg)	2019/12/06	<0.005		ug	
6480049	MPD	RPD - Sample/Sample Dup	3A Mercury (Hg)	2019/12/06	NC		%	20
6480201	MPD	Matrix Spike(LKU785)	2B Mercury (Hg)	2019/12/09		96	%	85 - 115
6480201	MPD	Matrix Spike DUP(LKU785)	2B Mercury (Hg)	2019/12/09		101	%	85 - 115

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	% Recovery	UNITS	QC Limits
6480201	MPD	MS/MSD RPD	2B Mercury (Hg)	2019/12/09	4.4		%	20
6480201	MPD	Spiked Blank	2B Mercury (Hg)	2019/12/09		96	%	90 - 110
6480201	MPD	Spiked Blank DUP	2B Mercury (Hg)	2019/12/09		95	%	90 - 110
6480201	MPD	RPD	2B Mercury (Hg)	2019/12/09	0.21		%	20
6480201	MPD	Method Blank	2B Mercury (Hg)	2019/12/09	<0.013		ug	
6480201	MPD	RPD - Sample/Sample Dup	2B Mercury (Hg)	2019/12/09	7.0		%	20
6480548	N_R	Matrix Spike(LKU785)	Front Half Antimony (Sb)	2019/12/09		99	%	75 - 125
			Front Half Arsenic (As)	2019/12/09		96	%	75 - 125
			Front Half Barium (Ba)	2019/12/09		99	%	75 - 125
			Front Half Beryllium (Be)	2019/12/09		106	%	75 - 125
			Front Half Cadmium (Cd)	2019/12/09		100	%	75 - 125
			Front Half Chromium (Cr)	2019/12/09		97	%	75 - 125
			Front Half Cobalt (Co)	2019/12/09		99	%	75 - 125
			Front Half Copper (Cu)	2019/12/09		97	%	75 - 125
			Front Half Lead (Pb)	2019/12/09		98	%	75 - 125
			Front Half Manganese (Mn)	2019/12/09		105	%	75 - 125
			Front Half Nickel (Ni)	2019/12/09		99	%	75 - 125
			Front Half Phosphorus (P)	2019/12/09		96	%	75 - 125
			Front Half Selenium (Se)	2019/12/09		97	%	75 - 125
			Front Half Silver (Ag)	2019/12/09		91	%	75 - 125
			Front Half Thallium (Tl)	2019/12/09		99	%	75 - 125
			Front Half Zinc (Zn)	2019/12/09		102	%	75 - 125
6480548	N_R	Matrix Spike DUP(LKU785)	Front Half Antimony (Sb)	2019/12/09		98	%	75 - 125
			Front Half Arsenic (As)	2019/12/09		96	%	75 - 125
			Front Half Barium (Ba)	2019/12/09		99	%	75 - 125
			Front Half Beryllium (Be)	2019/12/09		110	%	75 - 125
			Front Half Cadmium (Cd)	2019/12/09		99	%	75 - 125
			Front Half Chromium (Cr)	2019/12/09		97	%	75 - 125
			Front Half Cobalt (Co)	2019/12/09		99	%	75 - 125
			Front Half Copper (Cu)	2019/12/09		93	%	75 - 125
			Front Half Lead (Pb)	2019/12/09		96	%	75 - 125
			Front Half Manganese (Mn)	2019/12/09		104	%	75 - 125
			Front Half Nickel (Ni)	2019/12/09		98	%	75 - 125
			Front Half Phosphorus (P)	2019/12/09		98	%	75 - 125
			Front Half Selenium (Se)	2019/12/09		96	%	75 - 125
			Front Half Silver (Ag)	2019/12/09		90	%	75 - 125
			Front Half Thallium (Tl)	2019/12/09		99	%	75 - 125
			Front Half Zinc (Zn)	2019/12/09		101	%	75 - 125
6480548	N_R	MS/MSD RPD	Front Half Antimony (Sb)	2019/12/09	0.54		%	20
			Front Half Arsenic (As)	2019/12/09	0.14		%	20
			Front Half Barium (Ba)	2019/12/09	0.37		%	20
			Front Half Beryllium (Be)	2019/12/09	3.3		%	20
			Front Half Cadmium (Cd)	2019/12/09	0.56		%	20
			Front Half Chromium (Cr)	2019/12/09	0.25		%	20
			Front Half Cobalt (Co)	2019/12/09	0.75		%	20
			Front Half Copper (Cu)	2019/12/09	3.4		%	20
			Front Half Lead (Pb)	2019/12/09	1.6		%	20
			Front Half Manganese (Mn)	2019/12/09	1.3		%	20
			Front Half Nickel (Ni)	2019/12/09	0.49		%	20
			Front Half Phosphorus (P)	2019/12/09	2.3		%	20
			Front Half Selenium (Se)	2019/12/09	0.83		%	20
			Front Half Silver (Ag)	2019/12/09	0.84		%	20

BV Labs Job #: B9X5374
Report Date: 2019/12/10

Mostardi Platt
Client Project #: M193103-05
Site Location: CHICAGO- STACK

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	% Recovery	UNITS	QC Limits
			Front Half Thallium (Tl)	2019/12/09	0.51		%	20
			Front Half Zinc (Zn)	2019/12/09	0.62		%	20
6480548	N_R	Spiked Blank	Front Half Antimony (Sb)	2019/12/09		97	%	85 - 115
			Front Half Arsenic (As)	2019/12/09		98	%	85 - 115
			Front Half Barium (Ba)	2019/12/09		99	%	85 - 115
			Front Half Beryllium (Be)	2019/12/09		104	%	85 - 115
			Front Half Cadmium (Cd)	2019/12/09		100	%	85 - 115
			Front Half Chromium (Cr)	2019/12/09		97	%	85 - 115
			Front Half Cobalt (Co)	2019/12/09		100	%	85 - 115
			Front Half Copper (Cu)	2019/12/09		95	%	85 - 115
			Front Half Lead (Pb)	2019/12/09		95	%	85 - 115
			Front Half Manganese (Mn)	2019/12/09		100	%	85 - 115
			Front Half Nickel (Ni)	2019/12/09		97	%	85 - 115
			Front Half Phosphorus (P)	2019/12/09		105	%	85 - 115
			Front Half Selenium (Se)	2019/12/09		98	%	85 - 115
			Front Half Silver (Ag)	2019/12/09		96	%	85 - 115
			Front Half Thallium (Tl)	2019/12/09		96	%	85 - 115
			Front Half Zinc (Zn)	2019/12/09		99	%	85 - 115
6480548	N_R	Spiked Blank DUP	Front Half Antimony (Sb)	2019/12/09		98	%	85 - 115
			Front Half Arsenic (As)	2019/12/09		98	%	85 - 115
			Front Half Barium (Ba)	2019/12/09		98	%	85 - 115
			Front Half Beryllium (Be)	2019/12/09		103	%	85 - 115
			Front Half Cadmium (Cd)	2019/12/09		99	%	85 - 115
			Front Half Chromium (Cr)	2019/12/09		98	%	85 - 115
			Front Half Cobalt (Co)	2019/12/09		100	%	85 - 115
			Front Half Copper (Cu)	2019/12/09		95	%	85 - 115
			Front Half Lead (Pb)	2019/12/09		94	%	85 - 115
			Front Half Manganese (Mn)	2019/12/09		101	%	85 - 115
			Front Half Nickel (Ni)	2019/12/09		98	%	85 - 115
			Front Half Phosphorus (P)	2019/12/09		105	%	85 - 115
			Front Half Selenium (Se)	2019/12/09		98	%	85 - 115
			Front Half Silver (Ag)	2019/12/09		95	%	85 - 115
			Front Half Thallium (Tl)	2019/12/09		96	%	85 - 115
			Front Half Zinc (Zn)	2019/12/09		99	%	85 - 115
6480548	N_R	RPD	Front Half Antimony (Sb)	2019/12/09	1.5		%	20
			Front Half Arsenic (As)	2019/12/09	0.39		%	20
			Front Half Barium (Ba)	2019/12/09	0.84		%	20
			Front Half Beryllium (Be)	2019/12/09	0.69		%	20
			Front Half Cadmium (Cd)	2019/12/09	0.90		%	20
			Front Half Chromium (Cr)	2019/12/09	0.47		%	20
			Front Half Cobalt (Co)	2019/12/09	0.060		%	20
			Front Half Copper (Cu)	2019/12/09	0.65		%	20
			Front Half Lead (Pb)	2019/12/09	1.0		%	20
			Front Half Manganese (Mn)	2019/12/09	1.0		%	20
			Front Half Nickel (Ni)	2019/12/09	0.67		%	20
			Front Half Phosphorus (P)	2019/12/09	0.59		%	20
			Front Half Selenium (Se)	2019/12/09	0.41		%	20
			Front Half Silver (Ag)	2019/12/09	1.3		%	20
			Front Half Thallium (Tl)	2019/12/09	0.042		%	20
			Front Half Zinc (Zn)	2019/12/09	0.16		%	20
6480548	N_R	Method Blank	Front Half Antimony (Sb)	2019/12/09	<3.0		ug	
			Front Half Arsenic (As)	2019/12/09	<0.80		ug	

BV Labs Job #: B9X5374
Report Date: 2019/12/10

Mostardi Platt
Client Project #: M193103-05
Site Location: CHICAGO- STACK

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	% Recovery	UNITS	QC Limits
			Front Half Barium (Ba)	2019/12/09	<1.2		ug	
			Front Half Beryllium (Be)	2019/12/09	<0.18		ug	
			Front Half Cadmium (Cd)	2019/12/09	<0.18		ug	
			Front Half Chromium (Cr)	2019/12/09	<3.0		ug	
			Front Half Cobalt (Co)	2019/12/09	<0.18		ug	
			Front Half Copper (Cu)	2019/12/09	<1.8		ug	
			Front Half Lead (Pb)	2019/12/09	<0.60		ug	
			Front Half Manganese (Mn)	2019/12/09	<1.2		ug	
			Front Half Nickel (Ni)	2019/12/09	<1.0		ug	
			Front Half Phosphorus (P)	2019/12/09	<90		ug	
			Front Half Selenium (Se)	2019/12/09	<2.0		ug	
			Front Half Silver (Ag)	2019/12/09	<0.24		ug	
			Front Half Thallium (Tl)	2019/12/09	<0.24		ug	
			Front Half Zinc (Zn)	2019/12/09	<10		ug	
6480548	N_R	RPD - Sample/Sample Dup	Front Half Antimony (Sb)	2019/12/09	NC		%	20
			Front Half Arsenic (As)	2019/12/09	NC		%	20
			Front Half Barium (Ba)	2019/12/09	0.51		%	20
			Front Half Beryllium (Be)	2019/12/09	NC		%	20
			Front Half Cadmium (Cd)	2019/12/09	0.12		%	20
			Front Half Chromium (Cr)	2019/12/09	0.46		%	20
			Front Half Cobalt (Co)	2019/12/09	0.015		%	20
			Front Half Copper (Cu)	2019/12/09	1.5		%	20
			Front Half Lead (Pb)	2019/12/09	0.67		%	20
			Front Half Manganese (Mn)	2019/12/09	1.5		%	20
			Front Half Nickel (Ni)	2019/12/09	1.5		%	20
			Front Half Phosphorus (P)	2019/12/09	2.5		%	20
			Front Half Selenium (Se)	2019/12/09	NC		%	20
			Front Half Silver (Ag)	2019/12/09	NC		%	20
			Front Half Thallium (Tl)	2019/12/09	NC		%	20
			Front Half Zinc (Zn)	2019/12/09	1.7		%	20
6480567	MPD	Reagent Blank	1B Mercury (Hg)	2019/12/10	<0.015		ug	
6480567	MPD	Matrix Spike(LKU787)	1B Mercury (Hg)	2019/12/10		102	%	85 - 115
6480567	MPD	Matrix Spike DUP(LKU787)	1B Mercury (Hg)	2019/12/10		101	%	85 - 115
6480567	MPD	MS/MSD RPD	1B Mercury (Hg)	2019/12/10	0.79		%	20
6480567	MPD	Spiked Blank	1B Mercury (Hg)	2019/12/10		96	%	90 - 110
6480567	MPD	Spiked Blank DUP	1B Mercury (Hg)	2019/12/10		100	%	90 - 110
6480567	MPD	RPD	1B Mercury (Hg)	2019/12/10	4.7		%	20
6480567	MPD	Method Blank	1B Mercury (Hg)	2019/12/10	<0.013		ug	
6480567	MPD	RPD - Sample/Sample Dup	1B Mercury (Hg)	2019/12/10	2.3		%	20

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

Reagent Blank: A blank matrix containing all reagents used in the analytical procedure. Used to determine any analytical contamination.

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (absolute difference <= 2x RDL).

BV Labs Job #: B9X5374
Report Date: 2019/12/10

Mostardi Platt
Client Project #: M193103-05
Site Location: CHICAGO- STACK

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).

John Bowman, Supervisor, Metals Group

Ralph Siebert, Operations Manager - Inorganic Analyses

Walt Wang, Scientific Specialist – Inorganic

BV Labs has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

Client: General Iron Industries, Inc.
Facility: Chicago, IL
Test Location: Scrubber Stack
Test Method: 29

Source Condition:		**Normal Run 1**	**Normal Run 2**	**Normal Run 3**
Identify Analyte:	Antimony (Sb)			
Molecular Weight:	121.76	BDL	BDL	BDL
ug (net) collected:		3.4	3.4	3.4
Identify Analyte:	Arsenic (As)			
Molecular Weight:	74.92	BDL	BDL	BDL
ug (net) collected:		1.2	1.2	1.2
Identify Analyte:	Barium (Ba)			
Molecular Weight:	137.33	ADL	DLL	DLL
ug (net) collected:		21.61	7.57	5.81
Identify Analyte:	Beryllium (Be)			
Molecular Weight:	9.01	BDL	BDL	BDL
ug (net) collected:		0.27	0.27	0.27
Identify Analyte:	Cadmium (Cd)			
Molecular Weight:	112.41	ADL	ADL	DLL
ug (net) collected:		2.873	0.613	0.41
Identify Analyte:	Chromium (Cr)			
Molecular Weight:	52	ADL	DLL	DLL
ug (net) collected:		11.3	4.9	15.7
Identify Analyte:	Cobalt (Co)			
Molecular Weight:	58.93	ADL	BDL	DLL
ug (net) collected:		0.369	0.27	0.33
Identify Analyte:	Copper (Cu)			
Molecular Weight:	63.55	ADL	ADL	ADL
ug (net) collected:		17.9	7.54	10.17
Identify Analyte:	Lead (Pb)			
Molecular Weight:	207.2	ADL	ADL	ADL
ug (net) collected:		6.32	3.6	2.63
Identify Analyte:	Mercury (Hg)			
Molecular Weight:	54.94	DLL	DLL	DLL
ug (net) collected:		49.7923	29.3059	327.6254

Client: **General Iron Industries, Inc.**
Facility: **Chicago, IL**
Test Location: **Scrubber Stack**
Test Method: **29**

Source Condition:		**Normal Run 1**	**Normal Run 2**	**Normal Run 3**
Identify Analyte:	Manganese (Mn)			
Molecular Weight:	54.94	ADL	ADL	ADL
ug (net) collected:		8.65	3.96	5.78
Identify Analyte:	Nickel (Ni)			
Molecular Weight:	58.69	ADL	ADL	ADL
ug (net) collected:		11.04	6.09	12.98
Identify Analyte:	Phosphorus (P)			
Molecular Weight:	30.97	DLL	DLL	DLL
ug (net) collected:		380	363	359
Identify Analyte:	Selenium (Se)			
Molecular Weight:	78.96	DLL	DLL	ADL
ug (net) collected:		2.3	2.1	50.7
Identify Analyte:	Silver (Ag)			
Molecular Weight:	107.87	BDL	BDL	DLL
ug (net) collected:		0.36	0.36	8.41
Identify Analyte:	Thallium (Tl)			
Molecular Weight:	204.38	BDL	BDL	BDL
ug (net) collected:		0.36	0.36	0.36
Identify Analyte:	Zinc (Zn)			
Molecular Weight:	65.38	ADL	ADL	ADL
ug (net) collected:		118.9	57.5	66.6

Scrubber Stack

Client:	RK & Associates, Inc	Analysis Date:	11/18/2019
Facility:	General Iron	Analysis Location:	Elmhurst
Test Location:	Scrubber Stack	Analyst:	BWH
Project Number:	M1933103		
Method:	M26		
Date Samples Received:	11/14/2019		

Sampling Date		11/14/2019	11/14/2019	11/14/2019	11/14/2019		
	UNITS	M26A DI Blank	M26A H2SO4 Blank	M26A H2SO4-R1	M26A H2SO4-R1 Dup	RDL	MDL
Sulfuric Acid Volume	ml	200	200	390	390		
Hydrofluoric Acid	ug	<150	<150	1103	1113	150	15

Sampling Date		11/14/2019	11/14/2019	11/18/2019			
	UNITS	M26A- H2SO4 R2	M26A- H2SO4 R3	Audit		RDL	MDL
Sulfuric Acid Volume	ml	365	399	1000			
Hydrofluoric Acid	ug	514	479	7726		150	15

Scrubber Stack

Client:	RK & Associates, Inc	Analysis Date:	11/18/2019
Facility:	General Iron	Analysis Location:	Elmhurst
Test Location:	Scrubber Stack	Analyst:	BWH
Project Number:	M1933103		
Method:	M26		
Date Samples Received:	11/14/2019		

Sampling Date		11/14/2019	11/14/2019	11/14/2019	11/14/2019		
COC Number		000	000	000	000		
Sulfuric Acid Volume	ml	200	200	390	390		
Hydrochloric Acid	ug	<150	<150	2603	2674	150	15

Sampling Date		11/14/2019	11/14/2019	11/18/2019			
	UNITS	M26A- H2SO4 R2	M26A- H2SO4 R3	Audit		RDL	MDL
Sulfuric Acid Volume	ml	365	399	1000			
Hydrochloric Acid	ug	1181	1290	5393		150	15

A Waters Company

R 011634

November 19, 2019

Ben Hendricks
Mostardi Platt
888 Industrial Drive
Elmhurst, IL 60126

Enclosed is your final report for ERA's Stationary Source Audit Sample (SSAS) Program. Your final report includes an evaluation of all results submitted by your laboratory to ERA.

Data Evaluation Protocols: All analytes in ERA's SSAS Program have been evaluated comparing the reported result to the acceptance limits generated using the criteria contained in the TNI SSAS Table.

For any "Not Acceptable" results, please contact your state regulator for any corrective action requirements.

Thank you for your participation in ERA's SSAS Program. If you have any questions, please contact our Proficiency Testing Department at 1-800-372-0122.

Sincerely,

Matthew Seebeck
Quality Officer

cc: Project File Number 110419L

ERA
A Waters Company

R 011635

Recipient Type	Report Recipient	Contact	Project ID
Agency	IL EPA Des Plains (SSAS) 9511 Harrison Street Des Plaines, IL 60016 USA	Kevin Mattison kevin.mattison@illinois.gov Phone: 847-294-4019	
Facility	General Iron Industries 1909 N Clifton Ave Chicago, IL 60614 USA	Jim Kallas jim@general-iron.com Phone: 773-327-9600 x 431	
Lab	Mostardi Platt 888 Industrial Drive Elmhurst, IL 60126 USA	Ben Hendricks mplaboratory@mp-mail.com Phone: 630-993-2694	
Tester	Mostardi Platt 888 Industrial Drive Elmhurst, IL 60126 USA	Ben Hendricks mplaboratory@mp-mail.com Phone: 630-993-2694	M193103-03

A Waters Company

110419L Laboratory Exception Report

Ben Hendricks
Mostardi Platt
888 Industrial Drive
Elmhurst, IL 60126
630-993-2694

EPA ID:	**Not Reported**
ERA Customer Number:	**M748557**

Evaluation Checks

There are no values reported with < where the assigned value was greater than 0.

Not Acceptable Evaluations

There were no Not Acceptable evaluations for this study.

A Waters Company

Final Report Results For Laboratory
Mostardi Platt

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ERA
A Waters Company

SSAP Evaluation Report

Project Number: **110419L**

ERA Customer Number: **M748557**

Laboratory Name: **Mostardi Platt**

Inorganic Results

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110419L Evaluation Final Complete Report

A Waters Company

Ben Hendricks
Mostardi Platt
888 Industrial Drive
Elmhurst, IL 60126
630-993-2694

EPA ID: Not Reported
ERA Customer Number: M748557

TNI Analyte Code	Analyte	Units	Reported Value	Assigned Value	Acceptance Limits	Performance Evaluation	Method Description	Analysis Date	Analyst Name
SSAP Hydrogen Halides in Impinger Solution (cat# 1440, lot# 110419L) Study Dates: 11/04/19 - 11/19/19									
1770	Hydrogen Chloride	mg/L	5.39	5.39	4.85 - 5.93	Acceptable	EPA 26A 2000	11/19/2019	
1775	Hydrogen Fluoride	mg/L	7.73	7.63	6.87 - 8.39	Acceptable	EPA 26A 2000	11/19/2019	

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ERA
A Waters Company

R 011640

December 10, 2019

Ben Hendricks
Mostardi Platt
888 Industrial Drive
Elmhurst, IL 60126

Enclosed is your final report for ERA's Stationary Source Audit Sample (SSAS) Program. Your final report includes an evaluation of all results submitted by your laboratory to ERA.

Data Evaluation Protocols: All analytes in ERA's SSAS Program have been evaluated comparing the reported result to the acceptance limits generated using the criteria contained in the TNI SSAS Table.

For any "Not Acceptable" results, please contact your state regulator for any corrective action requirements.

Thank you for your participation in ERA's SSAS Program. If you have any questions, please contact our Proficiency Testing Department at 1-800-372-0122.

Sincerely,

Matthew Seebeck
Quality Officer

cc: Project File Number 110419K

R 011641

Recipient Type	Report Recipient	Contact	Project ID
Agency	IL EPA Des Plains (SSAS) 9511 Harrison Street Des Plaines, IL 60016 USA	Kevin Mattison kevin.mattison@illinois.gov Phone: 847-294-4019	
Facility	General Iron Industries 1909 N Clifton Ave Chicago, IL 60614 USA	Jim Kallas jim@general-iron.com Phone: 773-327-9600 x 431	
Lab	Bureau Veritas 6740 Campobello Rd Mississauga, ON L5N 2L8 Canada	Clayton Johnson Sr. Project Manager cjohnson@maxxam.ca Phone: (905) 817-5769	
Tester	Mostardi Platt 888 Industrial Drive Elmhurst, IL 60126 USA	Ben Hendricks mplaboratory@mp-mail.com Phone: 630-993-2694	M193103-03

A Waters Company

110419K Laboratory Exception Report

Clayton Johnson
Sr. Project Manager
Bureau Veritas
6740 Campobello Rd
Mississauga, ON L5N 2L8
(905) 817-5769

EPA ID: Not Reported
ERA Customer Number: M748564

Evaluation Checks

There are no values reported with < where the assigned value was greater than 0.

Not Acceptable Evaluations

There were no Not Acceptable evaluations for this study.

R 011642

ERA
A Waters Company

Final Report Results For Laboratory
Bureau Veritas

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A Waters Company

SSAP Evaluation Report

Project Number: **110419K**

ERA Customer Number: **M748564**

Laboratory Name: **Bureau Veritas**

Inorganic Results

R 011644

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110419K Evaluation Final Complete Report

A Waters Company

Clayton Johnson
Sr. Project Manager
Bureau Veritas
6740 Campobello Rd
Mississauga, ON L5N 2L8
(905) 817-5769

EPA ID: Not Reported
ERA Customer Number: M748564

R 011645

TNI Analyte Code	Analyte	Units	Reported Value	Assigned Value	Acceptance Limits	Performance Evaluation	Method Description	Analysis Date	Analyst Name
SSAP Mercury in Impinger Solution (cat# 1428, lot# 110419K) Study Dates: 11/04/19 - 12/10/19									
1095	Mercury	ng/mL	0.93	1.02	0.765 - 1.28	Acceptable	EPA Method 29 2000	12/9/2019	
SSAP Metals in Impinger Solution (cat# 1426, lot# 110419K) Study Dates: 11/04/19 - 12/10/19									
1005	Antimony	µg/mL	0.351	0.361	0.271 - 0.451	Acceptable	EPA Method 29 2000	12/3/2019	
1010	Arsenic	µg/mL	0.935	0.960	0.720 - 1.20	Acceptable	EPA Method 29 2000	12/3/2019	
1015	Barium	µg/mL	0.912	0.838	0.628 - 1.05	Acceptable	EPA Method 29 2000	12/3/2019	
1020	Beryllium	µg/mL	0.0789	0.0715	0.0500 - 0.0930	Acceptable	EPA Method 29 2000	12/3/2019	
1030	Cadmium	µg/mL	0.138	0.141	0.113 - 0.169	Acceptable	EPA Method 29 2000	12/3/2019	
1040	Chromium	µg/mL	0.560	0.546	0.437 - 0.655	Acceptable	EPA Method 29 2000	12/3/2019	
1050	Cobalt	µg/mL	0.839	0.775	0.581 - 0.969	Acceptable	EPA Method 29 2000	12/3/2019	
1055	Copper	µg/mL	0.685	0.698	0.524 - 0.872	Acceptable	EPA Method 29 2000	12/3/2019	
1075	Lead	µg/mL	0.940	0.911	0.683 - 1.14	Acceptable	EPA Method 29 2000	12/3/2019	
1090	Manganese	µg/mL	0.370	0.340	0.255 - 0.425	Acceptable	EPA Method 29 2000	12/3/2019	
1105	Nickel	µg/mL	0.667	0.622	0.498 - 0.746	Acceptable	EPA Method 29 2000	12/3/2019	
1140	Selenium	µg/mL	0.737	0.740	0.555 - 0.925	Acceptable	EPA Method 29 2000	12/3/2019	
1150	Silver	µg/mL	0.718	0.702	0.526 - 0.878	Acceptable	EPA Method 29 2000	12/3/2019	
1165	Thallium	µg/mL	0.471	0.442	0.332 - 0.552	Acceptable	EPA Method 29 2000	12/3/2019	
1190	Zinc	µg/mL	0.898	0.904	0.678 - 1.13	Acceptable	EPA Method 29 2000	12/3/2019	

A Waters Company

110419K Evaluation Final Complete Report

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EPA ID: Not Reported
ERA Customer Number: M748564

TNI Analyte Code	Analyte	Units	Reported Value	Assigned Value	Acceptance Limits	Performance Evaluation	Method Description	Analysis Date	Analyst Name
SSAP Metals on Filter Paper (cat# 1425, lot# 110419K) Study Dates: 11/04/19 - 12/10/19									
1005	Antimony	µg/Filter	38.0	38.9	29.2 - 48.6	Acceptable	EPA Method 29 2000	12/9/2019	
1010	Arsenic	µg/Filter	54.5	59.8	44.8 - 74.8	Acceptable	EPA Method 29 2000	12/9/2019	
1015	Barium	µg/Filter	41.7	40.2	30.2 - 50.2	Acceptable	EPA Method 29 2000	12/9/2019	
1020	Beryllium	µg/Filter	43.8	42.7	32.0 - 53.4	Acceptable	EPA Method 29 2000	12/9/2019	
1030	Cadmium	µg/Filter	32.1	32.3	25.8 - 38.8	Acceptable	EPA Method 29 2000	12/9/2019	
1040	Chromium	µg/Filter	35.9	37.6	30.1 - 45.1	Acceptable	EPA Method 29 2000	12/9/2019	
1050	Cobalt	µg/Filter	57.5	60.5	45.4 - 75.6	Acceptable	EPA Method 29 2000	12/9/2019	
1055	Copper	µg/Filter	34.7	36.2	27.2 - 45.2	Acceptable	EPA Method 29 2000	12/9/2019	
1075	Lead	µg/Filter	47.7	50.1	40.1 - 60.1	Acceptable	EPA Method 29 2000	12/9/2019	
1090	Manganese	µg/Filter	29.6	29.8	23.8 - 35.8	Acceptable	EPA Method 29 2000	12/9/2019	
1105	Nickel	µg/Filter	37.5	38.2	30.6 - 45.8	Acceptable	EPA Method 29 2000	12/9/2019	
1140	Selenium	µg/Filter	32.5	33.7	23.6 - 43.8	Acceptable	EPA Method 29 2000	12/9/2019	
1150	Silver	µg/Filter	30.3	30.8	21.6 - 40.0	Acceptable	EPA Method 29 2000	12/9/2019	
1165	Thallium	µg/Filter	43.5	44.2	33.2 - 55.2	Acceptable	EPA Method 29 2000	12/9/2019	
1190	Zinc	µg/Filter	38.0	37.9	26.5 - 49.3	Acceptable	EPA Method 29 2000	12/9/2019	
SSAP Mercury on Filter Paper (cat# 1427, lot# 110419K) Study Dates: 11/04/19 - 12/10/19									
1095	Mercury	µg/Filter	25.8	24.3	18.2 - 30.4	Acceptable	EPA Method 29 2000	12/10/2019	

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Appendix F – Reference Method Test Data (Computerized Sheets)

Client: General Iron Industries, Inc.
Facility: Chicago, IL
Project #: M193103
Test Location: RTO Inlet and Scrubber Stack
Operating Condition: Normal
Date: 11/15/19
Run 1

Time	THC In ppmv	THC Out ppmv	
10:33	339.00	3.57	
10:34	229.84	2.17	
10:35	240.32	5.36	
10:36	198.60	5.80	
10:37	295.09	5.53	
10:38	388.12	16.71	
10:39	417.22	3.99	
10:40	464.81	2.59	
10:41	295.28	5.56	
10:42	945.49	3.00	
10:43	773.96	15.57	
10:44	484.38	8.88	
10:45	484.38	8.88	
10:46	476.64	3.16	
10:47	417.88	14.46	
10:48	660.39	6.12	
10:49	599.36	2.97	
10:50	347.74	13.28	
10:51	304.28	4.35	
10:52	312.66	2.70	
10:53	270.32	17.48	
10:54	395.83	5.14	
10:55	371.74	3.09	
10:56	387.56	15.28	
10:57	354.71	4.74	
10:58	293.17	3.15	
10:59	561.92	15.95	
11:00	661.89	5.28	
11:01	403.55	3.41	
11:02	700.73	12.86	Port Change
11:17	536.59	17.28	
11:18	906.04	4.79	
11:19	516.47	4.12	
11:20	564.30	13.21	
11:21	734.47	7.95	
11:22	642.54	9.34	
11:23	671.77	8.03	
11:24	1782.64	9.85	RTO down
11:57	641.10	3.47	
11:58	678.59	5.82	
11:59	530.06	10.58	RTO down
12:36	279.67	3.85	
12:37	236.56	12.02	
12:38	277.69	11.56	
12:39	334.50	3.26	
12:40	184.45	6.56	
12:41	296.45	11.41	
12:42	351.81	6.99	
12:43	262.57	8.37	
12:44	210.46	8.37	
12:45	276.96	8.37	
12:46	294.89	8.37	
12:47	220.09	8.37	
12:48	573.44	8.37	
12:49	541.40	8.37	
12:50	858.66	8.26	
12:51	1606.43	8.37	RTO down
13:15	445.38	3.59	
13:16	453.09	4.75	
13:17	843.08	19.91	
Average	**497.20**	**7.90**	
Min	184.45	2.17	
Max	1782.64	19.91	

Client: General Iron Industries, Inc.
Facility: Chicago, IL
Project #: M193103
Test Location: RTO Inlet and Scrubber Stack
Operating Condition: Normal
Date: 11/18/19

Run 2

Time	THC In ppmv	THC Out ppmv
8:51	408.08	6.04
8:52	302.82	1.97
8:53	567.66	0.90
8:54	418.45	14.41
8:55	535.03	3.07
8:56	1008.67	1.43
8:57	630.35	6.88
8:58	512.24	2.43
8:59	535.88	1.16
9:00	893.48	14.59
9:01	593.37	2.74
9:02	570.40	1.33
9:03	327.03	4.44
9:04	272.39	1.65
9:05	283.97	0.86
9:06	314.08	14.02
9:07	579.59	2.87
9:08	684.49	1.15
9:09	434.86	18.00
9:10	481.66	2.59
9:11	327.41	1.12
9:12	520.18	8.27
9:13	762.81	3.83
9:14	510.71	1.74
9:15	773.03	33.21
9:16	1450.49	8.18
9:17	1153.67	2.44
9:18	763.20	6.90
9:19	571.70	3.58
9:20	673.29	1.86
9:42	971.26	7.70
9:43	457.48	2.18
9:44	417.87	1.08
9:45	387.10	19.88
9:46	870.30	4.29
9:47	434.50	1.28
9:48	319.41	12.02
9:49	595.99	3.85
9:50	567.14	1.56
9:51	575.10	6.96
9:52	518.34	3.07
9:53	594.18	1.22
9:54	365.46	16.82
9:55	662.12	4.29
9:56	546.99	1.55
9:57	427.90	3.57
9:58	330.58	1.89
9:59	358.60	1.35
10:00	987.56	13.31
10:01	719.23	4.03
10:02	658.39	1.61
10:03	858.15	28.14
10:04	1143.76	4.89
10:05	641.08	1.51
10:06	494.90	6.56
10:07	609.05	2.60
10:08	748.20	1.37
10:09	788.59	11.57
10:10	617.77	2.40
10:11	416.37	0.92
Average	**599.10**	**5.80**
Min	272.39	0.86
Max	1450.49	33.21

Client: General Iron Industries, Inc.
Facility: Chicago, IL
Project #: M193103
Test Location: RTO Inlet and Scrubber Stack
Operating Condition: Normal
Date: 11/18/19
Run 3

Time	THC In ppmv	THC Out ppmv
11:22	200.18	6.46
11:23	352.76	3.84
11:24	344.47	14.44
11:25	529.40	5.79
11:26	767.06	3.70
11:27	481.90	4.82
11:28	252.25	4.56
11:29	419.35	3.72
11:30	733.55	7.35
11:31	473.02	5.42
11:32	767.46	3.90
11:33	403.32	6.36
11:34	320.82	4.68
11:35	286.52	3.21
11:36	322.03	5.25
11:37	353.00	4.49
11:38	521.53	3.31
11:39	542.84	10.55
11:40	910.65	7.11
11:41	585.29	3.20
11:42	507.59	10.55
11:43	580.15	5.96
11:44	528.01	3.08
11:45	503.39	8.37
11:46	659.78	6.28
11:47	1058.02	4.82
11:48	1072.35	8.01
11:49	978.96	6.73
11:50	611.16	3.45
11:51	449.42	20.61
12:16	730.96	3.70
12:17	535.56	1.27
12:18	437.46	7.74
12:19	353.55	4.19
12:20	468.43	1.14
12:21	363.74	6.74
12:22	318.65	2.63
12:23	420.97	0.99
12:24	418.95	6.99
12:25	362.25	1.99
12:26	411.45	1.13
12:27	489.16	6.98
12:28	487.92	2.43
12:29	485.19	0.83
12:30	515.39	11.17
12:31	593.53	2.54
12:32	445.61	0.90
12:33	360.00	10.06
12:34	534.22	4.32
12:35	317.07	1.46
12:36	310.26	7.39
12:37	352.53	2.72
12:38	675.80	1.56
12:39	662.50	14.81
12:40	471.52	3.22
12:41	434.78	1.64
12:42	702.03	9.46
12:43	702.57	5.63
12:44	817.08	2.21
12:45	734.51	9.70
Average	**523.80**	**5.50**
Min	200.18	0.83
Max	1072.35	20.61

Client: General Iron Industries, Inc.
Facility: Chicago, IL
Project #: M193103
Test Location: RTO Inlet and Scrubber Stack
Operating Condition: Normal
Date: 11/18/19
Run 4

Time	THC In ppmv	THC Out ppmv
14:40	615.90	3.55
14:41	480.73	1.57
14:42	846.34	19.53
14:43	689.70	3.84
14:44	857.24	2.07
14:45	1345.82	24.45
14:46	811.18	5.09
14:47	768.42	1.91
14:48	716.54	26.21
14:49	1015.13	9.19
14:50	1840.37	4.37
14:51	1229.12	11.59
14:52	819.70	5.45
14:53	452.10	2.42
14:54	587.43	21.32
14:55	675.99	4.13
14:56	1034.00	2.31
14:57	1166.43	5.13
14:58	523.14	4.07
14:59	431.15	1.95
15:00	453.70	11.48
15:01	407.96	2.63
15:02	876.59	1.92
15:03	1554.82	9.13
15:04	775.04	4.55
15:05	625.89	2.00
15:06	793.30	8.42
15:07	554.00	3.22
15:08	492.54	1.75
15:09	732.07	20.83
17:26	376.44	1.29
17:27	418.15	14.46
17:28	318.16	3.11
17:29	298.33	1.18
17:30	137.05	2.26
17:31	93.63	1.30
17:32	645.35	1.39
17:33	487.04	15.22
17:34	548.23	3.67
17:35	589.60	1.75
17:36	405.06	5.56
17:37	329.12	2.64
17:38	502.07	2.91
17:39	550.82	16.98
17:40	471.79	3.72
17:41	463.26	1.81
17:42	518.18	13.18
17:43	362.45	3.23
17:44	378.49	1.82
17:45	744.13	19.36
17:46	717.97	5.26
17:47	436.86	2.10
17:48	429.61	11.31
17:49	411.03	3.78
17:50	326.23	1.96
17:51	800.82	16.16
17:52	636.00	4.89
17:53	741.64	2.43
17:54	677.35	14.07
17:55	556.24	4.57
Average	**642.40**	**6.80**
Min	93.63	1.18
Max	1840.37	26.21

Client:	General Iron Industries, Inc.	
Facility:	Chicago, IL	
Test Location:	RTO Inlet	
Project #:	M193103	
Test Method:	2	
Test Engineer:	BVG	
Test Technician:	CMB/CMT	
Temp ID:	CM17	
Meter ID:	CM17	
Pitot ID:	148A	
Pitot Type:	S-Type	
Pitot Tube Coefficient:	0.840	
Probe Length:	6.0	**ft**
Sample Plane:	Horizontal	
Port Length:	6.00	**in.**
Port Size (diameter):	3.00	**in.**
Port Type:	Nipple	
Duct Shape:	Circular	
Diameter:	4.167	**ft**
Duct Area:	13.64	**Sq. Ft.**
Upstream Diameters:	8.150	
Downstream Diameters:	2.630	
Number of Ports Sampled:	2	
Number of Points per Port:	8	
Total Number of Traverse Points:	16	
Operating Level:	Normal	
Moisture Balance ID:	S10-82	

METHOD 2 VOLUMETRIC FLOW DATA

Project Number:	M193103	**Operating Level:**	Normal
Client:	General Iron Industries, Inc.	**Run No.:**	Pre 1
Facility:	Chicago, IL	**Test Date:**	11/15/2019
Test Location:	RTO Inlet	**Start Time:**	10:35
Pitot ID:	148A	**End Time:**	10:45
Pitot Coefficient:	0.840	**Test Engineer:**	BVG **Test Tech:** CMB/CMT
Probe Length, Feet:	6	**Port Length, Inches:**	6

Port	Point	DP (in. H_2O)	Sqrt. DP	Temp (^oF)	Velocity (V)	Port	Point	DP (in. H_2O)	Sqrt. DP	Temp (^oF)	Velocity (V)
A	**1**	1.90	1.3784	76.0	77.05	**B**	**1**	2.10	1.4491	77.0	81.08
A	**2**	1.80	1.3416	76.0	74.99	**B**	**2**	2.20	1.4832	78.0	83.06
A	**3**	2.00	1.4142	74.0	78.90	**B**	**3**	2.20	1.4832	78.0	83.06
A	**4**	2.00	1.4142	75.0	78.98	**B**	**4**	2.20	1.4832	78.0	83.06
A	**5**	2.20	1.4832	76.0	82.91	**B**	**5**	1.90	1.3784	81.0	77.41
A	**6**	2.20	1.4832	76.0	82.91	**B**	**6**	1.90	1.3784	77.0	77.12
A	**7**	2.30	1.5166	76.0	84.77	**B**	**7**	1.80	1.3416	77.0	75.06
A	**8**	2.50	1.5811	75.0	88.30	**B**	**8**	1.80	1.3416	78.0	75.13

Test Parameters

P_{bar} - Barometric pressure, inches Hg	29.70	% CO_2	0.00
P_g - Stack Pressure, inches of H_2O	16.00	% O_2	20.90
P_s - Absolute stack pressure, inches Hg	30.88	% N_2	79.10
t_s - Average stack temperature, ^oF	76.8	Md - dry basis lb/lb mole	28.84
Duct Shape:	Circular	Ms - wet basis lb/lb mole	28.652
Diameter, Feet	4.167		
		Bws - Moisture content fraction	**0.017**
Cross Sectional Area of Stack, Ft^2	13.64	Moisture determined by wb/db?	N
		Supersaturation Value, Bws:	**0.030**

Method 2 Results

Average DP	2.0625	Q - ACFM	65,667
Average Sqrt DP	1.4345	Qsd - DSCFM	65,529
Average Velocity Vs (ft/sec)	80.239	Qs - SCFM	66,662
		Qs - SCFH	3,999,715

METHOD 2 VOLUMETRIC FLOW DATA

Project Number:	M193103	**Operating Level:**	Normal
Client:	General Iron Industries, Inc.	**Run No.:**	Post 1
Facility:	Chicago, IL	**Test Date:**	11/15/2019
Test Location:	RTO Inlet	**Start Time:**	13:15
Pitot ID:	148A	**End Time:**	13:20
Pitot Coefficient:	0.840	**Test Engineer:**	BVG **Test Tech:** CMB/CMT
Probe Length, Feet:	6	**Port Length, Inches:**	6

Port	Point	DP (in. H_2O)	Sqrt. DP	Temp (^oF)	Velocity (V)	Port	Point	DP (in. H_2O)	Sqrt. DP	Temp (^oF)	Velocity (V)
A	**1**	1.90	1.3784	77.0	77.12	**B**	**1**	1.70	1.3038	81.0	73.22
A	**2**	1.80	1.3416	80.0	75.27	**B**	**2**	2.00	1.4142	81.0	79.42
A	**3**	1.80	1.3416	82.0	75.41	**B**	**3**	1.80	1.3416	82.0	75.41
A	**4**	1.80	1.3416	83.0	75.48	**B**	**4**	1.90	1.3784	82.0	77.48
A	**5**	2.00	1.4142	82.0	79.49	**B**	**5**	1.90	1.3784	82.0	77.48
A	**6**	2.00	1.4142	82.0	79.49	**B**	**6**	2.00	1.4142	82.0	79.49
A	**7**	2.30	1.5166	82.0	85.24	**B**	**7**	2.50	1.5811	82.0	88.87
A	**8**	2.30	1.5166	82.0	85.24	**B**	**8**	3.00	1.7321	82.0	97.36

Test Parameters

P_{bar} - Barometric pressure, inches Hg	29.70	% CO_2	0.00
P_g - Stack Pressure, inches of H_2O	16.00	% O_2	20.90
P_s - Absolute stack pressure, inches Hg	30.88	% N_2	79.10
t_s - Average stack temperature, ^oF	81.5	Md - dry basis lb/lb mole	28.84
Duct Shape:	Circular	Ms - wet basis lb/lb mole	28.652
Diameter, Feet	4.167		
		Bws - Moisture content fraction	**0.017**
Cross Sectional Area of Stack, Ft^2	13.64	Moisture determined by wb/db?	N
		Supersaturation Value, Bws:	**0.035**

Method 2 Results

Average DP	2.0438	Q - ACFM	65,547
Average Sqrt DP	1.4256	Qsd - DSCFM	64,835
Average Velocity Vs (ft/sec)	80.092	Qs - SCFM	65,956
		Qs - SCFH	3,957,357

METHOD 2 VOLUMETRIC FLOW DATA

Project Number:	M193103	**Operating Level:**	Normal
Client:	General Iron Industries, Inc.	**Run No.:**	Pre 2
Facility:	Chicago, IL	**Test Date:**	11/18/2019
Test Location:	RTO Inlet	**Start Time:**	8:53
Pitot ID:	148A	**End Time:**	9:00
Pitot Coefficient:	0.840	**Test Engineer:**	BVG **Test Tech:** CMB/CMT
Probe Length, Feet:	6	**Port Length, Inches:**	6

Port	Point	DP (in. H_2O)	Sqrt. DP	Temp (^oF)	Velocity (V)	Port	Point	DP (in. H_2O)	Sqrt. DP	Temp (^oF)	Velocity (V)
A	**1**	1.20	1.0954	87.0	62.38	**B**	**1**	1.40	1.1832	88.0	67.44
A	**2**	1.30	1.1402	88.0	64.98	**B**	**2**	1.30	1.1402	88.0	64.98
A	**3**	1.50	1.2247	88.0	69.80	**B**	**3**	1.30	1.1402	87.0	64.92
A	**4**	1.50	1.2247	88.0	69.80	**B**	**4**	1.40	1.1832	87.0	67.37
A	**5**	1.50	1.2247	88.0	69.80	**B**	**5**	1.30	1.1402	87.0	64.92
A	**6**	1.60	1.2649	87.0	72.03	**B**	**6**	1.30	1.1402	87.0	64.92
A	**7**	1.80	1.3416	87.0	76.39	**B**	**7**	1.60	1.2649	87.0	72.03
A	**8**	2.40	1.5492	87.0	88.21	**B**	**8**	2.10	1.4491	87.0	82.52

Test Parameters

P_{bar} - Barometric pressure, inches Hg	29.20	% CO_2	0.00
P_g - Stack Pressure, inches of H_2O	16.00	% O_2	20.90
P_s - Absolute stack pressure, inches Hg	30.38	% N_2	79.10
t_s - Average stack temperature, ^oF	87.4	Md - dry basis lb/lb mole	28.84
Duct Shape:	Circular	Ms - wet basis lb/lb mole	28.641
Diameter, Feet	4.167		
		Bws - Moisture content fraction	**0.018**
Cross Sectional Area of Stack, Ft^2	13.64	Moisture determined by wb/db?	N
		Supersaturation Value, Bws:	**0.043**

Method 2 Results

Average DP	1.5313	Q - ACFM	57,416
Average Sqrt DP	1.2317	Qsd - DSCFM	55,217
Average Velocity Vs (ft/sec)	70.157	Qs - SCFM	56,229
		Qs - SCFH	3,373,743

METHOD 2 VOLUMETRIC FLOW DATA

Project Number:	M193103	**Operating Level:**	Normal
Client:	General Iron Industries, Inc.	**Run No.:**	Post 2/Pre 3
Facility:	Chicago, IL	**Test Date:**	11/18/2019
Test Location:	RTO Inlet	**Start Time:**	11:26
Pitot ID:	148A	**End Time:**	11:34
Pitot Coefficient:	0.840	**Test Engineer:**	BVG **Test Tech:** CMB/CMT
Probe Length, Feet:	6	**Port Length, Inches:**	6

Port	Point	DP (in. H_2O)	Sqrt. DP	Temp (^oF)	Velocity (V)	Port	Point	DP (in. H_2O)	Sqrt. DP	Temp (^oF)	Velocity (V)
A	**1**	1.30	1.1402	85.0	64.79	**B**	**1**	1.20	1.0954	87.0	62.36
A	**2**	1.40	1.1832	87.0	67.36	**B**	**2**	1.30	1.1402	87.0	64.91
A	**3**	1.40	1.1832	86.0	67.30	**B**	**3**	1.30	1.1402	87.0	64.91
A	**4**	1.30	1.1402	86.0	64.85	**B**	**4**	1.40	1.1832	87.0	67.36
A	**5**	1.50	1.2247	86.0	69.66	**B**	**5**	1.50	1.2247	88.0	69.79
A	**6**	1.70	1.3038	87.0	74.23	**B**	**6**	1.60	1.2649	86.0	71.95
A	**7**	1.90	1.3784	87.0	78.47	**B**	**7**	1.70	1.3038	86.0	74.16
A	**8**	2.10	1.4491	87.0	82.50	**B**	**8**	2.00	1.4142	86.0	80.44

Test Parameters

P_{bar} - Barometric pressure, inches Hg	29.20	% CO_2	0.00	
P_g - Stack Pressure, inches of H_2O	16.00	% O_2	20.90	
P_s - Absolute stack pressure, inches Hg	30.38	% N_2	79.10	
t_s - Average stack temperature, ^oF	86.6	Md - dry basis lb/lb mole	28.84	
Duct Shape:	Circular	Ms - wet basis lb/lb mole	28.652	
Diameter, Feet	4.167			
		Bws - Moisture content fraction		**0.017**
Cross Sectional Area of Stack, Ft^2	13.64	Moisture determined by wb/db?		N
		Supersaturation Value, Bws:		**0.042**

Method 2 Results

Average DP	1.5375	Q - ACFM	57,546
Average Sqrt DP	1.2356	Qsd - DSCFM	55,480
Average Velocity Vs (ft/sec)	70.315	Qs - SCFM	56,440
		Qs - SCFH	3,386,377

METHOD 2 VOLUMETRIC FLOW DATA

Project Number:	M193103	**Operating Level:**	Normal
Client:	General Iron Industries, Inc.	**Run No.:**	Post 3/Pre 4
Facility:	Chicago, IL	**Test Date:**	11/18/2019
Test Location:	RTO Inlet	**Start Time:**	16:45
Pitot ID:	148A	**End Time:**	16:55
Pitot Coefficient:	0.840	**Test Engineer:**	BVG **Test Tech:** CMB/CMT
Probe Length, Feet:	6	**Port Length, Inches:**	6

Port	Point	DP (in. H_2O)	Sqrt. DP	Temp (°F)	Velocity (V)	Port	Point	DP (in. H_2O)	Sqrt. DP	Temp (°F)	Velocity (V)
A	**1**	1.30	1.1402	88.0	64.97	**B**	**1**	1.20	1.0954	86.0	62.31
A	**2**	1.40	1.1832	88.0	67.42	**B**	**2**	1.30	1.1402	87.0	64.91
A	**3**	1.40	1.1832	87.0	67.36	**B**	**3**	1.30	1.1402	87.0	64.91
A	**4**	1.30	1.1402	87.0	64.91	**B**	**4**	1.40	1.1832	88.0	67.42
A	**5**	1.50	1.2247	87.0	69.73	**B**	**5**	1.50	1.2247	87.0	69.73
A	**6**	1.70	1.3038	87.0	74.23	**B**	**6**	1.60	1.2649	87.0	72.01
A	**7**	1.90	1.3784	87.0	78.47	**B**	**7**	1.70	1.3038	88.0	74.30
A	**8**	2.10	1.4491	87.0	82.50	**B**	**8**	2.00	1.4142	88.0	80.59

Test Parameters

P_{bar} - Barometric pressure, inches Hg	29.20	% CO_2	0.00
P_g - Stack Pressure, inches of H_2O	16.00	% O_2	20.90
P_s - Absolute stack pressure, inches Hg	30.38	% N_2	79.10
t_s - Average stack temperature, °F	87.3	Md - dry basis lb/lb mole	28.84
Duct Shape:	Circular	Ms - wet basis lb/lb mole	28.652
Diameter, Feet	4.167		
		Bws - Moisture content fraction	**0.017**
Cross Sectional Area of Stack, Ft^2	13.64	Moisture determined by wb/db?	N
		Supersaturation Value, Bws:	**0.043**

Method 2 Results

Average DP	1.5375	Q - ACFM	57,582
Average Sqrt DP	1.2356	Qsd - DSCFM	55,445
Average Velocity Vs (ft/sec)	70.359	Qs - SCFM	56,404
		Qs - SCFH	3,384,249

METHOD 2 VOLUMETRIC FLOW DATA

Project Number:	M193103	**Operating Level:**	Normal
Client:	General Iron Industries, Inc.	**Run No.:**	Post 4
Facility:	Chicago, IL	**Test Date:**	11/18/2019
Test Location:	RTO Inlet	**Start Time:**	17:40
Pitot ID:	148A	**End Time:**	17:48
Pitot Coefficient:	0.840	**Test Engineer:**	BVG **Test Tech:** CMB/CMT
Probe Length, Feet:	6	**Port Length, Inches:**	6

Port	Point	DP (in. H_2O)	Sqrt. DP	Temp (°F)	Velocity (V)	Port	Point	DP (in. H_2O)	Sqrt. DP	Temp (°F)	Velocity (V)
A	**1**	1.20	1.0954	88.0	62.42	**B**	**1**	1.30	1.1402	86.0	64.85
A	**2**	1.30	1.1402	87.0	64.91	**B**	**2**	1.40	1.1832	86.0	67.30
A	**3**	1.50	1.2247	87.0	69.73	**B**	**3**	1.40	1.1832	87.0	67.36
A	**4**	1.40	1.1832	86.0	67.30	**B**	**4**	1.60	1.2649	88.0	72.08
A	**5**	1.60	1.2649	86.0	71.95	**B**	**5**	1.60	1.2649	88.0	72.08
A	**6**	1.80	1.3416	86.0	76.31	**B**	**6**	1.70	1.3038	88.0	74.30
A	**7**	1.70	1.3038	87.0	74.23	**B**	**7**	1.70	1.3038	87.0	74.23
A	**8**	1.90	1.3784	87.0	78.47	**B**	**8**	1.90	1.3784	87.0	78.47

Test Parameters

P_{bar} - Barometric pressure, inches Hg	29.20	% CO_2	0.00
P_g - Stack Pressure, inches of H_2O	16.00	% O_2	20.90
P_s - Absolute stack pressure, inches Hg	30.38	% N_2	79.10
t_s - Average stack temperature, °F	86.9	Md - dry basis lb/lb mole	28.84
Duct Shape:	Circular	Ms - wet basis lb/lb mole	28.652
Diameter, Feet	4.167		
		Bws - Moisture content fraction	**0.017**
Cross Sectional Area of Stack, Ft^2	13.64	Moisture determined by wb/db?	N
		Supersaturation Value, Bws:	**0.042**

Method 2 Results

Average DP	1.5625	Q - ACFM	58,105
Average Sqrt DP	1.2472	Qsd - DSCFM	55,981
Average Velocity Vs (ft/sec)	70.998	Qs - SCFM	56,949
		Qs - SCFH	3,416,939

General Iron Industries, Inc.
Chicago, IL
RTO Inlet
Volumetric Flow Data - Normal Load

Test Run	Test Date	Pre Flow SCFM	Post Flow SCFM	Average Reference Method Flow SCFM
Pre 1/Post 1	11/15/19	66,662	65,956	66,309
Pre 2/Post 2	11/18/19	56,229	56,440	56,334
Pre 3/Post 3	11/18/19	56,440	56,404	56,422
Pre 4/Post 4	11/18/19	56,404	56,949	56,677

METHOD 4 MOISTURE DETERMINATION

Project Number:	M193103	**Run Number:**		**1**	
Client:	General Iron Industries, Inc.	**Operating Level:**		Normal	
Facility:	Chicago, IL	**Time:**	**Start-**	10:33	**End-** 12:46
Test Location:	RTO Inlet	**Test Engineer:**		BVG	
Test Date:	11/15/2019	**Test Tech:**		CMB/CMT	

Pressure, Barometric(Hg"):	29.70	**Meter Calibration (Y):**	0.994
Delta H:	1.800	**Meter Delta H (dH):**	1.842
Meter Initial Volume:	11.690	**Initial Wt:**	241.4
Meter Final Volume:	56.720	**Final Wt:**	243.7
Meter Temperature:	37.91	**Initial Volume:**	200.0
Meter Volume dscf:	47.326	**Final Volume:**	215.0
		Water Vapor in Flue Gas (Bws):	**0.017**

Project Number:	M193103	**Run Number:**		**2**	
Client:	General Iron Industries, Inc.	**Operating Level:**		Normal	
Facility:	Chicago, IL	**Time:**	**Start-**	8:51	**End-** 10:12
Test Location:	RTO Inlet	**Test Engineer:**		BVG	
Test Date:	11/15/2019	**Test Tech:**		CMB/CMT	

Pressure, Barometric(Hg"):	29.20	**Meter Calibration (Y):**	0.994
Delta H:	1.842	**Meter Delta H (dH):**	1.842
Meter Initial Volume:	58.470	**Initial Wt:**	252.0
Meter Final Volume:	103.680	**Final Wt:**	255.3
Meter Temperature:	43.41	**Initial Volume:**	200.0
Meter Volume dscf:	46.213	**Final Volume:**	215.0
		Water Vapor in Flue Gas (Bws):	**0.018**

Project Number:	M193103	**Run Number:**		**3**	
Client:	General Iron Industries, Inc.	**Operating Level:**		Normal	
Facility:	Chicago, IL	**Time:**	**Start-**	11:22	**End-** 12:46
Test Location:	RTO Inlet	**Test Engineer:**		BVG	
Test Date:	11/15/2019	**Test Tech:**		CMB/CMT	

Pressure, Barometric(Hg"):	29.20	**Meter Calibration (Y):**	0.994
Delta H:	1.842	**Meter Delta H (dH):**	1.842
Meter Initial Volume:	3.790	**Initial Wt:**	250.8
Meter Final Volume:	48.810	**Final Wt:**	252.7
Meter Temperature:	43.95	**Initial Volume:**	215.0
Meter Volume dscf:	45.969	**Final Volume:**	230.0
		Water Vapor in Flue Gas (Bws):	**0.017**

Project Number:	M193103	**Run Number:**		**4**	
Client:	General Iron Industries, Inc.	**Operating Level:**		Normal	
Facility:	Chicago, IL	**Time:**	**Start-**	16:40	**End-** 17:56
Test Location:	RTO Inlet	**Test Engineer:**		BVG	
Test Date:	11/15/2019	**Test Tech:**		CMB/CMT	

Pressure, Barometric(Hg"):	29.20	**Meter Calibration (Y):**	0.994
Delta H:	1.842	**Meter Delta H (dH):**	1.842
Meter Initial Volume:	49.425	**Initial Wt:**	252.7
Meter Final Volume:	94.455	**Final Wt:**	254.7
Meter Temperature:	42.00	**Initial Volume:**	230.0
Meter Volume dscf:	46.158	**Final Volume:**	245.0
		Water Vapor in Flue Gas (Bws):	**0.017**

Client:	General Iron Industries, Inc.			
Facility:	Chicago, IL			
Test Location:	Scrubber Stack			
Project #:	M193103			
Test Method:	5/202			
Test Engineer:	JRK			
Test Technician:	MAK1/KJB			
	R1	**R2**	**R3**	**R4**
Temp ID:	CM2	CM2	CM2	CM2
Meter ID:	CM2	CM2	CM2	CM2
Pitot ID:	569A	569A	569A	509A
Filter ID:	14068	14015	14338	14016
Filter Pre-Weight (grams):	0.40702	0.46113	0.46407	
Nozzle Diameter (Inches):	0.246	0.246	0.246	0.246
Meter Calibration Date:	11/4/2019	11/4/2019	11/4/2019	11/4/2019
Meter Calibration Factor (Y):	1.011	1.011	1.011	1.011
Meter Orifice Setting (Delta H):	1.883	1.883	1.883	1.883
Nozzle Kit ID Number and Material:	Teflon Kit #6	Teflon Kit #6	Teflon Kit #6	Teflon Kit #6
Pitot Tube Coefficient:	0.840			
Probe Length (Feet):	7.0			
Probe Liner Material:	Glass			
Sample Plane:	Horizontal			
Port Length (Inches):	6.00			
Port Size (Diameter, Inches):	3.00			
Port Type:	Nipple			
Duct Shape:	Circular			
Diameter (Feet):	6.167			
Duct Area (Square Feet):	29.870			
Upstream Diameters:	1.4			
Downstream Diameters:	2.0			
Number of Ports Sampled:	2			
Number of Points per Port:	12			
Minutes per Point:	2.5			
Minutes per Reading:	2.5			
Total Number of Traverse Points:	24			
Test Length (Minutes):	60			
Train Type:	Anderson Box			
Source Condition:	Normal			
Diluent Model/Serial Number:	Servomex 01440D1/3934			
Moisture Balance ID:	S10-82			
# of Runs	4			

Run 1-Method 5/202

Client:	General Iron Industries, Inc.	Date:	11/15/19
Facility:	Chicago, IL	Start Time:	10:33
Test Location:	Scrubber Stack	End Time:	13:18
Source Condition:	Normal		

DRY GAS METER CONDITIONS			STACK CONDITIONS		
ΔH:	1.44	in. H_2O	Static Pressure	0.30	in. H_2O
Meter Temperature, Tm:	43.4	°F	Flue Pressure (Ps):	29.69	in. Hg. abs.
Sqrt ΔP:	0.675	in. H_2O	Carbon Dioxide:	0.36	%
Stack Temperature, Ts:	100.7	°F	Oxygen:	20.16	%
Meter Volume, Vm:	42.130	ft^3	Nitrogen:	79.48	%
Meter Volume, Vmstd:	44.464	dscf	Gas Weight dry, Md:	28.864	lb/lb mole
Meter Volume, Vwstd:	3.471	wscf	Gas Weight wet, Ms:	28.136	lb/lb mole
Isokinetic Variance:	108.2	%I	Excess Air:	---	%
Heat Input, mmBtu/hr		Heat Input, mmBtu/hr	Gas Velocity, Vs:	39.707	fps
Test Length:	60.00	in mins.	Volumetric Flow:	71,164	acfm
Nozzle Diameter:	0.246	in inches	Volumetric Flow:	62,043	dscfm
Barometric Pressure:	29.67	in Hg	Volumetric Flow:	66,498	scfm
Filter ID:	14068		Calculated Fo:	2.06	
Filter Pre Weight (grams):	0.40702		Fo Validity:	#N/A	

MOISTURE DETERMINATION

Initial Impinger Content:	1727.1	ml	Silica Initial Wt.	251.4	grams
Final Impinger Content:	1776.7	ml	Silica Final Wt.	275.5	grams
Impinger Difference:	49.6	ml	Silica Difference:	24.1	grams

Total Water Gain: 73.7 Moisture, Bws: 0.072 **Supersaturation Value, Bws: 0.067**

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	10:33:00	0.36	1.10	80.845	98	39	40	265	255	38
1-2	10:35:30	0.35	1.10	82.251	99	39	39	265	261	38
1-3	10:38:00	0.40	1.30	83.640	98	39	40	265	263	40
1-4	10:40:30	0.43	1.40	85.120	98	40	40	265	265	42
1-5	10:43:00	0.45	1.40	86.660	97	40	39	265	265	44
1-6	10:45:30	0.40	1.30	88.220	103	41	40	265	266	47
1-7	10:48:00	0.41	1.30	89.690	100	42	40	265	266	48
1-8	10:50:30	0.46	1.50	91.200	99	42	40	265	264	51
1-9	10:53:00	0.51	1.60	92.790	99	44	41	265	265	53
1-10	10:55:30	0.51	1.60	94.470	100	44	41	265	266	55
1-11	10:58:00	0.53	1.70	96.150	100	45	41	265	265	57
1-12	11:00:30	0.51	1.60	97.860	102	45	42	265	265	58
	11:03:00			99.530						
2-1	11:17:00	0.55	1.70	99.530	106	43	43	265	263	38
2-2	11:19:30	0.57	1.80	101.270	99	43	43	265	264	40
2-3	11:22:00	0.56	1.70	103.050	99	43	43	265	264	41
2-4	11:24:30	0.56	1.80	104.810	100	43	42	265	265	42
	11:25:00			105.050						
2-4	11:57:00	0.49	1.50	105.050	104	43	42	265	265	37
2-5	11:59:00	0.54	1.70	106.690	91	45	44	265	265	40
	12:00:00			109.200						
2-5	12:36:00	0.45	1.40	109.200	103	46	46	265	264	39
2-6	12:37:30	0.45	1.40	110.790	105	46	46	265	264	40
2-7	12:40:00	0.44	1.40	112.370	110	47	46	265	266	45
2-8	12:42:30	0.43	1.40	113.920	104	47	46	265	266	46
2-9	12:45:00	0.41	1.30	115.480	101	47	46	265	266	49
2-10	12:47:30	0.38	1.20	116.990	104	47	46	265	264	54
2-11	12:50:00	0.39	1.20	118.450	104	48	47	265	263	54
	12:52:00			119.930						
2-11	13:15:00	0.40	1.30	119.930	98	48	47	264	264	38
2-12	13:15:30	0.42	1.30	121.450	99	48	47	264	265	37
	13:18:00			122.975						
Total	1:00:00			42.130		43.9	42.9			
Average			1.44		100.7	43.4				
Min			1.10		91.0	39.0				
Max			1.80		110.0	48.0				

IMPINGER WEIGHT SHEET - RUN 1

Client:	**General Iron Industries, Inc.**	**Scale Calibration Check Date:**	**11/15/2019**
Facility:	**Chicago, IL**	**Scale Calibration Check (see QS-6.05C for procedure)**	
Test Location:	**Scrubber Stack**	**must be within ± 0.5g of certified mass**	
Project #:	**M193103**		
Date:	**11/15/2019**	**250 grams:**	**250.2**
Test Method:	**5/202**		
		500 grams:	**500.2**
Weighed/Measured By:	**TER**		
Balance ID:	**S10-82**	**750 grams:**	**750.2**

IMPINGER CONTENTS	FINAL MLS / GRAMS	INITIAL MLS / GRAMS	GAIN MLS / GRAMS
Empty	419.3	418.4	0.9
Empty	604.5	573.3	31.2
DI Water	752.9	735.4	17.5
Silica Gel	275.5	251.4	24.1

1,776.7	1,727.1	49.6
Liquid Final	**Liquid Initial**	**Liquid Gain**
275.5	251.4	24.1
Silica Final	**Silica Initial**	**Silica Gain**

Run 2-Method 5/202

Client:	**General Iron Industries, Inc.**	**Date:**	**11/18/19**
Facility:	**Chicago, IL**	**Start Time:**	**8:51**
Test Location:	**Scrubber Stack**	**End Time:**	**10:12**
Source Condition:	**Normal**		

DRY GAS METER CONDITIONS			STACK CONDITIONS		
ΔH:	1.15	In. H_2O	Static Pressure	0.30	in. H_2O
Meter Temperature, Tm:	55.0	°F	Flue Pressure (Ps):	29.18	in. Hg. abs.
Sqrt ΔP:	0.580	In. H_2O	Carbon Dioxide:	0.50	%
Stack Temperature, Ts:	100.6	°F	Oxygen:	20.20	%
Meter Volume, Vm:	34.903	ft^3	Nitrogen:	79.3	%
Meter Volume, Vmstd:	35.358	dscf	Gas Weight dry, Md:	28.888	lb/lb mole
Meter Volume, Vwstd:	2.732	wscf	Gas Weight wet, Ms:	28.159	lb/lb mole
Isokinetic Variance:	100.9	%I	Excess Air:	---	%
Heat Input, mmBtu/hr		Heat Input, mmBtu/hr	Gas Velocity, Vs:	34.414	fps
Test Length:	60.00	in mins.	Volumetric Flow:	61,678	acfm
Nozzle Diameter:	0.246	in inches	Volumetric Flow:	52,864	dscfm
Barometric Pressure:	29.16	in Hg	Volumetric Flow:	56,660	scfm
Filter ID:	14015		Calculated Fo:	1.40	
Filter Pre Weight (grams):	0.46113		Fo Validity:	#N/A	

MOISTURE DETERMINATION

Initial Impinger Content:	1703.0	ml	Silica Initial Wt.	841.4	grams
Final Impinger Content:	1725.9	ml	Silica Final Wt.	876.5	grams
Impinger Difference:	22.9	ml	Silica Difference:	35.1	grams

Total Water Gain: 58.0 Moisture, Bws: 0.072 **Supersaturation Value, Bws: 0.067**

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	8:51:00	0.43	1.50	23.400	98	52	51	265	265	42
1-2	8:53:30	0.43	1.50	25.040	98	52	51	265	264	46
1-3	8:56:00	0.35	1.20	26.680	100	52	51	265	264	49
1-4	8:58:30	0.35	1.20	28.160	101	52	51	265	266	50
1-5	9:01:00	0.36	1.20	29.630	100	53	51	266	265	52
1-6	9:03:30	0.37	1.30	31.120	99	51	51	265	265	54
1-7	9:06:00	0.35	1.20	32.640	99	55	51	264	265	56
1-8	9:08:30	0.33	1.10	34.120	98	56	51	265	265	59
1-9	9:11:00	0.32	1.10	35.580	103	56	52	265	265	60
1-10	9:13:30	0.30	1.00	36.960	102	57	53	265	265	61
1-11	9:16:00	0.29	1.00	38.340	100	56	52	265	265	62
1-12	9:18:30	0.30	1.00	39.680	99	56	52	265	264	59
	9:21:00			41.050						
2-1	9:42:00	0.33	1.10	41.267	98	56	54	265	265	44
2-2	9:44:30	0.36	1.20	42.730	99	57	54	263	266	54
2-3	9:47:00	0.35	1.20	44.230	106	58	54	265	265	57
2-4	9:49:30	0.34	1.20	45.700	103	58	54	265	265	58
2-5	9:52:00	0.33	1.10	47.170	100	58	54	265	263	59
2-6	9:54:30	0.33	1.10	48.610	101	59	55	265	266	62
2-7	9:57:00	0.32	1.10	50.050	100	59	55	265	265	61
2-8	9:59:30	0.32	1.10	51.470	102	60	57	265	265	61
2-9	10:02:00	0.31	1.10	52.900	101	60	57	265	265	61
2-10	10:04:30	0.32	1.10	54.310	101	61	59	266	264	61
2-11	10:07:00	0.31	1.10	55.740	102	61	56	265	265	61
2-12	10:09:30	0.30	1.00	57.130	104	61	60	265	264	62
	10:12:00			58.520						
Total	1:00:00			34.903		56.5	53.6			
Average			1.15		100.6	55.0				
Min			1.00		98.0	51.0				
Max			1.50		106.0	61.0				

IMPINGER WEIGHT SHEET - RUN 2

Client: General Iron Industries, Inc.
Facility: Chicago, IL
Test Location: Scrubber Stack
Project #: M193103
Date: 11/18/2019
Test Method: 5/202

Weighed/Measured By: RICHS
Balance ID: S10-82

Scale Calibration Check Date: 11/18/2019
Scale Calibration Check (see QS-6.05C for procedure)
must be within ± 0.5g of certified mass

250 grams: 250.1

500 grams: 500.1

750 grams: 750.2

IMPINGER CONTENTS	FINAL MLS / GRAMS	INITIAL MLS / GRAMS	GAIN MLS / GRAMS
Empty	421.4	419.8	1.6
Empty	545.8	533.8	12.0
DI Water	758.7	749.4	9.3
Silica Gel	876.5	841.4	35.1

Liquid Final	Liquid Initial	Liquid Gain
1,725.9	1,703.0	22.9

Silica Final	Silica Initial	Silica Gain
876.5	841.4	35.1

Run 3-Method 5/202

Client:	**General Iron Industries, Inc.**	**Date:**	**11/18/19**
Facility:	**Chicago, IL**	**Start Time:**	**11:22**
Test Location:	**Scrubber Stack**	**End Time:**	**12:46**
Source Condition:	**Normal**		

DRY GAS METER CONDITIONS			STACK CONDITIONS		
ΔH:	1.17	In. H_2O	Static Pressure	0.30	in. H_2O
Meter Temperature, Tm:	56.3	°F	Flue Pressure (Ps):	29.18	in. Hg. abs.
Sqrt ΔP:	0.585	In. H_2O	Carbon Dioxide:	0.30	%
Stack Temperature, Ts:	103.3	°F	Oxygen:	20.20	%
Meter Volume, Vm:	35.179	ft^3	Nitrogen:	79.5	%
Meter Volume, Vmstd:	35.553	dscf	Gas Weight dry, Md:	28.856	lb/lb mole
Meter Volume, Vwstd:	2.755	wscf	Gas Weight wet, Ms:	28.075	lb/lb mole
Isokinetic Variance:	101.3	%I	Excess Air:	---	%
Heat Input, mmBtu/hr		Heat Input, mmBtu/hr	Gas Velocity, Vs:	34.827	fps
Test Length:	60.00	in mins.	Volumetric Flow:	62,417	acfm
Nozzle Diameter:	0.246	in inches	Volumetric Flow:	52,959	dscfm
Barometric Pressure:	29.16	in Hg	Volumetric Flow:	57,063	scfm
Filter ID:	14338		Calculated Fo:	2.33	
Filter Pre Weight (grams):	0.46407		Fo Validity:	#N/A	

MOISTURE DETERMINATION

Initial Impinger Content:	1657.8	ml	Silica Initial Wt.	833.7	grams
Final Impinger Content:	1698.2	ml	Silica Final Wt.	851.8	grams
Impinger Difference:	40.4	ml	Silica Difference:	18.1	grams

Total Water Gain: 58.5 Moisture, Bws: 0.072 **Supersaturation Value, Bws: 0.073**

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	11:22:00	0.38	1.30	59.190	102	54	53	265	265	41
1-2	11:24:30	0.37	1.30	60.730	100	53	53	265	265	45
1-3	11:27:00	0.37	1.30	62.260	105	54	53	265	262	49
1-4	11:29:30	0.36	1.20	63.790	102	55	53	265	266	54
1-5	11:32:00	0.35	1.20	65.260	100	55	53	266	264	56
1-6	11:34:30	0.36	1.20	66.740	106	56	53	265	265	59
1-7	11:37:00	0.36	1.20	68.250	101	57	54	265	264	61
1-8	11:39:30	0.36	1.20	69.740	106	57	54	265	265	60
1-9	11:42:00	0.35	1.20	71.250	103	58	54	265	264	62
1-10	11:44:30	0.35	1.20	72.730	103	59	54	266	265	64
1-11	11:47:00	0.35	1.20	74.220	106	61	55	265	265	65
1-12	11:49:30	0.34	1.20	75.670	102	61	55	265	265	66
	11:52:00			77.160						
2-1	12:16:00	0.37	1.30	77.316	99	57	56	265	264	41
2-2	12:18:30	0.35	1.20	78.850	103	58	56	264	265	42
2-3	12:21:00	0.34	1.20	80.350	102	58	56	265	266	43
2-4	12:23:30	0.34	1.20	81.810	102	57	56	265	266	44
2-5	12:26:00	0.33	1.10	83.260	101	57	56	266	266	47
2-6	12:28:30	0.33	1.10	84.710	109	57	56	265	264	48
2-7	12:31:00	0.33	1.10	86.160	104	58	56	265	264	49
2-8	12:33:30	0.32	1.10	87.580	102	58	57	265	265	50
2-9	12:36:00	0.32	1.10	89.010	103	59	57	265	265	51
2-10	12:38:30	0.30	1.00	90.440	103	60	57	265	266	50
2-11	12:41:00	0.30	1.00	91.800	110	61	57	265	265	52
2-12	12:43:30	0.29	1.00	93.180	105	61	57	265	265	51
	12:46:00			94.525						
Total	1:00:00			35.179		57.5	55.0			
Average			1.17		103.3	56.3				
Min			1.00		99.0	53.0				
Max			1.30		110.0	61.0				

IMPINGER WEIGHT SHEET - RUN 3

Client:	**General Iron Industries, Inc.**	**Scale Calibration Check Date:**	**11/18/2019**
Facility:	**Chicago, IL**	**Scale Calibration Check (see QS-6.05C for procedure)**	
Test Location:	**Scrubber Stack**	**must be within ± 0.5g of certified mass**	
Project #:	**M193103**		
Date:	**11/18/2019**	**250 grams:**	**250.1**
Test Method:	**5/202**		
		500 grams:	**500.1**
Weighed/Measured By:	**SWB**		
Balance ID:	**S10-82**	**750 grams:**	**750.2**

IMPINGER CONTENTS	FINAL MLS / GRAMS	INITIAL MLS / GRAMS	GAIN MLS / GRAMS
Empty	422.5	410.6	11.9
Empty	592.3	578.0	14.3
DI Water	683.4	669.2	14.2
Silica Gel	851.8	833.7	18.1

1,698.2	1,657.8	40.4
Liquid Final	**Liquid Initial**	**Liquid Gain**
851.8	833.7	18.1
Silica Final	**Silica Initial**	**Silica Gain**

Run 4-Method 5/202

Client:	**General Iron Industries, Inc.**	**Date:**	**11/18/19**
Facility:	**Chicago, IL**	**Start Time:**	**16:40**
Test Location:	**Scrubber Stack**	**End Time:**	**17:56**
Source Condition:	**Normal**		

DRY GAS METER CONDITIONS			STACK CONDITIONS		
ΔH:	1.21	In. H_2O	Static Pressure	0.30	in. H_2O
Meter Temperature, Tm:	53.5	°F	Flue Pressure (Ps):	29.18	in. Hg. abs.
Sqrt ΔP:	0.597	In. H_2O	Carbon Dioxide:	0.40	%
Stack Temperature, Ts:	104.1	°F	Oxygen:	20.40	%
Meter Volume, Vm:	35.672	ft^3	Nitrogen:	79.2	%
Meter Volume, Vmstd:	36.253	dscf	Gas Weight dry, Md:	28.880	lb/lb mole
Meter Volume, Vwstd:	2.063	wscf	Gas Weight wet, Ms:	28.294	lb/lb mole
Isokinetic Variance:	99.8	%I	Excess Air:	---	%
Heat Input, mmBtu/hr		Heat Input, mmBtu/hr	Gas Velocity, Vs:	35.423	fps
Test Length:	60.00	in mins.	Volumetric Flow:	63,485	acfm
Nozzle Diameter:	0.246	in inches	Volumetric Flow:	54,837	dscfm
Barometric Pressure:	29.16	in Hg	Volumetric Flow:	57,958	scfm
Filter ID:	14016		Calculated Fo:	1.25	
Filter Pre Weight (grams):			Fo Validity:	#N/A	

MOISTURE DETERMINATION

Initial Impinger Content:	1701.8	ml	Silica Initial Wt.	876.5	grams
Final Impinger Content:	1730.4	ml	Silica Final Wt.	891.7	grams
Impinger Difference:	28.6	ml	Silica Difference:	15.2	grams

Total Water Gain: 43.8 Moisture, Bws: 0.054 **Supersaturation Value, Bws: 0.075**

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	16:40:00	0.36	1.20	0.000	104	53	52	265	265	42
1-2	16:42:30	0.33	1.10	1.500	103	53	52	265	264	47
1-3	16:45:00	0.34	1.10	2.940	100	54	52	265	264	47
1-4	16:47:30	0.35	1.20	4.380	101	53	52	264	265	49
1-5	16:50:00	0.35	1.20	5.860	108	53	52	265	265	51
1-6	16:52:30	0.36	1.20	7.330	106	54	52	265	265	56
1-7	16:55:00	0.36	1.20	8.820	104	54	52	265	265	56
1-8	16:57:30	0.36	1.20	10.310	102	55	52	265	265	58
1-9	17:00:00	0.38	1.30	11.820	103	55	52	265	265	60
1-10	17:02:30	0.36	1.20	13.360	102	55	52	265	265	61
1-11	17:05:00	0.35	1.20	14.850	107	56	52	265	265	60
1-12	17:07:30	0.34	1.20	16.310	109	56	52	265	266	61
	17:10:00			17.750						
2-1	17:26:00	0.37	1.30	18.128	105	54	52	265	265	43
2-2	17:28:30	0.36	1.20	19.660	103	55	52	265	264	51
2-3	17:31:00	0.37	1.30	21.140	99	56	52	265	265	55
2-4	17:33:30	0.36	1.20	22.680	101	56	52	265	265	57
2-5	17:36:00	0.37	1.30	24.160	104	55	53	265	266	61
2-6	17:38:30	0.37	1.30	25.690	105	55	52	265	265	60
2-7	17:41:00	0.35	1.20	27.200	109	55	53	265	266	61
2-8	17:43:30	0.35	1.20	28.660	105	55	53	265	265	63
2-9	17:46:00	0.36	1.20	30.150	104	55	53	265	265	63
2-10	17:48:30	0.36	1.20	31.650	109	55	53	265	263	62
2-11	17:51:00	0.35	1.20	33.130	104	55	53	262	264	61
2-12	17:53:30	0.34	1.20	34.610	101	55	53	265	265	58
	17:56:00			36.050						
Total	1:00:00			35.672		54.7	52.3			
Average			1.21		104.1	53.5				
Min			1.10		99.0	52.0				
Max			1.30		109.0	56.0				

IMPINGER WEIGHT SHEET - RUN 4

Client:	**General Iron Industries, Inc.**	**Scale Calibration Check Date:**	**11/18/2019**
Facility:	**Chicago, IL**	**Scale Calibration Check (see QS-6.05C for procedure)**	
Test Location:	**Scrubber Stack**	**must be within ± 0.5g of certified mass**	
Project #:	**M193103**		
Date:	**11/18/2019**	**250 grams:**	**250.1**
Test Method:	**5/202**		
		500 grams:	**500.1**
Weighed/Measured By:	**SWB**		
Balance ID:	**S10-82**	**750 grams:**	**750.2**

IMPINGER CONTENTS	FINAL MLS / GRAMS	INITIAL MLS / GRAMS	GAIN MLS / GRAMS
Empty	412.6	407.2	5.4
Empty	543.1	536.0	7.1
DI Water	774.7	758.6	16.1
Silica Gel	891.7	876.5	15.2

Liquid Final	Liquid Initial	Liquid Gain
1,730.4	1,701.8	28.6

Silica Final	Silica Initial	Silica Gain
891.7	876.5	15.2

Client: General Iron Industries, Inc.
Facility: Chicago, IL
Test Location: Scrubber Stack
Project #: M193103

Run 1
Date: 11/15/2019

Time	O2 % (dry)	CO2 % (dry)
10:35	20,20	0,30
10:36	20,30	0,30
10:37	20,30	0,30
10:38	20,40	0,30
10:39	20,40	0,30
10:40	20,30	0,40
10:41	20,30	0,40
10:42	20,30	0,40
10:43	20,30	0,40
10:44	20,30	0,40
10:45	20,40	0,40
10:46	20,40	0,30
10:47	20,40	0,30
10:48	20,30	0,30
10:49	20,20	0,40
10:50	20,20	0,40
10:51	20,30	0,30
10:52	20,30	0,30
10:53	20,10	0,40
10:54	20,20	0,40
10:55	20,10	0,40
10:56	20,10	0,40
10:57	20,30	0,30
10:58	20,20	0,40
10:59	20,00	0,40
11:04	20,40	0,30
11:05	20,50	0,30
11:06	20,50	0,30
11:07	20,40	0,40
11:08	20,30	0,40
11:09	20,30	0,40
11:10	20,34	0,30
11:11	20,40	0,30
11:12	20,30	0,30
11:13	20,80	0,40
11:14	20,50	0,40
11:15	20,40	0,40
11:16	20,40	0,40
11:17	20,30	0,40
11:18	20,10	0,30
11:19	20,10	0,40
11:20	19,90	0,50
11:21	20,10	0,40
11:22	20,40	0,20
11:23	19,90	0,60
11:24	19,90	0,50
11:25	20,40	0,20
11:58	20,00	0,40
11:59	19,90	0,40
12:00	20,20	0,20
12:37	19,90	0,40
12:38	19,80	0,40
12:39	19,90	0,40
12:40	19,80	0,40
12:41	20,00	0,30
12:42	19,90	0,40
12:43	19,70	0,40
12:44	20,00	0,30
12:45	20,00	0,30
12:46	19,80	0,40
12:47	19,90	0,40
12:48	19,90	0,40
12:49	19,90	0,40
12:50	19,90	0,40
12:51	19,90	0,40
12:52	19,90	0,40
12:53	19,90	0,40
13:15	20,00	0,30
13:16	20,00	0,30
13:17	20,00	0,40
13:18	20,00	0,30
13:19	20,00	0,40
0,55	**20,16**	**0,36**
Min	19,70	0,20
Max	20,80	0,60

Run 2
Date: 11/18/2019

Time	O2 % (dry)	CO2 % (dry)
8:52	13,80	5,10
8:53	19,20	1,40
8:54	20,50	0,70
8:55	20,50	0,60
8:56	20,40	0,60
8:57	20,50	0,60
8:58	20,60	0,50
8:59	20,50	0,40
9:00	20,60	0,40
9:01	20,50	0,60
9:02	20,50	0,40
9:03	20,70	0,30
9:04	20,70	0,30
9:05	20,60	0,30
9:06	20,70	0,30
9:07	20,60	0,40
9:08	20,50	0,40
9:09	20,60	0,40
9:10	20,60	0,40
9:11	20,60	0,40
9:12	20,60	0,30
9:13	20,50	0,40
9:14	20,40	0,40
9:15	20,60	0,40
9:16	20,50	0,40
9:17	20,30	0,60
9:18	20,40	0,60
9:19	20,50	0,40
9:20	20,60	0,40
9:43	20,60	0,30
9:44	20,70	0,30
9:45	20,40	0,40
9:46	20,50	0,30
9:47	20,60	0,30
9:48	20,30	0,50
9:49	20,50	0,30
9:50	20,50	0,30
9:51	20,40	0,40
9:52	20,50	0,30
9:53	20,50	0,30
9:54	20,30	0,40
9:55	20,50	0,30
9:56	20,60	0,30
9:57	20,50	0,30
9:58	20,50	0,30
9:59	20,20	0,60
10:00	20,30	0,40
10:01	20,40	0,40
10:02	20,40	0,40
10:03	20,20	0,60
10:04	20,40	0,40
10:05	20,40	0,30
10:06	20,30	0,40
10:07	20,40	0,40
10:08	20,40	0,40
10:09	20,30	0,50
10:10	20,40	0,30
9:44	20,70	0,30
9:45	20,40	0,40
9:46	20,50	0,30
9:47	20,60	0,30
9:48	20,30	0,50
9:49	20,50	0,30
9:50	20,50	0,30
9:51	20,40	0,40
9:52	20,50	0,30
9:53	20,50	0,30
9:54	20,30	0,40
9:55	20,50	0,30
9:56	20,60	0,30
9:57	20,50	0,30
9:58	20,50	0,30
9:59	20,20	0,60
10:00	20,30	0,40
10:01	20,40	0,40
10:02	20,40	0,40
10:03	20,20	0,60
10:04	20,40	0,40
10:05	20,40	0,30
10:06	20,30	0,40
10:07	20,40	0,40
10:08	20,40	0,40
10:09	20,30	0,50
10:10	20,40	0,30
Average	**20,37**	**0,46**
Min	13,80	0,30
Max	20,70	5,10

Run 3
Date: 11/18/2019

Time	O2 % (dry)	CO2 % (dry)
11:22	20,90	0,10
11:23	20,30	0,40
11:24	20,30	0,40
11:25	20,50	0,30
11:26	20,60	0,30
11:27	20,50	0,30
11:28	20,50	0,40
11:29	20,40	0,40
11:30	20,40	0,40
11:31	20,60	0,30
11:32	20,60	0,30
11:33	20,50	0,30
11:34	20,60	0,30
11:35	20,40	0,40
11:36	20,40	0,40
11:37	20,50	0,30
11:38	20,40	0,40
11:39	20,30	0,40
11:40	20,40	0,40
11:41	20,40	0,40
11:42	20,40	0,40
11:43	20,50	0,30
11:44	20,50	0,40
11:45	20,20	0,50
11:46	20,20	0,50
11:47	20,20	0,40
11:48	20,40	0,30
11:49	20,50	0,20
11:50	20,30	0,40
11:51	20,30	0,40
11:52	20,50	0,30
12:17	20,20	0,30
12:18	20,30	0,30
12:19	20,50	0,20
12:20	20,40	0,30
12:21	20,30	0,30
12:22	20,30	0,30
12:23	20,20	0,40
12:24	20,30	0,30
12:25	20,40	0,30
12:26	20,20	0,40
12:27	20,20	0,30
12:28	20,30	0,40
12:29	20,10	0,40
12:30	20,30	0,30
12:31	20,40	0,30
12:32	20,20	0,40
12:33	20,30	0,30
12:34	20,30	0,30
12:35	20,20	0,40
12:36	20,20	0,40
12:37	20,30	0,30
12:38	20,20	0,30
12:39	20,20	0,30
12:40	20,20	0,40
12:41	20,10	0,40
12:42	20,10	0,40
12:43	20,20	0,30
Average	**20,35**	**0,34**
Min	20,10	0,10
Max	20,90	0,50

Run 4
Date: 11/18/2019

Time	O2 % (dry)	CO2 % (dry)
16:41	20,80	0,20
16:42	20,50	0,40
16:43	20,50	0,40
16:44	20,30	0,50
16:45	20,50	0,40
16:46	20,50	0,40
16:47	20,50	0,40
16:48	20,30	0,70
16:49	20,20	0,80
16:50	20,30	0,50
16:51	20,50	0,40
16:52	20,70	0,30
16:53	20,70	0,40
16:54	20,50	0,40
16:55	20,40	0,50
16:56	20,40	0,50
16:57	20,60	0,40
16:58	20,70	0,30
16:59	20,70	0,30
17:00	20,50	0,40
17:01	20,60	0,40
17:02	20,20	0,70
17:03	20,50	0,40
17:04	20,60	0,40
17:05	20,60	0,40
17:06	20,50	0,40
17:07	20,60	0,40
17:08	20,60	0,40
17:09	20,60	0,40
17:10	20,70	0,40
17:27	19,60	1,10
17:28	20,40	0,50
17:29	20,70	0,40
17:30	20,60	0,40
17:31	20,60	0,40
17:32	20,60	0,40
17:33	20,50	0,40
17:34	20,50	0,40
17:35	20,60	0,40
17:36	20,50	0,40
17:37	20,60	0,40
17:38	20,70	0,30
17:39	20,60	0,40
17:40	20,50	0,40
17:41	20,60	0,40
17:42	20,50	0,40
17:43	20,60	0,40
17:44	20,60	0,40
17:45	20,40	0,50
17:46	20,60	0,40
17:47	20,50	0,40
17:48	20,40	0,40
17:49	20,60	0,30
17:50	20,50	0,40
17:51	20,40	0,50
17:52	20,40	0,50
17:53	20,40	0,50
17:54	20,40	0,50
17:55	20,50	0,40
17:56	20,60	0,40
Average	**20,51**	**0,43**
Min	19,60	0,20
Max	20,80	1,10

Client: General Iron Industries, Inc.
Facility: Chicago, IL
Project #: M193103
Test Location: Scrubber Stack
Operating Condition: Normal
Date: 11/14/19

Run 1

Time	CO ppmvd	SO2 ppmvd	CO2 % (dry)	O2 % (dry)
8:45	14.87	0.03	0.35	20.11
8:46	19.28	-0.02	0.34	20.11
8:47	19.23	0.05	0.48	19.81
8:48	11.84	0.02	0.38	19.96
8:49	6.16	0.02	0.39	19.94
8:50	6.19	0.05	0.47	19.68
8:51	4.95	0.01	0.33	19.99
8:52	16.99	0.00	0.40	19.88
8:53	33.37	0.05	0.51	19.62
8:54	18.11	0.02	0.43	19.77
8:55	11.74	-0.01	0.42	19.77
8:56	12.06	0.06	0.48	19.61
8:57	8.21	0.01	0.31	19.96
8:58	8.64	0.02	0.33	19.93
8:59	12.10	0.06	0.46	19.65
9:02	16.92	0.04	0.49	19.59
9:03	13.64	-0.01	0.35	19.87
9:04	13.62	-0.02	0.37	19.87
9:05	21.54	0.04	0.49	19.60
9:06	9.98	-0.02	0.40	19.80
9:07	9.35	0.02	0.43	19.75
9:08	19.32	0.08	0.53	19.53
9:09	13.84	0.02	0.35	19.89
9:10	10.83	-0.01	0.34	19.92
9:11	24.67	0.04	0.49	19.62
9:12	11.35	0.03	0.39	19.78
9:13	10.41	0.01	0.42	19.78
9:14	17.41	0.06	0.51	19.58
9:15	7.83	0.02	0.35	19.91
9:16	15.94	-0.02	0.38	19.85
9:17	23.39	0.04	0.49	19.60
9:18	10.51	0.06	0.41	19.75
9:19	13.22	0.01	0.46	19.73
9:20	54.49	0.08	0.57	19.48
9:21	12.08	0.03	0.36	19.87
9:22	11.58	-0.01	0.37	19.87
9:23	73.22	0.04	0.62	19.39
9:24	12.22	0.03	0.45	19.72
9:25	21.93	0.02	0.52	19.59
9:26	57.25	0.06	0.52	19.54
9:27	12.02	0.02	0.35	19.88
9:28	10.70	0.01	0.34	19.91
9:29	40.47	0.02	0.48	19.65
9:30	10.56	0.02	0.40	19.80
9:31	8.95	0.00	0.40	19.80
9:32	17.71	0.13	0.49	19.61
9:33	9.47	0.05	0.36	19.87
9:34	11.41	0.00	0.35	19.89
10:00	11.24	0.72	0.46	19.66
10:01	21.18	0.39	0.46	19.67
10:02	23.50	0.46	0.53	19.52
10:03	16.45	0.30	0.41	19.78
10:04	26.45	0.19	0.39	19.84
10:05	56.35	0.19	0.51	19.59
10:06	13.46	0.14	0.41	19.79
10:07	27.20	0.12	0.52	19.63
10:08	50.05	0.14	0.50	19.59
10:09	10.29	0.11	0.34	19.94
10:10	18.15	0.09	0.39	19.86
10:11	49.79	0.10	0.52	19.59
10:12	11.14	0.09	0.46	19.72
10:13	10.42	0.08	0.41	19.80
10:14	29.14	0.12	0.47	19.65
10:15	8.56	0.07	0.32	19.94
10:16	12.37	0.04	0.34	19.92
10:17	46.81	0.08	0.48	19.64
10:18	10.12	0.08	0.40	19.79
10:19	10.63	0.07	0.40	19.79
10:20	22.60	0.11	0.47	19.62
10:21	5.93	0.04	0.43	19.77
10:22	13.49	0.02	0.37	19.86
10:23	42.21	0.07	0.60	19.51
10:24	4.55	0.05	0.52	19.56
10:25	11.64	0.04	0.41	19.79
10:26	38.51	0.07	0.49	19.60
10:27	8.68	0.03	0.31	19.94
10:28	9.12	0.00	0.39	19.85
10:29	77.27	0.02	0.54	19.53
10:30	7.79	0.04	0.45	19.70
10:31	9.63	0.06	0.40	19.80
10:32	36.89	0.08	0.51	19.56
10:33	10.34	0.03	0.36	19.87
10:34	11.04	0.02	0.35	19.89
10:35	37.51	0.06	0.47	19.64
10:36	8.22	0.06	0.39	19.78
10:37	9.40	0.02	0.40	19.78
10:38	28.88	0.08	0.48	19.60
10:39	8.33	0.06	0.37	19.87
10:40	12.48	0.04	0.38	19.86
10:41	47.86	0.08	0.50	19.58
10:42	11.88	0.06	0.37	19.83
Average	**19.40**	**0.10**	**0.43**	**19.75**
Min	4.55	-0.02	0.31	19.39
Max	77.27	0.72	0.62	20.11

Client: General Iron Industries, Inc.
Facility: Chicago, IL
Project #: M193103
Test Location: Scrubber Stack
Operating Condition: Normal
Date: 11/14/19
Run 2

Time	CO ppmvd	SO2 ppmvd	CO2 % (dry)	O2 % (dry)
12:00	14.22	0.10	0.47	19.60
12:01	18.51	0.06	0.47	19.64
12:02	35.83	0.11	0.55	19.46
12:03	15.70	0.03	0.35	19.85
12:04	21.17	0.03	0.39	19.82
12:05	42.18	0.02	0.50	19.58
12:06	10.20	0.15	0.47	19.65
12:07	12.61	0.06	0.39	19.79
12:08	27.91	0.08	0.49	19.58
12:09	11.43	0.06	0.34	19.91
12:10	14.24	0.03	0.35	20.11
12:11	43.19	0.07	0.50	19.80
12:12	10.10	0.06	0.47	19.88
12:13	16.30	0.02	0.47	19.87
12:14	51.86	0.03	0.50	19.78
12:15	11.10	0.03	0.35	20.08
12:16	13.23	0.03	0.35	20.10
12:17	33.26	0.02	0.51	19.78
12:18	7.08	0.07	0.39	19.97
12:19	12.55	0.01	0.42	19.95
12:20	25.42	0.10	0.47	19.81
12:21	9.12	0.03	0.33	20.13
12:22	11.44	0.00	0.36	20.09
12:23	41.38	0.07	0.49	19.82
12:24	10.82	0.05	0.38	20.02
12:25	13.47	0.05	0.46	19.91
12:26	45.49	0.08	0.56	19.68
12:27	9.11	0.03	0.35	20.07
12:28	8.55	0.03	0.32	20.14
12:29	21.35	0.07	0.45	19.88
12:30	7.27	0.03	0.37	20.03
12:31	10.74	-0.01	0.43	19.95
12:32	41.92	0.09	0.53	19.73
12:33	11.96	0.03	0.36	20.08
12:34	12.63	0.00	0.36	20.09
12:35	27.00	0.08	0.45	19.88
12:36	7.42	0.00	0.38	20.00
12:37	9.90	0.07	0.41	19.99
12:38	17.46	0.08	0.47	19.82
12:39	7.55	0.06	0.36	20.08
12:40	11.85	0.07	0.37	20.08
12:41	28.25	0.08	0.46	19.87
12:42	8.21	0.06	0.41	20.00
12:43	17.48	0.02	0.45	19.93
12:44	28.96	0.08	0.49	19.81
12:45	9.01	0.03	0.31	20.16
12:46	12.17	0.01	0.42	20.03
12:47	67.16	0.08	0.57	19.69
13:15	0.75	0.10	0.39	20.01
13:16	5.04	0.08	0.44	19.97
13:17	24.74	0.13	0.54	19.79
13:18	11.44	0.17	0.47	19.89
13:19	8.13	0.08	0.46	19.91
13:20	13.58	0.08	0.53	19.74
13:21	12.45	0.03	0.35	20.11
13:22	7.61	0.01	0.39	20.10
13:23	36.35	0.09	0.51	19.81
13:24	11.47	0.04	0.40	20.01
13:25	10.14	-0.01	0.43	19.99
13:26	26.75	0.11	0.48	19.86
13:35	10.80	0.08	0.49	19.79
13:36	2.86	0.05	0.38	19.98
13:37	3.64	0.07	0.42	19.94
13:38	15.88	0.14	0.50	19.78
13:39	6.42	0.07	0.36	20.14
13:40	20.19	0.03	0.42	20.52
13:41	58.72	0.04	0.55	20.36
13:42	16.41	0.04	0.38	20.69
13:43	14.61	0.03	0.44	20.60
13:44	28.53	0.18	0.51	20.43
13:45	10.29	0.02	0.34	20.78
13:46	11.68	0.07	0.39	20.72
13:47	48.81	0.07	0.50	20.46
13:48	11.40	0.04	0.41	20.63
13:49	14.49	0.03	0.43	20.59
13:50	25.93	0.07	0.52	20.36
13:51	11.76	0.01	0.42	20.61
13:52	13.28	0.01	0.37	20.60
13:53	48.71	0.10	0.52	20.20
13:54	12.36	0.03	0.40	20.39
13:55	13.70	0.06	0.44	20.32
13:56	34.65	0.07	0.54	20.05
13:57	11.69	0.06	0.34	20.35
13:58	9.54	0.02	0.33	20.30
13:59	21.54	0.08	0.50	19.94
14:00	10.33	0.09	0.45	20.04
14:01	11.18	0.06	0.43	20.08
14:02	28.28	0.11	0.49	19.90
14:03	8.17	0.05	0.37	20.18
14:04	14.19	0.06	0.39	20.14
14:05	45.08	0.11	0.53	19.87
14:06	11.69	0.03	0.40	20.11
14:07	11.94	0.01	0.43	20.07
14:08	20.48	0.17	0.51	19.88
14:09	10.13	0.00	0.34	20.22
14:10	12.78	0.03	0.39	20.14
Average	**18.60**	**0.10**	**0.43**	**20.03**
Min	0.75	-0.01	0.31	19.46
Max	67.16	0.18	0.57	20.78

Client: General Iron Industries, Inc.
Facility: Chicago, IL
Project #: M193103
Test Location: Scrubber Stack
Operating Condition: Normal
Date: 11/14/19

Run 3

Time	CO ppmvd	SO2 ppmvd	CO2 % (dry)	O2 % (dry)
15:30	32.59	0.26	0.46	20.04
15:31	31.89	0.25	0.49	20.00
15:32	31.61	0.31	0.53	19.90
15:33	11.16	0.31	0.44	20.04
15:34	11.67	0.23	0.48	20.00
15:35	23.34	0.34	0.57	19.82
15:36	19.01	0.28	0.46	20.03
15:37	16.88	0.26	0.43	20.10
15:38	25.68	0.36	0.53	19.90
15:39	11.99	0.23	0.44	20.08
15:40	16.20	0.28	0.49	20.05
15:41	42.46	0.32	0.56	19.85
15:42	13.27	0.29	0.33	20.28
15:43	8.80	0.25	0.35	20.28
15:44	24.12	0.28	0.48	19.99
15:45	10.83	0.29	0.37	20.18
15:46	7.15	0.12	0.38	20.19
15:47	11.15	0.07	0.51	19.92
15:48	9.50	0.26	0.34	20.25
15:49	8.25	0.23	0.33	20.28
15:50	17.06	0.28	0.49	19.97
15:51	10.02	0.26	0.41	20.13
15:52	9.10	0.20	0.40	20.15
15:53	16.57	0.31	0.51	19.91
15:54	8.94	0.23	0.33	20.27
15:55	19.44	0.22	0.46	20.09
15:56	83.51	0.24	0.54	19.88
15:57	20.62	0.22	0.38	20.18
15:58	13.19	0.29	0.42	20.14
15:59	24.41	0.27	0.50	19.94
16:00	11.03	0.26	0.40	20.17
16:01	12.03	0.27	0.34	20.28
16:02	28.36	0.28	0.47	20.00
16:03	10.83	0.26	0.35	20.20
16:04	4.41	0.22	0.38	20.18
16:05	11.22	0.33	0.52	19.90
16:06	12.79	0.29	0.39	20.16
16:07	15.05	0.23	0.42	20.14
16:08	36.57	0.24	0.49	19.95
16:09	13.24	0.28	0.40	20.13
16:10	10.04	0.23	0.40	20.14
16:11	27.27	0.28	0.54	19.86
16:12	13.69	0.28	0.39	20.15
16:13	10.56	0.21	0.35	20.25
16:14	45.72	0.35	0.54	19.89
16:15	18.58	0.18	0.49	19.98
16:16	9.82	0.24	0.42	20.11
16:17	42.97	0.27	0.53	19.86
16:35	24.15	0.19	0.53	19.83
16:36	13.82	0.27	0.35	20.15
16:37	9.65	0.33	0.37	20.14
16:38	38.73	0.26	0.51	19.86
16:39	13.67	0.27	0.36	20.12
16:40	11.69	0.24	0.43	20.03
16:41	37.75	0.35	0.52	19.82
16:42	16.70	0.27	0.37	20.12
16:43	15.79	0.28	0.38	20.14
16:44	33.28	0.30	0.46	19.95
16:45	10.45	0.26	0.38	20.10
16:46	11.93	0.28	0.41	20.07
16:47	25.91	0.26	0.52	19.82
16:48	11.75	0.28	0.35	20.15
16:49	11.58	0.30	0.35	20.16
16:50	32.33	0.31	0.51	19.85
16:51	17.33	0.24	0.42	20.00
16:52	13.40	0.32	0.41	20.02
16:53	32.31	0.35	0.52	19.76
16:54	15.27	0.34	0.34	20.11
16:55	13.94	0.30	0.38	20.07
16:56	38.91	0.32	0.48	19.84
16:57	14.44	0.28	0.39	20.02
16:58	13.30	0.30	0.45	19.93
16:59	44.60	0.33	0.52	19.74
17:00	16.07	0.29	0.32	20.12
17:15	22.20	0.38	0.49	19.77
17:16	19.39	0.30	0.45	19.89
17:17	34.77	0.32	0.52	19.71
17:18	12.52	0.33	0.32	20.10
17:19	10.08	0.26	0.34	20.10
17:20	24.80	0.36	0.48	19.79
17:21	10.07	0.28	0.34	20.04
17:22	7.15	0.30	0.38	20.01
17:23	21.45	0.37	0.49	19.76
17:24	9.86	0.22	0.38	20.00
17:25	14.72	0.25	0.36	20.07
17:26	38.58	0.25	0.48	19.80
17:27	13.21	0.29	0.35	20.04
17:28	7.25	0.27	0.37	20.02
17:29	27.98	0.32	0.51	19.74
17:30	12.50	0.25	0.32	20.10
17:31	13.17	0.33	0.37	20.04
17:32	37.90	0.42	0.49	19.79
17:33	15.41	0.33	0.38	20.00
17:34	15.30	0.34	0.42	19.95
17:35	30.52	0.39	0.50	19.75
17:36	13.23	0.35	0.36	20.06
Average	**19.50**	**0.30**	**0.43**	**20.02**
Min	4.41	0.07	0.32	19.71
Max	83.51	0.42	0.57	20.28

METHOD 26 TEST RESULTS

Date:	**11/14/2019**	**Condition:**	**Normal**
Project:	**M193103**	**Data Taken By:**	**RKS**
Location:	**Stack**		
Plant:	**General Iron Industries, Inc.**		
Source:	**Scrubber**		

Test Number:	1	**Time:**	9:02 - 10:35
Pressure, Barometric(Hg"):	29.560	**Carbon Dioxide Content(%):**	0.40
Pressure, Static(H_2O"):	0.30	**Oxygen Content(%):**	20.10
Pressure, Stack(Hg"):	29.582	**Nitrogen Content(%):**	79.50
Initial Volume (cu.ft.)	40.203	**HCl (mg)**	2.60
Final Volume (cu.ft.)	83.563	**Water Vapor in Flue Gas (Bws):**	0.071
Meter Temperature (°F)	46.45	**HCl (ppm):**	1.36
Meter Volume (dscf)	44.542	**HF (mg)**	1.10
Meter Calibration (Y)	0.993	**Water Vapor in Flue Gas (Bws):**	0.071
Initial Wt. (grms or mls)	0.0	**HF(ppm):**	1.05
Final Wt. (grms or mls)	72.6		
Average Delta H (ΔH)	1.756		
Dry Standard Flow Rate (dscfm):	56,670		

Test Number:	2	**Time:**	12:13 - 13:50
Pressure, Barometric(Hg"):	29.560	**Carbon Dioxide Content(%):**	0.40
Pressure, Static(H_2O"):	0.30	**Oxygen Content(%):**	20.50
Pressure, Stack(Hg"):	29.582	**Nitrogen Content(%):**	79.10
Initial Volume (cu.ft.)	83.731	**HCl (mg)**	1.18
Final Volume (cu.ft.)	127.043	**Water Vapor in Flue Gas (Bws):**	0.075
Meter Temperature (°F)	49.25	**HCl (ppm):**	0.62
Meter Volume (dscf)	44.248	**HF (mg)**	0.51
Meter Calibration (Y)	0.993	**Water Vapor in Flue Gas (Bws):**	0.075
Initial Wt. (grms or mls)	0.0	**HF (ppm):**	0.49
Final Wt. (grms or mls)	75.9		
Average Delta H (ΔH)	1.756		
Dry Standard Flow Rate (dscfm):	57,575		

Test Number:	3	**Time:**	15:45 - 17:20
Pressure, Barometric(Hg"):	29.560	**Carbon Dioxide Content(%):**	0.40
Pressure, Static(H_2O"):	0.30	**Oxygen Content(%):**	20.30
Pressure, Stack(Hg"):	29.582	**Nitrogen Content(%):**	79.30
Initial Volume (cu.ft.)	28.127	**HCl (mg)**	1.29
Final Volume (cu.ft.)	71.926	**Water Vapor in Flue Gas (Bws):**	0.064
Meter Temperature (°F)	47.12	**HCl (ppm):**	0.67
Meter Volume (dscf)	44.93	**HF (mg)**	0.48
Meter Calibration (Y)	0.993	**Water Vapor in Flue Gas (Bws):**	0.064
Initial Wt. (grms or mls)	0.0	**HF (ppm):**	0.45
Final Wt. (grms or mls)	65.4		
Average Delta H (ΔH)	1.756		
Dry Standard Flow Rate (dscfm):	63,280		

Client:	General Iron Industries, Inc.		
Facility:	Chicago, IL		
Test Location:	Scrubber Stack		
Project #:	M193103		
Test Method:	29		
Test Engineer:	JRK		
Test Technician:	RKS/RNS		
	R1	**R2**	**R3**
Temp ID:	CM2	CM2	CM2
Meter ID:	CM2	CM2	CM2
Pitot ID:	509A	509A	509A
Filter ID:	HP	HP	HP
Filter Pre-Weight (grams):	Unweighed	Unweighed	Unweighed
Nozzle Diameter (Inches):	0.242	0.242	0.242
Meter Calibration Date:	11/4/2019	11/4/2019	11/4/2019
Meter Calibration Factor (Y):	1.011	1.011	1.011
Meter Orifice Setting (Delta H):	1.883	1.883	1.883
Nozzle Kit ID Number and Material:	Teflon #5	Teflon #5	Teflon #5
Pitot Tube Coefficient:	0.840		
Probe Length (Feet):	7.0		
Probe Liner Material:	Glass		
Sample Plane:	Horizontal		
Port Length (Inches):	6.00		
Port Size (Diameter, Inches):	3.00		
Port Type:	Nipple		
Duct Shape:	Circular		
Diameter (Feet):	6.167		
Duct Area (Square Feet):	29.870		
Upstream Diameters:	1.4		
Downstream Diameters:	2.0		
Number of Ports Sampled:	2		
Number of Points per Port:	12		
Minutes per Point:	4.0		
Minutes per Reading:	4.0		
Total Number of Traverse Points:	24		
Test Length (Minutes):	96		
Train Type:	Anderson Box		
Source Condition:	Normal		
Diluent Model/Serial Number:	ECOM		
# of Runs	3		

Run 1-Method 29

Client:	**General Iron Industries, Inc.**	**Date:**	**11/14/19**
Facility:	**Chicago, IL**	**Start Time:**	**8:45**
Test Location:	**Scrubber Stack**	**End Time:**	**10:43**
Source Condition:	**Normal**		

DRY GAS METER CONDITIONS			STACK CONDITIONS		
ΔH:	1.22	in. H_2O	Static Pressure	0.30	in. H_2O
Meter Temperature, Tm:	42.0	°F	Flue Pressure (Ps):	29.58	in. Hg. abs.
Sqrt ΔP:	0.619	in. H_2O	Carbon Dioxide:	0.40	2
Stack Temperature, Ts:	101.6	°F	Oxygen:	20.10	%
Meter Volume, Vm:	56.698	ft^3	Nitrogen:	79.50	%
Meter Volume, Vmstd:	59.740	dscf	Gas Weight dry, Md:	28.868	lb/lb mole
Meter Volume, Vwstd:	4.847	wscf	Gas Weight wet, Ms:	28.118	lb/lb mole
Isokinetic Variance:	102.8	%I	Excess Air:	---	%
			Gas Velocity, Vs:	36.540	fps
Test Length:	96.00	in mins.	Volumetric Flow:	65,488	acfm
Nozzle Diameter:	0.242	in inches	Volumetric Flow:	56,670	dscfm
Barometric Pressure:	29.56	in Hg	Volumetric Flow:	60,870	scfm

MOISTURE DETERMINATION

Initial Impinger Content:	3617.2	ml	Silica Initial Wt.	857.1	grams
Final Impinger Content:	3706.8	ml	Silica Final Wt.	870.4	grams
Impinger Difference:	89.6	ml	Silica Difference:	13.3	grams

Total Water Gain: 102.9 Moisture, Bws: 0.075 **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	Probe Temp °F	Filter Exit Temp °F	Impinger Exit Temp °F
1-1	8:45:00	0.35	1.10	0.321	96	36	35	255	258	39
1-2	8:49:00	0.36	1.10	2.500	98	37	36	255	255	39
1-3	8:53:00	0.36	1.10	4.690	103	38	36	255	255	40
1-4	8:57:00	0.38	1.20	6.880	99	40	36	255	255	42
	9:00:00			8.762						
1-4	9:02:00	0.38	1.10	8.762	100	40	36	254	255	43
1-5	9:03:00	0.46	1.40	11.030	102	41	38	255	255	47
1-6	9:07:00	0.47	1.40	13.510	103	42	38	254	255	47
1-7	9:11:00	0.46	1.40	16.030	100	43	38	255	256	49
1-8	9:15:00	0.42	1.30	18.520	106	44	39	254	254	51
1-9	9:19:00	0.44	1.30	20.910	103	45	39	255	254	53
1-10	9:23:00	0.40	1.20	23.350	104	46	40	256	255	55
1-11	9:27:00	0.40	1.20	25.490	102	46	40	255	255	58
1-12	9:31:00	0.29	0.90	27.990	98	47	40	254	254	59
	9:35:00			30.000						
2-1	9:55:00	0.62	1.90	30.128	101	43	41	255	253	45
2-2	9:59:00	0.64	1.90	33.040	106	45	42	255	254	49
2-3	10:03:00	0.64	2.00	35.759	100	47	42	255	255	52
2-4	10:07:00	0.49	1.50	38.950	100	48	42	255	255	51
2-5	10:11:00	0.48	1.50	41.540	105	48	43	254	255	52
2-6	10:15:00	0.51	1.60	44.110	102	47	43	255	255	50
2-7	10:19:00	0.53	1.60	46.770	102	47	44	255	256	50
2-8	10:23:00	0.24	0.70	49.460	106	47	43	255	255	48
2-9	10:27:00	0.16	0.50	51.270	100	47	43	255	255	47
2-10	10:31:00	0.15	0.50	52.760	102	45	43	255	256	42
2-11	10:35:00	0.16	0.50	54.190	101	45	43	255	256	42
2-12	10:39:00	0.16	0.50	55.680	102	45	43	255	254	42
	10:43:00			57.147						
Total	1:36:00			56.698		44.0	40.1			
Average			1.22		101.6	42.0				
Min			0.50		96.0	35.0				
Max			2.00		106.0	48.0				

IMPINGER WEIGHT SHEET - RUN 1

Client:	**General Iron Industries, Inc.**	**Scale Calibration Check Date:**	**11/13/2019**
Facility:	**Chicago, IL**	**Scale Calibration Check (see QS-6.05C for procedure)**	
Test Location:	**Scrubber Stack**	**must be within ± 0.5g of certified mass**	
Project #:	**M193103**		
Date:	**11/14/2019**	**250 grams:**	**250.2**
Test Method:	**29**		
		500 grams:	**500.2**
Weighed/Measured By:	**SLB**		
Balance ID:	**0**	**750 grams:**	**750.2**

IMPINGER CONTENTS	FINAL MLS / GRAMS	INITIAL MLS / GRAMS	GAIN MLS / GRAMS
HNO3/H2O2	792.8	760.6	32.2
HNO3/H2O2	821.5	781.3	40.2
Empty	690.0	676.4	13.6
KMnO4/H2SO4	666.0	662.3	3.7
KMnO4/H2SO4	736.5	736.6	-0.1
Silica Gel	870.4	857.1	13.3
Silica Gel			

3,706.8	3,617.2	89.6
Liquid Final	**Liquid Initial**	**Liquid Gain**
870.4	857.1	13.3
Silica Final	**Silica Initial**	**Silica Gain**

Run 2-Method 29

Client: General Iron Industries, Inc. | **Date:** 11/14/19
Facility: Chicago, IL | **Start Time:** 12:00
Test Location: Scrubber Stack | **End Time:** 14:11
Source Condition: Normal

DRY GAS METER CONDITIONS			STACK CONDITIONS		
ΔH:	1.23	In. H_2O	Static Pressure	0.30	in. H_2O
Meter Temperature, Tm:	45.1	°F	Flue Pressure (Ps):	29.58	in. Hg. abs.
Sqrt ΔP:	0.626	In. H_2O	Carbon Dioxide:	0.40	%
Stack Temperature, Ts:	100.1	°F	Oxygen:	20.50	%
Meter Volume, Vm:	55.896	ft^3	Nitrogen:	79.1	%
Meter Volume, Vmstd:	58.537	dscf	Gas Weight dry, Md:	28.884	lb/lb mole
Meter Volume, Vwstd:	4.371	wscf	Gas Weight wet, Ms:	28.177	lb/lb mole
Isokinetic Variance:	99.1	%I	Excess Air:	---	%
			Gas Velocity, Vs:	36.862	fps
Test Length:	96.00	in mins.	Volumetric Flow:	66,065	acfm
Nozzle Diameter:	0.242	in inches	Volumetric Flow:	57,575	dscfm
Barometric Pressure:	29.56	in Hg	Volumetric Flow:	61,577	scfm

MOISTURE DETERMINATION

Initial Impinger Content:	3523.4	ml	Silica Initial Wt.	867.6	grams
Final Impinger Content:	3607.2	ml	Silica Final Wt.	876.6	grams
Impinger Difference:	83.8	ml	Silica Difference:	9.0	grams

Total Water Gain: 92.8 Moisture, Bws: 0.069 **Supersaturation Value, Bws: 0.065**

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	12:00:00	0.41	1.30	58.984	96	42	42	255	254	35
1-2	12:04:00	0.38	1.20	61.370	97	43	43	255	256	34
1-3	12:08:00	0.37	1.10	63.660	99	44	42	255	254	33
1-4	12:12:00	0.41	1.30	65.900	101	45	42	255	255	35
1-5	12:16:00	0.45	1.40	68.290	99	46	42	251	255	35
1-6	12:20:00	0.47	1.40	70.810	103	47	42	255	255	34
1-7	12:24:00	0.50	1.50	73.290	99	48	43	255	254	36
1-8	12:28:00	0.48	1.50	75.930	100	49	43	255	256	37
1-9	12:32:00	0.46	1.40	78.500	100	49	44	255	255	38
1-10	12:36:00	0.46	1.40	81.030	100	49	44	255	255	38
1-11	12:40:00	0.40	1.20	83.560	99	49	44	255	254	38
1-12	12:44:00	0.39	1.20	85.920	102	49	44	255	254	38
	12:48:00			88.230						
2-1	13:15:00	0.54	1.70	88.400	97	44	44	255	253	34
2-2	13:19:00	0.44	1.40	91.150	97	46	44	255	254	34
2-3	13:23:00	0.43	1.30	93.610	101	48	44	255	255	34
	13:27:00			96.110						
2-4	13:35:00	0.37	1.20	96.110	98	46	44	255	256	33
2-5	13:39:00	0.32	1.00	98.390	97	47	44	255	255	33
2-6	13:43:00	0.31	1.00	100.490	104	47	44	255	254	34
2-7	13:47:00	0.38	1.20	102.560	100	47	44	255	254	33
2-8	13:51:00	0.35	1.10	104.860	103	48	44	255	255	34
2-9	13:55:00	0.31	1.00	107.040	101	48	44	255	255	34
2-10	13:59:00	0.25	0.80	109.110	105	46	44	255	255	33
2-11	14:03:00	0.30	0.90	110.950	101	47	45	255	256	34
2-12	14:07:00	0.31	0.90	113.010	103	48	44	255	254	34
	14:11:00			115.050						
Total	1:36:00			55.896		46.8	43.5			
Average			1.23		100.1	45.1				
Min			0.80		96.0	42.0				
Max			1.70		105.0	49.0				

IMPINGER WEIGHT SHEET - RUN 2

Client: General Iron Industries, Inc.
Facility: Chicago, IL
Test Location: Scrubber Stack
Project #: M193103
Date: 11/14/2019
Test Method: 29

Weighed/Measured By: SLB
Balance ID: 0

Scale Calibration Check Date: 11/13/2019
Scale Calibration Check (see QS-6.05C for procedure)
must be within ± 0.5g of certified mass

250 grams: 250.2
500 grams: 500.2
750 grams: 750.2

IMPINGER CONTENTS	FINAL MLS / GRAMS	INITIAL MLS / GRAMS	GAIN MLS / GRAMS
HNO3/H2O2	800.5	753.1	47.4
HNO3/H2O2	758.4	727.0	31.4
Empty	655.9	652.0	3.9
KMnO4/H2SO4	649.7	648.5	1.2
KMnO4/H2SO4	742.7	742.8	-0.1
Silica Gel	876.6	867.6	9.0
Silica Gel			

Liquid Final	Liquid Initial	Liquid Gain
3,607.2	3,523.4	83.8

Silica Final	Silica Initial	Silica Gain
876.6	867.6	9.0

Run 3-Method 29

Client:	**General Iron Industries, Inc.**	**Date:**	**11/14/19**
Facility:	**Chicago, IL**	**Start Time:**	**15:30**
Test Location:	**Scrubber Stack**	**End Time:**	**17:37**
Source Condition:	**Normal**		

DRY GAS METER CONDITIONS			STACK CONDITIONS		
ΔH:	1.44	In. H_2O	Static Pressure	0.30	in. H_2O
Meter Temperature, Tm:	42.7	°F	Flue Pressure (Ps):	29.58	in. Hg. abs.
Sqrt ΔP:	0.689	In. H_2O	Carbon Dioxide:	0.40	%
Stack Temperature, Ts:	100.3	°F	Oxygen:	20.30	%
Meter Volume, Vm:	62.804	ft^3	Nitrogen:	79.3	%
Meter Volume, Vmstd:	66.119	dscf	Gas Weight dry, Md:	28.876	lb/lb mole
Meter Volume, Vwstd:	5.101	wscf	Gas Weight wet, Ms:	28.158	lb/lb mole
Isokinetic Variance:	101.8	%I	Excess Air:	---	%
			Gas Velocity, Vs:	40.576	fps
Test Length:	96.00	in mins.	Volumetric Flow:	72,720	acfm
Nozzle Diameter:	0.242	in inches	Volumetric Flow:	63,280	dscfm
Barometric Pressure:	29.56	in Hg	Volumetric Flow:	67,751	scfm

MOISTURE DETERMINATION

Initial Impinger Content:	3633.0	ml	Silica Initial Wt.	858.6	grams
Final Impinger Content:	3733.4	ml	Silica Final Wt.	866.5	grams
Impinger Difference:	100.4	ml	Silica Difference:	7.9	grams

Total Water Gain: 108.3 Moisture, Bws: 0.072 **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	15:30:00	0.44	1.40	15.480	93	40	40	255	255	33
1-2	15:34:00	0.41	1.20	17.950	98	39	40	255	251	33
1-3	15:38:00	0.42	1.30	20.310	101	40	40	255	255	33
1-4	15:42:00	0.43	1.30	22.680	97	41	40	255	255	33
1-5	15:46:00	0.49	1.50	25.110	104	42	40	255	254	35
1-6	15:50:00	0.51	1.50	27.670	104	44	40	255	255	35
1-7	15:54:00	0.50	1.50	30.280	98	44	40	255	256	35
1-8	15:58:00	0.46	1.40	32.910	99	45	41	255	254	36
1-9	16:02:00	0.44	1.30	35.430	101	46	41	255	255	36
1-10	16:06:00	0.44	1.30	37.880	99	46	41	255	255	35
1-11	16:10:00	0.43	1.30	40.330	99	46	41	255	255	35
1-12	16:14:00	0.40	1.20	42.760	101	47	42	255	255	35
	16:18:00			45.100						
2-1	16:35:00	0.60	1.80	45.256	104	43	41	255	254	33
2-2	16:39:00	0.60	1.80	48.110	105	43	42	255	251	34
2-3	16:43:00	0.62	1.90	50.970	99	45	42	255	251	33
2-4	16:47:00	0.59	1.80	53.890	99	46	42	255	253	33
2-5	16:51:00	0.61	1.90	56.730	99	46	41	255	254	33
2-6	16:55:00	0.54	1.60	59.630	103	47	42	255	255	33
2-7	16:59:00	0.47	1.40	62.350	108	47	44	255	254	33
	17:01:00			64.016						
2-7	17:15:00	0.45	1.40	64.016	98	43	42	255	254	33
2-8	17:17:00	0.44	1.30	66.510	104	43	42	255	254	34
2-9	17:21:00	0.42	1.30	68.950	97	45	42	255	252	33
2-10	17:25:00	0.42	1.30	71.360	97	46	42	255	253	33
2-11	17:29:00	0.39	1.20	73.760	98	46	41	254	251	33
2-12	17:33:00	0.41	1.20	76.080	103	46	42	255	252	33
	17:37:00			78.440						
Total	1:36:00			62.804		44.2	41.2			
Average			1.44		100.3	42.7				
Min			1.20		93.0	39.0				
Max			1.90		108.0	47.0				

IMPINGER WEIGHT SHEET - RUN 3

Client: General Iron Industries, Inc.
Facility: Chicago, IL
Test Location: Scrubber Stack
Project #: M193103
Date: 11/14/2019
Test Method: 29

Weighed/Measured By: SLB
Balance ID: 0

Scale Calibration Check Date: 11/13/2019
Scale Calibration Check (see QS-6.05C for procedure)
must be within ± 0.5g of certified mass

250 grams: 250.2
500 grams: 500.2
750 grams: 750.2

IMPINGER CONTENTS	FINAL MLS / GRAMS	INITIAL MLS / GRAMS	GAIN MLS / GRAMS
HNO3/H2O2	827.4	759.4	68.0
HNO3/H2O2	814.8	789.1	25.7
Empty	683.2	680.4	2.8
KMnO4/H2SO4	709.5	705.5	4.0
KMnO4/H2SO4	698.5	698.6	-0.1
Silica Gel	866.5	858.6	7.9
Silica Gel			

Liquid Final	Liquid Initial	Liquid Gain
3,733.4	3,633.0	100.4

Silica Final	Silica Initial	Silica Gain
866.5	858.6	7.9

Appendix G - Field Data Sheets

R 011683

11/15/19

Isokinetic Sampling Cover Sheet

Test Engineer: JKK
Test Technician: ~~RKB~~ /RNS

Plant Information

Run Number:
Test Location: Scrubber Stack
Duct Shape: Circular or Rectangular
Flue Area: 29.870
Port Type: Nipple
Test Method: 5/202

Date: 11/15/19
Client Name: General Iron Industries, Inc
Length: — Width: — or Diameter: 6.167
Upstream Diameters: 1.4
Port Length: 6
Source Condition: normal

Project Number: M193103
Plant Name: Chicago, IL
Downstream Diameters: 2.0
Port Diameter: 3

Meter and Probe Data

Meter ID: CM2
Pitot ID: 509A
Nozzle Kit ID teflon kit #6
Probe Length: 7
Pre-Test Nozzle Leak Check: 0 @ 12 "Hg
Pre-Test Pitot Leak Check: 0 @ 5 "H_2O

Meter Y Value: 1.011
Pitot Coefficient: .84
Nozzle Diameter: .246
Probe Liner: Glass
Post-Test Nozzle Leak Check: 0 @ 10 "Hg
Post-Test Pitot Leak Check: 0 @ 5 "H_2O

ΔH Value: 1.883
Train Type: Anderson Box
Filter Number/Weight: # 14068 / .45702
Thimble Number/Weight: —

Traverse Data

Ports Sampled: 2
Total Points: 24
Points/Port: 12
Total Test Time: 60
Min/Point: 2.5
Sample Plane: Horizontal or Vertical

Stack Parameters

Barometric Pressure: 29.67
Static Pressure: 0.3
CO_2 %: / / / Avg. 0.4
O_2 %: / / /Avg. 20.0
Determined by: Method 3 or Method 3A
Imp and/or silica balance Model and S/N: 510-82
Servomex Serial #: Elom 46 OL 3K
Initial Imp. Volume or Weight: 1727.1
Final Imp. Volume or Weight: 1776.7
Imp. Volume or Weight Gain: 49.6
Initial Silica Weight: 251.4
Final Silica Weight: 275.5
Silica Weight Gain: 24.1

Comments:

66498 scfm

DS-004 Method 5 Cover Sheet Rev. 1.1 6/15/2016

Isokinetic Sampling Field Data Sheet-M202

Project Number:	M193103	Date:	11/15/19	Test Number:	1
Client:	General Iron Industries, Inc	Test Location:	Scrubber Stack	Operator:	JRK Test Tech: RNS
Plant:	Chicago, IL	Test Method:	5 /202	Page Number:	1 of 2

Port-Point #.	Time	(ΔP)	Orifice Setting (ΔH)	Meter Volume (V_m) ft³, Actual	Square Root, ΔP	Meter Rate, Cubic Feet/ Min.	Theoretical Meter Volume, (V_m) ft³, per point	Theoretical Meter Volume, (V_m) ft³, total	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	CPM Filter Temp. °F
													248±25		max 68	69-85
1-1	1033	.36	1.1	80.845				—	98	39	40	3	265	255	36	69
1-2	1035 30	.35	1.1	82.251					99	39	39	4	265	261	38	69
1-3	1038	.40	1.3	83.64					98	39	40	4	265	263	40	77
1-4	1040 30	.43	1.4	85.12					98	40	40	4	265	265	42	80
1-5	1043	.45	1.4	86.66					97	40	39	5	265	265	44	83
1-6	1045 30	.40	1.3	88.22					103	41	40	4	265	266	47	84
1-7	1048	.41	1.3	89.69					100	42	40	4	265	266	48	85
1-8	1050 30	.46	1.5	91.20					99	42	40	5	265	264	51	85
1-9	1053	.51	1.6	92.79					99	44	41	4	265	265	53	84
1-10	1055 30	.51	1.6	94.47					100	44	41	4	265	266	55	84
1-11	1058	.53	1.7	96.15					100	45	41	4	265	265	57	81
1-12	1100 30	.51	1.6	97.86					102	45	42	4	265	265	58	79
	1103			99.53												
2-1	1117	.55	1.7	99.53				—	106	43	43	4	265	263	38	69
2-2	1119 30	.57	1.8	101.27					99	43	43	5	265	264	40	66
2-3	1122	.56	1.7	103.05					99	43	43	5	265	264	41	70
2-4	1124 30	.56	1.8	104.81					100	43	42	5	265	265	42	70
	1125			105.050												
2-4	1157	.49	1.5	105.050					101	43	42	5	265	265	37	69
2-5	1159	.54	1.7	106.69					96	45	44	5	265	265	40	69
	1200			109.200												
2-5	1231	.45	1.4	109.2					103	46	46	4	265	264	39	69
2-6	1237 30	.45	1.4	110.790					105	46	46	5	265	264	40	70
2-7	1240	.44	1.4	112.37					110	47	46	5	265	266	45	71
2-8	1242 30	.43	1.4	113.92					104	47	46	4	265	266	46	69
2-9	1245	.41	1.3	115.48					104	47	46	5	265	266	49	73
2-10	1247 30	.38	1.2	116.99					107	47	46	5	265	264	54	76
.																

DS-005B M5 with 202 Isokinetic Field Data Sheet   Rev. 1.1   5/22/19

R 011685

Isokinetic Sampling Field Data Sheet-M202

Project Number: M193103
Date: 11/15/19
Test Number: 1
Client: General Iron Industries, Inc
Test Location: Scrubber Stack
Operator: JRK
Test Tech: ~~RKS~~/RNS
Plant: Chicago, IL
Test Method: 5 /202
Page Number: 2 of 2

Port-Point #.	Time	(ΔP)	Orifice Setting (ΔH)	Meter Volume (V_m) ft³, Actual	Square Root, ΔP	Meter Rate, Cubic Feet/Min.	Theoretical Meter Volume, (V_m) ft³, per point	Theoretical Meter Volume, (V_m) ft³, total	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	CPM Filter Temp. °F
													248±25		max 68	69-85
2-11	1250	.39	1.2	118.45				—	104	48	47	4	265	263	34	79
	1252			119.93												
2-11	1315	.40	1.3	119.93					98	48	47	5	264	264	38	70
2-12	131530	.42	1.3	121.450					99	48	47	5	264	265	37	72
	1318			122.975												

IMPINGER WEIGHT SHEET

PLANT: General Iron

Scale ID Number 510 - 82

UNIT NO: Scrubber

Scale Calibration Check Date: 11/15/19

LOCATION: Stack

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

DATE: 11/15/19

250 grams 250.2 250.1 11/15/19

TEST NO: ~~X~~ 1 Ten

500 grams 500.2 500.1 TEN

METHOD: 202

750 grams 750.2 750.2

WEIGHED/MEASURED BY: TEN

Circle One:	FINAL WEIGHT MLS / GRAMS	INITIAL WEIGHT MLS / GRAMS	IMPINGER GAIN	IMPINGER CONTENTS
IMPINGER 1	419.3	418.4	0.9	Empty
IMPINGER 2	604.5	573.3	31.2	Empty
IMPINGER 3	752.9	735.4	17.5	DI
IMPINGER 4	275.5	251.4	24.1	Silica
IMPINGER 5				
IMPINGER 6				
IMPINGER 7				
IMPINGER 8				

	FINAL TOTAL	INITIAL TOTAL	TOTAL GAIN
IMPINGERS	1,776.7	1,727.1	49.6 (TOTAL IMPINGER GAIN)
SILICA	275.5	251.4	24.1 (TOTAL SILICA GAIN)

Isokinetic Sampling Cover Sheet

Test Engineer: JRK
Test Technician: KJB / MAKI

Plant Information

Run Number:	2	Date:	11/18/19	Project Number:	M193103
Test Location:	Scrubber Stack	Client Name:	General Iron Industries, Inc.	Plant Name:	Chicago, IL
Duct Shape:	**Circular** or Rectangular	Length: ____ Width: ____ or		Diameter:	6.167
Flue Area:	29.870	Upstream Diameters:	1.4	Downstream Diameters:	2.0
Port Type:	Nipple	Port Length:	6	Port Diameter:	3
Test Method:	5/202	Source Condition:	Normal		

Meter and Probe Data

Meter ID:	CM2	Meter Y Value:	1.011	ΔH Value:	1.883
Pitot ID:	509A	Pitot Coefficient:	.84	Train Type:	Anderson Box
Nozzle Kit ID	teflon Kit 6	Nozzle Diameter:	.246	Filter Number/Weight:	# 14015 / .4611
Probe Length:	7ft	Probe Liner:	Glass	Thimble Number/Weight:	n/a
Pre-Test Nozzle Leak Check:	0 @ 12 "Hg			Post-Test Nozzle Leak Check:	0 @ 8 "Hg
Pre-Test Pitot Leak Check:	0 @ 5 "H_2O			Post-Test Pitot Leak Check:	0 @ 5 "H_2O

Traverse Data

Ports Sampled:	2	Points/Port:	12	Min/Point:	2.5
Total Points:	24	Total Test Time:	60	Sample Plane:	**Horizontal** or Vertical

Stack Parameters

Barometric Pressure: 29.16 Static Pressure: + 0.3
CO_2 %: ___/___/___/ Avg. .5 O_2 %: ___/___/___/Avg. 20.3 Determined by: Method 3 or **Method 3A**
Imp and/or silica balance Model and S/N: S10-82 Servomex Serial #: Ecom 426
Initial Imp. Volume or Weight: 1703 Final Imp. Volume or Weight: 1725.9 Imp. Volume or Weight Gain: 22.9
Initial Silica Weight: 841.4 Final Silica Weight: 876.5 Silica Weight Gain: 35.1

Comments:

Isokinetic Sampling Field Data Sheet-M202

Project Number:	M193103	Date:	11 / 18 / 19	Test Number:	2
Client:	General Iron Industries, Inc.	Test Location:	Scrubber Stack	Operator:	JRK Test Tech: KJB/MAK1
Plant:	Chicago, IL	Test Method:	5/202	Page Number:	1 of 1

Port-Point #.	Time	(ΔP)	Orifice Setting (ΔH)	Meter Volume (V_m) ft³, Actual	Square Root, ΔP	Meter Rate, Cubic Feet/ Min.	Theoretical Meter Volume, (V_m) ft³, per point	Theoretical Meter Volume, (V_m) ft³, total	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	CPM Filter Temp. °F
1-1	851	.43	1.5	23.400				----------------	98	52	51	3	265	265	42	70
1-2	85330	.43	1.5	25.04				25.036	98	52	51	3	265	264	46	71
1-3	856	.35	1.2	26.68				26.671	100	52	51	3	265	264	49	72
1-4	85830	.35	1.2	28.16				28.144	101	52	51	3	265	266	50	75
1-5	901	.36	1.2	29.63				29.616	100	53	51	3	266	265	52	77
1-6	90330	.37	1.3	31.12				31.111	99	51	51	4	265	265	54	75
1-7	906	.35	1.2	32.64				32.630	99	55	51	3	264	265	56	77
1-8	908 30	.33	1.1	34.12				34.109	98	56	51	3	265	265	59	77
1-9	911	.32	1.1	35.58				35.547	103	56	52	3	265	265	60	78
1-10	913 30	.3	1.0	36.96				36.959	102	57	53	3	265	265	61	78
1-11	916	.29	1.0	38.34				38.329	100	56	52	3	265	265	62	77
1-12	91830	.3	1.0	39.68				39.676	99	56	52	3	265	268	59	76
	921			41.050				41.048								
2-1	942	.33	1.1	41.267				—	98	56	54	3	265	265	44	70
2-2	94430	.36	1.2	42.73				42.700	99	57	54	4	263	266	54	71
2-3	947	.35	1.2	44.23				44.217	106	58	54	4	265	265	57	70
2-4	94930	.34	1.2	45.70				45.695	103	58	54	4	265	265	58	70
2-5	952	.33	1.1	47.17				47.155	100	58	54	4	268	267	59	71
2-6	95430	.33	1.1	48.61				48.598	101	59	55	4	265	266	62	72
2-7	957	.32	1.1	50.05				50.042	100	59	55	4	265	265	61	72
2-8	95930	.32	1.1	51.47				51.466	102	60	57	4	265	265	61	71
2-9	100200	.31	1.1	52.90				52.891	101	60	57	4	265	265	61	73
2-10	100430	.32	1.1	54.31				54.295	101	61	59	4	266	264	61	74
2-11	1007	.31	1.1	55.74				55.726	102	61	56	4	265	265	61	75
2-12	100930	.30	1.0	57.13				57.128	104	61	60	4	265	264	62	76
	1012			58.520				58.511								

R 011688

1047 st purge

R 011689

IMPINGER WEIGHT SHEET

PLANT: General Iron

UNIT NO: Scrubber

LOCATION: Stack

DATE: 11/18/19

TEST NO: 2

METHOD: 5/202

WEIGHED/MEASURED BY: RICHS

Scale ID Number S10-82

Scale Calibration Check Date: 11/18/19

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

250 grams 250.1

500 grams 500.2

750 grams 750.2

Circle One:	FINAL WEIGHT MLS / GRAMS	INITIAL WEIGHT MLS / GRAMS	IMPINGER GAIN	IMPINGER CONTENTS
IMPINGER 1	421.4	419.8		MT
IMPINGER 2	545.8	533.8		MT
IMPINGER 3	758.7	749.4		DI
IMPINGER 4	876.5	841.4		Silica
IMPINGER 5				
IMPINGER 6				
IMPINGER 7				
IMPINGER 8				

IMPINGERS	FINAL TOTAL	INITIAL TOTAL	TOTAL IMPINGER GAIN
SILICA	FINAL TOTAL	INITIAL TOTAL	TOTAL SILICA GAIN

Isokinetic Sampling Cover Sheet

Test Engineer: JRK
Test Technician: KJB / MAK I

Plant Information

Run Number: 3
Test Location: Scrubber Stack
Duct Shape: **Circular** or Rectangular
Flue Area: 29.870
Port Type: Nipple
Test Method: 5/202

Date: 11/18/19
Client Name: General Iron Industries, Inc.
Length: ______ Width: ______ or Diameter: 6.167
Upstream Diameters: 1.4
Port Length: 6
Source Condition: Normal

Project Number: M193103
Plant Name: Chicago, IL
Downstream Diameters: 2.0
Port Diameter: 3

Meter and Probe Data

Meter ID: CM2
Pitot ID: 509A
Nozzle Kit ID: teflon kit 6
Probe Length: 7ft
Pre-Test Nozzle Leak Check: 0 @ 10 "Hg
Pre-Test Pitot Leak Check: 0 @ 5 "H_2O

Meter Y Value: 1.011
Pitot Coefficient: .84
Nozzle Diameter: .246
Probe Liner: Glass
Post-Test Nozzle Leak Check: 0 @ 10 "Hg
Post-Test Pitot Leak Check: 0 @ 5 "H_2O

ΔH Value: 1.883
Train Type: Anderson Box
Filter Number/Weight: # 14738 / .46407
Thimble Number/Weight: n/a

Traverse Data

Ports Sampled: 2
Total Points: 24

Points/Port: 12
Total Test Time: 60

Min/Point: 2.5
Sample Plane: **Horizontal** or Vertical

Stack Parameters

Barometric Pressure: 29.16
Static Pressure: 0.3
CO_2 %: ___ / ___ / ___ / Avg. 0.3
O_2 %: ___ / ___ / ___ /Avg. 20.2
Determined by: Method 3 or **Method 3A**
Imp and/or silica balance Model and S/N: S10-82
Servomex Serial #: Ecom 426
Initial Imp. Volume or Weight: 1657.8
Final Imp. Volume or Weight: 1698.2
Imp. Volume or Weight Gain: 40.2
Initial Silica Weight: 833.7
Final Silica Weight: 851.8
Silica Weight Gain: 18.1

Comments:

Isokinetic Sampling Field Data Sheet-M202

Project Number:	M193103	Date:	11/18/19	Test Number:	3
Client:	General Iron Industries, Inc.	Test Location:	Scrubber Stack	Operator:	JRK Test Tech: KJB/MAK I
Plant:	Chicago, IL	Test Method:	5/202	Page Number:	1 of 1

Port-Point #.	Time	(ΔP)	Orifice Setting (ΔH)	Meter Volume (V_m) ft^3, Actual	Square Root, ΔP	Meter Rate, Cubic Feet/Min.	Theoretical Meter Volume, (V_m) ft^3, per point	Theoretical Meter Volume, (V_m) ft^3, total	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	CPM Filter Temp. °F
1-1	1122	.38	1.3	59.19				----------------	102	54	53	3	265	265	41	70
1-2	112430	.37	1.3	60.77				60.728	100	53	53	3	265	265	45	72
1-3	1127	.37	1.3	62.26				62.247	105	54	53	4	265	262	49	75
1-4	112930	.36	1.2	63.79				63.761	102	55	53	4	265	266	54	77
1-5	1132	.35	1.2	65.26				65.255	100	55	53	3	266	264	56	75
1-6	113430	.36	1.2	66.74				66.839	101	56	53	4	265	265	59	76
1-7	1137	.36	1.2	68.250				68.234	101	57	54	4	265	264	61	75
1-8	113930	.36	1.2	69.74				69.738	106	57	54	4	265	265	60	69
1-9	1142	.35	1.2	71.25				71.236	103	58	54	4	265	264	62	71
1-10	114430	.35	1.2	72.73				72.718	103	59	54	5	266	265	64	72
1-11	1147	.35	1.2	74.22				74.201	106	61	55	5	265	265	65	71
1-12	114930	.34	1.2	75.67				75.685	102	61	55	5	265	265	66	76
	1152			77.160				77.153								
2-1	1216	.37	1.3	77.316				—	99	57	56	5	265	264	41	70
2-2	121830	.35	1.2	78.850				78.877	103	58	56	5	264	265	42	70
2-3	1221	.34	1.2	80.35				80.331	102	58	56	5	265	266	43	72
2-4	122330	.34	1.2	81.81				81.796	102	57	56	5	265	266	44	75
2-5	1226	.33	1.1	83.26				83.260	101	57	56	5	266	266	47	73
2-6	122830	.33	1.1	84.710				84.703	109	57	56	4	265	267	48	72
2-7	1231	.33	1.1	86.16				86.135	104	58	56	4	265	264	49	72
2-8	123330	.32	1.1	87.58				87.576	102	58	57	5	265	265	50	74
2-9	1236	.32	1.1	89.01				88.998	103	59	57	5	265	265	51	72
2-10	123830	.30	1.0	90.44				90.421	109	60	57	5	265	266	50	71
2-11	1241	.30	1.0	91.800				91.800	110	61	57	4	265	265	52	73
2-12	124330	.29	1	93.18				93.171	105	61	57	5	265	265	51	72
	1246			94.525				94.525								

R 011691

Purge 1:03

R 011692

IMPINGER WEIGHT SHEET

PLANT: General Iron

UNIT NO: Scrubber

LOCATION: Stack

DATE: 11.18.19

TEST NO: 3

METHOD: 5/202

WEIGHED/MEASURED BY: SJB

BALANCE ID: S10-82

Scale ID Number ____________

Scale Calibration Check Date: ________

Scale Calibration Check (see QS-6.05C for procedure)

250 grams ________

500 grams ________

750 grams ________

Circle One:	FINAL WEIGHT MLS / GRAMS	INITIAL WEIGHT MLS / GRAMS	IMPINGER GAIN	IMPINGER CONTENTS
IMPINGER 1	422.5	410.6		MT
IMPINGER 2	592.3	578.0		MT
IMPINGER 3	683.4	669.2		DI
IMPINGER 4	851.8	833.7		Silica
IMPINGER 5				
IMPINGER 6				
IMPINGER 7				
IMPINGER 8				

IMPINGERS	FINAL TOTAL	INITIAL TOTAL	TOTAL IMPINGER GAIN
SILICA	FINAL TOTAL	INITIAL TOTAL	TOTAL SILICA GAIN

Isokinetic Sampling Cover Sheet

Test Engineer: JRK
Test Technician: KJB / MAKI

Plant Information

Run Number:	4	Date:	11/18/15	Project Number:	M193103
Test Location:	Scrubber Stack	Client Name:	General Iron Industries, Inc.	Plant Name:	Chicago, IL
Duct Shape:	**Circular** or Rectangular	Length: ____ Width: ____		or Diameter:	6.167
Flue Area:	29.870	Upstream Diameters:	1.4	Downstream Diameters:	2.0
Port Type:	Nipple	Port Length:	6	Port Diameter:	3
Test Method:	5/202	Source Condition:	Normal		

Meter and Probe Data

Meter ID:	CM2	Meter Y Value:	1.011	ΔH Value:	1.883
Pitot ID:	509A	Pitot Coefficient:	.84	Train Type:	Anderson Box
Nozzle Kit ID	teflon kit 6	Nozzle Diameter:	.246	Filter Number/Weight:	# /
Probe Length:	7ft	Probe Liner:	Glass	Thimble Number/Weight:	n/a
Pre-Test Nozzle Leak Check:	0 @ 12 "Hg			Post-Test Nozzle Leak Check:	0 @ 10 "Hg
Pre-Test Pitot Leak Check:	0 @ 5 "H_2O			Post-Test Pitot Leak Check:	0 @ 5 "H_2O

Traverse Data

Ports Sampled:	2	Points/Port:	12	Min/Point:	2.5
Total Points:	24	Total Test Time:	60	Sample Plane:	**Horizontal** or Vertical

Stack Parameters

Barometric Pressure: 29.16 Static Pressure: 0.3

CO_2 %: ___/___/___/ Avg. 6.4 O_2 %: ___/___/___/Avg. 20.4 Determined by: Method 3 or **Method 3A**

Imp and/or silica balance Model and S/N: S10-81 Servomex Serial #: ECOM 416

Initial Imp. Volume or Weight: 1702.8 Final Imp. Volume or Weight: 1730.4 Imp. Volume or Weight Gain: 28.6

Initial Silica Weight: 876.5 Final Silica Weight: 891.7 Silica Weight Gain: 15.2

Comments:

Isokinetic Sampling Field Data Sheet-M202

Project Number:	M193103	Date:	11 / 18 / 19	Test Number:	4
Client:	General Iron Industries, Inc.	Test Location:	Scrubber Stack	Operator:	JRK Test Tech: MAKI/KJB
Plant:	Chicago, IL	Test Method:	5/202	Page Number:	1 of

Port-Point #.	Time	(ΔP)	Orifice Setting (ΔH)	Meter Volume (V_m) ft^3, Actual	Square Root, ΔP	Meter Rate, Cubic Feet/ Min.	Theoretical Meter Volume, (V_m) ft^3, per point	Theoretical Meter Volume, (V_m) ft^3, total	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	CPM Filter Temp. °F
1-1	1640	.36	1.2	0.000				----------------	104	53	52	3	265	265	42	71
1-2	164230	.33	1.1	1.50				1.491	103	53	52	3	265	264	47	73
1-3	1645	.34	1.1	2.94				2.920	100	54	52	3	265	264	47	75
1-4	164730	.35	1.2	4.38				4.375	101	53	52	3	264	265	49	76
1-5	1650	.35	1.2	5.86				5.849	108	53	52	3	263	265	51	77
1-6	165230	.36	1.2	7.33				7.314	106	54	52	3	265	265	56	78
1-7	1655	.36	1.2	8.82				8.804	104	54	52	3	265	265	56	79
1-8	165730	.36	1.2	10.31				10.296	102	55	52	3	265	265	58	80
1-9	1700	.38	1.3	11.82				11.797	103	55	52	4	265	265	60	80
1-10	170230	.36	1.2	13.36				13.334	102	55	52	4	265	265	61	80
1-11	1705	.35	1.2	14.85				14.831	107	56	52	4	265	265	60	81
1-12	170730	.34	1.2	16.31				16.307	109	56	52	3	265	266	61	80
	1710			17.750				17.749								
2-1	1726	.37	1.3	18.128				——	105	54	52	4	265	265	43	71
2-2	172830	.36	1.2	19.66				19.640	103	55	52	4	265	264	51	73
2-3	1731	.37	1.3	21.14				21.136	99	56	52	4	265	265	55	74
2-4	173330	.36	1.2	22.68				22.659	101	56	52	4	265	265	57	73
2-5	1736	.37	1.3	24.16				24.158	104	55	53	5	265	266	61	76
2-6	173830	.37	1.3	25.69				25.675	105	55	52	4	265	265	60	76
2-7	1741	.35	1.2	27.20				27.189	109	55	53	4	265	266	61	76
2-8	174330	.35	1.2	28.66				28.658	105	55	53	4	265	265	63	78
2-9	1746	.38	1.2	30.15				30.131	104	55	53	5	265	265	63	76
2-10	174830	.36	1.2	31.65				31.627	109	55	53	4	265	263	62	76
2-11	1751	.35	1.2	33.130				33.116	104	55	53	4	262	264	61	76
2-12	175330	.34	1.2	34.61				34.591	101	55	53	4	265	265	58	78
	1756							36.049								

IMPINGER WEIGHT SHEET

PLANT: General Iron

UNIT NO: Scrubber

LOCATION: Stack

DATE: 11.18.19

TEST NO: 4

METHOD: 5/202

WEIGHED/MEASURED BY: SCB

BALANCE ID: S10-82

Scale ID Number ______

Scale Calibration Check Date: ______

Scale Calibration Check (see QS-6.05C for procedure)

250 grams ______

500 grams ______

750 grams ______

Circle One:	FINAL WEIGHT MLS / GRAMS	INITIAL WEIGHT MLS / GRAMS	IMPINGER GAIN	IMPINGER CONTENTS
IMPINGER 1	412.6	407.2		MT
IMPINGER 2	543.1	536		MT
IMPINGER 3	774.7	758.6		DI
IMPINGER 4	891.7	876.5		silica
IMPINGER 5				
IMPINGER 6				
IMPINGER 7				
IMPINGER 8				

IMPINGERS ______ FINAL TOTAL ______ INITIAL TOTAL ______ TOTAL IMPINGER GAIN

SILICA ______ FINAL TOTAL ______ INITIAL TOTAL ______ TOTAL SILICA GAIN

✓ JWC 11/15/19

Volumetric Flow Rate Determination Field Data Sheet

Project Number: M193103
Client: GENERAL IRON, INDUSTRIES
Test Location: RTO INLET / ROOF
Source Condition: NORMAL
Test Engineer: BVG

Date: 11-15-19
Test Number: PRE 1
Start Time: 1035
End Time: 1045
Test Tech: CMB

Duct Diameter 4.167 ft
Flue Area 13.64 ft^2
Port Length 6 " Port Size 3 " Port Type NIP Pitot ID 148A Pitot Coefficient (C_p) .840
P_{bar} 29.1 "Hg
Static 8.5 "H_2O
Static ______ "Hg
P_s ______ "Hg
CO_2 % ______
O_2 % ______
N_2 % ______
Meter No. CM17
Upstream Disturbance, Diameters 7.50
Downstream Disturbance, Diameters 72.0
Wet Bulb Temp ______
Dry Bulb Temp ______
B_{ws} ______
Fluke # ______
Leak Checks Passed@
Pre 6@4 Inches H_2O
Post 6@4 Inches H_2O
Umbilical ID ___

Port-Point #	ΔP	Temp. °F	$\sqrt{\Delta P}$	Null Point Angle, Degrees	Port-Point #	ΔP	Temp. °F	$\sqrt{\Delta P}$	Null Point Angle, Degrees
1-1	1.9	74			2-1	2.1	77		
2	1.8	76			2	2.2	78		
3	2.0	74			3	2.2	78		
4	2.0	75			4	2.2	78		
5	2.2	76			5	1.9	81		
6	2.2	76			6	1.9	77		
7	2.3	76			7	1.8	77		
8	2.5	75			8	1.8	78		
Average									

$44 \times CO_2\% + .32 \times O_2\% + .28 \times N_2\% =$ ______ (Md)

(______ Md × ______ 1-Bws) + (18 × ______ Bws) = ______ (Ms)

$$85.49 \times \_\_\_\_ Cp \times \sqrt{\frac{(\_\_\_\_\_\_)Ts\ °R}{\_\_\_\_ Ms \times \_\_\_\_ Ps}} \times \_\_\_\_ \sqrt{\Delta P} = \_\_\_\_ ft/sec\ (Vs)$$

______ Vs × ______ Flue Area × 60 = ______________ acfm

$17.647 \times$ ______ acfm $\times \frac{Ps}{Ts\ °R} =$ 66064 scfm x 60 = ________ scfh

Volumetric Flow Rate Determination Field Data Sheet

Project Number:	M193103	Date:	11-15-19
Client:	Central Iowa Industry	Test Number:	Post 1 Proc
Test Location:	RTO Inlet / Roof	Start Time:	1315
Source Condition:	Normal	End Time:	1320
Test Engineer:	DM	Test Tech:	CMB

Duct Diameter 4.167 ft
Flue Area 13.64 ft²
Port Length 6 " Port Size 3 " Port Type NP Pitot ID M1D Pitot Coefficient (C_p) .840
Upstream Disturbance, Diameters 7.50
Downstream Disturbance, Diameters 7.20
P_{bar} 29.17 "Hg
Static -11.5 "H_2O
Static ______ "Hg
P_s ______ "Hg
CO_2 % ______
O_2 % ______
N_2 % ______
Meter No. CM17
Wet Bulb Temp ______
Dry Bulb Temp ______
B_{ws} 2
Fluke # 2
Leak Checks Passed@
Pre OK Inches H_2O
Post OK Inches H_2O
Umbilical ID 1

Port-Point #	ΔP	Temp. °F	$\sqrt{\Delta P}$	Null Point Angle, Degrees	Port-Point #	ΔP	Temp. °F	$\sqrt{\Delta P}$	Null Point Angle, Degrees
1-1	1.9	77			2-1	1.7	81		
2	1.5	80			2	2.0	81		
3	1.8	82			3	1.8	82		
4	1.8	83			4	1.9	82		
5	2.0	82			5	1.9	82		
6	2.0	82			6	2.0	82		
7	2.3	82			7	2.3	82		
8	2.3	82			8	3.0	82		
Average									

44 x CO_2% + .32 x O_2% + .28 x N_2% = ______ (Md)

(______ Md × ______ 1-Bws) + (18 × ______ Bws) = ______ (Ms)

$$85.49 \times \_\_\_\_ Cp \times \sqrt{\frac{(\_\_\_\_)Ts\ °R}{\_\_\_\_ Ms \times \_\_\_\_ Ps}} \times \_\_\_\_ \sqrt{\Delta P} = \_\_\_\_ \text{ft/sec (Vs)}$$

______ Vs × ______ Flue Area × 60 = ______ acfm

$$17.647 \times \_\_\_\_ acfm \times \frac{Ps}{Ts\ °R} = 65,364\ scfm \times 60 = \_\_\_\_ scfh$$

65,714 scfm

DS-001 Method 2 Pitot Sheet Rev. 1.1 3/15/2018

Volumetric Flow Rate Determination Field Data Sheet

Project Number: M193103
Client: GENERAL IRON INDUSTRY, INC
Test Location: RTO INLET
Source Condition: NORMAL
Test Engineer: BVH
Date: 11-18-19
Test Number: PRE 2
Start Time: 0853
End Time: 0900
Test Tech: CTM

Duct Diameter 4.167 ft
Flue Area 13.64 ft^2
Port Length 6 " Port Size 3 " Port Type NIPPLE
P_{bar} 29.2 "Hg
Static 1.6 "H_2O
Static ____ "Hg
P_s ____ "Hg
CO_2 % ____
O_2 % ____
N_2 % ____
Meter No. CM17
Upstream Disturbance, Diameters 8.15
Downstream Disturbance, Diameters 2.63
Pitot ID 178A Pitot Coefficient (C_p) .840
Wet Bulb Temp —
Dry Bulb Temp —
B_{ws} ____
Fluke # —
Leak Checks Passed@
Pre OK Inches H_2O
Post OK Inches H_2O
Umbilical ID ____

Port-Point #	ΔP	Temp. °F	$\sqrt{\Delta P}$	Null Point Angle, Degrees	Port-Point #	ΔP	Temp. °F	$\sqrt{\Delta P}$	Null Point Angle, Degrees
1-1	1.2	87			2-1	1.4	88		
2	1.3	88			2	1.3	88		
3	1.5	88			3	1.3	87		
4	1.5	88			4	1.4	87		
5	1.6	88			5	1.3	87		
6	1.6	87			6	1.3	87		
7	1.8	87			7	1.6	87		
8	2.4	87			8	2.1	87		
Average									

44 x CO_2% + .32 x O_2% + .28 x N_2% = ______ (Md)

(______ Md × ______1-Bws) + (18 × ______Bws) = ______ (Ms)

$$85.49 \times \_\_\_\_ Cp \times \sqrt{\frac{(\_\_\_\_\_\_)Ts\ °R}{\_\_\_\_ Ms \times \_\_\_\_ Ps}} \times \_\_\_\_ \sqrt{\Delta P} = \_\_\_\_ \text{ ft/sec (Vs)}$$

______ Vs × ______ Flue Area × 60 = ______________ acfm

$$17.647 \times \_\_\_\_\_\_ acfm \times \frac{Ps}{Ts\ °R} = \_\_\_\_\_\_\_\_ scfm \times 60 = \_\_\_\_\_\_\_\_ scfh$$

Volumetric Flow Rate Determination Field Data Sheet

Project Number: M193103
Client: GENERAL IRON INDUSTRIES, INC
Test Location: RTO INLET
Source Condition: NORMAL
Test Engineer: BVH
Date: 11-18-19
Test Number: POST 3 PRE 4
Start Time: 1126
End Time: 1134
Test Tech: CTM

Duct Diameter 4.167 ft
Flue Area 13.64 ft^2
Port Length 6 " Port Size 3 " Port Type MPT Pitot ID 14 Pitot Coefficient (C_p) .840
Upstream Disturbance, Diameters 8.5
Downstream Disturbance, Diameters 2.43
P_{bar} 29.3 "Hg
Static 14 "H_2O
Static ____ "Hg
P_s ____ "Hg
CO_2 % ____
O_2 % ____
N_2 % ____
Meter No. 2M17
Wet Bulb Temp ____
Dry Bulb Temp ____
B_{ws} ____
Fluke # ____
Leak Checks Passed@
Pre 24 Inches H_2O
Post 24 Inches H_2O
Umbilical ID ____

Port-Point #	ΔP	Temp. °F	$\sqrt{\Delta P}$	Null Point Angle, Degrees	Port-Point #	ΔP	Temp. °F	$\sqrt{\Delta P}$	Null Point Angle, Degrees
1-1	1.3	85			2-1	1.2	87		
2	1.4	87			2	1.3	87		
3	1.4	86			3	1.3	87		
4	1.3	86			4	1.4	87		
5	1.5	86			5	1.5	88		
6	1.7	87			6	1.6	86		
7	1.9	87			7	1.7	86		
8	2.1	87			8	2.0	86		
Average									

44 x CO_2% + .32 x O_2% + .28 x N_2% = ______ (Md)

(______ Md × ______ 1-Bws) + (18 × ______ Bws) = ______ (Ms)

$$85.49 \times \_\_\_\_ Cp \times \sqrt{\frac{(\_\_\_\_\_\_)Ts\ °R}{\_\_\_\_ Ms \times \_\_\_\_ Ps}} \times \_\_\_\_ \sqrt{\Delta P} = \_\_\_\_ \text{ ft/sec (Vs)}$$

______ Vs × ______ Flue Area × 60 = ______ acfm

$$17.647 \times \_\_\_\_ \text{acfm} \times \frac{Ps}{Ts\ °R} = \_\_\_\_ \text{ scfm} \times 60 = \_\_\_\_ \text{ scfh}$$

Volumetric Flow Rate Determination Field Data Sheet

Project Number: M193103
Client: GENERAL IRON, INC
Test Location: RTO INLET
Source Condition: NORMAL
Test Engineer: DVH

Date: 11-18-19
Test Number: POST 5 PRE 5
Start Time: 1645
End Time: 1655
Test Tech: CM

Duct Diameter 7.17 ft
Flue Area 40.37 ft^2
Port Length 6 " Port Size 2 " Port Type nipple Pitot ID 140 Pitot Coefficient (C_p) .840
Upstream Disturbance, Diameters 8.15
Downstream Disturbance, Diameters 2.63

P_{bar} 29.2 "Hg
Static -1.6 "H_2O
Static______ "Hg
P_s______ "Hg

CO_2 % ______
O_2 % ______
N_2 % ______
Meter No. CM17

Wet Bulb Temp ______
Dry Bulb Temp ______
B_{ws} ______
Fluke # ______

Leak Checks Passed@
Pre 4.0 Inches H_2O
Post 4.0 Inches H_2O
Umbilical ID ___

Port-Point #	ΔP	Temp. °F	$\sqrt{\Delta P}$	Null Point Angle, Degrees	Port-Point #	ΔP	Temp. °F	$\sqrt{\Delta P}$	Null Point Angle, Degrees
1-1	1.3	88			2-1	1.2	86		
2	1.4	88			2	1.3	87		
3	1.4	87			3	1.3	87		
4	1.3	87			4	1.4	88		
5	1.5	87			5	1.5	87		
6	1.7	87			6	1.4	87		
7	1.9	87			7	1.7	88		
8	2.1	87			8	2.0	88		
Average									

44 x CO_2% + .32 x O_2% + .28 x N_2% = _______ (Md)

(_________ Md × ________1-Bws) + (18 ×_______Bws) = ______ (Ms)

$$85.49 \times \_\_\_\_ Cp \times \sqrt{\frac{(\_\_\_\_\_\_\_)Ts\ °R}{\_\_\_\_ Ms \times \_\_\_\_ Ps}} \times \_\_\_\_ \sqrt{\Delta P} = \_\_\_\_ \text{ ft/sec (Vs)}$$

______ Vs × ______ Flue Area × 60 = ________________acfm

$$17.647 \times \_\_\_\_\_\_ acfm \times \frac{Ps}{Ts\ °R} = \_\_\_\_\_\_\_\_\_\_ scfm \times 60 = \_\_\_\_\_\_\_\_\_\_ scfh$$

Volumetric Flow Rate Determination Field Data Sheet

Project Number: M193103
Client: General Iron, Inc
Test Location: RTO Inlet
Source Condition: Normal
Test Engineer: BVL

Date: 11-18-19
Test Number: Post 5 Pre 6
Start Time: 1740
End Time: 1748
Test Tech: CTM

Duct Diameter 4.167 ft
Flue Area 13.64 ft^2
Port Length 4 " Port Size 3 " Port Type NPT 4 Pitot ID 78A Pitot Coefficient (C_p) .840
Upstream Disturbance, Diameters 8.15
Downstream Disturbance, Diameters 2.03

P_{bar} 29.7 "Hg
Static 1.1 "H_2O
Static ______ "Hg
P_s ______ "Hg

CO_2 % 0
O_2 % 20.9
N_2 % ______
Meter No. CM17

Wet Bulb Temp ______
Dry Bulb Temp ______
B_{ws} ______
Fluke # ——

Leak Checks Passed@
Pre @4 Inches H_2O
Post @4 Inches H_2O
Umbilical ID ___

Port-Point #	ΔP	Temp. °F	$\sqrt{\Delta P}$	Null Point Angle, Degrees	Port-Point #	ΔP	Temp. °F	$\sqrt{\Delta P}$	Null Point Angle, Degrees
1-1	1.2	88			2-1	1.3	86		
2	1.3	87			2	1.1	86		
3	1.5	87			3	1.1	87		
4	1.4	84			4	1.4	88		
5	1.4	84			5	1.4	88		
6	1.8	84			6	1.7	88		
7	1.7	87			7	1.7	87		
8	1.9	87			8	1.9	87		
						1.7			
Average									

$44 \times CO_2\% + .32 \times O_2\% + .28 \times N_2\% =$ ______ (Md)

(______ Md × ______ 1-Bws) + (18 × ______ Bws) = ______ (Ms)

$$85.49 \times \_\_\_\_ Cp \times \sqrt{\frac{(\_\_\_\_\_\_\_)Ts\ °R}{\_\_\_\_ Ms \times \_\_\_\_ Ps}} \times \_\_\_\_ \sqrt{\Delta P} = \_\_\_\_ \text{ ft/sec (Vs)}$$

______ Vs × ______ Flue Area × 60 = ______________ acfm

$$17.647 \times \_\_\_\_\_\_ acfm \times \frac{Ps}{Ts\ °R} = \_\_\_\_\_\_\_\_ scfm \times 60 = \_\_\_\_\_\_\_\_ scfh$$

NON-ISOKINETIC MOISTURE FIELD DATA SHEET

Project Name/Number: GENERAL IRON INC M193103 Date: 11-15-19
Test Location: ______ Source Condition: NORMAL
Test Method: ______ Meter ID: CM17 Pre-Calibration Date: 11-4-19
Meter ΔH: ______ Meter Y: ______ Test Engineer: BVG

Test (Run) No. 1 Barometric Pressure (P_{bar}) 29.7 in. Hg
Static Pressure: 8.5 Stack Temperature: 75 (From Method 2 Test Data)

Gas Sample Analysis
______ %CO_2 ______ %O_2

Clock Time 24 hour	Meter Volume (Vm) ft3 or L (Circle One)	Meter Gage Pressure (ΔH) in. H_2O	Meter Inlet Temp. (t_m) °F	Meter Outlet Temp. (t_m) °F	Impinger Outlet Temp °F	Meter Vacuum "Hg
1032	11.490	1.8	33	32	60	1
1038	15.45	"	36	33	60	1
1043	19.20		36	33	60	1
1048	22.95		37	34	60	1
1053	26.70		38	34	60	1
1059	30.45		41	35	60	1
1103/1117	34.20		41	35	60	1
1122/1125	37.95		41	37	60	1
1157/1200	41.70		44	41	60	1
1200	45.45		43	41	60	1
1231	49.20		45	41	60	1
1241	52.95		47	42	60	1
1246	56.720					
Total Vol. in ft3 (Vm)=		Multiply total volume collected in Liters by 0.035315 to convert to ft^3				

Comments: PAUSE — 1103-1117 1122-1125 1125-1157 1200-1236

Scale ID Number ______
Scale Calibration Check Date: ______
Scale Calibration Check (see QS-6.05C for procedure)
250 grams ______
500 grams ______
750 grams ______

Condensate	Silica Gel or Train
215 / ____ mls (V_f)	243.7 grams (W_f)
- 200 / ____ mls (V_i)	- 241.4 grams (W_i)
= 15 mls gained	= ______ grams gained

Average Meter Temperature: 37.91
(average of both inlet and outlet if applicable)

Pre-Test Leak Check: 0.0 @ 5 "Hg
Post-Test Leak Check: 0.0 @ 5 "Hg

Test (Run) No. ______ Barometric Pressure (P_{bar}) ______ in. Hg
Static Pressure: ______ Stack Temperature: ______ (From Method ______ Test Data)

Gas Sample Analysis
______ %CO_2 ______ %O_2

Clock Time 24 hour	Meter Volume (Vm) ft3 or L (Circle One)	Meter Gage Pressure (ΔH) in. H_2O	Meter Inlet Temp. (t_m) °F	Meter Outlet Temp. (t_m) °F	Impinger Outlet Temp °F	Meter Vacuum "Hg
Total Vol. in ft3 (Vm)=		Multiply total volume collected in Liters by 0.035315 to convert to ft^3				

Comments:

Condensate	Silica Gel or Train
____ / ____ / ____ mls (V_f)	______ grams (W_f)
- ____ / ____ / ____ mls (V_i)	- ______ grams (W_i)
= ______ mls gained	= ______ grams gained

Average Meter Temperature: ______
(average of both inlet and outlet if applicable)

Pre-Test Leak Check: ______ @ ______ "Hg
Post-Test Leak Check: ______ @ ______ "Hg

NON-ISOKINETIC MOISTURE FIELD DATA SHEET

Project Name/Number: M193103 GENERAL IRON INDUSTRY, INC Date: 11-18-19
Test Location: RTO INLET Source Condition: NORMAL
Test Method: M4 Meter ID: CM17 Pre-Calibration Date: 11-4-19
Meter ΔH: 1.842 Meter Y: .994 Test Engineer: BVG

Test (Run) No. 1 Barometric Pressure (P_{bar}) 29.2 in. Hg
Static Pressure: 16" Stack Temperature: 85 (From Method 2 Test Data)

Gas Sample Analysis: 0.0 $\%CO_2$ 20.9 $\%O_2$

Clock Time 24 hour	Meter Volume (Vm) ft3 or L (Circle One)	Meter Gage Pressure (ΔH) in. H_2O	Meter Inlet Temp. (t_m) °F	Meter Outlet Temp. (t_m) °F	Impinger Outlet Temp °F	Meter Vacuum "Hg
0851	58.470	1.8	40	40	60	1
0856	62.25		41	40	60	1
0901	65.95		41	40	60	1
0906	69.70		42	40	60	1
0911	73.45		44	41	60	1
0916	77.25		44	41	60	1
0921	80.95		47	41	60	1
0947	84.75		44	41	60	1
0952	88.45		44	42	60	1
0957	92.20		47	42	60	1
1002	95.95		47	42	60	1
1007	99.75		47	42	60	1
1012	103.480					1
Total Vol. in ft3 (Vm)=		Multiply total volume collected in Liters by 0.035315 to convert to ft³				

Comments:

Scale ID Number ____
Scale Calibration Check Date: ____
Scale Calibration Check (see QS-6.05C for procedure)
250 grams ____
500 grams ____
750 grams ____

Condensate	Silica Gel or Train
215 / ____ mls (V_f)	255.3 grams (W_f)
- 200 / ____ mls (V_i)	- 252.0 grams (W_i)
= 15 mls gained	= 3.3 grams gained

Average Meter Temperature: 43.41
(average of both inlet and outlet if applicable)

Pre-Test Leak Check: 0.0 @ 5 "Hg
Post-Test Leak Check: 0.0 @ 5 "Hg

Test (Run) No. 2 Barometric Pressure (P_{bar}) 29.2 in. Hg
Static Pressure: 16" Stack Temperature: 85 (From Method 2 Test Data)

Gas Sample Analysis: 0.0 $\%CO_2$ 20.9 $\%O_2$

Clock Time 24 hour	Meter Volume (Vm) ft3 or L (Circle One)	Meter Gage Pressure (ΔH) in. H_2O	Meter Inlet Temp. (t_m) °F	Meter Outlet Temp. (t_m) °F	Impinger Outlet Temp °F	Meter Vacuum "Hg
11:22	3.790	1.8	40	40	40	1
1127	7.55		42	40	60	1
1132	11.30		44	40	60	1
1137	15.00		46	40	60	1
1142	18.80		47	41	60	1
1147	22.55		47	41	60	1
1152	26.25		47	41	60	1
1221	30.00		48	42	60	1
1226	33.80		49	42	60	1
1231	37.55		49	43	60	1
1236	41.25		50	43	60	1
1241	45.00		50	43	60	1
1246	48.810					
Total Vol. in ft3 (Vm)=		Multiply total volume collected in Liters by 0.035315 to convert to ft³				

Comments:

Condensate	Silica Gel or Train
230 / ____ mls (V_f)	____ grams (W_f)
- 215 / ____ mls (V_i)	- 250.8 grams (W_i)
= ____ mls gained	= ____ grams gained

Average Meter Temperature: 43.95
(average of both inlet and outlet if applicable)

Pre-Test Leak Check: 0.0 @ 5 "Hg
Post-Test Leak Check: 0.0 @ 5 "Hg

NON-ISOKINETIC MOISTURE FIELD DATA SHEET

Project Name/Number: GENERAL IRON, INC., M193103 Date: 11-18-19
Test Location: RTO INLET Source Condition: NORMAL
Test Method: M4 Meter ID: CM17 Pre-Calibration Date: 11-4-19
Meter ΔH: 1.842 Meter Y: .994 Test Engineer: BVG

Test (Run) No. 3 Barometric Pressure (P_{bar}) 29.2 in. Hg
Static Pressure: 14" Stack Temperature: 85 (From Method 2 Test Data)

Gas Sample Analysis: 0.0 $\%CO_2$ 20.9 $\%O_2$

Clock Time 24 hour	Meter Volume (Vm) ft3 or L (Circle One)	Meter Gage Pressure (ΔH) in. H_2O	Meter Inlet Temp. (t_m) °F	Meter Outlet Temp. (t_m) °F	Impinger Outlet Temp °F	Meter Vacuum "Hg
1640	49.925	1.18	40	40	40	1
1645	53.90		41	40	60	1
1650	58.90		43	40	60	1
1655	60.60		44	40	60	1
1700	64.20		45	40	60	1
1705	68.90		45	40	40	1
1710/1726	71.00		45	40	60	1
1731	75.65		44	41	60	1
1736	79.40		44	41	60	1
1741	83.20		44	41	60	1
1746	86.90		44	41	60	1
1751	90.65		44	41	60	1
1756	94.455					1
Total Vol. in ft3 (Vm)=		Multiply total volume collected in Liters by 0.035315 to convert to ft^3				

Comments:

Scale ID Number ______
Scale Calibration Check Date: ______
Scale Calibration Check (see QS-6.05C for procedure)
250 grams ______
500 grams ______
750 grams ______

Condensate
245 / ____ mls (V_f)
- 250 / ____ mls (V_i)
= ______ mls gained

Silica Gel or Train
254.7 grams (W_f)
- 252.7 grams (W_i)
= ______ grams gained

Average Meter Temperature: ______
(average of both inlet and outlet if applicable)

Pre-Test Leak Check: 0.0 @ 5 "Hg
Post-Test Leak Check: 0.0 @ 5 "Hg

Test (Run) No. ______ Barometric Pressure (P_{bar}) ______ in. Hg
Static Pressure: ______ Stack Temperature: ______ (From Method ______ Test Data)

Gas Sample Analysis: ______ $\%CO_2$ ______ $\%O_2$

Clock Time 24 hour	Meter Volume (Vm) ft3 or L (Circle One)	Meter Gage Pressure (ΔH) in. H_2O	Meter Inlet Temp. (t_m) °F	Meter Outlet Temp. (t_m) °F	Impinger Outlet Temp °F	Meter Vacuum "Hg
Total Vol. in ft3 (Vm)=		Multiply total volume collected in Liters by 0.035315 to convert to ft^3				

Comments:

Condensate
____ / ____ / ____ mls (V_f)
- ____ / ____ / ____ mls (V_i)
= ______ mls gained

Silica Gel or Train
________ grams (W_f)
- ________ grams (W_i)
= ______ grams gained

Average Meter Temperature: ______
(average of both inlet and outlet if applicable)

Pre-Test Leak Check: ______ @ ______ "Hg
Post-Test Leak Check: ______ @ ______ "Hg

Isokinetic Sampling Cover Sheet

Test Engineer: JRK
Test Technician: RNS / CMB

Plant Information

Run Number:	1	Date:	11/ 14 /19	Project Number:	M193103
Test Location:	Scrubber Stack	Client Name:	General Iron Industries, Inc	Plant Name:	Chicago, IL
Duct Shape:	Circular or Rectangular	Length: — Width: — or		Diameter:	6.167
Flue Area:	29.870	Upstream Diameters:	1.4	Downstream Diameters:	2.0
Port Type:	Nipple	Port Length:	6	Port Diameter:	3
Test Method:	M29	Source Condition:	Normal		

Meter and Probe Data

Meter ID:	CM2	Meter Y Value:	1.011	ΔH Value:	1.883
Pitot ID:	509A	Pitot Coefficient:	.84	Train Type:	Anderson Box
Nozzle Kit ID	teflon kit #5	Nozzle Diameter:	.242	Filter Number/Weight:	# HP
Probe Length:	7	Probe Liner:	Glass	Thimble Number/Weight:	—

Pre-Test Nozzle Leak Check: 0 @ 12 "Hg Post-Test Nozzle Leak Check: 0 @ 7 "Hg
Pre-Test Pitot Leak Check: 0 @ 5 "H_2O Post-Test Pitot Leak Check: 0 @ 5 "H_2O

Traverse Data

Ports Sampled:	2	Points/Port:	12	Min/Point:	4
Total Points:	24	Total Test Time:	96	Sample Plane:	Horizontal or Vertical

Stack Parameters

Barometric Pressure: 29.56 Static Pressure: +0.3
CO_2 %: / / / Avg. 0.4 O_2 %: / / /Avg. 20.1 Determined by: Method 3 or Method 3A
Imp and/or silica balance Model and S/N: SJ2-82 Servomex Serial #: 01440D1 / 3434
Initial Imp. Volume or Weight: 3617.2 Final Imp. Volume or Weight: 3706.8 Imp. Volume or Weight Gain: 89.6
Initial Silica Weight: 857.1 Final Silica Weight: 870.4 Silica Weight Gain: 13.3

Comments:

R 011706

Isokinetic Sampling Field Data Sheet

Project Number: M193103
Client: General Iron Industries, INC
Plant: Chicago, IL
Date: 11/14/19
Test Location: Scrubber Stack
Test Method: M29
Test Number: 1
Operator: JRK
Test Tech: RNS
Page Number: 1 of 1

Port-Point #.	Time	(ΔP)	Orifice Setting (ΔH)	Meter Volume (V_m) ft³, Actual	Square Root, ΔP	Meter Rate, Cubic Feet/Min.	Theoretical Meter Volume, (V_m) ft³, per point	Theoretical Meter Volume, (V_m) ft³, total	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
1-1	845	.35	1.1	0.321				—	96	36	35	2	255	258	39
1-2	849	.36	1.1	2.50				2.487	98	37	36	2	255	255	39
1-3	853	.36	1.1	4.69				4.678	103	38	36	2	255	255	40
1-4	857	.38	1.2	6.88				6.865	99	40	36	2	255	255	42
Pause ~~4~~	900			8.762				9.125							
1-4 ~~6~~	902	.38	1.4	8.762				—	100	40	36	2	254	258	43
1-5 ~~7~~	903	.46	1.4	11.03				11.019	102	41	38	2	255	255	47
1-6 ~~8~~	907	.47	1.4	13.51				13.506	103	42	38	2	254	255	47
1-7	911	.46	1.4	16.03				16.219	100	43	38	2	255	256	49
1-8	915	.42	1.3	18.52				18.515	106	44	39	2	254	254	51
1-9	919	.44	1.3	20.91				20.892	103	45	39	3	255	254	53
1-10	923	.40	1.2	23.35				23.334	104	46	40	4	256	255	55
1-11	927	.40	1.2	25.49				25.665	102	46	40	4	255	255	58
1-12	931	.29	.9	27.99				28.000	98	47	40	4	254	254	59
	935			30.000				29.997							
2-1	955	.62	1.9	30.128				—	101	43	41	3	255	257	45
2-2	959	.64	1.9	33.04				33.032	106	45	42	3	255	254	49
2-3	1003	.64	2.0	35.759				35.978	100	47	42	3	255	255	52
2-4	1007	.49	1.5	38.95				38.945	100	48	42	3	255	255	51
2-5	1011	.48	1.5	41.54				41.545	105	48	43	3	254	255	52
2-6	1015	.51	1.6	44.11				44.108	102	47	43	3	255	255	50
2-7	1019	.53	1.6	46.77				46.755	102	47	44	3	255	256	50
2-8	1023	.24	.70	49.46				49.456	106	47	43	2	255	255	48
2-9	1027	.16	.50	51.270				51.266	100	47	43	2	255	255	47
2-10	1031	.15	.50	52.76				52.751	102	45	43	2	255	256	42
2-11	1035	.16	.50	54.19				54.184	101	45	43	2	255	256	42
2-12	1039	.16	.50	55.68				55.665	102	45	43	2	255	254	42
	1043			57.147				57.145							

IMPINGER WEIGHT SHEET

PLANT: General Iron

UNIT NO: Scrubber

LOCATION: Stack

DATE: 11.14.19

TEST NO: 1

METHOD: M29

WEIGHED/MEASURED BY: SLB

Scale ID Number SO - 82

Scale Calibration Check Date: 11/13/19

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

250 grams 250.2

500 grams 500.2

750 grams 750.2

	FINAL WEIGHT	INITIAL WEIGHT	IMPINGER	IMPINGER
Circle One:	MLS / GRAMS	MLS / GRAMS	GAIN	CONTENTS
IMPINGER 1	792.8	760.6		HNO_3/H_2O_2
IMPINGER 2	821.5	781.3		HNO_3/H_2O_2
IMPINGER 3	690	676.4		MT
IMPINGER 4	666	662.3		$KMnO_4$
IMPINGER 5	736.5	736.6		$KMnO_4$
IMPINGER 6	870.4	857.1		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

Test Engineer: JRK
Test Technician: RNS / CMB

Plant Information

Run Number: 2
Test Location: Scrubber Stack
Duct Shape: Circular or Rectangular
Flue Area: 29.870
Port Type: Nipple
Test Method: M29

Date: 11/ 14 /19
Client Name: General Iron Industries, Inc
Length: — Width: — or Diameter: 6.167
Upstream Diameters: 1.4
Port Length: 6
Source Condition: Normal

Project Number: M193103
Plant Name: Chicago, IL
Downstream Diameters: 2.0
Port Diameter: 3

Meter and Probe Data

Meter ID: CM2
Pitot ID: 509A
Nozzle Kit ID: teflon kit #5
Probe Length: 7
Pre-Test Nozzle Leak Check: 0 @ 12 "Hg
Pre-Test Pitot Leak Check: 0 @ 5 "H_2O

Meter Y Value: 1.011
Pitot Coefficient: .84
Nozzle Diameter: [illegible]
Probe Liner: Glass

ΔH Value: 1.883
Train Type: Anderson Box
Filter Number/Weight: # AP
Thimble Number/Weight: —
Post-Test Nozzle Leak Check: 0 @ 8 "Hg
Post-Test Pitot Leak Check: 0 @ 5 "H_2O

Traverse Data

Ports Sampled: 2
Total Points: 24
Points/Port: 12
Total Test Time: 96
Min/Point: 4
Sample Plane: Horizontal or Vertical

Stack Parameters

Barometric Pressure: 29.56
Static Pressure: +0.3
CO_2 %: ___ / ___ / ___ / Avg. .4
O_2 %: ___ / ___ / ___ /Avg. 20.5
Determined by: Method 3 or Method 3A
imp and/or silica balance Model and S/N: S10-82
Servomex Serial #: 0144001 / 3534
Initial Imp. Volume or Weight: 3523.4
Final Imp. Volume or Weight: 3607.2
Imp. Volume or Weight Gain: 83.8
Initial Silica Weight: 867.6
Final Silica Weight: 876.6
Silica Weight Gain: 9.0

Comments:

Isokinetic Sampling Field Data Sheet

Project Number: M193103
Client: General Iron Industries, INC
Plant: Chicago, IL
Date: 11/14/19
Test Location: Scrubber Stack
Test Method: M29
Test Number: 2
Operator: JRK
Test Tech: CMB/RNS
Page Number: 1 of 1

Port-Point #.	Time	(ΔP)	Orifice Setting (ΔH)	Meter Volume (V_m) ft^3, Actual	Square Root, ΔP	Meter Rate, Cubic Feet/Min.	Theoretical Meter Volume, (V_m) ft^3, per point	Theoretical Meter Volume, (V_m) ft^3, total	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
1-1	1200	.41	1.3	58.984				—	96	42	42	3	255	254	35
1-2	1204	.38	1.2	61.37				61.356	97	43	43	3	255	256	34
1-3	1208	.37	1.1	63.66				63.642	99	44	42	3	255	254	37
1-4	1212	.41	1.3	65.90				65.894	101	45	42	3	255	255	35
1-5	1216	.45	1.4	68.29				68.262	99	46	42	3	251	255	35
1-6	1220	.47	1.4	70.81				70.75	103	47	42	3	255	255	34
1-7	1224	.50	1.5	73.29				73.287	99	48	43	3	255	254	36
1-8	1228	.48	1.5	75.93				75.917	100	49	43	4	255	256	37
1-9	1232	.46	1.4	78.50				78.495	100	49	44	4	255	255	38
1-10	1236	.46	1.4	81.03				81.021	102	49	44	3	255	255	38
1-11	1240	.40	1.2	83.56				83.527	98	49	44	3	255	254	38
1-12	1244	.39	1.2	85.920				85.904	102	49	44	3	255	254	38
	1248			88.23				88.226							
2-1	1315	.54	1.7	88.400				—	97	44	44	3	255	253	34
2-2	1319	.44	1.4	91.15				91.131	97	46	44	3	255	254	34
2-3	1323	.43	1.3	93.61				93.600	101	48	44	4	255	255	34
~~2-4~~	1327			96.11				96.068							
2-4	1335	.37	1.2	96.11				—	98	46	44	4	255	256	33
2-5	1339	.32	1.0	98.39				98.373	97	47	44	2	255	255	37
2-6	1343	.31	1.0	100.49				100.481	104	47	44	2	255	254	34
2-7	1347	.38	1.2	102.56				102.523	100	47	44	2	255	254	33
2-8	1351	.35	1.1	104.86				104.834	103	48	44	3	255	255	34
2-9	1355	.38	1.00	109.14				107.029	101	48	44	3	255	254	34
2-10	1359	.25	.8	109.11				109.099	105	46	44	3	255	255	33
2-11	1403	.30	0.9	110.95				110.948	101	47	45	3	255	256	34
2-12	1407	.31	.9	113.010				112.984	103	48	44	3	255	254	34
	1411			115.050				115.049							

Pause @ 1327
Resume @ 1335

R 011709

IMPINGER WEIGHT SHEET

PLANT: General Iron

UNIT NO: Scrubber

LOCATION: Stack

DATE: 11-14-19

TEST NO: 2

METHOD: M29

WEIGHED/MEASURED BY: SLB

BALANCE ID: S10-82

Scale ID Number ________

Scale Calibration Check Date: ________

Scale Calibration Check (see QS-6.05C for procedure)

250 grams ________

500 grams ________

750 grams ________

Circle One:	FINAL WEIGHT MLS / GRAMS	INITIAL WEIGHT MLS / GRAMS	IMPINGER GAIN	IMPINGER CONTENTS
IMPINGER 1	800.5	753.1		HNO3 / H2O2
IMPINGER 2	758.4	727		HNO3 / H2O2
IMPINGER 3	655.9	652		MT
IMPINGER 4	649.7	648.5		KMNO4
IMPINGER 5	742.7	742.8		KMNO4
IMPINGER 6	876.6	867.6		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

Test Engineer: JRK
Test Technician: RNS / CMB

Plant Information

Run Number:	3	Date:	11/ 14 /19	Project Number:	M193103
Test Location:	Scrubber Stack	Client Name:	General Iron Industries, Inc	Plant Name:	Chicago, IL
Duct Shape:	Circular or Rectangular	Length: — Width: —		or Diameter:	6.167
Flue Area:	29.870	Upstream Diameters:	1.4	Downstream Diameters:	2.0
Port Type:	Nipple	Port Length:	6	Port Diameter:	3
Test Method:	M29	Source Condition:	Normal		

Meter and Probe Data

Meter ID:	CM2	Meter Y Value:	1.011	ΔH Value:	1.883
Pitot ID:	509A	Pitot Coefficient:	.84	Train Type:	Anderson Box
Nozzle Kit ID	teflon #5	Nozzle Diameter:	.148	Filter Number/Weight:	# HP
Probe Length:	7	Probe Liner:	Glass	Thimble Number/Weight:	—

Pre-Test Nozzle Leak Check: 0 @ 11 "Hg Post-Test Nozzle Leak Check: 0 @ 7 "Hg
Pre-Test Pitot Leak Check: 0 @ 5 "H_2O Post-Test Pitot Leak Check: 0 @ 5 "H_2O

Traverse Data

Ports Sampled:	2	Points/Port:	12	Min/Point:	4
Total Points:	24	Total Test Time:	96	Sample Plane:	Horizontal or Vertical

Stack Parameters

Barometric Pressure: 29.56 Static Pressure: + 0.3
CO_2 %: / / / Avg. 4 O_2 %: / / /Avg. 20.3 Determined by: Method 3 or Method 3A
Imp and/or silica balance Model and S/N: SD-82 Servomex Serial #: 01440D1 / 3934
Initial Imp. Volume or Weight: 3633 Final Imp. Volume or Weight: 3733.4 Imp. Volume or Weight Gain: 102.4
Initial Silica Weight: 858.6 Final Silica Weight: 866.5 Silica Weight Gain: 7.9

Comments:

Isokinetic Sampling Field Data Sheet

Project Number:	M193103	Date:	11/14/19	Test Number:	3
Client:	General Iron Industries, INC	Test Location:	Scrubber Stack	Operator:	JRK Test Tech: RNS/CMB
Plant:	Chicago, IL	Test Method:	M29	Page Number:	1 of 1

Port-Point #.	Time	(ΔP)	Orifice Setting (ΔH)	Meter Volume (V_m) ft^3, Actual	Square Root, ΔP	Meter Rate, Cubic Feet/Min.	Theoretical Meter Volume, (V_m) ft^3, per point	Theoretical Meter Volume, (V_m) ft^3, total	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
1-1	1530	.44	1.4	15.480				—	97	40	40	3	255	255	33
1-2	1534	.41	1.2	17.95				17.934	98	39	40	3	255	251	33
1-3	1538	.42	1.3	20.31				20.29	101	40	40	3	255	255	33
1-4	1542	.43	1.3	22.68				22.670	97	41	40	3	255	255	33
1-5	1546	.49	1.5	25.110				25.090	104	42	40	3	255	254	35
1-6	1550	.51	1.5	27.67				27.660	104	44	40	4	255	255	35
1-7	1554	.50	1.5	30.28				30.256	98	44	40	4	255	256	35
1-8	1558	.46	1.4	32.91				32.901	99	45	41	4	255	254	36
1-9	1602	.44	1.3	35.43				35.412	101	46	41	3	255	255	36
1-10	1606	.44	1.3	37.88				37.865	99	46	41	3	255	255	35
1-11	1610	.43	1.3	40.33				40.323	99	46	41	4	255	255	35
1-12	1614	.40	1.2	42.76				42.753	101	47	42	4	255	255	35
	1618			45.10				45.047							
2-1	1635	.60	1.8	45.256				—	104	43	41	4	255	254	33
2-2	1639	.60	1.8	48.[illegible]				48.105	105	43	42	4	255	251	34
2-3	1643	.62	1.9	50.97				50.954	99	45	42	4	255	251	33
2-4	1647	.59	1.8	53.89				53.87	99	46	42	4	255	253	33
2-5	1651	.61	1.9	56.73				56.721	99	46	41	4	255	254	33
2-6	1655	.54	1.6	59.63				59.615	103	47	42	4	255	255	33
2-7	1659	.47	1.4	62.35				62.334	108	47	44	4	255	254	33
-	1701			64.016				~~[illegible]~~							
2-8	1715	.45	1.4	64.016				—	98	43	42	4	255	254	33
-8	1718	.44	1.3	66.51				66.499	104	43	42	3	255	254	34
2-9	1722	.42	1.3	68.95				68.941	97	45	42	3	255	252	33
2-10	1725	.42	1.3	71.36				71.347	97	46	42	4	255	253	33
2-11	1729	.39	1.2	73.76				73.755	98	46	41	4	254	251	33
2-12	1733	.41	1.2	76.08				76.071	103	46	42	4	255	252	33
	1737			78.440				78.438							

Pause @ 1701
Resume

IMPINGER WEIGHT SHEET

PLANT: General Iron

UNIT NO: Scrubber

LOCATION: Stack

DATE: 11.14.19

TEST NO: 3

METHOD: 29

WEIGHED/MEASURED BY: SLB

Scale ID Number ______

Scale Calibration Check Date: ______

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

250 grams ______

500 grams ______

750 grams ______

Circle One:	FINAL WEIGHT MLS / GRAMS	INITIAL WEIGHT MLS / GRAMS	IMPINGER GAIN	IMPINGER CONTENTS
IMPINGER 1	827.4	759.4		
IMPINGER 2	814.8	789.1		
IMPINGER 3	683.2	680.4		MT
IMPINGER 4	709.5	705.5		KMNO4
IMPINGER 5	698.5	698.6		KMNO4
IMPINGER 6	866.5	858.6		Silica
IMPINGER 7				
IMPINGER 8				

IMPINGERS ______ FINAL TOTAL ______ INITIAL TOTAL ______ TOTAL IMPINGER GAIN

SILICA ______ FINAL TOTAL ______ INITIAL TOTAL ______ TOTAL SILICA GAIN

NON-ISOKINETIC MOISTURE FIELD DATA SHEET

Project Name/Number: General Iron M193103 Date: 11/14/19
Test Location: Scrubber Stack Source Condition: Normal
Test Method: M26A Meter ID: CM33 Pre-Calibration Date: 11/5/19
Meter ΔH: 1.796 Meter Y: .993 Test Engineer: RKS

Test (Run) No. 1 Barometric Pressure (P_{bar}) 29.56 in. Hg
Static Pressure: .3 Stack Temperature: 101.5 (From Method 29 Test Data)

Gas Sample Analysis: 0.4 $\%CO_2$ 20.80 $\%O_2$

Clock Time 24 hour	Meter Volume (Vm) ft3 or L (Circle One)	Meter Gage Pressure (ΔH) in. H_2O	Meter Inlet Temp. (t_m) °F	Meter Outlet Temp. (t_m) °F	Impinger Outlet Temp °F	Meter Vacuum "Hg
902	40.203	1.8	~~28~~ 42	~~260~~ 44	33	5
905	43.849	1.8	~~260~~ 42	~~260~~ 44	34	5
912	47.497	1.8	~~255~~ 42	~~25~~ 44	37	5
913	51.013	1.8	42	44	41	5
922	54.607	1.8	43	44	43	5
928	58.113	1.8	44	45	47	5
932	61.744	1.8	46	47	49	5
Port Change						
1005	61.744	1.8	42	47	50	5
1010	65.526	1.8	48	51	43	5
1015	69.368	1.8	49	51	45	5
1020	72.977	1.8	50	51	48	5
1025	76.651	1.8	51	52	49	5
1030	80.322	1.8	51	52	51	5
1035	83.563	1.8				5
Total Vol. in ft3 (Vm)=	43.360	Multiply total volume collected in Liters by 0.035315 to convert to ft^3				

Comments:

Scale ID Number ______
Scale Calibration Check Date: ______
Scale Calibration Check (see QS-6.05C for procedure)
250 grams ______
500 grams ______
750 grams ______

Condensate
29/131/.3 mls (V_f)
-28/49/1.9 mls (V_i)
= 63.4 mls gained

Silica Gel or Train
844.2 grams (W_f)
-853.4 grams (W_i)
= 9.2 grams gained

Average Meter Temperature: 46.45
(average of both inlet and outlet if applicable)

Pre-Test Leak Check: .000 @ 15 "Hg
Post-Test Leak Check: .00 @ 15 "Hg

Test (Run) No. 2 Barometric Pressure (P_{bar}) 29.56 in. Hg
Static Pressure: .3 Stack Temperature: 100.1 (From Method 29 Test Data)

Gas Sample Analysis: .4 $\%CO_2$ 20.5 $\%O_2$

Clock Time 24 hour	Meter Volume (Vm) ft3 or L (Circle One)	Meter Gage Pressure (ΔH) in. H_2O	Meter Inlet Temp. (t_m) °F	Meter Outlet Temp. (t_m) °F	Impinger Outlet Temp °F	Meter Vacuum "Hg
1215	83.731	1.8	43	46	23	5
1220	87.556	1.8	44	47	34	5
1225	91.207	1.8	45	48	34	5
1230	94.835	1.8	46	47	36	5
1235	98.409	1.8	47	50	40	5
1240	101.982	1.8	48	50	41	5
1245	105.684	1.8			43	5
Post Change						
1315	105.684	1.8	48	51	23	5
1320	109.436	1.8	49	52	35	5
1325	113.177	1.8	50	53	38	5
1330/1335	116.911	1.8	51	53	39	5
~~1335~~ 1340	120.277	1.8	53	55	40	5
~~1340~~ 1345	123.667	1.8	51	53	41	5
~~1345~~ 1350	127.043	1.8				5
Total Vol. in ft3 (Vm)=	43.312	Multiply total volume collected in Liters by 0.035315 to convert to ft^3				

Comments:

Condensate
29/20/.2 mls (V_f)
-28/54/1.2 mls (V_i)
= 61.0 mls gained

Silica Gel or Train
483.1 grams (W_f)
-468.2 grams (W_i)
= 14.9 grams gained

Average Meter Temperature: 49.25
(average of both inlet and outlet if applicable)

Pre-Test Leak Check: .00 @ 15 "Hg
Post-Test Leak Check: .00 @ 15 "Hg

R 011715

NON-ISOKINETIC MOISTURE FIELD DATA SHEET

Project Name/Number: General Iron / M193103 Date: 11/14/15
Test Location: Scrubber Stack Source Condition: Normal
Test Method: M26 Meter ID: CM37 Pre-Calibration Date: 11/5/15
Meter ΔH: 1.756 Meter Y: .963 Test Engineer: PKS

Test (Run) No. 3 Barometric Pressure (P_{bar}) 29.56 in. Hg
Static Pressure: -.3 Stack Temperature: ______ (From Method 26 Test Data)

Gas Sample Analysis
______ $\%CO_2$ ______ $\%O_2$

Clock Time 24 hour	Meter Volume (Vm) ft3 or L (Circle One)	Meter Gage Pressure (ΔH) in. H_2O	Meter Inlet Temp. (t_m) °F	Meter Outlet Temp. (t_m) °F	Impinger Outlet Temp °F	Meter Vacuum "Hg
1545	28.127	1.8	41	43	34	5
1550	32.011	1.8	41	44	34	5
1555	35.625	1.8	42	45	35	5
1600	39.261	1.8	43	46	36	5
1605	42.877	1.8	45	47	35	5
1610	46.505	1.8	47	48	36	5
1615	50.113	1.8			37	5
Port Change						
1635	50.113	1.8	47	50	34	5
1640	53.862	1.8	47	50	35	5
1645	57.521	1.8	49	51	37	5
1650	61.178	1.8	50	51	40	5
1655	64.876	1.8	50	52	41	5
~~1700~~ 1705	68.277	1.8	51	52	42	5
~~1705~~ 1720	71.926	1.8			43	5
Total Vol. in ft3 (Vm)=	43.799	Multiply total volume collected in Liters by 0.035315 to convert to ft^3				

Comments:

Scale ID Number ______
Scale Calibration Check Date: ______
Scale Calibration Check (see QS-6.05C for procedure)
250 grams ______
500 grams ______
750 grams ______

Condensate
___/___/___ mls (V_f)
- ___/___/___ mls (V_i)
= 58.8 mls gained

Silica Gel or Train
______ grams (W_f)
- ______ grams (W_i)
= 6.6 grams gained

Average Meter Temperature: 47.12
(average of both inlet and outlet if applicable)

Pre-Test Leak Check: .002 @ 15 "Hg
Post-Test Leak Check: ______ @ ______ "Hg

Test (Run) No. ______ Barometric Pressure (P_{bar}) ______ in. Hg
Static Pressure: ______ Stack Temperature: ______ (From Method ______ Test Data)

Gas Sample Analysis
______ $\%CO_2$ ______ $\%O_2$

Clock Time 24 hour	Meter Volume (Vm) ft3 or L (Circle One)	Meter Gage Pressure (ΔH) in. H_2O	Meter Inlet Temp. (t_m) °F	Meter Outlet Temp. (t_m) °F	Impinger Outlet Temp °F	Meter Vacuum "Hg
Total Vol. in ft3 (Vm)=		Multiply total volume collected in Liters by 0.035315 to convert to ft^3				

Comments:

Condensate
___/___/___ mls (V_f)
- ~~28/54/.2~~ mls (V_i)
= ______ mls gained

Silica Gel or Train
~~865~~ grams (W_f)
- ~~864.2~~ grams (W_i)
= ______ grams gained

Average Meter Temperature: ______
(average of both inlet and outlet if applicable)

Pre-Test Leak Check: ______ @ ______ "Hg
Post-Test Leak Check: ______ @ ______ "Hg

IMPINGER WEIGHT SHEET

PLANT: General Iron

UNIT NO: Scrubber

LOCATION: Stack

DATE: 11.14.19

TEST NO: 1

METHOD: 26A

WEIGHED/MEASURED BY: SLB

Scale ID Number S10-82

Scale Calibration Check Date:

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

250 grams

500 grams

750 grams

Circle One:	FINAL WEIGHT MLS / GRAMS	INITIAL WEIGHT MLS / GRAMS	IMPINGER GAIN	IMPINGER CONTENTS
IMPINGER 1	697.8	683.7		H_2SO_4
IMPINGER 2	729.7	697		H_2SO_4
IMPINGER 3	770.4	756.1		NaOH
IMPINGER 4	715.4	713.1		NaOH
IMPINGER 5	853.4	844.2		silica
IMPINGER 6				
IMPINGER 7				
IMPINGER 8				

	FINAL TOTAL	INITIAL TOTAL	TOTAL GAIN
IMPINGERS	2913.3	2849.9	63.4 (TOTAL IMPINGER GAIN)
SILICA	853.4	844.2	9.2 (TOTAL SILICA GAIN)

IMPINGER WEIGHT SHEET

PLANT: General Iron

UNIT NO: Scrubber

LOCATION: Stack

DATE: 11.14.19

TEST NO: 2

METHOD: 26A

WEIGHED/MEASURED BY: SLB

BALANCE ID: S10-82

Scale ID Number S10-82

Scale Calibration Check Date:

Scale Calibration Check (see QS-6.05C for procedure)

250 grams

500 grams

750 grams

Circle One:	FINAL WEIGHT MLS / GRAMS	INITIAL WEIGHT MLS / GRAMS	IMPINGER GAIN	IMPINGER CONTENTS
IMPINGER 1	772.2	758.4		H_2SO_4
IMPINGER 2	726.2	695.0		H_2SO_4
IMPINGER 3	685.6	675.9		NaOH
IMPINGER 4	731.2	729.9		NaOH
IMPINGER 5	883.1	868.2		silica
IMPINGER 6				
IMPINGER 7				
IMPINGER 8				

IMPINGERS 2920.2 FINAL TOTAL 2859.2 INITIAL TOTAL 61.0 TOTAL IMPINGER GAIN

SILICA 883.1 FINAL TOTAL 868.2 INITIAL TOTAL 14.9 TOTAL SILICA GAIN

IMPINGER WEIGHT SHEET

PLANT: General Iron

UNIT NO: Scrubber

LOCATION: Stack

DATE: 11.14.19

TEST NO: 3

METHOD: 26

WEIGHED/MEASURED BY: SLB

Scale ID Number S10-82

Scale Calibration Check Date:

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

250 grams

500 grams

750 grams

Circle One:	FINAL WEIGHT MLS / GRAMS	INITIAL WEIGHT MLS / GRAMS	IMPINGER GAIN	IMPINGER CONTENTS
IMPINGER 1	721.5	701.6		H_2SO_4
IMPINGER 2	727.7	698.5		H_2SO_4
IMPINGER 3	770.4	761.5		NaOH
IMPINGER 4	717.2	716.4		NaOH
IMPINGER 5	860.8	854.2		silica
IMPINGER 6				
IMPINGER 7				
IMPINGER 8				

	FINAL TOTAL	INITIAL TOTAL	TOTAL GAIN
IMPINGERS	2936.8	2878.0	58.8 (TOTAL IMPINGER GAIN)
SILICA	860.8	854.2	6.6 (TOTAL SILICA GAIN)

Appendix H- Calibration Data

MOSTARDI PLATT

Procedures for Method 5 and Flow 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.

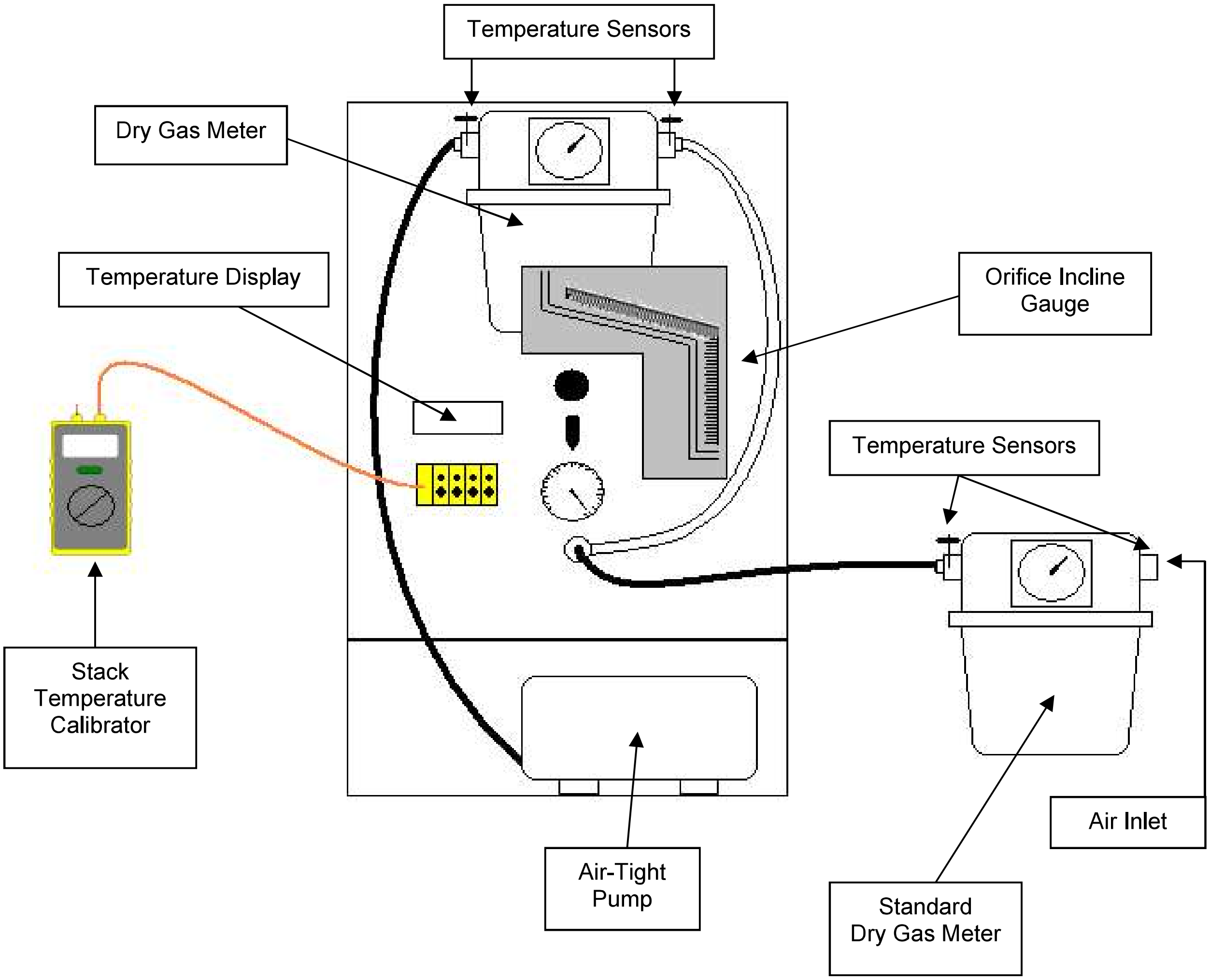
Temperature Sensing Devices

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

Pitot Tubes

The 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.

Dry Gas Meter/Control Module Calibration Diagram



Meter Box Calibration

Dry Gas Meter Calibration Data

Dry Gas Meter No.	*CM33*	*Date:*	*November 5, 2019*
Standard Meter No.	*18654530*	*Calibrated By:*	*KJW*
Standard Meter (Y)	*1.00490*	*Barometric Pressure:*	*29.44*

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			15.358	15.279	59	61	65					
Initial			10.302	10.126	59	64	65					
Difference	1	0.20	5.056	5.153	59	63	65	64	20	10	0.995	1.753
Final			20.691	20.714	59	60	63					
Initial			15.659	15.598	59	61	65					
Difference	2	0.50	5.032	5.116	59	61	64	62	12	42	0.993	1.760
Final			26.450	26.570	59	61	63					
Initial			21.420	21.452	59	60	63					
Difference	3	0.70	5.030	5.118	59	61	63	62	10	49	0.991	1.791
Final			32.211	32.443	59	60	62					
Initial			26.783	26.906	59	61	63					
Difference	4	0.90	5.428	5.537	59	61	63	62	10	18	0.988	1.794
Final			39.133	39.449	59	63	64					
Initial			33.392	33.632	59	60	62					
Difference	5	1.20	5.741	5.817	59	62	63	62	9	34	0.995	1.842
Final			10.124	9.955	59	64	65					
Initial			3.788	3.530	59	64	65					
Difference	6	2.00	6.336	6.425	59	64	65	65	8	11	0.997	1.836
									Average		**0.993**	**1.796**

Stack Temperature Sensor Calibration

Meter Box # : CM33 *Name :* KJW

Ambient Temperature : 60 °F *Date :* November 5, 2019

Calibrator Model # : CL23A

Serial # : T-285668

Date Of Certification : May 9, 2019

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	597	0.3
1200	1200	0.0

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

Meter Box Calibration

Dry Gas Meter Calibration Data

Dry Gas Meter No.	CM33	Date:	November 25, 2019
Standard Meter No.	18654530	Calibrated By:	DPP
Standard Meter (Y)	1.00490	Barometric Pressure:	28.91

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			102.713	83.066	59	70	71					
Initial			97.685	77.910	59	66	68					
Difference	1	0.20	5.028	5.156	59	68	70	69	20	23	0.998	1.827
Final			8.116	88.607	59	71	72					
Initial			3.043	83.387	59	70	71					
Difference	2	0.50	5.073	5.220	59	71	72	71	12	55	0.998	1.794
Final			13.345	94.013	59	71	72					
Initial			8.295	88.783	59	70	72					
Difference	3	0.70	5.050	5.230	59	71	72	71	11	3	0.991	1.854
Final			18.623	99.481	59	72	73					
Initial			13.578	94.251	59	71	72					
Difference	4	0.90	5.045	5.230	59	72	73	72	9	50	0.991	1.889
Final			23.924	104.980	60	73	73					
Initial			18.882	99.747	59	72	73					
Difference	5	1.20	5.042	5.233	60	73	73	73	8	34	0.990	1.915
Final			97.349	77.587	59	65	66					
Initial			92.176	72.337	59	62	63					
Difference	6	2.00	5.173	5.250	59	64	65	64	6	47	0.995	1.929
									Average		**0.994**	**1.868**

Stack Temperature Sensor Calibration

Meter Box # : CM33 *Name :* DPP

Ambient Temperature : 60 °F *Date :* November 25, 2019

Calibrator Model # : CL23A

Serial # : T-285668

Date Of Certification : May 9, 2019

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	597	0.3
1200	1200	0.0

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

Meter Box Calibration

Dry Gas Meter Calibration Data

Dry Gas Meter No.	CM2	Date:	November 4, 2019
Standard Meter No.	366118	Calibrated By:	LEM
Standard Meter (Y)	0.98788	Barometric Pressure:	29.23

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			45.126	51.931	62	67	66					
Initial			37.569	44.455	61	66	64					
Difference	1	0.20	7.557	7.476	62	67	65	66	31	4	1.006	1.952
Final			50.521	57.248	62	68	67					
Initial			45.391	52.194	62	67	66					
Difference	2	0.50	5.130	5.054	62	68	67	67	12	55	1.011	1.830
Final			57.870	64.499	63	69	68					
Initial			50.855	57.577	63	68	67					
Difference	3	0.70	7.015	6.922	63	69	68	68	15	9	1.009	1.889
Final			63.915	70.462	63	70	68					
Initial			58.334	64.957	63	69	68					
Difference	4	0.90	5.581	5.505	63	70	68	69	10	32	1.010	1.852
Final			72.637	79.060	63	71	69					
Initial			64.307	70.847	63	69	68					
Difference	5	1.20	8.330	8.213	63	70	69	69	13	44	1.011	1.882
Final			37.413	44.306	61	65	64					
Initial			32.263	39.297	61	64	64					
Difference	6	2.00	5.150	5.009	61	65	64	64	6	35	1.017	1.890
									Average		**1.011**	**1.883**

Stack Temperature Sensor Calibration

Meter Box # : CM2 *Name :* *LEM*

Ambient Temperature : *62* °*F* *Date :* *November 4, 2019*

Calibrator Model # : *CL23A*

Serial # : *T-285668*

Date Of Certification : *May 9, 2019*

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	1202	0.1

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

Meter Box Calibration

Dry Gas Meter Calibration Data

Dry Gas Meter No.	CM2	Date:	November 21, 2019
Standard Meter No.	18654530	Calibrated By:	LEM
Standard Meter (Y)	1.00490	Barometric Pressure:	29.09

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			30.285	93.790	66	68	70					
Initial			25.271	88.635	62	66	65					
Difference	1	0.20	5.014	5.155	64	67	68	67	19	32	0.983	1.714
Final			36.150	99.844	63	67	66					
Initial			30.294	93.818	63	66	65					
Difference	2	0.50	5.856	6.026	63	67	66	66	14	30	0.981	1.729
Final			42.533	6.416	63	69	67					
Initial			36.305	0.003	63	67	66					
Difference	3	0.70	6.228	6.413	63	68	67	67	13	13	0.982	1.773
Final			47.822	11.860	63	68	67					
Initial			42.810	6.700	63	68	67					
Difference	4	0.90	5.012	5.160	63	68	67	68	9	33	0.982	1.837
Final			54.224	18.460	63	69	67					
Initial			48.300	12.353	63	68	67					
Difference	5	1.20	5.924	6.107	63	69	67	68	9	30	0.981	1.734
Final			25.167	88.529	62	66	65					
Initial			20.100	83.336	63	65	65					
Difference	6	2.00	5.067	5.193	63	66	65	65	6	15	0.981	1.715

Average **0.982** **1.751**

Stack Temperature Sensor Calibration

Meter Box # : CM2 *Name :* *LEM*

Ambient Temperature : *62* °*F* *Date :* *November 21, 2019*

Calibrator Model # : *CL23A*

Serial # : *T-285668*

Date Of Certification : *May 9, 2019*

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	*1202*	0.1

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

Meter Box Calibration

Dry Gas Meter Calibration Data

Dry Gas Meter No.	*CM17*	*Date:*	*November 4, 2019*
Standard Meter No.	*14159239*	*Calibrated By:*	*LEM*
Standard Meter (Y)	*0.98554*	*Barometric Pressure:*	*29.23*

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			77.025	86.860	64	68	67					
Initial			68.554	78.438	64	66	64					
Difference	1	0.20	8.471	8.422	64	67	66	66	33	56	0.995	1.879
Final			82.832	92.655	64	70	68					
Initial			77.315	87.154	64	69	67					
Difference	2	0.50	5.517	5.501	64	70	68	69	13	39	0.996	1.784
Final			90.234	100.035	64	72	69					
Initial			83.221	93.044	64	71	68					
Difference	3	0.70	7.013	6.991	64	72	69	70	14	35	0.998	1.759
Final			95.865	5.675	64	72	70					
Initial			90.571	0.371	64	71	69					
Difference	4	0.90	5.294	5.304	64	72	70	71	9	45	0.994	1.773
Final			101.448	11.270	64	73	70					
Initial			96.147	5.941	64	72	70					
Difference	5	1.20	5.301	5.329	64	73	70	71	8	54	0.991	1.962
Final			68.274	78.165	64	67	64					
Initial			62.785	72.725	63	64	63					
Difference	6	2.00	5.489	5.440	64	66	64	65	6	59	0.991	1.898
									Average		**0.994**	**1.842**

Stack Temperature Sensor Calibration

Meter Box # : CM17 *Name :* *LEM*

Ambient Temperature : *62* ^{o}F *Date :* *November 4, 2019*

Calibrator Model # : *CL23A*

Serial # : *T-285668*

Date Of Certification : *May 9, 2019*

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

Reference Source Temperature (^{o}F)	Test Thermometer Temperature (^{o}F)	Temperature Difference %
0	1	0.2
250	251	0.1
600	599	0.1
1200	1202	0.1

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

Meter Box Calibration

Dry Gas Meter Calibration Data

Dry Gas Meter No.	*CM17*	*Date:*	*November 19, 2019*
Standard Meter No.	*14159239*	*Calibrated By:*	*KJW*
Standard Meter (Y)	*0.98554*	*Barometric Pressure:*	*29.06*

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			53.966	16.917	65	67	65					
Initial			48.173	11.120	63	64	64					
Difference	1	0.20	5.793	5.797	64	66	65	65	21	38	0.986	1.646
Final			59.795	22.735	66	68	66					
Initial			54.741	17.684	64	67	65					
Difference	2	0.50	5.054	5.051	65	68	66	67	12	22	0.988	1.769
Final			66.048	28.998	66	69	67					
Initial			61.020	23.959	65	68	66					
Difference	3	0.70	5.028	5.039	66	69	67	68	10	21	0.985	1.752
Final			72.149	35.122	67	70	67					
Initial			67.134	30.087	65	68	67					
Difference	4	0.90	5.015	5.035	66	69	67	68	9	15	0.983	1.811
Final			77.794	40.791	67	70	68					
Initial			72.773	35.748	66	69	67					
Difference	5	1.20	5.021	5.043	67	70	68	69	8	2	0.982	1.818
Final			47.614	10.566	65	66	62					
Initial			41.258	4.233	63	62	61					
Difference	6	2.00	6.356	6.333	64	64	62	63	8	6	0.982	1.925
									Average		**0.984**	**1.787**

Stack Temperature Sensor Calibration

Meter Box # : CM17 *Name :* KJW

Ambient Temperature : 60 °F *Date :* November 19, 2019

Calibrator Model # : CL23A

Serial # : T-285668

Date Of Certification : May 9, 2019

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

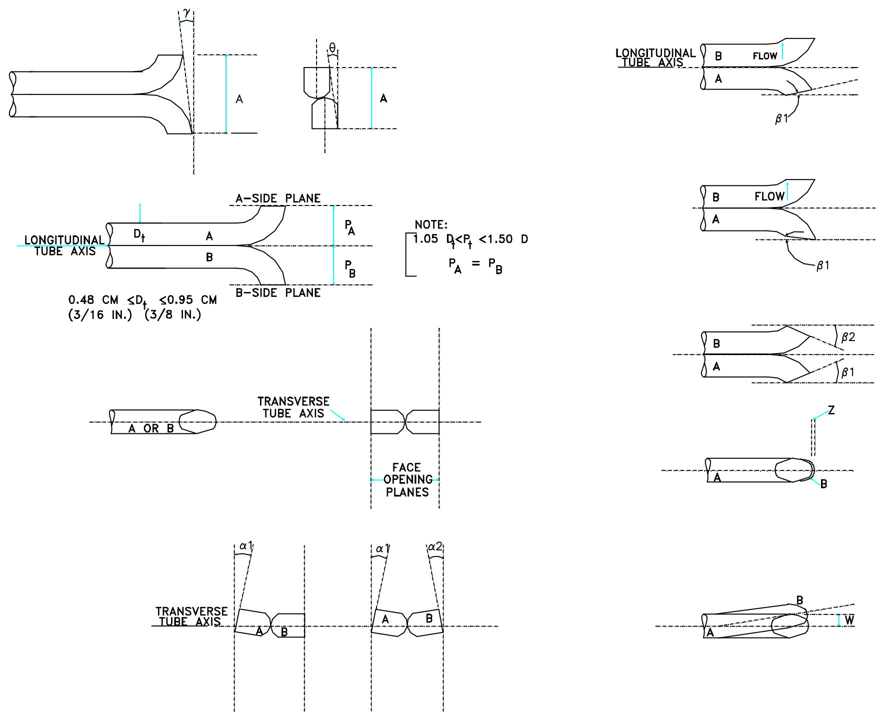
Reference Source Temperature (° F)	Test Thermometer Temperature (° F)	Temperature Difference %
0	0	0.0
250	250	0.0
600	599	0.1
1200	1202	0.1

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

S TYPE PITOT TUBE INSPECTION WORKSHEET

Pitot Tube No: 560 Date: 10/22/2019 Inspectors Name: WAP

Type of Probe: (circle one) M2 M5 M17 Probe Length: 7 ft.



Pitot tube assembly level? X yes ___ no

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

a_1 = 0.5 ° (<10°), a_2 = 2.5 ° (<10°) z = A sin g = 0.000 (in.); (<0.125 in.)

b_1 = 1.5 ° (<5°), b_2 = 1.5 ° (<5°) w = A sin q = 0.041 (in.); (<0.03125 in.)

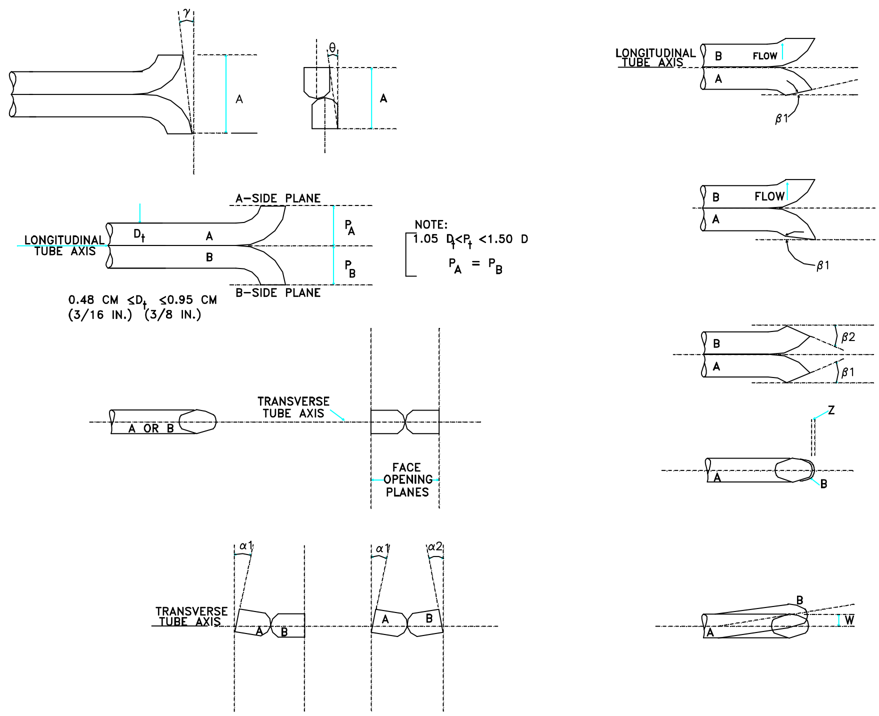
γ = 0.5 °, θ = 2.5 °, A = 0.950 (in.) P_A = 0.475 (in.), P_B = 0.475 (in.), D_t = 0.375 (in.)

Calibration required? ___ yes x no

S TYPE PITOT TUBE INSPECTION WORKSHEET

Pitot Tube No: 569 Date: 11/21/2019 Inspectors Name: WAP

Type of Probe: (circle one) M2 M5 M17 Probe Length: 7 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 = 0.000 (in.); (<0.125 in.)

b_1 = 2 ° (<5°), b_2 = 1 ° (<5°) w = A sin q = 0.025 (in.); (<0.03125 in.)

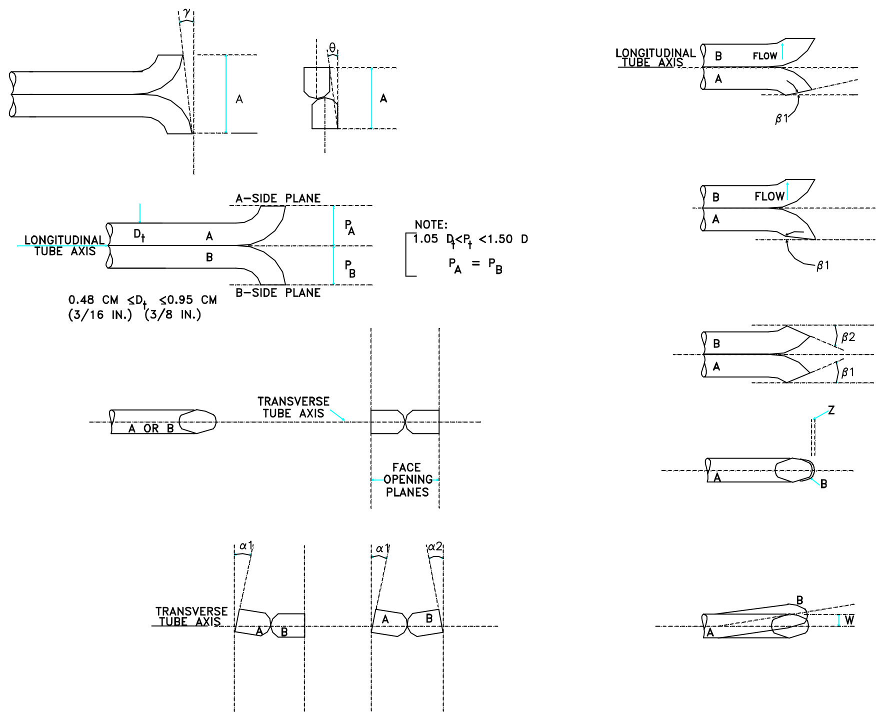
γ = 1 °, θ = 1.5 °, A = 0.951 (in.) P_A = 0.476 (in.), P_B = 0.476 (in.), D_t = 0.375 (in.)

Calibration required? ______ yes X no

S TYPE PITOT TUBE INSPECTION WORKSHEET

Pitot Tube No: 148   Date: 10/31/2019   Inspectors Name: KJD

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 = 1.5 ° (<10°), a_2 = 1 ° (<10°) z = A sin g = 0.000 (in.); (<0.125 in.)

b_1 = 3 ° (<5°), b_2 = 0 ° (<5°) w = A sin q = 0.024 (in.); (<0.03125 in.)

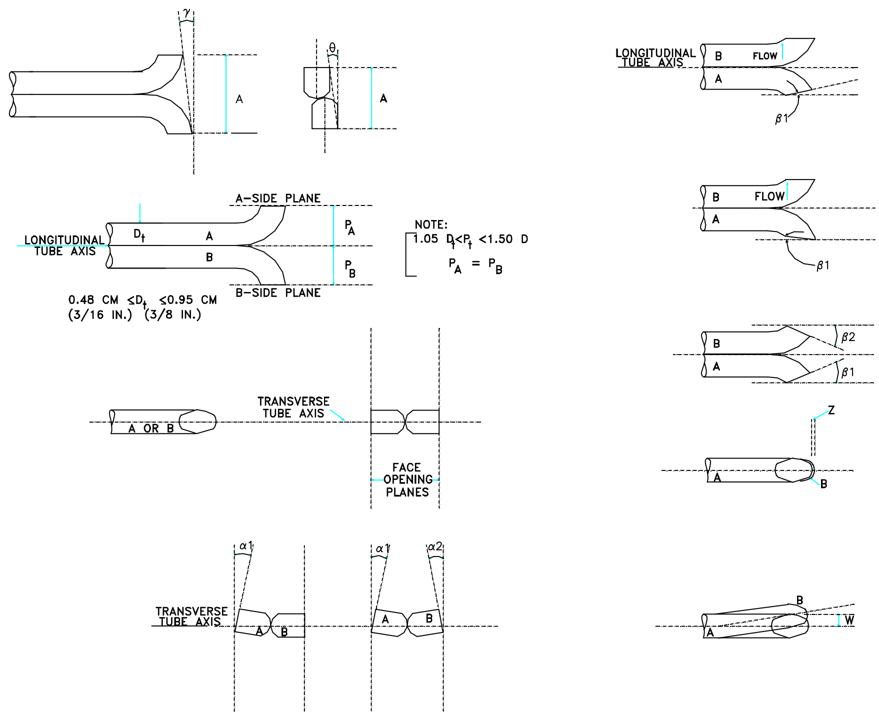
γ = 0 °, θ = 1.5 °, A = 0.930 (in.) P_A = 0.465 (in.), P_B = 0.465 (in.), D_t = 0.375 (in.)

Calibration required? ____ yes X no

S TYPE PITOT TUBE INSPECTION WORKSHEET

Pitot Tube No: 148 Date: 11/21/2019 Inspectors Name: WAP

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 ° (<10°), a_2 = 2 ° (<10°) z = A sin g = 0.000 (in.); (<0.125 in.)

b_1 = 2.5 ° (<5°), b_2 = 0.5 ° (<5°) w = A sin q = 0.000 (in.); (<0.03125 in.)

γ = 3.5 °, θ = 0 °, A = 0.995 (in.) P_A = 0.498 (in.), P_B = 0.498 (in.), D_t = 0.375 (in.)

Calibration required? ____ yes X no

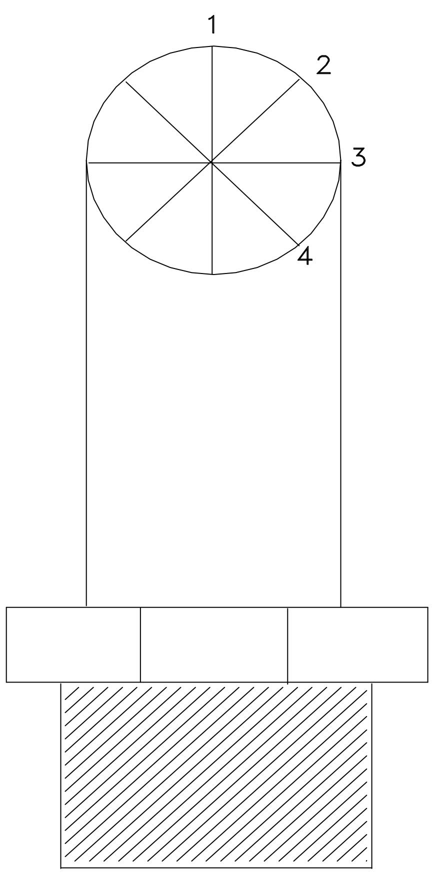
Nozzle Calibration

Date: 8/7/2015

Nozzle ID No.: 6T-8

Analyst: ADT

Material/Type: Teflon Coated



0.245	1
0.246	2
0.245	3
0.246	4

Average
0.246

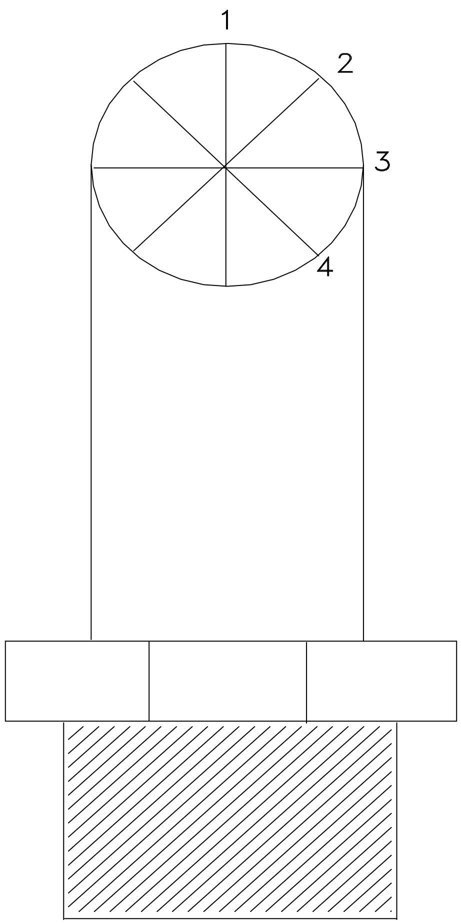
Nozzle Calibration

Date: 11/5/2019

Nozzle ID No.: #8-20

Analyst: MEP

Material/Type: Teflon



0.242	1
0.242	2
0.242	3
0.241	4

Average
0.242

Client: General Iron Industries, Inc.
Facility: Chicago, IL
Project #: M193103

Test Location: Scrubber Stack
Operator: JRK
Test Methods: 3A,5/202

Calibration Gases - Linearity

Type	Setting	Cylinder ID	Cylinder Value	Analyzer Response	Difference, % of Span	Expiration Date	Mid cylinder % of high cylinder
CO_2%	Zero	Zero Nitrogen	0	0.00	0.00%	N/A	
	Mid	ET0006082	9.936	10.00	-0.34%	9/9/2027	53.08%
	High	XL361318B	18.72	18.70	0.11%	6/14/2027	
O_2%	Zero	Zero Nitrogen	0	0.00	0.00%	N/A	
	Mid	ET0006082	9.993	10.10	-0.52%	9/9/2027	48.21%
	High	CC238024	20.73	20.70	0.14%	3/8/2025	

Analyzer Data

Type	Model/Serial #
CO_2 %	Servomex 01440D1/3934
O_2 %	Servomex 01440D1/3934

CO_2 % Correction Data

Run #	Source Condition	Start Time	End Time	Date	Cma	Precal	Postcal	Pre zero	Post zero	Co	Cm	C	Cgas	Span Bias	Span Drift	Zero Bias	Zero Drift
1	Normal	10:33	13:18	11/15/2019	9.94	10.00	10.10	0.00	0.00	0.00	10.05	0.36	0.4	-0.53	0.53	0.00	0.00
2	Normal	8:51	10:12	11/18/2019	9.94	10.10	10.10	0.00	0.00	0.00	10.10	0.46	0.5	-0.53	0.00	0.00	0.00
3	Normal	11:22	12:46	11/18/2019	9.94	10.10	10.10	0.00	0.00	0.00	10.10	0.34	0.3	-0.53	0.00	0.00	0.00
4	Normal	16:40	17:56	11/18/2019	9.94	10.10	10.10	0.00	0.00	0.00	10.10	0.43	0.4	-0.53	0.00	0.00	0.00

O_2 % Correction Data

Run #	Source Condition	Start Time	End Time	Date	Cma	Precal	Postcal	Pre zero	Post zero	Co	Cm	C	Cgas	Span Bias	Span Drift	Zero Bias	Zero Drift
1	Normal	10:33	13:18	11/15/2019	9.99	10.10	10.00	0.00	0.00	0.00	10.05	20.16	20.0	0.48	-0.48	0.00	0.00
2	Normal	8:51	10:12	11/18/2019	9.99	10.10	10.10	0.00	0.00	0.00	10.10	20.37	20.2	0.00	0.00	0.00	0.00
3	Normal	11:22	12:46	11/18/2019	9.99	10.10	10.00	0.00	0.00	0.00	10.05	20.35	20.2	0.48	-0.48	0.00	0.00
4	Normal	16:40	17:56	11/18/2019	9.99	10.00	10.10	0.00	0.00	0.00	10.05	20.51	20.4	0.00	0.48	0.00	0.00

Client: General Iron Industries, Inc.
Facility: Chicago, IL
Project #: Scrubber Stack
Test Location: M193103

Linearity Cal/Pre 1 Cal
Date: **11/15/2019**

Time	O2 % (dry)		CO2 % (dry)	
8:14	21.00		0.00	
8:14	20.70	ih	0.00	
8:15	20.70	h	0.00	
8:15	20.70		0.00	
8:15	17.00		0.00	
8:15	19.30		18.70	
8:16	19.30		18.70	ih
8:16	19.30		18.70	h
8:16	19.30		18.70	
8:16	19.30		16.70	
8:17	7.30		2.80	
8:17	2.20		1.00	
8:17	0.90		0.50	
8:17	0.50		0.30	
8:18	0.30		0.20	
8:18	0.00		0.00	
8:18	0.00	iz	0.00	iz
8:18	0.00	z	0.00	z
8:19	0.00		0.00	
8:19	6.50		9.80	
8:19	10.20		10.80	
8:19	10.00		10.20	
8:20	10.00		10.00	
8:20	10.10		10.00	
8:20	10.10	im	10.00	im
8:20	10.10	m	10.00	m

Client: General Iron Industries, Inc.
Facility: Chicago, IL
Project #: Scrubber Stack
Test Location: M193103

Linearity Cal/Pre 2 Cal
Date: 11/18/2019

Time	O2 % (dry)		CO2 % (dry)	
6:48	20.80		0.00	
6:48	20.70	ih	0.00	
6:48	20.70	h	0.00	
6:49	20.70		0.00	
6:49	19.60		18.90	
6:49	19.60		19.00	
6:49	19.60		18.70	ih
6:50	19.60		18.70	h
6:50	19.60		18.70	
6:50	19.60		18.70	
6:50	11.40		10.70	
6:51	3.30		4.30	
6:51	1.00		2.00	
6:51	0.50		1.20	
6:51	0.00		0.00	
6:52	0.00		0.00	
6:52	0.00	iz	0.00	iz
6:52	0.00	z	0.00	z
6:52	0.00		0.00	
6:53	0.00		0.00	
6:53	0.00		0.00	
6:53	3.40		4.80	
6:53	8.10		8.30	
6:54	9.70		9.40	
6:54	10.10		9.70	
6:54	10.10		10.10	
6:54	10.10		10.10	
6:55	10.10	im	10.10	im
6:55	10.10	m	10.10	m
6:55	10.10		10.10	
6:55	10.30		10.20	

Client: General Iron Industries, Inc.
Facility: Chicago, IL

Test Location: Scrubber Stack
Project #: M193103

Post 1

Time	O2 % (dry)		CO2 % (dry)	
13:21	10.00		10.10	
13:21	10.00	m	10.10	m
13:21	10.00		10.10	
13:21	10.00		7.80	
13:22	3.80		1.40	
13:22	1.20		0.40	
13:22	0.60		0.20	
13:22	0.30		0.10	
13:23	0.30		0.10	
13:23	0.00		0.00	
13:23	0.00		0.00	
13:23	0.00	z	0.00	z
13:24	0.00		0.00	
13:24	0.00		0.00	
13:24	0.00		0.00	
13:24	0.00		0.00	

Post 2

Time	O2 % (dry)		CO2 % (dry)	
10:13	10.40		10.20	
10:13	10.20		10.10	
10:13	10.10		10.10	
10:13	10.10	m	10.10	m
10:14	10.1		10.10	
10:14	7.70		6.50	
10:14	3.30		2.90	
10:14	1.40		1.40	
10:15	0.70		0.80	
10:15	0.00		0.00	
10:15	0.00		0.00	
10:15	0.00	z	0.00	z
10:16	0.00		0.00	
10:16	0.00		0.00	

Post 3/Pre 4

Time	O2 % (dry)		CO2 % (dry)	
12:50	0.60		0.00	
12:50	0.00		0.00	
12:51	0.00	z	0.00	z
12:51	0.00		0.00	
12:51	0.00		4.30	
12:51	7.30		8.20	
12:52	9.20		9.30	
12:52	9.70		9.60	
12:52	9.90		9.80	
12:52	10.00		10.10	
12:53	10.00	m	10.10	m
12:53	10.00		10.10	

Post 4

Time	O2 % (dry)		CO2 % (dry)	
0.75	10.10		10.10	
0.75	10.10		10.10	
0.75	10.10		10.10	
0.75	10.10	m	10.10	m
0.75	10.10		10.10	
0.75	0.00		0.00	
0.75	0.00		0.00	
0.75	0.00	z	0.00	z
0.75	0.00		0.00	
0.75	0.00		0.00	
0.75	0.00		0.00	

Client: General Iron Industries, Inc.
Facility: Chicago, IL
Project #: M193103
Operating Condition: Normal

Test Location: Scrubber Stack
Date: 11/14/19
Operator: R. Sollars

Probe Length:	6.0	**ft**
Probe Type:	Extractive	
Sample Plane:	Horizontal	
Port Length:	6.00	**in.**
Port Size (diameter):	3	**in.**
Port Type:	Nipple	
Duct Shape:	Circular	
Diameter:	6.167	**ft**
Duct Area:	29.87	**Sq. Ft.**
Upstream Diameters:	1.400	
Downstream Diameters:	2.000	
Number of Ports Sampled:	1	
Number of Points per Port:	3	

Point Markings (including port length):

Point #	Inches
1	18.36
2	43.00
3	67.65

3

Type	Setting	Cylinder ID	Cylinder Value	Analyzer Response	Difference, % of Span	Expiration Date	Final Bottle Pressure, PSI
CO ppmvd	Zero	CC352366	0	0.00	0.00%	8/6/2027	>500
	Mid	SG9176617BAL	90.55	90.64	-0.05%	10/8/2026	>500
	High	CC132209	184.9	185.07	-0.09%	2/26/2026	>500
SO2 ppmvd	Zero	CC352366	0	0.04	-0.08%	8/6/2027	>500
	Mid	CC502457	25.7	25.68	0.04%	6/1/2020	>500
	High	CC515958	50.56	50.55	0.02%	1/29/2027	>500
CO2 % (dry)	Zero	CC406120	0	-0.06	0.32%	10/5/2026	>500
	Mid	CC352366	9.882	9.85	0.17%	8/6/2027	>500
	High	CC191078	18.6	18.52	0.43%	9/26/2024	>500
O2 % (dry)	Zero	CC406120	0	0.03	-0.14%	10/5/2026	>500
	Mid	CC352366	10.09	10.10	-0.05%	8/6/2027	>500
	High	CC191078	21.76	21.92	-0.74%	9/26/2024	>500

Response Time Data

Type	RM Analyzer Make/Model	RM Analyzer s/n	Analyzer Span	RM Gas Span
CO ppmvd	Thermo 48i	1153170069	200	184.9
SO2 ppmvd	Thermo 43i-HL	1173100024	200	50.56
CO2 % (dry)	Servomex 1440	01440D1/3934	20	18.6
O2 % (dry)	Servomex 1440	01440D1/3934	25	22
	Start		**95% Response**	**Time (min)**
Upscale				1
Downscale				1

Client: General Iron Industries, Inc.
Facility: Chicago, IL

Location: Scrubber Stack
Date: 11/14/19
Operator: R. Sollars
Project #: M193103

CO ppmvd Correction Data

Run #	Cma	Precal	Postcal	Pre zero	Post zero	Co	Cm	C	Cgas	Span Bias	Span Drift	Zero Bias	Zero Drift
1	90.55	89.97	93.36	0.12	0.00	0.06	91.67	19.40	19.1	-1.47	1.83	0.00	-0.06
2	90.55	93.36	90.22	0.00	-0.67	-0.34	91.79	18.60	18.6	0.23	-1.70	0.36	-0.36
3	90.55	90.22	92.55	-0.67	-0.35	-0.51	91.39	19.50	19.7	-1.03	1.26	0.19	0.17

SO2 ppmvd Correction Data

Run #	Cma	Precal	Postcal	Pre zero	Post zero	Co	Cm	C	Cgas	Span Bias	Span Drift	Zero Bias	Zero Drift
1	25.70	25.84	26.02	0.00	0.80	0.40	25.93	0.10	-0.3	-0.67	0.36	-1.50	1.58
2	25.70	26.02	25.27	0.80	0.07	0.44	25.65	0.10	-0.3	0.81	-1.48	-0.06	-1.44
3	25.70	25.27	25.67	0.07	0.34	0.21	25.47	0.30	0.1	0.02	0.79	-0.59	0.53

CO2 % (dry) Correction Data

Run #	Cma	Precal	Postcal	Pre zero	Post zero	Co	Cm	C	Cgas	Span Bias	Span Drift	Zero Bias	Zero Drift
1	9.88	9.76	9.86	-0.01	-0.01	-0.01	9.81	0.43	0.4	-0.05	0.54	-0.27	0.00
2	9.88	9.86	9.87	-0.01	0.01	0.00	9.87	0.43	0.4	-0.11	0.05	-0.38	0.11
3	9.88	9.87	9.92	0.01	-0.01	0.00	9.90	0.43	0.4	-0.38	0.27	-0.27	-0.11

O2 % (dry) Correction Data

Run #	Cma	Precal	Postcal	Pre zero	Post zero	Co	Cm	C	Cgas	Span Bias	Span Drift	Zero Bias	Zero Drift
1	10.09	10.11	9.77	0.00	0.04	0.02	9.94	19.75	20.1	1.52	-1.56	-0.05	0.18
2	10.09	9.77	9.97	0.04	0.05	0.05	9.87	20.03	20.5	0.60	0.92	-0.09	0.05
3	10.09	9.97	9.96	0.05	0.02	0.04	9.97	20.02	20.3	0.64	-0.05	0.05	-0.14

Calibration Corrected Data

Run #	Run Date	Start Time	End Time	CO ppmvd	SO2 ppmvd	CO2 % (dry)	O2 % (dry)
1	11/14/19	8:45	10:42	19.1	-0.3	0.4	20.1
2	11/14/19	12:00	14:10	18.6	-0.3	0.4	20.5
3	11/14/19	15:30	17:36	19.7	0.1	0.4	20.3

Client: General Iron Industries, Inc.
Facility: Chicago, IL
Project #: M193103
Test Location: Scrubber Stack
Operating Condition: Normal
Date: 11/14/19

Linearity Cal/Pre 1 Cal

Time	CO ppmvd		SO2 ppmvd		CO2 % (dry)		O2 % (dry)	
7:10	-0.66		0.16		18.66		21.98	
7:11	0.00	iz	0.17		18.52	ih	21.92	ih
7:12	0.02		1.29		13.37		21.67	
7:13	0.40		48.22		-0.03		20.92	
7:14	0.46		50.61		-0.06		20.94	
7:15	0.47		50.67		-0.07		20.94	
7:16	0.47		50.91		-0.07		20.94	
7:17	0.47		50.55	ih	-0.06		20.93	
7:18	5.36		45.43		-0.05		12.22	
7:19	170.71		2.46		-0.07		-0.21	
7:20	200.76		0.21		-0.07		-0.05	
7:21	199.19		0.22		-0.06		0.01	
7:22	185.39		0.12		-0.07		0.01	
7:23	185.07	ih	0.04	iz	-0.06	iz	0.03	iz
7:24	143.41		0.05		7.14		7.06	
7:25	10.84		0.05		9.85	im	10.10	im
7:26	0.89		2.20		6.24		12.90	
7:27	0.89		22.47		-0.03		21.16	
7:28	0.59		25.22		-0.05		21.23	
7:29	0.51		25.68	im	-0.05		21.24	
7:30	0.36		25.59		-0.05		20.63	
7:31	96.82		7.31		-0.06		0.43	
7:32	177.78		0.31		-0.05		0.08	
7:33	103.41		0.10		-0.06		0.01	
7:34	89.35		0.05		-0.06		0.01	
7:35	90.64	im	0.05		-0.06		0.01	
7:36	103.66		0.08		-0.01		12.02	
7:37	30.91		0.07		0.00		22.16	
7:38	4.47		0.03		0.51		21.16	
8:03	0.96		0.05		9.82		10.12	
8:04	0.12	z	0.00	z	9.76	m	10.11	m
8:05	0.40		3.09		0.26		20.17	
8:06	0.50		20.14		0.02		21.03	
8:07	0.49		24.90		0.00		21.04	
8:08	0.45		25.84	m	0.00		21.05	
8:09	35.16		15.93		-0.01		3.07	
8:10	89.53		1.76		-0.01		0.02	
8:11	89.97	m	0.71		-0.01	z	0.00	z
8:12	90.40		0.45		-0.01		0.09	

Client: General Iron Industries, Inc.
Facility: Chicago, IL
Project #: M193103

Test Location: Scrubber Stack
Operating Condition: Normal
Date: 11/14/19

Post 1/Pre 2

Time	CO ppmvd		SO2 ppmvd		CO2 % (dry)		O2 % (dry)	
10:47	-0.05		1.38		-0.01		20.51	
10:48	-0.08		14.32		-0.01		20.52	
10:49	0.02		20.89		-0.01		20.52	
10:50	-0.03		22.74		-0.01		20.53	
10:51	-0.03		24.37		-0.01		20.52	
10:52	-0.06		25.58		-0.01		20.52	
10:53	0.00	z	26.02	m	-0.01		18.10	
10:54	60.74		14.67		-0.02		0.15	
10:55	93.36	m	4.16		-0.01	z	0.04	z
10:56	88.42		2.21		3.03		2.58	
10:57	16.13		1.52		9.76		9.73	
10:58	-0.45		1.16		9.86	m	9.77	m
10:59	-0.49		0.94		9.05		10.17	
11:00	1.32		0.80	z	0.40		19.57	

Post 2/Pre 3

Time	CO ppmvd		SO2 ppmvd		CO2 % (dry)		O2 % (dry)	
14:11	34.22		0.06		0.54		19.84	
14:12	32.28		0.06		0.39		8.82	
14:13	89.43		0.08		0.02		0.06	
14:14	90.22	m	0.07	z	0.01	z	0.05	z
14:15	46.38		0.05		0.04		18.53	
14:16	-0.40		0.05		0.02		20.84	
14:17	-0.59		0.28		0.02		20.85	
14:18	-0.63		6.11		0.01		20.87	
14:19	-0.66		14.34		0.01		20.86	
14:20	-0.67		18.55		0.01		20.85	
14:21	-0.67		25.24		0.01		20.84	
14:22	-0.67	z	25.27	m	0.01		20.83	
14:23	-0.91		21.82		7.69		12.84	
14:24	-1.11		8.41		9.86		9.98	
14:25	-1.05		4.10		9.87	m	9.97	m

Post 3

Time	CO ppmvd		SO2 ppmvd		CO2 % (dry)		O2 % (dry)	
17:38	68.84		0.28		0.49		19.78	
17:39	45.82		0.33		0.31		4.64	
17:40	91.86		0.31		0.00		0.04	
17:41	92.50		0.33		0.00		0.03	
17:42	92.50		0.39		0.00		0.02	
17:43	92.55	m	0.34	z	-0.01	z	0.02	z
17:44	81.57		0.35		0.00		10.12	
17:45	4.83		0.30		0.00		20.68	
17:46	-0.38		0.26		0.00		20.71	
17:47	-0.40		0.31		0.00		20.72	
17:48	-0.35		0.31		0.00		20.73	
17:49	-0.35		0.61		0.00		20.73	
17:50	-0.37		5.96		-0.01		20.73	
17:51	-0.37		13.51		-0.01		20.73	
17:52	-0.36		17.83		-0.01		20.73	
17:53	-0.37		24.92		-0.01		20.73	
17:54	-0.35	z	25.67	m	0.53		20.49	
17:55	-0.32		16.61		9.65		10.20	
17:56	-0.75		5.31		9.89		9.95	
17:57	-0.76		2.53		9.91		9.96	
17:58	-0.77		1.59		9.92	m	9.96	m
17:59	-0.77		1.12		8.97		10.36	
18:00	-0.22		0.90		0.32		20.09	
18:01	-0.03		0.76		0.27		20.40	
18:02	0.14		0.75		0.37		20.21	
18:03	0.02		0.57		0.35		20.21	

Appendix I- Gas Cylinder Certifications

Airgas
an Air Liquide company

Airgas Specialty Gases
Airgas USA, LLC
12722 S. Wentworth Ave.
Chicago, IL 60628
Airgas.com

R 011749

CERTIFICATE OF ANALYSIS
Grade of Product: EPA Protocol

Part Number:	E02AI99E15A1734	Reference Number:	54-124604145-6
Cylinder Number:	CC400409	Cylinder Volume:	146.2 CF
Laboratory:	124 - Chicago - IL	Cylinder Pressure:	2015 PSIG
PGVP Number:	B12017	Valve Outlet:	590
Gas Code:	PPN,BALA	Certification Date:	Mar 02, 2017

Expiration Date: Mar 02, 2025

Certification performed in accordance with "EPA Traceability Protocol for Assay and Certification of Gaseous Calibration Standards (May 2012)" document EPA 600/R-12/531, using the assay procedures listed. Analytical Methodology does not require correction for analytical interference. This cylinder has a total analytical uncertainty as stated below with a confidence level of 95%. There are no significant impurities which affect the use of this calibration mixture. All concentrations are on a volume/volume basis unless otherwise noted.

Do Not Use This Cylinder below 100 psig, i.e. 0.7 megapascals.

ANALYTICAL RESULTS

Component	Requested Concentration	Actual Concentration	Protocol Method	Total Relative Uncertainty	Assay Dates
PROPANE	10.00 PPM	10.07 PPM	G1	+/- 0.7% NIST Traceable	03/02/2017
AIR	Balance				

CALIBRATION STANDARDS

Type	Lot ID	Cylinder No	Concentration	Uncertainty	Expiration Date
NTRM	10061440	CC316745	9.93 PPM PROPANE/AIR	+/- 0.6%	Jun 29, 2022

ANALYTICAL EQUIPMENT

Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
Nicolet 6700 AHR0801332	FTIR	Feb 23, 2017

Triad Data Available Upon Request

Approved for Release

Airgas
an Air Liquide company

Airgas Specialty Gases R 011750
Airgas USA, LLC
12722 S. Wentworth Ave.
Chicago, IL 60628
Airgas.com

CERTIFICATE OF ANALYSIS

Grade of Product: EPA Protocol

Part Number:	E02AI99E15A01H9	Reference Number:	54-401400733-1
Cylinder Number:	CC430551	Cylinder Volume:	146.2 CF
Laboratory:	124 - Chicago (SAP) - IL	Cylinder Pressure:	2015 PSIG
PGVP Number:	B12019	Valve Outlet:	590
Gas Code:	PPN,BALA	Certification Date:	Jan 21, 2019

Expiration Date: Jan 21, 2027

Certification performed in accordance with "EPA Traceability Protocol for Assay and Certification of Gaseous Calibration Standards (May 2012)" document EPA 600/R-12/531, using the assay procedures listed. Analytical Methodology does not require correction for analytical interference. This cylinder has a total analytical uncertainty as stated below with a confidence level of 95%. There are no significant impurities which affect the use of this calibration mixture. All concentrations are on a volume/volume basis unless otherwise noted.
Do Not Use This Cylinder below 100 psig, i.e. 0.7 megapascals.

ANALYTICAL RESULTS

Component	Requested Concentration	Actual Concentration	Protocol Method	Total Relative Uncertainty	Assay Dates
PROPANE	20.00 PPM	20.13 PPM	G1	+/- 0.8% NIST Traceable	01/21/2019
AIR	Balance				

CALIBRATION STANDARDS

Type	Lot ID	Cylinder No	Concentration	Uncertainty	Expiration Date
NTRM	16061106	CC482563	50.06 PPM PROPANE/AIR	+/- 0.5%	Jul 26, 2022

ANALYTICAL EQUIPMENT

Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
Nicolet 6700 AHR0801332	FTIR	Dec 26, 2018

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C. Wright

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Airgas

Airgas USA, LLC
Airgas Specialty Gases
12722 S. Wentworth Avenue
Chicago, IL 60628
773-785-3000 Fax: 773 785-1928
Airgas.com

CERTIFICATE OF ANALYSIS

Grade of Product: EPA Protocol

Part Number:	E02AI99E15A0705	Reference Number:	54-124563196-1
Cylinder Number:	EB0065467	Cylinder Volume:	146.2 CF
Laboratory:	ASG - Chicago - IL	Cylinder Pressure:	2015 PSIG
PGVP Number:	B12016	Valve Outlet:	590
Gas Code:	PPN,BALA	Certification Date:	Jul 05, 2016

Expiration Date: Jul 05, 2024

Certification performed in accordance with "EPA Traceability Protocol for Assay and Certification of Gaseous Calibration Standards (May 2012)" document EPA 600/R-12/531, using the assay procedures listed. Analytical Methodology does not require correction for analytical interference. This cylinder has a total analytical uncertainty as stated below with a confidence level of 95%. There are no significant impurities which affect the use of this calibration mixture. All concentrations are on a volume/volume basis unless otherwise noted.

Do Not Use This Cylinder below 100 psig, i.e. 0.7 megapascals.

ANALYTICAL RESULTS

Component	Requested Concentration	Actual Concentration	Protocol Method	Total Relative Uncertainty	Assay Dates
PROPANE	30.00 PPM	30.03 PPM	G1	+/- 0.7% NIST Traceable	07/05/2016
AIR	Balance				

CALIBRATION STANDARDS

Type	Lot ID	Cylinder No	Concentration	Uncertainty	Expiration Date
NTRM	13060520	CC417457	50.80 PPM PROPANE/NITROGEN	+/- 0.6%	Feb 26, 2019

ANALYTICAL EQUIPMENT

Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
Nicolet 6700 AHR0801332	FTIR	Jun 06, 2016

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Airgas
an Air Liquide company

Airgas Specialty Gases
Airgas USA, LLC
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R 011752

CERTIFICATE OF ANALYSIS

Grade of Product: EPA Protocol

Part Number:	E02AI99E15A1877	Reference Number:	54-401424229-1
Cylinder Number:	ALM-066302	Cylinder Volume:	146.2 CF
Laboratory:	124 - Chicago (SAP) - IL	Cylinder Pressure:	2015 PSIG
PGVP Number:	B12019	Valve Outlet:	590
Gas Code:	PPN,BALA	Certification Date:	Feb 22, 2019

Expiration Date: Feb 22, 2027

Certification performed in accordance with "EPA Traceability Protocol for Assay and Certification of Gaseous Calibration Standards (May 2012)" document EPA 600/R-12/531, using the assay procedures listed. Analytical Methodology does not require correction for analytical interference. This cylinder has a total analytical uncertainty as stated below with a confidence level of 95%. There are no significant impurities which affect the use of this calibration mixture. All concentrations are on a volume/volume basis unless otherwise noted.

Do Not Use This Cylinder below 100 psig, i.e. 0.7 megapascals.

ANALYTICAL RESULTS

Component	Requested Concentration	Actual Concentration	Protocol Method	Total Relative Uncertainty	Assay Dates
PROPANE	60.00 PPM	61.28 PPM	G1	+/- 0.6% NIST Traceable	02/22/2019
AIR	Balance				

CALIBRATION STANDARDS

Type	Lot ID	Cylinder No	Concentration	Uncertainty	Expiration Date
NTRM	16060318	CC471451	99.7 PPM PROPANE/AIR	+/- 0.5%	Nov 16, 2021

ANALYTICAL EQUIPMENT

Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
Nicolet 6700 AHR0801332	FTIR	Jan 28, 2019

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Airgas
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R 011753

CERTIFICATE OF ANALYSIS

Grade of Product: EPA Protocol

Part Number:	E02AI99E15A0565	Reference Number:	54-401120996-1
Cylinder Number:	CC203587	Cylinder Volume:	146.2 CF
Laboratory:	124 - Chicago (SAP) - IL	Cylinder Pressure:	2015 PSIG
PGVP Number:	B12018	Valve Outlet:	590
Gas Code:	PPN,BALA	Certification Date:	Feb 13, 2018

Expiration Date: Feb 13, 2026

Certification performed in accordance with "EPA Traceability Protocol for Assay and Certification of Gaseous Calibration Standards (May 2012)" document EPA 600/R-12/531, using the assay procedures listed. Analytical Methodology does not require correction for analytical interference. This cylinder has a total analytical uncertainty as stated below with a confidence level of 95%. There are no significant impurities which affect the use of this calibration mixture. All concentrations are on a mole/mole basis unless otherwise noted.

Do Not Use This Cylinder below 100 psig, i.e. 0.7 megapascals.

ANALYTICAL RESULTS

Component	Requested Concentration	Actual Concentration	Protocol Method	Total Relative Uncertainty	Assay Dates
PROPANE	90.00 PPM	91.12 PPM	G1	+/- 0.6% NIST Traceable	02/13/2018
AIR	Balance			-	

CALIBRATION STANDARDS

Type	Lot ID	Cylinder No	Concentration	Uncertainty	Expiration Date
NTRM	16060318	CC471451	99.7 PPM PROPANE/AIR	+/- 0.5%	Nov 16, 2021

ANALYTICAL EQUIPMENT

Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
Nicolet 6700 AHR0801332	FTIR	Jan 21, 2018

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Airgas
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Chicago, IL 60628
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R 011754

CERTIFICATE OF ANALYSIS

Grade of Product: EPA Protocol

Part Number:	E02AI99E15A0453	Reference Number:	54-401247267-1
Cylinder Number:	CC494386	Cylinder Volume:	146.2 CF
Laboratory:	124 - Chicago (SAP) - IL	Cylinder Pressure:	2015 PSIG
PGVP Number:	B12018	Valve Outlet:	590
Gas Code:	PPN,BALA	Certification Date:	Jul 09, 2018

Expiration Date: Jul 09, 2026

Certification performed in accordance with "EPA Traceability Protocol for Assay and Certification of Gaseous Calibration Standards (May 2012)" document EPA 600/R-12/531, using the assay procedures listed. Analytical Methodology does not require correction for analytical interference. This cylinder has a total analytical uncertainty as stated below with a confidence level of 95%. There are no significant impurities which affect the use of this calibration mixture. All concentrations are on a volume/volume basis unless otherwise noted.

Do Not Use This Cylinder below 100 psig, i.e. 0.7 megapascals.

ANALYTICAL RESULTS

Component	Requested Concentration	Actual Concentration	Protocol Method	Total Relative Uncertainty	Assay Dates
PROPANE	300.0 PPM	301.2 PPM	G1	+/- 0.7% NIST Traceable	07/09/2018
AIR	Balance				

CALIBRATION STANDARDS

Type	Lot ID	Cylinder No	Concentration	Uncertainty	Expiration Date
NTRM	10060532	CC281503	495.3 PPM PROPANE/AIR	+/- 0.5%	Jan 06, 2022

ANALYTICAL EQUIPMENT

Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
Nicolet 6700 AHR0801332	FTIR	Jun 21, 2018

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Airgas Specialty Gases
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R 011755

CERTIFICATE OF ANALYSIS

Grade of Product: EPA Protocol

Part Number:	E02AI99E15A1472	Reference Number:	54-401478396-1
Cylinder Number:	CC486863	Cylinder Volume:	146.3 CF
Laboratory:	124 - Chicago (SAP) - IL	Cylinder Pressure:	2015 PSIG
PGVP Number:	B12019	Valve Outlet:	590
Gas Code:	PPN,BALA	Certification Date:	Apr 15, 2019

Expiration Date: Apr 15, 2027

Certification performed in accordance with "EPA Traceability Protocol for Assay and Certification of Gaseous Calibration Standards (May 2012)" document EPA 600/R-12/531, using the assay procedures listed. Analytical Methodology does not require correction for analytical interference. This cylinder has a total analytical uncertainty as stated below with a confidence level of 95%. There are no significant impurities which affect the use of this calibration mixture. All concentrations are on a volume/volume basis unless otherwise noted.

Do Not Use This Cylinder below 100 psig, i.e. 0.7 megapascals.

ANALYTICAL RESULTS

Component	Requested Concentration	Actual Concentration	Protocol Method	Total Relative Uncertainty	Assay Dates
PROPANE	600.0 PPM	604.3 PPM	G1	+/- 0.8% NIST Traceable	04/15/2019
AIR	Balance				

CALIBRATION STANDARDS

Type	Lot ID	Cylinder No	Concentration	Uncertainty	Expiration Date
NTRM	11060906	CC343399	1000.3 PPM PROPANE/NITROGEN	+/- 0.7%	Mar 15, 2023

ANALYTICAL EQUIPMENT

Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
Nicolet 6700 AHR0801332	FTIR	Mar 25, 2019

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R 011756

CERTIFICATE OF ANALYSIS

Grade of Product: EPA Protocol

Part Number:	E02AI99E15A0563	Reference Number:	54-401273634-1
Cylinder Number:	SG9163416BAL	Cylinder Volume:	146.3 CF
Laboratory:	124 - Chicago (SAP) - IL	Cylinder Pressure:	2015 PSIG
PGVP Number:	B12018	Valve Outlet:	590
Gas Code:	PPN,BALA	Certification Date:	Aug 06, 2018

Expiration Date: Aug 06, 2026

Certification performed in accordance with "EPA Traceability Protocol for Assay and Certification of Gaseous Calibration Standards (May 2012)" document EPA 600/R-12/531, using the assay procedures listed. Analytical Methodology does not require correction for analytical interference. This cylinder has a total analytical uncertainty as stated below with a confidence level of 95%. There are no significant impurities which affect the use of this calibration mixture. All concentrations are on a volume/volume basis unless otherwise noted.

Do Not Use This Cylinder below 100 psig, i.e. 0.7 megapascals.

ANALYTICAL RESULTS

Component	Requested Concentration	Actual Concentration	Protocol Method	Total Relative Uncertainty	Assay Dates
PROPANE	900.0 PPM	907.6 PPM	G1	+/- 0.7% NIST Traceable	08/06/2018
AIR	Balance				

CALIBRATION STANDARDS

Type	Lot ID	Cylinder No	Concentration	Uncertainty	Expiration Date
NTRM	11060906	CC343399	1000.3 PPM PROPANE/NITROGEN	+/- 0.7%	Mar 15, 2023

ANALYTICAL EQUIPMENT

Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
Nicolet 6700 AHR0801332	FTIR	Jul 23, 2018

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Airgas
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R 011757

CERTIFICATE OF ANALYSIS

Grade of Product: EPA Protocol

Part Number:	E02AI99E15A0966	Reference Number:	54-401628249-1
Cylinder Number:	EB0039361	Cylinder Volume:	146.3 CF
Laboratory:	124 - Chicago (SAP) - IL	Cylinder Pressure:	2015 PSIG
PGVP Number:	B12019	Valve Outlet:	590
Gas Code:	PPN,BALA	Certification Date:	Oct 21, 2019

Expiration Date: Oct 21, 2027

Certification performed in accordance with "EPA Traceability Protocol for Assay and Certification of Gaseous Calibration Standards (May 2012)" document EPA 600/R-12/531, using the assay procedures listed. Analytical Methodology does not require correction for analytical interference. This cylinder has a total analytical uncertainty as stated below with a confidence level of 95%. There are no significant impurities which affect the use of this calibration mixture. All concentrations are on a volume/volume basis unless otherwise noted.
Do Not Use This Cylinder below 100 psig, i.e. 0.7 megapascals.

ANALYTICAL RESULTS

Component	Requested Concentration	Actual Concentration	Protocol Method	Total Relative Uncertainty	Assay Dates
PROPANE	1500 PPM	1460 PPM	G1	+/- 0.7% NIST Traceable	10/21/2019
AIR	Balance				

CALIBRATION STANDARDS

Type	Lot ID	Cylinder No	Concentration	Uncertainty	Expiration Date
NTRM	00011612	K026026	2515 PPM PROPANE/NITROGEN	+/- 0.6%	May 09, 2024

ANALYTICAL EQUIPMENT

Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
Nicolet 6700 AHR0801332	FTIR	Sep 27, 2019

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Airgas
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R 011758

CERTIFICATE OF ANALYSIS
Grade of Product: EPA Protocol

Part Number:	E02AI99E15A0452	Reference Number:	54-124604145-1
Cylinder Number:	CC476181	Cylinder Volume:	146.5 CF
Laboratory:	124 - Chicago - IL	Cylinder Pressure:	2015 PSIG
PGVP Number:	B12017	Valve Outlet:	590
Gas Code:	PR,BALA	Certification Date:	Mar 04, 2017

Expiration Date: Mar 04, 2025

Certification performed in accordance with "EPA Traceability Protocol for Assay and Certification of Gaseous Calibration Standards (May 2012)" document EPA 600/R-12/531, using the assay procedures listed. Analytical Methodology does not require correction for analytical interference. This cylinder has a total analytical uncertainty as stated below with a confidence level of 95%. There are no significant impurities which affect the use of this calibration mixture. All concentrations are on a volume/volume basis unless otherwise noted.
Do Not Use This Cylinder below 100 psig, i.e. 0.7 megapascals.

ANALYTICAL RESULTS

Component	Requested Concentration	Actual Concentration	Protocol Method	Total Relative Uncertainty	Assay Dates
PROPANE	3000 PPM	2942 PPM	G1	+/- 0.7% NIST Traceable	03/04/2017
AIR	Balance				

CALIBRATION STANDARDS

Type	Lot ID	Cylinder No	Concentration	Uncertainty	Expiration Date
NTRM	12061208	CC357634	5026 PPM PROPANE/NITROGEN	+/- 0.6%	Jan 20, 2018

ANALYTICAL EQUIPMENT

Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
Nicolet 6700 AHR0801332	FTIR	Feb 23, 2017

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R 011759

Airgas
an Air Liquide company

Airgas Specialty Gases
Airgas USA, LLC
12722 S. Wentworth Ave.
Chicago, IL 60628
Airgas.com

CERTIFICATE OF ANALYSIS

Grade of Product: EPA Protocol

Part Number:	E02AI99E15A1883	Reference Number:	54-124604145-8
Cylinder Number:	CC208736	Cylinder Volume:	115.9 CF
Laboratory:	124 - Chicago - IL	Cylinder Pressure:	1580 PSIG
PGVP Number:	B12017	Valve Outlet:	590
Gas Code:	PPN,BALA	Certification Date:	Mar 04, 2017

Expiration Date: Mar 04, 2025

Certification performed in accordance with "EPA Traceability Protocol for Assay and Certification of Gaseous Calibration Standards (May 2012)" document EPA 600/R-12/531, using the assay procedures listed. Analytical Methodology does not require correction for analytical interference. This cylinder has a total analytical uncertainty as stated below with a confidence level of 95%. There are no significant impurities which affect the use of this calibration mixture. All concentrations are on a volume/volume basis unless otherwise noted.

Do Not Use This Cylinder below 100 psig, i.e. 0.7 megapascals.

ANALYTICAL RESULTS

Component	Requested Concentration	Actual Concentration	Protocol Method	Total Relative Uncertainty	Assay Dates
PROPANE	4500 PPM	4522 PPM	G1	+/- 0.6% NIST Traceable	03/04/2017
AIR	Balance				

CALIBRATION STANDARDS

Type	Lot ID	Cylinder No	Concentration	Uncertainty	Expiration Date
NTRM	12061208	CC357634	5026 PPM PROPANE/NITROGEN	+/- 0.6%	Jan 20, 2018

ANALYTICAL EQUIPMENT

Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
Nicolet 6700 AHR0801332	FTIR	Feb 23, 2017

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Airgas
an Air Liquide company

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R 011760

CERTIFICATE OF ANALYSIS
Grade of Product: EPA Protocol

Part Number:	E02NI99E15A0406	Reference Number:	54-401320817-1
Cylinder Number:	SG9176617BAL	Cylinder Volume:	144.3 CF
Laboratory:	124 - Chicago (SAP) - IL	Cylinder Pressure:	2015 PSIG
PGVP Number:	B12018	Valve Outlet:	350
Gas Code:	CO,BALN	Certification Date:	Oct 08, 2018

Expiration Date: Oct 08, 2026

Certification performed in accordance with "EPA Traceability Protocol for Assay and Certification of Gaseous Calibration Standards (May 2012)" document EPA 600/R-12/531, using the assay procedures listed. Analytical Methodology does not require correction for analytical interference. This cylinder has a total analytical uncertainty as stated below with a confidence level of 95%. There are no significant impurities which affect the use of this calibration mixture. All concentrations are on a volume/volume basis unless otherwise noted.

Do Not Use This Cylinder below 100 psig, i.e. 0.7 megapascals.

ANALYTICAL RESULTS

Component	Requested Concentration	Actual Concentration	Protocol Method	Total Relative Uncertainty	Assay Dates
CARBON MONOXIDE	90.00 PPM	90.55 PPM	G1	+/- 0.7% NIST Traceable	10/08/2018
NITROGEN	Balance				

CALIBRATION STANDARDS

Type	Lot ID	Cylinder No	Concentration	Uncertainty	Expiration Date
NTRM	12062224	CC365465	97.56 PPM CARBON MONOXIDE/NITROGEN	+/- 0.6%	May 10, 2024

ANALYTICAL EQUIPMENT

Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
CO-1 SIEMENS ULTRAMAT 6E N1J5700	NDIR	Oct 02, 2018

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Airgas.
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R 011761

CERTIFICATE OF ANALYSIS

Grade of Product: EPA Protocol

Part Number:	E02NI99E15A0110	Reference Number:	54-401131450-1
Cylinder Number:	CC132209	Cylinder Volume:	144.3 CF
Laboratory:	124 - Chicago (SAP) - IL	Cylinder Pressure:	2015 PSIG
PGVP Number:	B12018	Valve Outlet:	350
Gas Code:	CO,BALN	Certification Date:	Feb 26, 2018

Expiration Date: Feb 26, 2026

Certification performed in accordance with "EPA Traceability Protocol for Assay and Certification of Gaseous Calibration Standards (May 2012)" document EPA 600/R-12/531, using the assay procedures listed. Analytical Methodology does not require correction for analytical interference. This cylinder has a total analytical uncertainty as stated below with a confidence level of 95%. There are no significant impurities which affect the use of this calibration mixture. All concentrations are on a volume/volume basis unless otherwise noted.

Do Not Use This Cylinder below 100 psig, i.e. 0.7 megapascals.

ANALYTICAL RESULTS

Component	Requested Concentration	Actual Concentration	Protocol Method	Total Relative Uncertainty	Assay Dates
CARBON MONOXIDE	180.0 PPM	184.9 PPM	G1	+/- 0.9% NIST Traceable	02/26/2018
NITROGEN	Balance				

CALIBRATION STANDARDS

Type	Lot ID	Cylinder No	Concentration	Uncertainty	Expiration Date
NTRM	14060329	CC432354	252.5 PPM CARBON MONOXIDE/NITROGEN	+/- 0.3%	Feb 21, 2020

ANALYTICAL EQUIPMENT

Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
CO-1 SIEMENS ULTRAMAT 6E N1J5700	NDIR	Feb 14, 2018

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C. Wright

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Airgas

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CERTIFICATE OF ANALYSIS
Grade of Product: EPA Protocol

Part Number:	E02AI99E15A0274	Reference Number:	54-124555697-1
Cylinder Number:	CC502457	Cylinder Volume:	144.0 CF
Laboratory:	ASG - Chicago - IL	Cylinder Pressure:	2014 PSIG
PGVP Number:	B12016	Valve Outlet:	660
Gas Code:	SO2,BALA	Certification Date:	Jun 01, 2016

Expiration Date: Jun 01, 2020

Certification performed in accordance with "EPA Traceability Protocol for Assay and Certification of Gaseous Calibration Standards (May 2012)" document EPA 600/R-12/531, using the assay procedures listed. Analytical Methodology does not require correction for analytical interference. This cylinder has a total analytical uncertainty as stated below with a confidence level of 95%. There are no significant impurities which affect the use of this calibration mixture. All concentrations are on a volume/volume basis unless otherwise noted.

Do Not Use This Cylinder below 100 psig, i.e. 0.7 megapascals.

ANALYTICAL RESULTS

Component	Requested Concentration	Actual Concentration	Protocol Method	Total Relative Uncertainty	Assay Dates
SULFUR DIOXIDE	25.00 PPM	25.70 PPM	G1	+/- 1% NIST Traceable	05/23/2016, 06/01/2016
AIR	Balance				

CALIBRATION STANDARDS

Type	Lot ID	Cylinder No	Concentration	Uncertainty	Expiration Date
NTRM	11060221	CC281069	49.67 PPM SULFUR DIOXIDE/NITROGEN	+/- 1.2%	May 13, 2017
NTRM	11060221	CC281069	49.67 PPM SULFUR DIOXIDE/NITROGEN	+/- 1.2%	May 13, 2017

ANALYTICAL EQUIPMENT

Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
MKS Multigas 17707558	FTIR	May 24, 2016

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RL011763

CERTIFICATE OF ANALYSIS

Grade of Product: EPA Protocol

Part Number:	E02AI99E15W0094	Reference Number:	54-401400158-1
Cylinder Number:	CC515958	Cylinder Volume:	146.2 CF
Laboratory:	124 - Chicago (SAP) - IL	Cylinder Pressure:	2015 PSIG
PGVP Number:	B12019	Valve Outlet:	660
Gas Code:	SO2,BALA	Certification Date:	Jan 29, 2019

Expiration Date: Jan 29, 2027

Certification performed in accordance with "EPA Traceability Protocol for Assay and Certification of Gaseous Calibration Standards (May 2012)" document EPA 600/R-12/531, using the assay procedures listed. Analytical Methodology does not require correction for analytical interference. This cylinder has a total analytical uncertainty as stated below with a confidence level of 95%. There are no significant impurities which affect the use of this calibration mixture. All concentrations are on a volume/volume basis unless otherwise noted.

Do Not Use This Cylinder below 100 psig, i.e. 0.7 megapascals.

ANALYTICAL RESULTS

Component	Requested Concentration	Actual Concentration	Protocol Method	Total Relative Uncertainty	Assay Dates
SULFUR DIOXIDE	50.00 PPM	50.56 PPM	G1	+/- 1.1% NIST Traceable	01/22/2019, 01/29/2019
AIR	Balance				

CALIBRATION STANDARDS

Type	Lot ID	Cylinder No	Concentration	Uncertainty	Expiration Date
NTRM	17060412	CC484864	98.32 PPM SULFUR DIOXIDE/NITROGEN	+/- 0.8%	Dec 07, 2022
NTRM	17060403	CC484452	98.32 PPM SULFUR DIOXIDE/NITROGEN	+/- 0.8%	Dec 07, 2022

ANALYTICAL EQUIPMENT

Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
Nicolet 6700 AHR0801332	FTIR	Jan 28, 2019

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Airgas
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R 011764

CERTIFICATE OF ANALYSIS

Grade of Product: EPA Protocol

Part Number:	E03NI80E15A0138	Reference Number:	54-401553801-1
Cylinder Number:	CC352366	Cylinder Volume:	150.9 CF
Laboratory:	124 - Chicago (SAP) - IL	Cylinder Pressure:	2015 PSIG
PGVP Number:	B12019	Valve Outlet:	590
Gas Code:	CO2,O2,BALN	Certification Date:	Aug 06, 2019

Expiration Date: Aug 06, 2027

Certification performed in accordance with "EPA Traceability Protocol for Assay and Certification of Gaseous Calibration Standards (May 2012)" document EPA 600/R-12/531, using the assay procedures listed. Analytical Methodology does not require correction for analytical interference. This cylinder has a total analytical uncertainty as stated below with a confidence level of 95%. There are no significant impurities which affect the use of this calibration mixture. All concentrations are on a volume/volume basis unless otherwise noted.

Do Not Use This Cylinder below 100 psig, i.e. 0.7 megapascals.

ANALYTICAL RESULTS

Component	Requested Concentration	Actual Concentration	Protocol Method	Total Relative Uncertainty	Assay Dates
CARBON DIOXIDE	10.00 %	9.882 %	G1	+/- 1.0% NIST Traceable	08/06/2019
OXYGEN	10.00 %	10.09 %	G1	+/- 1.0% NIST Traceable	08/06/2019
NITROGEN	Balance				

CALIBRATION STANDARDS

Type	Lot ID	Cylinder No	Concentration	Uncertainty	Expiration Date
NTRM	08010607	K003900	13.94 % CARBON DIOXIDE/NITROGEN	+/- 0.57	Jan 30, 2024
NTRM	98051019	SG9168269BAL	12.05 % OXYGEN/NITROGEN	+/- 0.7%	Dec 14, 2023

ANALYTICAL EQUIPMENT

Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
CO2-1 HORIBA VIA-510 V1E3H7P5	NDIR	Jul 08, 2019
O2-1 HORIBA MPA-510 3VUYL9NR	Paramagnetic	Aug 05, 2019

Triad Data Available Upon Request

Approved for Release

Page 1 of 54-401553801-1

CERTIFICATE OF ANALYSIS
Grade of Product: EPA Protocol

Part Number:	E03NI59E15A3452	Reference Number:	54-124579079-4
Cylinder Number:	CC191078	Cylinder Volume:	159.0 CF
Laboratory:	124 - Chicago - IL	Cylinder Pressure:	2015 PSIG
PGVP Number:	B12016	Valve Outlet:	590
Gas Code:	CO2,O2,BALN	Certification Date:	Sep 26, 2016

Expiration Date: Sep 26, 2024

Certification performed in accordance with “EPA Traceability Protocol for Assay and Certification of Gaseous Calibration Standards (May 2012)” document EPA 600/R-12/531, using the assay procedures listed. Analytical Methodology does not require correction for analytical interference. This cylinder has a total analytical uncertainty as stated below with a confidence level of 95%. There are no significant impurities which affect the use of this calibration mixture. All concentrations are on a volume/volume basis unless otherwise noted.

Do Not Use This Cylinder below 100 psig, i.e. 0.7 megapascals.

ANALYTICAL RESULTS

Component	Requested Concentration	Actual Concentration	Protocol Method	Total Relative Uncertainty	Assay Dates
CARBON DIOXIDE	19.00 %	18.60 %	G1	+/- 1.0% NIST Traceable	09/26/2016
OXYGEN	22.00 %	21.76 %	G1	+/- 1.1% NIST Traceable	09/26/2016
NITROGEN	Balance				

CALIBRATION STANDARDS

Type	Lot ID	Cylinder No	Concentration	Uncertainty	Expiration Date
NTRM	13060709	CC413602	16.939 % CARBON DIOXIDE/NITROGEN	+/- 0.6%	May 08, 2019
NTRM	12062016	CC367570	22.88 % OXYGEN/NITROGEN	+/- 0.2%	Apr 24, 2018

ANALYTICAL EQUIPMENT

Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
CO2-1 HORIBA VIA-510 V1E3H7P5	NDIR	Sep 21, 2016
O2-1 HORIBA MPA-510 3VUYL9NR	Paramagnetic	Sep 23, 2016

Triad Data Available Upon Request

Signature on file

Approved for Release

Airgas
an Air Liquide company

Airgas USA, LLC
525 North Industrial Loop Road
Tooele, UT 84074
Airgas.com

R 011766

CERTIFICATE OF ANALYSIS
Grade of Product: EPA Protocol

Part Number:	E03NI80E80A7767	Reference Number:	153-401591108-1
Cylinder Number:	ET0006082	Cylinder Volume:	87.4 CF
Laboratory:	124 - Tooele (SAP) - UT	Cylinder Pressure:	2214 PSIG
PGVP Number:	B72019	Valve Outlet:	590
Gas Code:	CO2,O2,BALN	Certification Date:	Sep 09, 2019

Expiration Date: Sep 09, 2027

Certification performed in accordance with "EPA Traceability Protocol for Assay and Certification of Gaseous Calibration Standards (May 2012)" document EPA 600/R-12/531, using the assay procedures listed. Analytical Methodology does not require correction for analytical interference. This cylinder has a total analytical uncertainty as stated below with a confidence level of 95%. There are no significant impurities which affect the use of this calibration mixture. All concentrations are on a volume/volume basis unless otherwise noted.

Do Not Use This Cylinder below 100 psig, i.e. 0.7 megapascals.

ANALYTICAL RESULTS

Component	Requested Concentration	Actual Concentration	Protocol Method	Total Relative Uncertainty	Assay Dates
CARBON DIOXIDE	10.00 %	9.936 %	G1	+/- 0.8% NIST Traceable	09/09/2019
OXYGEN	10.00 %	9.993 %	G1	+/- 0.4% NIST Traceable	09/09/2019
NITROGEN	Balance				

CALIBRATION STANDARDS

Type	Lot ID	Cylinder No	Concentration	Uncertainty	Expiration Date
NTRM	13060628	CC413727	13.359 % CARBON DIOXIDE/NITROGEN	0.6%	May 14, 2025
NTRM	09060238	CC263127	9.961 % OXYGEN/NITROGEN	0.3%	Nov 05, 2024

ANALYTICAL EQUIPMENT

Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
Horiba VIA-510 SV4MEUTJ CO2	CO2 NDIR (Dixon)	Sep 06, 2019
Horiba MPA-510 W603MM58 O2	O2 Paramagnetic (Mason)	Sep 05, 2019

Triad Data Available Upon Request

Approved for Release

Airgas
an Air Liquide company

Airgas Specialty Gases R 014767
Airgas USA, LLC
12722 S. Wentworth Ave.
Chicago, IL 60628
Airgas.com

CERTIFICATE OF ANALYSIS

Grade of Product: EPA Protocol

Part Number:	E03NI62E80A0014	Reference Number:	54-401522587-1
Cylinder Number:	XL361318B	Cylinder Volume:	92.2 CF
Laboratory:	124 - Chicago (SAP) - IL	Cylinder Pressure:	2214 PSIG
PGVP Number:	B12019	Valve Outlet:	590
Gas Code:	CO2,O2,BALN	Certification Date:	Jun 14, 2019

Expiration Date: Jun 14, 2027

Certification performed in accordance with "EPA Traceability Protocol for Assay and Certification of Gaseous Calibration Standards (May 2012)" document EPA 600/R-12/531, using the assay procedures listed. Analytical Methodology does not require correction for analytical interference. This cylinder has a total analytical uncertainty as stated below with a confidence level of 95%. There are no significant impurities which affect the use of this calibration mixture. All concentrations are on a volume/volume basis unless otherwise noted.

Do Not Use This Cylinder below 100 psig, i.e. 0.7 megapascals.

ANALYTICAL RESULTS

Component	Requested Concentration	Actual Concentration	Protocol Method	Total Relative Uncertainty	Assay Dates
CARBON DIOXIDE	19.00 %	18.72 %	G1	+/- 0.6% NIST Traceable	06/14/2019
OXYGEN	19.00 %	19.42 %	G1	+/- 0.6% NIST Traceable	06/14/2019
NITROGEN	Balance				

CALIBRATION STANDARDS

Type	Lot ID	Cylinder No	Concentration	Uncertainty	Expiration Date
NTRM	060118	K008299	23.04 % CARBON DIOXIDE/NITROGEN	+/- 0.5%	Jun 27, 2022
NTRM	15010420	K027067	22.454 % OXYGEN/NITROGEN	+/- 0.2%	Aug 05, 2021

ANALYTICAL EQUIPMENT

Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
CO2-1 HORIBA VIA-510 V1E3H7P5	NDIR	Jun 03, 2019
O2-1 HORIBA MPA-510 3VUYL9NR	Paramagnetic	May 25, 2019

Triad Data Available Upon Request

Approved for Release

Airgas Specialty Gases
Airgas USA, LLC
12722 S. Wentworth Ave.
Chicago, IL 60628
Airgas.com

R 011768

Airgas
an Air Liquide company

CERTIFICATE OF ANALYSIS
Grade of Product: EPA Protocol

Part Number:	E02NI80E15A3290	Reference Number:	54-124607465-3
Cylinder Number:	CC238024	Cylinder Volume:	146.1 CF
Laboratory:	124 - Chicago (SAP) - IL	Cylinder Pressure:	2015 PSIG
PGVP Number:	B12017	Valve Outlet:	590
Gas Code:	O2,BALN	Certification Date:	Mar 08, 2017

Expiration Date: Mar 08, 2025

Certification performed in accordance with "EPA Traceability Protocol for Assay and Certification of Gaseous Calibration Standards (May 2012)" document EPA 600/R-12/531, using the assay procedures listed. Analytical Methodology does not require correction for analytical interference. This cylinder has a total analytical uncertainty as stated below with a confidence level of 95%. There are no significant impurities which affect the use of this calibration mixture. All concentrations are on a volume/volume basis unless otherwise noted.

Do Not Use This Cylinder below 100 psig, i.e. 0.7 megapascals.

ANALYTICAL RESULTS

Component	Requested Concentration	Actual Concentration	Protocol Method	Total Relative Uncertainty	Assay Dates
OXYGEN	20.00 %	20.73 %	G1	+/- 0.7% NIST Traceable	03/08/2017
NITROGEN	Balance			-	

CALIBRATION STANDARDS

Type	Lot ID	Cylinder No	Concentration	Uncertainty	Expiration Date
NTRM	12062017	CC367575	22.88 % OXYGEN/NITROGEN	+/- 0.2%	Apr 24, 2018

ANALYTICAL EQUIPMENT

Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
O2-1 HORIBA MPA-510 3VUYL9NR	Paramagnetic	Mar 03, 2017

Triad Data Available Upon Request

Signature on file

Approved for Release

Appendix J - Visible Emissions Data and Reader Certification

VISIBLE EMISSIONS EVALUATOR

Larry Sorce

This is to certify that the above named observer has met the specifications of Federal Reference Method 9 and is qualified as a visible emissions evaluator. Maximum deviation on white and black smoke did not exceed 7.5% opacity and no single error exceeding 15% opacity was incurred during the certification test conducted by Eastern Technical Associates, Inc. of Raleigh, N.C. This certificate is valid for six months from date of issue.

465264
Certificate #

SOR247112
Student ID Number

8/28/2019
Date of Certification

Valparaiso, IN
Location

2/27/2020
Certification Expiration Date

NonETA
Last Lecture

Jody Monk

General Manager

M193103

Visible Emissions Observation Record Form

Sheet: 1 of 1

Facility Location:
General Iron Industries, Inc.
1909 N. Clifton St.
Chicago, IL 60614

Date: 11-15-19

Observer: A. L. SORCE
Observation Start: 1035
End: 1323

* scrubber stack outlet

Observation Point:
Due west of bay door off maintenance bldg. approx 10 ft from river.

Distance from Source: 80 ft.
Source Height: ≈ 50 ft.
Emission Color: As noted
Background: sky

Sky Condition: Overcast, HIGH

Sun Position: In compliance
Temperature: 32 °F
Wind Direction: W≤W at 7-10 mph
Reading Conditions: GOOD

Operating Conditions:
Normal operation

Plume Description:
steam
Attached or Detached

Signature: [signature]

Certification Date:
Aug. 28, 2019

><	0	15	30	45	Notes
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6	0	0	0	0	
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29	0	0	0	0	1

><	0	15	30	45	Notes
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59	0	0	0	0	

Comments / Process Information:

Notes:
1 Pause for port change @ 1105

Notes:
2 Resume observation at 1118
3 Pause at 1123 for mist.
4 Resume at 1136.
5 Pause at 1252
6 Resume at 1315

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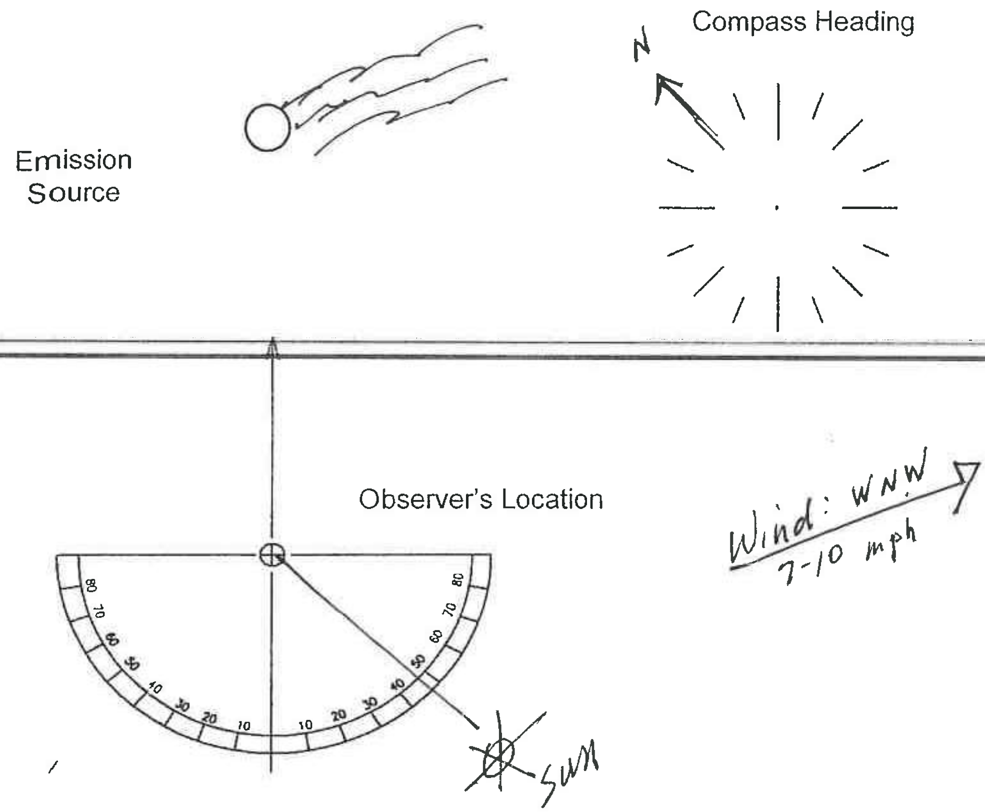
M193103

Visible Emissions Record Form

USEPA Method 9

Date 11 / 15 / 19

Site General Iron Ind., Inc
Chicago, IL 60614



Observer: A. L. SORCE

Comments: ① In compliance
② + ③ As noted
④ Attached steam
⑤ NORMAL OPERATION

Note:
1. Sun Position
2. Wind Direction
3. Wind Speed
4. Plume Type
5. Operating Level

EPA Reference Method 9

M193103

Visible Emissions Observation Record Form

Sheet: 1 of 1

Date: 11-18-19

Facility Location:
General Iron Industries, Inc.
1909 N. Clifton St.
Chicago, IL 60614

+ scrubber stack outlet

Observer: A. L. SORCE
Observation Start: 0851
End: 1112

Observation Point:
Due west of main bldg. bay door approx 10ft from river. WSW of source outlet

Distance from Source: 80 ft.
Source Height: @ 50 ft.
Emission Color: As noted
Background: sky
Sky Condition: Low overcast
Sun Position: In compliance
Temperature: 39 °F
Wind Direction: NNW at 6-10 mph
Reading Conditions: FAIR

Operating Conditions:
Normal operation

Plume Description:
steam
Attached or Detached

Signature:

Certification Date:
Aug. 28, 2019

><	0	15	30	45	Notes	><	0	15	30	45	Notes
0	0	0	0	0		30	0	0	0	0	2
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29	0	0	0	0	1	59	0	0	0	0	

Comments / Process Information:
Run #2

Notes:
1 Port change @ 0921

Notes:
2 Resume test @ 1042

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Visible Emissions Record Form

USEPA Method 9

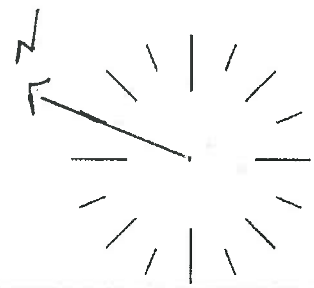
Date 11/18/19

Site General Iron Ind. Inc.
Chicago, IL 60614

Run #2

Compass Heading

Emission Source

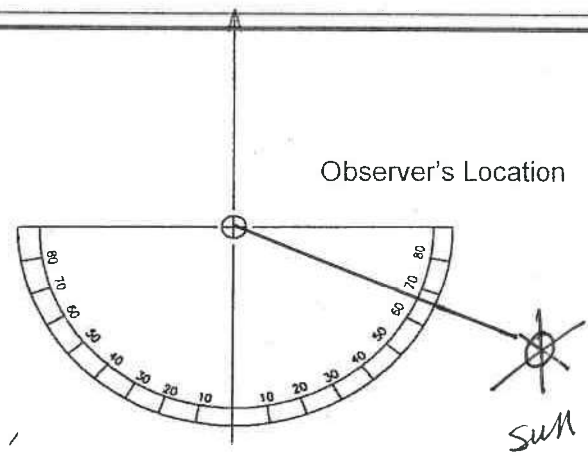


0851 – 1112

Observer's Location

Wind: NNW

6-10 mph



Observer: A. L. SORCE

Comments: ① In compliance.
② + ③ As noted
④ Attached steam
⑤ Normal operation

Note:
1. Sun Position
2. Wind Direction
3. Wind Speed
4. Plume Type
5. Operating Level

EPA Reference Method 9

M193103

Visible Emissions Observation Record Form

Run #3

Sheet: 1 of 1

Facility Location:
General Iron Industries, Inc.
1909 No. Clifton St.
CHICAGO, IL 60614

Date: 11-18-19

Observer: A. L. SORCE
Observation Start: 1122
End: 1246

* scrubber stack outlet

Observation Point:
Due west of main bldg. bay door approx. 10ft. from river & WSW of source outlet

Distance from Source: 80 ft.
Source Height: @ 50 ft.
Emission Color: As noted
Background: SKY

Sky Condition: Low overcast

Sun Position: In compliance
Temperature: 43 °F
Wind Direction: NNW at 6-10 mph
Reading Conditions: FAIR

Operating Conditions:
NORMAL OPERATION

Plume Description:
steam
Attached or Detached

Signature:

Certification Date:
Aug. 28, 2019

><	0	15	30	45	Notes	><	0	15	30	45	Notes
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28	0	0	0	0		58	0	0	0	0	
29	0	0	0	0	1	59	0	0	0	0	

Comments / Process Information:
Run #3

Notes:
1 Port change @ 1152

Notes:
2 Resume at 1216

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M 193103

Visible Emissions Record Form

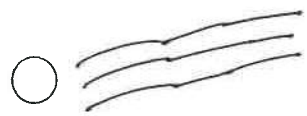
Date 11/18/19

Site General Iron Ind., Inc.
Chicago, IL

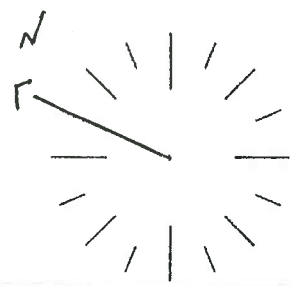
USEPA Method 9

Run #3

Emission Source

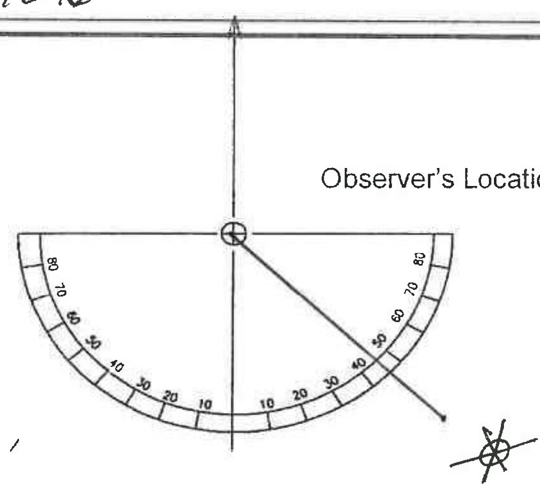


Compass Heading



1122 – 1246

Observer's Location



sun.

Wind: NNW
6-10 mph

Observer: A. L. SORCE

Comments:
① In compliance
② + ③ As noted
④ Attached steam
⑤ Normal operation.

Note:
1. Sun Position
2. Wind Direction
3. Wind Speed
4. Plume Type
5. Operating Level

EPA Reference Method 9

END OF THE REPORT

Bureau of Air Permit Section

File Organization Cover Sheet

Source Name:	General Iron Industries	
ID No.:	031600BTB	
Application No.:	18110021	
Category:	03K	
Item Date:	2-11-2019	
Keyword:	Choose an item.	*
Comment:		*
Part:	1 of 1	*

* If applicable

R 011779

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

1021 NORTH GRAND AVENUE EAST, P.O. BOX 19276, SPRINGFIELD, ILLINOIS 62794-9276 • (217) 782-3397

JB PRITZKER, GOVERNOR JOHN J. KIM, ACTING DIRECTOR

217/785-1705

CONSTRUCTION PERMIT

PERMITTEE

General Iron Industries, Inc.
Attn: Jim Kallas
1909 North Clifton Avenue
Chicago, Illinois 60614-4893

Application No.: 18110021 I.D. No.: 031600BTB
Applicant's Designation: Date Received: November 20, 2018
Subject: Installation of an RTO/Scrubber on Existing Metal Shredder
Date Issued: February 11, 2019
Location: 1909 North Clifton Avenue, Chicago, Cook County, 60614

This permit is hereby granted to the above-designated Permittee to CONSTRUCT emission source(s) and/or air pollution control equipment consisting of one (1) Natural Gas-Fired Regenerative Thermal Oxidizer (RTO) and one (1) Quench/Packed Tower Scrubber to control emissions from the existing Metal Shredder System with Integral Water Injection System, Cyclone and Roll Media Filter pursuant to the above-referenced application. This Permit is subject to standard conditions attached hereto and the following special condition(s):

1a. This permit is issued based on the construction of the Regenerative Thermal Oxidizer (RTO) and Quench/Packed Tower Scrubber not constituting a new major source or major modification pursuant to Title I of the Clean Air Act, specifically 40 CFR 52.21 Prevention of Significant Deterioration (PSD).

b. This permit is issued based on the construction of the Regenerative Thermal Oxidizer (RTO) and Quench/Packed Tower Scrubber not constituting a new major source or major modification pursuant to Title I of the Clean Air Act, specifically 35 Ill. Adm. Code Part 203 (Major Stationary Sources Construction and Modification

c. Operation of the RTO and Quench/Packed Tower Scrubber is allowed under this Construction Permit until final action is taken on the Federally Enforceable State Operating Permit (FESOP) application for this source.

2a. The Metal Shredder System controlled by Regenerative Thermal Oxidizer (RTO) and Quench/Packed Tower Scrubber is subject to 35 Ill. Adm. Code Part 212 Subpart B (Visible Emissions). Pursuant to 35 Ill. Adm. Code 212.123(a), no person shall cause or allow the emission of smoke or other particulate matter, with an opacity greater than 30 percent, into the atmosphere from any emission unit other than those emission units subject to 35 Ill. Adm. Code 212.122.

b. Pursuant to 35 Ill. Adm. Code 212.123(b), the emission of smoke or other particulate matter from any such emission unit may have an opacity greater than 30 percent but not greater than 60 percent for a period or periods aggregating 8 minutes in any 60 minute period provided that such opaque emissions permitted during any 60 minute

REVIEWER: EMI

APR 22 2019

IEPA-DIVISION OF RECORDS MANAGEMENT RELEASABLE period shall occur from only one such emission unit located within a 305 m (1000 ft) radius from the center point of any other such emission unit owned or operated by such person, and provided further that such opaque emissions permitted from each such emission unit shall be limited to 3 times in any 24 hour period.

c. The Metal Shredder System controlled by Regenerative Thermal Oxidizer (RTO) and Quench/Packed Tower Scrubber is subject to 35 Ill. Adm. Code Part 212 Subpart L (Particulate Matter Emissions from Process Emission Units). Pursuant to 35 Ill. Adm. Code 212.321(a), except as further provided in 35 Ill. Adm. Code Part 212, no person shall cause or allow the emission of particulate matter into the atmosphere in any one hour period from any new process emission unit which, either alone or in combination with the emission of particulate matter from all other similar process emission units for which construction or modification commenced on or after April 14, 1972, at a source or premises, exceeds the allowable emission rates specified in 35 Ill. Adm. Code 212.321(c).

3. The Metal Shredder System controlled by Regenerative Thermal Oxidizer (RTO) and Quench/Packed Tower Scrubber. Pursuant to 35 Ill. Adm. Code 214.301, except as further provided by 35 Ill. Adm. Code Part 214, no person shall cause or allow the emission of sulfur dioxide into the atmosphere from any process emission source to exceed 2000 ppm.

4a. The Metal Shredder System controlled by Regenerative Thermal Oxidizer (RTO) and Quench/Packed Tower Scrubber is subject to 35 Ill. Adm. Code Part 218 Subpart G (Use of Organic Material). Pursuant to 35 Ill. Adm. Code 218.301, no person shall cause or allow the discharge of more than 3.6 kg/hr (8 lbs/hr) of organic material into the atmosphere from any emission unit, except as provided in 35 Ill. Adm. Code 218.302, 218.303, or 218.304 and the following exception: If no odor nuisance exists the limitation of 35 Ill. Adm. Code Part 218 Subpart G shall only apply to photochemically reactive material.

b. Pursuant to 35 Ill. Adm. Code 218.302(a), emissions of organic material in excess of those permitted by 35 Ill. Adm. Code 218.301 are allowable if such emissions are controlled by one of the following methods:

Flame, thermal or catalytic incineration so as either to reduce such emissions to 10 ppm equivalent methane (molecular weight 16) or less, or to convert 85 percent of the hydrocarbons to carbon dioxide and water.

c. The existing Metal Shredder System controlled by Regenerative Thermal Oxidizer (RTO) and Quench/Packed Tower Scrubber is subject to 35 Ill. Adm. Code Part 218 Subpart TT (Other Emission Units). Pursuant to 35 Ill. Adm. Code 218.986(a), every owner or operator of an emission unit subject to 35 Ill. Adm. Code 218 Subpart TT shall comply with the requirements of 35 Ill. Adm. Code 218.986(a) below.

Emission capture and control equipment which achieve an overall reduction in uncontrolled VOM emissions of at least 81 percent from each emission unit.

5a. In the event that the operation of this source results in an odor nuisance, the Permittee shall take appropriate and necessary actions to minimize odors, including but not limited to, changes in material or installation of controls, in order to eliminate the odor nuisance.

b. The Regenerative Thermal Oxidizer (RTO) and Quench/Packed Tower Scrubber shall be in operation at all times when the associated Metal Shredder System is in operation and emitting air contaminants.

c. The Permittee shall, in accordance with the manufacturer(s) and/or vendor(s) recommendations, perform periodic maintenance on the Regenerative Thermal Oxidizer (RTO) and the Quench/Packed Tower Scrubber associated with the Metal Shredder System such that the RTO and the Quench/Packed Tower Scrubber are kept in proper working condition and not cause a violation of the Illinois Environmental Protection Act or regulations promulgated therein.

d. The Regenerative Thermal Oxidizer (RTO) combustion chambers shall be preheated to at least the manufacturer's recommended temperature but no less than the average temperature at which compliance was demonstrated in the most recent compliance test, or 1400°F in the absence of a compliance test. The rolling three hour average temperature shall be maintained during operation of the Metal Shredder System.

e. The Regenerative Thermal Oxidizer (RTO) shall only be operated with natural gas as the fuel. The use of any other fuel in the RTO may require that the Permittee first obtain a construction permit from the Illinois EPA and then perform stack testing to verify compliance with all applicable requirements.

f. The Regenerative Thermal Oxidizer (RTO) shall be equipped with a temperature monitoring device that is installed, calibrated, operated and maintained, in accordance with vendor/manufacturer specifications and 35 Ill. Adm. Code 218.105(d)(2).

g. The Quench/Packed Tower Scrubber shall be equipped with monitoring devices for pressure differential, scrubbant liquid flow rate, and pH of the scrubbant liquid. These monitoring devices shall be installed, calibrated, operated and maintained, in accordance with vendor/manufacturer specifications.

h. Within 30 days of the startup of the Regenerative Thermal Oxidizer (RTO) and the Quench/Packed Tower Scrubber, the Permittee shall submit for Illinois EPA approval a Metal Shredder System operation, monitoring, and maintenance plan that details specific operation, monitoring, and maintenance practices for the equipment identified in this Permit, including frequencies of such specific activities and actions, individuals responsible for such activities and actions, and associated recordkeeping procedures.

6a. The Regenerative Thermal Oxidizer (RTO) and Quench/Packed Tower Scrubber shall be designed, operated, and maintained in a manner that ensures the minimum destruction efficiency for VOM emissions from the Existing Metal Shredder is 98%.

b. Emissions from fuel combustion in the Regenerative Thermal Oxidizer (RTO) associated with the Metal Shredding System shall not exceed the following limits:

i. Natural gas Usage: 6.57 mmscf/month, 52.5 mmscf/year

ii. Emissions from the combustion of natural gas:

Pollutant	Emission Factor (lbs/mmscf)	Emissions (Tons/Mo)	Emissions (Tons/Yr)
Carbon Monoxide (CO)	149.23	0.49	3.92
Nitrogen Oxides (NO_x)	100.00	0.33	2.63

These limits are based on the maximum firing rate of the RTO burner (15.0 mmBtu/hour), maximum natural gas usage, approximately 1% of uncontrolled VOM emissions being emitted as CO emissions due to incomplete combustion, and standard emission factors (Tables 1.4-1 and 1.4-2, AP-42, Fifth Edition, Volume I, Supplement D, July 1998).

c. Compliance with the annual limits of this permit shall be determined on a monthly basis from the sum of the data for the current month plus the preceding 11 months (running 12-month total).

7. Pursuant to 35 Ill. Adm. Code 218.988(a), when in the opinion of the Illinois EPA it is necessary to conduct testing to demonstrate compliance with 35 Ill. Adm. Code 218.986, the owner or operator of a VOM emission unit subject to the requirements of 35 Ill. Adm. Code Part 218 Subpart TT shall, at his own expense, conduct such tests in accordance with the applicable test methods and procedures specified in 35 Ill. Adm. Code 218.105.

8a. Within sixty (60) days after initial startup of the Regenerative Thermal Oxidizer (RTO) and the Quench/Packed Tower Scrubber, the Permittee shall have emission measurements and VOM efficiency stack testing conducted during conditions which are representative of maximum emissions from the Metal Shredding System controlled by Regenerative Thermal Oxidizer (RTO) and the Quench/Packed Tower Scrubber using USEPA Methods and Procedures detailed in Condition 8(d) below.

b. This testing shall be conducted by an independent testing service.

c. This testing shall determine the mass emission rates of PM, SO_2, CO, Metals, HCl, HF, condensable particulate matter, and VOM from the Metal Shredding System controlled by a Regenerative Thermal Oxidizer (RTO) and Quench/Packed Tower Scrubber, and VOM destruction efficiency of the RTO.

d. The following methods and procedures shall be used for testing of emissions, unless another method is approved by the Illinois EPA: Refer to 40 CFR 51, Appendix M and 40 CFR 60, Appendix A for USEPA test methods.

Sample and Velocity Traverses for Stationary Sources	USEPA Method 1 or 1A
Determination of Stack Gas Velocity and Volumetric Flow Rate (Type S Pitot Tube)	USEPA Method 2, 2A, 2C, 2D
Gas Analysis for the Determination of Dry Molecular Weight	USEPA Method 3
Determination of Moisture Content in Stack Gases	USEPA Method 4
Determination of Particulate Matter from Stationary Sources	USEPA Method 5
Determination of Sulfur Dioxide from Stationary Sources	USEPA Method 6 or 6C
Visual Determination of the Opacity of Emissions from Stationary Sources	USEPA Method 9
Determination of Carbon Monoxide from Stationary Sources	USEPA Method 10
Determination of Total Gaseous Nonmethane Organic Emissions as Carbon	USEPA Method 25
Determination of Total Gaseous Organic Concentration Using a Flame Ionization Analyzer	USEPA Method 25A*
Determination of Hydrogen Chloride Emissions From Stationary Sources	USEPA Method 26 or 26A
Determination of Metals Emissions from Stationary Sources	USEPA Method 29
Determination of Condensable Particulate from Stationary Sources	USEPA Method 202

*USEPA Method 25A may only be used if outlet VOM concentration is less than 50 ppm as carbon (non-methane).

e. At least sixty (60) days prior to the actual date of testing, the Permittee shall submit a written test plan to the Illinois EPA, Compliance Section. The IEPA may at the discretion of the Compliance Section Manager (or designee) accept protocol less than 60 days prior to testing provided it does not interfere with the IEPA's ability to review and comment on the protocol and does not deviate from the applicable state or federal statutes. The protocol shall be submitted to the IEPA, Compliance Section and IEPA, Stack Test Specialist for its review. This test plan shall include at a minimum:

i. The name (or other identification) of the emission unit(s) to be tested and the name and address of the facility at which they are located;

ii. The name and address of the independent testing service(s) performing the tests, with the names of the individuals who may be performing sampling and analysis and their experience with similar tests;

iii. The specific determinations of emissions and/or performance which are intended to be made, including the site(s) in the ductwork or stack at which sampling will occur;

iv. The specific conditions under which testing will be performed, including a discussion of why these conditions will be representative of the maximum emissions, maximum operating rate, the levels of operating parameters for the emission unit, including associated control equipment, at or within which compliance is intended to be shown, and the means by which the operating parameters will be determined;

v. The test method(s) which will be used, with the specific analysis method, if the method can be used with different analysis methods. The specific sampling, analytical and quality control procedures which will be used, with an identification of the standard methods upon which they are based;

vi. Any minor changes in standard methodology proposed to accommodate the specific circumstances of testing, with justification;

vii. Any proposed use of an alternative test method, with detailed justification; and

viii. The format and content of the Source Test Report.

f. The Permittee shall provide the Illinois EPA with written notification of testing at least thirty (30) days prior to testing to enable the Illinois EPA to have an observer present. This notification shall include the name of emission unit(s) to be tested, scheduled date and time, and contact person with telephone number. The IEPA may at its discretion of the Compliance Section Manager (or designee) accept notifications with shorter advance notice provided such notifications will not interfere with the IEPA's ability to observe testing.

g. If testing is delayed from the date provided, the Permittee shall promptly notify the Illinois EPA by e-mail or facsimile, at least five (5) days prior to the scheduled date of testing or immediately, if the delay occurs in the five (5) days prior to the scheduled date. This notification shall also include the new proposed date and time for testing, if set, or a separate notification shall be sent with this information when it is set.

h. The Permittee shall submit the Final Test Report(s) for these tests accompanied by a cover letter stating whether or not compliance was shown, to the Illinois EPA, within fourteen (14) days after the test results are compiled and finalized, but no later than sixty (60) days after the date of testing or sampling. The Final Test Report shall include as a minimum:

i. General information describing the test, including the name and identification of the emission source which was tested, date of testing, names of personnel performing the tests, and Illinois

EPA observers, if any;

ii. A summary of results;

iii. Description of test procedures and method(s), including description and map of emission units and sampling points, sampling train, testing and analysis equipment, and test schedule;

iv. Detailed description of test conditions, including:

A. List and description of the equipment (including serial numbers or other equipment specific identifiers) tested and process information (i.e., mode(s) of operation, process rate or throughput of the metal shredder, and a description of material processed in the metal shredder;

B. Control equipment information (i.e., equipment condition and operating parameters (i.e. RTO temperature, RTO fuel feed rate, scrubbant flow rate, scrubbant PH, and differential pressure of the scrubber) during testing; and

C. A discussion of any preparatory actions taken (i.e., equipment inspections, shredder feed material separation, shredder/RTO/Scrubber equipment maintenance and repair).

v. Data and calculations, including copies of all raw data sheets and records of laboratory analyses, sample calculations, and data on equipment calibration. Identification of the applicable regulatory standards and permit conditions that the testing was performed to demonstrate compliance with, a comparison of the test results to the applicable regulatory standards and permit conditions, and a statement whether the test(s) demonstrated compliance with the applicable standards and permit conditions;

vi. An explanation of any discrepancies among individual tests, failed tests or anomalous data;

vii. The results and discussion of all quality control evaluation data, including a copy of all quality control data; and

viii. The applicable operating parameters of the pollution control device(s) during testing (temperature, pressure drop, scrubbant flow rate, etc.), if any.

i. Satisfactory completion of this test so as to demonstrate compliance with applicable emission standards and permit conditions is a prerequisite to issuance of an operating permit, pursuant to 35 Ill. Adm. Code 201.160(b).

9a. Pursuant to 35 Ill. Adm. Code 218.105(d)(2)(A)(i), an owner or operator: That uses an afterburner to comply with any Section of 35 Ill. Adm. Code Part 218 shall use Illinois EPA and USEPA approved continuous monitoring equipment which is installed, calibrated, maintained, and operated according to vendor specifications at all times the control device is in use except as provided in 35 Ill. Adm. Code 218.105(d)(3). The continuous monitoring equipment must monitor the combustion chamber temperature of each afterburner.

b. Pursuant to 35 Ill. Adm. Code 218.105(d)(2)(B), an owner or operator: Must install, calibrate, operate and maintain, in accordance with manufacturer's specifications, a continuous recorder on the RTO combustion chamber temperature monitoring device, such as a strip chart, recorder or computer, having an accuracy of ± 1 percent of the temperature measured in degrees Celsius or ± 0.5° C, whichever is greater.

c. The Permittee shall conduct daily USEPA Method 22 observations of the exhaust stack for the Regenerative Thermal Oxidizer (RTO) and the Quench/Packed Tower Scrubber associated with the Metal Shredder System during normal operations. If visible emissions are observed, then the Permittee shall conduct Opacity observations using USEPA Method 9. The RTO combustion chamber temperature, scrubbant flow rate, and scrubbant PH shall be documented along with these observations.

i. If after 10 consecutive days of daily Method 22 observations, no visible emission are observed, the frequency of required observations will decrease to weekly.

ii. if a weekly observation identifies visible emissions, the frequency of required observations will return to daily until such time as the frequency is decreased to weekly, pursuant to Condition 9(c)(i) above.

iii. If after 4 consecutive weekly Method 22 observations, if no visible emission are observed, the frequency of required observations will decrease to monthly.

iv. if a monthly observation identifies visible emissions, the frequency of required observations will return to weekly until such time as the frequency is decreased to monthly, pursuant to Condition 9(c)(iii) above.

10a. Pursuant to 35 Ill. Adm. Code 218.991(a)(2), any owner or operator of a VOM emission unit which is subject to the requirements of 35 Ill. Adm. Code Part 218 Subpart TT and complying by the use of emission capture and control equipment shall comply with the following:

On and after a date consistent with 35 Ill. Adm. Code 218.106, or on and after the initial start-up date, the owner or operator of a subject VOM source shall collect and record all of the following information each day and maintain the information at the source for a period of three years:

i. Control device monitoring data.

ii. A log of operating time for the capture system, control device, monitoring equipment and the associated emission source.

iii. A maintenance log for the capture system, control device and monitoring equipment detailing all routine and non-routine maintenance performed including dates and duration of any outages.

11a. The Permittee shall maintain records of the following items so as to demonstrate compliance with the conditions of this permit:

i. Records addressing use of good operating practices for the Regenerative Thermal Oxidizer (RTO) and the Quench/Packed Tower Scrubber associated with the Metal Shredder System:

A. Records for monthly inspection of the RTO and Quench/Packed Tower Scrubber with date, individual performing the inspection, and nature of inspection; and

B. Records for prompt repair of defects, with identification and description of defect, effect on emissions, date identified, date repaired, and nature of repair.

ii. Records of the temperature for the RTO, pressure differential across inlet and outlet of the Quench/Packed Tower Scrubber, scrubbant liquid flow rate, and pH of the scrubbant liquid;

iii. Records for each USEPA Method 22 and 9 visual observation conducted of the RTO and Quench/Packed Tower Scrubber with date, individual performing the observation, along with the RTO combustion chamber temperature, scrubbant flow rate, and scrubbant PH. Additionally, for USEPA Method 9 observations shall include a copy of documents indicating the individual is a certified USEPA Method 9 observer;

iv. A copy of the shredder startup procedure, operations manual, and procedures which ensures that the shredder is in proper operating condition prior to startup;

v. Natural gas usage for RTO (mmscf/month and mmscf/year); and

vi. Monthly and annual emissions of NOx and CO from the RTO, with supporting calculations (tons/month and tons/year).

b. All records and logs required by Condition 11(a) of this permit shall be retained at a readily accessible location at the source for at least five (5) years from the date of entry and shall be made available for inspection and copying by the Illinois EPA or USEPA upon request. Any records retained in an electronic format (e.g., computer storage device) shall be capable of being retrieved and printed on paper during normal source office hours so as to be able to respond to an Illinois EPA or USEPA request for records during the course of a source inspection.

12a. Pursuant to 35 Ill. Adm. Code 218.991(a), any owner or operator of a VOM emission unit which is subject to the requirements of 35 Ill. Adm. Code Part 218 Subpart TT and complying by the use of emission capture and control equipment shall comply with the following:

On and after a date consistent with 35 Ill. Adm. Code 218.106, the owner or operator of a subject VOM emission source shall notify the Illinois EPA of any violation of the requirements of 35 Ill. Adm. Code Part 218 Subpart TT by sending a copy of any record showing a violation to the Illinois EPA within 30 days following the occurrence of the violation;

13a. If there is an exceedance of or a deviation from the requirements of this permit as determined by the records required by this permit or otherwise, the Permittee shall submit a report to the Illinois EPA's Bureau of Air Compliance Section in Springfield, Illinois within thirty (30) days after the exceedance or deviation. The report shall identify the duration and the emissions impact of the exceedance or deviation, a copy of the relevant records and information to resolve the exceedance or deviation, and a description of the efforts to reduce emissions from, and the duration of exceedance or deviation, and to prevent future occurrences of any such exceedance or deviation.

b. One (1) copy of required reports and notifications shall be sent to:

Illinois Environmental Protection Agency
Bureau of Air
Compliance Section (#40)
P.O. Box 19276
Springfield, Illinois 62794-9276

If you have any questions on this permit, please call German Barria at 217/785-1705.

Raymond E. Pilapil
Manager, Permit Section
Bureau of Air

REP:GB:mlm

R 011789

STATE OF ILLINOIS
ENVIRONMENTAL PROTECTION AGENCY
DIVISION OF AIR POLLUTION CONTROL
P. O. BOX 19506
SPRINGFIELD, ILLINOIS 62794-9506

STANDARD CONDITIONS FOR CONSTRUCTION/DEVELOPMENT PERMITS ISSUED BY THE ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

July 1, 1985

The Illinois Environmental Protection Act (Illinois Revised Statutes, Chapter 111-1/2, Section 1039) authorizes the Environmental Protection Agency to impose conditions on permits which it issues.

The following conditions are applicable unless superseded by special condition(s).

1. Unless this permit has been extended or it has been voided by a newly issued permit, this permit will expire one year from the date of issuance, unless a continuous program of construction or development on this project has started by such time.

2. The construction or development covered by this permit shall be done in compliance with applicable provisions of the Illinois Environmental Protection Act, and Regulations adopted by the Illinois Pollution Control Board.

3. There shall be no deviations from the approved plans and specifications unless a written request for modification, along with plans and specifications as required, shall have been submitted to the Agency and a supplemental written permit issued.

4. The Permittee shall allow any duly authorized agent of the Agency upon the presentation of credentials, at reasonable times:

   a. to enter the Permittee's property where actual or potential effluent, emission or noise sources are located or where any activity is to be conducted pursuant to this permit,

   b. to have access to and copy any records required to be kept under the terms and conditions of this permit,

   c. to inspect, including during any hours of operation of equipment constructed or operated under this permit, such equipment and any equipment required to be kept, used, operated, calibrated and maintained under this permit,

   d. to obtain and remove samples of any discharge or emission of pollutants, and

   e. to enter and utilize any photographic, recording, testing, monitoring or other equipment for the purpose of preserving, testing, monitoring, or recording any activity, discharge, or emission authorized by this permit.

5. The issuance of this permit:

   a. shall not be considered as in any manner affecting the title of the premises upon which the permitted facilities are to be located,

   b. does not release the Permittee from any liability for damage to person or property caused by or resulting from the construction, maintenance, or operation of the proposed facilities,

   c. does not release the Permittee from compliance with the other applicable statues and regulations of the United States, of the State of Illinois, or with applicable local laws, ordinances and regulations,

   d. does not take into consideration or attest to the structural stability of any units or parts of the project, and

e. in no manner implies or suggests that the Agency (or its officers, agents or employees) assumes any liability, directly or indirectly, for any loss due to damage, installation, maintenance, or operation of the proposed equipment or facility.

6. a. Unless a joint construction/operation permit has been issued, a permit for operation shall be obtained from the Agency before the equipment covered by this permit is placed into operation.

   b. For purposes of shakedown and testing, unless otherwise specified by a special permit condition, the equipment covered under this permit may be operated for a period not to exceed thirty (30) days.

7. The Agency may file a complaint with the Board for modification, suspension or revocation of a permit:

   a. upon discovery that the permit application contained misrepresentations, misinformation or false statements or that all relevant facts were not disclosed, or

   b. upon finding that any standard or special conditions have been violated, or

   c. upon any violations of the Environmental Protection Act or any regulation effective thereunder as a result of the construction or development authorized by this permit.

EJ Review Request #3407

Site/Facility Information

Site Name: General III LLC
Site ID: 170002390446
Bureau Site ID: 031600SFX
Bureau: AIR
Address: 11600 South Burley Avenue
EJ Status: 99 - EJ Status Unknown due to incomplete site data.
City/State/Zip: Chicago, Illinois 60617
Contact Name: Mr. Jim Kallas
Contact Title:
Contact Address: 11600 South Burley Avenue
Contact City/State/Zip: Chicago, Illinois 60617
Phone: 847-508-9170
Email: jim@general-iron.com

Application Information

Reference Number: 19090021
Activity Type: Permit
Activity Subtype: Construction
Application Scope/Description:
Scrap Metal Recycling Facility
Other Relevant Information:
Request Submitted: 9/27/2019
Submitted by: Bob.Bernoteit
Application Received: 9/25/2019
Decision Due: 12/24/2019
Reviewer Name: German.Barria
Review Status: Outreach In Progress
Review Status Notes: Sent out 10/1/2019

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& Associates, Inc.

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Principal Engineer

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ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

1021 NORTH GRAND AVENUE EAST, P.O. BOX 19276, SPRINGFIELD, ILLINOIS 62794-9276 · (217) 782-3397

JB PRITZKER, GOVERNOR **JOHN J. KIM**, DIRECTOR

Exhibit 219

Responsiveness Summary
June 25, 2020
Construction Permit General III, LLC
Source ID No.: 031600AGJ
Application No.: 19090021

Table of Contents

INTRODUCTION

This document is a Responsiveness Summary prepared by the Illinois EPA in conjunction with the issuance of a construction permit to General III, LLC (General III) for a scrap metal recycling facility to be located at 11600 South Burley Avenue in Chicago, IL. This document provides a written response to significant, permit-related comments raised at public hearing and during the related written public comment period.

RECENT EVENTS

The Director and staff of the Illinois EPA share a sincere appreciation and sympathy for the hardships that many residents of Illinois and particularly Chicago's Southeast Side have endured in recent months due to the COVID-19 pandemic. The pandemic dramatically altered daily life for almost everyone in our Nation and in many other countries around the globe. The public health impact of the virus has been felt most severely by several vulnerable segments of our society including the elderly and patients living in long-term healthcare facilities, individuals with certain respiratory or cardiovascular co-morbidities or weakened immune systems, and, as we have learned more recently, communities of color have contracted and died from the disease in disproportionate numbers. The related social and economic impacts caused by the virus, which have ranged from the closures of our schools, governmental offices and religious activities, the shut-down of non-essential businesses, and the fears and isolationism that accompanies social distancing, to the loss of friends and loved ones who succumbed to the contagion, are nothing short of profound. Regrettably, these and other effects of the pandemic are still being felt, even as medical science and public health officials continue to fight and monitor the disease, and our collective efforts turn to restoring some semblance of normalcy to our lives.

The recent protests posed a separate set of physical and emotional difficulties for many residents in Chicago and surrounding communities. National events that ignited the protests are slowly giving way to a renewed sense of commitment to end systemic racism. For the many thousands of peaceful protesters marching in the region, these events have given voice to their frustrations with our institutions, past and present, and sounded a call for not just institutional reforms but for a change in how we interact with each other as human beings. For others, the shadow of violence in the wake of some protests provoked anxieties about the safety of their communities, as suggested by comments received during the public comment period urging a delay in the current proceeding.

The confluence of these events during the current permitting process was unfortunate. However, while various regulatory activities at different levels of government were canceled or delayed, essential activities conducted by state agencies continued without significant interruption as part of Governor J.B. Pritzker's Disaster Proclamations and Executive Orders responding to the COVID-19 crisis. This essential work included activities overseen by the Illinois EPA in the area of environmental permitting.

The Illinois EPA administers its permit programs pursuant to the requirements of the Illinois Environmental Protection Act and implementing regulations, including a decision deadline under which the Illinois EPA must act on a given permit application. These requirements are at the heart of why the current action cannot be delayed. Moreover, permit applications remained pending with the Illinois EPA from before the start of the pandemic, and some applicants, including General III, continued to work with Illinois EPA Permits staff throughout the Spring in anticipation of securing the necessary permits. As more people return to work and businesses reopen, and as broader sectors of our economy become more functional again, applicants are inquiring about their projects and submitting new applications. These signs point to the need for us to continue the administration of permit programs.

Due to the COVID-19 pandemic and subsequent Proclamations and Executive Orders by Governor Pritzker limiting large public gatherings, the Illinois EPA as with all other agencies and governmental bodies in the State, was not able to provide an "in-person" hearing in this matter. In lieu of a traditional hearing venue, the Illinois EPA opted to provide a "virtual" hearing, where participants called in by phone or joined by computer to make comments or listen to the proceedings. A virtual hearing comports with all requirements of 35 IAC Part 166, Subpart A, while also minimizing the threat of COVID-19 exposure to the public. These steps sought to balance the interests of public safety with the need to implement existing programs consistent with legal requirements.[1]

PUBLIC OUTREACH

Pursuant to an IEPA environmental justice notification for the new construction permit, advocacy groups submitted a request for hearing on the project. Recognizing the significant public interest in the facility, IEPA issued a notice of public comment period beginning on March 30, 2020 and two virtual public hearing sessions on May 14, 2020. The purpose of this action was to allow for public participation in the permitting process for a draft construction permit developed by the Illinois EPA's Bureau of Air.

The public outreach associated with the application for construction permit was not required by statute or regulation but, rather, was discretionary on the part of the Illinois EPA's Director. A hearing officer was designated, the notice was issued, and the comment period and the informational permit hearing were all conducted, in accordance with applicable regulations found at 35 Ill. Adm. Code Parts 166 and 252. The notice of the comment period and virtual hearing was posted to the agency website, as well as forwarded to numerous elected officials and persons known to be interested in the matter, including representatives from various environmental advocacy groups. Contemporaneous with the notice, the draft permit and related documents from the administrative record were also posted to the Illinois EPA's website.

Instructions detailing how to participate in the informational hearing, either through oral comments or simply listening in to the proceedings, were also posted. The notice and instructions for hearing participation included numerous references to agency contacts (either the Hearing Officer or the Office of Community Relations) for any questions or concerns (e.g., requests for interpretation, informational or special needs, assistance with WebEx).

The public hearing was held on May 14, 2020. As originally scheduled, the Illinois EPA held two sessions: the first session was held at 1:30 pm and featured seven speakers and approximately 117 participants, and the second session was held at 6:00 pm and featured 14 speakers and approximately 86 participants. All told, over 200 people participated in the public hearing, far exceeding the level of participation shown in recent informational permit hearings concerning projects in EJ areas. A Webex recording of the hearing sessions was later posted to the agency website.
https://www2.illinois.gov/epa/public-notices/boa-notices/Pages/default.aspx

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[1] **Even now, public gatherings of uncertain size are still prohibited. A gathering of more than 200 people as participated in the public hearing is not envisioned until the state has reached Level 5 of the Governor's plan. This would only result in the issuance of a permit by default or a permit denial, the latter of which is not supported by the administrative record.**

It can be noted that the Hearing Officer and Office of Community Relations assisted participants in advance of the hearing and several speakers during the two sessions. They also worked assiduously with all commenters who contacted the Illinois EPA to assure timely receipt of comments, including several commenters who sought help with more voluminous comments to avoid the necessity of printing and mailing.

The public comment period ran for 77 days, thus affording the public nearly two and half months to consider the planned permitting action. Approximately 329 people submitted written statements, submissions and exhibits during the comment period, again exceeding the level of past participation in previous projects impacting EJ areas. Oral and written comments generally expressed opposition to the project and the accompanying participation process, with many people urging the Illinois EPA to suspend or deny the application for construction permit. While acknowledging the voiced opposition to the process, the level of participation supports the Illinois EPA's position that the right of the public to voice their concerns about the project was assured.

SPECIAL MENTION

Before the company can begin operations at the Burley Avenue location, it must also receive permits from the City of Chicago, including one pursuant to the City's new rules for large recycling facilities. The new rules, effective June 5, 2020, implement the City's Recycling Facility ordinance and include additional requirements that General Iron meet in order to begin operating at the southeast side location. The City's rules provide minimum standards for what is required in a permit application, including information to demonstrate that the facility will be designed and operated in a manner that prevents public nuisance and protects the public health, safety, and the environment. The rules also contain location, operational, and design standards applicable to large recycling facilities such as General III, including vehicle and traffic requirements, noise monitoring, air quality standards, and air emission monitoring.

DECISION

On June 25, 2020, the Illinois EPA issued a construction permit for General III, LLC. This final permit determination was rendered after consideration of all comments and in accordance with the Illinois Environmental Protection Act.

Significant changes have been made to the draft permit in response to public input and are noted in Attachment A to this Responsiveness Summary.

BACKGROUND

On September 25, 2019, General III, LLC applied for a permit to construct a scrap metal recycling facility to be located at 11600 South Burley Avenue in Chicago, Illinois.

This application for permit arises based on an agreement between the City of Chicago, General Iron Industries, and RMG Investment Group that the existing scrap metal recycling operations of General II, LLC, at 1909 North Clifton Avenue in Chicago, Illinois cease and relocate, matters for which the Illinois EPA had no involvement and for which it has no legal role.

Rather, the Illinois EPA is the state permitting authority charged with permitting Illinois sources consistent with applicable state and federal laws and regulations. General III is required to obtain an air pollution control construction permit from the Illinois EPA Bureau of Air prior to beginning construction because it is a new emission source. For additional background information, please refer to the Project

Summary, which is available on the Illinois EPA Public Notice webpage:
https://www2.Illinois.gov/epa/public-notices/boa-notices/Pages/archive.aspx.

As the scrap metal recycling facility is relocating to a site that the Agency would deem to be within an environmental justice area, the Agency sent an EJ notification on October 1, 2019, consistent with its environmental justice public participation policy. This letter was mailed to 48 persons, including numerous groups and elected officials representing the local community. This environmental justice letter elicited a response sent to Director Kim on October 30, 2019, from Keith Harley, on behalf of Southeast Environmental Task Force, the Chicago South East Side Coalition to Ban Petcoke and the Natural Resources Defense Council, requesting an Environmental Justice Analysis, a hearing and a subsequent written public comment period for the proposed facility. Acknowledging the request for hearing, and in recognizing the public interest in the proposed project, the Agency determined that it was appropriate to hold a public hearing on the permitting transaction.

AVAILABILITY OF DOCUMENTS AND ILLINOIS EPA CONTACT

Copies of the construction permit that has been issued, as well as this Responsiveness Summary, are available for viewing by the public at the Illinois EPA's Headquarters at 1021 North Grand Avenue East in Springfield.

Copies are also available electronically at:
https://www2.illinois.gov/epa/public-notices/boa-notices/Pages/archive.aspx

Printed copies of these documents are also available free of charge by contacting
Brad Frost
Office of Community Relations.
217-782-7027
brad.frost@illinois.gov

QUESTIONS AND COMMENTS WITH RESPONSES BY THE ILLINOIS EPA

Comments are shown in conventional text and responses are shown in boldface. Comments and responses are arranged by subject matter, paraphrasing and grouping similar comments and questions. Numerous comments in this document are depicted in a condensed or paraphrased from, rather than recited in full. In other instances, comments are retained in original form because of their complexity or level of specificity.

All significant comments relating to the draft construction permit or that otherwise fall within the Illinois EPA's scope of permit authority are being addressed in this Responsiveness Summary. This framework necessarily does not answer some of the comments raised at the public meeting or during the comment period but this is appropriate due to the inability to address matters outside of the Illinois EPA's regulatory expertise.

Public Participation

1. The Illinois EPA should take public comment on the proposed issuance of the permit into consideration.

The Illinois EPA held extensive public outreach on its permitting transaction. The outreach included a 77-day written public comment period and a two-session public hearing wherein individuals could make oral comments that were entered into the hearing record. The Agency has reviewed those comments and this document responds to significant comments that are pertinent to the Agency's decision, process and review.

2. The affected community is largely Hispanic yet there was no information in Spanish including the notice.

The Agency frequently interacts with bilingual residents throughout the State on a number of issues. When a need or desire for services is evidenced or expressed, the Agency does everything in its power to provide those services to the best of its ability. The Agency has not been lax in providing translation services where local representatives or persons expressed simply a desire for such services, even while the use of those services at Agency meetings has not been robust; this includes recent outreach for permitting, rulemaking and cleanup programs. The Agency has also been responsive to local groups and representatives that have come forward with suggestions for changes and enhancements to the translation services that it provides. Additionally, the Agency has made strides in providing routine Spanish language services including by the hiring of a bilingual employee in its Office of Community Relations to help with such needs.

The Agency has conducted extensive outreach on the SE side of Chicago going back decades, with established contacts and regular communications with advocacy groups, elected officials and individuals on the SE side of Chicago including the East Side neighborhood, including holding and attending meetings and hearings on numerous projects and subjects. In past Agency meetings and hearings on the SE side of Chicago, neither need or desire for translation services have been requested or evidenced, nor has the Agency received comment previously that these services were not provided at hearings and meetings on the SE side of Chicago. Translation services are a large expense, and while the Agency is happy to provide those services when there is a need or an expressed desire, the Agency policy to this point has been to allow for the request of translation.

In the case of General III, a statement allowing for the request for translation, specifically including American Sign Language services, was included in the public notice. The Agency was in regular communication with local groups and their representatives and did not receive a request for translation either prior to issuance of the notice or subsequently to the notice but prior to the hearing. A simple request, by phone, letter, e-mail or other communication, would have produced from the Agency such notice and translation. No request was forthcoming until comments made at the public hearing and post-hearing and beyond a general complaint, the complainants did not identify individuals that needed the service. The good faith efforts of the Agency are adduced by the fact that although no request was received, the Agency was prepared to provide services during the hearing and had a translator available. No commenters used the services of the translator.

It should be here noted that in keeping with current Agency practice that since a request was received during this transaction, although at too late a point in the process to provide services during this transaction, for future transactions in this area, the Agency will provide translation of notices and other documents and work with community groups to determine the need for translation services at meetings and hearings.

3. This permitting process did not allow for meaningful public participation as the hearing was not

being translated into Spanish—the language of a significant proportion of the affected community—and the notice to ask for Spanish translation was not in Spanish. It seems highly unlikely that people would be able to ask for translation service if the notice is in a language that they do not understand. Thus, interested and affected persons likely missed out on any information shared in the public hearing.

As mentioned in other responses, the Agency had numerous communications with representatives of groups representing neighboring residents. Neither in conversations nor submittals by these groups, although other specific perceived deficiencies were outlined, was a request for translation enumerated.

It should be here noted that in keeping with current Agency practice that since a request was received during this transaction, although at too late a point in the process to provide services during this transaction, for future transactions in this area, the Agency will provide translation of notices and other documents and work with community groups to determine the need for translation services at meetings and hearings.

4. Very few local residents knew about the hearing or how to participate.

   There are also issues with advertising for an online [hearing].

   SETF cannot provide training to remedy this problem because its office is closed and its leadership, members and local residents are required to be distant from one another. As a small non-profit, SETF is experiencing almost insurmountable complications to continue functioning, let alone to mount a major campaign to facilitate public participation in an unfamiliar venue.

The Illinois EPA in performing notification of a hearing must meet certain statutory requirements of 35 IAC 166 Subpart A. In addition to those requirements, the Agency seeks to inform persons and groups that it may be aware have an interest in the project. In no instance does the Agency have complete information on the residents that may be interested in participating in its outreach proceedings and relies to a certain extent on groups and elected officials that are interested in environmental issues in the locality. One such group is the Southeast Environmental Task Force (SETF) who has been a longstanding and reliable partner in helping the Agency provide community outreach to interested residents on the South East side of Chicago.

However, while the Agency appreciates that groups are willing to partner in assistance, in particular SETF, this does not abrogate the Agency's responsibility for community relations. The Agency was thoughtful in establishing the procedures for its first virtual hearing. The Agency established the hearing in such a manner that the only need to participate was a telephone.

5. The Illinois EPA needs to work with elected officials at the city and state level to get information to the community members who will be impacted by this facility.

The Agency has contacts with officials in the City and specifically on the South East side. Notice of the hearing was sent to many elected officials, including Chicago's Mayor and Clerk, the County Board Chair, Clerk and State's Attorney, Chicago City Council's Environmental Protection and Energy Committee, federal Senators and Representatives, the state Senator and Representative, the local Alderman, the Attorney General, and the Cook County Board Environment Committee. Additionally,

various local and state agencies were notified as well as numerous non-profit and local interest groups.

6. A virtual public hearing during a pandemic is not acceptable; it did not provide a meaningful opportunity for public participation.

With respect to holding a public hearing/comment period during a pandemic, state government is still functioning and has responsibilities regardless. Also, the statutory and regulatory provisions associated with the evaluation of permitting requests, such as acting in a timely manner (permit application), are still in place. Illinois EPA is obligated to act in a certain period of time in regard to state construction permits. The initial 90 days set forth in Section 39a of Act was waived by the applicant late last year and two times since. The current decision deadline is June 25, 2020 and the applicant has made clear it will not waive this decision beyond this date. The permit will be issued by default if the Illinois EPA fails to act on the permit by this date. General III would have a legal defense or protection from having to obtain a construction permit; under this scenario, important conditions of the draft permit (e.g. testing, reporting, monitoring, record keeping) would not be put in put in place. Therefore, Illinois EPA makes all manner of attempt to avoid issuing permits by default.

Although this process is a departure from the past with respect to hearing venues, the procedural rules for Agency hearings at 35 IAC 166 accommodate for this type of hearing – the purpose of which is to enable the Agency to receive comments from the public regarding a draft permitting action.

7. The permitting process utilized for the Draft Permit hindered meaningful public participation. Outside of a pandemic, limiting public hearing to an online forum is a deterrent to public participation for those who do not have the broadband width to participate. It impedes the spirit of an actual public hearing—people cannot see any visual aids that would otherwise be present, and both they and the decisionmakers do not see the numbers of people in support of or opposed to a position. Neither body language nor emotion are conveyed as well over the phone or computer. A public hearing also does not usually have people register ahead of time to speak as was the case here, thereby limiting the voices of those who did not receive notice in time.

The online format of the hearing was established in a thoughtful manner to as closely resemble an "in-person" hearing as possible. As noted in other responses, the purpose of a hearing is to accept oral comments accurately into the hearing record for review by the Agency staff as part of a permit review. The Agency at any hearing tries to maximize the amount of time for public comment. The Agency typically minimizes its presentations at a hearing and rarely if ever utilizes visual aids as these tend to make Agency presentations lengthier with detriment to the amount of time available for public comment. In this instance the Agency did provide some visual aids that it believed to be helpful because of the new nature of the "virtual" format without taking extra time away from the amount of time to comment. It is also typical to have commenters register to speak prior to the hearing so that the Agency hearing officer may gauge how much time to allow for each speaker without impeding the opportunity to make comment for those who register later. Further, the hearing officer allowed all commenters that had contacted him prior to the beginning of the hearing a slot to provide comments regardless of whether they had met the deadline established in the notice. As noted in other responses, the Agency's decision-making is not based on opposition or support for a project but instead on the legal and technical merits of the proposal outlined in the application.

8. Illinois EPA has persisted with holding the public hearing and written comment period during the

local, state and national COVID-19 pandemic, coupled with demonstrations around racial injustice that have rocked Chicago and the nation. During this time, it is absurd to expect the residents of this overburdened community – residents who are struggling to protect themselves and their families from disease, layoffs, racial injustice and literally bullets in their streets – to be able meaningfully to participate in a permit process. This non-inclusive process has a clear impact on an environmental justice community and requires Illinois EPA to step back from issuing a permit until true community participation is made possible.

During the pandemic, people didn't have the health, means, or resources to participate, particularly in low income/minority community, already disadvantaged.

This reflects the racism that causes southeast Chicago to be a sacrifice zone.

This process lacked regard for the community and was racist.

While the pandemic has certainly caused changes to the usual or customary proceedings of numerous public bodies, the operation of public business must continue, particularly in light of the uncertainty in the length of time needed to have in place real remedies to COVID-19. Protection of the environment is important enough public business that the legislature has passed numerous laws over the last 50 years directing Agencies to be established, actions to be taken on regulation, and public monies to be expended in this pursuit.

While a public process is not a statutory requirement of the review of projects such as General III, the Agency believes it important to solicit public input on its decisions, particularly in areas it designates as environmental justice, and make such improvements to a permit as may come about as review of public comments allow. The Agency also believed it important to hold a public hearing and the associated process and comment period for this project and to seek the additional time necessary to achieve that end. Changes and improvements have been made to the permit mainly because of its location and the comments received. Due to the proposed location of the facility the Agency took additional considerations in regard to the impact on the community and provided additional outreach.

While the hearing was of necessity different than the usual hearing, the Agency made several enhancements and was thoughtful about the process such that it was inclusive for the public. Any hearing at any time will not allow all members of the public to participate. By the Agency historical standards, the hearing for General III was well attended with significant participation and written comments exceeding all but a few of the actions for which the Agency has held comment periods. In example of this, two recent, pre-pandemic, highly controversial permit hearings in the Chicagoland area, concerning the CAAPP permits for BWAY and Midwest Generation's Waukegan coal-fired power plant, drew attendance of approximately 40 and 35 respectively. Both were "in-person" hearings for controversial sources located in environmental justice areas.

It should also be noted that written comments submitted during the comment period carry the same weight as oral comments made at the hearing, as evidenced by this responsiveness summary.

9. In a pandemic, people are even further limited in their ability to participate—people can have broadband connection limitations, and moreover, people—especially on the East Side—are facing

the health implications of a pandemic and are rightfully more consumed with surviving this global emergency. The public should not be limited in their ability to meaningfully participate.

As noted in other answers, the Agency's intent within the strictures imposed by the pandemic and the requirements of Illinois law is to provide robust and effective outreach. As also noted, the process resulted in a public hearing and lengthy written comment period. Based on the number of comments received, participation in the hearing, and the resulting enhancements made to the permit as a result of the outreach process, the Agency believes that meaningful participation through its community outreach process has been effective in this case.

10. The hearing was inaccessible to community residents many of which are poor and lack technology.

    [I have] received many text messages/phone calls from community members that cannot login or participate or do not have the resources or capability.

    Neither SETF's members nor other local residents have participated in this type of hearing. Many do not have the technology and/or technical capability to participate.

The only technology needed to participate in the hearing was a telephone. Consideration was also give to the fact that people connecting by telephone may be using a cell phone and potentially limited cell phone minutes, thus the Agency established procedures allowing for commenters to have a relatively defined time when they would be called on for comment and allowed for commenters to request a more specific time if they had a need for such. The meeting was also recorded so that those who couldn't otherwise listen to a particular session or to the hearing as a whole could peruse the hearing at their convenience.

Additionally, contact information for the Agency was included in the notice and the Agency responded to all requests for assistance sent to it before and even during the hearing. These included e-mails directly to the Office of Community Relations and chats through the WebEx system. Further, between the two sessions, the Agency proactively contacted persons that had signed up to speak at the first session but that did not come on the line and at the commenters choice either scheduled them to speak at the 2nd session or gave them information on how to submit written comments; Similarly, the one person who did not come on the line to make comment at the second session was contacted after the hearing to inform on how to submit written comments.

For those that did not choose to comment but instead wanted to listen to the hearing, in addition to the live event, a recording was posted such that anyone of the public could listen to the proceedings at a later time.

11. The hearing process was difficult, and people struggled to connect and failed to connect.

The Agency is unaware of any specific persons and was not contacted before, during or after by any persons that were not able to connect and thus missed the opportunity to make oral comments. Additionally, for those who only desired to listen to the hearing, the Agency posted a recording of the hearing. The point of the public comment period and hearing is to afford the public and opportunity to comment. That opportunity to comment in writing or orally existed beginning March 30, 2020 and ending June 15, 2020.

12. People with impairments could not participate.

A statement allowing for the request for translation, specifically including American Sign Language services, was included in the public notice. The Public Notice provided guidance on contacting the Agency for an accommodation in this regard and no requests were made.

13. There should be another hearing so comments from Spanish speaking people are not limited to writing.

While this comment was made at the hearing, as noted in other responses, the Agency had a translator available at the hearing to translate for any person that would have needed such service to make their comment. All commenters that signed up to make oral comments were accommodated in the process.

14. Was there both translation of Agency statements and the opportunity for commenters to be translated?

Without a request for translation, the Agency did not have a good understanding of what services would be needed or who would need those services and thus how best to provide those services in the virtual hearing format. The Agency had a Spanish language translator available at the hearing if a commenter had come onto the line with a need to speak Spanish to make their comment. Without a request, this may have resulted in a slower or different process than the process that would have been established if a request was received timely before the hearing. No commenters requested or availed themselves of the translation services.

15. The process should provide for more public interaction and different ways to engage.

Since no specifics are provided, the Agency is unclear on the process changes desired. The Agency works with representatives and groups to provide appropriate and effective outreach; however, a hearing is a more structured and defined process both statutorily and in practice. While Agency hearings tend to be more interactive, and therefore the Agency feels, more informative than some similar agencies, notably federal counterparts, the purpose is still primarily to accept public comments into the record through recording or transcription. The Agency's Office of Community Relations is available to work with communities and groups to provide other forms of outreach and tools for public interaction. An OCR contact is listed in this document if further discussions along these lines is desirable.

16. More communication between the Illinois EPA and community is requested.

The Agency also desires to build substantive and lasting connections with communities in the State. This serves to help the Agency better understand the local environmental conditions as experienced by the local community and helps inform Agency decisions. To this end, the Agency has an established Office of Community Relations, whose purpose is to establish and participate in mutual dialogue with communities in the State relative to the authorities of the Agency. The Office of Community Relations has been in existence since the early days of the Agency. Similarly, and more recently, the Agency has established an Office of Environmental Justice. One among other duties is to specifically provide additional services of a similar nature to communities that meet the Agency definition of Environmental Justice.

17. Illinois EPA's website is not user-friendly and time consuming when searching for documents.

While the Agency houses numerous programs and services on its website, the Agency has prioritized certain programs on the front page, including public notices. The webpage provides a direct "Quicklink" easily visible for users of the website. Nonetheless, if difficulty is experienced in finding information on the website, the Agency's Office of Community Relations is always available to provide additional assistance. Most of the contacts on the Agency Contacts page go directly to the Office of Community Relations and the notice itself included contact information for two employees of the Office.

18. Will a hearing transcript be available?

The relevant hearing regulations require a transcript or recording of the hearing to be made available. A recording of the hearing was made and link to the recording posted to the Agency website on May 26, 2020. Interested persons can find the link at https://www2.illinois.gov/epa/public-notices/boa-notices/Pages/archive.aspx

19. How does the Illinois EPA weigh our comments? For example, if 100% of our comments are fully opposed to this permit, will the Illinois EPA not grant the permit?

As mentioned in the hearing officer's opening statement in the General III permitting matter, the Illinois EPA bases its decisions on the governing law and regulations. There is no way for the Illinois EPA to account for general opposition comments in the permit review. However, the Illinois EPA reviews and considers all comments received. And certain comments such as suggestions on enhancements to the permit may be reflected as part of permit decisions.

20. A petition was received with over 5500 signatures opposing General III.

    A petition was received with over 1500 signatures supporting General III.

The Agency must act on substantive issues within its express statutory and regulatory authority, not public opposition or favor for projects. That a project is located in one place or another, or is moving from one place to another, is properly the realm of zoning and land-use decision-making. To this end, the City of Chicago made clear decisions, where those decisions properly rest at the local level. A note here is made that the City must make additional decisions in approval of this project pursuant to its new rules for large recycling facilities.

21. Most of the participants who testified asserted that Illinois EPA's decision was fundamentally unfair and defeated the purpose for a public hearing.

The express intent of a public hearing and the associated process is the solicitation of public comments so that the Agency, within its authority, may contemplate and act on these comments in its permitting transaction. A virtual hearing achieved this end and comports both with the regulations and the practice of numerous other public bodies under similar circumstance. While there may be aspects differing between a "virtual" and "in-person" hearing, the underlying intent of a hearing was served, and even secondary considerations not provided for in regulation or guidance such as answering of questions and explication of the Agency permit were achieved.

22. Polluters request one-year construction permit or a 5-year, 10 year, or lifetime permit, so it is prudent to have more public hearings, more public notice, and more public input so that the community is fully aware of what is coming into their neighborhood.

The Agency has established an Environmental Justice notification process to do just this in areas that meet the Agency definition for environmental justice, such as the SE side of Chicago which includes the East Side neighborhood. As discussed above, this process resulted in the request for hearing and numerous communications with representatives of local groups interested in the proposed facility. Information on the Agency Environmental Justice program and how to sign-up for EJ notifications may be found at https://www2.illinois.gov/epa/topics/environmental-justice/Pages/default.aspx

23. [Due to] COVID-19 and local civil unrest it was not feasible for these aligned organizations to coordinate fully on a single set of comments [and thus] meaningfully participate.

The Agency does not require groups or individuals to coordinate their submissions. The Agency reviews all comments received and from all sources. As noted in other responses, the Agency has received an extraordinary number of comments in this matter. As always, the Agency appreciates the engagement by the public in its process and recognizes the considerable sacrifice in time and energy that the public makes in reviewing documents and commenting on permit transactions. The comments are valuable to the Agency's review and have helped the Agency to provide an enhanced permit that has significant conditions and requirements for the protection of the environment.

24. The agency lawyer did not appropriately respond to a hearing question regarding the consideration of violations by General Iron at its existing facility in the review of the permit application for the new facility.

The Illinois EPA conducts informational permit hearings, such as was done in this instance, to hear concerns from the public with the draft permit and/or proposed project.[2] While questions are sometimes asked of the panel, these questions commonly only elicit brief answers from the panel members. This is by design, as it allows for maximum participation by those in the hearing audience who wish to speak and assure that the hearing can be completed within the allotted time. General questions are usually answered by the hearing panel with a general answer, and a drawn-out answer by a panel member can risk taking away time otherwise best given to members of the public for their presentations. More detailed responses are provided to those hearing questions that are significant or complex, together with similar questions or comments submitted during the comment period, in the Responsiveness Summary.

In this instance, the response to the question raised at hearing was appropriately responsive to the question posed to the panel and was not prejudicial error. A speaker in the first session of the hearing asked two questions at the conclusion of his remarks, including how the Illinois EPA had considered the violations at the existing General II facility in the review of the project. The panel member, answered the question in roughly three parts. First, the panel member stated that the Illinois EPA did not consider alleged violations in its review of the permit application. Second, the

[2] **This general point was evident in the Hearing Officer's opening remarks**.

panel member briefly provided the reasoning for his answer.[3] Lastly, the panel member acknowledged exceptions to the rule that he had briefly described, stating that "there are limited exceptions to that but, by and large, that is the rule that we are controlled by."[4]

25. In the same incident as above, the Agency lawyer did not refer to the three parts of the statute that governed the legal issue, conflating them in a confusing and misleading fashion and did not adequately explain the caselaw authorities and existing law.

As discussed elsewhere, only two of the three cited parts to Section 39(a) are relevant to the consideration of adjudicated noncompliance or a past compliance history. The third part of the statute cited by the comment is a general authority by which the Illinois EPA is guided in developing conditions for a permit, allowing for the inclusion of terms that are "necessary to accomplish the purposes of this Act, and as are not inconsistent with the [Board] regulations…"[5] As mentioned, while this legal authority served as the basis for the inclusion of many of the construction permit's terms, including new conditions added in response to comments, there was no error committed by not mentioning it in relation to matters of prior enforcement history. Written comments and the Illinois EPA's more detailed response to comments are for matters such as this.

Environmental Justice

26. The most important reason to deny this permit is because it epitomizes institutional environmental racism. Racist outcomes do not require racist intent. We do know the intent behind the permit request, nor of the reviewers, and we are not claiming to. But based on the following three components, we are confident of the outcome.

The Illinois EPA strongly rejects any insinuation that racism played any role in the review of this permit application. The Agency's review was performed strictly according to relevant legal and technical requirements.

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[3] "And the reason for that is that our review is pretty much constrained to what is outlined within a permit application and is pretty much just addressing whether or not there are operational or design capabilities that are set out in a project that… whether those will meet applicable requirements. We cannot review or consider violations at another facility as in the case of GIII here having a previous operation at the Clifton Avenue address. The reason for that boils down to caselaw that Illinois courts have developed in the past in interpreting the Environmental Protection Act. That caselaw has directed the Agency to assure that we confine our review to just matters of the application and not to compliance and enforcement considerations."

[4] *See,* Hearing Recording beginning at 36.26. A related written comment regarding the panel member's response to the same question is baseless. The comment states: "[A hearing speaker], a resident living near General Iron, testified about the negative health consequences and a history of violations, prompting an Illinois EPA attorney to immediately intervene to discount this testimony." SETF comments, dated June 15, 2020. The panel member was "prompted" only by a general question asked by the speaker, at the conclusion of his remarks, concerning any review of violations in the permit review. The response by the panel member did not discount any testimony of the speaker.

[5] *See,* 415 ILCS 5/39(a). This authority bears no relation or significance to the consideration of alleged violations, which are addressed by the more specific criteria identified in the two preceding sentences of Section 39(a).

27. Why was there no EJ analysis as requested?

In order to analyze the environmental justice impacts of the proposed relocation of the source, the Illinois EPA first looked to the demographics and then reviewed discretionary modelling conducted by the permit application. In order to evaluate demographic information, the Illinois EPA utilized the Agency's Geographic Information System (GIS) mapping tool EJ Start. EJ Start identified the area as an "area of EJ concern" pursuant to the Illinois EPA's EJ Public Participation Policy (https://www2.illinois.gov/epa/topics/environmental-justice/Documents/public-participation-policy.pdf). As such, the Illinois EPA sent an environmental justice notification letter early in the application process and which ultimately led to requests for a public hearing, which was not statutorily required, but was granted given significant public outreach. The Illinois EPA therefore conducted enhanced public outreach in accordance with existing policies. In addition, recognizing the concern for the proposed location of the source being located in an area of EJ concern, the Illinois EPA requested and obtained modelling from the permit applicant in order to determine whether there would be significant impacts for emissions from the shredding operation.

28. The public hearing was not consistent with the Agency's EJ policy.

Much of the Agency's Environmental Justice Policy is concerned with enhanced public outreach, which as discussed herein, the Illinois EPA conducted via an environmental justice notification letter and subsequent discretionary public hearing.

On September 25, 2019, the Agency received an application from General III, LLC to construct a new scrap metal recycling facility at 11600 South Burley Avenue in Chicago. The Agency is subject by law to a maximum 90-day review time for an application of this nature unless the applicant waives such restriction. Additionally, for an application of this nature, public notice is not required by law or regulation. As such, to provide an opportunity for the public to become aware and have an opportunity to request information and provided feedback, the Illinois EPA has established an EJ notification process for facilities that will be located in a designated EJ area. It is important in cases such as this where a 90 day decision deadline is in place that the Agency send the EJ notification letter in a timely manner so that the public has as much notification and time as possible to request and review documents and ask questions of the Agency. In keeping with this practice, on October 1, 2019, the Agency issued an Environmental Justice notification letter. This letter was mailed to 48 persons, including numerous groups and elected officials representing the local community. This environmental justice notification letter elicited a response sent to Director Kim on October 30, 2019, from Keith Harley, on behalf of Southeast Environmental Task Force, the Chicago South East Side Coalition to Ban Petcoke and the Natural Resources Defense Council, groups that the Illinois EPA routinely works and has conversations with about projects on the South East side of Chicago; groups that as evidenced by past interactions represent a broad swath of residents in SE Chicago including the East Side neighborhood. The letter expressly requested an Environmental Justice Analysis, a hearing and a subsequent written public comment period for the proposed facility. Acknowledging the request and in recognizing the public interest in the proposed project, the Agency determined that it was appropriate to hold a public hearing on the permitting transaction. The Agency had numerous communications with these groups or their representatives. Additionally, Agency staff had conversations with these same parties to discuss issues and answer questions about the other facilities that are currently on the site and that will be a single source with GIII once the facility has relocated.

As an additional point, the Agency places great importance on its Environmental Justice program and ensuring that minority and low- income persons in Illinois are able to have information about and input into Agency decisions consistent with sound EJ principles. The seriousness of our consideration of the input received leads the Agency frequently, as in the case of the GIII application and permit, to make demands of facilities over and above legal requirements in the submittal and review of application materials and conditions of the permit. Demands made of the applicant are described in other responses in this document and changes to the draft permit may be found in Appendix A of this document.

29. The public hearing was inadequate: (a). it was only in English;

the Illinois EPA Spanish interpreter did not interpret anything said by Agency officials or English speaking participants so the hearing discriminated against Spanish speaking residents in this community;

(c) there is no way for Spanish speaking residents to listen to the recorded hearing unless they found their own interpreter; and

According to the Illinois EPA's EJ Policy, "The EJ Officer will determine when public notices should be bi- or multi-lingual, where these notices should be published, and when translators should attend hearings. The EJ Officer will also review and approve the proposed response to EJ comments raised at hearing or in written comments, and coordinate this response among the Bureaus, Division of Legal Counsel and the Office of Community Relations.

The Illinois EPA Office of Environmental Justice coordinates with the Office of Community Relations in accordance with the Illinois EPA's Environmental Justice Policy on translation issues, with the EJ Office goal to establish guidelines and Community Relations to implement those within the Agency outreach. As mentioned elsewhere, the public notice requested that anyone needing translation services contact the Illinois EPA and no one did. Notwithstanding, the Illinois EPA had a Spanish speaking employee on hand at all times during the hearing. As discussed elsewhere, the Illinois EPA seeks to work with local communities and representatives to determine appropriate outreach. The Illinois EPA acknowledges the comment and though the Agency believed that it had been having sufficient conversations in the days and months leading up to the notice and hearing, the Agency hopes to work closely with groups in the future to ensure that these types of issues are more fully addressed.

30. Agency did not translate its own comments during hearing (e.g. how to submit written comments)

Although the Illinois EPA hearing notice mentioned the process to request interpretation, the Illinois EPA should not place the burden of requesting interpretation on an Environmental Justice community, a low-income minority community. Instead, the Illinois EPA should proactively research the basic demographic and linguistic isolation statistics of every Environmental Justice community (available on the US Census website) before every public hearing (whether in-person or virtual) to ensure full public participation in the permitting process.

The Illinois EPA recognizes this concern and, in the future, hopes to work closely with community members and groups to evaluate the need for translation services in addition to the steps mentioned in the comment. As mentioned elsewhere, while the Agency must operate within its statutory constraints, including time constraints, the Agency prides itself on being responsive to communities

and their needs or desires as relate to the outreach the Agency performs and did not believe that its outreach was lacking as it related to the need or desire for translation. The Illinois EPA has in the past and will continue to evaluate issues concerning translation and appreciates the input of local community groups as expressed in these comments and dialogues that the Agency enjoys in its regular outreach.

31. In addition to the problematic public participation process, Illinois EPA's broader permitting action will result in significant, disproportionate impacts on communities of color and other protected classes, in violation of federal and state civil rights laws

There is no information in the record to suggest that issuance of the construction permit will result in significant, disproportionate impacts. The Illinois EPA reviewed modelling conducted by the permit applicant, which did not demonstrate any significant adverse impacts. Furthermore, the Illinois EPA has an air monitor at nearby Washington High School, which will provide information concerning emissions impacts of the shredding operation.

32. The Agency should especially pay attention to the history of this facility because General Iron is moving to an area of environmental justice concern. The Illinois legislature has recognized that the principle of environmental justice requires that no segment of the population, regardless of race, national origin, age, or income, should bear disproportionately high or adverse effects of environmental pollution. 415 Ill. Comp. Stat. Ann. 155/5. Moving this facility to the East Side community does just that.

415 Ill. Comp. Stat. Ann. 155/5 references the Findings in the Illinois Environmental Justice Act. The Act goes on to provide for the formation of the Illinois Environmental Justice Commission to address these Findings. An Illinois EPA representative is designated by the EJ Act to serve as a Commissioner on the Commission and the Agency is further directed to provide administrative support to the Commission. The EJ Act does not place additional authority with the Agency to address permitting, zoning, or otherwise provide regulatory direction to the Agency.

33. The Draft Permit fails to consider the cumulative impacts on the East Side community to which the facility is moving. When there are potential environmental impacts in an area of environmental justice concern, the Agency is supposed to look at the information provided as well as other available information to assess whether there are potentially significant adverse environmental impacts.

As described above, the Illinois EPA looked at the modelled emissions impacts and has an air quality monitor on Washington High School, both of which provide information concerning potential environmental impacts. While the Illinois EPA can and does evaluate environmental impacts from sources during a permit transaction, there is not currently any Illinois or federal law or regulation addressing cumulative impacts in the context of a permitting transaction. Without a legal mandate, the Illinois EPA is limited as to what it do can regarding cumulative impacts (e.g., more stringent permit conditions).

34. [I] oppose yet another heavy industrial facility notorious polluter relocating from the well-off, predominantly white Lincoln Park community, to this environmental justice community. The Mayor's Office behind closed doors facilitated an agreement whereby General Iron would leave the higher income and largely white Northside Lincoln Park neighborhood by 2020 and relocated to the

Southeast Side environmental justice community. Mayor Lightfoot's election in 2019 did not change the overall trajectory.

As noted in this comment, the Agency does not have authority or review over land-use and zoning decisions. For decisions within the boundary of the City, this authority resides with the City.

35. This is not the just and equitable process or outcome that Illinois EPA purports to uphold.

The Agency followed its Environmental Justice Public Participation Policy, a policy that has well served the Agency and the commenters on numerous occasions including the present instance. Notwithstanding, the Illinois EPA has acknowledged and demonstrated in practice that the policy is a living document, one that has and will be revised based on real world experience and input from environmental justice communities. While the commenters may not like the decision at the end of the review process, the Illinois EPA strives to ensure that the public outreach process is as robust as possible. The steps taken in this case, pursuant to the Agency's EJ Public Participation Policy, provided for meaningful input from the public.

The Agency issued an environmental justice notification letter which solicited a hearing request. The Agency held a hearing including written comment period. Additionally, the Agency worked with various local groups to answer questions related to the application. While the hearing was of necessity different than the usual hearing, the Agency made several enhancements and was thoughtful about the process such that it was inclusive for the public.

Information Sharing

36. How may I get access to the readings taken from the air monitoring station at G.W. High School?

The monitoring information is readily available to the public through requests to the Agency under the Freedom of Information Act. For ease, requests of this nature may be submitted to Brad Frost of the Office of Community Relations, who will then forward them to the Agency Records Unit for response. To directly request the documents, the FOIA request form may be found at https://external.epa.illinois.gov/FOIA

37. What is the best way to maintain a direct line of communication with the Illinois EPA if emissions are seen from this facility?

Directions on how to submit complaints and observations are found on the Agency's pollution complaint page, https://www2.illinois.gov/epa/pollution-complaint/Pages/default.aspx There you will find an online form for ease of submittal that includes all of the information that the Agency requests.

All complaints are investigated by the Illinois EPA. Notably, for complaints relating to sources located within the City of Chicago, the Illinois EPA often seeks the assistance of the City of Chicago Department of Public Health. Of course, any violations of City ordinances would be addressed by the City and violations of the Environmental Protection Act would be addressed by the Illinois EPA.

38. Can members of the general public request information directly from the source?

The public is certainly free to communicate with a source regarding requests, questions, comments or concerns. Often, sources welcome the exchange and find it mutually beneficial. For example, some sources afford tours so that the public may see what it is they do. However, the source is not under a statutory obligation to directly provide to the public reports relative to its operations that are regulated by the Agency. Notwithstanding, the information required to be reported to the Agency under the permit is available under the Freedom of Information Act; and, as noted elsewhere herein, the reporting obligations have been expanded under the issued permit.

39. The permit should require notification to the public, in addition to Illinois EPA, of any emissions violations.

The permit contains numerous reporting obligations incumbent upon General III. Notably, a key reporting requirement relates to deviations from the terms of the permit. Information reported to the Illinois EPA by General III is available to the public under the Freedom of Information process. FOIA requests may be made by request to the Agency; the online FOIA request form may be found at https://external.epa.illinois.gov/FOIA For assistance in this regard, please contact the Office of Community Relations contact listed in the introductory section of this responsiveness summary.

40. Page 23 of the draft construction permit says "the owner or operator of a subject VOM source shall collect and record all of the following information each day and maintain the information at the source for a period of three years." The Illinois EPA should require the company to post all monitoring data weekly on a publicly available website, given the company's record of past violations.

The permit contains numerous recordkeeping obligations incumbent upon General III. The records that are to be maintained are voluminous. Reporting all of this information to the Illinois EPA or posting same to a website would not be practical. Rather, key information in ensuring compliance with applicable terms is reported to the Illinois EPA. This information is available to the public.

Cumulative Risk

41. I would hope that the Illinois EPA will consider the cumulative burden on the Southeast Side community when evaluating this new facility.

While not statutorily or regulatorily required to perform any cumulative impact analysis, General III performed air dispersion modeling to address its impacts on ambient air quality. The modeling looked at metallic hazardous air pollutants, with special attention to lead and manganese. The modeling demonstrated that the air impact will not exceed any established standards. A robust inventory of other local sources was included in the modeling inventory and any other potential sources are accounted for through use of the monitoring station at Washington High School for background monitoring values.

42. EPA should consider all emissions (total amount) not just from this location, but other nearby emission sources.

The Illinois EPA has endeavored to address the contributions from other sources in the region to the two hazardous air pollutant metals believed to be of significance – lead (Pb) and manganese (Mn). Not only was there a robust inventory of other sources included in the modeling inventory, but a background monitored concentration was added to the modeled impacts to account for potentially unknown, unpermitted, natural and/or distant sources.

43. The EPA to not just consider the emissions from this one location, but instead add these emissions to the total amount that the neighbors of Eastside and the students of GWHS will be exposed to. If we think of the environment surrounding this facility and the school as a bathtub, the proposed emissions are only adding to a bathtub that is already full of emissions from other sources nearby and there is little to nothing being done to empty the tub. I have already cited the Air Dispersion Modeling Protocol document. In that same section, RK & Associates are asking the EPA to allow them to not count emissions collected at the Washington High School air monitoring station on days when the wind is not blowing from the southwest.

The Illinois EPA has endeavored to address the contributions from other sources in the region to the two hazardous air pollutant metals believed to be of significance – lead (Pb) and manganese (Mn). Not only was there a robust inventory of other sources included in the modeling inventory, but a background monitored concentration was added to the modeled impacts to account for potentially unknown, unpermitted, natural and/or distant sources. The Illinois EPA directed the permit applicant's consultant to use conservative background values obtained from the analysis of total suspended particulate samples from the Washington High School monitor. For lead, this represented the highest three-month rolling average concentration for years 2016-2018. For manganese, the background values represented the maximum 24-hour average and annual average concentrations during those same years. The monitored values did not selectively eliminate emissions collected from any wind direction, including "when the wind is not blowing from the southwest." The Illinois EPA is well aware of air pollutant levels in the Lake Calumet region of Cook County and the need for maintaining health-protective levels.

44. Another failure of the EPA was its failure to consider the George Washington High School air monitoring data when drafting the permit. This data shows that the Southeast Side neighborhood already deals with the state's highest levels of toxic heavy metals, chromium and cadmium, as well as sulfates."

The Illinois EPA required the company to perform ambient air modelling and submit such to the Agency as part of its application, an atypical request for a facility of this size. This modeling used data from the Washington monitor as its background ambient data.

45. The applicant has failed to describe and Illinois EPA has failed to consider cumulative impacts of permitting a new source of heavy metals in an already overburdened EJ community, which has among the highest monitored levels of airborne metals in entire state.

While not statutorily or regulatorily required to perform any modeling in the application, the Agency required General III to perform air dispersion modeling demonstrating that the air impact will not exceed any established standards for the HAP metals. lead and manganese. Notwithstanding that the monitor at Washington High School registers metals as a fraction of the captured PM emissions, the levels do not exceed any health-based ambient air standards for metals.

46. GIII did not consider the impact of the existing operations at the site.

GIII performed air dispersion modeling for metallic HAPs in support of the air construction permit application and demonstrated that the air impact will not exceed any established standards. The Illinois EPA later evaluated the increase in metallic HAPs from the four SCPM facilities in conjunction with the GIII HAP emissions but did not find any increases of potential concern. Metal HAP emissions from the SCPM Entities' ROSS affected sources are less than 0.1 tons annually.

47. The cumulative effects of this pollution are already causing negative health consequences to residents, including asthma and other respiratory illnesses.

The community already has health problems like asthma. The cumulative effects of existing pollution are already causing negative health consequences to residents, including asthma and other respiratory illnesses.

Concern with health issues (e.g. students with asthma, chronic lung problems) in area with citation of data from Respiratory Health Association

The Agency recognizes that low-income and minority communities may struggle with health issues at rates disproportionate to the general population. While certain state and federal environmental regulations are based on health data, e.g National Ambient Air Quality Standards, the Agency's statutory authority rests with the regulation of sources of air pollution. The statutory authority to work toward healthy outcomes for the State's population rests with the federal, state and local Health Departments as health outcomes are resultant from numerous and complex factors of which ambient air quality may be one, but except in rare instances, only as a secondary or aggravating factor to other more systemic issues. The past fifty years of environmental regulation have resulted in large reductions in point source emissions and large improvements to ambient air quality throughout the state.

48. The site is located within the Calumet Industrial Corridor and the greater Calumet region, where multiple industries contribute to poor air quality. Compared to citywide averages and most other industrial corridors in Chicago, there are higher rates of chronic obstructive pulmonary disease and heart disease within this corridor, signaling existing negative health impacts. Residents of the Southeast Side should not be asked to bear yet another health burden.

While the Agency recognizes that the SE side is home to the Calumet Industrial Corridor these designations and the resultant zoning are City of Chicago land use planning decisions. As regards the Illinois EPA's authorities, the area is in attainment for all health-based National Ambient Air Quality Standards with the exception of ozone, a non-attainment area that generally covers six counties and two partial counties in the Chicago metropolitan area.

49. What is the Illinois EPA doing to address environmental health disparities and inequities? How can Illinois EPA continue to allow heavy polluters negatively impact the health of residents on the southeast side?

Within its statutory authority, the Agency provides certain enhancements to its permitting. In this instance, these included requiring ambient air modeling in the application; permit enhancements

including increased recordkeeping; a plan to mitigate fugitive emissions; and an Environmental Justice outreach process by which the public was notified of the application receipt triggering a request for a public hearing. The resulting public comments had an impact on the final content of the issued permit.

50. The neighborhood (East Side) adjacent to the proposed General Iron facility is an Environmental Justice community. According to the US Environmental Protection Agency's EJSCREEN tool, the area within 1 mile of this proposed facility falls in the 93rd percentile for particulate matter (PM2.5)

The whole of the East Side neighborhood is defined an environmental justice area by the Illinois EPA's EJ mapping tool. As such, and described in more detail elsewhere in this document, there were certain enhancements made to the Agency process and ultimately to the permit based on this designation.

51. Concern that this is a residential area with school and parks in vicinity of the proposed location.

The Agency has no role in zoning, neither in the siting of facilities, nor in the emplacement of public or educational facilities, nor in the determination of appropriate barriers, distance or otherwise, between residential and commercial or industrial parcels. More specifically, local land use is the exclusive determination of local units of government, in this instance, the City of Chicago.

52. Potential and likely effects—direct, indirect and cumulative—of the proposed action should be taken into consideration.

Historically, the evolution of environmental regulation is such that the underlying statutes and rules are developed to address and minimize the likely potential emissions and effects from a particular industry and for larger sources to account for the impact of a facility on ambient air quality. Although this facility will not be a major source; nonetheless, the Agency had the company perform certain analysis to evaluate the impact of likely pollutants on ambient air quality.

53. Requests that any new facility be evaluated for its capacity to provide a net reduction in the air pollution burden on the community.

This suggestion is a requirement for new major sources of air pollution in non-attainment areas under the state rules for Major Stationary Source Construction and Modification (35 IAC 203). In this case, the Chicago metropolitan area is non-attainment for ozone. Chicago and indeed the whole of the state has demonstrated attainment for all other NAAQS pollutants. As a non-attainment area for ozone, oxides of nitrogen and volatile organic material are regulated as precursor chemicals. New major sources or major modifications to existing sources of NOx or VOM pollution must obtain reductions over and above the potential amount of new pollution. General III does not meet the definition of a major new source or major modification for either NOx or VOM and thus this requirement does not apply to this permitting transaction.

54. The EPA has already designated the Southeast Side neighborhood as an area that is "environmentally overburdened." (See, https://www.epa.gov/il/environmental-issues-southeast-chicago). The EPA's website boasts that it has "empowered" this community and suggests that it is attempting to "ensure the area's continued progress." Granting the proposed permit makes a mockery of the EPA's environmental justice designation and discredits the EPA's own promise to help this community.

The commenter is pointing to a United States Environmental Protection Agency webpage and verbiage. Nonetheless, the Illinois EPA does not dispute that most if not all of the SE side of Chicago has an environmental justice designation, indeed, it is the Illinois EPA's mapping that designates the area as such; USEPA's EJSCREEN tool does not give such designation. With such designation, the Illinois EPA enhances its review and outreach on projects. As mentioned elsewhere, this does not remove Illinois EPA's responsibility to take action on applications in a timely manner or to make determinations in compliance with state and federal law and rules.

55. The Illinois EPA should deny General Iron a permit based on the on the levels of pollution the new facility is expected to emit, taking into consideration the EPA's own recognition that the Southeast Side neighborhood is already overburdened with environmental hazards.

The USEPA includes this language on its website, and defines overburdened in its EJ 2020 Glossary, https://www.epa.gov/environmentaljustice/ej-2020-glossary **Notwithstanding there are no statutory or regulatory authorities assigned to this definition but rather it guides policy. Similarly, there is not a state-level definition of "overburdened communities" either in statute or SIP and no clear state-level activities that should occur for such community except as provided for in the Illinois EPA's Environmental Justice Policy and EJ Public Participation Policy.**

The Illinois EPA does define the area as environmental justice[6], and had no statutory bases for denial, but included enhancements to its outreach and permitting process which resulted in a more robust permit.

56. It is time for the Illinois EPA to protect the health of our community for future generations.

The environmental laws as currently written, specifically the Clean Air Act, include mechanisms to reduce air pollution over time including requirements for development of state plans to improve and maintain ambient air quality and reduce emissions from stationary sources, among other emission reductions. This has achieved for the State and nation significant and important reductions in pollutants since the inception of the Clean Air Act in 1970, including improved air quality for ozone, sulfur dioxide, and particulate matter, including lead and other heavy metal emissions. These mechanisms in the Act still apply and continue to drive environmental progress on air quality. That said, the Act does not prohibit new stationary sources; it instead provides for regulation of stationary sources, including a requirement for permitting to provide a legally enforceable document that sets out the relevant and applicable environmental regulations, compliance, recordkeeping and reporting requirements that must be met.

57. It is critical that we don't add another massive polluter on the Southeast side.

While the facility is an addition to several operations currently at the site, it is not a major source of emissions as defined by the Clean Air Act. The source will have emissions that are below major

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[6] It should be noted that the Illinois EPA does not define "communities" or municipalities definitionally as environmental justice. The Illinois EPA uses census block groups for demographic analysis, defines each block group and includes a buffer to ensure largely unpopulated industrial or commercial areas do not inadvertently fall out of the definitional area, see Illinois EPA's Environmental Justice Public Participation Policy and EJ Mapping Tool, http://www.epa.illinois.gov/topics/environmental-justice/index

source levels. And in fact, the existing sources at the site, which all currently are ROSS sources will be required to obtain FESOP permits as a single source with these additional operations.

58. The Southeast Side faces among the highest cumulative environmental burdens in the City of Chicago and the state, given these impacts and numerous other environmental threats in combination with sociodemographic factors that make the community more susceptible to environmental impacts. As a matter of environmental justice, the community overall should not be subjected to the additional pollution from the proposed facility.

While it is not within the statutory or regulatory authority of the Agency to determine zoning or deny permits that otherwise would comply with the applicable environmental laws and rules, the Agency has had the company submit additional information, including modeling to assess the impact on local ambient air quality, and added enhancements to the permit because of the recognition that the facility is proposed for an area that meets the Agency definition of environmental justice.

59. The record claims that there is a buffer between the facility and residences, but several residences are within a half-mile radius of the proposed site. There are also a high school and a park about a half-mile away, along with an elementary school and another park within a mile of the proposed site.

It is not within the statutory or regulatory authority of the Agency to determine zoning including the establishment of appropriate setbacks or buffers between residential and commercial or industrial areas. Indeed, the Act does not consider setbacks or buffers as acceptable for sources of air pollution. Instead, the Act determines the property boundary as the only acceptable division between neighboring parcels and provides that visible emissions may not cross the property boundary except under certain limited conditions.

60. There are at least 10 permitted facilities in the area that will continue to negatively impact the health of the residents.

The Illinois EPA is aware of the sources in the area as companies must obtain and keep current either permits or registrations for sources of air emissions. Indeed, this is one of the substantive requirements of the Act to ensure that the Agency has an accurate inventory of sources such that when further reductions are needed to meet State Implementation Plan goals, an inventory is on hand to assess how best to reduce emissions to achieve state and federal air quality goals.

Zoning

61. Why is this plant not acceptable in Lincoln Park, but is acceptable down here?

Zoning and local land use decisions are not the purview of the State. This authority rests with local decision makers, in this instance the City of Chicago and Chicago City Council.

62. Why is it that these companies are coming to the southeast and southwest sides?

Again, the Agency has no role in zoning or siting of facilities. More specifically, where a facility may locate is the exclusive determination of local units of government. In this instance, the determination that General III may locate at Burley Avenue was the decision of the City of Chicago.

63. Why did this company pick this area?

The Illinois EPA does not play a role in determining where a facility may locate. An agreement between the City of Chicago, General Iron Industries, and RMG Investment Group was reached such that the existing scrap metal recycling operations of General II, LLC, at 1909 North Clifton Avenue in Chicago, Illinois cease and relocate, matters for which the Illinois EPA had no involvement and for which it has no legal role.

64. This permit involves racially unjust siting. GIII is proposing to relocate a harmful industrial use from a wealthier, whiter part of the city to one that has more black and brown residents. Again, racist outcomes do not require racist intent. The outcome of this relocation is to remove a health hazard from an affluent white neighborhood and place it in a lower-income Latinx neighborhood. Institutional racism, intentionally or not, produces outcomes that chronically favor or disfavor racial groups. That is exactly what a permit for this would do. This is most assuredly a racist outcome.

    There is environmental racism embedded in this relocation and it represents poor land-use planning.

The Illinois EPA has no role in locating or relocating sources nor in land use planning.

65. The City of Chicago has embarked upon a process of Industrial Corridor Modernization, reviewing and potentially modifying existing land uses within its industrial corridors. Some corridors, such as along the North Branch of the Chicago River, are complete, while others, such as the Calumet River, are not. At best, it is premature to relocate an industrial facility of this magnitude given that this planning process has not yet occurred. At worst, relocating this project would have an outsized influence on any future planning efforts, incentivizing other businesses to similarly move to the Southeast Side. This plant should not be relocated until a planning process is allowed to occur.

As the commenter notes, it is the City of Chicago who has embarked upon this process of industrial corridor modernization. And it is the City of Chicago that is making determinations as to where particular sources may locate. Indeed, the City still has determinations and permits that must be obtained by the company prior to relocation and certainly before construction and or operation of the scrap metal recycling operations at the Burley site.

Such activity is not within the statutory purview of the Illinois EPA. The issuance of the construction permit to General III is independent of and does not bear on the relocation. Indeed, while the permit would authorize the source to construct at the Burley Avenue location, it does not require the source to relocate there.

66. This permit involves racially unjust siting. GIII is proposing to relocate a harmful industrial use from a wealthier, whiter part of the city to one that has more black and brown residents. Again, racist outcomes do not require racist intent. The outcome of this relocation is to remove a health hazard from an affluent white neighborhood and place it in a lower-income Latinx neighborhood. Institutional racism, intentionally or not, produces outcomes that chronically favor or disfavor racial

groups. That is exactly what a permit for this would do. This is most assuredly a racist outcome.

Once again, the Illinois EPA does not make zoning or siting decisions. An agreement between the City of Chicago, General Iron Industries, and RMG Investment Group was reached such that the existing scrap metal recycling operations of General II, LLC, at 1909 North Clifton Avenue in Chicago, Illinois cease and relocate, matters for which the Illinois EPA had no involvement and for which it has no legal role.

Permitting

67. The application was not complete. General Iron's current facility experienced an explosion that caused significant damage to the facility and equipment in use there. The permit application represents that this equipment will be relocated to and used at the 11600 S. Burley Avenue site. The transfer of any equipment that can cause this kind of catastrophic failure requires that the permit application be revised to address risks related the proposed use of any equipment, its control efficiency, and the applicant's ability to operate the equipment safely and effectively. Further, existing emission estimates and air quality models do not account for emissions during periods of catastrophic failure and also must be revised. And, additional permit terms and conditions are clearly necessary to prevent future accidents and to ensure the integrity of the equipment and the applicant's operating systems.

The application contained the necessary information for the Illinois EPA to issue the construction permit. As a rule, permit forms seek information to assist an agency's evaluation of an application, however, the Illinois EPA is not without jurisdiction to base its permit decision on matters outside of the permit forms (e.g. its own institutional knowledge or judgement). In this instance, the application contained enough information to demonstrate that the source would not cause a violation of the Act.

The existing site did experience an incident at the Hammermill Shredder system on May 18th that damaged the control for the shredder system including the RTO. By letter dated May 20th, the Illinois EPA communicated its expectation that GII, LLC, retain a third-party consultant to perform a comprehensive investigation and evaluation of the incident and submit a report of same to Illinois EPA for its review. That evaluation would include a root cause analysis of the incident and of any necessary replacement of or repairs to the control train. Such investigation and evaluation was undertaken and is ongoing. Based on recent communications between Illinois EPA's staff and General III, as well as counsel for same, it appears that the RTO is reparable and that measures can be put in place to ensure that a further incident of this type can be avoided including a safety bypass valve. The Illinois EPA will continue to monitor that situation along with the USEPA and the City including reviewing the reports of the evaluation.

The construction permit is issued to the scrap metal recycling facility on the basis that it can comply with applicable requirements most notably Pollution Control Board Part 218, Subpart TT, which requires an overall reduction in uncontrolled VOM emissions of 81%. With the proposed RTO and enclosure, the requisite demonstration has been made. This demonstration will be verified via post construction emissions testing of the control and enclosure. The permit is for an RTO, not necessarily the RTO from the existing site. In the event, it is determined that the existing RTO cannot be utilized, a like RTO could be constructed. Regardless, the issued permit requires the source to install, operate

and maintain a continuous monitoring device for the inlet gas stream to the control train for the Hammermill Shredder System for the flammability of this gas stream as a percentage of the LEL of this stream. The LEL monitor would ensure that prior to reaching the LEL and potentially causing an explosion, the scrap metal feed to the shredder would be cut and the gaseous emissions stream would bypass the control train. Bypass events cannot be predicted but would be expected to be limited in number and duration. The estimated emissions impact is expected to fit within the established permit limits. Records and reports of such events are required under the issued permit.

68. Is the permit decision being rushed? What is the Illinois EPA's timeframe?

The permit is not being rushed, as the timeframe for permit decisions is governed by the Environmental Protection Act. The relevant provisions of Section 39(a) of the Act provide that if there is no action by the Illinois EPA within 90 days of receipt of the permit application, the applicant may deem the permit issued by operation of law. *See, 415 ILCS 5/39(a).* A permit that issued by operation of law is simply a type of enforcement shield, protecting a permittee from the allegation that source is constructing or operating without a permit. A permit issued by operation of law does not provide for substantive requirements that would ordinarily appear in a permit, such as numerous testing, monitoring, recordkeeping and reporting requirements detailed in the permit. Consequently, the Illinois EPA strives to avoid permit issuance by default.

General III's permit application was received by Illinois EPA on September 25, 2019, and multiple extensions of the statutory decision deadline were obtained to allow sufficient time to review the application, prepare a draft permit, and allow for public input. In fact, the time taken by the Illinois EPA to review the application and allow for public outreach was three times longer than the standard statutory time allowed for this type of permit application.

69. The permit should be denied. It is within the Illinois EPA's discretion.

Under the Environmental Protection Act, the Illinois EPA is required to issue a permit to an applicant upon proof that the proposed facility or equipment will not cause a violation of the Act or promulgated regulations. *See*, *415 ILCS 5/39(a).* This standard is a mandatory one, expressed in the language of the provision as a "duty" that is imposed upon the Illinois EPA. While agency deliberation of certain aspects of the permit may be grounded in the exercise of discretion, the broader legal standard governing permit issuance or denial limits the discretion of the Illinois EPA. The Illinois EPA finds that the legal standard noted above has been met. Nothing in the record, including the public comments on the draft construction permit, adduces otherwise.

70. Will you consider extending this process and making an adjustment to your decisional timeline, to allow equitable and robust participation for the community?

The decisional deadline associated with this construction permitting action is statutorily established – 90 days from receipt of application. That decision has already been waived more than once to accommodate for modeling and public participation, among other. The applicant has indicated an unwillingness to provide a further waiver. To avoid a default decision on the matter, the Agency must take action by June 25, 2020.

71. Please create a moratorium on permitting during a pandemic.

The Illinois EPA is a creature of statute. It does not possess the authority to create a moratorium on permitting.

72. The Illinois EPA cannot ignore public comment and approve the construction permit.

The Illinois EPA reviewed all comments provided at the public hearing and submitted during the public comment period. The Illinois EPA is generally responding to all comments that are significant and, as frequently happens, has made various changes to the permit in response to the comments, as discussed later in this document.

73. No company should be permitted to operate if that company poses a risk of serious health issues to the public.

Permits for the construction or operation of emissions units or control equipment may be acquired under the Environmental Protection Act upon a showing that there is no violation of the Act or applicable regulations. 415 ILCS 5/39(a). Except for some requirements that are developed on a health-based standard (e.g. National Ambient Air Quality Standards), this legal standard for permit issuance may not appear to directly account for risks posed to human health from an activity or exposure to a particular pollutant. This does not mean that the permitting process ignores these risks, only that they are accounted for, indirectly, through an evaluation of the rules and regulations that a stationary source must meet when constructing and operating new emissions units or control devices. The Act contains several enforcement provisions that are available to restrain violations, such as injunctions that can be sought by prosecutorial authorities under Sections 42(e) and 43, and by any persons adversely affected in fact under Section 45. Other statutory or common law remedies exist that complement the enforcement remedies under the Act.

74. Is it fair to say public comments would not prevent the permit's issuance, unless a commenter can somehow prove General Iron would violate said regulations?

Again, permits for the construction or operation of emissions units or control equipment may be acquired under the Environmental Protection Act upon a showing that there is no violation of the Act or applicable regulations. 415 ILCS 5/39(a).

75. How does the permit process work for existing equipment?

To remove emission units or air pollution control equipment from a property, a permit is not required. To relocate or "construct" that same piece of equipment at a new property a permit is required. In this case, General III has indicated that the RTO is being relocated. Thus, a construction permit for that RTO is necessary. However, it must be noted that there is no requirement to relocate any of the equipment from the existing location to the new location. Rather, the requirement is to obtain a permit for the operations that will be conducted at a given site and to demonstrate that the source can operate in compliance with applicable requirements.

76. It was misleading for the hearing panel to state that the Illinois EPA has no choice but to issue a permit to a source if the source will be in compliance with the regulations.

Under the Environmental Protection Act, the Illinois EPA is required to issue an air permit to an applicant upon proof that the proposed facility or equipment will not cause a violation of the

Environmental Protection Act or the Pollution Control Board's Subtitle B regulations. This standard is expressed as a statutory duty, not an exercise of discretion, and it focuses on whether the proposed facility or equipment will possess the design and operational capabilities to comply with environmental requirements.

Public comments frequently question why compliance problems occurring at another facility operated by the applicant (as relevant here), or at the same facility in the case of a new or renewed operating permit, are not factored into the permit review process. In general, and for the reasons described elsewhere, the Illinois EPA's review of an application does not look to past practices at the source (or the same source at another location) but, rather, on the ability of an applicant to comply prospectively with the applicable requirements that govern the emissions source that is being constructed or operated. In the case of air construction permits, this review reflects the required standard of issuance and the application content requirements mentioned above, which focus on prospective compliance and not aspects of enforcement.

77. How did the Illinois EPA consider violations from General II's existing facility in the review of the construction permit application for a new facility on the East Side.

As stated at the public hearing, the Illinois EPA did not consider alleged violations at the existing facility in its review of the construction permit application for the new facility. As a general rule, the Illinois EPA does not consider the enforcement-related history of an applicant as part of the permit review process. This is because the structure of the Environmental Protection Act, as revealed in its provisions, divides permitting and enforcement functions into separate programs, though there are limited exceptions that will be discussed later. The Act provides for a state-wide program that is aided by private remedies, namely, the enforcement provisions found at Titles VIII and XII, to hold polluters responsible for the harm that they cause.[7]

Civil enforcement can be brought through a filing of a complaint in a circuit court or with the Board against any person that violates the Act, Board regulations or a permit. Legal actions can be initiated by state prosecutorial officials or by any person through a citizen's suit. Such cases can involve extensive discovery proceedings, pre-trial procedures, and eventually either a settlement or a trial (or evidentiary hearing) to determine liability and requested relief (civil penalties, injunction, cease and desist, etc.) sought in the complaint. A complainant bears the burden of proof in a civil enforcement action.

Permitting programs are codified at Title X of the Act and in the Board's implementing regulations, including 35 Ill. Adm. Code Part 201 governing state air construction permits. These requirements assure that the permit review is conducted as a record proceeding, which is part of an intricate administrative continuum between the Illinois EPA and the Pollution Control Board. Under Section 39(a) and Part 201, the Illinois EPA reviews an application for air construction permit according to a formal standard of issuance and permit content requirements, as discussed above, and other rules of procedures.

If an applicant appeals an agency decision to deny or issue the permit, the Board acts as an overseer to determine whether the permit decision, based exclusively on the record prepared by the Illinois EPA, is supported by the relevant standard of administrative review. The burden of proof in a permit

[7] **415 ILCS 5/2(b).**

appeal is on the applicant and because the review is based only on the record assembled by the Illinois EPA, discovery proceedings are usually limited. Other procedures not addressed by the Act or implementing regulations may also be relevant to the Illinois EPA's permitting role. This includes procedural due process implications outlined by appellate court rulings beginning nearly forty years ago. A seminal case is *Martell v. Mauzy,*[8] which laid the groundwork for later recognition that the programs are separate. The federal district court decision held that the Illinois EPA's denial of an operating permit based on "putative" (or alleged) violations[9] required a pre-denial hearing by the Illinois EPA, as opposed to the usual post-decision appeal procedures before the Board, because it deprived the applicant of recognized liberty interests protected by procedural due process.

Other cases followed, establishing the basic principles that have frequently been cited by the Illinois EPA at informational permit hearings and in responsiveness documents for many years. The Illinois Third District Appellate Court affirmed the Pollution Control Board's decision that a special waste stream permit was improperly denied on the grounds of alleged violations cited from a parallel pre-enforcement action.[10] In citing to the Board's opinion that the Act's procedures for permitting and enforcement are "separate and distinct," the appellate court affirmed the Board and upheld the latter's inference that the permit denial process was "improperly" used in lieu of enforcement.[11] [12]

As mentioned, there are limited exceptions to the general rule described above. Notably, two exceptions originate from statutory amendments by the Illinois General Assembly to the Act in 2003 in P.A. 93-575 (93rd General Assembly). The amendments introducing these exceptions to Section 39(a) of the Act did not eclipse the existing framework of the Act or its implementing regulations, as much of that construct was left untouched. The legislature also did not overrule existing caselaw and, as such, the changes simply memorialized existing caselaw and other provisions of the Act that existed at the time.

The first exception created by the amendments to Section 39(a) allows for agency discretion in considering "prior adjudications of noncompliance" with the Act for environmental releases by an

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8 511 F. Supp. 729 (N.D. Ill. 1981).

9 The purported authority for the permit denial was Section 39(e), later re-codified at 39(i). The grounds for the denial of the operating permit rested with a history of alleged violations involving refuse disposal facilities, including a past enforcement action involving USEPA, two past and one pending state enforcement actions, a pending *quo warranto* action and agency inspection reports.

10 *See, EPA v. PCB,* 252 Ill. App. 3d 828 (3rd Dist. App. Ct. 1993).

11 *Id.* at 830. The ruling also illustrates the difference between evaluating a source's compliance status (viewed through an enforcement lens) and determining whether a permit application meets the Act's requirements for permit issuance (viewed through the Act's standard for permit review). This is shown by the court citing to application materials showing that the applicant's analyses of compounds used in its special waste streams were below regulatory limits, thus negating the grounds cited for permit denial.

12 *See also, ESG Watts, Inc., v. PCB,* 286 Ill. App.3d 325, 334-335 (3rd Dist. App. Ct. 1997)(agency consideration of alleged violations was not proper permit denial was supported for other reasons); *The Grigoleit Co. v. EPA*, PCB No. 89-184 (November 29, 1990)(if IEPA has waste concerns, the proper mechanism to address those concerns is an enforcement action rather than a denial of a permit).

applicant. The Illinois EPA only uses this authority rarely, in large part, because judicial (or quasi-judicial) rulings based 'on the merits' of an environmental enforcement case are uncommon. The bar set by these criteria is high, as it is perhaps meant to protect against a potential deprivation of the same interests claimed by the applicant in *Martell v. Mauzy.* Based on institutional knowledge, the Illinois EPA has used analogous, but more specific authority found in Section 39(i) in a handful of prior occasions.[13]

The other exception introduced in the 2003 amendments allows for agency discretion in imposing reasonable conditions relating to a "past compliance history" with the Act as is necessary to correct, detect, or prevent "noncompliance." *See,* 415 ILCS 5/39(a). The Illinois EPA does not routinely employ this authority, as it is also prudently viewed to hold a high bar by requiring demonstrated, not merely alleged, noncompliance. However, the Illinois EPA will sometimes incorporate relevant requirements from a final adjudication into a construction or operating permit, often doing so at the request of a respondent who has been directed to undertake a permitting change as a result of a settlement.

78. The Illinois EPA should deny the permit application for a construction permit because of adjudicated violations relating to the General Iron (or General II) facility.

A permit denial of General III's application for a construction permit based on the application before the Illinois EPA is not justified or authorized by the provisions of the Environmental Protection Act. Section 39(a) provides that the Illinois EPA may consider a permit applicant's prior adjudications of noncompliance with the Environmental Protection Act if the noncompliance involved a release of some contaminant to the environment. The Illinois EPA did not consider the entirety of General Iron's past compliance history cited in the comments to this proceeding because nearly all of it fails to satisfy the legal criteria set forth in the provision.

For purposes of this exception to the rule, an adjudication is generally regarded as a judgment by a court (or quasi-judicial body), relating to the Latin term "*judicare*," which means "to judge."[14] The concept of an adjudication consists of a formal determination 'on the merits' of the legal controversy.[15] The federal district court's ruling in *Martell v. Mauzy* is informative in this regard, as

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[13] **Sheridan-Joliet Land Development, LLC, denial letter dated August 14, 2018 (denying a renewal of clean construction and demolition debris development/operating permit due to a PCB enforcement adjudication); City of Morris and Community Landfill Company, denial letter dated May 11, 2001 (denying a request for significant modification to a development permit as a result of a criminal felony conviction); and *ESG Watts Inc. v. PCB,* 286 Ill. App.3rd 325 (3rd Dist. App. Ct. 1997)(denying renewal applications for a landfill's waste-streams based on a circuit court finding of liability and administrative citations).**

[14] ***See, Merriam-Webster On-line Dictionary* (www.merriam-webster.com) ("transitive verb: to make an official decision about who is right in (a dispute)"); Wikipedia (https://en.m.wikipedia.org) ("the legal process by which an arbiter or judge reviews evidence and argumentation, including legal reasoning set forth by opposing parties or litigants, to come to a decision which determines rights and obligations between the parties involved").**

[15] **Some might assert that the term should also include any type of court decree, including a settlement agreement resolving a case short of actual litigation, but such a notion misses the mark. A consent decree approving a settlement does not entail a judicial determination "on the merits."**

the "risk of erroneous deprivation" of the applicant's protected liberty interests was, at least in part, because the alleged violations had not been adjudicated.[16]

In many instances cited in comments, the claimed adjudications stem from administrative citations issued by the City of Chicago. It is not plainly evident that the resolution of those citations constituted a formal adjudication of noncompliance under the Act. The administrative citations issued by the City do not address infractions that arise from the Environmental Protection Act but, rather, are ordinance violations. A municipality's ordinances are entirely separate from the General Assembly's legislative enactments and, in this instance, nothing in the Act signals that the legislature meant for the Illinois EPA's purview to act upon ordinance violations. In this regard, it is not relevant that the facts relating to the citations correspond to matters that might be alleged under the Act, as Section 39(a) speaks to only the State's sovereignty.

79. The Illinois EPA should deny approval of the construction permit application for General III due to both admitted and adjudicated violations historically caused by Reserve Management Group/South Chicago Property Management ("RMG/SCPM") operating at the site of the planned construction of the General III facility.

For clarification of the record, and based on institutional knowledge, there are four manufacturing facilities that conduct metal recycling operations at the existing South Burley Avenue site where the planned construction of the General III facility will occur. The entities consist of Reserve FTL (d/b/a Reserve Marine Terminals), Napuck Salvage of Waupaca, LLC, South Shore Recycling, LLC, and RSR Partners, LLC (d/b/a Regency Technologies) and are collectively known as South Chicago Property Management, Ltd. ("SCPM"). SCPM is a corporate affiliate of two holding companies, RMG Investment Group, LLC, and RMG Investment Group II, LLC, who are doing business as Reserve Management Group ("RMG").

As previously discussed, the administrative citations issued by the City concerning the SCPM-related facilities are not adjudications involving the Environmental Protection Act but, rather, violations of City ordinances. There is also no indication in the record of this proceeding that violations by SCPM, who currently oversees the operations of the four manufacturing facilities at the existing site, would constitute a formal adjudication, or even noncompliance with the Act, relative to GIII's permit application.

Although the permit application indicates that the General III will be a single source together with the SCPM-related facilities, and the construction permit includes a permit condition to that effect, a source designation only addresses the respective roles and responsibilities of facilities recognized as a single source in the context of permit classification, though it can, on rare occasion, affect rule applicability too. However, a source designation used in classifying permitted sources under the Clean Air Act Permit Program ("CAAPP") and the FESOP should not be confused with shared or joint liability amongst related entities under applicable laws. As discussed elsewhere, how General III and the SCPM-related facilities opt to permit their single FESOP source, whether as single or multiple FESOP permits, will be addressed in the operating phase of the project.

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[16] **511 F. Supp at 741 (i.e. applicant lacked an "evidentiary hearing of any kind" regarding state settlement order and pre-enforcement orders considered by the Illinois EPA in its denial).**

80. RMG/SCPM has admitted to noncompliance with the Environmental Protection Act in a letter sent to the Illinois EPA in November 2019, such that there is a basis for a past adjudication with the Act for permit denial. The noncompliance relates to the failure of the manufacturing facilities to historically obtain the proper operating permits and the admission(s) addressed in the letter are not paper violations but involve unpermitted releases of pollutants to the environment.

As mentioned in a prior response, the Illinois EPA does not view SCPM to be the same legal entity as the permit applicant involved in this proceeding.[17]

Additionally, the Illinois EPA does not view a voluntary self-disclosure letter submitted under the enforcement provisions of Section 42(i) as evidence of a formal adjudication for purposes of Section 39(a), such that it could be considered in a permit review. Although a pre-enforcement letter could contain admissions, they would not be adjudicative in nature.

81. The noncompliance by the SCPM-related facilities occurred over many years and the discovery of such violations was inevitable given that they are mentioned in the General III permit application. It was grossly unfair and contrary to the Act [for the Illinois EPA] to offer the companies enforcement protections with respect to the noncompliance.

For reasons mentioned above, the Illinois EPA did not consider the pre-enforcement investigation of the SCPM-related facilities, including the self-disclosure letter, as evidence of noncompliance by General III in this permit proceeding.[18]

82. The structure of the Environmental Protection Act should compel the Illinois EPA to recognize the past violations being addressed by the City of Chicago, who acts as a local environmental agency and maintains a close relationship with the Illinois EPA, as adjudications of noncompliance with the Act. Such recognition will promote the goal of encouraging the coordination of environmental protection by local governments.

The Illinois EPA recognizes the strong working relationship with the City of Chicago in the investigation of emissions sources in the region, as well as the significance and value that the relationship provides to the residents and the State of Illinois. However, the reach of Section 39(a), including the Illinois EPA's consideration of a possible permit denial based on adjudicated noncompliance with the Act, depends upon the applicability of facts to the law. In this case, even the most liberal construction of the Act's relevant provisions cannot reconcile the issuance of a permit denial with the absence of a formal adjudication of noncompliance with the Environmental Protection Act. Recognizing and promoting the involvement of local governments in environmental protection efforts is important but not germane to the analysis of this permit application.

[17] **Because the Illinois EPA declines to consider the SCPM self-disclosure letter to be within the scope of review of the General III application, the notion that the nature of the unpermitted operations should constitute a release of contaminants to the atmosphere for purposes of Section 39(a) is moot.**

[18] **To assist the public's understanding concerning a matter of possible interest, the Illinois EPA notes that any relief (i.e., enforcement protections) in a civil penalty assessment provided by the State of Illinois in response to a voluntary self-disclosure letter does not arise unless or until a formal enforcement action is commenced and resolved through either a negotiated settlement or adjudication.**

83. Nowhere does the Act expressly state that the Illinois EPA cannot consider adjudications of local air ordinances as a basis for denying a permit under Section 39(a).

The Illinois EPA is a creature of state law, which means that its legal authority derives from the laws enacted by the General Assembly and approved by the Governor. Such authority takes the form of expressed powers, as found within the enactment's provisions, or implied powers, to the extent necessary to execute the expressed powers. The absence of specific authority in the law (e.g., "nowhere in the Act does it say") does not create a source of authority for an administrative agency, it simply confirms that no such authority exists. Put another way, the Illinois EPA's powers are defined in relation to the Act, and do not include the vast universe of authorities that are not otherwise specifically prohibited.

In this instance, if the Act does not expressly provide for the consideration of enforcement-related matters that stem from local air ordinances, or are not implied from those expressed powers contained in the Act, the Illinois EPA plainly lacks the authority to consider such things in its permitting capacity. The Act neither expressly provides for, nor otherwise implies, that violations of local air ordinances are within the purview of the Illinois EPA's permit review under Section 39(a).

84. Thirty-three unresolved administrative citations involving General Iron are currently pending with the City of Chicago, delayed in their resolution and rescheduled for hearings due to the COVID-19 pandemic. Because the citations involve repeated and substantive violations that relate to matters addressed by this permitting action, the Illinois EPA should postpone the permit decision to allow for the resolution of the citations so that they may be considered in the permit's review.

The Illinois EPA acknowledges the administrative delays associated with governmental affairs during the COVID-19 pandemic and understands the desire expressed by the comment to account for all relevant information that could support a basis for a permit denial. However, the Illinois EPA is unable to extend the decision deadline and, in any event, could not evaluate the citations even if resolved in favor of the City. This is because the Illinois EPA lacks an ability to unilaterally postpone or extend the current decision deadline and, as mentioned elsewhere, the administrative citations process represents the sovereign power of the City to enforce violations its municipal ordinances, not noncompliance with the Environmental Protection Act.

85. Evidence of noncompliance by the SPCM-related facilities from multiple sources, including prior admissions from a pre-enforcement process overseen by the Illinois EPA, liability findings by the City of Chicago and past City inspection reports, should be considered by the Illinois EPA in imposing more stringent conditions in any issued permit.

As discussed elsewhere, SCPM is not the permit applicant in this proceeding. The fact that the SCPM-related facilities will be treated as a single source for purposes of future FESOP permitting does not now, and will not prospectively, affect issues relating to the liability. As also discussed, the cited allegations from the comments do not relate to noncompliance with the Act.

Separately, the Illinois EPA does not construe Section 39(a) of the Act as authorizing permit conditions based only on allegations of noncompliance with the Environmental Protection Act, as suggested by

the comment. The text of this part of Section 39(a) provision speaks plainly to "noncompliance"[19] and does so without qualifying its meaning as either alleged or adjudicated. In comparison to other provisions of the Act, when the legislature means "alleged violations" it employs the modifier expressly, as in the case of the Act's pre-enforcement process where it is quite sensible. 415 ILCS 5/31(2018).[20] In other contexts, the General Assembly seems to find reliance on mere allegations as antithetical to the Act's history and purpose. For example, the Board is not able to consider past enforcement history of a respondent in its determination of civil penalties unless the noncompliance is adjudicated.[21] It is also incongruous to suggest that the Illinois EPA can permissibly craft permitting conditions from mere allegations under the Section 39(a) when any revocation of a permit by the Board requires a formal enforcement action.[22]

In the recent past, the Illinois EPA asserted that the "noncompliance" language of the statute's text is best thought synonymous with "adjudications," in part, for reasons to avoid constitutional problems.[23] However, the Illinois EPA will allow for the consideration of admitted or uncontested matters in this analysis, to the extent that such proof support a showing of noncompliance. Note that court-approved settlement agreements containing admissions of liability or a clause allowing the Illinois EPA's use of the agreement for purposes of an adjudication under Section 39(a) would signal a court's affirmation of such a finding.

86. Evidence of noncompliance by the General Iron facility from multiple sources, including liability findings by the City of Chicago, pending citations before the City and past City inspection reports, and USEPA enforcement actions against General Iron should be considered by the Illinois EPA in imposing more stringent conditions in any issued permit.

The previous response answers several of the reasons why evidence of many of the alleged violations cited by comments cannot be considered by the Illinois EPA in this proceeding. One issue remaining is the effect of USEPA's consent agreements and administrative settlements on the Illinois EPA's ability to impose permit conditions under Section 39(a).

Based on the comment and its supporting attachments, prior USEPA investigations and resulting lawsuits involving the former owner of the facility, General Iron, occurred on at least three occasions in the last two decades, culminating in lawsuits resolved by way of a consent decree in 2006 and two

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[19] **The language used in the relevant text, as introduced to the Act as an amendment in 2003, essentially refers to "noncompliance" twice: the first time indirectly, as "past compliance history" would seem synonymous with noncompliance, and the second time directly.**

[20] **There are also instances where the term is unqualified but there is no need for a modifier, as the context is one in which the liability for actual noncompliance is being, or already has been, determined. *See,***

[21] **415 ILCS 5/42(h)(5). *See also,* 415 ILCS 5/42(b)(4-5)(2018)(assessing an additional penalty amount for certain administrative citation matters is restricted to a "second or subsequent adjudication violation" of the relevant provision).**

[22] **415 ILCS 5/33(b).**

[23] **See, Illinois EPA Responsiveness Summary for Sterigenics U.S., LLC, Willowbrook I, pages 68-70, dated September 20, 2019.**

administrative settlement agreements in 2012 and 2019. The earlier consent decree from 2006 does not purport to be a fully executed order, as it is not signed by the parties or the presiding judge, and it is not clear whether it is still in effect, as it contains a termination clause that may likely have been executed by now. The decree also only addressed federal matters[24] and therefore does not fall within the scope of the Section 39(a).

The administrative order from 2012 cites a single day of violation by the facility with the Board's fugitive emissions standard[25] and the regulatory equivalent of Section 9(a) of the Act. The 2019 administrative order cites to four inspection dates alleging that the facility failed to control VOM emissions below the applicability thresholds of the Board's Part 218 regulations.[26] The order also alleges that the facility operated as a major source without a requisite Title V operating permit, citing to the Illinois Clean Air Act Operating Permit Program.[27] Both orders required corrective action by the facility, including obtaining the necessary permits from the Illinois EPA.

The two administrative orders are within the scope of the Illinois EPA's authority under Section 39(a) for the consideration of permit conditions, as they reflected noncompliance with the Act through the State's Implementation Plan. The Illinois EPA reads the administrative orders as a fair acknowledgement by General Iron of its agreement with the terms of the orders, including statements asserting the company's failure to meet emission control requirements from the Board's Subtitle B regulations (i.e., fugitive emissions standard and Part 218, Subpart TT.

However, the Illinois EPA will not exercise discretion to apply the administrative orders to impose new conditions in the construction permit, as circumstances do not warrant them. It would also require significant record support, should General III appeal the imposed permit conditions, to support a showing of the *necessity* for conditions to correct or prevent the noncompliance addressed by the administrative orders.[28] It is noted that comment(s) do not allude to specific conditions that are necessary to address noncompliance covered by the orders.

87. Evidence of noncompliance by another facility, Chicago Rail and Port, should be considered for the GII facility because of fugitive dust violations addressed by USEPA in a Notice of Violation letter.

The record of this proceeding does not indicate that the referenced facility currently has any relationship to General III or the SCPM-related facilities such that it should be considered in this permit proceeding.

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[24] **The complaint alleged that the respondent knowingly disposed of appliances containing substances used as a refrigerant pursuant to 40 C.F.R. §82.154(a) and 82.156(f).**

[25] 35 Ill. Adm. Code 212.301.

[26] 35 Ill. Adm. Code 218.980(a)(1) and (b)(1).

[27] 415 ILCS 5/39.5(2)(c)(1).

[28] **At this stage of development, the facility has already installed the controls and performed the necessary emissions testing that were an outgrowth of the allegations, and the related permitting requirements addressed only the existing facility, not a new one at a different location.**

88. The Illinois EPA should ask Governor Pritzker to postpone the statutory deadline or declare the permit application incomplete.

The Illinois EPA is not inclined to seek a postponement of the current decision deadline through use of an executive order or otherwise, as the permit application contains all the requisite information to be deemed complete. To be accurate, the current deadline of June 25th governing the Illinois EPA's review of the construction permit application reflects the applicant's waiver of the decision deadline, not the original timeframe set forth in Section 39(a) of the Act.

89. Another source of authority under Section 39(a), which references the use of conditions "necessary to accomplish the purposes of the Act, and as not inconsistent with" Board regulations," is relevant to this proceeding. It provides broad authority for the imposition of conditions that go beyond the regulations if the two criteria reflected in the text are met.

The Illinois EPA agrees that this authority is relevant to this proceeding and, indeed, it is by far the most common source of authority used in the development of a construction permit for emission sources or equipment required by Section 39(a). Generally speaking, the language reflects a kind of catch-all authority and for many permits issued by the Bureau of Air, the authority is usually cited generically, and usually only once, for a wide range of conditions that are not expressly identified elsewhere in the Act or implementing regulations.

But this authority does not extend beyond its plain wording, as this comment contemplates. In fact, the Illinois EPA's role as a permit authority is tempered as much by the role that the Pollution Control Board shares under the Act as by Section 39(a). The Illinois EPA cannot misappropriate the role of the Board as the State agency charged with setting environmental control standards. The Board may even be guided by this concept when the statute's text comes into focus in permitting appeals, as more often than not, the Board sets a noteworthy bar in judging the "necessity" of operating conditions.[29]

90. The plain language of the [catch-all] authority of Section 39(a) contrasts with a misleading statement by one of the members of the hearing panel, who said that the Illinois EPA had no choice but to issue a construction permit to a source if the source will be in regulatory compliance.

This comparison tries to combine different concepts, leading to an incorrect conclusion. The reference to Section 39(a) relates to the scope of authority in setting permit conditions and the statement regarding permit issuance based on regulatory compliance is a restatement of the standard of permit issuance. Incidentally, because the restatement is a fairly accurate representation, there is nothing misleading about it.

91. The Illinois EPA is in error when it contends that it may only deny a permit a permit under Section 39(a) if there is an adjudicated liability finding by a circuit court or the Board (citing to a previous responsiveness summary discussion and footnote accompanying the Sterigenics permit proceeding).

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[29] ***See, IEPA v. Jersey Sanitation Corp.,*** **784 NE2d 867, 875-875 (4th Dist. Ct. App. 2003)(holding that petitioner was required to show that its [closure/post-closure] plan, which agency found lacking, "would not result in any violation of the Act and the modifications, therefore, were arbitrary and unnecessary").**

The discussion referenced in the cited responsiveness summary responded to a question regarding whether the Illinois EPA could deny a permit on grounds of past violations. The answers outlined in that earlier discussion are generally in accord with responses in this document, including the Illinois EPA's contention that the Act requires an adjudication if a past history of violations is the basis for a permit denial under Section 39(a).[30] The comment is mistaken in the belief that the document cites to a proposition that no other basis for permit denial exists under Section 39(a) than for of an adjudicated liability, as there are numerous other grounds that can form the basis for a permit denial.

92. The Illinois EPA is hypocritical when it claims that permitting is separate from enforcement, especially given the lack of enforcement activities conducted by the Illinois EPA in the last 15 years. The Illinois EPA cannot fail to meet its enforcement and permitting responsibilities and then rely on those failures to justify agency inaction, as it causes a vicious cycle and evidence of a failed agency.

The Illinois EPA appreciates the candor of this and related comments, but its enforcement programs are not at issue here. Certainly, the Illinois EPA is not above criticism in the performance of its responsibilities, and residents of the local community and throughout the State are free to express their displeasure with the Illinois EPA's implementation of its many roles.

The point at issue is about how an organization, a state agency whose authorities are defined by statute, perceives its roles, and performs its responsibilities, under existing laws and regulations. As mentioned, the Illinois EPA's permitting and enforcement programs typically operate independently of one another as a matter of course, as they have for many years. There is no doubt that the caselaw authorities cited in this document, and the principles that informed them, have been an organizing principle in bringing about this separation.

93. Illinois EPA must include permit conditions that provide the community with data about the facility's emissions.

The permit as revised has enhanced recordkeeping and reporting requirements. Notably, records and reports of the results of emissions testing are required under the revised permit. Also, quarterly reports are required under the final permit. These reports would include data about the facility's emissions. All reports required under the permit will be available to the public.

94. I am concerned for what a permit application review is constrained to.

Illinois EPA is generally constrained to what is contained in a permit application, such as whether applicable requirements will be met. The Illinois EPA cannot review/consider violations at another facility, as in this case, due to Illinois case law and interpretation of the permit Environmental Protection Act. As a result, Illinois EPA review is confined to matters of the application and not to compliance or enforcement considerations, with some limited exceptions.

95. The draft permit should require General Iron to keep records of emissions control testing and emissions for a longer period of time and should be made available to the public upon request.

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[30] **In retrospect, footnote 6 could have observed that a liability adjudication might also originate with a federal district court (or body acting in a quasi-judicial capacity) provided that the Act or implementing regulations in Illinois is the basis for the noncompliance addressed in the controversy.**

Generally, the records that are required under the permit have a retention period of five years. This is the customary retention period for FESOP and CAAPP sources. Unlike the records of the State, the records of a facility are not available to the public upon request. However, the records are available to the State upon request, which records would then be available to the public under the Freedom of Information Act.

96. Both Condition 19 and Condition 21 require that records be kept for "at least" a period of time, these two conditions contain inconsistent lower bounds – three years and five years.

Condition 19 merely recites the recordkeeping required by specific rule. Condition 21 addresses recordkeeping that goes beyond that rule. The timeframe for record retention in Condition 21 is consistent with that required of FESOP and CAAPP sources. That there are two discreet record retention periods is not an issue. To reconcile the two would serve to undermine the greater retention requirement.

97. Descriptions of the Ferrous and Non-Ferrous Material Separation Systems on page 1 of the draft permit are inconsistent with the emission limits for these Systems contained on pages 14-16. Illinois EPA must correct all descriptions and ensure that all emissions estimates, modeling based on those estimates, and proposed limits and monitoring, recordkeeping and reporting requirements encompass all proposed emission sources/units associated with their respective Systems.

The Illinois EPA acknowledges the inconsistency and has revised the permit to accurately list emission units. In short, the magnetic separators, box separators, and the stacking conveyors are not in addition to, but are the 70 conveyor transfer points.

98. We note that there appears to be a grammatical error in Cond. 10(b) – it may be that the provision omits an "and" between "unpaved areas" and "shall be treated."

This comment has been addressed.

Single Source

99. As part of its permit review and contrary to its well-established permitting standards, the Illinois EPA failed to address the SCPM-related manufacturing facilities that will be co-located with General III at the new facility.

The Illinois EPA addressed the single source permitting issue relating to this proceeding in accordance with applicable law and consistent with past practices. The permit application acknowledged that the General III facility will comprise a single source for purposes of permitting under the Act with the existing SCPM-related entities located at the site. In view of the relevant single source criteria that is reflected in Section 39.5 of the Act, together with the acknowledgement from the application, the Illinois EPA did not question treating the various facilities as a single permitted source. This is reflected in the draft and final permit at Condition 1e.

100. Despite apparently concluding that the General III and SCPM-facilities are a single stationary source, the Illinois EPA is conducting separate permitting activities of the two, which improperly segments all of the pollutant-emitting activities at the source. The current application provides an incomplete picture of the source and a single application is needed that combines the comprehensive emission-requirements into a single construction permit for the source.

As this permit proceeding involves an application for construction permit, the Illinois EPA is addressing matters relating to the development of the project, including the design and operating capabilities of General III's emissions units and control equipment that will be authorized by the permit. The application does not address activities relating to the SCPM-related activities due to the fact that those sources do not require a construction permit, independently or in conjunction with the project. At present, the SCPM facilities are operating pursuant to an existing Registration of Smaller Source ("ROSS") registered under SCPM's name. Condition 1e of the draft construction permit recognizes that General III is a single source with SCPM. Beyond this recognition, it is not necessary for the draft permit to contain any other requirements relative to the issue.

The Illinois EPA is aware that General III must submit a Federally Enforceable State Operating Permit ("FESOP") application on CAAPP forms in order to avoid major source status under the CAAPP. Based on institutional knowledge, the Illinois EPA is also aware that SCPM will be submitting a FESOP application at the same time. This indicates that the sources anticipate obtaining separate FESOP permits, notwithstanding that the facilities are sharing the same FESOP source status.

This approach is consistent with applicable law and past practices, which is illustrated in a USEPA petition response involving U.S. Steel Corporation issued December 3, 2012 (Petition No. V-2011-2). In denying a petition point addressing similar concerns expressed by the comment, USEPA observed that Title V permit authorities may issue "multiple title V permits to a single Title V source" provided that the compliance obligations for each facility are clear and that all applicable requirements are contained in a Title V permit. *Id.* at page 26. In its decision, USEPA declined to require the Illinois EPA's processing of U.S. Steel's Title V permit to be consolidated with a separate supporting facility, Gateway Energy & Coke Company. Both facilities were treated as a single source. The discretion in the permit authority likely relates to a recognized need to provide flexibility in reporting and other permit obligations in the context of a single source classification, given that different responsible officials or personnel will be overseeing the responsibilities of the respective facilities.

101. General Iron's operating permit application has not been acted on by the Illinois EPA in years. Deferring a single source determination to the operating permit phase of permitting for the source is inadequate.

The Illinois EPA is not deferring any single source determination, as the decision to treat the General III and SCPM-related facilities as a single FESOP source is being memorialized in the construction permit. The processing of the operating permits for the sources will be addressed in the future, in parallel fashion to the extent practicable.

102. The applicant has failed to describe, and the Illinois EPA has failed to consider the proposed new source along with the other sources already located at South Burley as a single source for air permitting purposes.

As elsewhere discussed, the existing SCPM Entities will be a single source with General III and will be

required to obtain a Federally Enforceable State Operating Permit. The other entities will be addressed, along with General III, during that operating permit application process.

103. "The Draft Permit fails to consider all of the RMG facilities in the Potential to Emit or air quality modeling of the proposed GIII."

The SCPM Entities continue to qualify for eligibility under the Registration of Smaller Sources (ROSS) program. Sources are eligible for the ROSS program if combined actual emissions of PM, CO, NOx, VOM and SO2 from non-exempt sources are less than 5.0 tons per year, or less than 10 tons over the two most recent years and total hazardous air pollutant (HAP) emissions are less than 0.50 tons per year. The ROSS program is mandatory meaning that if a source meets the eligibility criteria, it must be registered in the program. Absent changes in operation or new information, the SCPM entities must remain in the ROSS program until General III triggers the requirement to seek an operating permit.

Ambient air impacts from these operations are accounted for in the background monitoring values at the Illinois EPA's monitoring station at Washington High School, which evidences attainment of the NAAQS for PM.

Periodic Monitoring/ Practical Enforceability

104. The Draft Permit is unenforceable. Numerous permit limits, in particular on fugitive sources, are vague, require only weak or nonexistent testing or monitoring, and/or require insufficient recordkeeping, with virtually no mandated reporting.

As is explained elsewhere, this construction permit for this minor source does not require the content associated with permitting of major sources of emissions and specifically that associated with Clean Air Act Permit Program permitting. There is no requirement for periodic monitoring such as testing, monitoring, recordkeeping and reporting in this minor source construction permit. Notwithstanding, in response to comment, the Agency has clarified and enhanced many requirements within the permit.

105. The permit lacks specificity and is not enforceable.

Further specificity is not needed to make the permit enforceable. The applicable regulations and requirements that would apply to the facility are clear. Further, the construction permit requires General III to conduct emission testing, monitoring, and recordkeeping to show compliance with new emission limits and control requirements. The permit also requires GIII to prepare and implement plans for Operation and Maintenance and Feedstock Management as well as a Fugitive Emissions Operating Program.

106. The permit lacks monitoring and recordkeeping/reporting requirements to ensure compliance with and enable enforcement of the limits on the hours of operation. With respect to the shredder, noise monitoring can and should be used to track shredder operations on a continuous basis for purposes of determining compliance with the limit on hours of operations.

The permit as revised now includes a recordkeeping requirement relative to hours of operation per day, month and year for each process area. The draft permit already required deviation reporting from the hours of operation requirement. Illinois has no noise program, and regardless is not inclined to use noise to know whether a source is operating. Hours of operation is a very common consideration in determining and limiting the emissions of a source. Never has noise been the means by which compliance with the hours of operation was assured or determined.

107. Concern with Agency undercounting emissions from metal recyclers; these facilities have been miscategorized as minor emitters of pollution.

It is true that there is limited data on the emissions from scrap metal recyclers and that their emissions impact has not been readily understood. Given its national presence and role, USEPA took the lead on the matter in Illinois seeking emissions testing of select sources. Through that testing it was determined that the scrap metal recycling operation on Clybourn was a major source of VOC emissions. The USEPA entered an administrative order mandating the installation and destruction efficiency testing of an RTO. Under this construction permit, the Illinois EPA is also requiring emissions testing. That testing and the data resulting therefrom will prove instructive relative to the emissions from such operations.

108. The Draft Permit is utterly lacking in any control requirements and monitoring, recordkeeping and reporting requirements sufficient to ensure compliance with these limits by various "fugitive" sources on an ongoing, continuous basis.

The draft permit was not completely devoid of control, recordkeeping and reporting requirements. Fugitive control requirements included enclosure, sweeping and watering, and reporting was required for deviations. However, in response to comment additional the Fugitive Emissions Operating Program has been enhanced as has the recordkeeping and reporting.

109. Illinois Environmental Protection Agency should impose new permit conditions to control emissions and address General Iron's long history of non-compliance.

It is not clear what additional control requirements the commenter seeks to have imposed. The scrap metal operation is only subject to regulatory requirements for visible and particulate matter emissions and for emission of volatile organic material. The sole control requirement to which the source is subject applies to the Hammermill Shredder System and necessitates the reduction of uncontrolled VOM emissions by at least 81%. The Illinois EPA cannot unilaterally create and impose additional control requirements by way of this permit.

110. I am concerned for boilerplate restatements in the permit.

The use of boiler plate restatements of regulatory requirements is a practice of the Agency for efficiency in certain types of permitting as well as to minimize errant restatements of regulatory requirements. This approach creates no legal or technical issues, rather it serves to identify applicable rules and related provisions such as test methods.

111. Condition 10, merely contains vague, general control obligations for storage piles, roadways, vehicle loading and unloading, and other transfer points that simply list available control measures in the alternative and state that control shall be done "in accordance with" a required operating program,

for which Condition 10 lays out minimum requirements, along with incorporation by reference of a December 2019 fugitive particulate operating program and a provision for updating the operating program and incorporating it into the permit.

This approach presents no legal or technical issues. However, in response to comment, requirements addressing fugitive visible emissions have been clarified and enhanced in the permit and fugitive particulate operating program.

112. Condition 13 sets forth a restatement of Section 201.282 that confusingly includes a directive that sources “shall” conduct testing, followed by a permissive clause that Illinois EPA “may” require an owner or operator to conduct testing and a clause that Illinois EPA “shall have the right” to conduct tests at Illinois EPA’s request; 13(a) only includes a vague commitment by Illinois EPA to require the facility to test its pollution control equipment when Illinois EPA deems it is a "reasonable time[]" to do so.

The condition does not include a directive that sources shall conduct testing followed by two clauses. Rather, the condition indicates that the source shall be subject to Agency requests for source testing as well as Agency conducted testing. Also, condition 13 is a mere recitation of the regulatorily established obligations for a source to test. Any testing specifically called for in the permit is set forth elsewhere in the permit.

113. Condition 14 sets forth references to the methods for conducting monitoring and testing of various emissions sources set out in Sections 212.107 to 212.110, including methods for visible emissions and opacity;

The condition simply makes clear the appropriate reference methods for testing.

114. Cond. 16(g) includes a statement that satisfactory completion of the initial test is a prerequisite to issuance of an operating permit, which in theory could set an outer boundary on delays. However, given Illinois EPA’s practice of sitting on permit applications for extended periods of time we have concerns that testing may be delayed indefinitely.

Initial testing required under the permit is to be conducted within a defined window of time. Subsequent testing addressed in the permit is also to be conducted at a defined point. As drafted, the permit does not provide for delays in testing. As to permitting, the Illinois EPA has never had a practice of sitting on permits. However, there was a period, when for myriad reasons including limited resources, the Illinois EPA fell behind in permitting and a backlog was created. In recent years that backlog has largely been eliminated in the CAAPP and it has been significantly reduced in the FESOP program.

115. Condition 25 sets forth a requirement to submit a report to Illinois EPA “[i]f there is an exceedance of or deviation from the requirements of this permit as determined by the records required by this permit or otherwise.”

This condition is one of the most if not the most important permit condition. This condition requires the reporting of any deviation from any requirement in the permit as determined not just by the records required under the permit but by any credible evidence.

116. Section 9(a) on page 8 does not indicate how often the facility should be required to do visual inspections or otherwise inspect or evaluate its pollution controls.

In response to comment, the Illinois EPA is requiring the expansion of the Maintenance Plan required at condition 11(h) in the draft permit to include all maintenance activities required under this issued permit. This plan will address practices and frequency, among other.

117. I have concern for the operating program and maintenance plan. The permit should specify what, at a minimum, must be in those plans to ensure protection of public health.

As is stated on the face of the permit, the terms of the operating program are incorporated into the permit, with the program itself as an attachment. The practices detailed in the program are intended to minimize visible fugitive particulate matter emissions and ensure compliance with the Board's Part 212 regulations. In response to comment the operating program has been enhanced. The maintenance plan, which has been expanded to additional equipment, is now required to be submitted 90 days prior to startup of the covered equipment. The plan will address maintenance activities and frequencies among other.

118. The hazardous air emissions permitted in section 12(b) should be reduced to 0 tons per year. Alternatively, Illinois EPA and General Iron should demonstrate to the public why this cannot be done and demonstrate that the pollution controls selected are those that will reduce hazardous air emissions to the lowest possible amount, i.e. that they are the best available control technologies.

Among its other responsibilities, the Illinois EPA is the permitting authority in Illinois. In that role, pursuant to and consistent with statutory and regulatory requirements, it is the Illinois EPA's duty to ensure sources are appropriately permitted. During the permit review process, the Illinois EPA determines whether a source has demonstrated that it can comply with the Environmental Protection Act and applicable regulations thereunder. The purpose of any issued permit is to memorialize the statutes, regulations and related terms such as recordkeeping and reporting applicable to the permittee and with which the source must comply as it is constructed and operated. In this instance, there is no basis for the imposition of an emission limit of 0 on the hazardous air pollutants.

119. "Emissions limitations in the Draft Permit are based on underestimated emissions of air pollutants, Likewise, the permit is based on artificially high control assumptions and greatly underestimated emissions for a range of fugitive sources including paved roads, vehicle loading/unloading, and piles)."

As has been stated elsewhere, where technically feasible, testing to validate the nature and quantity of emissions and the efficiency of controls has been required in the draft permit and further enhanced in the final permit.

120. The Draft Permit improperly assesses emissions from torch cutting and fails entirely to propose controls for torch cutting.

General III does not perform torch cutting, thus this activity is not addressed in the permit.

121. Conditions are lacking in the permit for emission controls that will achieve compliance with permit limits, and other conditions of the draft permit are unenforceable as being too vague, have no objective sufficiency or have no measures, including monitoring, record-keeping and reporting, by which to ensure compliance with particulate matter source and fugitive emissions.

The comment presumes the Illinois EPA can impose emissions standards and any related means of ensuring that a source will meet the requisite standards through this proceeding. However, the Illinois EPA does not wield a broad, or plenary, authority in its permitting role under the Act. The Act vests rulemaking authority for environmental control standards in the Board, not the Illinois EPA.[31] Analogous to the rule that permitting is no substitute for enforcement, it can be said that the Illinois EPA's permitting function is no substitute for the Board's rulemaking function.

From a legal perspective, it must also be observed that the state construction permit process for minor or synthetic air emission sources does not possess the rigors of major source programs. There is not a clear path to achieving controls and ancillary measures ordinarily reserved for New Source Review permitting. Periodic monitoring, a notion that springs from the Title V program, is similarly out of reach. USEPA has previously approved the relevant parts of the Illinois SIP as it relates the existing legal framework for state construction permits issued pursuant to Section 39(a) of the Act and the Board's Part 201 regulations. Region V staff also routinely reviews draft and final FESOP permits issued under this same regulatory framework, as they did in the case of the draft permit.

In general, a permit issued by the Illinois EPA is merely a vessel containing the relevant requirements that apply to the stationary source. The permitting role required of the Illinois EPA for a state construction permit (and operating permits that do not comprise major sources) is to mirror the basic control standards imposed upon a stationary source by the Act and Board regulations, and to provide basic measures for assuring compliance with the regulations and/or the permit. This approach is supported by the Part 201 regulations in the monitoring and testing provisions (Subpart J) and the records and reports provisions (Subpart K).

As mentioned elsewhere, the final construction permit includes additional monitoring that will be obtained through the development and operation of plans, and additional emissions testing, records and reporting requirements.

122. Many of the requirements of the fugitive particulate operating program ("FPOP") are practically unenforceable because they are overly vague and lack sufficient monitoring, recordkeeping and reporting details, or general sufficiency, to ensure continuous compliance with 35 Ill. Adm. Code Part 212.

The permit contains appropriate conditions for a state construction permit for the proposed emission source and control equipment. The more substantive rules for fugitive emissions (or dust) is commonly addressed by the Board's Subpart K regulations found at Section 212.301 and Sections 212.302-212.310 and 212.312). The former is a narrative standard that prohibits fugitive particulate emissions from any process that is visible beyond the property's boundaries when looking towards the zenith. The latter is the fugitive particular matter operating program requirements, which is designed to identity and implement best management practices to control fugitive dust activities at a site. General III is subject to the narrative visible emissions standard but not the operating program,

[31] **415 ILCS 5/5(b).**

as the facility's Standard Industrial Classification (SIC) code does not include the two-digit major groups specified in Section 212.302.

In the absence of applicability of the Board's Subpart K regulations, the Illinois EPA could have attempted to impose broad, cut-from-whole-cloth permit conditions, possibly even compelling many of the dictates regarding controls and timing requested by some comments. But given the possibility of an appeal, the Illinois EPA opted to pursue an alternative path for obtaining comprehensive measures for fugitive dust control. Successfully negotiated in other permits under similar circumstances, the FPOP is essentially a product of General III's willingness to commit to voluntary measures for controlling fugitive dust from the site. These voluntary measures, in turn, are incorporated into the construction permit and made enforceable through the most recent version of the plan submitted by General III on June 25, 2020.

123. The draft permit fails to ensure that the 30% opacity limit will be met for the facility's fugitive emissions sources, thus excluding them from a requirement that applies to process units and fugitive sources alike.

In response to comments, the draft permit will be amended to clarify that fugitive sources at the facility are subject to the opacity requirements of 35 Ill. Adm. Code 212.123. In addition, opacity observations are being included in the final permit to assure that the fugitive sources demonstrate an ability to comply with the emissions standard.

124. The draft permit allows for an improper automatic approval of a future revision to the FPOP and, in doing so, disallows the right to public review and comment prior to its approval.

Condition 10(i) of the draft permit provides that in the event a future revision to the FPOP is made during the permit term, the revision is automatically incorporated into the permit subject to the right of the Illinois EPA to approve the revision. The comment is therefore not correct in stating that the revision is automatic. However, the comment does correctly note that in the event that a future revision is incorporated to the permit, it will occur without undergoing public review, as there will be no permitting transaction contemporaneous with the change to the FPOP. In view of the FPOP's relative importance for source compliance with the permit's fugitive emission standards, and the protective requirement that the revisions must be consistent with Condition 10e and 10f, the Illinois EPA believes it is appropriate for FPOP revisions to go into the permit sooner rather than later. In this regard, the benefits obtained from fugitive dust controls through in-term revisions to the FPOP out-weighs the right of public review.

125. The draft permit allows for an improper post-issuance submission of the Contingency Plan required by 35 Ill. Adm. Code Part 212, Subpart U, thus disallowing the right to public review and comment of the document.

The submission of the Contingency Plan is tied to the submittal requirements set forth in Subpart U in Part 212. More specifically, sources subject to the rule after July 1, 1994, must submit contingency measure plans to the Illinois EPA for review and approval within 90 days following of the date that the source becomes subject to the rules. Condition 9b simply mirrors the regulatory requirement governing submission of the plan.

126. The permit allows several conditions of the permit to improperly defer the selection of multiple control options to the source and relegates the specificity of the permit's obligations to the FPOP.

For the reasons described above, the Illinois EPA exercised its discretion to address fugitive particulate emissions from the site through the avenue of a FPOP that the permittee has agreed to implement, and which will be enforceable through the incorporation by reference of the permit.

127. The emissions testing and monitoring under the draft permit is virtually nonexistent and contains conflicting requirements with respect to the Illinois EPA's testing authorities.

Emissions testing from the draft permit obligates the applicant to undertake an initial test with 60 days of the date that raw materials are first processed through the shredder, with an emissions protocol for the emissions testing submitted to the Illinois EPA within 90 days of issuance of the construction permit. *See,* Condition 16. Additional emissions testing and monitoring requirements have been added in response to public comment, as detailed elsewhere in this document. This includes capture efficiency testing as part of the testing evaluation of the RTO, testing of select pollutants from the fines processing system, testing of select pollutants from the Shredder system and opacity observations.

Contrary to the comment, there is no contradictions in the conditions relating to the testing authorities, as found in Condition 13. These requirements merely restate the testing requirements set forth in Part 201, Subpart J.

128. The permit does not contain any references to Section 9(a) of the Act and 35 Ill. Adm. Code 201.141, which are an on-going compliance requirement and was addressed by the Illinois EPA through its evaluation of air quality impacts in its air quality modeling.

The comment misapprehends the nature of the Section 9(a) prohibition and the similar standard found at 35 Ill. Adm. Code 201.141 in the Board's Part 201 regulations. The prohibitions contained in both requirements are narrative standards designed for implementing the Act's broad enforcement remedies.[32] Prohibitions are enforceable but only on a relative basis, as when evidence is adduced to show that conduct does not comport with the standard. The relativity of prohibitions make them meaningful in the enforcement realm, where they provide a broad outline with which to allege elements of a violation, as in the case of a polluter who is alleged to have caused air pollution or a violation of the Board's standards. But they are less relevant in permitting, where emission standards or limitations must be quantitatively certain.

Generally speaking, the use of statutory or regulatory prohibitions urged by comments are not included to air construction or operating permits. In addition, it is not clear how the cited prohibitions would have been factored into the air quality modeling of the project, in contrast perhaps to noncompliant sources. Efforts to gauge the impacts of general prohibitions would be futile.

129. The FPOP states that certain emission sources located within the Shredder system are potential sources of fugitive emissions.

[32] **Similar statutory prohibitions are found in close proximity to Section 9(a) that include the prohibition against constructing or operating any equipment or facility without a permit and the open burning of refuse. *See,* 415 ILCS 5/9(b) and (c).**

In response to comments, the draft permit will be amended to clarify that the three conveyors associated with the Shredder system and referenced in the FPOP are not potential sources of fugitive sources.

130. The FPOP contains repeated usage of "as needed" in describing when controls will be applied and is in need for elaboration of objectivity. Similarly, the FSOP fails to specify which sources or areas are subject to the different controls.

In response to comments, some changes to the FPOP will be made to enhance the specificity of its provisions. However, neither the FPOP or draft permit is the appropriate venue for dictating the time, place and manner of fugitive dusts controls, as that venue is more appropriately addressed by the Board in its rulemaking role. In the absence of a type of operating program that applies to a source under Subpart K, which similarly does not dictate the requirements suggested by the comments, the Illinois EPA's broader approach to employing the use of the FPOP is not unreasonable and reflects considered judgment.

Stack Testing

131. What is emissions testing or stack testing and why is it not performed before the permit is issued and before the controls are used at the source to confirm that the controls will work and should be permitted?

Stack testing is a tool used to determine a source's compliance status with applicable control efficiencies. General III is subject to a control efficiency. Compliance with this efficiency will be determined by an initial stack test, and thereafter periodic stack testing.

Stack testing appropriately and necessarily is to be conducted after construction or installation of emission units and air pollution control equipment. Testing before construction is not an option as the units would not yet exist nor be in operation at a location. The purpose of the testing is to assess the efficiency of the control systems when in use at the source. As such, the testing necessarily must occur after issuance of the construction permit and when in use at the source.

132. Why are the details of the emissions testing to be performed not set forth in the permit?

Certain details of the testing will be set forth in an emissions test protocol. This protocol shall be prepared by an independent third-party consultant and submitted by General III and, after review and approval by the Illinois EPA, will serve as the guide for testing. However, the requirement for testing, the frequency of that testing and the methods to be used for testing are all set forth in the issued permit.

133. With respect to testing, are there standards of how frequent testing results would be available. Testing every week is requested.

For the scrap metal recycling operations addressed by this permit, there are no standards addressing the frequency of testing beyond the initial testing required by rule or permit. That lack of standards in

not unique to this sort of operation Given this is a construction permitting action for what will be a minor source of emissions falling within the Federally Enforceable State Operating Permit program, periodic monitoring in the form of testing (beyond the initial testing) is neither necessary nor the norm. The draft construction permit did require initial testing to demonstrate compliance with applicable rules and emissions and permitted emissions limits. And, in response to comments, the Illinois EPA has expanded emissions testing. For example, the RTO is now subject to periodic testing as frequently as annually under certain circumstances.

134. The draft construction permit lists emission limits based on stack tests conducted in May/June 2018 and November 2019 at General Iron II, LLC (ID#031600BTB), located at 1909 N Clifton Ave, Chicago. These emission limits are improper as they rely on tests conducted at the company's current location and not at the proposed location. The Illinois EPA should require stack tests during the 1-year construction phase at the proposed facility location (11600 South Burley Avenue, Chicago).

The limited reliance on the earlier testing of the RTO is not improper. Indeed, that earlier testing evidences the destruction efficiency of the RTO that may be constructed at the Burley site. In the absence of such testing information, the Illinois EPA would be forced to rely upon information from the manufacturer, information from similar units in similar operations, estimations, institutional knowledge and reasoned engineering judgement. As a practical matter, testing necessarily occurs after the construction of an emission unit and or air pollution control equipment. It simply cannot occur prior. Thus, in making construction permitting decisions, unit or control-specific test data is often not available. As to post construction, the draft permit required initial emissions testing and the final issued permit has expanded the requisite testing. With this site-specific testing, compliance with applicable regulatory requirements and emissions limits under the permit can be assessed for the General III operations at the Burley site.

135. The permit should contain measures that require General Iron III LLC to more frequently check and publicly report the current destruction efficiencies of the RTO and other pollution control technology.

As previously noted, the source will be conducting initial and periodic testing of the RTO and balance of the control train. The information from the testing will be available to the public.

136. With respect to pollution mitigations, what is being done at the new facility compared to current facility to give residents peace of mind?

Notably, the Hammermill Shredder System is new and there will be improved capture at the enclosure. And, in contrast to the existing site, there will be Method 204 capture testing of the enclosure that will definitively establish the extent of the capture. There will also be a Feedstock Management Plan and an Operations and Maintenance Plan, as well as an enhanced Fugitive Emissions Operating Program. There will be differential pressure monitoring of the roll media filter. And there will also be limits on hours of operation for purposes of limiting emissions.

137. Condition 6-2(c)(iii). If the control devices are not run with the same parameters during testing as they are for normal operations, then the test would not address normal operation and therefore could not verify compliance.

The cited condition does not exist in the draft permit, however the comment seems to relate to testing conditions. Emissions testing is to be performed under conditions that are representative of

how the source normally operates. How a source operates during successful testing establishes parameters on future operations until the next test event.

138. The Draft Permit is based on artificially high control assumptions and underestimated emissions from the Hammermill Shredder. There is substantial evidence of uncontrolled emissions from the shredder in its current location, including with the hood/RTO set-up. These shortcomings are exacerbated by weak testing and monitoring requirements that omit continuous monitoring, FLIR and other options.

The application describes the shredder as being located within a "partial enclosure with… a vented metal roof," outfitted with a "capture hood" for routing shredder emissions to the RTO and scrubber.

The Hammermill Shredder will be located in a partial enclosure with acoustic roof and wall panels. The majority of one side of the enclosure, adjacent to the shredder, is a solid wall extending to ground level. The remainder of that wall and the other three walls consist of acoustic panels that extend to approximately 18 feet from ground level. Rubber belts extend downward covering a portion of the lower 18 feet. There will be an open area at the bottom to allow access to the interior of the enclosure for equipment maintenance. Shredder emissions are captured by a hood located over the top of the shredder and are routed to the shredder emission control system. The capture of the enclosure will be determined by testing. Short of testing, there is no definitive way to establish the actual capture efficiency and thus to quantify any uncontrolled emissions. Destruction efficiency testing will also be performed. After testing, compliance with Subpart TT of the Pollution Control Boards' regulations and with emission limits will be confirmed. The destruction efficiency set forth in the application is technically reasonable and has been demonstrated previously with the RTO at the Clifton location. The capture efficiency presented in the application was 95%. It is reasonable that with the proposed air flow and the improved enclosure the capture could achieve 100%. The permit as drafted aggressively addresses both destruction efficiency and capture.

139. The capture efficiency of the rubber-lined conceptual enclosure (in combination with wet suppression for PM) is unlikely to exceed 50% as an engineering judgement. It could be even lower given the high degree of wear of this type of enclosure over time, which makes the effectiveness over the long-term even more questionable, and the potential for irregular use of wet suppression (see below with respect to General Iron's and RMG's track record with wet suppression). 81% control.

As noted above, the capture efficiency set forth in the application is not unreasonable as a technical matter. Regardless, the capture efficiency will be established by way of initial emissions testing. Thereafter periodic testing will ensure the level of capture at the time of testing and at which the source can demonstrate compliance with Subpart TT and emissions limitations set forth in the permit. In keeping with its historical practice, the Agency did not factor in any degradation of emission units or controls. Rather, periodic emissions testing is the primary means by which the Illinois EPA ensures the continuing integrity of emission units and air pollution control equipment.

140. To the extent that such shredders require a cleaner, more specific feedstock on the front end, Illinois EPA should require enforceable feedstock sorting and cleaning.

The Illinois EPA has revised the construction permit to require a Feedstock Management Plan. This plan will address the materials that the facility receives, cleans, sorts and processes. This plan is to be submitted for Illinois EPA review and approval 90 days prior to General III receiving any materials at the Burley site.

141. The hood structure at the current General Iron location has been reported as allowing emissions to escape before the control devices. CDPH inspectors have observed "untreated emissions" and sometimes smoke escaping the top and sides of the shredder. Indeed, CDPH inspectors have noted that the emission controls do not appear to be working, and that the shredder has a hood but is not fully enclosed, causing emissions to escape the shredder before the treatment process and rendering the RTO and scrubber ineffective for those escaped emissions. As one inspector stated in January 2020, "being able to observe emissions escaping the shredder leads me to believe that the equipment capturing the emissions is insufficient."

The Illinois EPA is aware of the observations of the City of Chicago Department of Public Health. Indeed, these observations have been the subject of discussions with USEPA as well as the City. Learning of the observations by the City and knowing that the USEPA had brought and technically resolved an administrative action against General Iron for noncompliance with Subpart TT, requiring that the RTO be installed and subjected to emissions testing, had witnessed the testing, and had reviewed and approved the test report, the Illinois EPA reached out to the USEPA inquiring of any requirement for full enclosure or 100% capture, any concern for the destruction efficiency of the RTO, and any concern for noncompliance with Subpart TT, indicating that any concerns would most appropriately be addressed by the USEPA given the earlier order. Also, the Illinois EPA not only discussed the matter with the City but accompanied City inspectors to the facility where the Illinois EPA and City observed the Hammermill Shredder, enclosure and control system, and discussed the nature and function of same.

The Illinois EPA is not aware of information that suggests that the RTO is not achieving the destruction efficiency of 98% demonstrated during the most recent testing. Thus, there is no basis to conclude that "the controls are not working or are ineffective." The Illinois EPA is likewise not aware of any information that suggests that the capture efficiency is not what is was on the day of the most recent testing. The hooding is not a full enclosure, nor does it need to be as a regulatory matter nor pursuant to the federal administrative order. As it is not fully enclosed it should be understood that some quantity of emissions will be uncontrolled as they will not reach the RTO, whereas the emissions that do reach the RTO will be reduced by 98%. (And one must ensure that the steam that is often present at the enclosure is not confused for emissions.) This does not evidence that the "enclosure or capture is insufficient." Rather, the enclosure is a partial enclosure, and it achieves whatever capture such partial enclosure can achieve. The capture and control together shall provide for an overall control of 81% as is required under Subpart TT.

However, any issues with the Hammermill Shredder System at the Clifton site are not being formally considered as part of this permit proceeding. Rather, what is being considered is the application that delineates a new Hammermill Shredder and an enhanced enclosure with control train and contains a demonstration of compliance with applicable regulatory requirements.

142. Illinois EPA must require GIII to employ a fully enclosed shredder design with no openings.

The shredder is subject to Subpart TT, which requires 81% overall control of emissions. Subpart TT does not establish a floor for capture nor a floor for control. It does not require 100% capture nor full enclosure nor does it require 100% control nor specify the control equipment to be utilized. As such, the Illinois EPA has no basis to require General III nor any other source subject to Subpart TT to install a total enclosure.

143. If the applicant and Illinois EPA determine such a fully enclosed design is infeasible, they must fully explain this determination on the record and provide further measures to continuously and stringently control the emissions that will escape the shredder, the enclosure, and the hood capture setup as proposed. Additional VOM measures may be needed in order to meet Subpart TT's 81% control requirement (additional feedstock cleaning measures are one additional front end VOM control that may significantly reduce VOM from the shredder and so that should be considered). Such measures must be accompanied by robust recordkeeping and mandated reporting obligations.

As explained elsewhere, full enclosure is not in the first instance a matter of feasibility. Rather, it is a matter of statutory and regulatory authority and applicability. The Illinois is obligated to permit units that emit that are not otherwise exempt and air pollution control equipment. In doing so it is obligated to apply applicable regulatory provisions. It may add conditions to permits to further the purposes of the Act, but not without limitation. In a situation such as this, where there is an applicable regulation that quite clearly establishes the regulatory requirement, the Illinois EPA is not at liberty to utilize its permitting process to create a different more onerous requirement. That would be a matter for rulemaking.

The permit makes clear the applicability of Subpart TT. The permit establishes an initial test to demonstrate compliance with Subpart TT. The permit as enhanced also provides for testing thereafter to ensure ongoing compliance between test events. Based on the application, compliance with TT has been demonstrated. The Agency has required a Feedstock Management Plan in the final permit.

144. Monitoring of uncontrolled emissions must be included and consist of ground-based continuous VOM monitoring, such as AERARAE monitors and ground-based continuous PM monitoring as well as FLIR monitoring. The Draft Permit should require at least monthly, and preferably real-time, reporting of this monitoring data to be made public on Illinois EPA's website, The Draft Permit should require upfront provision of "stack" testing protocols for the Hammermill Shredder, and mandatory repeat testing on a quarterly, with requirements to do regular feedstock characterization testing and conduct emissions testing with significant changes in the feedstock. Such mandatory repeat testing is also needed given the likely deterioration of the hood over time.

The initial VOC emissions testing will assess the nature of the enclosure and definitively determine its capture efficiency. The revised permit now calls for subsequent emissions testing. The frequency of testing is either annually or every 5 years depending on the nature of the enclosure. It is not more frequent as these test events will be time involved; there will be protocol submittals and reviews, testing, and test result submittals and reviews. These activities associated with testing cannot reasonably be completed within any one quarter. The suggestion for testing quarterly is impractical as it would have the effect of the source and the Agency being in a never-ending testing mode – never establishing the compliance status from one test before the chain of activities commenced for the next test. And, periodic monitoring will be established based on testing. The monitoring will not consist of ambient monitoring nor will is consist of FLIR monitoring as neither can determine the quantity of emissions escaping from a unit at the facility nor the facility as a whole. The testing will be pursuant to protocol submitted before conduct of the testing as has been the long-standing practice of the state and federal government. As always, the testing will be representative and will establish the operating parameters for the tested units until the next test event. And, the feedstock concern is now addressed via a Feed Stock Management Plan and will also be addressed as part of any emissions testing protocol.

145. The November 2019 stack test conducted at the existing facility, and upon which the permit's emission limits are based, was performed with 50 percent ELVs in the feed. However, the permit does not include permit conditions that take into account this operating condition at the time of the stack test. EPA's experience with hammermill metal shredders indicates that, in general, the higher the proportion of ELVs in the feed the higher the VOM and organic hazardous air pollutant (HAP) emissions from the shredder. EPA has also observed that draining of fluids from ELVs before they are fed to the shredder will generally reduce actual VOM and organic HAP emissions from hammermill shredders. EPA requests that ILLINOIS EPA consider incorporating into the permit terms and conditions that address the maximum percentage of ELVs allowed in the feed, and whether or not fluids are drained from ELVs before they are fed to the shredder, consistent with the operating conditions at the time of the relevant stack test. Alternatively, Illinois EPA may clarify in the permit record how such permit provisions are unnecessary for this facility.

As addressed elsewhere herein, the Illinois EPA is requiring capture and control efficiency testing. The conditions under which testing will occur will form the basis for conditions relating to later operations. The Illinois EPA is inclined to limit conditions in this construction permit based on prior test events. Rather, it will create conditions based on test events at the new location that are reflective of the conditions during those test events including feed. The test events will seek to ensure the destruction efficiency under representative worst case conditions, which may or may not be the 50% ELV feed. As to the fluid draining, the Illinois EPA has required the development and implementation of a Feed Stock Management Plan, which plan is to be submitted to and approved by the Illinois EPA well before the testing. Fluid draining would be addressed in this Plan. Prior to testing, an emissions testing protocol is to be submitted to the Illinois EPA for approval. This protocol will address the particulars of the testing including test methods and procedures and feed among other.

146. Condition 5d requires the Permittee to operate emission capture and control equipment which achieves an overall reduction in uncontrolled VOM emissions of at least 81 percent from each emission unit. Based on the emission estimates included in the permit record, it appears Illinois EPA assumed the hood capture efficiency to be 100 percent. EPA requests Illinois EPA to supplement the permit record to provide support for the 100 percent hood capture efficiency used for calculating emissions and setting emission limits. If Illinois EPA's analysis shows that the proposed facility would not continuously achieve 100 percent capture in practice, please consider adjusting the emission factor in Condition 12b(i) to account for potential uncaptured VOM emissions. In this regard, it may be necessary to incorporate into the permit additional provisions for estimating the capture efficiency that would be used to calculate actual emissions. EPA is available to assist Illinois EPA with developing appropriate procedures for this purpose, which may include the use of EPA Test Methods 204 through 204F, computational fluid dynamics modeling, or visible emissions observations, as appropriate.

The Illinois EPA did assume a hood capture efficiency of 100 percent. This is not unreasonable based on the application which set forth a capture efficiency of 95%, high air flow, and an enhanced enclosure relative to the existing site (where the assumed capture seemingly approximated 83%). In addition to destruction efficiency testing, the permit calls for capture testing. After compliance with regulatory provisions and permitted emissions, limits can be evaluated.

147. We note as discussed with respect to conveyors within the shredder enclosure, that sources that can in fact be enclosed are not properly considered sources of fugitive emissions and their emissions count towards major source thresholds for facilities like GIII.

Correct, the Hammermill Shredder System in the entirety is a process emission unit. No part of the system including the conveyors is considered a fugitive emission source. All emissions from the Hammermill Shredder System count toward major source thresholds.

Fugitive Particulate Operating Program

148. Fugitive Particulate Operating Program fails to acknowledge applicable legal requirements.

The Fugitive Emissions Operating Program identifies 35 IAC 212.301 as the rule for which the program is designed to ensure compliance. This rule prohibits visible fugitive emissions beyond the property line.

149. The FPOP characterizes itself as a "voluntary" program because the source is not otherwise covered by the express requirement to prepare such a plan contained in Section 212.302.

Notwithstanding that the source is not subject to the regulatory requirement to develop and implement a FPOP, the permit requires such a program and the measures set forth within. Identified as a Fugitive Emissions Operating Program, neither the Program nor the measures set forth in the Program are voluntary.

150. FPOP is otherwise unenforceable as a practical matter.

The Fugitive Emissions Operating Program addresses the operations and best management practices that will serve to minimize fugitive emissions. It also sets forth record keeping and reporting. The program is not required to satisfy the letter of practical enforceability given that this is a state construction permit transaction for a minor source of emissions who is not even subject to the regulatory requirement for such program.

151. The applicant can include specificity on the operations that are expected to generate more fugitive emissions, and specificity on the controls to be deployed to these areas and specifics on how they will be deployed, control can be built into the front-end design.

The Ferrous Separation System, Non-Ferrous Separation System, and the Miscellaneous Fugitive sources are the categorical operations that generate fugitive emissions. The June 25th version of the Fugitive Emissions Operating Program more clearly delineates the best management practices to be utilized in these areas.

152. There is little to no discussion of controls to be used for truck, rail or barge unloading or even confirmation that rail and/or barge loading occurs on the GIII property.

The Fugitive Emissions Operating Program has been revised to clarify that General III will conduct loading of rail and barge. Additionally, the location of these activities and the measures that will be used to address fugitive emissions from truck, barge and rail loading have been clarified.

153. As noted above loading of at least trucks and rail cars should occur in enclosures.

There is no regulatory requirement applicable to the source that requires an enclosure for truck or rail car loading. However, measures to minimize fugitive emissions from these activities are addressed in the Fugitive Emissions Operating Program. For example, tarping, sweeping and watering address visible emissions from truck travel. For rail car loading, watering and minimization of drop distances are employed.

154. Illinois EPA must impose objective, stringent measures to control fugitive dust from piles, transfer points, and roadways.

Again, the scrap recycling facility is not subject to the regulatory requirement for a fugitive emissions operating program. However, to ensure compliance with 35 IAC 212.301 which prohibits visible emissions from crossing the property line, the Illinois EPA has required the development of a Fugitive Emissions Operating Program. This program addresses the best management practices for piles, transfer points and roadways.

155. Illinois EPA should require evaluation and deployment of full enclosure for conveyors, vehicle loading/unloading, piles and other transfer points associated with all three Systems.

There is no regulatory requirement applicable to the source that requires full enclosures for conveyors, vehicle loading and unloading, piles or other transfer points. Notwithstanding, the Fugitive Emissions Operating Program addresses the measure that will be taken to minimize fugitive emissions from these areas.

156. Must specify where specifically the Dust Bosses will be deployed and under what operating and weather conditions Illinois EPA should require that Dust Bosses “shall” be used at all times during active working of piles and vehicle loading, as opposed to allowing for use of this equipment “as needed” or only after the fact if visible emissions are identified.

The Fugitive Emissions Operating Program contains diagrams indicating where the Dust Bosses will be located. The Program as revised in response to comments is more robust in terms of specific commitments.

157. Illinois EPA also should require use of dry fogging systems at low temperatures when regular wetting procedures cannot be deployed effectively.

The Illinois EPA could see minimal distinction between the use of the Dust Bosses and the dry fogging system. Further, there is no legal basis for such technical requirement.

158. Chicago’s Department of Public Health June 2020 large recycling facility regulations require substantial control of ASR, Section4.4.2. That ASR can reasonably be stored in a full enclosure also renders emissions from ASR piles point source emissions, not fugitive emissions.

As addressed in the fugitive plan incorporated by reference into this permit, that subset of ASR that is fluff will be stored in a 3-walled, covered enclosure. It is not a full enclosure as the source needs to access the pile with material moving equipment such as end loaders. There are no applicable state or federal regulations that specifically call for enclosure much less a full enclosure of ASR. However, in looking at the ordinance as a point of reference, and while the Illinois is not in the habit of interpreting City ordinances, it notes that in the cited provision the enclosure requirement applies to post processed ASR, which is seemingly the fluff. Further, the ordinance does not expressly call for a full enclosure. Moreover, there is nothing that suggests that the ASR can reasonably be stored in a full enclosure. It is true that the ASR piles are point sources.

159. Illinois EPA must impose conditions to prevent auto fluff from migrating offsite.

Auto fluff is a subset of ASR. The conveyor to the fluff storage is covered. The fluff will be stored in a 3-walled, covered enclosure. Also, trucks hauling the fluff from the site will be tarped. This and other mitigative measures such as visual observations, watering and sweeping will ensure that the fluff does not migrate offsite.

160. Regular (at least monthly) testing of ASR should be required to characterize the content of the material, which may vary significantly with feedstock.

Illinois EPA is requiring a Feedstock Management Plan to address material screening and sorting and related issues.

161. The Illinois EPA should require regular moisture content testing for ASR.

The ASR comes off the shredder sufficiently wet (having been wetted by the spray system on the shredder) so as to make moisture content testing unnecessary.

162. The application mischaracterizes Section 212.123 as follows: "Section 212.123(a) prohibits the emission of smoke or other particulate matter from any process source to exceed 30% opacity." The FPOP repeats this misstatement of Section 212.123 by recognizing only the applicability of the prohibition on visible emissions beyond the fence line contained in Section 212.301 to fugitive sources. Nor does the FPOP include any mention of opacity limits as applicable to fugitive sources, let alone actual monitoring of opacity using Method 22 at each source of fugitive emissions to ensure compliance with this applicable provision. Indeed, the word "opacity" is only used three times in the operating program, in each case to explain that certain point sources that do have opacity limits are not in fact fugitive sources.[89] This omission/mischaracterization creates a conflict with the Draft Permit, which as discussed above appears to recognize the applicability of 212.123 to fugitive emission units.

The revised permit makes clear the applicability of 35 IAC 212.123 to all emission units encompassed within the Hammermill Shredder System, Ferrous Separation System, Non-Ferrous Separation System, Fines Building, and Miscellaneous Fugitive Emissions. The Fugitive Emissions Operating Program is the means of ensuring compliance with 35 IAC 212.301. Separate compliance assurance measures are included in the permit for 35 IAC 212.123.

163. The FPOP creates a conflict with the Draft Permit with respect to the applicable legal requirements.

The final permit has attempted to address any confusion or conflict.

The practically enforceable constraints on fugitive emissions are those found in the Pollution Control Board's Part 212 regulations. The measures in the FPOP are intended to assure compliance with the applicable provisions of the Part 212 regulations. There is no obligation for periodic monitoring in this construction permit much less periodic monitoring to assure compliance with a prohibition against air pollution.

164. The FPOP mysteriously claims that the three conveyors located within the shredder enclosure and uncaptured emissions from the shredder itself constitute "potential sources of fugitive emissions," in contrast to shredder emissions within the enclosure that in fact end up captured by the hood setup.

The FPOP has been revised to exclude the shredding operation. Indeed, as the permit makes clear, the shredding operation in the entirety is not a fugitive source. Rather it is a point source with emissions capture and control, with the extent of capture and control to be established by way of destruction efficiency and capture testing.

165. The FPOP fails to objectively describe the specific conditions under which the limited visible emissions testing will occur. See e.g., FPOP at p8, stating that visual observations will be conducted "three times per day," without specifying when, under what operating and weather/atmospheric conditions, and for what duration such observations will occur.

The revised Fugitive Emissions Operating Program now specifies that visible emissions observations will be taken from one to three times daily at raw material unloading/handling, material transfer points, intermediate and product stockpiles, fluff storage and loadout, material loadout, traffic areas, employee parking, barge, rail and truck loading, and the plant boundary. The precise time of the readings is not mandated, however, records of the date, time, location, observation and any response are to be kept.

166. The fugitive particulate operating program also contains a puzzling provision that describes additional visible emissions identification by "other employees" who are "trained to identify Visible Emissions," but whose observations will NOT be recorded in the same format as the visible emissions monitoring by "designated trained personnel."

This provision has been deleted within the latest revision to the program.

167. How will pollution from the roads be addressed?

Roads within property will be addressed by way of visible observation, sweeping and watering. The fugitive plan also includes vehicle speed limitations. Lastly, the permit limits the hours of operation of General III including truck operations.

Ambient Air Monitoring

168. What will the ambient monitoring tell us?

It will tell us the amount of a particular pollutant in the ambient air. While it is sometimes possible, under certain conditions, to determine the approximate direction from which pollution is originating, it will not directly identify the contributing source or sources of the pollutant.

169. More ambient monitoring stations are needed.

The Illinois EPA has designed its ambient air monitoring network to provide timely air pollution data to the public, to meet federal requirements, to support compliance with ambient air quality standards and emissions strategy development, and support air pollution research studies. This network satisfies or exceeds all relevant criteria. Regardless, the expansion of the network would not occur in the context of a permitting action.

170. Continuous ambient air monitoring is necessary to ensure that facilities are not causing or contributing to levels of PM and/or air toxics that exceed the NAAQS or other health-based thresholds, in particular with respect to fugitive emissions.

Again, ambient monitoring will only tell us the amount of a particular pollutant in the ambient air. It will not directly identify the contributing source or sources of the pollutant. Further, the existing monitoring network is sufficient to address the emissions from General III. Lastly, the existing monitoring data evidences compliance with the NAAQS for PM.

171. Illinois EPA must require fence line continuous monitoring of PM and metals to ensure compliance with the prohibition of air pollution.

The existing monitors in the vicinity, including those at Washington High School, evidence compliance with the NAAQS for PM. In the context of this construction permit for a minor source, there is no statutory or regulatory requirement for and the Illinois EPA is not inclined to attempt to stretch its authority to insert a requirement for the installation of fence line monitors.

172. The Illinois EPA should require fence line particulate monitoring surrounding the perimeter of the facility to ensure compliance with Illinois fugitive dust regulations. A combination of fence line monitoring and video surveillance can help ensure the facility is following Illinois pollution regulations and would represent a step forward in Illinois EPA requiring state-of-the-art technology to protect the health and wellbeing of Illinois residents.

As noted, the Illinois EPA is not inclined to require fence line PM monitoring at the perimeter of General III, nor video surveillance. The existing monitors in the vicinity, including those at Washington High School, evidence compliance with the NAAQS for PM.

173. Recent resident observations have frequently contended that General Iron facility in Lincoln Park frequently operates beyond their permitted hours of operation. If the Illinois EPA is to issue this permit, the Illinois EPA should require the installation of a 24/7 surveillance camera to ensure hours of operations restrictions are being followed.

Hours of operation is a common constraint found in a permit, the purpose of which is generally to limit emissions. The typical practice for ensuring compliance with such requirement is the inclusion of recordkeeping and reporting requirements. There is no legal or technical basis for surveillance

monitoring to ensure compliance with this limitation on hours of operation. It is believed that the hours of operation referred by the commenter relates to the relocation agreement with the City.

174. The federal monitors are not near the current site of General Iron. The data gathered around the existing General Iron location shows concentrations of air quality that are unhealthy (or "show unhealthy levels of fine particulates"). See Exhibit A, Maps of Air Quality Monitoring Data Around General Iron Facility.

These concentrations are from personal, small sensors. These monitors measure very short timeframe concentrations – down to the second in some cases. While these sensors can provide useful indicator information, they are not federally approved for comparison to any NAAQS and are not subject to the same rigorous standards of quality control and quality assurance as Illinois EPA monitors. Additionally, the reported concentrations, often listed as "brief" or for only a few seconds, have no direct comparison to PM2.5 standards. The current standards for PM2.5 are measured on an annual basis and a 24-hour basis. For the small sensor concentrations to be compared to an Air Quality Index value, a 24-hour concentration needs to be established. Exceedances of the 24-hour standard are rare. The Illinois EPA monitoring data at monitors nearest to the current site do not show unhealthy levels of fine particulates and, in fact, that area, along with the entire State of Illinois, is in attainment with the PM2.5 National Ambient Air Quality Standard.

175. Given that much of the pollution control equipment will be moving to the South Burley Avenue location, which is in a frontline community, the Agency should first consider the monitoring data from the existing facility. David, relate that the monitoring data on Clifton and monitoring data for Burley say the same thing.

As noted above, the monitoring data from the monitors nearest to the existing facility demonstrate that the area is in attainment of the particulate matter standards, as is the case for the new location and the entire State of Illinois. One benefit of the new location is that the prevailing winds will typically carry emissions toward nearby Illinois EPA monitors, which will provide good information about the nearby ambient air.

176. In General II, LLC's initial submission of repository documents, the introduction states: "There are no Illinois EPA or USEPA regulations limiting emissions of specific metals or requiring an ambient impact analysis." Can this truly be the case and if so, has it always been the case?

Yes, it is true that there are no regulations limiting specific metals that apply to this scrap metal recycling facility. Rather, the scrap metal recycling facility it is subject to the Pollution Control Board's rules applicable to visible and particulate matter emissions and to volatile organic material emissions. Further, it is true that there is no requirement for an ambient impact analysis for a facility of this type and size. And this has always been the case.

177. Have any of the applicable standards currently being applied to this proposed permit changed over the course of the last 3 ½ years and if so, in what way.

It is not clear whether the commenter is referring to the standards that govern the permitting process or the source itself. Regardless, the answer is the same – no, there have not been any changes in the last 3 ½ years. The requirements applicable to construction permitting and the public process are long

established. Likewise, the Pollution Control Board's air pollution control regulatory requirements that are applicable to this source are long established.

178. In October 2019, ELPC air quality monitoring data showed concentrations of poor air quality close to existing General Iron facility, which creates doubts about the adequacy of the pollution controls to protect the community. Of great concern are the intersections at Clifton and Kingsbury, and the intersection at Kingsbury and Wisconsin which have had PM 2.5 readings greater than 35 ug/m^3. See Attachment A.

As noted above, while these sensors can provide useful indicator information, they are not federally approved for comparison to any NAAQS and are not subject to the same rigorous standards of quality control and quality assurance as Illinois EPA monitors. Additionally, the reported concentrations, often listed as "brief" or for only a few seconds, have no direct comparison to PM2.5 standards. The current standards for PM2.5 are measured on an annual basis and a 24-hour basis. For the small sensor concentrations to be compared to an Air Quality Index value, a 24-hour concentration needs to be established. Exceedances of the 24-hour standard are rare. The Illinois EPA monitoring data at monitors nearest to the current site do not show unhealthy levels of fine particulates and, in fact, that area, along with the entire State of Illinois, is in attainment with the PM2.5 National Ambient Air Quality Standard. Based on a review of the application, the source has demonstrated that it can comply with the Pollution Control Board's regulations for organic material and visible emissions.

Modeling

179. Why was the modeling performed?

The Illinois EPA requested air quality modeling of hazardous air pollutant (HAP) metal emissions from General III in support of the construction permit application.

180. Who performed the modeling?

A third-party consultant for General III performed the modeling which was then audited by the Illinois EPA.

181. What does the modeling conclude?

Predicted modeled concentrations were compared against the National Ambient Air Quality Standard for lead, and for other metals against the Agency for Toxic Substances and Disease Registry (ATSDR) risk levels and Wisconsin Department of Natural Resources (WDNR) air toxics rule. Predicted concentrations were well below the identified limits. For carcinogenic substances, the inhalation risk was calculated using USEPA or California Air Resource Board unit risk factors. Estimated risk levels for all carcinogenic substances were less than 1 in 1,000,000.

182. The prevailing wind direction of the proposed new site (from SW to NE) means that majority of emissions will be blown toward G.W. High School and G.W. Elementary School and students will be exposed to PM and other emissions, such as manganese.

It is true that prevailing wind direction in the Chicago area is generally from the southwest. In such a situation, the prevailing winds would typically carry emissions toward the George Washington schools and thus the monitors that are located there. There are three types of monitors at George Washington High School – PM10, PM2.5, and lead/metals/TSP. The Illinois EPA would consider the Washington High School monitors to be very well situated to measure the air that may be impacted by emissions from this source. And, the monitors are measuring attainment with the National Ambient Air Quality Standard for PM10, which is designed to be protective of human health and the environment.

183. "The Draft Permit is based on deficient air quality modeling. The modeling assumes exceptionally high and artificial levels of control from the Hammermill Shredder; omits the co-located, unpermitted sources already operating at Burley as well as other known nearby sources of fugitive air toxics; fails to justify employing Wisconsin's air toxics rules versus other available state approaches; and omits PM10 modeling altogether."

Since the proposed General III PM10 emission rates would not exceed regulatory thresholds triggering the requirement for modeling, the applicant was not required to do so. Rather, the modeling was performed at the request of the Illinois EPA. The Illinois EPA was aware that Wisconsin had promulgated a rulemaking that had resulted in a relatively comprehensive set of toxic air contaminant air quality standards. Many of them comparable to or identical with values issued or used by other entities that may be regarded as more appropriate for off-site health risk evaluation. Capture and control of emissions is discussed elsewhere herein. Importantly, the actual capture and control will be definitively determined through emissions testing required under the issued construction permit. As to the other operations at the Burley site, they will be addressed along with General III during the operating permit phase of review.

184. The Illinois EPA cannot issue permit as the modeling demonstrates General III will violate the prohibition on air pollution.

The Lake Calumet region of Cook County (and the entire State of Illinois) are in attainment with the primary and secondary PM10 NAAQS. Since the proposed General III PM10 emission rates would not exceed regulatory thresholds triggering the requirement for modeling, the applicant was not required to do so. Equally relevant, however, is the Agency's firm expectation that Genera III's proposed PM10 emission rates would not "cause air pollution" as a result of the facility's contribution to existing ambient loadings in the Lake Calumet region. There was not an "omission" of PM10 modeling, there was simply a targeted focus on metallic HAPs. Manganese concentrations were modeled that represent 24-hour average and annual average concentrations. The 24-hour average concentrations are considered short-term average impact predictions. Though California has an 8-hour average Reference Exposure Level for manganese, the Agency is unaware of any federal agency or any other states issuing or using an 8-hour exposure level. The modeling analysis reflects conservative assumptions about facility operations and emissions-generating activities. These are believed to be consistent with the language of the draft permit and therefore lend support to the permit decision.

185. Emissions estimates in the air quality modeling are unsupported and otherwise inappropriate. The proposed hammermill shredder will not be completely enclosed. Therefore, any assumption that 100% of the particulate matter generated will be captured and controlled is not correct. Unless and until the shredder fugitive emissions are quantified and included in the metals and particulate matter modeling, the application materials before the agency cannot be relied upon for permit issuance.

The Agency stands by the permit and modeling. Notwithstanding, the actual capture and control will be addressed through emissions testing as set forth in the permit. With the results of that testing, additional modeling will be performed.

186. The conveyor emission factors are of concern. The applicant provided detailed particulate matter emission calculations regarding the ferrous material processing emissions, that largely rely upon AP-42, Section 11.19.2 Crushed Stone Processing and Pulverized Mineral Processing. The emission factor tables in AP-42, Section 11.19.2 provide two factors (controlled and uncontrolled) with controlled factors applicable to operations utilizing wet suppression. The controlled factors reflect an approximate 95% reduction in emissions due to wet suppression. The applicant assumes that a natural moisture content above 1.5% allows the use of the controlled factors without wet suppression equipment in operation. There is nothing magical about a 1.5% moisture content that immediately affords 95% reduction in fugitive dust emission generating potential equivalent to wet suppression. Depending on the material involved, significant fugitive dust emission generating potential can exist at moisture contents significantly in excess of 1.5%. Unless and until the conveyor emission calculations are corrected and the revised estimates included in the metals and particulate matter modeling, the application materials before the agency cannot be relied upon for permit issuance.

It is acknowledged that there are shortcomings in attempting to apply some AP-42 emission factors and associated emission suppression assumptions to scrap metal processing operations. Despite that, the Agency believes that the applicant adopted a reasonable approach in developing the conveyor emission estimates. And again, the modeling was not statutorily or regulatorily required to be performed as part of the application nor review process for this construction permit.

187. The non-ferrous material processing system includes a fines processing system controlled by four dust collectors. Three of the dust collectors vent indoors with the fourth venting to atmosphere. The applicant estimates particulate matter emissions from the fourth dust collector (DC-01) utilizing the potential airflow and an assumed exit loading of 0.005 grains per cubic foot (gr/cf). A more appropriate grain loading to estimate particulate matter emissions from DC-01 is in the range of 0.04 gr/cf. The applicant's proposed factor is simply not tenable given the type of collection systems in use at these types of operations nationwide. The applicant's proposed 0.005 gr/cf factor represents the pinnacle of particulate control from a state of the art, brand new baghouse equipped with polyester filter bags and reverse jet pulse cleaning. Absent substantial justification and documentation, the usual and customary factor of 0.04 gr/cf should be used. Unless and until the DC-01 emission calculations are corrected and the revised estimates included in the metals and particulate matter modeling, the application materials before the agency cannot be relied upon for permit issuance.

Regulatorily, the factor would need to be at least 0.03 gr/cf for PM10, thus the suggested factor could not be utilized. The permit requires testing of the DC-01 dust collector, to demonstrate compliance with the expected grain loading performance of this control device.

188. The modeling approach relative to roadways is not appropriate. A more robust and appropriate approach given general engineering knowledge/experience, the history of failed paving at General Iron and the RMGSCPM facilities and the vagueness of pavement-related requirements in the Draft Permit and FPOP is to use a simplified fugitive dust estimate, taken from AP-42 Section 13.2.3 Heavy Construction Operations. The recommended emission factor is 1.2 tons/acre/month. Annual

emissions can be therefore estimated using estimates of potentially erodible acreage. To allow for a portion of the area which might be paved (assumed to be 20%), we suggest that this emission factor be applied to the rest (i.e., 80%) of the total GII acreage at the rate of 1.2 tons/acre/month. Unless and until the vehicle traffic emission calculations are provided for review and comment, the application materials before the agency cannot be relied upon for permit issuance.

Ideally, estimates of re-entrained roadway particulate emissions should be based upon site-specific (road segment-specific) characteristics and established (generally accepted) emission factors. Speculation regarding pavement degradation as the basis for applying an alternative emission factor that is based only upon a single set of field studies (AP-42, p.13.2.3-1), rather that the applicant's use of an emission factor that "is based on a regression analysis of 83 tests" (AP-42, Section 3.2.1), should be considered suspect and potentially without merit. The commenter's proposed emission factor choice would potentially grossly overstate paved roadway fugitive emissions, certainly for a newly constructed operation. If the City of Chicago requires that all roadways at the GIII facility be paved, then the modeling analysis becomes more conservative, since it includes unpaved roadway emission estimates, which are typically higher.

189. Modeling Inputs/Assumptions Used by the Applicant and Illinois EPA are Unsupported and Otherwise Inappropriate particularly as to meteorological datasets. Two National Weather Service meteorological datasets were used. Surface data was taken from the Midway Airport in conjunction with coincident air sounding data from Davenport, Iowa for the years 2012 through 2016. In general, use of one year of onsite meteorological data is the preferred approach in U.S. EPA modeling guidance. Use of five years of "off-site" meteorological datasets may be used unless (1) specific terrain, coastal proximity, or other unique geographical issues make such data unsuitable and/or (2) "on-site" meteorological datasets are available. In this case, given the proximity of the site to Lake Michigan and the Calumet River and the availability of surface data from three meteorological stations in close proximity to the site (KCBX, S.H. Bell, and Watco Terminal), use of the surface data from the Midway Airport cannot be supported. Unless and until the modeling is revised to include the surface data from the local meteorological stations, the application materials before the agency cannot be relied upon for permit issuance.

The Agency acknowledges that the use of "on-site" meteorological data is preferred in regulatory modeling applications. Unfortunately, the commenter's three recommended "meteorological stations near the site" do not actually represent "on-site" locations for the proposed General III facility. Furthermore, it hasn't been demonstrated that those datasets are sufficiently robust for a refined modeling application. The Midway International Airport surface observations were chosen because of the proximity of this National Weather Service site to the GIII site and because the data is representative of the complex circulation patterns and other meteorological factors that influence the GIII site.

190. With the exception of the regenerative thermal oxidizer (RTO) and DC-01, all of the proposed emission generating activities are treated as a volume source. Volume source representation for air dispersion modeling purposes is a complex combination of location, release height, initial lateral dimensions, and initial vertical dimensions. However, because the applicant redacted the process flow diagrams from the original modeling submittal with a claim of Trade Secret, this reviewer cannot vet the volume source representations. And while the applicant does provide some information about the location of the haul roads, the depiction is spartan. Unless and until all volume source

representations can be fully vetted, the application materials before the agency cannot be relied upon for permit issuance.

The applicant did indeed redact the diagrams showing the volume source groupings of emission sources from the original modeling submittal. However, these diagrams, though pictorially useful, did not actually show the precise location and dimensions of the volume sources modeled. That information is found in the model input files and the supporting documentation.

191. Unless and until all particulate matter emissions from the co-located operations are included in the modeling, the application materials before the agency cannot be relied upon for permit issuance.

Since analyzing for total PM, PM10, and/or PM2.5 was outside the scope of the modeling analysis for General III (which focused exclusively on metallic HAPs), any extension of that modeling analysis would not have included evaluating particulate matter (PM, PM10, PM2.5) for the four SCPM facilities. The Illinois EPA did evaluate the increase in metallic HAPs from the four SCPM facilities in conjunction with the General III HAP emissions but did not find any increases of potential concern.

192. Based on the applicant's own emissions estimates and modeling, the proposed General III will result in exceedances of the PM10 NAAQS and unacceptable short-term manganese impacts. Impacts of manganese exceed the 8-hour Reference Exposure Level of 0.17 micrograms per cubic meter (ug/m3) established by the California Office of Environmental Health Hazard Assessment OEHHA. Unless and until impacts (including regional sources such as the significant known sources of fugitive manganese along the Calumet River that are not reflected in Illinois EPA's inventory can be shown to reside below 0.17 ug/m3, the application materials before the agency cannot be relied upon for permit issuance. This is especially true given the history of manganese issues in this environmental justice community.

The manganese modeling conducted by the applicant and reviewed by the Agency simulated 24-hour and annual averaging periods. A Wisconsin air quality standard and an ATSDR Minimal Risk Level (MRL), respectively, represented the human health standards against which the 24-hour and annual modeling results were compared. Modeling was not conducted for an 8-hour averaging period. The California Environmental Protection Agency Office of Environmental Health Hazard Assessment (OEHHA) 8-hour inhalation Reference Exposure Level of 0.17 ug/m3 can be viewed as a guideline level rather than as a bright line standard. As indicated in OEHHA's <u>Air Toxics Hot Spots Program Technical Support Document for the Derivation of Noncancer Reference Levels</u>, "a reference exposure level (REL) is an airborne level of a chemical that is not anticipated to present a significant risk of an adverse non-cancer health effect."

193. PM air quality modeling was not conducted, without explanation, despite the prohibition on air pollution, which encompasses causing or tending to cause air pollution in violation of the National Ambient Air Quality Standards. Based on the applicant's own emission calculations and modeling approach, impacts of particulate matter less than 10 microns in aerodynamic diameter (PM10) (added to background) exceed the 24-hour National Ambient Air Quality Standard (NAAQS) of 150 ug/m3. Unless and until PM10 impacts (including background) can be shown to reside below 150 ug/mg (24-hour average), the application materials before the agency cannot be relied upon for permit issuance.

As indicated previously, an expansion of the modeling analysis to address total PM10 was considered unnecessary by the Agency in a minor source construction permit transaction particularly when the Lake Calumet region of Cook County (and the entire State of Illinois) are in attainment with the primary and secondary PM10 NAAQS.

194. The applicant proposes to control emissions from the hammermill shredder with a control train including a regenerative thermal oxidizer (RTO). The presence of the RTO indicates high levels of volatile organic compounds (VOC), organic hazardous air pollutants (HAP), and other air toxics. Unless and until all reasonably identified HAP and air toxics are identified, quantified, and modeled, the application materials before the agency cannot be relied upon for permit issuance.

Organic hazardous air pollutants were not modeled because Table 3-1C of the permit application and Table 3-1C in the Updated Emissions Estimate document (January 27, 2020) indicated that the quantity of emissions would be quite small. The presence of an RTO does not at all automatically suggest that organic HAPs will be present, as many facilities use RTOs to control non-HAP VOCs. Further, there was no requirement to do modeling in the first instance.

195. We support Illinois EPA's investigation into the air toxics impacts of this facility on air quality and health, however, the following short list identifies high-level issues identified in the health analysis:

- •Failure to assess PM10
- •Failure to fully justify use of the Wisconsin approach for air toxics, versus other available approaches for assessing air toxics in states such as Michigan, Minnesota, Ohio, California, and Texas
- •Failure to assess the combined impacts of multiple metals and other hazardous air pollutants ("HAPs") from the proposed GIII, and in the context of the overburdened Southeast Side
- •Failure to take into account non-cancer impacts of HAPs
- •Failure to assess the impacts of VOCs along with metallic HAPs
- •Failure to account for the toxicity of hexavalent chromium
- •Failure to evaluate available short-term health thresholds for certain HAPs, such as the 8-hour manganese threshold of 0.17 ug/m3
- •Failure to accurately account for fugitive emissions from nearby facilities, given shortcomings in the state's emissions inventory for such sources
- •Failure to take into account the mobile source-related emissions from the trucks, trains and barges that will accompany the proposed GIII and related sources
- •Failure to evaluate other proposed and/or in-construction nearby sources of air pollution, such as a proposed new SCPM recycling facility immediately to the East of GIII200 and large warehousing facilities by developer NorthPoint
- •Failure to take into account the multiple pollutant exposures via air, water and soil; historic and existing health burdens; and sociodemographic characteristics of the impacted population, as pertain to the overall cumulative vulnerability to impacts from air pollution that would be emitted from the proposed GIII Illinois EPA must address at least these shortcomings in a revised assessment of whether the proposed GIII will run afoul of the prohibition on air pollution.

The Illinois EPA was aware that Wisconsin had promulgated a rulemaking that had resulted in a relatively comprehensive set of toxic air contaminant air quality standards. Though many of the standards are apparently based on Threshold Limit Values established by the American Conference of Governmental Industrial Hygienists (ACGIH), and may be thought of by some as insufficiently protective of the general public and the environment, they are clearly comparable to or identical with

values issued or used by other entities that may be regarded as more appropriate for off-site health risk evaluation. The Illinois EPA had no obligation to perform the modeling much less to fully research what other state regulatory agencies are using, and how those standards were developed. The Illinois EPA does prefer using ATSDR Minimal Risk Levels, however, many of these may not be available for specific toxic air contaminants and specific averaging periods. The other "high-level issues" identified by the commenter above are either simply beyond the scope of the analysis, were known but considered insignificant, have already been addressed, and/or are excessively difficult to quantify or incorporate into the Agency's analysis.

196. The modeling seems to include approximate rather than precise locations for emissions sources. Do these sources need to remain at these locations? If so, what guarantees they will be so located.

There are no specific guarantees or express requirements that these sources will be precisely located at their identified locations; however, any significant deviation from the proposed locations could give rise to concern or even a violation of the issued construction permit. This is a matter that would be addressed in the compliance or enforcement process as would other deviations at this or any other source.

197. In the modeling GIII did not consider the impact of all sources of pollutants and assumed control levels that it cannot meet**.**

General III modeling accounted for emissions from the Hammermill Shredder system, conveyors, separators, storage piles and roadway traffic. Manufacturer-guaranteed control efficiencies are used to estimate emissions from point sources, which is standard practice particularly prior to or in the absence of facility specific emissions testing which is not possible during the construction permitting phase.

Published USEPA emission factors for material handling operations at metal shredding facilities do not exist. Therefore, surrogate emission factors from crushed stone processing were utilized. These surrogate emission factors may overstate particulate matter emissions because the material processed through a hammermill has a high moisture content, thereby reducing the potential for particulate matter emissions from the ferrous material processing operations.

198. GIII did not consider the cumulative impact in the community and the impact of the existing operations at the site.

While not statutorily or regulatorily required to perform any cumulative impact analysis, General III performed air dispersion modeling demonstrating that the air impact will not exceed any established standards for lead or manganese. Modeling of the existing SCPM entities was not performed. However, ambient impacts from these operations are accounted for in the background monitoring values at the monitoring station at Washington High School. The monitors have identified no NAAQS concerns.

199. I am concerned that diesel trucks were not included in the pollution assessment and that truck traffic will increase additionally because of the seven warehouses that are coming to the area.

The construction permit application includes emissions from roadways within site boundaries. There is no requirement to address off-site emissions from mobile sources. The warehouses that may be

added in the area are not relevant to this permitting action.

Inspections/Oversight/Compliance/Enforcement/Penalties

200. An additional concern is the lack of Illinois EPA inspections of and enforcement actions against pollution law violations at General Iron.

Inspections and compliance and enforcement actions are important statutory functions. However, any concerns in that regard are not germane to this permitting decision. Notwithstanding, federal air program guidance addresses the frequency of inspection. For a minor source of emissions such as this scrap metal recycling facility, that inspection frequency would be every five years. In addition, the source is the subject of periodic report reviews. Additionally, as discussed elsewhere, the Illinois EPA utilizes its partnership with the local unit of government, requesting assistance from them regarding complaint response. And, in a further measure to most effectively utilize the available resources, the Illinois EPA coordinates its efforts with the USEPA.

201. There has been issues at the existing site, what will you do about issues at the new site.

As a general matter, permits address applicable requirements and the means to assure compliance with such requirements, rather than the actions or consequences that would ensue from issues encountered in attempts to implement or comply with an issued permit. This is, in part, because one cannot anticipate all issues that might later develop, much less how those might be appropriately addressed in the permitting context. Further, some issues that may develop may not be permitting considerations but compliance or enforcement considerations. However, the Illinois EPA will be overseeing GIII operations in a myriad of ways and will appropriately address any identified issues.

202. Illinois EPA's statutory mandates not only include permitting but monitoring and enforcement of compliance of permits. By issuing this construction permit while refusing to acknowledge a well-documented negative track record of this company, the Illinois EPA is burdening the city and passing its mandate to a city government as opposed to taking responsibility for monitoring the permits issued by the agency.

The Illinois EPA is aware of its statutory mandates and takes them seriously. In making this permitting decision, the Illinois EPA is not ignoring its mandates but rather following them. Specifically, it is making this permitting decision as directed by statute. By no means does the issuance of this permit pass any state mandates to the City. Further, the City is not responsible for ensuring compliance with Illinois EPA issued permits nor state or federal regulations. Rather, the City is responsible for ensuring compliance with its ordinances and regulations.

203. IIllinois EPA has chosen not to conduct inspections or commence enforcement proceedings against General Iron or RMG, at most they have conducted limited investigations that have failed to remedy the ongoing problems.

The inspection, compliance and enforcement history at the existing scrap metal operations on Clifton is not relevant to this permitting action. Notwithstanding, the Illinois EPA did not make a choice to

not inspect the Clifton operations. It has been to the Clifton site twice in the last six months. In addition, the Illinois EPA utilized its local partner to respond to complaints relative to the source. Also, it coordinated with the USEPA in its efforts. Additionally, records received from the source were reviewed.

204. Staffer Eric Jones recommended that a voluntary self-disclosure be submitted.

Mr. Jones is an employee of the Bureau of Air Permit Section. In response to a phone call from the source informing the Agency of noncompliance, he simply conveyed that the information needed to be disclosed to the Compliance Section, and that disclosure indeed occurred. That disclosure formed the basis for a VN that is pending resolution. Irrespective of his message, a source can follow the state or federal self-disclosure provisions. Whether the disclosure satisfies the criteria of these provisions is a separate consideration.

205. Illinois EPA has dramatically downsized its staff in recent years, causing reductions in inspection and enforcement. Inspections of air-polluting facilities have declined 80 percent since 2003. Enforcement cases referred to the Attorney General have also declined. The community, City and USEPA have been left to police pollution on the Southeast Side, addressing pet coke, manganese and identifying multiple facilities operating without state permits, due to Illinois EPA's absence in its role of primary environmental regulator and enforcer.

There have not been any staffing cuts in recent years, rather staff losses through retirements or attrition that are the subject of very aggressive hiring efforts. Since the time Gov. Pritzker took office, the IEPA has made a renewed emphasis on both hiring and enforcement. In fact, in the first year of Gov. Pritzker's administration the IEPA issued the most violation notices since 2011 and issued the most referrals to the Attorney General's Office since 2015.

206. Illinois EPA has a delegation agreement with the City of Chicago, Department of Public Health essentially deputizing them as an enforcement partner carrying out the Act and to assist with the state Agency's enforcement actions, conduct inspections, note violations of state law, respond to citizen complaints, and keep records of inspections and violations.

The Illinois EPA has an agreement with the City; however, it is an IGA or Intergovernmental Agreement, not a delegation agreement. As such, the City is not delegated any of the authorities under the Environmental Protection Act and is not "deputized" in any regard. It does not carry out the Act nor does it have the authority to do so. The agreement does seek inspection services by the City, most notably in response to citizen complaints. In investigating these complaints under the IGA, the City is accessing the facilities via its own rights of access. In identifying any potential violations of state law or regulation, the City reports such information to the Agency. Any actions by the City relate to violation of local ordinance or regulation.

207. Chicago's Department of Public Health enforcement activities are a critical part of the state-local partnership, and recognition of this important role warrants treating the violations of local ordinances and rules in this case as constituting "non-compliance" with the Illinois Environmental Protection Act. Chicago's Department of Public Health actions as the primary air regulator and enforcer in Chicago, including under an express delegation agreement with the Illinois EPA.

The inspections under the IGA and particularly the complaint response are an important aspect of the state-local partnership. However, inspections by the local unit of government are not inspections by the State. Such inspections may serve to inform the Illinois EPA and may serve to address or resolve a citizen complaint. But, the City is not delegated inspection authority. It is not delegated compliance or enforcement authority. It is not delegated the authority to implement state regulations. Thus, observations of the City and any tickets issued for ordinance violations do not translate to a violation of the Environmental Protection Act. And while it plays a significant role in environmental protection, the City is not the primary regulator and enforcer of the Environmental Protection Act.

208. When these provisions are not met, General Iron III LLC must face severe enforcement penalties, these penalties should be acknowledged within the permit.

The Illinois Environmental Protection Act provides for the imposition of civil penalties for violation of the Act. It is not necessary to recite the provisions of the Act in this regard in a permit.

Explosion

209. That explosion renders the current permit application incomplete.

The explosion does not render the application incomplete. The application sets forth information that demonstrates that the source can comply with the applicable provisions of the Act and regulations thereunder.

210. I am concerned for the recent explosion at current facility and ask that the construction permit be delayed until a complete investigation can be done. The failed equipment is not reliable to control emissions at new facility.

Proximate to the explosion the Illinois EPA sent a letter that among other things sought both a report of any damage to the RTO and root cause of the explosion. The letter has been acknowledged and there exists a commitment to provide the reports when final. In the meantime, in the context of the pending application, General III has represented that it remains committed to the use of an RTO at the new site and believes that the use of the existing RTO remains a viable option. It further represents that measures have been identified to prevent explosions in the RTO. Those measures including the installation, operation, and maintenance of a continuous monitoring device for the inlet gas stream to the control train to the Hammermill Shredder System for the flammability of this gas stream as a percentage of the lower explosive limit of this stream, have been added to the issued permit.

211. "The transfer of any equipment that can cause this kind of catastrophic failure requires that the permit application be revised to address risks related the proposed use of any equipment, its control efficiency, and the applicant's ability to operate the equipment safely and effectively. Further, existing emission estimates and air quality models do not account for emissions during periods of catastrophic failure and also must be revised. And, additional permit terms and conditions are clearly necessary to prevent future accidents and to ensure the integrity of the equipment and the applicant's operating systems."

The incident at the RTO was not a failure of the control device, nor does is render the device unreliable at reducing the organic emissions from the shredder. The destruction efficiency of the RTO will be tested at the new location. As noted above measures have been added to the permit to guard against future incidents of this type. Emissions from events of this type will be included in the calculation of total VOM emissions from the shredder. However, an event of this type is likely of limited duration and impact. Information provided by General III estimates an impact of approximately 3 pounds of VOM per event. The Operations and Maintenance Plan and the Feedstock Management Plan will also serve to improve operations.

212. Illinois EPA must impose additional permit conditions to prevent explosions.

The draft permit has been revised to include a Lower Explosive Level monitor and set point. It has also been revised to include a bypass safety vent to ensure the release of VOM-rich materials that would otherwise threaten an explosion. This bypass safety vent will be equipped with a device that ensures and monitors its use. The emissions from the vent will be included in the determinations of compliance with Subpart TT and the permit emission limits.

213. Measures that ensure that General Iron III LLC will employ a sufficient amount of qualified operators that are highly trained in operating applicable pollution control technologies such as the Regenerative Thermal Oxidizer (RTO). As demonstrated by the recent explosion at General Iron's current location in the Lincoln Park neighborhood, General Iron III LLC does not currently have the capability to operate these technologies safely.

The Illinois EPA does not have the authority to dictate who a regulated or permitted entity employs nor their credentials with limited exception. An RTO is a well-established and common means of controlling volatile organic compounds and hazardous air pollutants. There are no operator or training requirements for an RTO under the Environmental Protection Act or the Clean Air Act.

214. The record for the Draft Permit also fails to take into consideration a recent explosion at the Clifton Ave. site. On May 18, 2020, General Iron was shut down due to two explosions there. Subsequently, Chicago Department of Public Health issued two citations totaling up to $6000 to General Iron for violation of Illinois state pollution standards. See Chicago Dept of Public Health, "Statement from CDPH on Citations to General Iron on Explosions at the Facility," Public Health (May 21, 2020), available at https://www.chicago.gov/city/en/depts/cdph/provdrs/healthy_communities/news/2020/may/statement-from-cdph-on-citations-to-general-iron-on-explosions-a.html. The City's investigation is still ongoing. Given that much of the equipment is supposed to be transferred to the South Burley Ave site on the East Side, the Agency should (or "at a minimum") reassess the permit to determine if the pollution control equipment and other operating equipment at the Clifton Avenue site still meets the parameters of the Draft Permit without resulting in noncompliance.

The City, the Illinois EPA and the USEPA are all aware of, involved with, and in communication on the explosion. The Illinois EPA has added provisions in the permit to minimize the risk of explosions in the RTO at the Burley site.

215. The permit should be denied because the EPA did not consider the George Washington air monitoring data or consider the likelihood and effect of failures of the Hammermill Shredder System.

The Illinois EPA did consider the data. There are three types of monitors at George Washington High School – PM10, PM2.5, and lead/metals/TSP. These monitors are very well situated to measure the air that may be impacted by emissions from this source. And, the monitors are measuring attainment with the National Ambient Air Quality Standard for PM10, which is designed to be protective of human health and the environment.

216. They require a lot of maintenance to ensure the controls are effective.

It is unclear what controls are being referenced. Regardless, the permit addresses maintenance of equipment with the requirement for an Operations and Maintenance Plan.

217. This permit must have provisions in place that require General Iron III to regularly prove that it operates the pollution control technologies to the highest standard.

The permit includes periodic monitoring including testing to ensure compliance with applicable regulatory requirements and the terms of the permit.

Miscellaneous

218. Can a third-party auditor be in charge of reporting and report to community?

General III, as owner or operator of the scrap metal facility bears responsibility for the obligations under the Environmental Protection Act and regulations thereunder. It is General III that is required to comply with the requirements to obtain a permit and to comply with the terms of the permit. As with all permits, the construction permit issued to General III includes record keeping and reporting requirements. Records and reports are subject to review by the Illinois EPA, among other. Reports and other information within the possession of the Illinois EPA constitute state records and are generally available to the public. Access to the information occurs by way of requests under the Freedom of Information Act. Failure to maintain the requisite records or to submit the requisite reports subjects a source to compliance and enforcement actions as provided for under the Environmental Protection Act. In this instance, there is no basis for the inclusion of a condition requiring the retention and use of a third-party auditor by General Iron. Notwithstanding, the permit has been revised to require that the testing required under this permit will be performed by independent-third party contractors. Also, the protocols and plans required under this permit will be prepared by third-party contractors.

219. How do we know that you can’t be influenced by this economic powerhouse?

The Illinois EPA is a creature of statute and its responsibilities and authorities are dictated by same. Employees of the Illinois EPA are individually subject to ethical constraints. The permitting program affords structure, by which facilities must operate consistent with governing rules and regulations. Reporting, record keeping, and monitoring is also required. The records within the Illinois EPA are generally readily available to the public.

220. The facility has not proposed any “community benefits agreement” or made efforts to reach out to community.

Community benefits agreements are often executed between community groups and the developer of a project and delineate measures that the developer will afford the community that are not otherwise required. These agreements are often used in low-income and communities of color. Such agreements are not a requirement under the Environmental Protection Act.

221. Why can't the Illinois EPA mandate that GIII employees live within 5-10 miles of the source?

State laws and regulations concerning environmental protection generally address sources of pollution and not ancillary issues related to the residency of employees.

222. Nowhere does the FPOP attempt to demonstrate how the proposed measures in fact will ensure that fugitive sources will not cause levels of air contaminants that are injurious to human, plant, or animal life. The program solely focuses on the prohibition of visible emissions beyond the fence line, which is at best a very rough proxy for PM or air toxics particles in the air.

As discussed elsewhere, the prohibitions reflected in the Act and Board regulations are an enforcement tool separate from the FPOP's implementation of measures designed to assure compliance with Part 212. There is no direct means of measuring enforcement with the prohibitions through a permit evaluation.

223. Illinois EPA must impose conditions that prevent odors. Illinois EPA should include specific odor management provisions in the Draft Permit, including use of available odor monitoring systems.

General III is subject to the statutory prohibition against air pollution. In simplest terms, the statute prohibits General III from causing, threatening or allowing air pollution that would cause a violation of a Pollution Control Board regulation or create a nuisance.

224. Neither the Draft Permit nor the fugitive particulate operating program nor the yet-to-be- submitted Contingency Plan contain any practicably enforceable limits on fugitive emissions that demonstrate compliance with the prohibitions on air pollution.

The fugitive emissions from sources such as General III are addressed by state standards. Specifically, they are addressed by provisions within Part 212 Visible and Particulate Matter Emissions of the Pollution Control Board's regulations. These regulations address fugitive emissions by way of limitation on opacity from material handling and processing activities and by way of a prohibition on visible fugitive emissions beyond the plant property line. These regulations also address fugitive emissions through a fugitive particulate operating program, however, General III is not subject to same. Notwithstanding, the Illinois EPA has required General III to develop and implement a fugitive emissions operating program, that was submitted for Agency review, the current version of which is incorporated into the permit. This is the means by which the source ensures compliance with 212.301.

The Contingency Plan that is regulatorily required to be submitted but not at this time, will later be reviewed by the Agency and available to the public. However, it is of limited relevance as it is only activated in the event of a violation of the National Ambient Air Quality Standard for PM10.

The Board's Part 212 regulations were developed with an eye toward the protection of human health and the environment, and the goal of ensuring compliance with the National Ambient Air Quality Standard for Particulate Matter. Indeed, the entire state of Illinois is in compliance with this standard.

Attachment 1: Listing of Significant Changes Between the Draft Construction Permit and the Issued Construction Permit

1. Added a Miscellaneous Fugitive Sources category in the equipment listing to clarify these units are part of the permit.
2. Clarified the requirements for VOM emissions capture from the Hammermill Shredder System.
3. Clarified that the Miscellaneous Fugitive Sources are subject to 35 Ill. Adm. Code 212.123.
4. Clarified that the Ferrous Material Separation System, Non-Ferrous Material Separation System, and Miscellaneous Fugitive Sources are to be operated under the provisions of a Fugitive Emissions Operating Program.
5. Clarified the emission sources in the Ferrous and Non-Ferrous Material Separation equipment listing.
6. Clarified emission testing for Fine Processing Building and Hammermill Shredder System.
7. Added a requirement for the development of and operation under a Feedstock Management Plan for the Hammermill Shredder System.
8. Added a requirement for the development of and operation under an Operation and Maintenance Plan for the control systems.
9. Added a condition to monitor the pressure differential for the Roll-media filter associated with the Hammermill Shredder System and recordkeeping for the differential pressure to ensure proper operation of the control.
10. Added a condition to monitor the pressure differential for Dust Collector (DC-01) associated with the Fines Processing Building to ensure proper operation of the control.
11. Added a requirement for opacity observations from the Hammermill Shredder System stack, each emission unit in the Ferrous Material Separation System, the Fines Processing Building (DC-01), each emission unit in the Non-Ferrous Material Separation System, and Miscellaneous Fugitive Sources.
12. Added recordkeeping for Scrubber differential pressure, scrubbant flow rate, and scrubbant PH monitoring data to ensure proper operation of the control.
13. Added recordkeeping requirement for hours of operation.
14. Added recordkeeping requirement for material receipts.
15. Added recordkeeping requirement for type and amount of material processed by the Hammermill Shredder System.
16. Added recordkeeping requirement for amount of fluff shipped offsite.
17. Added LEL Monitoring system to the exhaust from the capture system associated with the Hammermill Shredder System and associated recordkeeping, and reporting requirements.
18. Added reporting requirement for initial startup for Hammermill Shredder System
19. Added quarterly reporting requirement for type and amount of material received, type and amount of material processed by the Hammermill Shredder System, throughput for the Ferrous Material Separation Process, Non-Ferrous Material Process, and Fines Processing Building, PM, PM_{10}, and HAPs emissions from the Hammermill Shredder System, Ferrous Material Separation System, and Non-Ferrous Material Separation System with supporting calculations, VOM emissions from the Hammermill Shredder System, Ferrous Material Separation System, and Non-Ferrous Material Separation System with supporting calculations, and amount of non-metallic materials (fluff) shipped offsite.
20. Reconciled the records retention requirements for all records required by the permit requiring retention for at least 5 years.

PERMIT CALCULATION SHEET

Facility: General III, LLC		**I.D.:** 031600SFX
Anal. Eng.: GB	**Date:** 10/17/19	**P.N.:** 19090021
Rev. Eng.:	**Date:**	**Date Rec.:** 09/25/19

Section 1: Identify noted File Traveler Sheet and ICEMAN source information that may affect permit issuance; if active VN indicate if Compliance is ok with issuance of a permit or NOI/Denial letter: There is no open flags or VN with IEPA, there are four (4) USEPA inspection reports for facilities collocated at this location 11600 South Buirley Avenue. An E.J. request (#3407) was done 9/22/2019. The applicant is yet to submit a fugitive Particulate Operating Plan, it shall be submitted and review by Eric Jones. or 212.309.

LEGAL:	None
FOS FLAG:	None
CROPA:	None
Other	None

Section 2: Identify type of permit and brief summary of application/permit history if submitted in response to a NOI/Denial letter or to request revision to an existing permit:
The purpose for opening this permit is to review an application for Construction permit #19090021 for the construction of a scrap metal recycling plant. The current ICEMAN status for the above mentioned permit number is for Construction.

Type Of Application:	Construction

County:	Cook
Attainment:	Non-Attainment
Pollutant:	Ozone

Section 3: Description of the source with an itemized list of emission units and pollution control equipment included in the application. If for an operating permit, list all existing and proposed units and equipment that the operating permit will need to address:
General III, LLC is a scrap metal recycling facility to be located at 11600 South Burley Avenue, Chicago, Cook County, 60617. Scrap recyclable metal including End of Life Vehicle (ELVs) is received and shredded in various forms to produce uniform grades of ferrous and non-ferrous metals. The scrap handling and processing activities includes receiving, sorting, shredding metal separation, and recovery of ferrous and non-ferrous metals. Following is a list of proposed emission units/equipment to be constructed:

One (1) raw material receiving and handling system;
One (1) Hammermill Shredder with Integral Water Injection System equipped with capture hood and controlled by Cyclone, Roll-media Filter, Regenerative Thermal Oxidizer (RTO), and Wet Scrubber;
One (1) 15.0 mmBtu/hour Natural Gas-Fired Regenerative Thermal Oxidizer (RTO);
One (1) Quench/Packed Tower Scrubber;
One (1) Vibratory Feeder;
Several Belt Conveyors (skirted or troughing);
One (1) Ferrous Material Separation System (that includes)
Poker picker and gravity chutes;
Several magnetic separators;
Cleaning system;
Takeaway conveyors;
ASR Stockpile and Stack Conveyor;
Secondary magnetic separation;
Gravity separator (Z-box) with cyclones;
Ferrous Stockpiles;
Barge Loading
One (1) Non-Ferrous Material Separation System (that includes)
ASR batch feeder;
Magnetic separator;
Small Storage Piles with partial enclosures;
One (1) three-sizing material screen;
Two (2) vibratory screens;
Eddy Current Separators;
Four (4) Wind Sifters – Air Classifiers with Cyclones;

Eight (8) Induction Sorters;
Five (5) Polishers Controlled by Dust Collector (DC-01);
One (1) Air Vib – Vibratory Air Separator controlled by closed loop capture device with built-in cyclone;
One (1) Low Speed Shredder;
Several Conveyors; and
Fines Processing System controlled by Dust Collectors (DC-01 – DC04)

Section 4: Identify the proposed type(s) and maximum actual operating quantities and rates of pollutant containing materials to be used/processed/produced that will be included in permit:

For the purpose of this construction permit the proposed types and maximum actual operating quantities and rates of pollutant containing materials are as follows:

Item of Equipment	Process Rate (Tons/Month)	(Tons/Year)
Hammermill Shredder with RTO/Scrubber	100,000	1,000,000

Natural gas Usage for the RTO: 6.57 mmscf/month, 52.5 mmscf/year

Section 5: Identify the proposed type(s), quantities and rates of maximum actual operating emissions for the source to be included in the permit including the units/controls proposed. Identify the source(s) of the emission factors used:

For the purpose of this construction permit the proposed types, quantities and rates of maximum actual operating emissions are as follow:

Emissions from and operation of the Hammermill Shredder System shall not exceed the following limits:

VOM emissions:

	Process Rate		Emission Factor	VOM Emission	
Emission Unit	(Tons/Mo)	(Tons/Yr)	(lb/Ton)	(Tons/Mo)	(Tons/Yr)
Hammermill Shredder RTO/Scrubber Stack	100,000	1,000,000	0.243	0.24	2.43

These limits are based upon maximum shredder material throughput, an uncontrolled emission factor derived from a stack test, and 98% removal efficiency by the RTO/Scrubber. All measured total hydrocarbon (THC) emissions are assumed to be VOM.

Hazardous Air Pollutant emissions:

	Single HAP		Combined HAPs	
Emission Unit	(Tons/Mo)	(Tons/Yr)	(Tons/Mo)	(Tons/Yr)
Metal Shredder RTO/Scrubber Stack	0.03	0.30	0.06	0.61

These limits are based upon maximum shredder material throughput in Condition 9(a)(i) above, combined HAPs comprising 25% of the THC emissions and any single HAP comprising no more than 50% of the combined HAPs (12.5% of the THC emissions).

PM & PM_{10} emissions:

	Process Rate		Emission Factor	PM & PM_{10} Emission	
Emission Unit	(Tons/Mo)	(Tons/Yr)	(lb/Ton)	(Tons/Mo)	(Tons/Yr)
Metal Shredder RTO/Scrubber Stack	100,000	1,000,000	0.0047	0.24	2.36

CALCULATION SHEET

These limits are based upon maximum shredder material throughput, emission factors derived from stack test captured and measured filterable PM/PM_{10} emission, and all measured filterable PM assumed to be PM_{10}.

Emissions from fuel combustion in the Regenerative Thermal Oxidizer (RTO) associated with the Hammermill Shredding System shall not exceed the following limits:

Natural gas Usage: 6.57 mmscf/month, 52.5 mmscf/year

Emissions from the combustion of natural gas:

Pollutant	Emission Factor (lbs/mmscf)	Emissions (Tons/Mo)	Emissions (Tons/Yr)
Carbon Monoxide (CO)	131.43	0.43	3.45
Nitrogen Oxides (NO_x)	100.0	0.28	2.20
Particulate Matter (PM)	7.6	0.02	0.20
Sulfur Dioxide (SO_2)	0.6	0.01	0.02
Volatile Organic Material (VOM)	5.5	0.02	0.14

These limits are based on the maximum firing rate of the RTO burner (15.0 mmBtu/hour), maximum natural gas usage, approximately 1% (1.22 tons/year) of uncontrolled VOM emissions being emitted as CO emissions due to incomplete combustion, and standard emission factors (Tables 1.4-1 and 1.4-2, AP-42, Fifth Edition, Volume I, Supplement D, July 1998).

Emissions from and operation of the Ferrous Material Separation Process shall not exceed the following limits:

PM & PM_{10} emissions:

Emission Unit	Process Rate (Tons/Mo)	Process Rate (Tons/Yr)	Emission Factor (lb/Ton)	PM & PM_{10} Emission (Tons/Mo)	PM & PM_{10} Emission (Tons/Yr)
57 - Conveyors Transfer Points	1,245,450	12,454,500	0.00014	0.08	0.82
3 - Truck & Barge Loadings	174,000	1,740,000	0.00020	0.02	0.18
7 - Stockpile Loadings	300,000	3,000,000	0.00122	0.18	1.83
				Total:	2.83

These limits are based upon maximum material throughput, Standard emission factors from AP-42 (Table 11.19.2-2, Fifth Edition, Volume I, Update 2004, August 2004) for conveyors transfer points and Truck/Barge Loading, stockpile loadings emission factor derived using AP-42, Section 13.2.4.3 (Table 13.2.4, AP-42, Fifth Edition, Volume I, November 2006) using coefficients of K=0.74 (PM) and K=0.35 (PM_{10}), U (mean windspeed) = 9.0 mph, and M (minimum moisture content) = 1.5% applied to light material stockpile, 5.4% applied to raw scrap metal handling, 10% applied to ASR stockpile loading.

Metal HAPs emissions combined from Ferrous Material Separation Process shall not exceed the following limits:

Emission Unit	Combined HAPs (Tons/Mo)	Combined HAPs (Tons/Yr)
Ferrous Material Separation Process	0.01	0.04

These limits are based upon metal HAPs being 1.33% of the total PM emission measured at the discharge of existing roll media filter during June 2018 metal emission test at General II, LLC.

Emissions from and operation of the Non-Ferrous Material Separation Process and Fines Processing System shall not exceed the following limits:

PM & PM_{10} emissions for sources inside building:

	Process Rate	Emission	PM & PM_{10} Emission

Emission Unit	(Tons/Mo)	(Tons/Yr)	Factor (lb/Ton)	(Tons/Mo)	(Tons/Yr)
74 - Conveyors Transfer Points Uncontrolled	110,624	1,106,236	0.00300	0.17	1.66
74 - Conveyors Transfer Points Controlled	13,436	134,361	0.00014	0.01	0.01
8 - Screening Points Uncontrolled	2,820	28,196	0.02500	0.04	0.35
8 - Screening Points Controlled	1,541	15,406	0.00220	0.01	0.02
17 - Stockpile Loading	838	8,381	0.00761	0.01	0.03
				Total:	2.07*

* These sources located inside building exhaust to the atmosphere through Dust Collector DC-01, estimated emissions may be calculation by using the stack flow rate (12,000 cfm) and grain loading of 0.005 gr/dscf (1.36 tons/year)

These limits are based upon maximum material throughput, Standard emission factors from AP-42 (Table 11.19.2-2, Fifth Edition, Volume I, Update 2004, August 2004) for conveyors transfer points screening and Truck Loading, stockpile loading emission factor derived using AP-42, Section 13.2.4.3 (Table 13.2.4, AP-42, Fifth Edition, Volume I, November 2006) using coefficients of K=0.74 (PM) and K=0.35 (PM_{10}), U (mean windspeed) = 9.0 mph, and M (minimum moisture content) = 1.5% applied to light material stockpile loading.

PM & PM_{10} emissions for sources outdoor:

Emission Unit	Process Rate (Tons/Mo)	Process Rate (Tons/Yr)	Emission Factor (lb/Ton)	PM & PM_{10} Emission (Tons/Mo)	PM & PM_{10} Emission (Tons/Yr)
59 - Conveyors Transfer Points Uncontrolled	215,368	2,153,675	0.00300	0.32	3.23
11 - Conveyors Transfer Points Controlled	57,210	572,103	0.00014	0.01	0.04
13 - Screening Points Uncontrolled (13)	13,670	136,702	0.02500	0.17	1.71
12 - Screening Points Controlled	42,209	422,085	0.00220	0.04	0.41
2 - Truck Loading	26,003	260,027	0.00020		0.03
10 - Stockpile Loading	23,073	230,725	0.00761	0.08	0.85
				Total:	6.27

These limits are based upon maximum material throughput, Standard emission factors from AP-42 (Table 11.19.2-2, Fifth Edition, Volume I, Update 2004, August 2004) for conveyors transfer points screening and Truck Loading, stockpile loading emission factor derived using AP-42, Section 13.2.4.3 (Table 13.2.4, AP-42, Fifth Edition, Volume I, November 2006) using coefficients of K=0.74 (PM) and K=0.35 (PM_{10}), U (mean windspeed) = 9.0 mph, and M (minimum moisture content) = 1.5% applied to light material stockpile loading.

Metal HAPs emissions combined from Ferrous Material Separation Process shall not exceed the following limits:

Emission Unit	Combined HAPs (Tons/Mo)	Combined HAPs (Tons/Yr)
Non-Ferrous Material Separation Process	0.01	0.10

These limits are based upon metal HAPs being 1.33% of the total PM emission measured at the discharge of existing roll media filter during June 2018 metal emission test at General II, LLC.

Fugitive emissions from Stockpile operations for the Ferrous Plant and Non-Ferrous Plant shall not exceed the following limits:

PM & PM_{10} emissions:

Emission Unit	PM & PM_{10} Emission (Tons/Mo)	PM & PM_{10} Emission (Tons/Yr)

CALCULATION SHEET

Ferrous Plant	0.33	3.28
Non-Ferrous Plant	0.01	0.05
Paved Roads	1.31	13.05
Unpaved Roads	0.40	3.96
	Total:	20.34

These limits are based upon 312 active days, 0.01303 acres average size for stockpiles with three side enclosure, and an average control factor of 90%, 0.305 acres average size for uncontrolled stockpiles, inactive emission factor 3.50 lb-PM/acre-day and active emission factor 13.20 lb-PM/acre-day, average vehicle weight 19.08 tons, using Equation 2 from AP-42 13.2.1, January 2011, 75% control efficiency for sweeping paved roads, 50% control efficiency for watering unpaved roads.

This permit is issued based on negligible emissions of particulate matter (PM & PM_{10}) from the raw material receiving and handling, one Vibratory Feeder, and # Belt Conveyors (skirted or troughing). For this purpose, emissions from each emission unit shall not exceed nominal emission rate of 0.1 lb/hour and 0.44 ton/year for PM, PM_{10}.

Compliance with the annual limits of this permit shall be determined on a monthly basis from the sum of the data for the current month plus the preceding 11 months (running 12 month total).

Emission Summary:

Emission Unit	EMISSIONS (Tons/Year) CO	NO_x	PM/PM_{10}	SO_2	VOM	Single HAP	Total HAPs
Hammermill Shredder RTO/Scrubber Stack			2.36		2.43	0.30	0.61
Ferrous Material Separation Process			2.83				0.04
Non-Ferrous Material Separation Process			8.34				0.10
Fugitive from stockpile operations, paved & unpaved roads			20.34				
Raw material receiving/ handling, Vibratory Feeder, and # Belt Conveyors (skirted or troughing)			1.76				
RTO Natural Gas Combustion	3.45	2.20	0.20	0.02	0.14	--	--
Totals	3.45	2.20	35.83	0.02	2.57	0.30	0.75

Section 6: Identify the source's potential-to-emit (PTE) including any proposed additions/revisions. Show calculations or reference where in application or file PTE is satisfactorily presented. Emissions from 35 IAC 201.146 exempt units must be included in PTE calculations:

The source's potential-to-emit (PTE) has being determined to be greater than major source threshold for PM_{10} and VOM therefore the source intent to request a federally enforceable state operating permit (FESOP) to limit the emissions of air pollutants from the source to less than major source thresholds (i.e., 100 tons/year for PM_{10} and 50 tons/year for VOM). As a result, the source is excluded from the requirement to obtain a Clean Air Act Permit Program (CAAPP) permit.

Section 7: List potentially applicable State and Federal (NSPS and NESHAP) regulations and indicate if application demonstrated those regulations would not be violated by construction and/or operation of equipment/units/processes in application:

1) 35 Ill. Adm. Code 212.123, 212.301, 212.314, and 212.321 process emission units.
2) 35 Ill. Adm. Code 214.301 sulfur dioxide emissions
3) 35 Ill. Adm. Code 218.301 (8 lbs/hr) of Volatile organic material.
4) 35 Ill. Adm. Code Part 218 Subpart TT (Other Emission Units).

Section 8: Conclusions and recommendations. Indicate your final recommendation (e.g., NOI, denial, issue permit with conditions, etc.) and indicate reason(s) for that action:
It is recommended that a **Construction Permit** – be issued to allow additional time for testing.

Subject: FW: Meeting with GII
Location: EPA.Air.BOA.3South.ConferenceRoom3110N

Start: Wed 10/23/2019 10:00 AM
End: Wed 10/23/2019 12:00 PM
Show Time As: Tentative

Recurrence: (none)

Organizer: Bernoteit, Bob

-----Original Appointment-----
From: Bernoteit, Bob
Sent: Wednesday, October 16, 2019 10:16 AM
To: Bernoteit, Bob; Barria, German; Jones, Eric E.; Pressnall, Chris; Frost, Brad; Pilapil, Ray
Cc: Layman, Robb
Subject: Meeting with GII
When: Wednesday, October 23, 2019 10:00 AM-12:00 PM (UTC-06:00) Central Time (US & Canada).
Where: EPA.Air.BOA.3South.ConferenceRoom3110N

From: Armitage, Julie <Julie.Armitage@Illinois.gov>
Sent: Thursday, October 17, 2019 9:42 AM
To: Layman, Robb
Cc: Pilapil, Ray; Bernoteit, Bob
Subject: FW: Meeting regarding the GIII Construction Permit Application - Wednesday October 23, 2019 at 10 AM at IEPA in Springfield

Robb – since you've been assisting on this matter, I'd like you to continue to do so including attending this meeting if at all possible. Thanks much.

From: Pilapil, Ray
Sent: Thursday, October 17, 2019 9:21 AM
To: Armitage, Julie <Julie.Armitage@Illinois.gov>
Subject: FW: Meeting regarding the GIII Construction Permit Application - Wednesday October 23, 2019 at 10 AM at IEPA in Springfield

FYI - - Meeting set.

Thanks.

Ray

From: Bernoteit, Bob
Sent: Thursday, October 17, 2019 9:18 AM
To: Pilapil, Ray <Ray.Pilapil@Illinois.gov>
Subject: FW: Meeting regarding the GIII Construction Permit Application - Wednesday October 23, 2019 at 10 AM at IEPA in Springfield

FYI.

Bob Bernoteit
FESOP/State Permits Unit Manager,
Illinois EPA, Bureau of Air - Permit Section

From: John Pinion <jpinion@rka-inc.com>
Sent: Wednesday, October 16, 2019 2:26 PM
To: Bernoteit, Bob <Bob.Bernoteit@Illinois.gov>
Cc: GII, LLC; Kallas, Jim (jimkallas@general-iron.com) <jimkallas@general-iron.com>; 'Freeborn & Peters LLP; Zwick, Ann (azwick@freeborn.com)' <azwick@freeborn.com>
Subject: [External] Meeting regarding the GIII Construction Permit Application - Wednesday October 23, 2019 at 10 AM at IEPA in Springfield

Bob,

Thank you for getting back to me regarding our request for a meeting to discuss IEPA comments on General III, LLC's Construction Permit Application for a proposed metal recycling facility to be located at 11600 South Burley Avenue in Chicago.

Scheduling our meeting for Wednesday October 23, 2019 at 10 AM in your offices works for General III participants (Jim Kallas – GIII Environmental Manager, Ann Zwick of Freeborn & Peters who is GIII's Environmental Attorney, and me).

I assume you will take care of scheduling for IEPA attendees (you, German Barria, Brad Frost, Chris Pressnall, Eric Jones and a representative from IEPA's legal team).

In our discussion earlier this morning you identified four questions that you had compiled thus far about the GIII construction permit. With regard to the analysis of off site impacts from shredder metal emissions at GII, the modeling study performed and the comparison to WDNR's NR-445 ambient standards is included in Section 5 of the GII shredder emission test report included in Appendix B (starting on Page B-28) of the GIII construction permit application.

We will address the other items you identified during our meeting.

If you have any questions, please do not hesitate to contact me.

Regards,
John Pinion

RK & Associates, Inc.
2 South 631 Route 59, Suite B
Warrenville, Illinois 60555
Phone: 630-393-9000 x 208
Fax: 630-393-9111
Cell: 630-917-1455
E-mail: jpinion@rka-inc.com

From: Bernoteit, Bob <Bob.Bernoteit@Illinois.gov>
Sent: Thursday, October 17, 2019 9:18 AM
To: Pilapil, Ray
Subject: FW: Meeting regarding the GIII Construction Permit Application - Wednesday October 23, 2019 at 10 AM at IEPA in Springfield

FYI.

Bob Bernoteit
FESOP/State Permits Unit Manager,
Illinois EPA, Bureau of Air - Permit Section

From: John Pinion <jpinion@rka-inc.com>
Sent: Wednesday, October 16, 2019 2:26 PM
To: Bernoteit, Bob <Bob.Bernoteit@Illinois.gov>
Cc: GII, LLC; Kallas, Jim (jimkallas@general-iron.com) <jimkallas@general-iron.com>; 'Freeborn & Peters LLP; Zwick, Ann (azwick@freeborn.com)' <azwick@freeborn.com>
Subject: [External] Meeting regarding the GIII Construction Permit Application - Wednesday October 23, 2019 at 10 AM at IEPA in Springfield

RK & Associates, Inc.

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End: Wed 10/23/2019 12:00 PM
Show Time As: Tentative

Recurrence: (none)

Organizer: Bernoteit, Bob

Robb,

I understand that Jim has asked you to attend our meeting. It will be at 10 AM next Wednesday (10/23) in the BOA 3 South Conference Room. Thank you.

-Bob

-----Original Appointment-----
From: Bernoteit, Bob
Sent: Wednesday, October 16, 2019 10:16 AM
To: Bernoteit, Bob; Barria, German; Jones, Eric E.; Pressnall, Chris; Frost, Brad; Pilapil, Ray
Subject: Meeting with GII
When: Wednesday, October 23, 2019 10:00 AM-12:00 PM (UTC-06:00) Central Time (US & Canada).
Where: EPA.Air.BOA.3South.ConferenceRoom3110N

From: Bernoteit, Bob <Bob.Bernoteit@Illinois.gov>
Sent: Wednesday, October 16, 2019 11:42 AM
To: Morgan, James
Subject: RE: Request for Meeting with IEPA to discuss General III, LLC construction permit application

Thanks Jim.

Bob Bernoteit
FESOP/State Permits Unit Manager,
Illinois EPA, Bureau of Air - Permit Section

From: Morgan, James
Sent: Wednesday, October 16, 2019 11:41 AM
To: Bernoteit, Bob <Bob.Bernoteit@Illinois.gov>
Subject: RE: Request for Meeting with IEPA to discuss General III, LLC construction permit application

Robb will assist.

James Morgan
Division of Legal Counsel
Air Enforcement
Illinois EPA
217-524-1376
217-341-0415 (Cell)

From: Bernoteit, Bob
Sent: Wednesday, October 16, 2019 10:42 AM
To: Morgan, James <James.Morgan@illinois.gov>
Subject: FW: Request for Meeting with IEPA to discuss General III, LLC construction permit application

Jim,

We are planning to meet with representatives of the company formerly known as General Iron next Wednesday (10/23) at 10 AM (BOA 3rd Floor South Conference Room). The purpose of the meeting is to discuss the construction permitting of their new site. The company is planning to bring an attorney to the meeting. Therefore, I believe that we will need our own representation. Would you please assign an attorney to attend this meeting? Thank you.

Bob Bernoteit
FESOP/State Permits Unit Manager,
Illinois EPA, Bureau of Air - Permit Section

From: John Pinion <jpinion@rka-inc.com>
Sent: Monday, October 14, 2019 12:13 PM
To: Bernoteit, Bob <Bob.Bernoteit@Illinois.gov>
Subject: [External] Request for Meeting with IEPA to discuss General III, LLC construction permit application

RK & Associates, Inc.

Bob,

As you are aware, General III, LLC (GIII) has submitted an application for a construction permit for a proposed scrap metal recycling facility to be located at 11600 South Burley Avenue in Chicago, Illinois.

GIII is requesting a meeting with you and other members of your permitting staff and other IEPA representatives you may recommend, to discuss the permit application and to identify and address any concerns the Agency may have at this point. As we have previously discussed, and with your concurrence, we will also invite Chris Pressnall and Brad Frost to participate in this meeting. We would like to schedule this meeting at IEPA's offices in Springfield for the week of October 21, 2019.

Can you please let me know your availability for the proposed meeting and your recommendations of who should participate so that we can make necessary arrangements.

Thank you for your consideration in this matter.

If you have any questions, please do not hesitate to contact me.

Regards,
John Pinion

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Warrenville, Illinois 60555
Phone: 630-393-9000 x 208
Fax: 630-393-9111
Cell: 630-917-1455
E-mail: jpinion@rka-inc.com

From: Morgan, James <James.Morgan@illinois.gov>
Sent: Wednesday, October 16, 2019 10:44 AM
To: Bernoteit, Bob
Subject: RE: Request for Meeting with IEPA to discuss General III, LLC construction permit application

Will do.

James Morgan
Division of Legal Counsel
Air Enforcement
Illinois EPA
217-524-1376
217-341-0415 (Cell)

From: Bernoteit, Bob
Sent: Wednesday, October 16, 2019 10:42 AM
To: Morgan, James <James.Morgan@illinois.gov>
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Illinois EPA, Bureau of Air - Permit Section

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E-mail: jpinion@rka-inc.com

From: Bernoteit, Bob <Bob.Bernoteit@Illinois.gov>
Sent: Tuesday, October 15, 2019 11:22 AM
To: Pilapil, Ray
Cc: Barria, German
Subject: FW: Request for Meeting with IEPA to discuss General III, LLC construction permit application

FYI.

Bob Bernoteit
FESOP/State Permits Unit Manager,
Illinois EPA, Bureau of Air - Permit Section

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To: Bernoteit, Bob <Bob.Bernoteit@Illinois.gov>
Subject: [External] Request for Meeting with IEPA to discuss General III, LLC construction permit application

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