Gerdau Ameristeel US, Inc.

Jackson, Tennessee

Compliance Test Report

Title V Permit Number 558867

Electric Arc Furnace Baghouse Numbers 1 and 2,
Meltshop Building and
Dust Handling Systems

July 10 – 11, 2013

Prepared By:

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LELAP ACCREDITED LABORATORY CERTIFICATION NUMBER 04064
LELAP AGENCY INTEREST NUMBER 100329

CERTIFICATION

Ambient Air Services, Inc. (AASI) of Starke, Florida has completed the testing as described in this report for Gerdau Ameristeel US, Inc. (Gerdau) in Jackson, Tennessee. To the best of our knowledge and abilities, all information, facts, and test data are true and correct. Information supplied to AASI for use in this report from Gerdau is perceived to be accurate and is used as such where necessary.

This report contains pages 1 through 299.

This report was reviewed by:

Joseph Cooksey, Technical Director — Date: 9/3/13

David Sholtes, Quality Assurance Manager — Date: 9/3/13

Any questions concerning this report or the process information should be directed to:

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EXECUTIVE SUMMARY

Ambient Air Services, Inc. (AASI) conducted emission testing at Gerdau Ameristeel US, Inc. (Gerdau) in Jackson, Tennessee on July 10 – 11, 2013. The testing involved the determination of particulate matter (PM), lead (Pb), sulfur dioxide (SO_2), oxides of nitrogen (NO_x), carbon monoxide (CO), and visible emissions (VE) from the Electric Arc Furnace Baghouse Number 1 and Baghouse Number 2. Additionally, visible emissions were determined from the meltshop building and the baghouse dust handling systems. A summary of the results is presented in the table on the next page.

Executive Summary

Gerdau Ameristeel US, Inc.
Jackson, Tennessee

July 10 – 11, 2013

Sources	Parameters	Permit Limits	Test Results
Electric Arc Furnace Baghouse Number 2 (Primary) and Baghouse Number 1 (Secondary) Combined	Particulate Matter (PM)	0.0041 gr/dscf 40.76 lbs/hr	0.0012 gr/dscf 8.45 lbs/hr
	Lead (Pb)	1.0 lbs/hr	0.1 lbs/hr
	Carbon Monoxide (CO)	945 lbs/hr	337 lbs/hr
	Oxides of Nitrogen (NO_x)	72.9 lbs/hr	15.5 lbs/hr
	Sulfur Dioxide (SO_2)	40.5 lbs/hr	7.4 lbs/hr
	Visible Emissions (VE)	3% Opacity	0% Opacity
Baghouse 1 and 2 Dust Handling System	Visible Emissions (VE)	10% Opacity	0% Opacity
Meltshop Building	Visible Emissions (VE)	6% Opacity	3% Opacity

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Revision History

Revision	Comments	Issue Date
0	Original issued to William Ownby	September 3, 2013

1.0 INTRODUCTION

1.1 General

Gerdau Ameristeel US, Inc. (Gerdau) contracted with Ambient Air Services, Inc. (AASI) to conduct emission testing on their Electric Arc Furnace Baghouse Number 1, Baghouse Number 2, Meltshop Building, and the Dust Handling System. The testing was conducted on July 10-11, 2013. A summary of the testing conducted is presented in Table 1.1.1.

Table 1.1.1

Summary of Testing Conducted **Gerdau Ameristeel US, Inc.** **Jackson, Tennessee** **July 10 – 11, 2013**			
Sources	**Parameters**	**EPA Reference Methods**	**Duration of Tests**
Electric Arc Furnace Baghouse Number 2 (Primary) and Baghouse Number 1 (Secondary)	Particulate Matter (PM), Lead (Pb), and Flow	40 CFR, Part 60, Appendix A, Methods 1, 2, 3, 4 and 5D/12[(A)]	3 test runs, each run a minimum of 4 hours in duration, sampling a minimum of 160 dscf and included an integral number of heats
	Sulfur Dioxide (SO_2)	40 CFR, Part 60, Appendix A, Method 6C	3 test runs, each run 2 heat cycles
	Oxides of Nitrogen (NO_x)	40 CFR, Part 60, Appendix A, Method 7E	
	Carbon Monoxide (CO)	40 CFR, Part 60, Appendix A, Method 10	
	Opacity (VE)	40 CFR, Part 60, Appendix A, Method 9	Aggregate total of 180 minutes concurrent with PM test
Baghouse Number 1 and Number 2 Dust Handling Systems	Opacity (VE)	40 CFR, Part 60, Appendix A, Method 9	Aggregate total of 180 minutes concurrent with PM test
Meltshop Building	Opacity (VE)	40 CFR, Part 60, Appendix A, Method 9	Aggregate total of 180 minutes concurrent with PM test

Note:
[(A)] Methods 5D and 12 were combined.

1.2 Project Participants

The personnel indicated in Table 1.2.1 participated in this project:

Table 1.2.1

Project Participants **Gerdau Ameristeel US, Inc.** **Jackson, Tennessee** **July 10 – 11, 2013**		
Name	**Affiliation**	**Project Responsibility**
Daniel Ockenhouse	Ambient Air Services, Inc.	Project Manager, Field Testing
William Garabrandt	Ambient Air Services, Inc.	Field Testing
Jack Jory	Ambient Air Services, Inc.	Field Testing
Andrea Yerina	Ambient Air Services, Inc.	Report Preparation
Joseph Cooksey	Ambient Air Services, Inc.	Technical Director
David Sholtes	Ambient Air Services, Inc.	Quality Assurance Manager, Visible Emissions Observer
William Ownby	Gerdau Ameristeel US, Inc.	Environmental Manager
Jerry Allen	Columbia Analytical Services	Lead Analysis
Bryan Parker	State of Tennessee	Test Observer
Steve Morgan	State of Tennessee	Test Observer

2.0 PROCESS DESCRIPTION

Gerdau operates a steel mill in Jackson, Tennessee. This plant recycles scrap steel using an electric arc furnace to produce a variety of products including rebar and merchant carbon steel bars.

Scrap steel is delivered pre-sorted to the site by truck where it is stored in various piles. Pebble limestone, the principal slagging component, is delivered to the site by truck where it is transferred via pneumatic lifts to a lime storage silo. Other steel additives are delivered to the site in drums, sacks, or other containers. The scrap steel, along with properly proportional quantities of additional materials (such as carbon, lime, alloying metals), are loaded to bottom opening charge buckets. The charge buckets enter the meltshop and are picked up by overhead crane and moved to the single electric arc furnace. During charging, the top of the arc furnace is raised and rotated to one side allowing the crane-suspended charge bucket to be positioned directly over the furnace shell. Once in that position, the bottom clamshell halves of the charge bucket are opened allowing the contents to fall into the arc furnace shell. The charge bucket contents are properly sized so that the charge completely fills the furnace shell to that level which will allow the re-positioning of the furnace top without interference. After dropping the charge of scrap, the charge bucket is quickly removed from the arc furnace and refilled. As soon as the arc furnace top is re-positioned, the scrap is melted down by energy input from the three electric electrodes creating an arc and from supplementary natural gas fired burners mounted strategically about the shell. When the initial or first charge has been melted into a molten bath, the charging process is repeated with a second but smaller charge.

An arc submerging foamy slag is created by the injection of carbon and oxygen for the purpose of more efficient energy transfer from the arc to the steel bath and for preservation of refractory lining material in the upper sections of the furnace shell. This refractory would otherwise be directly exposed to the arc. After all scrap has been melted and "flat bath" conditions achieved in the furnace, refining takes place. The molten bath is first sampled to determine the existing chemistry. The chemistry is then adjusted by additions of various materials such as carbon, lime, oxygen and fluorspar. After reaching appropriate chemistry, the bath temperature is elevated above the steel melting temperature to assure continued maintenance of a liquid state as the steel is tapped and subject to further handling.

Shortly before the steel is tapped, excess slag is removed from the top of the molten bath, through the "slag door" in the furnace side which is opposite the tap hole. The molten slag is poured out by slightly tilting the furnace and allowing the material to fall into a slag pot that is removed by overhead crane. A pot carrier transports the slag to an on-site processing plant.

When all conditions are satisfactory, the batch of molten steel or "heat" is tapped into a previously prepared and preheated ladle by opening the EAF tap hole and tilting the EAF. A small quantity of liquid is normally left in the furnace as a "heel".

During charging and tapping, air pollutant emissions are controlled by canopy hoods. During melting and refining, EAF emissions are captured by the direct evacuation system, (DES). Pollutants which escape the DES are captured by the canopy hoods.

After refining, the ladle of molten steel is transported by overhead crane to the continuous caster. When properly positioned above the caster, a drain hole in the bottom of the ladle is opened and the molten steel empties into a tundish. The tundish is a refractory-lined, elongated trough which

has drain holes for the (billet) strands of the continuous caster. As the continuous billet strands emerge from the caster in 4.5 to 6 inch cross-sections, they are automatically cut in equal lengths for handling. The cut lengths are referred to as “billets” and are subsequently stacked and allowed to cool to ambient temperature pending further processing or sale. The limited air pollutant emissions resulting from the casting operations are released into the caster building and captured by the canopy hood.

3.0 SUMMARY OF TEST RESULTS

The test results are summarized in the following tables:

Table 3.1 presents a summary of test results.

Table 3.2 presents a summary of particulate matter (PM) emissions.

Table 3.3 presents a summary of lead (Pb) emissions.

Table 3.4 presents a summary of sulfur dioxide (SO_2) emissions.

Table 3.5 presents a summary of oxides of nitrogen (NO_x) emissions.

Table 3.6 presents a summary of carbon monoxide (CO) emissions.

Table 3.7 presents a summary of visible (VE) emissions.

Table 3.1

Summary of Test Results **Gerdau Ameristeel US, Inc.** **Jackson, Tennessee** **July 10 – 11, 2013**			
Sources	**Parameters**	**Permit Limits**	**Test Results**
Electric Arc Furnace Baghouse Number 2 (Primary) and Baghouse Number 1 (Secondary) Combined	Particulate Matter (PM)	0.0041 gr/dscf 40.76 lbs/hr	0.0012 gr/dscf 8.45 lbs/hr
	Lead (Pb)	1.0 lbs/hr	0.1 lbs/hr
	Carbon Monoxide (CO)	945 lbs/hr	337 lbs/hr
	Oxides of Nitrogen (NO_x)	72.9 lbs/hr	15.5 lbs/hr
	Sulfur Dioxide (SO_2)	40.5 lbs/hr	7.4 lbs/hr
	Visible Emissions (VE)	3% Opacity	0% Opacity
Baghouse 1 and 2 Dust Handling System	Visible Emissions (VE)	10% Opacity	0% Opacity
Meltshop Building	Visible Emissions (VE)	6% Opacity	3% Opacity

Table 3.2

AASI

Particulate Matter (PM) Emissions Summary

Gerdau Ameristeel US, Inc.
Jackson, Tennessee
Baghouses Number 1 and Number 2
July 10 - 11, 2013

Baghouse Number 1										
Run			Particulate Emissions		Volumetric Flow Rates		Stack		Sample Volume	Percent
Date	Number [B]	Time (CDT)	GR/SCFD	LBS/HR	ACFM	SCFMD	Temp °F	Moisture %	SCFD	Isokinetic
7/10/2013	1	8:48 13:31	0.0020	5.40	359092	314370	120	3	184.091	98
7/11/2013	3	8:29 13:32	0.0018	4.85	356870	307600	126	3	187.246	98
7/11/2013	4	14:40 19:50	0.0004	1.16	355824	307518	128	3	175.429	100
Average			**0.0014**	**3.80**	**357262**	**309829**	**125**	**3**	**182.255**	**98**
Baghouse Number 2										
Run			Particulate Emissions		Volumetric Flow Rates		Stack		Sample Volume	Percent
Date	Number	Time (CDT)	GR/SCFD	LBS/HR	ACFM	SCFMD	Temp °F	Moisture %	SCFD	Isokinetic
7/10/2013	1	8:48 13:31	0.0009	3.88	633100	494562	186	3	195.691	102
7/10/2012	2	14:41 20:14	0.0019	8.14	668933	512259	192	4	214.852	102
7/11/2013	3	8:29 13:31	0.0004	1.94	650896	504205	187	4	206.100	102
Average			**0.0011**	**4.65**	**650976**	**503675**	**188**	**4**	**205.547**	**102**
Total/Average [A]			**0.0012**	**8.45**	**1008238**	**813505**				

NOTE(S):

(A) grains/scfd reported as a flow weighted average.

(B) During Run 2 of Baghouse Number 1 PM testing the nozzle scrapped across a beam thus collecting accumulated particulate matter. Run 2 of Baghouse Number 1 was voided and an extra run was conducted.

Table 3.3

AASI

Lead (Pb) Emissions Summary

Gerdau Ameristeel US, Inc.
Jackson, Tennessee
Baghouses Number 1 and Number 2
July 10 - 11, 2013

Baghouse Number 1											
Run			Lead Emissions			Volumetric Flow Rates		Stack		Sample Volume	Percent
Date	Number [B]	Time (CDT)	GR/SCFD	LBS/HR	TONS/YR [C]	ACFM	SCFMD	Temp °F	Moisture %	SCFD	Isokinetic
7/10/2013	1	8:48 13:31	1.41E-05	0.04	0.17	359092	314370	120	3	184.091	98
7/11/2013	3	8:29 13:32	3.02E-06	0.01	0.03	356870	307600	126	3	187.246	98
7/11/2013	4	14:40 19:50	2.27E-06	0.01	0.03	355824	307518	128	3	175.429	100
Average			**6.46E-06**	**0.02**	**0.08**	**357262**	**309829**	**125**	**3**	**182.255**	**98**
Baghouse Number 2											
Run			Lead Emissions			Volumetric Flow Rates		Stack		Sample Volume	Percent
Date	Number	Time (CDT)	GR/SCFD	LBS/HR	TONS/YR [C]	ACFM	SCFMD	Temp °F	Moisture %	SCFD	Isokinetic
7/10/2013	1	8:48 13:31	4.86E-06	0.02	0.09	633100	494562	186	3	195.691	102
7/10/2012	2	14:41 20:14	2.40E-05	0.11	0.46	668933	512259	192	4	214.852	102
7/11/2013	3	8:29 13:31	1.34E-06	0.01	0.03	650896	504205	187	4	206.100	102
Average			**1.01E-05**	**0.04**	**0.19**	**650976**	**503675**	**188**	**4**	**205.547**	**102**
Total/Average [A]			**8.70E-06**	**0.06**	**0.27**	**1008238**	**813505**				

Baghouse Number 1 Laboratory Results (total ug)		
R-1	R-3	R-4
168	37	26

Baghouse Number 2 Laboratory Results (total ug)		
R-1	R-2	R-3
62	335	18

NOTE(S):

(A) grains/scfd reported as a flow weighted average.
(B) During Run 2 of Baghouse Number 1 PM testing the nozzle scrapped across a beam thus collecting accumulated particulate matter. Run 2 of Baghouse Number 1 was voided and an extra run was conducted.
(C) Tons per year based on 8760 operating hours per year.

Table 3.4

AASI

Sulfur Dioxide (SO_2) Emissions Summary
USEPA Method 6C (40 CFR Part 60 Appendix A)
Gerdau Ameristeel US, Inc.
Jackson, Tennessee
Baghouses Number 1 and Number 2
July 10, 2013

Baghouse Number 1

Run			Concentration	Volumetric Flow Rates	Production	Mass Emissions	
Date	Number	Time (CDT)	ppm-v/v	SCFM-Dry	Tons per Hour	Pounds per Hour	Pounds per Ton
7/10/2013	1	9:52 12:18	0.3	314370	111.6	0.9	0.01
7/10/2013	2	13:29 16:03	0.6	300905	96.1	1.8	0.02
7/10/2013	3	17:19 20:11	0.6	300905	97.4	1.8	0.02
Average			**0.5**	**305393**	**101.7**	**1.5**	**0.02**

Baghouse Number 2

Run			Concentration	Volumetric Flow Rates	Production	Mass Emissions	
Date	Number	Time (CDT)	ppm-v/v	SCFM-Dry	Tons per Hour	Pounds per Hour	Pounds per Ton
7/10/2013	1	9:52 12:18	1.0	494562	111.6	4.9	0.04
7/10/2013	2	13:29 16:03	1.0	512259	96.1	5.1	0.05
7/10/2013	3	17:19 20:11	1.5	512259	97.4	7.7	0.08
Average			**1.2**	**506360**	**101.7**	**5.9**	**0.06**

Combined

Run			Concentration	Volumetric Flow Rates	Production	Mass Emissions	
Date	Number	Time (CDT)	ppm-v/v (flow weighted)	SCFM-Dry	Tons per Hour	Pounds per Hour	Pounds per Ton
7/10/2013	1	9:52 12:18	0.7	808932	111.6	5.9	0.05
7/10/2013	2	13:29 16:03	0.9	813164	96.1	6.9	0.07
7/10/2013	3	17:19 20:11	1.2	813164	97.4	9.5	0.10
Average			**0.9**	**811753**	**101.7**	**7.4**	**0.07**

Table 3.5

AASI

Oxides of Nitrogen (NO_X) Emissions Summary
USEPA Method 7E (40 CFR Part 60 Appendix A)
Gerdau Ameristeel US, Inc.
Jackson, Tennessee
Baghouses Number 1 and Number 2
July 10, 2013

Baghouse Number 1

Run			Concentration	Volumetric Flow Rates	Production	Mass Emissions (as NO_2)	
Date	Number	Time (CDT)	ppm-v/v	SCFM-Dry	Tons per Hour	Pounds per Hour	Pounds per Ton
7/10/2013	1	9:52 12:18	0.5	314370	111.6	1.1	0.01
7/10/2013	2	13:29 16:03	0.7	300905	96.1	1.5	0.02
7/10/2013	3	17:19 20:11	1.2	300905	97.4	2.6	0.03
Average			**0.8**	**305393**	**101.7**	**1.7**	**0.02**

Baghouse Number 2

Run			Concentration	Volumetric Flow Rates	Production	Mass Emissions	
Date	Number	Time (CDT)	ppm-v/v	SCFM-Dry	Tons per Hour	Pounds per Hour	Pounds per Ton
7/10/2013	1	9:52 12:18	3.6	494562	111.6	12.8	0.11
7/10/2013	2	13:29 16:03	4.2	512259	96.1	15.4	0.16
7/10/2013	3	17:19 20:11	3.6	512259	97.4	13.2	0.14
Average			**3.8**	**506360**	**101.7**	**13.8**	**0.14**

Combined

Run			Concentration	Volumetric Flow Rates	Production	Mass Emissions	
Date	Number	Time (CDT)	ppm-v/v (flow weighted)	SCFM-Dry	Tons per Hour	Pounds per Hour	Pounds per Ton
7/10/2013	1	9:52 12:18	2.4	808932	111.6	13.9	0.15
7/10/2013	2	13:29 16:03	2.9	813164	96.1	16.9	0.14
7/10/2013	3	17:19 20:11	2.7	813164	97.4	15.8	0.18
Average			**2.7**	**811753**	**101.7**	**15.5**	**0.16**

Table 3.6

AASI

Carbon Monoxide (CO) Emissions Summary
USEPA Method 10 (40 CFR Part 60 Appendix A)
Gerdau Ameristeel US, Inc.
Jackson, Tennessee
Baghouses Number 1 and Number 2
July 10, 2013

Baghouse Number 1

Run			Concentration	Volumetric Flow Rates	Production	Mass Emissions	
Date	Number	Time (CDT)	ppm-v/v	SCFM-Dry	Tons per Hour	Pounds per Hour	Pounds per Ton
7/10/2013	1	9:52 12:18	115.0	314370	111.6	157.7	1.41
7/10/2013	2	13:29 16:03	84.2	300905	96.1	110.5	1.15
7/10/2013	3	17:19 20:11	134.6	300905	97.4	176.7	1.81
Average			**111.3**	**305393**	**101.7**	**148.3**	**1.46**

Baghouse Number 2

Run			Concentration	Volumetric Flow Rates	Production	Mass Emissions	
Date	Number	Time (CDT)	ppm-v/v	SCFM-Dry	Tons per Hour	Pounds per Hour	Pounds per Ton
7/10/2013	1	9:52 12:18	85.3	494562	111.6	184.0	1.65
7/10/2013	2	13:29 16:03	75.7	512259	96.1	169.2	1.76
7/10/2013	3	17:19 20:11	94.7	512259	97.4	211.6	2.17
Average			**85.2**	**506360**	**101.7**	**188.3**	**1.86**

Combined

Run			Concentration	Volumetric Flow Rates	Production	Mass Emissions	
Date	Number	Time (CDT)	ppm-v/v (flow weighted)	SCFM-Dry	Tons per Hour	Pounds per Hour	Pounds per Ton
7/10/2013	1	9:52 12:18	96.8	808932	111.6	341.8	3.06
7/10/2013	2	13:29 16:03	78.8	813164	96.1	279.7	2.91
7/10/2013	3	17:19 20:11	109.5	813164	97.4	388.3	3.99
Average			**95.1**	**811753**	**101.7**	**336.6**	**3.32**

Table 3.7

AASI

Visible Emission (VE) Observations Summary
USEPA Method 9 (40 CFR Part 60 Appendix A)
Gerdau Ameristeel US, Inc.
Jackson, Tennessee

July 10 - 11, 2013

Date	Time (CDT)		Source	Opacity (Highest 6-Minute Average)
7/10/2013	14:45	18:06	Baghouse 1	0%
7/11/2013	9:13	12:35	Baghouse 2	0%
7/10/2013	8:54	11:56	Meltshop Building	3%
7/10/2013	14:45	18:06	Baghouse 1 Dust Handling System	0%
7/11/2013	9:13	12:35	Baghouse 2 Dust Handling System	0%

4.0 TESTING METHODOLOGY AND PROCEDURES

4.1 Sampling Points

USEPA Method 1, as published in 40 CFR, Part 60, Appendix A, was used as the reference method for the selection of sampling points for flows on each inlet duct. The sampling points for PM/Pb were selected in accordance with USEPA Method 5D with deviations as described in section 5.0. Each baghouse was divided into 3 sections, each section nominally 1/3 of the baghouse exhaust. Each section was tested per gas and particulate/lead run.

4.1.1 Baghouse 2 (Primary)

Baghouse Number 2 is a positive pressure baghouse without a stack. The filtered air exhausts through a monovent design in the roof structure of the baghouse. The measurement site is 178 feet by 10 feet. This baghouse serves as the furnace's direct evacuation system as well as serving a portion of the canopy exhaust.

The baghouse flow was determined at the inlet to the baghouse. This flow was used to determine the measurement location velocity as described in USEPA Method 5D when the velocity of air at the measurement site was less than that which could be measured by Method 2. The assumption was made that all measurement points had the same velocity.

4.1.2 Baghouse 1 (Canopy/Secondary)

Baghouse Number 1 is a positive pressure baghouse without a stack. The filtered air exhausts through a monovent design in the roof structure of the baghouse. The measurement site is 85 feet by 12 feet. This baghouse serves as the roof canopy evacuation system. A portion of the gases evacuated by this baghouse originates from the furnace with the other gases originating from other sources within the shop.

The baghouse flow was determined at the inlet to the baghouse. This flow was used to determine the measurement location velocity as described in USEPA Method 5D when the velocity of air at the measurement site was less than that which could be measured by Method 2. The assumption was made that all measurement points had the same velocity.

4.2 Velocity and Volumetric Flow Rate

USEPA Method 2, as published in 40 CFR, Part 60, Appendix A, was used as the reference method to determine average gas velocity. A type "S" pitot tube and magnehelic was used for velocity determination. Gas temperature was measured with a type K thermocouple. Calibration checks were performed on the pitot tube to verify the face opening alignments, external tubing diameter, and base-to-opening plane distances. A base-line coefficient of 0.84 was assigned to each pitot tube. Flow was measured at the inlet to each baghouse and prorated to the outlet based on the ratio of the inlet area to the outlet area.

4.3 Oxygen (O_2) and Carbon Dioxide (CO_2)

USEPA Method 3, as published in 40 CFR, Part 60, Appendix A, was used as the reference method to determine oxygen (O_2) and carbon dioxide (CO_2) concentrations. A Fyrite was used to determine both O_2 and CO_2 concentrations. The O_2 and CO_2 concentrations were used for the calculation of molecular weight of the exhaust gas.

4.4 Moisture

USEPA Method 4, as published in 40 CFR, Part 60, Appendix A, was used as the reference method to determine the moisture content. The sample was collected at a known and regulated rate through a glass condenser. The condenser consisted of the back half of the relevant sampling system. The gas sample was extracted through the impingers (maintained at below 68° F in an ice bath) with a vacuum pump. The amount of gas sampled was measured with a

calibrated dry gas meter. The amount of moisture collected during the test was measured and the amount of gas drawn, corrected to dry standard conditions, was determined.

4.5 Particulate Matter (PM) and Lead (Pb)

USEPA Method 5D was combined with USEPA Method 12 to determine the particulate matter (PM) and lead (Pb) emissions from each baghouse referencing EPA Methods 1-4 for traverse point selection, determination of stack gas molecular weight, stack gas moisture determination, and volumetric flow rate. The following is a synopsis of the method and a list of equipment and specifications. A diagram of the sampling system is presented in Figure 4.5.1.

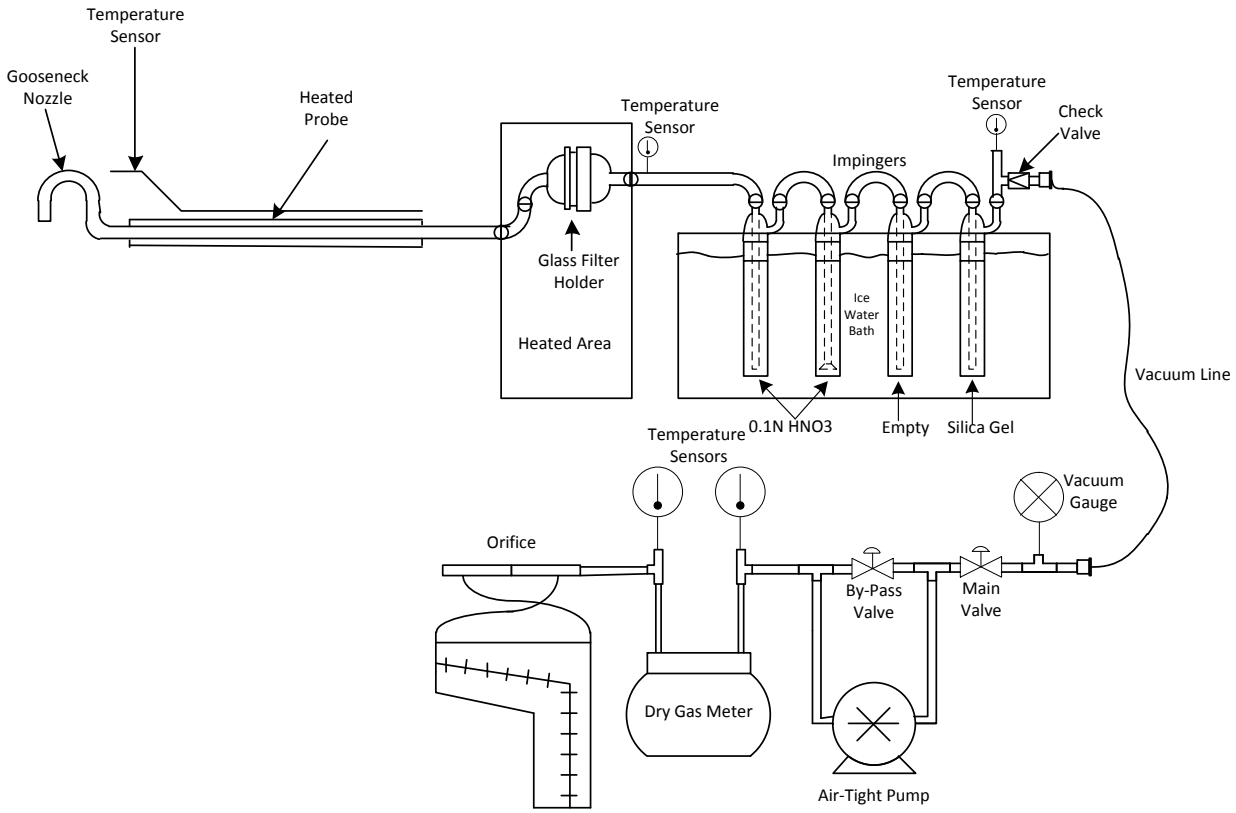
Sampling Apparatus

1)	Probe Nozzle	Stainless steel with sharp tapered leading edge.
2)	Probe	Stainless steel 5/8" OD.
3)	Pitot Tube	Not used at the PM measurement site. This is addressed in Method 5D, Section 8.3.1.
4)	Filter Holder	The filter holder was constructed of glass. The gasket was made of silicone rubber. The filter holder was designed to provide a positive seal against leakage from the outside or around the filter. A flexible Teflon line was used in between the filter and the impingers.
5)	Impingers	Four (4) glass impingers connected in series with glass ball joint fittings. The first, third, and fourth were of the Greenburg-Smith design modified by replacing the tip with a 1.3 cm (1/2 inch) Id glass tube extending to about ½ inch from the bottom of the flask. The second impinger was of the Greenburg-Smith design with a standard tip. All were submerged in an ice bath during the sample runs. The first and second impingers contained 100 ml of 0.1N HNO_3. The third impinger was empty, and the fourth impinger contained approximately 400g of silica gel.

6)	Meter Box	Module containing a vacuum gauge, leak free pump, dry gas meter with a minimum of one percent accuracy, valves, and related equipment to maintain isokinetic sampling rate and to determine sample volume.
7)	Barometer	Measured atmospheric pressure on-site to ±0.05 inches of mercury.
8)	Thermocouples	Type K thermocouples were utilized to monitor temperatures for stack gas, last impinger, and dry gas meter.
9)	Filters	Pall glass fiber filter.

Figure 4.5.1

Method 5D/12 Sampling System



Impinger Set-up:

1) Modified tip, 100 ml 0.1N HNO_3
2) Standard tip, 100 ml 0.1N HNO_3
3) Modified tip, empty
4) Modified tip, approximately 400g silica gel

4.6 Sulfur Dioxide (SO_2)

USEPA Method 6C, as published in 40 CFR, Part 60, Appendix A, was used as the reference method for determining the sulfur dioxide (SO_2) concentration in the effluent gas stream. A Thermo Environmental Instruments Model 43C was used for each baghouse.

4.7 Oxides of Nitrogen (NO_x)

USEPA Method 7E, as published in 40 CFR, Part 60, Appendix A, was used as the reference method for determining the oxides of nitrogen (NO_x) concentration in the effluent gas stream. A Thermo Environmental Instrument (TEI) Model 42C chemiluminescence analyzer (or equivalent) was used for each baghouse.

4.8 Carbon Monoxide (CO)

USEPA Method 10, as published in 40 CFR, Part 60, Appendix A, was used as the reference method for determining the carbon monoxide (CO) concentration in the effluent gas stream. A Thermo Environmental Instrument Model 48 analyzer (or equivalent) was used for each baghouse.

4.9 Visible Emissions (VE)

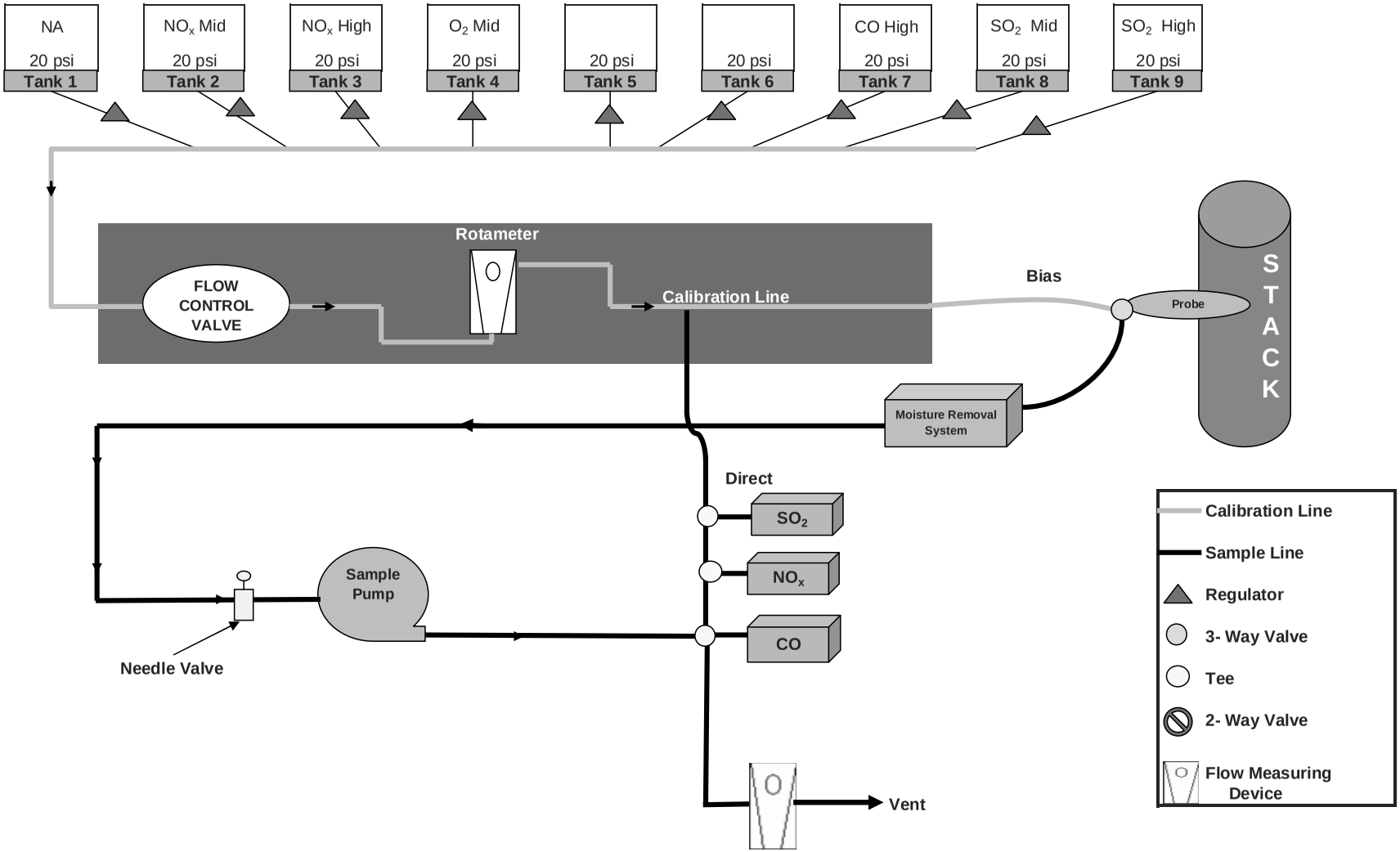
USEPA Method 9, as published in 40 CFR, Part 60, Appendix A, was used to determine visible emissions. The plume opacity was observed and recorded every 15 seconds. Opacity was calculated as the average of the highest concurrent 24 readings over the period of observation.

4.10 Sampling System

A fully extractive sample system for each baghouse was utilized to convey the stack gas to the analytical instruments. The sample system consisted of the following components: a stainless steel probe, calibration tee, particulate filter, 200 feet of sample line (Teflon), moisture removal system, a sample pump, and a sample manifold to distribute the sample gas to the analytical

instruments. The system was designed so that all calibration gases could be injected at the probe and passed through the same system as the sample gas. A schematic of the sampling system is shown in Figure 4.10.1.

4.10.1
PNEUMATIC SCHEMATIC
(Not To Scale)



5.0 TEST COMMENTS AND METHOD DEVIATIONS

Baghouse Number 1

1) The 85-foot cross section was divided into 3 sections, each section nominally 1/3 of the baghouse exhaust. Each section was tested per gas and particulate/lead run.

2) During run 2 of the PM/Pb test the nozzle scraped across a beam collecting accumulated particulate matter. Run 2 was voided and an additional run was conducted. This was discussed with the on site inspectors and approved.

Baghouse Number 2

1) The 178 foot cross section was divided into 3 sections, each section nominally 1/3 of the baghouse exhaust. Each section was tested per gas and particulate/lead run.

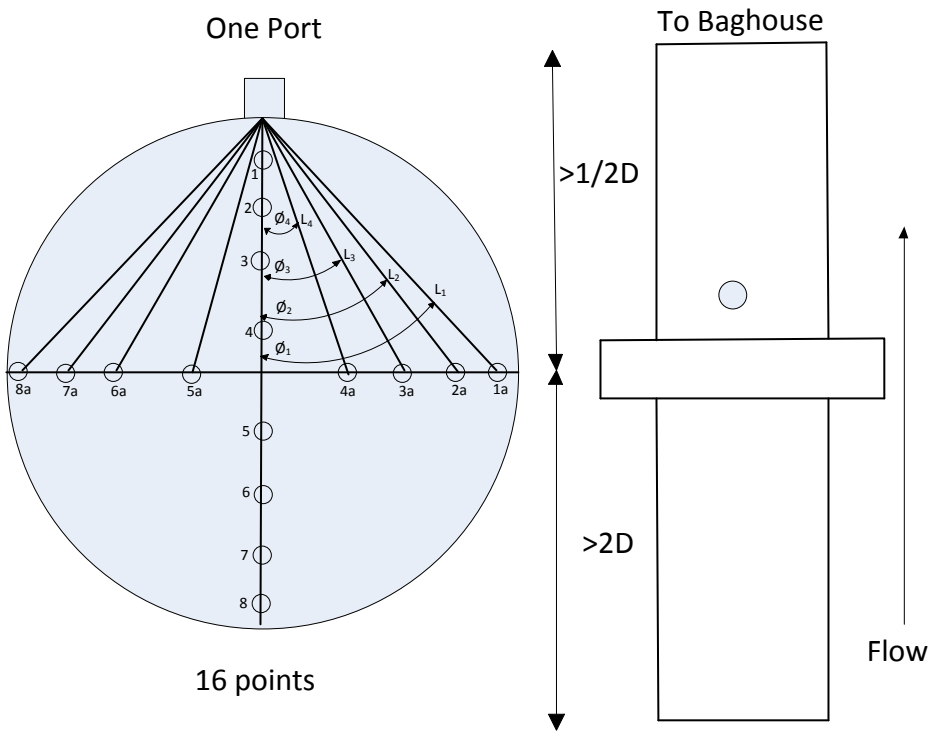
6.0 SAMPLING POINT LOCATIONS

Figure 6.1

Gerdau Ameristeel US, Inc.
Jackson, Tennessee
Baghouse Number 1-Inlet Duct

Diameters Upstream:	>1/2
Diameters Downstream	>2
Stack diameter	150”
Drawing Date	9/1/10

Drawing Not to Scale



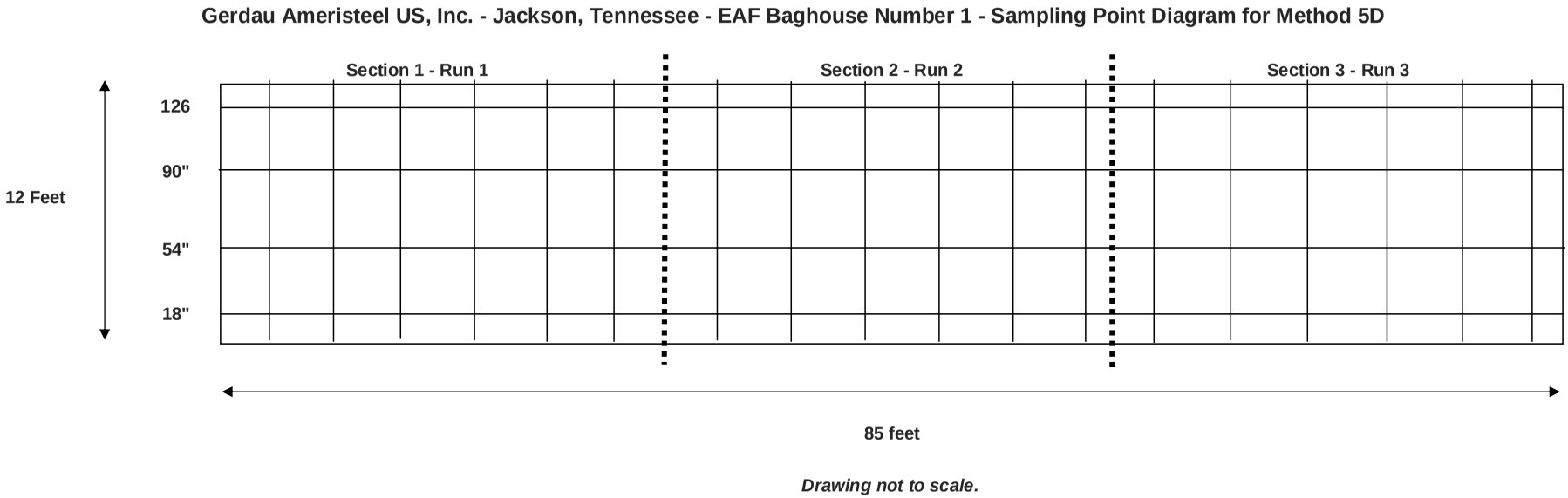
Straight Traverse Sampling Points (inches)	
1	4.8”
2	15.8”
3	29.1”
4	48.5”
5	101.6”
6	120.9”
7	134.3”
8	145.2”

Angled Traverse Sampling Points (inches)

	Distance (L)	Angle (Θ)
1a	102.7”	48°
2a	95.6”	45°
3a	87.9”	41°
4a	79.6”	36°
5a	79.6”	36°
6a	87.9”	41°
7a	95.6”	45°
8a	102.7”	48°

Notes: One port with 16 points. All distances are approximate.

Figure 6.2



Note: Each section was tested for one run and has a 4 x 6 matrix for a total sampling points of 24 at 10 minutes per point for a total of 240 minutes. Baghouse has 24 sampling ports, only 18 were used.

Figure 6.3

EPA Method 5D Considerations Gerdau Ameristeel US, Inc. Jackson, Tennessee Baghouse 1	
Total Measurement Site Area	1020 Ft^2
Portion of Baghouse Tested Per Run	Baghouse divided into 3 portions, 1 portion tested per run
Number of traverse points per run (Method 5D, 8.1.4)	24
Number of Minutes per point	10
Total Run Duration (Minutes)	240*
Number of Test Runs	3
Minimum Sample Volume per run (DSCF)	160
Sample Nozzle Size (Inches) – Nominal	0.641
Probe Length	~10ft
Stack Temperature (estimated)	120° F
Stack Moisture (estimated)	2%
CO_2 Concentration Expected	0.0%
O_2 Concentration Expected	20.9%

NOTE: Method 5D data recorded every 10 minutes.

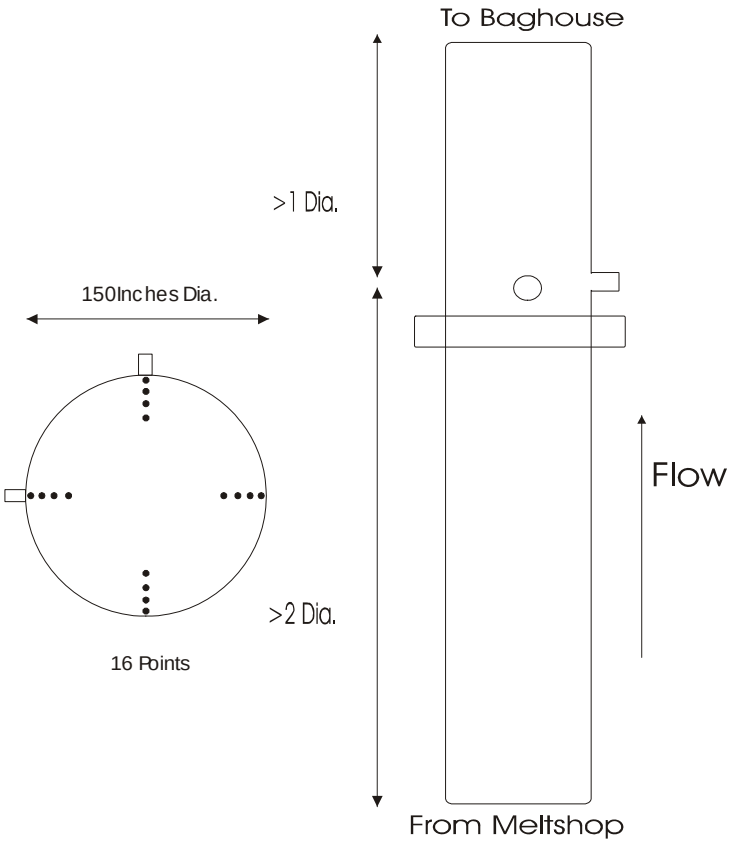
*NOTE: This facility operates a single furnace. For single furnace facilities NSPS AAa (60.275a) requires particulate sampling to include an integral number of furnace heats. If the end of the test run does not correspond with the end (tap) of the furnace heat, the test will be extended through the completion of the furnace heat. The test points were continued in reverse order until the heat in progress is completed.

Figure 6.4

Gerdau Ameristeel US, Inc.
Jackson, Tennessee
Baghouse Number 2 Inlet Traverse Points

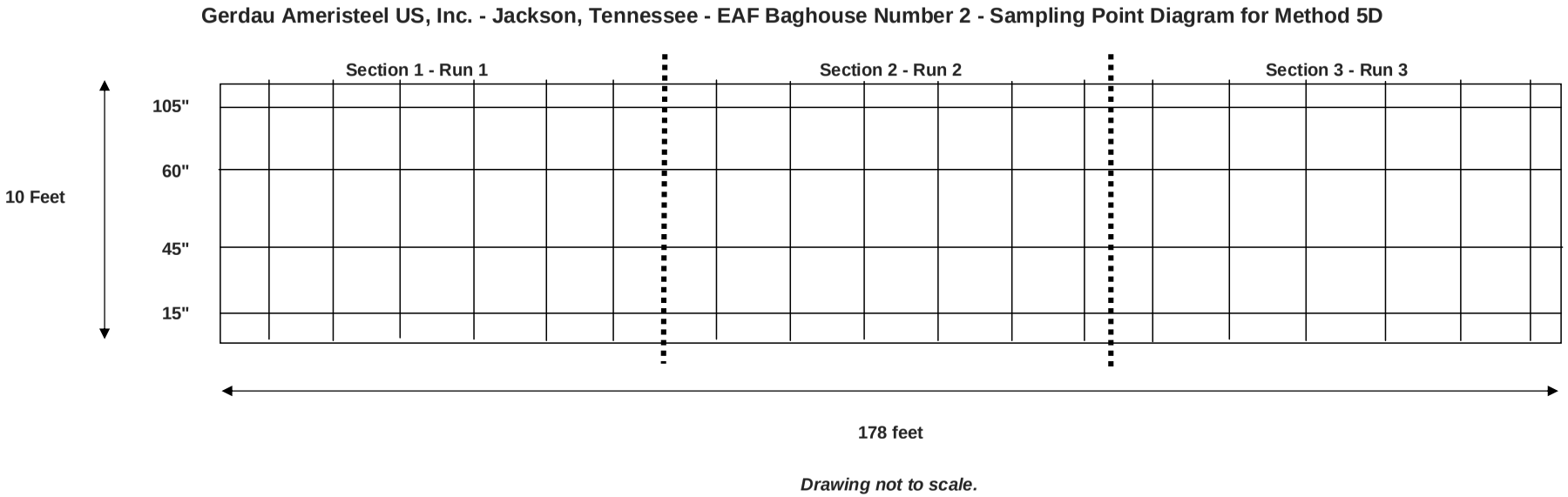
		Sampling Points (inches)	
Diameters Upstream:	>1		
Diameters Downstream	>2	1	4.8”
Stack diameter	150”	2	15.8”
Drawing Date	04/03/06	3	29.1”
		4	48.5”
		5	101.6”
		6	120.9”
		7	134.3”
		8	145.2”

Drawing Not to Scale



Note: All distances are approximate. Duct is overhead approximately 80 feet agl. Access by manlift. 2 test ports, 8 points per port, 16 total points.

Figure 6.5



Note: Each section was tested for one run and has a 4 X 6 matrix for a total sampling points of 24 at 10 minutes per point for a total of 240 minutes.

Figure 6.6

Method 5D Considerations Gerdau Ameristeel US, Inc. Jackson, Tennessee Baghouse 2	
Measurement Site Area	1780 ft^2
Portion of Baghouse Tested Per Run	Baghouse divided into 3 portions, 1 portion tested per run
Number of traverse points per run (Method 5D, 8.1.4)	24
Number of Minutes per point	10
Total Run Duration (Minutes)	240*
Number of Test Runs	3
Minimum Sample Volume per run (DSCF)	160
Sample Nozzle Size (Inches) – Nominal	0.680 inches
Probe Length (In stack filter used)	~10 ft
Stack Temperature (estimated)	190° F
Stack Moisture (estimated)	2%
CO_2 Concentration Expected	0.5%
O_2 Concentration Expected	20.5%

NOTE: Method 5D data recorded every 10 minutes.

*NOTE: This facility operates a single furnace. For single furnace facilities NSPS AAa (60.275a) requires particulate sampling to include an integral number of furnace heats. If the end of the test run does not correspond with the end (tap) of the furnace heat, the test will be extended through the completion of the furnace heat. The test points were continued in reverse order until the heat in progress is completed.

APPENDICES

APPENDIX A	PARTICULATE MATTER (PM) AND LEAD (Pb) DATA
APPENDIX B	GASEOUS & INSTRUMENT DATA
APPENDIX C	VISIBLE EMISSIONS
APPENDIX D	TEST PROTOCOL
APPENDIX E	LABORATORY ACCREDITATION
APPENDIX F	PROCESS DATA

APPENDIX A

PARTICULATE MATTER (PM) AND LEAD (Pb) DATA

Appendix A.1	Baghouse Number 1
Appendix A.2	Baghouse Number 2
Appendix A.3	ALS Laboratory Report

APPENDIX A.1
PARTICULATE MATTER AND LEAD DATA
BAGHOUSE NUMBER 1

Example Calculations

Emission Run Summaries

Field Data Sheets

PM Laboratory Report

Meter Box Pre-Test Calibration

Meter Post-Test Calibration

Pitot Tube Calibration

Thermocouple Calibration

Magnehelic Calibration

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AASI USEPA Method 5D Single-Inlet 60 Point Template - Rev 2, 042508

Example Calculations, PM Test Run 1

Facility	**Gerdau Ameristeel US, Inc.**	**Source**	**Baghouse Number 1**
Location	**Jackson, TN**	**Date**	**July 10, 2013**

1. **Stack Gas Flow Rate, Standard Temperature and Pressure, Dry, ($Q_{d(std)}$)**

=

$Q_{d(std)inlet} = Q_{d(std)outlet}$

Example	$Q_{d(std)inlet}$	=	314370	**$Q_{d(std)outlet}$**	=	**314370**	**SCFMD**

2. **Stack Gas Flow Rate, Standard Temperature and Pressure ($Q_{s(std)}$)**

=

$Q_{d(std)} / B_{wd}$

	$Q_{d(std)}$	=	314370	**$Q_{s(std)}$**	=	**323083**	**SCFMW**
	B_{wd}	=	0.973				

3. **Actual Stack Gas Flow Rate, Dry (Q_d)**

=

$Q_d = Q_{d(std)} \times ((P_{std} \times T_{s(abs)})/(T_{std} \times P_s)$

Example.	$Q_{d(std)}$	=	314370	**Q_d**	=	**349407**	**ACFMD**
	P_{std}	=	29.92				
	$T_{s(abs)}$	=	580				
	T_{std}	=	528				
	P_s	=	29.58				

4. **Actual Stack Gas Flow Rate (Q_s).**

=

Q_d/B_{wd}

Example.	Q_d	=	349407.2	**Q_s**	=	**359092**	**ACFM**
	B_{wd}	=	0.973				

5. **Velocity of Stack Gas, as feet per minute, (v_s).**

=

Q_s/A

Example.	Q_s	=	359092	**v_s**	=	**352.1**	**FPM**
	A	=	1020.0				

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Example Calculations, PM Test Run 1

Facility	**Gerdau Ameristeel US, Inc.**	**Source**	**Baghouse Number 1**
Location	**Jackson, TN**	**Date**	**July 10, 2013**

6. **Stack Pressure (P_s)**

=

$P_s = P_{bar} + (P_g / 13.6)$

Example.	P_{bar}	=	29.58	**P_s**	=	**29.58**	**in. Hg.**
	P_g	=	0.05				

7. **Volume Water Vapor, ($V_{w(std)}$).**

=

$V_{lc} \times 0.04706$

Example.	V_{lc}	=	108.4	**$V_{w(std)}$**	=	**5.102**	**SCF**

8. **Meter Volume, corrected to Standard Conditions, ($V_{m(std)}$)**

=

$V_m \times Y \times 17.64 (P_{bar} + (\Delta H/13.6))/T_m$

Example.	V_m	=	192.918	**$V_{m(std)}$**	=	**184.091**	**SCF**
	P_{bar}	=	29.58				
	T_m	=	554.8				
	Y	=	1.009				
	K_1	=	17.64				
	ΔH_{avg}	=	2.200				

9. **Total Volume Of Sample, (V_t).**

=

$V_{w(std)} + V_{m(std)}$

Example.	$V_{m(std)}$	=	184.091	**V_t**	=	**189.193**	**SCF**
	$V_{w(std)}$	=	5.102				

10. **Moisture in stack gas, volume fraction (B_{ws})**

=

$V_{w(std)} / (V_{w(std)} + V_{m(std)})$

Example.	$V_{m(std)}$	=	184.091	**B_{ws}**	=	**0.027**	
	$V_{w(std)}$	=	5.102				

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Example Calculations, PM Test Run 1

Facility	**Gerdau Ameristeel US, Inc.**	**Source**	**Baghouse Number 1**
Location	**Jackson, TN**	**Date**	**July 10, 2013**

11. **Dry Stack Gas, volume fraction (B_{wd})**

$$= 1 - B_{ws}$$

Example. B_{ws} = 0.027 **B_{wd} = 0.973**

12. **Molecular Weight of Stack Gas, Dry, (M_d).**

$$= (0.44 \times \%CO2) + (0.32 \times \%O2) + (0.28 \times \%N2) + (0.28 \times \%CO)$$

Example.	CO2	=	0	**M_d**	**=**	**28.84**
	O2	=	20.9			
	N2	=	79.1			
	CO	=	0			

13. **Molecular Weight of Stack Gas, Stack Conditions, (M_s).**

$$= M_d \times B_{wd} + 18.0 \times B_{ws}$$

Example.	M_d	=	28.84	**M_s**	**=**	**28.54**
	B_{wd}	=	0.973			
	B_{ws}	=	0.027			

14. **Specific Gravity of Gas, Relative to Air, (G_s)**

$$= M_S / 28.99$$

Example. M_s = 28.54 **G_s = 0.985**

15. **Percent Isokinetic Sampled, (I)**

$$(100 \times V_{m(std)} \times 29.92 \times T_{s(abs)}) / (528 \times v_s \times \Theta \times A_n \times P_s \times B_{wd})$$

Example.	A_n	=	0.002241	**I**	**=**	**98**	**%**
	Θ	=	273	P_{std}	=	29.92	
	$V_{m(std)}$	=	184.09	T_{std}	=	528	
	$T_{s(abs)}$	=	580.25	P_s	=	29.58	
	v_s	=	352.1	B_{wd}	=	0.973	

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Example Calculations, PM Test Run 1

Facility	**Gerdau Ameristeel US, Inc.**	**Source**	**Baghouse Number 1**
Location	**Jackson, TN**	**Date**	**July 10, 2013**

16. **Particulate Concentration, grains per Standard Cubic Foot, (C_s).**

$$(0.01543 \times Mg.) / V_{m(std)}$$

Example.	Mg	=	23.9	**C_s**	=	**0.0020**	**Grs/ SCF.**
	$V_{m(std)}$	=	184.091				

17. **Mass Emission Rate, Lbs / Hr, (Em).**

$$C_s \times Q_{d(std)} \times 60 / 7000$$

Example.	$Q_{d(std)}$	=	314370	**Em**	=	**5.40**	**Lbs/ Hr**

18. **Lead Concentration, grains per Standard Cubic Foot, (C_{Pb}).**

$$(0.00001543 \times ug.) / V_{m(std)}$$

Example.	ug	=	168.1	**C_{Pb}**	=	**1.4E-05**	**Grs/ SCF.**
	$V_{m(std)}$	=	184.091				

19. **Lead Mass Emission Rate, Lbs / Hr, (EPb).**

$$C_{Pb} \times Q_{d(std)} \times 60 / 7000$$

Example.	C_{Pb}	=	1.41E-05				
	$Q_{d(std)}$	=	314370	**EPb**	=	**3.8E-02**	**Lbs/ Hr**

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Example Calculations, PM Test Run 1

Facility	**Gerdau Ameristeel US, Inc.**	**Source**	**Baghouse Number 1**
Location	**Jackson, TN**	**Date**	**July 10, 2013**

Constants

K	=	0.005 English	K_p	=	85.49 equation constant
K_1	=	17.64 °R/in. Hg	T_{std}	=	528 °R
K_2	=	0.04706 ft^3/ml	P_{std}	=	29.92 inches Hg
K_3	=	0.0154 gr/mg	p_W	=	0.9982 g/ml

Variables

A	=	Stack Area (ft^2)	Q_s	=	Actual Stack Gas Flow Rate, ACFM
A_n	=	Nozzle Area (ft^2)	Q_d	=	Actual Stack Gas Flow Rate, ACFMD
B_{ws}	=	Moisture in stack gas, volume fraction	$Q_{s(std)}$	=	Stack Gas Flow Rate Wet, SCFMW
B_{wd}	=	Dry Stack Gas, volume fraction	$Q_{d(std)}$	=	Stack Gas Flow Rate, SCFMD
C_p	=	Pitot Correction Factor	$T_{s(abs)}$	=	Stack Temp (degrees R)
C_s	=	Grains per DSCF	T_m	=	Meter Temp (degrees R)
D_e	=	Equivilent Diameter (inches)	v_s	=	Average Stack Velocity, FPM
E_m	=	Mass Emission Rate, Lb/hr	V_{lc}	=	Condensate Volume (ml)
I	=	Percent Isokinetic	V_m	=	Volume Metered (ft^3)
m_s	=	Prefilter Weight (grams)	$V_{m(std)}$	=	Gas Volume Sampled, STPD
m_n	=	Total Particulate (grams)	$V_{w(std)}$	=	Volume Water Vapor, SCF
M_d	=	Molecular Weight of Stack Gas (Dry Basis)	V_t	=	Total Volume Collected, SCF
M_s	=	Molecular Weight of Stack Gas (Stack conditions)	Y	=	Meter Correction
n	=	Number of Points	ΔH_{avg}	=	Delta H (inches H_2O)
P_{bar}	=	Barometric Pressure (inches Hg)	Δp_{avg}	=	Avg of SQRT of V.H.
P_g	=	Static Pressure	Θ	=	Total Time (minutes)
P_s	=	Stack Pressure (inches Hg)	ug	=	Total micrograms Lead Collected
C_{Pb}	=	Lead Grains per DSCF	EPb	=	Lead Mass Emission rate (Lbs/Hr)

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Example Calculations, Pre-Test Flow

Facility	**Gerdau Ameristeel US, Inc.**	**Source**	**Baghouse Number 1**
Location	**Jackson, TN**	**Date**	**07/10/13**

1. **Stack Pressure (P_s)**

$$P_s = P_{bar} + (P_g / 13.6)$$

Example.	P_{bar}	=	29.51	P_s	=	**29.39**	**in. Hg.**
	P_g	=	-1.6				

2. **Dry Stack Gas, volume fraction (B_{wd})**

$$1 - B_{ws}$$

Example.	B_{ws}	=	0.020	B_{wd}	=	**0.980**

Note: Bws is estimated

Molecular Weight of Stack Gas, Dry, (M_d).

$$(0.44 \times \%CO2) + (0.32 \times \%O2) + (0.28 \times \%N2) + (0.28 \times \%CO)$$

Example.	CO2	=	0	M_d	=	**28.84**
	O2	=	20.9			
	N2	=	79.1			
	CO	=	0.0			

Note: O2, CO2, and CO are estimated

4. **Molecular Weight of Stack Gas, Stack Conditions, (M_s).**

$$(M_d \times B_{wd}) + (18.0 \times B_{ws})$$

Example.	M_d	=	28.84	M_s	=	**28.62**
	B_{wd}	=	0.980			
	B_{ws}	=	0.020			

5. **Specific Gravity of Gas, Relative to Air, (G_s)**

$$M_S / 28.99$$

Example.	M_s	=	28.62	G_s	=	**0.987**

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AASI USEPA Method 5D Single-Inlet 60 Point Template - Rev 2, 042508

Example Calculations, Pre-Test Flow

Facility	**Gerdau Ameristeel US, Inc.**	**Source**	**Baghouse Number 1**
Location	**Jackson, TN**	**Date**	**07/10/13**

6. **Velocity of Stack Gas, as feet per minute, (v_s).**

$$= (K_p \times C_p \times (\Delta p_{avg})^{.5} \times (T_{s(abs)} / (P_s \times M_s)^{.5} \times 60$$

Example.	C_p	=	0.84	v_s	=	**2827.9**	**FPM**
	$(\Delta p_{avg})^{.5}$	=	0.8059				
	$T_{s(abs)}$	=	557.9				
	P_s	=	29.39				
	M_s	=	28.62				
	K_p	=	85.49				

7. **Actual Stack Gas Flow Rate (Q_s).**

$$= A \times v_s$$

Example.	v_s	=	2827.9	Q_s	=	**347033**	**ACFM**
	A	=	122.72				

8. **Actual Stack Gas Flow Rate, Dry (Q_d)**

$$= Q_s \times B_{wd}$$

Example.	Q_s	=	347033	Q_d	=	**340093**	**ACFMD**
	B_{wd}	=	0.980				

9. **Stack Gas Flow Rate, Standard Temperature and Pressure, Dry, ($Q_{d(std)}$)**

$$= Q_d \times ((T_{std} \times P_s) / (P_{std} \times T_{s(abs)}))$$

Example	Q_d	=	340093	$Q_{d(std)}$	=	**316204**	**SCFMD**
	P_s	=	29.39				
	T_s	=	557.9				
	P_{std}	=	29.92				
	T_{std}	=	528				

10. **Stack Gas Flow Rate, Standard Temperature and Pressure ($Q_{s(std)}$)**

$$= Q_{d(std)} / B_{wd}$$

	$Q_{d(std)}$	=	316204	$Q_{s(std)}$	=	**322657**	**SCFMW**
	B_{wd}	=	0.980				

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AASI USEPA Method 5D Single-Inlet 60 Point Template - Rev 2, 042508

Example Calculations, Pre-Test Flow

Facility	Gerdau Ameristeel US, Inc.	**Source**	Baghouse Number 1
Location	Jackson, TN	**Date**	07/10/13

Constants

K_p	=	85.49 Velocity equation constant	P_{std}	=	29.92 inches Hg
T_{std}	=	528 °R	p_W	=	0.9982 g/ml

Variables

A	=	Stack Area (ft^2)	Q_s	=	Actual Stack Gas Flow Rate, ACFM
A_n	=	Nozzle Area (ft^2)	Q_d	=	Actual Stack Gas Flow Rate, ACFMD
B_{ws}	=	Moisture in stack gas, volume fraction	$Q_{s(std)}$	=	Stack Gas Flow Rate Wet, SCFMW
B_{wd}	=	Dry Stack Gas, volume fraction	$Q_{d(std)}$	=	Stack Gas Flow Rate, SCFMD
C_p	=	Pitot Correction Factor	$T_{s(abs)}$	=	Stack Temp (degrees R)
M_d	=	Molecular Weight of Stack Gas (Dry Basis)	T_m	=	Meter Temp (degrees R)
M_s	=	Molecular Weight of Stack Gas (Stack conditions)	v_s	=	Average Stack Velocity, FPM
n	=	Number of Points	Y	=	Meter Correction
P_{bar}	=	Barometric Pressure (inches Hg)	ΔH_{avg}	=	Delta H (inches H_2O)
P_g	=	Static Pressure	Δp_{avg}	=	Avg of SQRT of V.H.
P_s	=	Stack Pressure (inches Hg)	Θ	=	Total Time (minutes)

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EXAMPLE CALCULATION for Orifice Setting for Method 5D

Calculation of Baghouse Exhaust Velocity

EPA Method 5D (section 8.3) states that velocity through a positive pressure baghouse can be determined by measuring the gas flow rate at the inlet to the baghouse:

$$Q_o = Q_i$$

Where: $Q_{i\,=}$ Inlet Gas Volumetric Flow Rate (SCFMD)
$Q_{o\,=}$ Outlet Gas Volumetric Flow Rate (SCFMD)

For Run 1 of the Method 5D Test:

Qi = Qo = 316204 (based on estimates for moisture and molecular weight)

This equation can be substituted into equation 2-8 of EPA Method 2 to obtain the outlet stack velocity. This equation, solved for outlet baghouse velocity, is presented below:

$$v_s = Q_i/(60 \times (1-B_{ws}) \times A_o) \times ((T_s \times P_{std})/(T_{std} \times P_s))$$

Where: v_s = Outlet Stack Velocity (ft/sec)
B_{ws} = Moisture Fraction
A_o = Outlet Baghouse Area (ft^2)
T_s = Outlet Baghouse Temperature (^oR)
P_s = Outlet Baghouse Pressure (in. Hg) = $P_{bar} + (P_{static}/13.6)$
P_{std} = Standard Pressure (29.92 in. Hg)
T_{std} = Standard Temperature (528 ^oR)

For Run 1 of the 5D Test:

B_{ws} = 0.02 (estimated)
A_o = 1020.0
T_s = 554.9
P_{bar} = 29.50
P_{static} = 0.05
P_s = 29.50

	Q_i	T_s	P_{std}		
v_s =	316203.6631	555	29.92		
	60	0.98	1020	528	29.50
		$(1-B_{ws})$	A_o	T_{std}	P_s

v_s = 5.62

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Calculation of the Theoretical Pitot Differential Pressure

EPA Method 2, equation 2-7 gives the equation relating stack gas velocity to the velocity head measured with a pitot tube. This equation, solved for the velocity head, is presented below:

$$Dp = [v_s/(Kp \times Cp)]2 \times P_s \times M_s / T_s$$

Where:	Dp =	Theoretical Velocity Head of outlet stack gas (in. H_2O)
	v_s =	Outlet Stack Velocity (ft/sec)
	Kp =	Velocity Equation Constant (85.49 for English Units)
	Cp =	Pitot Tube Coefficient (0.84 for type s pitots)
	P_s =	Outlet Baghouse Pressure (in. Hg)
	M_s =	Outlet Stack Gas Molecular Weight ($M_s = [M_d \times (1-B_{ws})] + (18 \times B_{ws})$)
	M_d =	Dry Stack Gas Molecular Weight
	B_{ws} =	Stack Gas Moisture Fraction
	T_s =	Outlet Baghouse Temperature (^oR)

For Run 1 of the 5D Test:

v_s =	5.62	
P_s =	29.50	
M_d =	28.90	(estimated)
B_{ws} =	0.02	(estimated)
M_s =	28.68	(estimated)
T_s =	554.9	

	v_s^2	P_s	M_s
Dp =	31.57	29.50	28.68
	7308.5401	0.7056	555
	Kp^2	Cp^2	T_s

Dp = 9.34E-03

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Calculation of the meter box setting from a nomograph factor

Ambient Air Services uses the following equation to determine meter box settings that correspond to isokinetic sampling rates:

$$S = Dp \times F$$

Where: S = Meter Box Setting
Dp = Velocity Head of outlet stack gas (in. H_2O)
F = Nomograph Factor

The nomograph factor is obtained through the following equation:

$$F = 1570 \times a \times c / b$$

a, b, and c are defined as the following:

$$a = (D_n^2 \times FDA)^2$$

Where: Dn = Nozzle Diameter (in.)
FDA = Fraction Dry Air (1 - Moisture Fraction)

$$b = (1.6 + FDA) \times Ts$$

Where: Ts = Outlet Baghouse Temperature (^oR)

$$c = Tm \times dHa$$

Where: Tm = Meter Box Temperature (^oR)
DHa = Meter Orifice Setting that corresponds to 0.75 scfm

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For Run 1 of the 5D Test:

D_n =	0.641	
FDA =	0.98	(estimated)
T_s =	554.9	
T_m =	570	(estimated)
DHa =	2.279	

a = D_n^2 FDA squared
0.410881 0.98

a = 0.16

b = (1.6 + FDA) T_s
2.58 555

b = 1431.64

c = Tm dHa
570 2.279

c = 1299.03

F = a c
1570 / 0.162137798 1299.03
1431.642
b

F = 230.98

S = Dp F
0.00933669 230.9769658

S = 2.16

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Volumetric Flow Calculations Worksheet

Data Request Entry Area	Inlet #1 - Flow Run 1
Facility	Gerdau Ameristeel US, Inc.
Location	Jackson, TN
Source	Baghouse Number 1
Date	07/10/13
Run Number	1
Start Time	6:33
Finish Time	6:40
Weather	Partly Cloudy
Total Time (min)	8.0
Number of Points	16
Barometric Pressure	29.51
Static Pressure ("H20)	-1.60
Stack Diameter (inches)	150.00
Pitot Factor	0.84
Moisture Fraction (estimated)	0.020
CO2 (estimated)	0.0
O2 (estimated)	20.9
CO (estimated)	0.0
N2 (estimated)	79.1

Field Data Points - Inlet #1 - Flow Run 1

Port	Trav. Pt.	Velocity Head (in H2O)	Stack Temp (^{o}F)	Square Root Velocity Head
1	**1**	0.24	98	0.490
	2	0.27	98	0.520
	3	0.32	97	0.566
	4	0.42	97	0.648
	5	1.10	98	1.049
	6	1.20	98	1.095
	7	1.30	98	1.140
	8	0.84	98	0.917
2	**1**	0.80	98	0.894
	2	0.82	98	0.906
	3	0.64	98	0.800
	4	0.64	98	0.800
	5	0.64	98	0.800
	6	0.62	98	0.787
	7	0.54	98	0.735
	8	0.56	98	0.748

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Inlet #1 - Flow Summary Run 1

Facility	Gerdau Ameristeel US, Inc.	**Source**	Baghouse Number 1
Location	Jackson, TN	**Run Date**	7/10/2013
Start Time	6:33	**Weather**	Partly Cloudy
Finish Time	6:40	**(Θ) Total Time (minutes)**	8
(P_{bar}) Barometric Pressure	29.51	**CO2 %**	0.0
(D) Diameter (inches)	150.00	**O2 %**	20.9
(A) Stack Area (ft^2)	122.718	**CO %**	0.0
(n) Number of Points	16	**N %**	79.1
(Δp_{avg}) Avg of SQRT of V.H.	0.8059	**(P_s)Stack Pressure (in. Hg)**	29.39
(Cp) Pitot Correction Factor	0.84	**($T_{s(abs)}$) Stack Temp (°R)**	557.9

(B_{ws}) Moisture in stack gas, volume fraction	0.020
(B_{wd}) Dry Stack Gas, volume fraction	0.980
(M_d) Molecular Weight of Stack Gas (Dry Basis)	28.84
(M_s) Molecular Weight of Stack Gas (Stack conditions)	28.62
(G_s) Specific gravity of Stack Gas Relative to Air	0.987
(v_s) Average Stack Velocity, FPM	2827.9
(Q_s) Actual Stack Gas Flow Rate, ACFM	347033
(Q_d) Actual Stack Gas Flow Rate, ACFMD	340093
($Q_{d(std)}$) Stack Gas Flow Rate, SCFMD	316204
($Q_{s(std)}$) Stack Gas Flow Rate Wet, SCFMW	322657

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Run 1 Flow Summary

Parameter	BH1
Inlet Used	y
(Cp) Pitot Correction Factor	0.84
(P_s)Stack Pressure (in. Hg)	29.39
($T_{s(abs)}$) Stack Temp (°R)	557.9
(B_{ws}) Moisture in stack gas, volume fraction (estimated)	0.02
(B_{wd}) Dry Stack Gas, volume fraction (estimated)	0.98
(O_2) Oxygen in stack gas, percent volume (estimated)	20.9
(CO_2) Carbon Dioxide in stack gas, percent volume (estimated)	0.0
(M_d) Molecular Weight of Stack Gas (Dry Basis, estimated)	28.84
(M_s) Molecular Weight of Stack Gas (Stack conditions, estimated)	28.62
(v_s) Average Stack Velocity, FPM (estimated)	2827.9
(A) Stack Area (ft^2)	122.72
(Q_s) Actual Stack Gas Flow Rate, ACFM (estimated)	347033
(Q_d) Actual Stack Gas Flow Rate, ACFMD (estimated)	340093
($Q_{d(std)}$) Stack Gas Flow Rate, SCFMD (estimated)	316204
($Q_{s(std)}$) Stack Gas Flow Rate Wet, SCFMW (estimated)	322657

Initial estimates for isokinetic sampling are made for moisture, O_2, and CO_2 content. Inputing these actual values from the PM run will result in a corrected flow rate.

(B_{ws}) Moisture in stack gas, volume fraction (corrected)	0.027
(O_2) Oxygen in stack gas, percent volume (corrected)	20.9
(CO_2) Carbon Dioxide in stack gas, percent volume (corrected)	0
(M_d) Molecular Weight of Stack Gas (Dry Basis, corrected)	28.84
(M_s) Molecular Weight of Stack Gas (Stack conditions, corrected)	28.54
(v_s) Average Stack Velocity, FPM (corrected)	2831.6
($Q_{d(std)}$) Stack Gas Flow Rate, SCFMD (corrected)	314370
($Q_{s(std)}$) Stack Gas Flow Rate Wet, SCFMW (corrected)	323083

($Q_{d(std)}$) Stack Gas Flow Rate, SCFMD (estimated)	316204
($Q_{d(std)}$) Stack Gas Flow Rate, SCFMD (corrected)	314370

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AASI USEPA Method 5D Single-Inlet 60 Point Template - Rev 2, 042508

Derivation of H orifice Setting For Method 5D

Facility	Gerdau Ameristeel US, Inc.
Location	Jackson, TN
Source	Baghouse Number 1
Date	July 10, 2013

Input Variables Run 1

ΔH@	Orifice Pressure Differential (.75 cfm at STP)	2.279
D_n (in)	Nozzle Diameter (in)	0.641
T_m	Average Meter Temperature (^oF, estimated)	110
B_{wo}	Moisture Fraction (by volume) (estimated)	0.02
W	Compartment Width (ft)	12.00
L	Compartment Length (ft)	85.00
n	Number Compartments	1.00
A_o	Outlet Baghouse Area (ft^2)	1020.00
T_i	Outlet Stack Temperature (^oF)	120.30
Cp	Pitot Tube Coefficient	0.84
P_{bar}	Barometric Pressure at box location (in Hg)	29.51
P_s	Outlet Stack Static Pressure (in H_2O, estimated)	0.05
M_m	Dry Stack Gas Molecular Weight (lb/lb-mole, estimated)	28.84
M_i	Molecular Weight of Stack Gas at Stack Conditions (lb/lb-mole, estimated)	28.62

Calculated Variables

T_{ia}	Absolute Stack Temperature (^oR)	580
T_{ma}	Absolute Meter Temperature (^oR, estimated)	570
P_i	Absolute Stack Pressure (in Hg, estimated)	29.51
A	Isokinetic Rate Factor Calculation	0.16
B	Isokinetic Rate Factor Calculation	1497.17
C	Isokinetic Rate Factor Calculation	1299.03
F	Isokinetic Rate Factor	220.87

Calculated Meter Orifice Setting, Run 1

H	**=**	**2.15**

Q_s	Total Outlet SCFMD (estimated)	316204
v_s	Outlet Stack Velocity (fps,estimated)	5.87
A_o	Outlet Stack Area (ft^2)	1020.00
Δp	Outlet Stack Dp (estimated)	9.74E-03

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Volumetric Flow Calculations Worksheet

Data Request Entry Area	PM Run 1	
Facility	Gerdau Ameristeel US, Inc.	
Location	Jackson, TN	
Source	Baghouse Number 1	
Date	07/10/13	
Run Number	1	
Start Time	8:48	
Finish Time	13:31	
Weather	Cloudy	
Total Time (minutes)	273.0	
Number of Points	24	
Barometric Pressure (inches Hg)	29.58	
Static Pressure (inches H_2O)	0.05	
Stack Dimensions (feet) L X W	85.00	12.00
Nozzle Diameter (inches)	0.641	
Meter Y Factor	1.009	
Pitot Factor	0.84	
Final Meter Reading (ft^3)	759.964	
Initial Meter Reading (ft^3)	567.046	
Condensate (ml)	50	
Silica Gel Weight (grams)	58.4	
Carbon Dioxide (%)	0.0	
Oxygen (%)	20.9	
Carbon Monoxide (%)	0.0	
Nitrogen (%)	79.1	
Filter Weight (grams)	0.0022	
Prefilter Weight (grams)	0.0217	

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Field Data Points - PM Run 1 **Gerdau Ameristeel US, Inc.** **Baghouse Number 1**

Port	Traverse Point		Meter Orifice (inches H_2O)	Stack Temperature (^oF)	Meter Inlet Temperature (^oF)	Meter Outlet Temperature (^oF)	
1	1		2.2	120	87	85	
	2		2.2	113	92	86	
	3		2.2	112	100	87	
	4		2.2	109	104	89	
2	1		2.2	111	105	88	
	2		2.2	117	103	91	
	3		2.2	118	106	92	
	4		2.2	127	109	93	
3	1		2.2	118	97	89	
	2		2.2	114	94	87	
	3		2.2	113	97	87	
	4		2.2	118	96	86	
4	1		2.2	123	95	86	
	2		2.2	122	95	85	
	3		2.2	121	98	87	
	4		2.2	118	99	87	
5	1		2.2	117	100	89	
	2		2.2	123	103	91	
	3		2.2	127	101	91	
	4		2.2	125	102	91	
6	1		2.2	121	103	92	
	2		2.2	133	102	92	
	3		2.2	123	103	92	
	4		2.2	125	101	91	
	4		2.2	119	102	91	
	3		2.2	124	104	91	
	2		2.2	131	104	92	
	1		2.2	125	104	92	

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AASI USEPA Method 5D Single-Inlet 60 Point Template - Rev 2, 042508

PM Summary Run 1

Facility	Gerdau Ameristeel US, Inc.	**Source**	Baghouse Number 1
Location	Jackson, TN	**Start Time**	8:48
Source	Baghouse Number 1	**Finish Time**	13:31
Run Date	7/10/2013	**Weather**	Cloudy

(Θ) Total Time (minutes)	273	**Impinger Condensate (g or ml)**	50.0
(P_{bar}) Barometric Pressure (inches Hg)	29.58	**Silica Gel Condensate (g)**	58.4
(L) Stack Length (feet)	85.00	**(V_{lc}) Condensate Volume (ml)**	108.4
(W) Stack Width (feet)	12.00	**Carbon Dioxide (%)**	0.0
(A) Stack Area (ft^2)	1020.000	**Oxygen (%)**	20.9
(A_n) Nozzle Area (ft^2)	0.0022410	**Carbon Monoxide (%)**	0.0
(n) Number of Points	24	**Nitrogen (%)**	79.1
(Y) Meter Correction	1.009	**(V_m) Volume Metered (ft^3)**	192.918
Nozzle Diameter (inches)	0.641	**(ΔH_{avg}) Delta H (inches H_2O)**	2.2000
(Cp) Pitot Correction Factor	0.84	**(P_g) Static Pressure (inches H_2O)**	0.05
Filter Weight (grams)	0.0022	**(P_s)Stack Pressure (inches Hg)**	29.58
(m_s) Prefilter Weight (grams)	0.0217	**($T_{s(abs)}$) Stack Temp (°R)**	580.3
(m_n) Total Particulate (grams)	0.0239	**(T_m) Meter Temp (°R)**	554.8

($V_{w(std)}$) Volume Water Vapor, SCF	5.102
($V_{m(std)}$) Gas Volume Sampled, STPD	184.091
Total Volume, STP	189.193
(B_{ws}) Moisture in stack gas, volume fraction	0.027
(B_{wd}) Dry Stack Gas, volume fraction	0.973
(M_d) Molecular Weight of Stack Gas (Dry Basis)	28.84
(M_s) Molecular Weight of Stack Gas (Stack conditions)	28.54
(G_s) Specific gravity of Stack Gas Relative to Air	0.985
(v_s) Average Stack Velocity, FPM	352.1
(Q_s) Actual Stack Gas Flow Rate, ACFM	359092
(Q_d) Actual Stack Gas Flow Rate, ACFMD	349407
($Q_{d(std)}$) Stack Gas Flow Rate, SCFMD	314370
($Q_{s(std)}$) Stack Gas Flow Rate Wet, SCFMW	323083
(I) Percent Isokinetic	98

Stack Emissions:	**(C_s) Grains per DSCF**	0.0020
	(Em) Pounds per Hour	5.40

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Volumetric Flow Calculations Worksheet

Data Request Entry Area	Inlet #1 - Flow Run 2
Facility	Gerdau Ameristeel US, Inc.
Location	Jackson, TN
Source	Baghouse Number 1
Date	07/10/13
Run Number	2
Start Time	14:01
Finish Time	14:10
Weather	Cloudy
Total Time (min)	9.0
Number of Points	16
Barometric Pressure	29.58
Static Pressure ("H20)	-1.90
Stack Diameter (inches)	150.00
Pitot Factor	0.84
Moisture Fraction (estimated)	0.020
CO2 (estimated)	0.0
O2 (estimated)	20.9
CO (estimated)	0.0
N2 (estimated)	79.1

Field Data Points - Inlet #1 - Flow Run 2

Port	Trav. Pt.	Velocity Head (in H2O)	Stack Temp (^{o}F)	Square Root Velocity Head
1	1	0.28	107	0.529
	2	0.29	107	0.539
	3	0.32	107	0.566
	4	0.41	108	0.640
	5	1.00	109	1.000
	6	1.20	108	1.095
	7	1.20	108	1.095
	8	1.10	107	1.049
2	1	0.54	109	0.735
	2	0.48	108	0.693
	3	0.54	108	0.735
	4	0.55	108	0.742
	5	0.53	114	0.728
	6	0.57	110	0.755
	7	0.68	109	0.825
	8	0.64	109	0.800

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Inlet #1 - Flow Summary Run 2

Facility	Gerdau Ameristeel US, Inc.		**Source**	Baghouse Number 1	
Location	Jackson, TN		**Run Date**	7/10/2013	
Start Time	14:01		**Weather**	Cloudy	
Finish Time	14:10		**(Θ) Total Time (minutes)**	9	
(P_{bar}) Barometric Pressure		29.58	**CO2 %**	0.0	
(D) Diameter (inches)		150.00	**O2 %**	20.9	
(A) Stack Area (ft^2)		122.718	**CO %**	0.0	
(n) Number of Points		16	**N %**	79.1	
(Δp_{avg}) Avg of SQRT of V.H.		0.7828	**(P_s)Stack Pressure (in. Hg)**	29.44	
(Cp) Pitot Correction Factor		0.84	**($T_{s(abs)}$) Stack Temp (°R)**	568.5	

(B_{ws}) Moisture in stack gas, volume fraction	0.020
(B_{wd}) Dry Stack Gas, volume fraction	0.980
(M_d) Molecular Weight of Stack Gas (Dry Basis)	28.84
(M_s) Molecular Weight of Stack Gas (Stack conditions)	28.62
(G_s) Specific gravity of Stack Gas Relative to Air	0.987
(v_s) Average Stack Velocity, FPM	2770.6
(Q_s) Actual Stack Gas Flow Rate, ACFM	340003
(Q_d) Actual Stack Gas Flow Rate, ACFMD	333203
($Q_{d(std)}$) Stack Gas Flow Rate, SCFMD	304504
($Q_{s(std)}$) Stack Gas Flow Rate Wet, SCFMW	310718

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Run 2 Flow Summary

Parameter	BH1
Inlet Used	y
(Cp) Pitot Correction Factor	0.84
(P_s)Stack Pressure (in. Hg)	29.44
($T_{s(abs)}$) Stack Temp (°R)	568.5
(B_{ws}) Moisture in stack gas, volume fraction (estimated)	0.02
(B_{wd}) Dry Stack Gas, volume fraction (estimated)	0.98
(O_2) Oxygen in stack gas, percent volume (estimated)	20.9
(CO_2) Carbon Dioxide in stack gas, percent volume (estimated)	0.0
(M_d) Molecular Weight of Stack Gas (Dry Basis, estimated)	28.84
(M_s) Molecular Weight of Stack Gas (Stack conditions, estimated)	28.62
(v_s) Average Stack Velocity, FPM (estimated)	2770.6
(A) Stack Area (ft^2)	122.72
(Q_s) Actual Stack Gas Flow Rate, ACFM (estimated)	340003
(Q_d) Actual Stack Gas Flow Rate, ACFMD (estimated)	333203
($Q_{d(std)}$) Stack Gas Flow Rate, SCFMD (estimated)	304504
($Q_{s(std)}$) Stack Gas Flow Rate Wet, SCFMW (estimated)	310718

Initial estimates for isokinetic sampling are made for moisture, O_2, and CO_2 content. Inputing these actual values from the PM run will result in a corrected flow rate.

(B_{ws}) Moisture in stack gas, volume fraction (corrected)	0.034
(O_2) Oxygen in stack gas, percent volume (corrected)	20.9
(CO_2) Carbon Dioxide in stack gas, percent volume (corrected)	0
(M_d) Molecular Weight of Stack Gas (Dry Basis, corrected)	28.84
(M_s) Molecular Weight of Stack Gas (Stack conditions, corrected)	28.47
(v_s) Average Stack Velocity, FPM (corrected)	2778.1
($Q_{d(std)}$) Stack Gas Flow Rate, SCFMD (corrected)	300905
($Q_{s(std)}$) Stack Gas Flow Rate Wet, SCFMW (corrected)	311556

($Q_{d(std)}$) Stack Gas Flow Rate, SCFMD (estimated)	304504
($Q_{d(std)}$) Stack Gas Flow Rate, SCFMD (corrected)	300905

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Derivation of H orifice Setting For Method 5D

Facility	Gerdau Ameristeel US, Inc.
Location	Jackson, TN
Source	Baghouse Number 1
Date	July 10, 2013

Input Variables Run 2

ΔH@	Orifice Pressure Differential (.75 cfm at STP)	2.279
D_n (in)	Nozzle Diameter (in)	0.641
T_m	Average Meter Temperature (^oF, estimated)	110
B_{wo}	Moisture Fraction (by volume) (estimated)	0.02
W	Compartment Width (ft)	12.00
L	Compartment Length (ft)	85.00
n	Number Compartments	1.00
A_o	Outlet Baghouse Area (ft^2)	1020.00
T_i	Outlet Stack Temperature (^oF)	125.80
Cp	Pitot Tube Coefficient	0.84
P_{bar}	Barometric Pressure at box location (in Hg)	29.58
P_s	Outlet Stack Static Pressure (in H_2O, estimated)	0.05
M_m	Dry Stack Gas Molecular Weight (lb/lb-mole, estimated)	28.84
M_i	Molecular Weight of Stack Gas at Stack Conditions (lb/lb-mole, estimated)	28.62

Calculated Variables

T_{ia}	Absolute Stack Temperature (^oR)	586
T_{ma}	Absolute Meter Temperature (^oR, estimated)	570
P_i	Absolute Stack Pressure (in Hg, estimated)	29.58
A	Isokinetic Rate Factor Calculation	0.16
B	Isokinetic Rate Factor Calculation	1511.36
C	Isokinetic Rate Factor Calculation	1299.03
F	Isokinetic Rate Factor	218.79

Calculated Meter Orifice Setting, Run 2

H	**=**	**1.99**

Q_s	Total Outlet SCFMD (estimated)	304504
v_s	Outlet Stack Velocity (fps,estimated)	5.70
A_o	Outlet Stack Area (ft^2)	1020.00
Δp	Outlet Stack Dp (estimated)	9.10E-03

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Volumetric Flow Calculations Worksheet

Data Request Entry Area	PM Run 2	
Facility	Gerdau Ameristeel US, Inc.	
Location	Jackson, TN	
Source	Baghouse Number 1	
Date	07/10/13	
Run Number	2	
Start Time	14:41	
Finish Time	20:12	
Weather	Cloudy	
Total Time (minutes)	288.0	
Number of Points	24	
Barometric Pressure (inches Hg)	29.40	
Static Pressure (inches H_2O)	0.05	
Stack Dimensions (feet) L X W	85.00	12.00
Nozzle Diameter (inches)	0.641	
Meter Y Factor	1.009	
Pitot Factor	0.84	
Final Meter Reading (ft^3)	955.822	
Initial Meter Reading (ft^3)	761.765	
Condensate (ml)	95	
Silica Gel Weight (grams)	42.0	
Carbon Dioxide (%)	0.0	
Oxygen (%)	20.9	
Carbon Monoxide (%)	0.0	
Nitrogen (%)	79.1	
Filter Weight (grams)	0.1840	
Prefilter Weight (grams)	0.5503	

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AASI USEPA Method 5D Multi-Inlet 60 Point Template - Rev 2, 042508

Field Data Points - PM Run 2 **Gerdau Ameristeel US, Inc.** **Baghouse Number 1**

Port	Traverse Point		Meter Orifice (inches H_2O)	Stack Temperature (^oF)	Meter Inlet Temperature (^oF)	Meter Outlet Temperature (^oF)	
7	1		2.0	139	90	90	
	2		2.0	125	97	90	
	3		2.0	122	99	91	
	4		2.0	121	101	92	
8	1		2.0	119	102	93	
	2		2.0	117	94	93	
	3		2.0	122	100	94	
	4		2.0	121	100	94	
9	1		2.0	135	101	94	
	2		2.0	123	104	99	
	3		2.0	123	107	101	
	4		2.0	126	110	101	
10	1		2.0	126	105	101	
	2		2.0	128	104	100	
	3		2.0	126	105	102	
	4		2.0	135	106	102	
11	1		2.0	126	104	101	
	2		2.0	129	105	100	
	3		2.0	122	102	100	
	4		2.0	121	112	104	
12	1		2.0	130	107	101	
	2		2.0	127	104	98	
	3		2.0	128	104	97	
	4		2.0	129	106	97	
	4		2.0	129	108	98	
	3		2.0	127	107	96	
	2		2.0	123	108	96	
	1		2.0	125	106	95	
11	1		2.0	123	99	91	

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AASI USEPA Method 5D Multi-Inlet 60 Point Template - Rev 2, 042508

PM Summary Run 2

Facility	Gerdau Ameristeel US, Inc.	**Source**	Baghouse Number 1
Location	Jackson, TN	**Start Time**	14:41
Source	Baghouse Number 1	**Finish Time**	20:12
Run Date	7/10/2013	**Weather**	Cloudy

(Θ) Total Time (minutes)	288	**Impinger Condensate (g or ml)**	95.0
(P_{bar}) Barometric Pressure (inches Hg)	29.4	**Silica Gel Condensate (g)**	42.0
(L) Stack Length (feet)	85.00	**(V_{lc}) Condensate Volume (ml)**	137.0
(W) Stack Width (feet)	12.00	**Carbon Dioxide (%)**	0.0
(A) Stack Area (ft^2)	1020.000	**Oxygen (%)**	20.9
(A_n) Nozzle Area (ft^2)	0.0022410	**Carbon Monoxide (%)**	0.0
(n) Number of Points	24	**Nitrogen (%)**	79.1
(Y) Meter Correction	1.009	**(V_m) Volume Metered (ft^3)**	194.057
Nozzle Diameter (inches)	0.641	**(ΔH_{avg}) Delta H (inches H_2O)**	2.0000
(Cp) Pitot Correction Factor	0.84	**(P_g) Static Pressure (inches H_2O)**	0.05
Filter Weight (grams)	0.1840	**(P_s)Stack Pressure (inches Hg)**	29.40
(m_s) Prefilter Weight (grams)	0.5503	**($T_{s(abs)}$) Stack Temp (°R)**	585.8
(m_n) Total Particulate (grams)	0.7343	**(T_m) Meter Temp (°R)**	560.1

($V_{w(std)}$) Volume Water Vapor, SCF	6.449
($V_{m(std)}$) Gas Volume Sampled, STPD	182.196
Total Volume, STP	188.644
(B_{ws}) Moisture in stack gas, volume fraction	0.034
(B_{wd}) Dry Stack Gas, volume fraction	0.966
(M_d) Molecular Weight of Stack Gas (Dry Basis)	28.84
(M_s) Molecular Weight of Stack Gas (Stack conditions)	28.47
(G_s) Specific gravity of Stack Gas Relative to Air	0.982
(v_s) Average Stack Velocity, FPM	344.8
(Q_s) Actual Stack Gas Flow Rate, ACFM	351706
(Q_d) Actual Stack Gas Flow Rate, ACFMD	339684
($Q_{d(std)}$) Stack Gas Flow Rate, SCFMD	300905
($Q_{s(std)}$) Stack Gas Flow Rate Wet, SCFMW	311556
(I) Percent Isokinetic	96

Stack Emissions:	**(C_s) Grains per DSCF**	0.0622
	(Em) Pounds per Hour	160.39

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AASI USEPA Method 5D Multi-Inlet 60 Point Template - Rev 2, 042508

Volumetric Flow Calculations Worksheet

Data Request Entry Area	Inlet #1 - Flow Run 3
Facility	Gerdau Ameristeel US, Inc.
Location	Jackson, TN
Source	Baghouse Number 1
Date	07/11/13
Run Number	3
Start Time	8:01
Finish Time	8:10
Weather	Clear
Total Time (min)	9.0
Number of Points	16
Barometric Pressure	29.52
Static Pressure ("H20)	-1.80
Stack Diameter (inches)	150.00
Pitot Factor	0.84
Moisture Fraction (estimated)	0.020
CO2 (estimated)	0.0
O2 (estimated)	20.9
CO (estimated)	0.0
N2 (estimated)	79.1

Field Data Points - Inlet #1 - Flow Run 3

Port	Trav. Pt.	Velocity Head (in H2O)	Stack Temp (^{o}F)	Square Root Velocity Head
1	1	0.29	100	0.539
	2	0.29	100	0.539
	3	0.34	99	0.583
	4	0.42	100	0.648
	5	1.10	102	1.049
	6	1.20	101	1.095
	7	1.30	101	1.140
	8	1.20	101	1.095
2	1	0.58	101	0.762
	2	0.50	102	0.707
	3	0.51	103	0.714
	4	0.46	103	0.678
	5	0.58	105	0.762
	6	0.56	105	0.748
	7	0.72	108	0.849
	8	0.64	108	0.800

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AASI USEPA Method 5D Multi-Inlet 60 Point Template - Rev 2, 042508

Inlet #1 - Flow Summary Run 3

Facility	Gerdau Ameristeel US, Inc.		**Source**	Baghouse Number 1	
Location	Jackson, TN		**Run Date**	7/11/2013	
Start Time	8:01		**Weather**	Clear	
Finish Time	8:10		**(Θ) Total Time (minutes)**	9	
(P_{bar}) Barometric Pressure		29.52	**CO2 %**	0.0	
(D) Diameter (inches)		150.00	**O2 %**	20.9	
(A) Stack Area (ft^2)		122.718	**CO %**	0.0	
(n) Number of Points		16	**N %**	79.1	
(Δp_{avg}) Avg of SQRT of V.H.		0.7942	**(P_s)Stack Pressure (in. Hg)**	29.39	
(Cp) Pitot Correction Factor		0.84	**($T_{s(abs)}$) Stack Temp (°R)**	562.4	

(B_{ws}) Moisture in stack gas, volume fraction	0.020
(B_{wd}) Dry Stack Gas, volume fraction	0.980
(M_d) Molecular Weight of Stack Gas (Dry Basis)	28.84
(M_s) Molecular Weight of Stack Gas (Stack conditions)	28.62
(G_s) Specific gravity of Stack Gas Relative to Air	0.987
(v_s) Average Stack Velocity, FPM	2798.4
(Q_s) Actual Stack Gas Flow Rate, ACFM	343419
(Q_d) Actual Stack Gas Flow Rate, ACFMD	336550
($Q_{d(std)}$) Stack Gas Flow Rate, SCFMD	310322
($Q_{s(std)}$) Stack Gas Flow Rate Wet, SCFMW	316655

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Run 3 Flow Summary

Parameter	BH1
Inlet Used	y
(Cp) Pitot Correction Factor	0.84
(P_s)Stack Pressure (in. Hg)	29.39
($T_{s(abs)}$) Stack Temp (°R)	562.4
(B_{ws}) Moisture in stack gas, volume fraction (estimated)	0.02
(B_{wd}) Dry Stack Gas, volume fraction (estimated)	0.98
(O_2) Oxygen in stack gas, percent volume (estimated)	20.9
(CO_2) Carbon Dioxide in stack gas, percent volume (estimated)	0.0
(M_d) Molecular Weight of Stack Gas (Dry Basis, estimated)	28.84
(M_s) Molecular Weight of Stack Gas (Stack conditions, estimated)	28.62
(v_s) Average Stack Velocity, FPM (estimated)	2798.4
(A) Stack Area (ft^2)	122.72
(Q_s) Actual Stack Gas Flow Rate, ACFM (estimated)	343419
(Q_d) Actual Stack Gas Flow Rate, ACFMD (estimated)	336550
($Q_{d(std)}$) Stack Gas Flow Rate, SCFMD (estimated)	310322
($Q_{s(std)}$) Stack Gas Flow Rate Wet, SCFMW (estimated)	316655

Initial estimates for isokinetic sampling are made for moisture, O_2, and CO_2 content. Inputing these actual values from the PM run will result in a corrected flow rate.

(B_{ws}) Moisture in stack gas, volume fraction (corrected)	0.031
(O_2) Oxygen in stack gas, percent volume (corrected)	20.9
(CO_2) Carbon Dioxide in stack gas, percent volume (corrected)	0
(M_d) Molecular Weight of Stack Gas (Dry Basis, corrected)	28.84
(M_s) Molecular Weight of Stack Gas (Stack conditions, corrected)	28.51
(v_s) Average Stack Velocity, FPM (corrected)	2804.0
($Q_{d(std)}$) Stack Gas Flow Rate, SCFMD (corrected)	307600
($Q_{s(std)}$) Stack Gas Flow Rate Wet, SCFMW (corrected)	317289

($Q_{d(std)}$) Stack Gas Flow Rate, SCFMD (estimated)	310322
($Q_{d(std)}$) Stack Gas Flow Rate, SCFMD (corrected)	307600

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AASI USEPA Method 5D Multi-Inlet 60 Point Template - Rev 2, 042508

Derivation of H orifice Setting For Method 5D

Facility	Gerdau Ameristeel US, Inc.
Location	Jackson, TN
Source	Baghouse Number 1
Date	July 11, 2013

Input Variables Run 3

ΔH@	Orifice Pressure Differential (.75 cfm at STP)	2.279
D_n (in)	Nozzle Diameter (in)	0.641
T_m	Average Meter Temperature (^oF, estimated)	105
B_{wo}	Moisture Fraction (by volume) (estimated)	0.02
W	Compartment Width (ft)	12.00
L	Compartment Length (ft)	85.00
n	Number Compartments	1.00
A_o	Outlet Baghouse Area (ft^2)	1020.00
T_i	Outlet Stack Temperature (^oF)	126.0
Cp	Pitot Tube Coefficient	0.84
P_{bar}	Barometric Pressure at box location (in Hg)	29.52
P_s	Outlet Stack Static Pressure (in H_2O, estimated)	0.05
M_m	Dry Stack Gas Molecular Weight (lb/lb-mole, estimated)	28.84
M_i	Molecular Weight of Stack Gas at Stack Conditions (lb/lb-mole, estimated)	28.62

Calculated Variables

T_{ia}	Absolute Stack Temperature (^oR)	586
T_{ma}	Absolute Meter Temperature (^oR, estimated)	565
P_i	Absolute Stack Pressure (in Hg, estimated)	29.52
A	Isokinetic Rate Factor Calculation	0.16
B	Isokinetic Rate Factor Calculation	1511.88
C	Isokinetic Rate Factor Calculation	1287.64
F	Isokinetic Rate Factor	216.80

Calculated Meter Orifice Setting, Run 3

H	**=**	**2.05**

Q_s	Total Outlet SCFMD (estimated)	310322
v_s	Outlet Stack Velocity (fps,estimated)	5.82
A_o	Outlet Stack Area (ft^2)	1020.00
Δp	Outlet Stack Dp (estimated)	9.47E-03

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AASI USEPA Method 5D Multi-Inlet 60 Point Template - Rev 2, 042508

Volumetric Flow Calculations Worksheet

Data Request Entry Area	PM Run 3	
Facility	Gerdau Ameristeel US, Inc.	
Location	Jackson, TN	
Source	Baghouse Number 1	
Date	07/11/13	
Run Number	1	
Start Time	8:29	
Finish Time	13:32	
Weather	Cloudy	
Total Time (minutes)	284.0	
Number of Points	24	
Barometric Pressure (inches Hg)	29.52	
Static Pressure (inches H_2O)	0.05	
Stack Dimensions (feet) L X W	85.00	12.00
Nozzle Diameter (inches)	0.641	
Meter Y Factor	1.009	
Pitot Factor	0.84	
Final Meter Reading (ft^3)	1154.469	
Initial Meter Reading (ft^3)	956.303	
Condensate (ml)	83	
Silica Gel Weight (grams)	42.3	
Carbon Dioxide (%)	0.0	
Oxygen (%)	20.9	
Carbon Monoxide (%)	0.0	
Nitrogen (%)	79.1	
Filter Weight (grams)	0.0106	
Prefilter Weight (grams)	0.0117	

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Field Data Points - PM Run 3 **Gerdau Ameristeel US, Inc.** **Baghouse Number 1**

Port	Traverse Point		Meter Orifice (inches H_2O)	Stack Temperature (^oF)	Meter Inlet Temperature (^oF)	Meter Outlet Temperature (^oF)	
13	1		2.0	126	91	87	
	2		2.1	126	95	89	
	3		2.1	124	101	91	
	4		2.1	120	100	91	
14	1		2.1	121	101	91	
	2		2.1	126	100	91	
	3		2.1	118	103	92	
	4		2.1	121	104	92	
15	1		2.1	129	103	92	
	2		2.1	131	104	93	
	3		2.1	124	104	94	
	4		2.1	123	104	94	
16	1		2.1	118	105	94	
	2		2.1	122	101	93	
	3		2.1	123	103	93	
	4		2.1	129	104	93	
17	1		2.1	124	106	94	
	2		2.1	126	107	95	
	3		2.1	130	109	97	
	4		2.1	124	110	96	
18	1		2.1	122	111	99	
	2		2.1	126	107	98	
	3		2.1	137	107	96	
	4		2.1	128	105	96	
	4		2.1	133	107	95	
	3		2.1	126	107	96	
	2		2.1	126	108	96	
	1		2.1	139	106	96	
17	1		2.1	132	107	96	

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PM Summary Run 3

Facility	Gerdau Ameristeel US, Inc.	**Source**	Baghouse Number 1
Location	Jackson, TN	**Start Time**	8:29
Source	Baghouse Number 1	**Finish Time**	13:32
Run Date	7/11/2013	**Weather**	Cloudy

(Θ) Total Time (minutes)	284	**Impinger Condensate (g or ml)**	83.0
(P_{bar}) Barometric Pressure (inches Hg)	29.52	**Silica Gel Condensate (g)**	42.3
(L) Stack Length (feet)	85.00	**(V_{lc}) Condensate Volume (ml)**	125.3
(W) Stack Width (feet)	12.00	**Carbon Dioxide (%)**	0.0
(A) Stack Area (ft^2)	1020.000	**Oxygen (%)**	20.9
(A_n) Nozzle Area (ft^2)	0.0022410	**Carbon Monoxide (%)**	0.0
(n) Number of Points	24	**Nitrogen (%)**	79.1
(Y) Meter Correction	1.009	**(V_m) Volume Metered (ft^3)**	198.166
Nozzle Diameter (inches)	0.641	**(ΔH_{avg}) Delta H (inches H_2O)**	2.0966
(Cp) Pitot Correction Factor	0.84	**(P_g) Static Pressure (inches H_2O)**	0.05
Filter Weight (grams)	0.0106	**(P_s)Stack Pressure (inches Hg)**	29.52
(m_s) Prefilter Weight (grams)	0.0117	**($T_{s(abs)}$) Stack Temp (°R)**	586.0
(m_n) Total Particulate (grams)	0.0223	**(T_m) Meter Temp (°R)**	559.0

($V_{w(std)}$) Volume Water Vapor, SCF	5.898
($V_{m(std)}$) Gas Volume Sampled, STPD	187.246
Total Volume, STP	193.144
(B_{ws}) Moisture in stack gas, volume fraction	0.031
(B_{wd}) Dry Stack Gas, volume fraction	0.969
(M_d) Molecular Weight of Stack Gas (Dry Basis)	28.84
(M_s) Molecular Weight of Stack Gas (Stack conditions)	28.51
(G_s) Specific gravity of Stack Gas Relative to Air	0.983
(v_s) Average Stack Velocity, FPM	349.9
(Q_s) Actual Stack Gas Flow Rate, ACFM	356870
(Q_d) Actual Stack Gas Flow Rate, ACFMD	345972
($Q_{d(std)}$) Stack Gas Flow Rate, SCFMD	307600
($Q_{s(std)}$) Stack Gas Flow Rate Wet, SCFMW	317289
(I) Percent Isokinetic	98
Stack Emissions: — **(C_s) Grains per DSCF**	0.0018
Stack Emissions: — **(Em) Pounds per Hour**	4.85

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AASI USEPA Method 5D Single-Inlet 60 Point Template - Rev 2, 042508

Volumetric Flow Calculations Worksheet

Data Request Entry Area	Inlet #1 - Flow Run 4
Facility	Gerdau Ameristeel US, Inc.
Location	Jackson, TN
Source	Baghouse Number 1
Date	07/11/13
Run Number	4
Start Time	15:50
Finish Time	16:03
Weather	Cloudy
Total Time (min)	13.0
Number of Points	16
Barometric Pressure	29.54
Static Pressure ("H20)	-1.70
Stack Diameter (inches)	150.00
Pitot Factor	0.84
Moisture Fraction (estimated)	0.020
CO2 (estimated)	0.0
O2 (estimated)	20.9
CO (estimated)	0.0
N2 (estimated)	79.1

Field Data Points - Inlet #1 - Flow Run 4

Port	Trav. Pt.	Velocity Head (in H2O)	Stack Temp (^{o}F)	Square Root Velocity Head
1	1	0.29	117	0.539
	2	0.30	119	0.548
	3	0.35	123	0.592
	4	0.42	119	0.648
	5	1.10	117	1.049
	6	1.20	115	1.095
	7	1.20	121	1.095
	8	1.30	117	1.140
2	1	0.53	130	0.728
	2	0.51	121	0.714
	3	0.54	116	0.735
	4	0.56	114	0.748
	5	0.57	113	0.755
	6	0.72	112	0.849
	7	0.60	112	0.775
	8	0.65	113	0.806

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AASI USEPA Method 5D Single-Inlet 60 Point Template - Rev 2, 042508

Inlet #1 - Flow Summary Run 4

Facility	Gerdau Ameristeel US, Inc.		**Source**	Baghouse Number 1	
Location	Jackson, TN		**Run Date**	7/11/2013	
Start Time	15:50		**Weather**	Cloudy	
Finish Time	16:03		**(Θ) Total Time (minutes)**	13	
(P_{bar}) Barometric Pressure		29.54	**CO2 %**	0.0	
(D) Diameter (inches)		150.00	**O2 %**	20.9	
(A) Stack Area (ft^2)		122.718	**CO %**	0.0	
(n) Number of Points		16	**N %**	79.1	
(Δp_{avg}) Avg of SQRT of V.H.		0.8010	**(P_s)Stack Pressure (in. Hg)**	29.42	
(Cp) Pitot Correction Factor		0.84	**($T_{s(abs)}$) Stack Temp (°R)**	577.4	

(B_{ws}) Moisture in stack gas, volume fraction	0.020
(B_{wd}) Dry Stack Gas, volume fraction	0.980
(M_d) Molecular Weight of Stack Gas (Dry Basis)	28.84
(M_s) Molecular Weight of Stack Gas (Stack conditions)	28.62
(G_s) Specific gravity of Stack Gas Relative to Air	0.987
(v_s) Average Stack Velocity, FPM	2858.2
(Q_s) Actual Stack Gas Flow Rate, ACFM	350759
(Q_d) Actual Stack Gas Flow Rate, ACFMD	343744
($Q_{d(std)}$) Stack Gas Flow Rate, SCFMD	309009
($Q_{s(std)}$) Stack Gas Flow Rate Wet, SCFMW	315315

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Run 4 Flow Summary

Parameter	BH1
Inlet Used	y
(Cp) Pitot Correction Factor	0.84
(P_s)Stack Pressure (in. Hg)	29.42
($T_{s(abs)}$) Stack Temp (°R)	577.4
(B_{ws}) Moisture in stack gas, volume fraction (estimated)	0.02
(B_{wd}) Dry Stack Gas, volume fraction (estimated)	0.98
(O_2) Oxygen in stack gas, percent volume (estimated)	20.9
(CO_2) Carbon Dioxide in stack gas, percent volume (estimated)	0.0
(M_d) Molecular Weight of Stack Gas (Dry Basis, estimated)	28.84
(M_s) Molecular Weight of Stack Gas (Stack conditions, estimated)	28.62
(v_s) Average Stack Velocity, FPM (estimated)	2858.2
(A) Stack Area (ft^2)	122.72
(Q_s) Actual Stack Gas Flow Rate, ACFM (estimated)	350759
(Q_d) Actual Stack Gas Flow Rate, ACFMD (estimated)	343744
($Q_{d(std)}$) Stack Gas Flow Rate, SCFMD (estimated)	309009
($Q_{s(std)}$) Stack Gas Flow Rate Wet, SCFMW (estimated)	315315

Initial estimates for isokinetic sampling are made for moisture, O_2, and CO_2 content. Inputing these actual values from the PM run will result in a corrected flow rate.

(B_{ws}) Moisture in stack gas, volume fraction (corrected)	0.026
(O_2) Oxygen in stack gas, percent volume (corrected)	20.9
(CO_2) Carbon Dioxide in stack gas, percent volume (corrected)	0
(M_d) Molecular Weight of Stack Gas (Dry Basis, corrected)	28.84
(M_s) Molecular Weight of Stack Gas (Stack conditions, corrected)	28.56
(v_s) Average Stack Velocity, FPM (corrected)	2861.4
($Q_{d(std)}$) Stack Gas Flow Rate, SCFMD (corrected)	307518
($Q_{s(std)}$) Stack Gas Flow Rate Wet, SCFMW (corrected)	315662

($Q_{d(std)}$) Stack Gas Flow Rate, SCFMD (estimated)	309009
($Q_{d(std)}$) Stack Gas Flow Rate, SCFMD (corrected)	307518

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AASI USEPA Method 5D Single-Inlet 60 Point Template - Rev 2, 042508

Derivation of H orifice Setting For Method 5D

Facility	Gerdau Ameristeel US, Inc.
Location	Jackson, TN
Source	Baghouse Number 1
Date	July 11, 2013

Input Variables Run 4

ΔH@	Orifice Pressure Differential (.75 cfm at STP)	2.279
D_n (in)	Nozzle Diameter (in)	0.641
T_m	Average Meter Temperature (^oF, estimated)	110
B_{wo}	Moisture Fraction (by volume) (estimated)	0.02
W	Compartment Width (ft)	12.00
L	Compartment Length (ft)	85.00
n	Number Compartments	1.00
A_o	Outlet Baghouse Area (ft^2)	1020.00
T_i	Outlet Stack Temperature (^oF)	125.00
Cp	Pitot Tube Coefficient	0.84
P_{bar}	Barometric Pressure at box location (in Hg)	29.54
P_s	Outlet Stack Static Pressure (in H_2O, estimated)	0.05
M_m	Dry Stack Gas Molecular Weight (lb/lb-mole, estimated)	28.84
M_i	Molecular Weight of Stack Gas at Stack Conditions (lb/lb-mole, estimated)	28.62

Calculated Variables

T_{ia}	Absolute Stack Temperature (^oR)	585
T_{ma}	Absolute Meter Temperature (^oR, estimated)	570
P_i	Absolute Stack Pressure (in Hg, estimated)	29.54
A	Isokinetic Rate Factor Calculation	0.16
B	Isokinetic Rate Factor Calculation	1509.30
C	Isokinetic Rate Factor Calculation	1299.03
F	Isokinetic Rate Factor	219.09

Calculated Meter Orifice Setting, Run 4

H	**=**	**2.05**

Q_s	Total Outlet SCFMD (estimated)	309009
v_s	Outlet Stack Velocity (fps,estimated)	5.78
A_o	Outlet Stack Area (ft^2)	1020.00
Δp	Outlet Stack Dp (estimated)	9.37E-03

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AASI USEPA Method 5D Single-Inlet 60 Point Template - Rev 2, 042508

Volumetric Flow Calculations Worksheet

Data Request Entry Area	PM Run 4	
Facility	Gerdau Ameristeel US, Inc.	
Location	Jackson, TN	
Source	Baghouse Number 1	
Date	07/11/13	
Run Number	4	
Start Time	14:40	
Finish Time	19:50	
Weather	Cloudy	
Total Time (minutes)	260.0	
Number of Points	24	
Barometric Pressure (inches Hg)	29.54	
Static Pressure (inches H_2O)	0.05	
Stack Dimensions (feet) L X W	85.00	12.00
Nozzle Diameter (inches)	0.641	
Meter Y Factor	1.009	
Pitot Factor	0.84	
Final Meter Reading (ft^3)	341.100	
Initial Meter Reading (ft^3)	155.025	
Condensate (ml)	60	
Silica Gel Weight (grams)	38.7	
Carbon Dioxide (%)	0.0	
Oxygen (%)	20.9	
Carbon Monoxide (%)	0.0	
Nitrogen (%)	79.1	
Filter Weight (grams)	0.0019	
Prefilter Weight (grams)	0.0031	

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Field Data Points - PM Run 4 **Gerdau Ameristeel US, Inc.** **Baghouse Number 1**

Port	Traverse Point		Meter Orifice (inches H_2O)	Stack Temperature (^oF)	Meter Inlet Temperature (^oF)	Meter Outlet Temperature (^oF)	
7	1		2.1	136	100	99	
	2		2.1	133	105	98	
	3		2.1	133	108	98	
	4		2.1	127	110	99	
8	1		2.1	129	108	100	
	2		2.1	135	110	99	
	3		2.1	132	110	99	
	4		2.1	133	111	99	
9	1		2.1	130	110	100	
	2		2.1	128	110	99	
	3		2.1	124	110	99	
	4		2.1	129	101	98	
10	1		2.1	127	104	97	
	2		2.1	135	106	97	
	3		2.1	128	106	96	
	4		2.1	131	106	95	
11	1		2.1	124	104	95	
	2		2.1	134	105	95	
	3		2.1	118	97	93	
	4		2.1	122	101	92	
12	1		2.1	128	102	93	
	2		2.1	121	103	93	
	3		2.1	121	102	92	
	4		2.1	117	102	92	
	4		2.1	121	101	91	
	3		2.1	124	101	90	

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AASI USEPA Method 5D Single-Inlet 60 Point Template - Rev 2, 042508

PM Summary Run 4

Facility	Gerdau Ameristeel US, Inc.	**Source**	Baghouse Number 1
Location	Jackson, TN	**Start Time**	14:40
Source	Baghouse Number 1	**Finish Time**	19:50
Run Date	7/11/2013	**Weather**	Cloudy

(Θ) Total Time (minutes)	260	**Impinger Condensate (g or ml)**	60.0
(P_{bar}) Barometric Pressure (inches Hg)	29.54	**Silica Gel Condensate (g)**	38.7
(L) Stack Length (feet)	85.00	**(V_{lc}) Condensate Volume (ml)**	98.7
(W) Stack Width (feet)	12.00	**Carbon Dioxide (%)**	0.0
(A) Stack Area (ft^2)	1020.000	**Oxygen (%)**	20.9
(A_n) Nozzle Area (ft^2)	0.0022410	**Carbon Monoxide (%)**	0.0
(n) Number of Points	24	**Nitrogen (%)**	79.1
(Y) Meter Correction	1.009	**(V_m) Volume Metered (ft^3)**	186.075
Nozzle Diameter (inches)	0.641	**(ΔH_{avg}) Delta H (inches H_2O)**	2.1000
(Cp) Pitot Correction Factor	0.84	**(P_g) Static Pressure (inches H_2O)**	0.05
Filter Weight (grams)	0.0019	**(P_s)Stack Pressure (inches Hg)**	29.54
(m_s) Prefilter Weight (grams)	0.0031	**($T_{s(abs)}$) Stack Temp (°R)**	587.7
(m_n) Total Particulate (grams)	0.0050	**(T_m) Meter Temp (°R)**	560.6

($V_{w(std)}$) Volume Water Vapor, SCF	4.646
($V_{m(std)}$) Gas Volume Sampled, STPD	175.429
Total Volume, STP	180.075
(B_{ws}) Moisture in stack gas, volume fraction	0.026
(B_{wd}) Dry Stack Gas, volume fraction	0.974
(M_d) Molecular Weight of Stack Gas (Dry Basis)	28.84
(M_s) Molecular Weight of Stack Gas (Stack conditions)	28.56
(G_s) Specific gravity of Stack Gas Relative to Air	0.985
(v_s) Average Stack Velocity, FPM	348.8
(Q_s) Actual Stack Gas Flow Rate, ACFM	355824
(Q_d) Actual Stack Gas Flow Rate, ACFMD	346644
($Q_{d(std)}$) Stack Gas Flow Rate, SCFMD	307518
($Q_{s(std)}$) Stack Gas Flow Rate Wet, SCFMW	315662
(I) Percent Isokinetic	100

Stack Emissions:	**(C_s) Grains per DSCF**	0.0004
	(Em) Pounds per Hour	1.16

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Velocity Traverse

Plant: Gerdau - Jackson Date: 7/10/13

Source: BH #1 Inlet Magnehelic ID: F78 / R48

Stack Diameter: 150" (7/10/13) Pitot ID 15-1 (7-10-13) Thermocouple ID 15-1 (7/11/13)

Run 1			Run 2			Run 3		
Static Pressure		-1.6	Static Pressure		-1.9	Static Pressure		-1.8
Start	0633		Start	1401		Start	801	
Stop	0640		Stop	1410		Stop	810	
Barometer (in. Hg)		29.51	Barometer (in. Hg)		29.58	Barometer (in. Hg)		29.52
Wet Bulb (WB)		N/A	Wet Bulb (WB)		N/A	Wet Bulb (WB)		N/A
Dry Bulb (DB)		N/A	Dry Bulb (DB)		N/A	Dry Bulb (DB)		N/A
Traverse Point No.	Velocity Head	Stack Temp Deg F	Traverse Point No.	Velocity Head	Stack Temp Deg F	Traverse Point No.	Velocity Head	Stack Temp Deg F
1	.24	98	1	0.38	107	1-1	0.29	100
2	.27	98	2	0.39	107	2	0.29	100
3	.32	97	3	0.32	107	3	0.34	99
4	.42	97	4	0.41	108	4	0.42	100
5	1.1	98	5	1.0	109	5	~~0.98~~ 1.1	102
6	1.2	98	6	1.2	108	6	1.2	101
7	1.3	98	7	1.2	108	7	1.3	101
8	.84	98	8	1.1	107	8	1.2	101
1	.80	98	1	0.54	109	2-1	~~0.48~~ 0.58	101
2	.82	98	2	0.48	108	2	0.50	102
3	.64	98	3	0.54	108	3	0.51	103
4	.64	98	4	0.55	108	4	0.46	103
5	.64	98	5	0.53	114	5	0.58	105
6	.62	98	6	0.57	110	6	0.56	105
7	.54	98	7	0.68	109	7	~~0.60~~ 0.73	108
8	.56	98	8	0.64	109	8	0.64	108

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Velocity Traverse

Plant: Gerdau - Jackson Date: 7/10 - 7/11/13

Source: BH #1 Inlet Magnehelic ID: F78/R48

Stack Diameter: 150" Pitot ID 15-1 Thermocouple ID 15-1

7/11/13

Run 4			Run 2			Run 3		
Static Pressure	-1.7		Static Pressure			Static Pressure		
Start	1550		Start			Start		
Stop	1603		Stop			Stop		
Barometer (in. Hg)	29.54		Barometer (in. Hg)			Barometer (in. Hg)		
Wet Bulb (WB)	N/A		Wet Bulb (WB)			Wet Bulb (WB)		
Dry Bulb (DB)	N/A		Dry Bulb (DB)			Dry Bulb (DB)		
Traverse Point No.	Velocity Head	Stack Temp Deg F	Traverse Point No.	Velocity Head	Stack Temp Deg F	Traverse Point No.	Velocity Head	Stack Temp Deg F
1 - 1	0.29	117						
2	0.30	119						
3	0.35	123						
4	0.42	119						
5	1.1	117						
6	~~1.1~~ 1.2	115						
7	1.2	121						
8	~~1.3~~ 1.3	117						
2 - 1	0.53	130						
2	0.51	121						
3	0.54	116						
4	0.56	114						
5	0.57	113						
6	0.72	112						
7	0.60	112						
8	0.65	113						

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20.9 - 0 29.58

SOURCE SAMPLING FIELD DATA SHEET

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Facility	Gerdau Jackson					**Run No.**	1		
Source	Baghouse #1					**Date**	7/10/13		
Weather	Cloudy					**Filter Number**	5319		
Testers	DO, WG		**Test(s)**	SD, TT		**Barometric Pressure**	29.58		
Equipment Identification	Pitot	10C	Probe	10C	Heater Box	DHB2	Meter Box	11	Cold box	2
Thermocouple Identification	Stack	10C	Impinger	A-12	Heater Box		Meter In	M11-1	Meter Out	M11-2
Sampling	**Total min (Θ)**		273	**Total Points (n)**		24		Min/Pt	10	
Profile	**Stack Diameter (in) (D)**		—	Downstream Dia.		—		Upstream Dia.	—	
Nozzle Diameter (avg) (D_n)	0.641	Nozzle Diameter Calibration Checks		1	0.641	2	0.641	3	0.642	
	Pre T_s	—	Pre T_m	—	Pre Dry Stack Gas (B_{wd})	—	Meter (ΔHa)	2.279	**Meter (Y)**	1.009
	$a = (D_n^2 X B_{wd})^2$		$b = (1.6+B_{wd})T_s$		$c = T_m X \Delta H_a$		$F = 1570(aXc)/b$		**Isokinetic Rate Factor**	
Isokinetic Factor Calculation	—		—		—		—		see Hing	2.2

Start Time	8:48	Final Meter Reading (ft3)	759.964	**Orsat/Fyrite/ Analyzer**	O_2 (%)	20.9	Comments:
Finish Time	1:31	Initial Meter Reading (ft3)	567.046		CO_2 (%)	0	

Pre Test Leak Check	Post Test Leak Check	**Static Pressure**	Pitot Leak Check	**Volume H_2O Collected**	
.012 cfm@15"Hg	.007 cfm@ 5 "H_g	0.05 "H_2O	N/A at 3"	**Silica Gel Weight**	58.4 gr

Port and Sample Point	Clock Time (min)	**Gas Meter Reading (cfm)**	**Stack Velocity (in H_2O)**	**Orifice Pressure Drop (in H_2O)**	Vacuum (in H_g)	**Stack Gas Temp (°F)**	Filter Temp (°F)	**Last Impinger Temp (°F)**	**Meter Temp (°F)**	**Meter Temp (°F)**	
1 - 1	0	567.046	NA	2.2	4	120	235	54	87	85	
2	10	574.0		2.2	4	113	240	48	92	86	
3	20	581.0		2.2	4	112	240	53	100	87	
4	30	588.3		2.2	4	109	250	55	104	89	
2 - 1	40	595.122		2.2	4	111	254	57	105	88	
2	50	602.1		2.2	4	117	249	56	103	91	
3	60	609.2		2.2	4	118	249	56	106	92	
4	70	616.3		2.2	4	127	248	57	109	93	
3 - 1	80	623.412		2.2	4	118	250	59	97	89	
2	90	630.4		2.2	4	114	251	57	94	87	
3	100	637.4		2.2	4	113	253	57	97	87	
4	110	644.5		2.2	4	118	253	57	96	86	
4 - 1	120	651.604		2.2	4	123	251	56	95	86	

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Facility	GERDAU JACKSON	Run No.	1
Source	BH #1	Date	7-10-13
Weather	Cloudy	Filter Number	5319
Testers	DO, WG	Test(s)	5D, 12
		Factor	Setting - 2.2

Port and Sample Point	Clock Time (min)	Gas Meter Reading (cfm)	Stack Velocity (in H_2O)	Orifice Pressure Drop (in H_2O)	Vacuum (in H_g)	Stack Gas Temp (°F)	Filter Temp (°F)	Last Impinger Temp (°F)	Meter Temp (°F)	Meter Temp (°F)	
4-2	130	658.6	NA	2.2	4	122	240	55	95	85	
4-3	140	665.6		2.2	4	121	251	55	98	87	
4	150	672.7		2.2	4	118	254	56	99	87	
5-1	160	679.762		2.2	4	117	254	56	100	89	
2	170	686.6		2.2	4	123	251	59	103	91	
3	180	693.6		2.2	4	127	251	61	101	91	
4	190	700.8		2.2	4	125	253	62	102	91	
6-1	200	707.887		2.2	5	121	250	60	103	92	
2	210	714.9		2.2	5	133	249	61	102	92	
3	220	722.1		2.2	5	123	251	59	103	92	
4	230	729.2		2.2	5	125	251	59	101	91	
4	240	736.4	↓	2.2	5	119	252	58	102	91	
3	250	743.5		2.2	5	124	250	59	104	91	
2	260	750.7		2.2	5	131	256	60	104	92	
1	270	757.8		2.2	5	125	252	60	104	92	
	273	759.964									

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Facility	GERDAU JACKSON					Run No.	2				
Source	BH 1					Date	7/10/13				
Weather	Cloudy					Filter Number	5324				
Testers	DO, WG	Test(s)	5D, 12			Barometric Pressure	29.40				
Equipment Identification	Pitot	10C	Probe	10C	Heater Box	DHB2	Meter Box	11	Cold box	2	
Thermocouple Identification	Stack	10C	Impinger	A-12	Heater Box		Meter In	M11-1	Meter Out	M11-2	
Sampling	Total min (Θ)	288	Total Points (n)		24			Min/Pt	10		
Profile	Stack Diameter (in) (D)	—	Downstream Dia.					Upstream Dia.	—		
Nozzle Diameter (avg) (D_n)	0.641	Nozzle Diameter Calibration Checks		1	0.641	2	0.641	3	0.642		
	Pre T_s	—	Pre T_m	—	Pre Dry Stack Gas (B_{wd})	—	Meter (ΔHa)	2.279	Meter (Y)	1.009	
1441	$a = (D_n^2 X B_{wd})^2$		$b = (1.6+B_{wd})T_s$		$c = T_m \times \Delta H_a$		$F = 1570(aXc)/b$		Isokinetic Rate Factor		
Isokinetic Factor Calculation	—		—		—		—		setting 2.0		
Start Time	~~1434~~ 1434 PM	Final Meter Reading (ft3)	955.822	Orsat/Fyrite/ Analyzer		O_2 (%)	20.9	Comments:			
Finish Time	1812	Initial Meter Reading (ft3)	761.765			CO_2 (%)	0.0				
Pre Test Leak Check	Post Test Leak Check	Static Pressure		Pitot Leak Check		Volume H_2O Collected	95 ml				
.015 cfm@15"Hg	.008 cfm@ 4 "H_g	0.05 "H_2O		— at 3"		Silica Gel Weight	42 gr				

Port and Sample Point	Clock Time (min)	Gas Meter Reading (cfm)	Stack Velocity (in H_2O)	Orifice Pressure Drop (in H_2O)	Vacuum (in H_g)	Stack Gas Temp (°F)	Filter Temp (°F)	Last Impinger Temp (°F)	Meter Temp (°F)	Meter Temp (°F)	
7-1	0	~~760.919~~ 761.765 PM		2.0	4	139	250	63	90	90	
2	10	768.4		2.0	4	125	250	47	97	90	
3	20	775.2		2.0	4	122	252	45	99	91	
4	30	781.9		2.0	4	121	253	44	101	92	
8-1	40	788.669		2.0	4	119	251	44	102	93	
2	50	795.2		2.0	4	117	251	42	94	93	48-793.939 1531 STOP
3	60	801.8		2.0	4	122	248	42	100	94	1539 START
4	78	808.6		2.0	4	121	248	42	100	94	
9-1	80	815.2		2.0	4	135	250	43	101	94	
2	90	821.9		2.0	4	123	250	42	104	99	
3	100	828.7		2.0	4	123	251	43	107	101	
4	110	835.5		2.0	4	126	250	43	110	101	
10-1	120	842.362		2.0	4	126	251	43	105	101	

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Facility	GERDAU JACKSON	Run No.	2
Source	RH #1	Date	7-10-13
Weather	Cloudy	Filter Number	5324
Testers	DO, WG	Test(s)	9D, 12	Factor	Setting - 2.0

Port and Sample Point	Clock Time (min)	Gas Meter Reading (cfm)	Stack Velocity (in H_2O)	Orifice Pressure Drop (in H_2O)	Vacuum (in H_g)	Stack Gas Temp (°F)	Filter Temp (°F)	Last Impinger Temp (°F)	Meter Temp (°F)	Meter Temp (°F)	
2	130	849.1		2.0	4	128	251	41	104	100	
3	140	855.9		2.0	4	126	253	42	105	102	
4	150	862.7		2.0	4	135	252	43	106	102	
11-1	160	869.525		2.0	4	126	251	43	104	101	(175) 879.602
2	170	876.2		2.0	4	129	253	44	105	100	1751 STOP 1758 START
3	180	882.9		2.0	4	122	252	42	102	100	
4	190	889.6		2.0	4	121	251	43	112	104	
12-1	200	896.454		2.0	4	130	250	46	107	101	
2	210	903.2		2.0	4	127	250	46	104	98	
3	220	909.9		2.0	4	128	251	47	104	97	
4	230	916.7		2.0	4	129	253	48	106	97	
12-4	240	923.4		2.0	4	129	253	49	108	98	
3	250	930.2		2.0	4	127	253	49	107	96	
2	260	937.0		2.0	4	123	253	50	108	96	271 944.476
1	270	943.8		2.0	4	125	252	50	106	95	1935 STOP 1953 START
11-1	280	950.475		2.0	4	123	250	47	99	91	
~~2~~	288	955.822									

Method 5 Field Data Sheet Rev 3, 031008

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Facility	GERDAU JACKSON					Run No.	3				
Source	BH1					Date	7-11-13				
Weather	Cloudy					Filter Number	5349				
Testers	WG		Test(s)	1-4, 5D		Barometric Pressure	~~29.20~~ 29.52				
Equipment Identification	Pitot	10C	Probe	10C	Heater Box	DHB2	Meter Box	11	Cold box	2	
Thermocouple Identification	Stack	10C	Impinger	A-12	Heater Box	DHB2	Meter In	M11-1	Meter Out	M11-2	
Sampling	Total min (Θ)	240	Total Points (n)	24				Min/Pt	10		
Profile	Stack Diameter (in) (D)	—	Downstream Dia.	—				Upstream Dia.	—		
Nozzle Diameter (avg) (D_n)	0.641	Nozzle Diameter Calibration Checks	1	0.641	2	0.641	3	0.642			
Isokinetic Factor Calculation	Pre T_s	—	Pre T_m	—	Pre Dry Stack Gas (B_{wd})	—	Meter (ΔHa)	2.279	Meter (Y)	1.009	
	$a = (D_n^2 X B_{wd})^2$	—	$b = (1.6+B_{wd})T_s$	—	$c = T_m X \Delta H_a$	—	$F = 1570(aXc)/b$	—	Isokinetic Rate Factor	2.1	
Start Time	829	Final Meter Reading (ft3)	1154.469	Orsat/Fyrite Analyzer		O_2 (%)	20.9	Comments:			
Finish Time	1332	Initial Meter Reading (ft3)	956.303			CO_2 (%)	0.0				
Pre Test Leak Check		Post Test Leak Check		Static Pressure		Pitot Leak Check		Volume H_2O Collected	83	ml	
.015	cfm@15"Hg	.010	cfm@ 4 "H_g	+0.05	"H_2O	—	at 3"	Silica Gel Weight	42.3	gr	

Port and Sample Point	Clock Time (min)	Gas Meter Reading (cfm)	Stack Velocity (in H_2O)	Orifice Pressure Drop (in H_2O)	Vacuum (in H_g)	Stack Gas Temp (°F)	Filter Temp (°F)	Last Impinger Temp (°F)	Meter Temp (°F)	Meter Temp (°F)	
13-1	0	956.303		2.0	4	126	245	48	91	87	
2	10	963.1		2.1	4	126	248	46	95	89	
3	20	970.1		2.1	4	124	249	51	101	91	
4	30	977.1		2.1	4	120	248	51	100	91	
14-1	40	984.097		2.1	4	121	248	49	101	91	
2	50	991.0		2.1	4	126	248	47	100	91	
3	60	998.1		2.1	4	118	248	47	103	92	
4	70	004.8		2.1	4	121	249	48	104	92	
15-1	80	011.784		2.1	4	129	247	49	103	92	
2	90	018.7		2.1	4	131	250	48	104	93	
3	100	025.624		2.1	4	124	249	47	104	94	
4	110	032.5		2.1	4	123	249	46	104	94	
16-1	120	039.473	↓	2.1	4	118	247	46	105	94	

SOURCE SAMPLING FIELD DATA SHEET

AASI
Ambient Air Services, Inc.
Environmental Consulting and Engineering
106 Ambient Airway
Starke, FL 32091
Phone (904) 964-8440
www.ambientairservices.com

Facility	GERDAU JACKSON	Run No.	3
Source	BH 1	Date	7-11-13
Weather	cloudy	Filter Number	5389
Testers	WG	Test(s) 1-4,5D	Factor setting 2.1

Port and Sample Point	Clock Time (min)	Gas Meter Reading (cfm)	Stack Velocity (in H_2O)	Orifice Pressure Drop (in H_2O)	Vacuum (in H_g)	Stack Gas Temp (°F)	Filter Temp (°F)	Last Impinger Temp (°F)	Meter Temp (°F)	Meter Temp (°F)	
2	130	046.4		2.1	4	122	246	46	101	93	
3	140	053.370		2.1	4	123	240	46	103	93	
4	150	060.2		2.1	4	129	242	46	104	93	
17-1	160	067.244		2.1	4	124	242	49	106	94	
2	170	074.1		2.1	4	126	242	48	107	95	
3	180	081.181		2.1	4	130	250	48	109	97	
4	190	088.2		2.1	4	124	248	49	110	96	1912 089.632 1151 STOP
18-1	200	095.222		2.1	4	122	245	51	111	99	1152 START
2	210	102.1		2.1	4	126	245	50	107	98	
3	220	109.072		2.1	4	137	248	50	107	96	
4	230	116.0		2.1	4	128	248	49	105	96	
18-4	240	123.0		2.1	4	133	250	51	107	95	
3	250	129.9		2.1	4	126	249	51	107	96	
2	260	137.003		2.1	4	126	246	52	108	96	
1	270	143.9		2.1	4	139	249	53	106	96	
17-1	280	151.012		2.1	4	132	249	54	107	96	
	284	154.469									

Method 5 Field Data Sheet Rev 3, 031008

Richard

SOURCE SAMPLING FIELD DATA SHEET

AASI Ambient Air Services, Inc
Environmental Consulting and Engineering
106 Ambient Airway
Starke, FL 32091
Phone (904) 964-8440
www.ambientairservices.com

Facility	Gerdau - Jackson					Run No.	4				
Source	BH #1					Date	7/11/13				
Weather	Cloudy					Filter Number	53x5				
Testers	JJ, RD	Test(s)	5D, 12			Barometric Pressure	29.54				
Equipment Identification	Pitot	10C	Probe	10C	Heater Box	DHB2	Meter Box	11	Cold box	2	
Thermocouple Identification	Stack	10C	Impinger	A-12	Heater Box	DHB2	Meter In	M11-1	Meter Out	M11-2	
Sampling	Total min (Θ)	240	Total Points (n)	24					Min/Pt	10	
Profile	Stack Diameter (in) (D)	—	Downstream Dia.						Upstream Dia.	—	
Nozzle Diameter (avg) (D_n)	0.641	Nozzle Diameter Calibration Checks		1	0.641	2	0.641	3	0.641		
Isokinetic Factor Calculation	Pre T_s	—	Pre T_m	—	Pre Dry Stack Gas (B_{wd})	—	Meter (ΔHa)	2.279	Meter (Y)	1.009	
	$a = (D_n^2 X B_{wd})^2$		$b = (1.6+B_{wd})T_s$		$c = T_m X \Delta H_a$		$F = 1570(aXc)/b$		Isokinetic Rate Factor		
	—		—		—		—		2.1		

Start Time	1440	Final Meter Reading (ft3)	341.100	Orsat/Fyrite/Analyzer	O_2 (%)	20.9	Comments:	
Finish Time	1950	Initial Meter Reading (ft3)	~~150.015~~ 155.025		CO_2 (%)	0		

Pre Test Leak Check	Post Test Leak Check	Static Pressure	Pitot Leak Check	Volume H_2O Collected	
0.010 cfm@15"Hg	0.005 cfm@ 5 "H_g	+0.05 "H_2O	N/A at 3"	Silica Gel Weight	38.7 gr

Port and Sample Point	Clock Time (min)	Gas Meter Reading (cfm)	Stack Velocity (in H_2O)	Orifice Pressure Drop (in H_2O)	Vacuum (in H_g)	Stack Gas Temp (°F)	Filter Temp (°F)	Last Impinger Temp (°F)	Meter Temp (°F)	Meter Temp (°F)	
7-1	0	155.025		~~2.1~~	4	136	~~251~~ 241	55	100	99	
2	10	161.9		2.1	4	133	244	47	105	98	
3	20	169.1		2.1	4	133	246	48	108	98	
4	30	176.1		2.1	4	127	247	48	110	99	
8-1	40	183.1		2.1	4	129	244	49	108	100	
2	50	190.1		2.1	4	135	245	48	110	99	
3	60	197.3		2.1	4	132	247	49	110	99	
4	70	204.5		2.1	4	133	246	50	111	99	
9-1	80	211.5		2.1	4	130	247	52	110	100	
2	90	218.6		2.1	4	128	246	51	110	99	
3	100	225.9		2.1	4	124	246	52	110	99	1639 pause 1653 resume
4	110	232.9		2.1	4	129	246	53	101	98	
10-1	120	240.0		2.1	4	127	240	51	104	97	

Gerdau Jackson EAF #1&2
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Revision 0: 090313

SOURCE SAMPLING FIELD DATA SHEET

AASI Ambient Air Services, Inc
Environmental Consulting and Engineering
106 Ambient Airway
Starke, FL 32091
Phone (904) 964-8440
www.ambientairservices.com

Facility	Gerdau Jackson TN	Run No.	4
Source	EAF baghouse #1	Date	7/11/13
Weather	Mostly sunny, warm, breezy	Filter Number	53885
Testers	J. Jory Test(s) 5d/12	Factor	2.1

Port and Sample Point	Clock Time (min)	Gas Meter Reading (cfm)	Stack Velocity (in H_2O)	Orifice Pressure Drop (in H_2O)	Vacuum (in H_g)	Stack Gas Temp (°F)	Filter Temp (°F)	Last Impinger Temp (°F)	Meter Temp (°F)	Meter Temp (°F)	
10-2	130	246.9		2.1	4	135	235	52	106	97	
3	140	254.7		2.1	4	128	242	52	106	96	recharge @ 145
4	150	262.0		2.1	4	131	240	52	106	95	
11-1	160	269.2		2.1	4	124	246	52	104	95	
2	170	276.5		2.1	4	134	248	51	105	95	1800 pause 1923 resume
3	180	283.5		2.1	4	118	247	50	97	93	
4	190	290.7		2.1	4	122	246	52	101	92	top @ 190 1944 change!
12-1	200	297.7		2.1	4	128	247	53	102	93	
2	210	304.9		2.1	4	121	246	52	103	93	
3	220	312.0		2.1	4	121	246	52	102	92	
4	230	319.4		2.1	4	117	246	52	102	92	
4	240	326.7		2.1	4	121	245	52	101	91	
3	250	333.9		2.1	4	124	245	53	101	90	
R	260	341.100									finish temp 259 min

Method 5 Field Data Sheet Rev 3, 031008

Ambient Air Services, Inc.

Analytical Report

Client:	Gerdau Ameristeel US, Inc.			Date Collected:	7/11-12/13
Source:	EAF Baghouse Number 1			Date Processed:	7/16/2013
Balance:	Make:	AND		Date Weighed:	7/18/2013
	Model:	ER120A		units:	grams
	Serial Number:	3502688			

Analysis Method: USEPA Method 5

Filterable Particulate Matter

Filter Weights

Sample Name	Run Number	Result (grams)	Q	MRL	MDL	Matrix	Comments
5319	1	0.0022		0.0010	0.0001	Glass	
5324	2	0.1840		0.0010	0.0001	Glass	Voided Run
5399	3	0.0106		0.0010	0.0001	Glass	
5385	4	0.0019		0.0010	0.0001	Glass	

Prefilter Weights

Sample Name	Run Number	Result (grams)	Q	MRL	MDL	Matrix	Comments
G699	1	0.0217		0.0010	0.0001	Acetone	
G700	2	0.5503		0.0010	0.0001	Acetone	Voided Run
G701	3	0.0117		0.0010	0.0001	Acetone	
G702	4	0.0031		0.0010	0.0001	Acetone	
G073	Blank	0.0002	j	0.0010	0.0001	Acetone	

Silica Gel Weights

Sample Name	Run Number	Result (grams)	Q	MRL	MDL	Matrix	Comments
1	1	58.4		0.5	0.1	Silica Gel	
2	2	42.0		0.5	0.1	Silica Gel	Voided Run
3	3	42.3		0.5	0.1	Silica Gel	
4	4	38.7		0.5	0.1	Silica Gel	

Processed by: Martin Rosier Date: 7/22/2013

Quality Assurance: David C. Shelton Date: 8/1/2013

Acronyms

MRL	Method Reporting Limit
MDL	Method Detection Limit

Data Qualifiers (Q)

ND	Not Detected
j	The result is between the MDL and the MRL
#	The control limit criteria was exceeded

Method 5 Lab
Template
Rev 2, 020812

Raw Data Entry

CLIENT	Gerdau Ameristeel US, Inc.			
SOURCE	EAF Baghouse Number 1			
DATE COLLECTED	7/11-12/13			
DATE PROCESSED	7/16/2013			
DATE Weighed	7/18/2013			
Filter Media:	Glass			
PM Filter	**R-1**	**R-2**	**R-3**	**R-4**
Filter No.	5319	5324	5399	5385
Final wt.(grams)	0.4272	0.6160	0.4373	0.4255
Tare Wt.(grams)	0.4250	0.4320	0.4267	0.4236
Net Wt. (grams)	**0.0022**	**0.1840**	**0.0106**	**0.0019**
PM Wash Weight	**R-1**	**R-2**	**R-3**	**R-4**
Sample No.	G699	G700	G701	G702
Sample Volume(ml)	132	226	244	68
Final wt.(grams)	106.056	110.2593	113.6103	105.6904
Tare Wt.(grams)	106.0340	109.7085	113.5981	105.6872
Blank Correction	0.0003	0.0005	0.0005	0.000136
Net gain (grams)	**0.0217**	**0.5503**	**0.0117**	**0.0031**

Reagent Blank				
Reagent	Acetone			
Sample No.	G073			
Sample Volume(ml)	100			
Final wt.(grams)	94.8964			
Tare Wt.(grams)	94.8962			
Net gain (grams)	**0.0002**			
Silica	**R-1**	**R-2**	**R-3**	**R-4**
Sample No.	1	2	3	4
Final wt.(grams)	420.3	402.8	407.4	389.8
Tare Wt.(grams)	361.9	360.8	365.1	351.1
Net gain (grams)	**58.4**	**42.0**	**42.3**	**38.7**

Technician MR

QA David C. Shotter 8/1/2013

Ambient Air Services, Inc.

Quality Assurance Balance Check Report

Client:	Gerdau Ameristeel US, Inc.	Date Collected:	7/11-12/13
Source:	EAF Baghouse Number 1	Date Processed:	7/16/2013
Balance:	Make: AND	Date Weighed:	7/18/2013
	Model: ER120A	units:	grams
	Serial Number: 3502688		

Analysis Method: USEPA Method 5

Quality Assurance Balance Checks

Weight Set ID	Audit Weight	Scale Weight	Q	Difference	Limits	Comments
S-2	100.0000	99.9998		-0.0002	0.0004	
S-2	10.0000	10.0000		0.0000	0.0004	
S-2	5.0000	5.0000		0.0000	0.0004	
S-2	2.0000	2.0000		0.0000	0.0004	
S-2	0.5000	0.5001		0.0001	0.0004	

Technician: Martin Rosier Date: 7/18/2013

Quality Assurance: David C. Rutter Date: 8/1/2013

Method 5 Lab
Template
Rev 2, 020812

Ambient Air Services, Inc
106 Ambient Airway Starke, FL 32091 (904) 964-8440 FAX: (904) 964-6675

No. 1 Baghouse

Chain of Custody & Analysis Request

Project Name: Gerdau Jackson Location: Jackson, TN

Laboratory Name: ALS
Address:
Lab Contact: Jerry Aller
Project #

Samplers: DO, WG

Page 1 of 2
RUSH!
Standard X
Date Report Desired:

Sample ID	Sample Date	Source	Run	Method	Type	Matrix	Number of Containers	Gravimetric	Pb	Remarks
5319	7/11/13	No.1 Baghouse	1	12	Pb	filter	1		X	
FH-1-BH1	↓	↓	1	↓	↓	0.1N HNO_3	1		X	Please record volume of liquid
BH-1-BH1	↓	↓	1	↓	↓	↓	1		X	
5399	7/12/13	↓	3	↓	↓	filter	1		X	
FH-3-BH1	↓	↓	3	↓	↓	0.1N HNO_3	1		X	
BH-3-BH1	↓	↓	3	↓	↓	↓	1		X	
5385	↓	↓	4	↓	↓	filter	1		X	
FH-4-BH1	↓	↓	4	↓	↓	0.1N HNO_3	1		X	
BH-4-BH1	↓	↓	4	↓	↓	↓	1		X	
BH1-Blank	7/11/13	↓	Blank	12	Pb	0.1N HNO_3	1		X	

Relinquished by:	Printed Name: Daniel Ockerhouse	Time 1540	Received by:	Printed Name: Ladira Alvarez
	Signature:	Date 7/25/13		Signature:
	Affiliation: AASI			Affiliation: ALS
Relinquished by:	Printed Name:	Time	Received by:	Printed Name:
	Signature:	Date		Signature:
	Affiliation:			Affiliation:

Time 1540		
Date 7/25/13		
Time		
Date		

For Lab Use Only

Sample Integrity: (Note here any damage or loss during transport)	Lab results issued to: By: When:	Remarks:
	Disposition of samples to others:	
	Where stored:	

Chain of Custody Analysis Request Form
Rev 6 020612

Calibration Report

LOCATION : Ambient Air Services, Inc.

MAKE : AND

N.I.S.T. TRACEABILITY NO.: **1308**

MODEL : ER120A

SERIAL NO. : 3502688

FOR COMPLIANCE WITH : **I.S.O. 9002**
MIL-STD 45662A

ENVIRONMENTAL CONDITIONS : 22° C, 34% RH

READABILITY : 0.0001 g

	BEFORE CALIBRATION	AFTER CALIBRATION
MICROMETER ERROR :	N/A	N/A
SCALE DEFLECTION :	110.0008 g	110.0000 g
MID - SCALE READING :	55.0004 g	55.0000 g
LINEARITY :	±0.0001 g	±0.0001 g
DEF. AT FULL TARE :	N/A	N/A
DEF. AT CAPACITY :	N/A	N/A
TIME TO STABILITY :	<15 sec	<15 sec
ARM LENGTH ERROR :	N/A	N/A
CORNER LOAD ERROR :	0.0004 %	0.0002 %
STANDARD DEVIATION :	0.110 mg @ 20 g	0.088 mg @ 20 g
CAL. WEIGHT ERROR :	-0.4 mg	<0.1 mg
ACCUMULATIVE ERROR OF DIAL WEIGHTS BY DECADE :	N/A	N/A

NOTES : Cleaned, inspected and calibrated. Balance was exercised prior to testing. Standard deviation determined using filter paper and 20 g load. Adjusted corner load and internal calibration weight value.

SERVICED BY : JOHN P. MULLER ASSOC., DECORAH, IA 52101-0583

TECHNICIAN'S INITIALS AND SERVICE DATE: JPS **2/18/13**

Mass II Calibration Certificate 1308

Missouri Department of Agriculture
Weights, Measures and Consumer Protection, Metrology Laboratory
Location: 1616 Missouri Blvd., Jefferson City, MO 65109
Mailing Address: PO Box 630 Jefferson City, MO 65102
Telephone (573) 751-3440 or (573) 751-9487

Fred Bryant, John P Muller & Associates, 507 Franklin Street, Decorah, IA 52101-1709
Phone Number: 813-786-8345, Customer Number: 628, Submission Date: 3/22/12

Procedure is NISTIR 5672 SOP 5. The 3-1 weighing design is a combination of three double substitution comparisons of three weights of equal nominal value; a standard, an unknown weight, and a second standard which can be a summation of weights. The Missouri metrology laboratory has demonstrated measurement proficiency through training and interlaboratory comparisons compliant to NIST HB 143:2007 (ISO/IEC 17025:2005): Laboratory standards used for comparison are traceable to the National Institute of Standards and Technology (NIST). Traceable test numbers: NIST(39598); NIST(822/259883-98); NIST(822/274998-07); OK(OBS 11-0913).

The Kragten method was used to quantify the measurement uncertainty and estimate the magnitude of each uncertainty component. Uncertainty conforms to NIST Technical Note 1297 *"Guidelines for Evaluating and Expressing the Uncertainty of Measurement Results."* Uncertainty is multiplied by Technical Note 1297 Table B.1 coverage factor for an approximate 95 % confidence level.

Conditions During Test (Temperature 21.2 to 22.6 °C) (Barometric Pressure 741.4 to 750.5 mmHg) (Humidity 41.4 to 47.8 %)

Weight Manufacturer: Troemner Condition: good Weight set ID/Serial: Master Set

Calibrating Metrologist: Bob Wittenberger Laboratory Manager:

Conventional Mass (Mass in air versus reference density of 8.0 g/cm^3), represents the mass at exactly 20°C, atmospheric pressure of 760.5 mmHg, and a relative humidity of 50%. Formula to calculate True Mass = weight's conventional mass/(1- 0.0012/weight's density) x 0.99985

Remarks All weights were adjusted to meet ASTM Class 1 tolerance.

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Certificate 1308 Fred Bryant, John P Muller & Associates Weight set ID/Serial: Master Set

Test Date	Standard Serial/ID	Nominal Value	Conventional Mass (Mass vs 8.0 g/cm^3) As Found	If Adjusted	Correction	Density g/cm^3	Tolerance Applied		Measurement Uncertainty	Comparator Used For Test
4/3/12		1 kg		1000.00018 g	0.18 mg	7.84	ASTM 1	2.5 mg	0.33 mg	Mettler AT1005
4/3/12		500 g		499.99946 g	-0.54 mg	7.84	ASTM 1	1.2 mg	0.16 mg	Mettler AT1005
4/3/12		200 g		199.999932 g	-0.068 mg	7.84	ASTM 1	0.5 mg	0.074 mg	Mettler AT1005
4/3/12	*	200 g		200.000207 g	0.207 mg	7.84	ASTM 1	0.5 mg	0.073 mg	Mettler AT1005
4/5/12		100 g		100.000074 g	0.074 mg	7.84	ASTM 1	0.25 mg	0.035 mg	Mettler AT106
4/5/12		50 g		50.000089 g	0.089 mg	7.84	ASTM 1	0.12 mg	0.019 mg	Mettler AT106
4/5/12		20 g		20.0000152 g	0.0152 mg	7.84	ASTM 1	0.07 mg	0.0091 mg	Mettler AT106
4/5/12	*	20 g		19.9999828 g	-0.0172 mg	7.84	ASTM 1	0.07 mg	0.009 mg	Mettler AT106
4/5/12		10 g		10.0000233 g	0.0233 mg	7.84	ASTM 1	0.05 mg	0.0058 mg	Mettler AT106
4/6/12		5 g		5.0000127 g	0.0127 mg	7.84	ASTM 1	0.03 mg	0.0029 mg	Mettler UMT5
4/6/12		2 g		2.0000107 g	0.0107 mg	7.84	ASTM 1	0.03 mg	0.0015 mg	Mettler UMT5
4/6/12	*	2 g		2.0000188 g	0.0188 mg	7.84	ASTM 1	0.03 mg	0.0015 mg	Mettler UMT5
4/6/12		1 g		1.0000072 g	0.0072 mg	7.84	ASTM 1	0.03 mg	0.0014 mg	Mettler UMT5

TROEMNER
Henry Troemner LLC

Traceable Certificate

201 Wolf Drive • P.O. Box 87 • Thorofare, NJ 08086-0087 • Phone:856-686-1600 • Fax: 856-686-1601 • www.troemner.com • e-mail: troemner@troemner.com

Weight

ID Number	TS-1250
Serial Number	S1
Order Number	DCS110612
Certificate Number	692779
Date Of Calibration	13-NOV-2012
Calibration Due Date	13-NOV-2013
As Found	Out of Tolerance
As Left	In Tolerance, Adjusted

Ambient Air Services Inc
106 Ambient Airway
Starke, FL 32091

Description of Weights: Analytical Weight Set

Material	Assumed Density at 20°C	Range
Stainless Steel (mg)	7.95 g/cm3	500mg
Stainless Steel	7.85g/cm3	1g-50g
Stainless Steel	8.03 g/cm3	100g

Tested with Reference Standards Traceable to the National Institute of Standards & Technology through NIST Test Number 822-275872-11.

We certify that the weights listed are calibrated to ASTM E617-97 Class 1 tolerances.

The calibration of these weights is based on apparent mass vs material of density 8.0g/cm3.

Nominal Mass Value	Serial Number	Correction before Calibration *	Correction after Calibration *	Tolerance (+ or -)	Uncertainty (+ or -)
100 g		-0.0571 mg	-0.0571 mg	0.250 mg	0.065 mg
50 g		+0.0226 mg	+0.0226 mg	0.120 mg	0.040 mg
10 g		-0.0031 mg	-0.0031 mg	0.050 mg	0.015 mg
5 g		-0.0418 mg	+0.0241 mg	0.034 mg	0.0075 mg
2 g		+0.0061 mg	+0.0061 mg	0.034 mg	0.0075 mg
500 mg		+0.0007 mg	+0.0007 mg	0.010 mg	0.0032 mg

* Correction is defined as the difference between the mass value of a weight and its nominal value. A positive correction indicates that the mass value is greater than the nominal value by the amount of the correction.

Lynn Dickerson, Metrologist, Approved Signatory

6 As Found / 6 Total

TROEMNER
Henry Troemner LLC

Traceable Certificate

201 Wolf Drive • P.O. Box 87 • Thorofare, NJ 08086-0087 • Phone:856-686-1600 • Fax: 856-686-1601 • www.troemner.com • e-mail: troemner@troemner.com

Weight

ID Number	TS-1250
Serial Number	S1
Order Number	DCS110612
Certificate Number	692779
Date of Calibration	13-NOV-2012
Calibration Due Date	13-NOV-2013
As Found	Out of Tolerance
As Left	In Tolerance, Adjusted

Ambient Air Services Inc
106 Ambient Airway
Starke, FL 32091

ADDENDUM

100g & 50g Weight(s) has/ have excessive wear

Ambient Air Services, Inc.
Environmental Consulting and Engineering

AMBIENT AIR SERVICES METHOD 5 PRE-TEST CONSOLE CALIBRATION
USING CALIBRATED CRITICAL ORIFICES
5-POINT ENGLISH UNITS

Meter Console Information	
Console Model	AASI
Console Serial Number	11
DGM Model Number	R 275
DGM Serial Number	2501466

Calibration Conditions			
Date	Time	12/28/2012	2:10
Barometric Pressure		29.80	in Hg
Theoretical Critical Vacuum[1]		14.1	in Hg
Calibration Technician		WLG	

Factors/Conversions		
Std Temp	528	^{o}R
Std Press	29.92	in Hg
K_1	17.647	oR/in Hg

[1]For valid test results, the Actual Vacuum should be 1 to 2 in. Hg greater than the Theoretical Critical Vacuum shown above.

[2]The Critical Orifice Coefficient, K', must be entered in English units, $(ft^3*^oR^{1/2})/(in.Hg*min)$.

Calibration Data

Run Time	Metering Console					Critical Orifice				
Elapsed	DGM Orifice ΔH	Volume Initial	Volume Final	Outlet Temp Initial	Outlet Temp Final	Serial Number	Coefficient	Amb Temp Initial	Amb Temp Final	Actual Vacuum
(Θ)	(P_m)	(V_{mi})	(V_{mf})	(t_{mi})	(t_{mf})		K'	(t_{amb})	(t_{amb})	
min	in H_2O	cubic feet	cubic feet	^{o}F	^{o}F		see above2	^{o}F	^{o}F	in Hg
6	4.9	490.440	496.968	64	67	73	0.8486	59	60	17
8	2.7	496.968	503.434	67	68	63	0.6213	60	60	19
10	1.6	503.434	509.619	68	68	55	0.4793	60	60	20
13	1.0	516.656	522.852	63	64	48	0.3740	60	60	20
19	0.4	539.568	545.748	67	66	40	0.2511	62	61	21

Results

Standardized Data				Dry Gas Meter				
				Calibration Factor		Flowrate	ΔH @	
Dry Gas Meter		Critical Orifice		Value	Variation	Std & Corr	0.75 SCFM	Variation
($V_{m(std)}$)	($Q_{m(std)}$)	($Vcr_{(std)}$)	($Q_{cr(std)}$)	(Y)	(ΔY)	($Q_{cr(std)(corr)}$)	(ΔH@)	(ΔΔH@)
cubic feet	cfm	cubic feet	cfm		Note	cfm	in H2O	
6.612	1.102	6.657	1.109	1.007	-0.002	1.109	2.297	0.018
6.489	0.811	6.495	0.812	1.001	-0.008	0.812	2.329	0.050
6.185	0.618	6.264	0.626	1.013	0.003	0.626	2.305	0.026
6.239	0.480	6.354	0.489	1.018	0.009	0.489	2.260	-0.019
6.179	0.325	6.226	0.328	1.008	-0.002	0.328	2.204	-0.075
				1.009	Y Average		2.279	ΔH@ Average

Note: For Calibration Factor Y, the ratio of the reading of the calibration meter to the dry gas meter, acceptable tolerance of individual values from the average is +-0.02.

I certify that the above Dry Gas Meter was calibrated in accordance with USEPA Methods, CFR 40 Part 60, using the Precision Wet Test Meter # 11AE6, which in turn was calibrated using the American Bell Prover # 3785, certificate # F107, which is traceable to the National Bureau of Standards (N.I.S.T.) and in accordance with AASI Shop SOP 3.3.B.

Technician Sign: William Garabrandt Date: 12/28/2012 Q A Signature: David C. Shelton Date: 1/8/2013

Meterbox pre-test
Template
Rev 1, 070808

AMBIENT AIR SERVICES METHOD 5 POST-TEST CONSOLE CALIBRATION

USING CALIBRATED CRITICAL ORIFICES

3-POINT ENGLISH UNITS

Meter Console Information	
Console Number	11
Pre-test "Y' value	1.009
DGM Model Number	R275
DGM Serial Number	2501466

Calibration Conditions			
Date	**Time**	7/19/2013	14:00
Barometric Pressure		28.93	in Hg
Theoretical Critical Vacuum[1]		13.7	in Hg
Calibration Technician	**JJ**	**Project**	Jackson BH1

Factors/Conversions		
Std Temp	528	^{o}R
Std Press	29.92	in Hg
K_1	17.647	oR/in Hg

[1]For valid test results, the Actual Vacuum should be 1 to 2 in. Hg greater than the Theoretical Critical Vacuum shown above.

[2]The Critical Orifice Coefficient, K', must be entered in English units, $(ft^3*^oR^{1/2})/(in.Hg*min)$.

Calibration Data										
Run Time	**Metering Console**					**Critical Orifice**				
Elapsed	**DGM Orifice ΔH**	**Volume Initial**	**Volume Final**	**Outlet Temp Initial**	**Outlet Temp Final**	**Serial Number**	**Coefficient**	**Amb Temp Initial**	**Amb Temp Final**	**Actual Vacuum**
(Θ)	(P_m)	(V_{mi})	(V_{mf})	(t_{mi})	(t_{mf})		K'	(t_{amb})	(t_{amb})	
min	in H_2O	cubic feet	cubic feet	^{o}F	^{o}F		see above2	^{o}F	^{o}F	in Hg
12	1.6	887.800	895.375	87	88	55	0.4793	86	87	18
12	1.6	895.375	902.972	88	89	55	0.4793	87	88	18
10	1.6	902.972	909.328	89	90	55	0.4793	88	88	18

Results								
Standardized Data				**Dry Gas Meter**				
				Calibration Factor		**Flowrate**	**ΔH @**	
Dry Gas Meter		**Critical Orifice**		**Value**	**Variation**	**Std & Corr**	**0.75 SCFM**	**Variation**
($V_{m(std)}$)	($Q_{m(std)}$)	($Vcr_{(std)}$)	($Q_{cr(std)}$)	(Y)	(ΔY)	($Q_{m(std)(corr)}$)	(ΔH@)	(ΔΔH@)
cubic feet	cfm	cubic feet	cfm		Note 1	cfm	in H2O	
7.092	0.591	7.118	0.593	1.004	0.002	0.593	2.407	0.001
7.100	0.592	7.111	0.593	1.002	0.000	0.593	2.407	0.001
5.929	0.593	5.923	0.592	0.999	-0.002	0.592	2.405	-0.001
				1.001	Y Average (Note 2)		2.406	ΔH@ Average

Yc Calibration											
Elasped Time (> 10 min)	13	DGM Beginning	875.2	DGM End	885.309	Outlet Meter Temp Beginning	86	Outlet Meter Temp End	87	**Yc**	0.998

Note 1: For Calibration Factor Y, the ratio of the reading of the calibration meter to the dry gas meter, acceptable tolerance of individual values from the average is +-0.02.

Note 2: For Calibration Factor Y, the resulting average difference shall not more than + or - 5% of the Pre-test Y value.

I certify that the above Dry Gas Meter was calibrated in accordance with USEPA Methods, CFR 40 Part 60, using the Precision Wet Test Meter # 11AE6, which in turn was calibrated using the American Bell Prover # 3785, certificate # F107, which is traceable to the National Bureau of Standards (N.I.S.T.) and in accordance with AASI Shop SOP 3.3.B.

Technician Sign: JJ Date: 7/19/2013 Q A Signature: David C. Buchter Date: 8/1/2013

Ambient Air Services, Inc.

106 Ambient Airway

Starke, Florida 32091

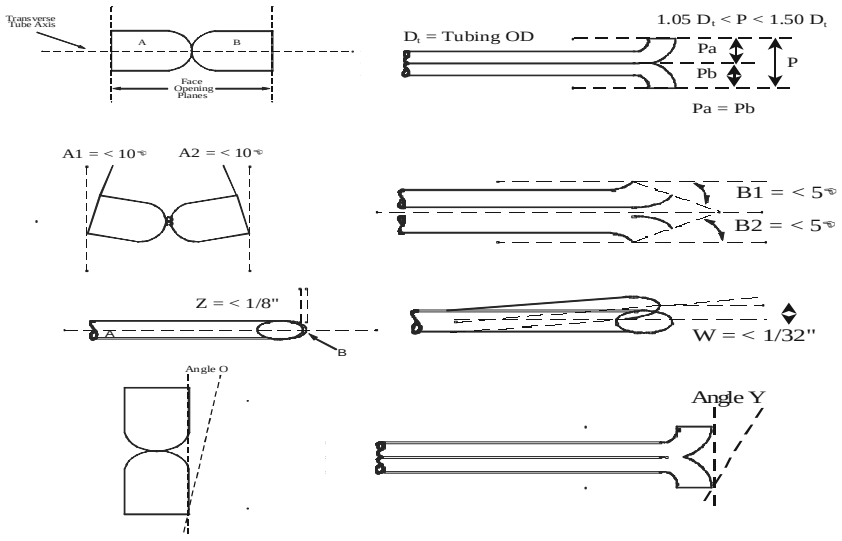
PITOT TUBE POST TEST CALIBRATION FORM

Pitot ID	15-1			
Technician	JJ			
Project	Gerdau Jackson			
Date:	7/19/2013			
Pitot Assembly Level	Yes	X	No	
Pitot tube opening damaged or out-of-round	Yes		No	X

If damage is noted, comment below

Pitot Measurements

Pitot tube outside diameter					D_t	0.375			
a1	0				**a2**	1			
b1	2				**b2**	0			
Pa	0.540				**Pb**	0.540			
P	1.08			Max	1.125		Min	0.7875	
Angle Y	0	Degrees	sin	0.000	**Angle O**	0	Degrees	sin	0.000
z = P sin Y		0.000	Inches		w = P sin O		0.000	Inches	
z = < 1/8 Inch					w = < 1/32 inch				



I certify that the measurements contained within this form was conducted correctly and within the guidelines of EPA Method 2.

Technician Signature:	JJ	Date:	7/19/2013
Quality Assurance Signature:	David C. Shelton	Date:	8/1/2013

Pitot Calibration Template
Rev 3, 020112

Ambient Air Services, Inc.
106 Ambient Airway
Starke, Florida 32091

Alternative (EMC ALT-011) Method 2 Thermocouple Calibration

Date	7/21/2013	Reference Thermometer	Type:	Ms in Glass	Manufacturer:	BCR	
Time	11:30		Serial number	208252			
Project	Gerdau Jackson Inlet Ducts	Pyrometer	Manufacturer	Model	Serial number		
Technician	JJ		Omega	HH74K	110214		

Thermocouple ID	Location	Indicated Temperature			Reference Temperature			Difference (must be ± 2°)			Continuity (Pass / Fail)		
15-1	Stack		85.0			85			0			Pass	
	Filter												
	Impinger												
	Meter In												
	Meter Out												

Comments:

Technician Signature: JJ Date: 7/21/2013

Quality Assurance signature: David C. Shelton QA date: 8/1/2013

Thermocouple (EMC ALT-011) Calibration
Template
060112

Ambient Air Services, Inc.

106 Ambient Airway
Starke, Florida 32091

Alternative (EMC ALT-011) Method 2 Thermocouple Calibration

Date	7/19/2013	Reference Thermometer	Type:	Ms in Glass	Manufacturer:	BCR	
Time	13:00		Serial number	208252			
Project	Gerdau Jackson Baghouse No.1	Pyrometer	Manufacturer	Model	Serial number		
Technician	JJ		Omega	DP460	99100267		

Thermocouple ID	Location	Indicated Temperature			Reference Temperature			Difference (must be ± 2°)			Continuity (Pass / Fail)		
10C	Stack		86.0			86			0			Pass	
DHB2	Filter		85.0			86			1			Pass	
A-12	Impinger		86.0			87			1			Pass	
M11-1	Meter In		84.0			85			1			Pass	
M11-2	Meter Out		84.0			85			1			Pass	

Comments:

Technician Signature: JJ Date: 7/19/2013

Quality Assurance signature: David C. Shelton QA date: 8/1/2013

Ambient Air Services, Inc.
106 Ambient Airway
Starke, Florida 32091

Magnehelic Calibration (Source)

Date:	7/21/2013	**Magnehelic serial number**	F78	**Range**	0-1
Standard Manometer ID:	Omega 0-6" IN3	**Calibration Technician:**	DO		
Client	Gerdau Jackson	**Project:**	Gerdau Jackson Baghouse Inlets		

Data Entry

Manometer Standard Value	**Magnehelic** (Display value) **Positive**	**Magnehelic** (Display value) **Negative**	**Percent Difference Positive**	**Percent Difference Negative**
0.3	0.3	0.3	0.0	0.0
0.6	0.6	0.61	0.0	1.7
0.9	0.92	0.91	2.2	1.1
Average % Difference			0.7	0.9

Technician Signature: DO
Date: 7/21/2013

Quality Assurance Review: David C. Shelton
Quality Assurance Date: 8/8/2013

Magnehelic Calibration (Source)
Template
Rev 3, 11/15/11

Ambient Air Services, Inc.
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Starke, Florida 32091

Magnehelic Calibration (Source)

Date:	7/21/2013	**Magnehelic serial number**	KV0116	**Range**	0-25
Standard Manometer ID:	Slack Tube 0-36	**Calibration Technician:**	DO		
Client	Gerdau Jackson	**Project:**	Gerdau Jackson Baghouse Inlets		

Data Entry

Manometer Standard Value	**Magnehelic** (Display value) **Positive**	**Magnehelic** (Display value) **Negative**	**Percent Difference Positive**	**Percent Difference Negative**
8	8	8	0.0	0.0
16	16	16	0.0	0.0
24	24	24	0.0	0.0
Average % Difference			0.0	0.0

Technician Signature: DO
Date: 7/21/2013

Quality Assurance Review: David C. Shelton
Quality Assurance Date: 8/8/2013

Magnehelic Calibration (Source)
Template
Rev 3, 11/15/11

APPENDIX A.2
PARTICULATE MATTER AND LEAD DATA
BAGHOUSE NUMBER 2

Emission Run Summaries

Field Data Sheets

PM Lab Data Sheet

Meter Box Pre-Test Calibration

Meter Post-Test Calibration

Pitot Tube Calibration

Thermocouple Calibration

Magnehelic Calibrations

Ambient Air Services, Inc.
Environmental Consultants
106 Ambient Airway Starke, Florida (904) 964-8440

AASI USEPA Method 5D Single-Inlet 60 Point Template - Rev 2, 042508

Volumetric Flow Calculations Worksheet

Data Request Entry Area	Inlet #1 - Flow Run 1
Facility	Gerdau Ameristeel US, Inc.
Location	Jackson, Tennessee
Source	Baghouse Number 2
Date	07/10/13
Run Number	1
Start Time	6:54
Finish Time	7:06
Weather	Partly
Total Time (min)	12.0
Number of Points	16
Barometric Pressure	29.51
Static Pressure ("H20)	-18.00
Stack Diameter (inches)	150.00
Pitot Factor	0.84
Moisture Fraction (estimated)	0.020
CO2 (estimated)	0.5
O2 (estimated)	20.5
CO (estimated)	0.0
N2 (estimated)	79.0

Field Data Points - Inlet #1 - Flow Run 1

Port	Trav. Pt.	Velocity Head (in H2O)	Stack Temp (^{o}F)	Square Root Velocity Head
1	**1**	1.6	280	1.265
	2	2.0	277	1.414
	3	1.9	260	1.378
	4	1.9	243	1.378
	5	3.0	162	1.732
	6	2.6	150	1.612
	7	2.1	142	1.449
	8	3.1	113	1.761
2	**1**	1.2	231	1.095
	2	1.5	231	1.225
	3	1.7	230	1.304
	4	2.2	217	1.483
	5	2.6	196	1.612
	6	2.2	192	1.483
	7	1.6	195	1.265
	8	1.8	186	1.342

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Environmental Consultants
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AASI USEPA Method 5D Single-Inlet 60 Point Template - Rev 2, 042508

Inlet #1 - Flow Summary Run 1

Facility	Gerdau Ameristeel US, Inc.		**Source**	Baghouse Number 2	
Location	Jackson, Tennessee		**Run Date**	7/10/2013	
Start Time	6:54		**Weather**	Partly	
Finish Time	7:06		**(Θ) Total Time (minutes)**	12	
(P_{bar}) Barometric Pressure		29.51	**CO2 %**	0.5	
(D) Diameter (inches)		150.00	**O2 %**	20.5	
(A) Stack Area (ft^2)		122.718	**CO %**	0.0	
(n) Number of Points		16	**N %**	79.0	
(Δp_{avg}) Avg of SQRT of V.H.		1.4250	**(P_s)Stack Pressure (in. Hg)**	28.19	
(Cp) Pitot Correction Factor		0.84	**($T_{s(abs)}$) Stack Temp (°R)**	666.6	

(B_{ws}) Moisture in stack gas, volume fraction	0.020
(B_{wd}) Dry Stack Gas, volume fraction	0.980
(M_d) Molecular Weight of Stack Gas (Dry Basis)	28.90
(M_s) Molecular Weight of Stack Gas (Stack conditions)	28.68
(G_s) Specific gravity of Stack Gas Relative to Air	0.989
(v_s) Average Stack Velocity, FPM	5575.1
(Q_s) Actual Stack Gas Flow Rate, ACFM	684166
(Q_d) Actual Stack Gas Flow Rate, ACFMD	670483
($Q_{d(std)}$) Stack Gas Flow Rate, SCFMD	500334
($Q_{s(std)}$) Stack Gas Flow Rate Wet, SCFMW	510545

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Run 1 Flow Summary

Parameter	BH2
Inlet Used	y
(Cp) Pitot Correction Factor	0.84
(P_s)Stack Pressure (in. Hg)	28.19
($T_{s(abs)}$) Stack Temp (°R)	666.6
(B_{ws}) Moisture in stack gas, volume fraction (estimated)	0.02
(B_{wd}) Dry Stack Gas, volume fraction (estimated)	0.98
(O_2) Oxygen in stack gas, percent volume (estimated)	20.5
(CO_2) Carbon Dioxide in stack gas, percent volume (estimated)	0.5
(M_d) Molecular Weight of Stack Gas (Dry Basis, estimated)	28.90
(M_s) Molecular Weight of Stack Gas (Stack conditions, estimated)	28.68
(v_s) Average Stack Velocity, FPM (estimated)	5575.1
(A) Stack Area (ft^2)	122.72
(Q_s) Actual Stack Gas Flow Rate, ACFM (estimated)	684166
(Q_d) Actual Stack Gas Flow Rate, ACFMD (estimated)	670483
($Q_{d(std)}$) Stack Gas Flow Rate, SCFMD (estimated)	500334
($Q_{s(std)}$) Stack Gas Flow Rate Wet, SCFMW (estimated)	510545

Initial estimates for isokinetic sampling are made for moisture, O_2, and CO_2 content. Inputing these actual values from the PM run will result in a corrected flow rate.

(B_{ws}) Moisture in stack gas, volume fraction (corrected)	0.034
(O_2) Oxygen in stack gas, percent volume (corrected)	20.5
(CO_2) Carbon Dioxide in stack gas, percent volume (corrected)	0.5
(M_d) Molecular Weight of Stack Gas (Dry Basis, corrected)	28.90
(M_s) Molecular Weight of Stack Gas (Stack conditions, corrected)	28.53
(v_s) Average Stack Velocity, FPM (corrected)	5589.8
($Q_{d(std)}$) Stack Gas Flow Rate, SCFMD (corrected)	494562
($Q_{s(std)}$) Stack Gas Flow Rate Wet, SCFMW (corrected)	511894

($Q_{d(std)}$) Stack Gas Flow Rate, SCFMD (estimated)	500334
($Q_{d(std)}$) Stack Gas Flow Rate, SCFMD (corrected)	494562

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AASI USEPA Method 5D Single-Inlet 60 Point Template - Rev 2, 042508

Derivation of H orifice Setting For Method 5D

Facility	Gerdau Ameristeel US, Inc.
Location	Jackson, Tennessee
Source	Baghouse Number 2
Date	July 10, 2013

Input Variables Run 1

ΔH@	Orifice Pressure Differential (.75 cfm at STP)	1.963
D_n (in)	Nozzle Diameter (in)	0.680
T_m	Average Meter Temperature (^oF, estimated)	130
B_{wo}	Moisture Fraction (by volume) (estimated)	0.02
W	Compartment Width (ft)	10.00
L	Compartment Length (ft)	178.00
n	Number Compartments	1.00
A_o	Outlet Baghouse Area (ft^2)	1780.00
T_i	Outlet Stack Temperature (^oF)	185.70
Cp	Pitot Tube Coefficient	0.84
P_{bar}	Barometric Pressure at box location (in Hg)	29.51
P_s	Outlet Stack Static Pressure (in H_2O, estimated)	0.05
M_m	Dry Stack Gas Molecular Weight (lb/lb-mole, estimated)	28.90
M_i	Molecular Weight of Stack Gas at Stack Conditions (lb/lb-mole, estimated)	28.68

Calculated Variables

T_{ia}	Absolute Stack Temperature (^oR)	646
T_{ma}	Absolute Meter Temperature (^oR, estimated)	590
P_i	Absolute Stack Pressure (in Hg, estimated)	29.51
A	Isokinetic Rate Factor Calculation	0.21
B	Isokinetic Rate Factor Calculation	1665.91
C	Isokinetic Rate Factor Calculation	1158.17
F	Isokinetic Rate Factor	224.13

Calculated Meter Orifice Setting, Run 1

H	**=**	**2.00**

Q_s	Total Outlet SCFMD (estimated)	500334
v_s	Outlet Stack Velocity (fps,estimated)	5.93
A_o	Outlet Stack Area (ft^2)	1780.00
Δp	Outlet Stack Dp (estimated)	8.93E-03

Ambient Air Services, Inc.
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AASI USEPA Method 5D Single-Inlet 60 Point Template - Rev 2, 042508

Volumetric Flow Calculations Worksheet

Data Request Entry Area	PM Run 1	
Facility	Gerdau Ameristeel US, Inc.	
Location	Jackson, Tennessee	
Source	Baghouse Number 2	
Date	07/10/13	
Run Number	1	
Start Time	8:48	
Finish Time	13:31	
Weather	Cloudy	
Total Time (minutes)	274.0	
Number of Points	24	
Barometric Pressure (inches Hg)	29.58	
Static Pressure (inches H_2O)	0.05	
Stack Dimensions (feet) L X W	178.00	10.00
Nozzle Diameter (inches)	0.680	
Meter Y Factor	1.003	
Pitot Factor	0.84	
Final Meter Reading (ft^3)	1005.559	
Initial Meter Reading (ft^3)	794.100	
Condensate (ml)	97	
Silica Gel Weight (grams)	48.7	
Carbon Dioxide (%)	0.5	
Oxygen (%)	20.5	
Carbon Monoxide (%)	0.0	
Nitrogen (%)	79.0	
Filter Weight (grams)	0.0041	
Prefilter Weight (grams)	0.0075	

Ambient Air Services, Inc.
Environmental Consultants
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AASI USEPA Method 5D Single-Inlet 60 Point Template - Rev 2, 042508

Field Data Points - PM Run 1 **Gerdau Ameristeel US, Inc.** **Baghouse Number 2**

Port	Traverse Point		Meter Orifice (inches H_2O)	Stack Temperature (^oF)	Meter Inlet Temperature (^oF)	Meter Outlet Temperature (^oF)	
1	1		2.0	158	91	91	
	2		2.0	184	104	90	
	3		2.0	191	113	91	
	4		2.0	198	115	93	
2	1		2.0	185	110	96	
	2		2.0	187	118	97	
	3		2.0	171	118	98	
	4		2.0	178	118	98	
3	1		2.0	203	112	98	
	2		2.0	205	117	98	
	3		2.0	215	117	98	
	4		2.0	200	118	98	
4	1		2.0	186	111	98	
	2		2.0	153	115	98	
	3		2.0	173	117	98	
	4		2.0	183	117	98	
5	1		2.0	189	116	100	
	2		2.0	189	122	101	
	3		2.0	188	125	103	
	4		2.0	178	126	105	
6	1		2.0	157	119	107	
	2		2.0	170	121	106	
	3		2.0	185	122	106	
	4		2.0	194	124	106	
	1		2.0	209	121	105	
	2		2.0	202	123	105	
	3		2.0	200	123	104	
	4		2.0	168	123	105	

Ambient Air Services, Inc.
Environmental Consultants
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AASI USEPA Method 5D Single-Inlet 60 Point Template - Rev 2, 042508

PM Summary Run 1

Facility	Gerdau Ameristeel US, Inc.	**Source**	Baghouse Number 2
Location	Jackson, Tennessee	**Start Time**	8:48
Source	Baghouse Number 2	**Finish Time**	13:31
Run Date	7/10/2013	**Weather**	Cloudy

(Θ) Total Time (minutes)	274	**Impinger Condensate (g or ml)**	97.0
(P_{bar}) Barometric Pressure (inches Hg)	29.58	**Silica Gel Condensate (g)**	48.7
(L) Stack Length (feet)	178.00	**(V_{lc}) Condensate Volume (ml)**	145.7
(W) Stack Width (feet)	10.00	**Carbon Dioxide (%)**	0.5
(A) Stack Area (ft^2)	1780.000	**Oxygen (%)**	20.5
(A_n) Nozzle Area (ft^2)	0.0025220	**Carbon Monoxide (%)**	0.0
(n) Number of Points	24	**Nitrogen (%)**	79.0
(Y) Meter Correction	1.003	**(V_m) Volume Metered (ft^3)**	211.459
Nozzle Diameter (inches)	0.680	**(ΔH_{avg}) Delta H (inches H_2O)**	2.0000
(Cp) Pitot Correction Factor	0.84	**(P_g) Static Pressure (inches H_2O)**	0.05
Filter Weight (grams)	0.0041	**(P_s)Stack Pressure (inches Hg)**	29.58
(m_s) Prefilter Weight (grams)	0.0075	**($T_{s(abs)}$) Stack Temp (°R)**	645.7
(m_n) Total Particulate (grams)	0.0116	**(T_m) Meter Temp (°R)**	568.3

($V_{w(std)}$) Volume Water Vapor, SCF	6.858
($V_{m(std)}$) Gas Volume Sampled, STPD	195.691
Total Volume, STP	202.549
(B_{ws}) Moisture in stack gas, volume fraction	0.034
(B_{wd}) Dry Stack Gas, volume fraction	0.966
(M_d) Molecular Weight of Stack Gas (Dry Basis)	28.90
(M_s) Molecular Weight of Stack Gas (Stack conditions)	28.53
(G_s) Specific gravity of Stack Gas Relative to Air	0.984
(v_s) Average Stack Velocity, FPM	355.7
(Q_s) Actual Stack Gas Flow Rate, ACFM	633100
(Q_d) Actual Stack Gas Flow Rate, ACFMD	611664
($Q_{d(std)}$) Stack Gas Flow Rate, SCFMD	494562
($Q_{s(std)}$) Stack Gas Flow Rate Wet, SCFMW	511894
(I) Percent Isokinetic	102

Stack Emissions:	**(C_s) Grains per DSCF**	0.0009
	(Em) Pounds per Hour	3.88

Ambient Air Services, Inc.
Environmental Consultants
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AASI USEPA Method 5D Multi-Inlet 60 Point Template - Rev 2, 042508

Volumetric Flow Calculations Worksheet

Data Request Entry Area	Inlet #1 - Flow Run 2
Facility	Gerdau Ameristeel US, Inc.
Location	Jackson, Tennessee
Source	Baghouse Number 2
Date	07/10/13
Run Number	2
Start Time	13:35
Finish Time	13:44
Weather	Cloudy
Total Time (min)	9.0
Number of Points	16
Barometric Pressure	29.54
Static Pressure ("H20)	-17.00
Stack Diameter (inches)	150.00
Pitot Factor	0.84
Moisture Fraction (estimated)	0.020
CO2 (estimated)	0.5
O2 (estimated)	20.5
CO (estimated)	0.0
N2 (estimated)	79.0

Field Data Points - Inlet #1 - Flow Run 2

Port	Trav. Pt.	Velocity Head (in H2O)	Stack Temp (^{o}F)	Square Root Velocity Head
1	**1**	2.2	214	1.483
	2	2.3	211	1.517
	3	2.1	208	1.449
	4	2.2	198	1.483
	5	2.8	158	1.673
	6	2.9	149	1.703
	7	2.1	142	1.449
	8	2.2	126	1.483
2	**1**	1.6	199	1.265
	2	1.8	209	1.342
	3	1.8	220	1.342
	4	2.0	231	1.414
	5	2.3	201	1.517
	6	2.0	199	1.414
	7	1.9	207	1.378
	8	2.2	209	1.483

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AASI USEPA Method 5D Multi-Inlet 60 Point Template - Rev 2, 042508

Inlet #1 - Flow Summary Run 2

Facility	Gerdau Ameristeel US, Inc.	**Source**	Baghouse Number 2
Location	Jackson, Tennessee	**Run Date**	7/10/2013
Start Time	13:35	**Weather**	Cloudy
Finish Time	13:44	**(Θ) Total Time (minutes)**	9
(P_{bar}) Barometric Pressure	29.54	**CO2 %**	0.5
(D) Diameter (inches)	150.00	**O2 %**	20.5
(A) Stack Area (ft^2)	122.718	**CO %**	0.0
(n) Number of Points	16	**N %**	79.0
(Δp_{avg}) Avg of SQRT of V.H.	1.4622	**(P_s)Stack Pressure (in. Hg)**	28.29
(Cp) Pitot Correction Factor	0.84	**($T_{s(abs)}$) Stack Temp (°R)**	652.6

(B_{ws}) Moisture in stack gas, volume fraction	0.020
(B_{wd}) Dry Stack Gas, volume fraction	0.980
(M_d) Molecular Weight of Stack Gas (Dry Basis)	28.90
(M_s) Molecular Weight of Stack Gas (Stack conditions)	28.68
(G_s) Specific gravity of Stack Gas Relative to Air	0.989
(v_s) Average Stack Velocity, FPM	5650.0
(Q_s) Actual Stack Gas Flow Rate, ACFM	693364
(Q_d) Actual Stack Gas Flow Rate, ACFMD	679496
($Q_{d(std)}$) Stack Gas Flow Rate, SCFMD	519841
($Q_{s(std)}$) Stack Gas Flow Rate Wet, SCFMW	530450

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Run 2 Flow Summary

Parameter	BH2
Inlet Used	y
(Cp) Pitot Correction Factor	0.84
(P_s)Stack Pressure (in. Hg)	28.29
($T_{s(abs)}$) Stack Temp (°R)	652.6
(B_{ws}) Moisture in stack gas, volume fraction (estimated)	0.02
(B_{wd}) Dry Stack Gas, volume fraction (estimated)	0.98
(O_2) Oxygen in stack gas, percent volume (estimated)	20.5
(CO_2) Carbon Dioxide in stack gas, percent volume (estimated)	0.5
(M_d) Molecular Weight of Stack Gas (Dry Basis, estimated)	28.90
(M_s) Molecular Weight of Stack Gas (Stack conditions, estimated)	28.68
(v_s) Average Stack Velocity, FPM (estimated)	5650.0
(A) Stack Area (ft^2)	122.72
(Q_s) Actual Stack Gas Flow Rate, ACFM (estimated)	693364
(Q_d) Actual Stack Gas Flow Rate, ACFMD (estimated)	679496
($Q_{d(std)}$) Stack Gas Flow Rate, SCFMD (estimated)	519841
($Q_{s(std)}$) Stack Gas Flow Rate Wet, SCFMW (estimated)	530450

Initial estimates for isokinetic sampling are made for moisture, O_2, and CO_2 content. Inputing these actual values from the PM run will result in a corrected flow rate.

(B_{ws}) Moisture in stack gas, volume fraction (corrected)	0.038
(O_2) Oxygen in stack gas, percent volume (corrected)	20.5
(CO_2) Carbon Dioxide in stack gas, percent volume (corrected)	0.5
(M_d) Molecular Weight of Stack Gas (Dry Basis, corrected)	28.90
(M_s) Molecular Weight of Stack Gas (Stack conditions, corrected)	28.49
(v_s) Average Stack Velocity, FPM (corrected)	5668.9
($Q_{d(std)}$) Stack Gas Flow Rate, SCFMD (corrected)	512259
($Q_{s(std)}$) Stack Gas Flow Rate Wet, SCFMW (corrected)	532224

($Q_{d(std)}$) Stack Gas Flow Rate, SCFMD (estimated)	519841
($Q_{d(std)}$) Stack Gas Flow Rate, SCFMD (corrected)	512259

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AASI USEPA Method 5D Multi-Inlet 60 Point Template - Rev 2, 042508

Derivation of H orifice Setting For Method 5D

Facility	Gerdau Ameristeel US, Inc.
Location	Jackson, Tennessee
Source	Baghouse Number 2
Date	July 10, 2013

Input Variables Run 2

ΔH@	Orifice Pressure Differential (.75 cfm at STP)	1.963
D_n (in)	Nozzle Diameter (in)	0.680
T_m	Average Meter Temperature (^oF, estimated)	130
B_{wo}	Moisture Fraction (by volume) (estimated)	0.02
W	Compartment Width (ft)	10.00
L	Compartment Length (ft)	178.00
n	Number Compartments	1.00
A_o	Outlet Baghouse Area (ft^2)	1780.00
T_i	Outlet Stack Temperature (^oF)	192.2
Cp	Pitot Tube Coefficient	0.84
P_{bar}	Barometric Pressure at box location (in Hg)	29.40
P_s	Outlet Stack Static Pressure (in H_2O, estimated)	0.05
M_m	Dry Stack Gas Molecular Weight (lb/lb-mole, estimated)	28.90
M_i	Molecular Weight of Stack Gas at Stack Conditions (lb/lb-mole, estimated)	28.68

Calculated Variables

T_{ia}	Absolute Stack Temperature (^oR)	652
T_{ma}	Absolute Meter Temperature (^oR, estimated)	590
P_i	Absolute Stack Pressure (in Hg, estimated)	29.40
A	Isokinetic Rate Factor Calculation	0.21
B	Isokinetic Rate Factor Calculation	1682.68
C	Isokinetic Rate Factor Calculation	1158.17
F	Isokinetic Rate Factor	221.90

Calculated Meter Orifice Setting, Run 2

H	**=**	**2.17**

Q_s	Total Outlet SCFMD (estimated)	519841
v_s	Outlet Stack Velocity (fps,estimated)	6.24
A_o	Outlet Stack Area (ft^2)	1780.00
Δp	Outlet Stack Dp (estimated)	9.77E-03

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AASI USEPA Method 5D Multi-Inlet 60 Point Template - Rev 2, 042508

Volumetric Flow Calculations Worksheet

Data Request Entry Area	PM Run 2	
Facility	Gerdau Ameristeel US, Inc.	
Location	Jackson, Tennessee	
Source	Baghouse Number 2	
Date	07/10/12	
Run Number	2	
Start Time	14:41	
Finish Time	20:14	
Weather	Cloudy	
Total Time (minutes)	290.0	
Number of Points	24	
Barometric Pressure (inches Hg)	29.40	
Static Pressure (inches H_2O)	0.05	
Stack Dimensions (feet) L X W	178.00	10.00
Nozzle Diameter (inches)	0.680	
Meter Y Factor	1.003	
Pitot Factor	0.84	
Final Meter Reading (ft^3)	242.400	
Initial Meter Reading (ft^3)	6.400	
Condensate (ml)	130	
Silica Gel Weight (grams)	47.9	
Carbon Dioxide (%)	0.5	
Oxygen (%)	20.5	
Carbon Monoxide (%)	0.0	
Nitrogen (%)	79.0	
Filter Weight (grams)	0.0164	
Prefilter Weight (grams)	0.0094	

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AASI USEPA Method 5D Multi-Inlet 60 Point Template - Rev 2, 042508

Field Data Points - PM Run 2 **Gerdau Ameristeel US, Inc.** **Baghouse Number 2**

Port	Traverse Point		Meter Orifice (inches H_2O)	Stack Temperature (^oF)	Meter Inlet Temperature (^oF)	Meter Outlet Temperature (^oF)	
7	1		2.2	173	99	98	
	2		2.2	187	110	98	
	3		2.2	187	116	98	
	4		2.2	178	119	99	
8	1		2.2	212	118	100	
	2		2.2	174	107	101	
	3		2.2	197	122	101	
	4		2.2	171	127	103	
9	1		2.2	188	120	103	
	2		2.2	197	126	104	
	3		2.2	199	129	105	
	4		2.2	198	132	106	
10	1		2.2	193	130	107	
	2		2.2	182	128	107	
	3		2.2	168	128	107	
	4		2.2	175	126	107	
11	1		2.2	202	120	106	
	2		2.2	196	126	106	
	3		2.2	186	125	105	
	4		2.2	204	130	106	
12	1		2.2	204	126	106	
	2		2.2	198	132	108	
	3		2.2	199	133	109	
	4		2.2	200	134	109	
	4		2.2	212	134	110	
	3		2.2	194	131	110	
	2		2.2	210	129	109	
	1		2.2	201	130	109	
11	1		2.2	188	113	105	

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AASI USEPA Method 5D Multi-Inlet 60 Point Template - Rev 2, 042508

PM Summary Run 2

Facility	Gerdau Ameristeel US, Inc.	**Source**	Baghouse Number 2
Location	Jackson, Tennessee	**Start Time**	14:41
Source	Baghouse Number 2	**Finish Time**	20:14
Run Date	7/10/2012	**Weather**	Cloudy

(Θ) Total Time (minutes)	290	**Impinger Condensate (g or ml)**	130.0
(P_{bar}) Barometric Pressure (inches Hg)	29.4	**Silica Gel Condensate (g)**	47.9
(L) Stack Length (feet)	178.00	**(V_{lc}) Condensate Volume (ml)**	177.9
(W) Stack Width (feet)	10.00	**Carbon Dioxide (%)**	0.5
(A) Stack Area (ft^2)	1780.000	**Oxygen (%)**	20.5
(A_n) Nozzle Area (ft^2)	0.0025220	**Carbon Monoxide (%)**	0.0
(n) Number of Points	24	**Nitrogen (%)**	79.0
(Y) Meter Correction	1.003	**(V_m) Volume Metered (ft^3)**	236.000
Nozzle Diameter (inches)	0.680	**(ΔH_{avg}) Delta H (inches H_2O)**	2.2000
(Cp) Pitot Correction Factor	0.84	**(P_g) Static Pressure (inches H_2O)**	0.05
Filter Weight (grams)	0.0164	**(P_s)Stack Pressure (inches Hg)**	29.40
(m_s) Prefilter Weight (grams)	0.0094	**($T_{s(abs)}$) Stack Temp (°R)**	652.2
(m_n) Total Particulate (grams)	0.0258	**(T_m) Meter Temp (°R)**	574.5

($V_{w(std)}$) Volume Water Vapor, SCF	8.374
($V_{m(std)}$) Gas Volume Sampled, STPD	214.852
Total Volume, STP	223.225
(B_{ws}) Moisture in stack gas, volume fraction	0.038
(B_{wd}) Dry Stack Gas, volume fraction	0.962
(M_d) Molecular Weight of Stack Gas (Dry Basis)	28.90
(M_s) Molecular Weight of Stack Gas (Stack conditions)	28.49
(G_s) Specific gravity of Stack Gas Relative to Air	0.983
(v_s) Average Stack Velocity, FPM	375.8
(Q_s) Actual Stack Gas Flow Rate, ACFM	668933
(Q_d) Actual Stack Gas Flow Rate, ACFMD	643840
($Q_{d(std)}$) Stack Gas Flow Rate, SCFMD	512259
($Q_{s(std)}$) Stack Gas Flow Rate Wet, SCFMW	532224
(I) Percent Isokinetic	102
Stack Emissions: — **(C_s) Grains per DSCF**	0.0019
Stack Emissions: — **(Em) Pounds per Hour**	8.14

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Volumetric Flow Calculations Worksheet

Data Request Entry Area	Inlet #1 - Flow Run 3
Facility	Gerdau Ameristeel US, Inc.
Location	Jackson, Tennessee
Source	Baghouse Number 2
Date	07/11/13
Run Number	3
Start Time	8:34
Finish Time	8:45
Weather	Clear
Total Time (min)	9.0
Number of Points	16
Barometric Pressure	29.51
Static Pressure ("H20)	-14.50
Stack Diameter (inches)	150.00
Pitot Factor	0.84
Moisture Fraction (estimated)	0.020
CO2 (estimated)	0.5
O2 (estimated)	20.5
CO (estimated)	0.0
N2 (estimated)	79.0

Field Data Points - Inlet #1 - Flow Run 3

Port	Trav. Pt.	Velocity Head (in H2O)	Stack Temp (^{o}F)	Square Root Velocity Head
1	**1**	2.0	238	1.414
	2	2.4	239	1.549
	3	2.3	236	1.517
	4	2.3	230	1.517
	5	2.8	170	1.673
	6	2.9	154	1.703
	7	2.2	137	1.483
	8	2.0	104	1.414
2	**1**	1.7	284	1.304
	2	1.9	304	1.378
	3	2.0	289	1.414
	4	2.2	274	1.483
	5	2.0	227	1.414
	6	1.9	229	1.378
	7	1.8	225	1.342
	8	2.2	205	1.483

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Inlet #1 - Flow Summary Run 3

Facility	Gerdau Ameristeel US, Inc.		**Source**	Baghouse Number 2	
Location	Jackson, Tennessee		**Run Date**	7/11/2013	
Start Time	8:34		**Weather**	Clear	
Finish Time	8:45		**(Θ) Total Time (minutes)**	9	
(P_{bar}) Barometric Pressure		29.51	**CO2 %**	0.5	
(D) Diameter (inches)		150.00	**O2 %**	20.5	
(A) Stack Area (ft^2)		122.718	**CO %**	0.0	
(n) Number of Points		16	**N %**	79.0	
(Δp_{avg}) Avg of SQRT of V.H.		1.4667	**(P_s)Stack Pressure (in. Hg)**	28.44	
(Cp) Pitot Correction Factor		0.84	**($T_{s(abs)}$) Stack Temp (°R)**	681.6	

(B_{ws}) Moisture in stack gas, volume fraction	0.020
(B_{wd}) Dry Stack Gas, volume fraction	0.980
(M_d) Molecular Weight of Stack Gas (Dry Basis)	28.90
(M_s) Molecular Weight of Stack Gas (Stack conditions)	28.68
(G_s) Specific gravity of Stack Gas Relative to Air	0.989
(v_s) Average Stack Velocity, FPM	5776.3
(Q_s) Actual Stack Gas Flow Rate, ACFM	708853
(Q_d) Actual Stack Gas Flow Rate, ACFMD	694676
($Q_{d(std)}$) Stack Gas Flow Rate, SCFMD	511607
($Q_{s(std)}$) Stack Gas Flow Rate Wet, SCFMW	522048

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Run 3 Flow Summary

Parameter	BH2
Inlet Used	y
(Cp) Pitot Correction Factor	0.84
(P_s)Stack Pressure (in. Hg)	28.44
($T_{s(abs)}$) Stack Temp (°R)	681.6
(B_{ws}) Moisture in stack gas, volume fraction (estimated)	0.02
(B_{wd}) Dry Stack Gas, volume fraction (estimated)	0.98
(O_2) Oxygen in stack gas, percent volume (estimated)	20.5
(CO_2) Carbon Dioxide in stack gas, percent volume (estimated)	0.5
(M_d) Molecular Weight of Stack Gas (Dry Basis, estimated)	28.90
(M_s) Molecular Weight of Stack Gas (Stack conditions, estimated)	28.68
(v_s) Average Stack Velocity, FPM (estimated)	5776.3
(A) Stack Area (ft^2)	122.72
(Q_s) Actual Stack Gas Flow Rate, ACFM (estimated)	708853
(Q_d) Actual Stack Gas Flow Rate, ACFMD (estimated)	694676
($Q_{d(std)}$) Stack Gas Flow Rate, SCFMD (estimated)	511607
($Q_{s(std)}$) Stack Gas Flow Rate Wet, SCFMW (estimated)	522048

Initial estimates for isokinetic sampling are made for moisture, O_2, and CO_2 content. Inputing these actual values from the PM run will result in a corrected flow rate.

(B_{ws}) Moisture in stack gas, volume fraction (corrected)	0.037
(O_2) Oxygen in stack gas, percent volume (corrected)	20.5
(CO_2) Carbon Dioxide in stack gas, percent volume (corrected)	0.5
(M_d) Molecular Weight of Stack Gas (Dry Basis, corrected)	28.90
(M_s) Molecular Weight of Stack Gas (Stack conditions, corrected)	28.49
(v_s) Average Stack Velocity, FPM (corrected)	5795.4
($Q_{d(std)}$) Stack Gas Flow Rate, SCFMD (corrected)	504205
($Q_{s(std)}$) Stack Gas Flow Rate Wet, SCFMW (corrected)	523780

($Q_{d(std)}$) Stack Gas Flow Rate, SCFMD (estimated)	511607
($Q_{d(std)}$) Stack Gas Flow Rate, SCFMD (corrected)	504205

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AASI USEPA Method 5D Multi-Inlet 60 Point Template - Rev 2, 042508

Derivation of H orifice Setting For Method 5D

Facility	Gerdau Ameristeel US, Inc.
Location	Jackson, Tennessee
Source	Baghouse Number 2
Date	July 11, 2013

Input Variables Run 3

ΔH@	Orifice Pressure Differential (.75 cfm at STP)	1.963
D_n (in)	Nozzle Diameter (in)	0.680
T_m	Average Meter Temperature (^oF, estimated)	130
B_{wo}	Moisture Fraction (by volume) (estimated)	0.02
W	Compartment Width (ft)	10.00
L	Compartment Length (ft)	178.00
n	Number Compartments	1.00
A_o	Outlet Baghouse Area (ft^2)	1780.00
T_i	Outlet Stack Temperature (^oF)	230.00
Cp	Pitot Tube Coefficient	0.84
P_{bar}	Barometric Pressure at box location (in Hg)	29.52
P_s	Outlet Stack Static Pressure (in H_2O, estimated)	0.05
M_m	Dry Stack Gas Molecular Weight (lb/lb-mole, estimated)	28.90
M_i	Molecular Weight of Stack Gas at Stack Conditions (lb/lb-mole, estimated)	28.68

Calculated Variables

T_{ia}	Absolute Stack Temperature (^oR)	690
T_{ma}	Absolute Meter Temperature (^oR, estimated)	590
P_i	Absolute Stack Pressure (in Hg, estimated)	29.52
A	Isokinetic Rate Factor Calculation	0.21
B	Isokinetic Rate Factor Calculation	1780.20
C	Isokinetic Rate Factor Calculation	1158.17
F	Isokinetic Rate Factor	209.74

Calculated Meter Orifice Setting, Run 3

H	**=**	**2.09**

Q_s	Total Outlet SCFMD (estimated)	511607
v_s	Outlet Stack Velocity (fps,estimated)	6.47
A_o	Outlet Stack Area (ft^2)	1780.00
Δp	Outlet Stack Dp (estimated)	9.97E-03

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Volumetric Flow Calculations Worksheet

Data Request Entry Area	PM Run 3	
Facility	Gerdau Ameristeel US, Inc.	
Location	Jackson, Tennessee	
Source	Baghouse Number 2	
Date	07/11/13	
Run Number	3	
Start Time	8:29	
Finish Time	13:31	
Weather	Cloudy	
Total Time (minutes)	284.0	
Number of Points	24	
Barometric Pressure (inches Hg)	29.52	
Static Pressure (inches H_2O)	0.05	
Stack Dimensions (feet) L X W	178.00	10.00
Nozzle Diameter (inches)	0.680	
Meter Y Factor	1.003	
Pitot Factor	0.84	
Final Meter Reading (ft^3)	467.500	
Initial Meter Reading (ft^3)	243.300	
Condensate (ml)	127	
Silica Gel Weight (grams)	43.0	
Carbon Dioxide (%)	0.5	
Oxygen (%)	20.5	
Carbon Monoxide (%)	0.0	
Nitrogen (%)	79.0	
Filter Weight (grams)	0.0009	
Prefilter Weight (grams)	0.0051	

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Field Data Points - PM Run 3 **Gerdau Ameristeel US, Inc.** **Baghouse Number 2**

Port	Traverse Point		Meter Orifice (inches H_2O)	Stack Temperature (^oF)	Meter Inlet Temperature (^oF)	Meter Outlet Temperature (^oF)	
13	1		2.2	150	92	94	
	2		2.2	182	108	94	
	3		2.2	200	117	95	
	4		2.2	210	119	97	
14	1		2.1	193	115	101	
	2		2.1	192	120	102	
	3		2.1	163	121	102	
	4		2.1	161	124	103	
15	1		2.1	145	114	104	
	2		2.1	180	120	103	
	3		2.1	201	122	104	
	4		2.1	203	124	103	
16	1		2.1	196	117	104	
	2		2.1	194	121	103	
	3		2.1	163	124	104	
	4		2.1	188	126	104	
17	1		2.1	189	114	104	
	2		2.1	204	120	104	
	3		2.1	201	123	104	
	4		2.1	177	126	104	
18	1		2.1	181	118	105	
	2		2.1	176	122	105	
	3		2.1	190	124	104	
	4		2.1	204	121	104	
	4		2.1	200	120	103	
	3		2.1	219	124	103	
	2		2.1	203	126	105	
	1		2.1	206	127	107	
17	1		2.1	165	120	109	

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PM Summary Run 3

Facility	Gerdau Ameristeel US, Inc.	**Source**	Baghouse Number 2
Location	Jackson, Tennessee	**Start Time**	8:29
Source	Baghouse Number 2	**Finish Time**	13:31
Run Date	7/11/2013	**Weather**	Cloudy

(Θ) Total Time (minutes)	284	**Impinger Condensate (g or ml)**	127.0
(P_{bar}) Barometric Pressure (inches Hg)	29.52	**Silica Gel Condensate (g)**	43.0
(L) Stack Length (feet)	178.00	**(V_{lc}) Condensate Volume (ml)**	170.0
(W) Stack Width (feet)	10.00	**Carbon Dioxide (%)**	0.5
(A) Stack Area (ft^2)	1780.000	**Oxygen (%)**	20.5
(A_n) Nozzle Area (ft^2)	0.0025220	**Carbon Monoxide (%)**	0.0
(n) Number of Points	24	**Nitrogen (%)**	79.0
(Y) Meter Correction	1.003	**(V_m) Volume Metered (ft^3)**	224.200
Nozzle Diameter (inches)	0.680	**(ΔH_{avg}) Delta H (inches H_2O)**	2.1138
(Cp) Pitot Correction Factor	0.84	**(P_g) Static Pressure (inches H_2O)**	0.05
Filter Weight (grams)	0.0009	**(P_s)Stack Pressure (inches Hg)**	29.52
(m_s) Prefilter Weight (grams)	0.0051	**($T_{s(abs)}$) Stack Temp (°R)**	647.4
(m_n) Total Particulate (grams)	0.0060	**(T_m) Meter Temp (°R)**	571.2

($V_{w(std)}$) Volume Water Vapor, SCF	8.002
($V_{m(std)}$) Gas Volume Sampled, STPD	206.100
Total Volume, STP	214.102
(B_{ws}) Moisture in stack gas, volume fraction	0.037
(B_{wd}) Dry Stack Gas, volume fraction	0.963
(M_d) Molecular Weight of Stack Gas (Dry Basis)	28.90
(M_s) Molecular Weight of Stack Gas (Stack conditions)	28.49
(G_s) Specific gravity of Stack Gas Relative to Air	0.983
(v_s) Average Stack Velocity, FPM	365.7
(Q_s) Actual Stack Gas Flow Rate, ACFM	650896
(Q_d) Actual Stack Gas Flow Rate, ACFMD	626569
($Q_{d(std)}$) Stack Gas Flow Rate, SCFMD	504205
($Q_{s(std)}$) Stack Gas Flow Rate Wet, SCFMW	523780
(I) Percent Isokinetic	102

Stack Emissions:	**(C_s) Grains per DSCF**	0.0004
	(Em) Pounds per Hour	1.94

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Velocity Traverse

Plant: Gerdau Jackson Date: 7/10-11/13

Source: BH #2 Inlet Magnehelic ID: F78/R48 Silver Box

Stack Diameter: 150 Pitot ID 15-1 Thermocouple ID 15-1
7-10-13 7-10-13 7-11-13

Run 1			Run 2			Run 3		
Static Pressure		-18.0	Static Pressure		-17.0	Static Pressure		-14.5
Start		0654	Start		1335	Start		0834
Stop		0706	Stop		1344	Stop		0845
Barometer (in. Hg)		29.51	Barometer (in. Hg)		29.54	Barometer (in. Hg)		29.51
Wet Bulb (WB)		N/A	Wet Bulb (WB)		N/A	Wet Bulb (WB)		N/A
Dry Bulb (DB)		N/A	Dry Bulb (DB)		N/A	Dry Bulb (DB)		N/A
Traverse Point No.	Velocity Head	Stack Temp Deg F	Traverse Point No.	Velocity Head	Stack Temp Deg F	Traverse Point No.	Velocity Head	Stack Temp Deg F
Bottom 1	1.6	280	1	2.2	214	1-1	2.0	238
2	2.0	277	2	2.3	211	2	2.4	239
3	1.9	260	3	2.1	208	3	2.3	236
4	1.9	243	4	2.2	198	4	2.3	230
5	3.0	162	5	2.8	158	5	2.8	170
6	2.6	150	6	2.9	149	6	2.9	154
7	2.1	142	7	2.1	142	7	2.2	137
8	3.1	113	8	2.2	126	8	2.0	104
side 1	1.2	231	1	1.6	199	2-1	1.7	284
2	1.5	231	2	1.8	209	2	1.9	304
3	1.7	230	3	1.8	220	3	2.0	289
4	2.2	217	4	2.0	231	4	2.2	274
5	2.6	196	5	2.3	201	5	2.0	227
6	2.7	192	6	2.0	199	6	1.9	229
7	1.6	195	7	1.9	207	7	1.8	225
8	1.8	186	8	2.2	209	8	2.2	205

Velocity Traverse Rev 2, 102608

SOURCE SAMPLING FIELD DATA SHEET

AASI Ambient Air Services, Inc
Environmental Consulting and Engineering
106 Ambient Airway
Starke, FL 32091
Phone (904) 964-8440
www.ambientairservices.com

Facility	Gerdau Jackson TN			Run No.	1
Source	Baghouse #2			Date	7/10/13
Weather	mostly cloudy and warm			Filter Number	~~5~~ 3446
Testers	J. Jory	Test(s)	5D, 12	Barometric Pressure	29.58

Equipment Identification	Pitot	NA	Probe	9C	Heater Box	4	Meter Box	4	Cold box	1	
Thermocouple Identification	Stack	9C	Impinger	P	Heater Box	HB4	Meter In	M4-1	Meter Out	M4-2	
Sampling	Total min (Θ)	240	Total Points (n)	24					Min/Pt	10	
Profile	Stack Diameter (in) (D)	—	Downstream Dia.	—					Upstream Dia.	—	
Nozzle Diameter (avg) (D_n)	0.680	Nozzle Diameter Calibration Checks		1	0.680	2	0.680	3	0.681		
	Pre T_s	—	Pre T_m	—	Pre Dry Stack Gas (B_{wd})	—	Meter (ΔHa)	1.963	Meter (Y)	1.003	
	$a = (D_n^2 X B_{wd})^2$		$b = (1.6+B_{wd})T_s$		$c = T_m X \Delta H_a$		$F = 1570(aXc)/b$		Isokinetic Rate Factor		
Isokinetic Factor Calculation	—		—		—		—		setting 2.0		
Start Time	0848	Final Meter Reading (ft3)	1005.559		Orsat/Fyrite/ Analyzer		O_2 (%)	20.5	Comments:		
Finish Time	1331	Initial Meter Reading (ft3)	794.100				CO_2 (%)	0.5			

Pre Test Leak Check	Post Test Leak Check	Static Pressure	Pitot Leak Check	Volume H_2O Collected	
0.008 cfm@15"Hg	0.011 cfm@ 9 "H_g	+0.05 "H_2O	N/A at 3"	Silica Gel Weight	97 ml / 48.7 gr

Port and Sample Point	Clock Time (min)	Gas Meter Reading (cfm)	Stack Velocity (in H_2O)	Orifice Pressure Drop (in H_2O)	Vacuum (in H_g)	Stack Gas Temp (°F)	Filter Temp (°F)	Last Impinger Temp (°F)	Meter Temp (°F)	Meter Temp (°F)	
1-1	0	794.1	N/A	2.0	7	158	267	67	91	91	
2	10	800.7		2.0	7	184	254	65	104	90	
3	20	808.3		2.0	7	191	243	62	113	91	
4	30	816.0		2.0	7	198	244	63	115	93	
2-1	40	823.6		2.0	7	185	233	65	110	96	
2	50	831.3		2.0	<8	187	249	66	118	97	
3	60	839.1		2.0	<8	171	246	69	118	98	
4	70	846.9		2.0	<8	178	244	61	118	98	
3-1	80	854.6		2.0	<8	203	235	56	112	98	
2	90	862.4		2.0	<8	205	252	57	117	98	
3	100	870.1		2.0	<8	215	246	57	117	98	
4	110	878.9		2.0	7.5	200	245	57	118	98	
4-1	~~#100~~	885.6	↓	2.0	7.5	184	241	55	111	98	

Method 5 Field Data Sheet Rev 3, 031008

SOURCE SAMPLING FIELD DATA SHEET

AASI
Ambient Air Services, Inc
Environmental Consulting and Engineering
106 Ambient Airway
Starke, FL 32091
Phone (904) 964-8440
www.ambientairservices.com

Facility	Gerdau Jackson TN			Run No.	1
Source	EAF Baghouse #2			Date	7/10/13
Weather	Ovc, warm lt w wind			Filter Number	
Testers	J. Jory	Test(s)	Sd/12	Factor	Setting 2.0

Port and Sample Point	Clock Time (min)	Gas Meter Reading (cfm)	Stack Velocity (in H_2O)	Orifice Pressure Drop (in H_2O)	Vacuum (in H_g)	Stack Gas Temp (°F)	Filter Temp (°F)	Last Impinger Temp (°F)	Meter Temp (°F)	Meter Temp (°F)	
4-2	130	893.3	NA	2.0	7.5	153	246	57	115	98	
3	140	901.1		2.0	7.5	173	243	56	117	98	
4	150	908.8		2.0	7.5	183	244	56	117	98	
5-1	160	916.5		2.0	7.5	189	242	56	116	100	
2	170	924.3		2.0	<8	189	247	57	122	101	
3	180	932.1		2.0	<8	188	244	58	125	103	
4	190	939.9		2.0	<8	178	242	59	126	105	
6-1	200	947.7		2.0	<8	157	242	60	119	107	
2	210	955.4		2.0	7.5	170	245	60	121	106	
3	220	963.2		2.0	7.5	185	247	61	122	106	
4	230	971.1		2.0	7.5	194	246	61	124	106	
4	240	978.9		2.0	7.5	209	239	62	121	105	
3	250	986.9		2.0	7.5	202	244	62	123	105	
2	260	994.7		2.0	7.5	200	246	62	123	104	
1	270	1002.5		2.0	7.5	168	245	62	123	105	
	274	1005.58									

Method 5 Field Data Sheet Rev 3, 031008

SOURCE SAMPLING FIELD DATA SHEET

AASI Ambient Air Services, Inc. Environmental Consulting and Engineering
106 Ambient Airway
Starke, FL 32091
Phone (904) 964-8440
www.ambientairservices.com

Facility	Gerdau Jackson TN					Run No.	2		
Source	EAF Baghouse #2					Date	7/10/13		
Weather	mostly Cloudy warm					Filter Number	5355		
Testers	J. Jory	Test(s)	5d/12			Barometric Pressure	29.40		
Equipment Identification	Pitot N/A	Probe	9C	Heater Box	4	Meter Box	4	Cold box	1
Thermocouple Identification	Stack 9C	Impinger	ρ	Heater Box	HB4	Meter In	M4-1	Meter Out	M4-2
Sampling	Total min (Θ) 240	Total Points (n)	24			Min/Pt	10		
Profile	Stack Diameter (in) (D) —	Downstream Dia.	—			Upstream Dia.	—		
Nozzle Diameter (avg) (D_n)	0.680	Nozzle Diameter Calibration Checks	1	0.680	2	0.680	3	0.680	
Isokinetic Factor Calculation	Pre T_s —	Pre T_m —	Pre Dry Stack Gas (B_{wd}) —			Meter (ΔHa)	1.963	Meter (Y)	1.003
	$a = (D_n^2 X B_{wd})^2$	$b = (1.6+B_{wd})T_s$	$c = T_m X \Delta H_a$		$F = 1570(aXc)/b$			Isokinetic Rate Factor	
	—	—	—		—			setting 2.2	
Start Time	1434	Final Meter Reading (ft3)	242.400	Orsat/Fyrite/Analyzer	O_2 (%)	20.8	Comments:		
Finish Time	2014	Initial Meter Reading (ft3)	6.400		CO_2 (%)	0.5			
Pre Test Leak Check	Post Test Leak Check	Static Pressure	Pitot Leak Check		Volume H_2O Collected	130 ml			
0.018 cfm@15"Hg	0.007 cfm@ 8 "Hg	+0.05 "H_2O	N/A at 3"		Silica Gel Weight	47.9 gr			

Port and Sample Point	Clock Time (min)	Gas Meter Reading (cfm)	Stack Velocity (in H_2O)	Orifice Pressure Drop (in H_2O)	Vacuum (in H_g)	Stack Gas Temp (°F)	Filter Temp (°F)	Last Impinger Temp (°F)	Meter Temp (°F)	Meter Temp (°F)	
7-1	0	6.4		2.2	<6	173	243	68	99	98	
2	10	14.0		2.2	<6	187	242	56	110	98	
3	20	22.1		2.2	<6	187	247	52	116	98	
4	30	30.3		2.2	<6	178	248	54	119	99	
8-1	40	38.1		2.2	<6	212	243	57	118	100	1531 pause
2	50	46.2		2.2	6	174	246	64	107	101	1541 resume
3	60	54.4		2.2	6	197	230	57	122	101	
4	70	62.6		2.2	6	171	243	57	127	103	
9-1	80	70.1		2.2	6.5	184	243	62	120	103	
2	90	78.8		2.2	7	192	246	40	126	104	
3	100	87.0		2.2	7	199	246	62	129	105	
4	110	95.2		2.2	7	198	246	63	132	106	
10-1	120	103.4		2.2	7.5	193	247	59	130	107	

SOURCE SAMPLING FIELD DATA SHEET

AASI Ambient Air Services, Inc
Environmental Consulting and Engineering
106 Ambient Airway
Starke, FL 32091
Phone (904) 964-8440
www.ambientairservices.com

Facility	Gerdau Jackson TN	Run No.	2
Source	EAF Baghouse #2	Date	7/10/13
Weather	Mostly Clear, hot, lt wind	Filter Number	5355
Testers	J. Sory Test(s) 5d/12	Factor	Setting 2.2

Port and Sample Point	Clock Time (min)	Gas Meter Reading (cfm)	Stack Velocity (in H_2O)	Orifice Pressure Drop (in H_2O)	Vacuum (in H_g)	Stack Gas Temp (°F)	Filter Temp (°F)	Last Impinger Temp (°F)	Meter Temp (°F)	Meter Temp (°F)	
10-2	130	111.6	NA	2.2	7.5	182	244	56	128	107	
3	140	119.9			7.5	168	245	55	128	107	
4	150	128.2			7.5	175	244	54	126	107	
11-1	160	136.3			7.5	202	240	55	120	106	
2	170	144.6			7.5	196	249	54	126	106	1751 pause
3	180	148.7			7.5	186	247	54	125	105	1758 resume
4	190	161.80			7.5	204	244	54	130	106	
12-1	200	169.1			7.5	204	242	57	126	106	
2	210	177.2			7.5	198	249	57	132	108	
3	220	185.5			7.5	199	248	58	133	109	
4	230	193.7			7.5	200	246	59	134	109	
4	240	201.8	V	V	7.5	212	247	59	134	110	
3	250	210.0			7.5	194	245	59	131	110	
2	260	218.3			7.5	210	245	59	129	109	
1	270	226.5			7.5	201	245	59	130	109	1935 pause 1953 resume
11-1	280	234.4			7.5	188	246	59	113	105	
	290	242.400									

Method 5 Field Data Sheet Rev 3, 031008

SOURCE SAMPLING FIELD DATA SHEET

AASI Ambient Air Services, Inc. Environmental Consulting and Engineering
106 Ambient Airway
Starke, FL 32091
Phone (904) 964-8440
www.ambientairservices.com

Facility	Gerdau Jackson TN					Run No.	3				
Source	EAF baghouse #2					Date	7/11/13				
Weather	Sunny & Hot No wind					Filter Number	53813				
Testers	J. Jory		Test(s)	5d/12		Barometric Pressure	29.52				
Equipment Identification	Pitot	NA	Probe	9C	Heater Box	4	Meter Box	4	Cold box	1	
Thermocouple Identification	Stack	9C	Impinger	4	Heater Box	HB4	Meter In	M4-1	Meter Out	M4-2	
Sampling	Total min (Θ)	240	Total Points (n)		~~240~~ 24			Min/Pt	10		
Profile	Stack Diameter (in) (D)	—	Downstream Dia.		—			Upstream Dia.	—		
Nozzle Diameter (avg) (D_n)	0.680	Nozzle Diameter Calibration Checks	1	0.680	2	0.680	3	0.680			
Isokinetic Factor Calculation	Pre T_s	—	Pre T_m	—	Pre Dry Stack Gas (B_{wd})	—	Meter (ΔHa)	1.963	Meter (Y)	1.003	
	$a = (D_n^2 X B_{wd})^2$		$b = (1.6+B_{wd})T_s$		$c = T_m X \Delta H_a$		$F = 1570(aXc)/b$		Isokinetic Rate Factor		
	—		—		—		—		Setting 2.1		
Start Time	0829	Final Meter Reading (ft3)	467.500		Orsat/Fyrite/ Analyzer		O_2 (%)	20.5	Comments:		
Finish Time	1331	Initial Meter Reading (ft3)	243.300				CO_2 (%)	0.5			
Pre Test Leak Check	Post Test Leak Check	Static Pressure	Pitot Leak Check		Volume H_2O Collected						
0.020 cfm@15"Hg	0.003 cfm@ ~~5~~ 8 "Hg	+0.05 "H_2O	N/A at 3"		Silica Gel Weight				127 ml 43.0 gr		

Port and Sample Point	Clock Time (min)	Gas Meter Reading (cfm)	Stack Velocity (in H_2O)	Orifice Pressure Drop (in H_2O)	Vacuum (in H_g)	Stack Gas Temp (°F)	Filter Temp (°F)	Last Impinger Temp (°F)	Meter Temp (°F)	Meter Temp (°F)	
13-1	0	243.3		2.2	6	150	242	48	92	94	
2	10	251.5		2.2	6	182	241	44	108	94	
3	20	259.5		2.2	6	200	241	45	117	95	
4	30	267.5		2.2	6.5	210	243	46	119	97	
14-1	40	275.5		2.1	6	193	235	47	115	101	
2	50	283.4		2.1	6	192	242	47	120	102	
3	60	291.3		2.1	6	163	243	47	121	102	
4	70	299.2		2.1	6	161	243	48	124	103	
15-1	80	307.1		2.1	5.5	145	238	49	114	104	
2	90	315.0		2.1	5.5	180	242	48	120	103	
3	100	322.9		2.1	5.5	201	243	48	122	104	
4	110	330.8		2.1	5.5	203	243	48	124	103	
16-1	120	338.6		2.1	5.5	196	239	49	117	104	

SOURCE SAMPLING FIELD DATA SHEET

AASI Ambient Air Services, Inc.
Environmental Consulting and Engineering
106 Ambient Airway
Starke, FL 32091
Phone (904) 964-8440
www.ambientairservices.com

Facility	Gerdau Ds Jackson TN	Run No.	3
Source	EAF baghouse # 2	Date	7/11/13
Weather	mostly cloudy, warm 4 wind	Filter Number	5383
Testers	J. Jory	Test(s)	12/12	Factor	Setting 2.1

Port and Sample Point	Clock Time (min)	Gas Meter Reading (cfm)	Stack Velocity (in H_2O)	Orifice Pressure Drop (in H_2O)	Vacuum (in H_g)	Stack Gas Temp (°F)	Filter Temp (°F)	Last Impinger Temp (°F)	Meter Temp (°F)	Meter Temp (°F)	
16-2	130	346.4		2.1	5.5	194	244	48	121	103	
3	140	354.3		2.1	5.5	163	244	49	124	104	
4	150	362.2		2.1	5.5	188	243	49	126	104	
17-1	160	370.0		2.1	5.5	189	231	53	114	104	
2	170	377.8		2.1	5.5	204	244	52	120	104	
3	180	385.8		2.1	5.5	201	242	54	123	104	
4	190	393.7		2.1	5.5	177	243	56	126	104	1151 Pause 1153 resume
18-1	200	401.4		2.1	5.5	181	235	62	118	105	
2	210	409.2		2.1	5.5	176	241	59	122	105	
3	220	417.1		2.1	5.5	190	238	60	124	104	
4	230	425.0		2.1	5.5	204	247	60	121	104	
4	240	432.9		2.1	5.5	200	244	60	120	103	
3	250	440.8		2.1	5.5	219	245	60	124	103	
2	260	448.7		2.1	6	203	248	60	126	105	
1	270	456.6		2.1	6	206	244	62	127	107	
17-1	280	464.5		2.1	6	165	246	59	120	109	
	284	467.500									

Ambient Air Services, Inc.

Analytical Report

Client:	Gerdau Ameristeel US, Inc.			Date Collected:	7/11-12/13
Source:	EAF Baghouse Number 2			Date Processed:	7/16/2013
Balance:	Make:	AND		Date Weighed:	7/18/2013
	Model:	ER120A		units:	grams
	Serial Number:	3502688			

Analysis Method: USEPA Method 5

Filterable Particulate Matter

Filter Weights

Sample Name	Run Number	Result (grams)	Q	MRL	MDL	Matrix	Comments
5346	1	0.0041		0.0010	0.0001	Glass	
5355	2	0.0164		0.0010	0.0001	Glass	
5383	3	0.0009	j	0.0010	0.0001	Glass	

Prefilter Weights

Sample Name	Run Number	Result (grams)	Q	MRL	MDL	Matrix	Comments
G704	1	0.0075		0.0010	0.0001	Acetone	
G705	2	0.0094		0.0010	0.0001	Acetone	
G706	3	0.0051		0.0010	0.0001	Acetone	
G707	Blank	0.0002	j	0.0010	0.0001	Acetone	

Silica Gel Weights

Sample Name	Run Number	Result (grams)	Q	MRL	MDL	Matrix	Comments
1	1	48.7		0.5	0.1	Silica Gel	
2	2	47.9		0.5	0.1	Silica Gel	
3	3	43.0		0.5	0.1	Silica Gel	

Processed by: Martin Rosier Date: 7/22/2013

Quality Assurance: David C. Shelton Date: 8/1/2013

`

Acronyms

MRL	Method Reporting Limit
MDL	Method Detection Limit

Data Qualifiers (Q)

ND	Not Detected
j	The result is between the MDL and the MRL
#	The control limit criteria was exceeded

Method 5 Lab
Template
Rev 2, 020812

Raw Data Entry

CLIENT	Gerdau Ameristeel US, Inc.			
SOURCE	EAF Baghouse Number 2			
DATE COLLECTED	7/11-12/13			
DATE PROCESSED	7/16/2013			
DATE Weighed	7/18/2013			
Filter Media:	Glass			
PM Filter	**R-1**	**R-2**	**R-3**	**R-4**
Filter No.	5346	5355	5383	
Final wt.(grams)	0.4356	0.4476	0.4252	
Tare Wt.(grams)	0.4315	0.4312	0.4243	
Net Wt. (grams)	**0.0041**	**0.0164**	**0.0009**	
PM Wash Weight	**R-1**	**R-2**	**R-3**	**R-4**
Sample No.	G704	G705	G706	
Sample Volume(ml)	67	79	112	
Final wt.(grams)	112.761	111.3608	115.0458	
Tare Wt.(grams)	112.7534	111.3512	115.0405	
Blank Correction	0.0001	0.0002	0.0002	
Net gain (grams)	**0.0075**	**0.0094**	**0.0051**	

Reagent Blank

Reagent	Acetone
Sample No.	G707
Sample Volume(ml)	100
Final wt.(grams)	109.2742
Tare Wt.(grams)	109.2740
Net gain (grams)	**0.0002**

Silica	**R-1**	**R-2**	**R-3**	**R-4**
Sample No.	1	2	3	
Final wt.(grams)	411.3	410.6	404.6	
Tare Wt.(grams)	362.6	362.7	361.6	
Net gain (grams)	**48.7**	**47.9**	**43.0**	

Technician MR

QA David C. Shelton 8/1/2013

Ambient Air Services, Inc.

Quality Assurance Balance Check Report

Client:	Gerdau Ameristeel US, Inc.			Date Collected:	7/11-12/13
Source:	EAF Baghouse Number 2			Date Processed:	7/16/2013
Balance:	Make:	AND		Date Weighed:	7/18/2013
	Model:	ER120A		units:	grams
	Serial Number:	3502688			

Analysis Method: USEPA Method 5

Quality Assurance Balance Checks

Weight Set ID	Audit Weight	Scale Weight	Q	Difference	Limits	Comments
S-2	100.0000	99.9998		-0.0002	0.0004	
S-2	10.0000	10.0000		0.0000	0.0004	
S-2	5.0000	5.0000		0.0000	0.0004	
S-2	2.0000	2.0000		0.0000	0.0004	
S-2	0.5000	0.5001		0.0001	0.0004	

Technician: Martin Rosier Date: 7/18/2013

Quality Assurance: Date: 8/1/2013

Method 5 Lab
Template
Rev 2, 020812

Ambient Air Services, Inc
106 Ambient Airway Starke, FL 32091 (904) 964-8440 FAX: (904) 964-6675

No. 2 Baghouse

Chain of Custody & Analysis Request

Project Name: Gerdau Jackson — Location: Jackson, TN

Laboratory Name: ALS
Address:
Lab Contact: Jerry Aller
Project #

Samplers: DO, JS

Page 2 of 2
RUSH!
Standard X
Date Report Desired:

Sample ID	Sample Date	Source	Run	Method	Type	Matrix	Number of Containers	Required Analysis: Gravimetric	Required Analysis: Pb
5346	7/11/13	No.2 Baghouse	1	12	Pb	filter	1		X
FH-1-BH2			1			0.1N HNO_3	1		X
BH-1-BH2			1			↓	1		X
5355			2			filter	1		X
FH-2-BH2			2			0.1N HNO_3	1		X
BH-2-BH2	↓		2			↓	1		X
5383	7/12/13		3			filter	1		X
FH-3-BH2			3			0.1N HNO_3	1		X
BH-3-BH2	↓	↓	3		↓	↓	1		X
				↓					
BH2-Blank	7/11/13	↓	Blank	12	Pb	0.1N HNO_3	1		X

Remarks: Please record volume of liquid

Relinquished by:	Printed Name: Daniel Ockerhouse	Time 1540	Received by: Printed Name: Adria Alvarez
	Signature:	Date 7/25/13	Signature:
	Affiliation: AAST		Affiliation: ALS
Relinquished by:	Printed Name:	Time	Received by: Printed Name:
	Signature:	Date	Signature:
	Affiliation:		Affiliation:

Time 1540
Date 7/25/13

For Lab Use Only

Sample Integrity: (Note here any damage or loss during transport)

Lab results issued to:
By: When:
Disposition of samples to others:
Where stored:

Remarks:

Chain of Custody Analysis Request Form
Rev 6 020612

Calibration Report

LOCATION : Ambient Air Services, Inc.

MAKE : AND

N.I.S.T. TRACEABILITY NO.: **1308**

MODEL : ER120A

SERIAL NO. : 3502688

FOR COMPLIANCE WITH : **I.S.O. 9002**
MIL-STD 45662A

ENVIRONMENTAL CONDITIONS : 22° C, 34% RH

READABILITY : 0.0001 g

	BEFORE CALIBRATION	AFTER CALIBRATION
MICROMETER ERROR :	N/A	N/A
SCALE DEFLECTION :	110.0008 g	110.0000 g
MID - SCALE READING :	55.0004 g	55.0000 g
LINEARITY :	±0.0001 g	±0.0001 g
DEF. AT FULL TARE :	N/A	N/A
DEF. AT CAPACITY :	N/A	N/A
TIME TO STABILITY :	<15 sec	<15 sec
ARM LENGTH ERROR :	N/A	N/A
CORNER LOAD ERROR :	0.0004 %	0.0002 %
STANDARD DEVIATION :	0.110 mg @ 20 g	0.088 mg @ 20 g
CAL. WEIGHT ERROR :	-0.4 mg	<0.1 mg
ACCUMULATIVE ERROR OF DIAL WEIGHTS BY DECADE :	N/A	N/A

NOTES : Cleaned, inspected and calibrated. Balance was exercised prior to testing. Standard deviation determined using filter paper and 20 g load. Adjusted corner load and internal calibration weight value.

SERVICED BY : JOHN P. MULLER ASSOC., DECORAH, IA 52101-0583

TECHNICIAN'S INITIALS AND SERVICE DATE: JPS **2/18/13**

Mass II Calibration Certificate 1308

Missouri Department of Agriculture
Weights, Measures and Consumer Protection, Metrology Laboratory
Location: 1616 Missouri Blvd., Jefferson City, MO 65109
Mailing Address: PO Box 630 Jefferson City, MO 65102
Telephone (573) 751-3440 or (573) 751-9487

Fred Bryant, John P Muller & Associates, 507 Franklin Street, Decorah, IA 52101-1709
Phone Number: 813-786-8345, Customer Number: 628, Submission Date: 3/22/12

Procedure is NISTIR 5672 SOP 5. The 3-1 weighing design is a combination of three double substitution comparisons of three weights of equal nominal value; a standard, an unknown weight, and a second standard which can be a summation of weights. The Missouri metrology laboratory has demonstrated measurement proficiency through training and interlaboratory comparisons compliant to NIST HB 143:2007 (ISO/IEC 17025:2005): Laboratory standards used for comparison are traceable to the National Institute of Standards and Technology (NIST). Traceable test numbers: NIST(39598); NIST(822/259883-98); NIST(822/274998-07); OK(OBS 11-0913).

The Kragten method was used to quantify the measurement uncertainty and estimate the magnitude of each uncertainty component. Uncertainty conforms to NIST Technical Note 1297 *"Guidelines for Evaluating and Expressing the Uncertainty of Measurement Results."* Uncertainty is multiplied by Technical Note 1297 Table B.1 coverage factor for an approximate 95 % confidence level.

Conditions During Test (Temperature 21.2 to 22.6 °C) (Barometric Pressure 741.4 to 750.5 mmHg) (Humidity 41.4 to 47.8 %)

Weight Manufacturer: Troemner Condition: good Weight set ID/Serial: Master Set

Calibrating Metrologist: Bob Wittenberger Laboratory Manager:

Conventional Mass (Mass in air versus reference density of 8.0 g/cm^3), represents the mass at exactly 20°C, atmospheric pressure of 760.5 mmHg, and a relative humidity of 50%. Formula to calculate True Mass = weight's conventional mass/(1- 0.0012/weight's density) x 0.99985

Remarks All weights were adjusted to meet ASTM Class 1 tolerance.

This document shall not be reproduced except in full or used to claim product endorsement by this laboratory without written approval from the Missouri Metrology Laboratory.

Certificate 1308 Fred Bryant, John P Muller & Associates Weight set ID/Serial: Master Set

Test Date	Standard Serial/ID	Nominal Value	Conventional Mass (Mass vs 8.0 g/cm^3) As Found	If Adjusted	Correction	Density g/cm^3	Tolerance Applied		Measurement Uncertainty	Comparator Used For Test
4/3/12		1 kg		1000.00018 g	0.18 mg	7.84	ASTM 1	2.5 mg	0.33 mg	Mettler AT1005
4/3/12		500 g		499.99946 g	-0.54 mg	7.84	ASTM 1	1.2 mg	0.16 mg	Mettler AT1005
4/3/12		200 g		199.999932 g	-0.068 mg	7.84	ASTM 1	0.5 mg	0.074 mg	Mettler AT1005
4/3/12	*	200 g		200.000207 g	0.207 mg	7.84	ASTM 1	0.5 mg	0.073 mg	Mettler AT1005
4/5/12		100 g		100.000074 g	0.074 mg	7.84	ASTM 1	0.25 mg	0.035 mg	Mettler AT106
4/5/12		50 g		50.000089 g	0.089 mg	7.84	ASTM 1	0.12 mg	0.019 mg	Mettler AT106
4/5/12		20 g		20.0000152 g	0.0152 mg	7.84	ASTM 1	0.07 mg	0.0091 mg	Mettler AT106
4/5/12	*	20 g		19.9999828 g	-0.0172 mg	7.84	ASTM 1	0.07 mg	0.009 mg	Mettler AT106
4/5/12		10 g		10.0000233 g	0.0233 mg	7.84	ASTM 1	0.05 mg	0.0058 mg	Mettler AT106
4/6/12		5 g		5.0000127 g	0.0127 mg	7.84	ASTM 1	0.03 mg	0.0029 mg	Mettler UMT5
4/6/12		2 g		2.0000107 g	0.0107 mg	7.84	ASTM 1	0.03 mg	0.0015 mg	Mettler UMT5
4/6/12	*	2 g		2.0000188 g	0.0188 mg	7.84	ASTM 1	0.03 mg	0.0015 mg	Mettler UMT5
4/6/12		1 g		1.0000072 g	0.0072 mg	7.84	ASTM 1	0.03 mg	0.0014 mg	Mettler UMT5

TROEMNER
Henry Troemner LLC

Traceable Certificate

201 Wolf Drive • P.O. Box 87 • Thorofare, NJ 08086-0087 • Phone:856-686-1600 • Fax: 856-686-1601 • www.troemner.com • e-mail: troemner@troemner.com

Weight

ID Number	TS-1250
Serial Number	S1
Order Number	DCS110612
Certificate Number	692779
Date Of Calibration	13-NOV-2012
Calibration Due Date	13-NOV-2013
As Found	Out of Tolerance
As Left	In Tolerance, Adjusted

Ambient Air Services Inc
106 Ambient Airway
Starke, FL 32091

Description of Weights: Analytical Weight Set

Material	Assumed Density at 20°C	Range
Stainless Steel (mg)	7.95 g/cm3	500mg
Stainless Steel	7.85g/cm3	1g-50g
Stainless Steel	8.03 g/cm3	100g

Tested with Reference Standards Traceable to the National Institute of Standards & Technology through NIST Test Number 822-275872-11.

We certify that the weights listed are calibrated to ASTM E617-97 Class 1 tolerances.

The calibration of these weights is based on apparent mass vs material of density 8.0g/cm3.

Nominal Mass Value	Serial Number	Correction before Calibration *	Correction after Calibration *	Tolerance (+ or -)	Uncertainty (+ or -)
100 g		-0.0571 mg	-0.0571 mg	0.250 mg	0.065 mg
50 g		+0.0226 mg	+0.0226 mg	0.120 mg	0.040 mg
10 g		-0.0031 mg	-0.0031 mg	0.050 mg	0.015 mg
5 g		-0.0418 mg	+0.0241 mg	0.034 mg	0.0075 mg
2 g		+0.0061 mg	+0.0061 mg	0.034 mg	0.0075 mg
500 mg		+0.0007 mg	+0.0007 mg	0.010 mg	0.0032 mg

* Correction is defined as the difference between the mass value of a weight and its nominal value. A positive correction indicates that the mass value is greater than the nominal value by the amount of the correction.

Lynn Dickerson, Metrologist, Approved Signatory

6 As Found / 6 Total

TROEMNER
Henry Troemner LLC

Traceable Certificate

201 Wolf Drive • P.O. Box 87 • Thorofare, NJ 08086-0087 • Phone:856-686-1600 • Fax: 856-686-1601 • www.troemner.com • e-mail: troemner@troemner.com

Weight

ID Number	TS-1250
Serial Number	S1
Order Number	DCS110612
Certificate Number	692779
Date of Calibration	13-NOV-2012
Calibration Due Date	13-NOV-2013
As Found	Out of Tolerance
As Left	In Tolerance, Adjusted

Ambient Air Services Inc
106 Ambient Airway
Starke, FL 32091

ADDENDUM

100g & 50g Weight(s) has/ have excessive wear

AMBIENT AIR SERVICES METHOD 5 PRE-TEST CONSOLE CALIBRATION

USING CALIBRATED CRITICAL ORIFICES

5-POINT ENGLISH UNITS

Meter Console Information	
Console Model	AASI
Console Serial Number	4
DGM Model Number	T-110
DGM Serial Number	10103917

Calibration Conditions			
Date	Time	12/27/2012	3:10
Barometric Pressure		29.90	in Hg
Theoretical Critical Vacuum[1]		14.1	in Hg
Calibration Technician		WLG	

Factors/Conversions		
Std Temp	528	°R
Std Press	29.92	in Hg
K_1	17.647	oR/in Hg

[1]For valid test results, the Actual Vacuum should be 1 to 2 in. Hg greater than the Theoretical Critical Vacuum shown above.

[2]The Critical Orifice Coefficient, K', must be entered in English units, $(ft^3 * {}^oR^{1/2})/(in.Hg * min)$.

Calibration Data

Run Time	Metering Console					Critical Orifice				
Elapsed	DGM Orifice ΔH	Volume Initial	Volume Final	Outlet Temp Initial	Outlet Temp Final	Serial Number	Coefficient	Amb Temp Initial	Amb Temp Final	Actual Vacuum
(Θ)	(P_m)	(V_{mi})	(V_{mf})	(t_{mi})	(t_{mf})		K'	(t_{amb})	(t_{amb})	
min	in H_2O	cubic feet	cubic feet	°F	°F		see above2	°F	°F	in Hg
6	4.3	858.979	865.561	71	71	73	0.8486	60	61	16
8	2.2	852.406	858.979	71	75	63	0.6213	60	60	19
10	1.4	839.399	845.662	71	71	55	0.4793	60	61	21
13	0.8	865.561	871.881	69	69	48	0.3740	60	61	23
19	0.4	871.881	878.146	67	67	40	0.2511	61	59	25

Results

Standardized Data				Dry Gas Meter				
				Calibration Factor		Flowrate	ΔH @	
Dry Gas Meter		Critical Orifice		Value	Variation	Std & Corr	0.75 SCFM	Variation
($V_{m(std)}$)	($Q_{m(std)}$)	($Vcr_{(std)}$)	($Q_{cr(std)}$)	(Y)	(ΔY)	($Q_{m(std)(corr)}$)	(ΔH@)	(ΔΔH@)
cubic feet	cfm	cubic feet	cfm		Note	cfm	in H2O	
6.610	1.102	6.673	1.112	1.010	0.006	1.112	1.986	0.023
6.542	0.818	6.517	0.815	0.996	-0.007	0.815	1.867	-0.095
6.245	0.624	6.282	0.628	1.006	0.003	0.628	1.998	0.036
6.316	0.486	6.372	0.490	1.009	0.005	0.490	1.877	-0.085
6.279	0.330	6.256	0.329	0.996	-0.007	0.329	2.084	0.121
				1.003	Y Average		1.963	ΔH@ Average

Note: For Calibration Factor Y, the ratio of the reading of the calibration meter to the dry gas meter, acceptable tolerance of individual values from the average is +-0.02.

I certify that the above Dry Gas Meter was calibrated in accordance with USEPA Methods, CFR 40 Part 60, using the Precision Wet Test Meter # 11AE6, which in turn was calibrated using the American Bell Prover # 3785, certificate # F107, which is traceable to the National Bureau of Standards (N.I.S.T.) and in accordance with AASI Shop SOP 3.3.B.

Technician Sign: William Garabrandt Date: 12/27/2012 Q A Signature: David C. Shelton Date: 1/8/2013

Meterbox pre-test
Template
Rev 1, 070808

AMBIENT AIR SERVICES METHOD 5 POST-TEST CONSOLE CALIBRATION
USING CALIBRATED CRITICAL ORIFICES
3-POINT ENGLISH UNITS

Ambient Air Services, Inc.
Environmental Consulting and Engineering

Meter Console Information	
Console Number	4
Pre-test "Y' value	1.003
DGM Model Number	T110
DGM Serial Number	10103917

Calibration Conditions			
Date	Time	7/19/2013	13:00
Barometric Pressure		28.93	in Hg
Theoretical Critical Vacuum[1]		13.7	in Hg
Calibration Technician	JJ	Project	Jackson BH2

Factors/Conversions		
Std Temp	528	^{o}R
Std Press	29.92	in Hg
K_1	17.647	oR/in Hg

[1]For valid test results, the Actual Vacuum should be 1 to 2 in. Hg greater than the Theoretical Critical Vacuum shown above.

[2]The Critical Orifice Coefficient, K', must be entered in English units, $(ft^3*^oR^{1/2})/(in.Hg*min)$.

Calibration Data										
Run Time	Metering Console					Critical Orifice				
Elapsed	DGM Orifice ΔH	Volume Initial	Volume Final	Outlet Temp Initial	Outlet Temp Final	Serial Number	Coefficient	Amb Temp Initial	Amb Temp Final	Actual Vacuum
(Θ)	(P_m)	(V_{mi})	(V_{mf})	(t_{mi})	(t_{mf})		K'	(t_{amb})	(t_{amb})	
min	in H_2O	cubic feet	cubic feet	^{o}F	^{o}F		see above2	^{o}F	^{o}F	in Hg
12	2.4	489.500	499.525	89	91	63	0.6213	86	87	18
12	2.4	499.525	509.560	91	92	63	0.6213	87	88	18
9	2.4	509.560	517.114	92	92	63	0.6213	88	88	18

Results								
Standardized Data				Dry Gas Meter				
				Calibration Factor		Flowrate	ΔH @	
Dry Gas Meter		Critical Orifice		Value	Variation	Std & Corr	0.75 SCFM	Variation
($V_{m(std)}$)	($Q_{m(std)}$)	($Vcr_{(std)}$)	($Q_{cr(std)}$)	(Y)	(ΔY)	($Q_{m(std)(corr)}$)	(ΔH@)	(ΔΔH@)
cubic feet	cfm	cubic feet	cfm		Note 1	cfm	in H2O	
9.362	0.780	9.226	0.769	0.985	0.001	0.769	2.147	0.001
9.346	0.779	9.218	0.768	0.986	0.001	0.768	2.145	-0.001
7.029	0.781	6.910	0.768	0.983	-0.002	0.768	2.145	-0.001
				0.985	Y Average (Note 2)		2.146	ΔH@ Average

Yc Calibration											
Elasped Time (> 10 min)	13	DGM Beginning	477.1	DGM End	487.022	Outlet Meter Temp Beginning	86	Outlet Meter Temp End	88	Yc	1.018

Note 1: For Calibration Factor Y, the ratio of the reading of the calibration meter to the dry gas meter, acceptable tolerance of individual values from the average is +-0.02.

Note 2: For Calibration Factor Y, the resulting average difference shall not more than + or - 5% of the Pre-test Y value.

I certify that the above Dry Gas Meter was calibrated in accordance with USEPA Methods, CFR 40 Part 60, using the Precision Wet Test Meter # 11AE6, which in turn was calibrated using the American Bell Prover # 3785, certificate # F107, which is traceable to the National Bureau of Standards (N.I.S.T.) and in accordance with AASI Shop SOP 3.3.B.

Technician Sign: JJ Date: 7/19/2013 Q A Signature: David C. Buttler Date: 8/1/2013

Ambient Air Services, Inc.

106 Ambient Airway

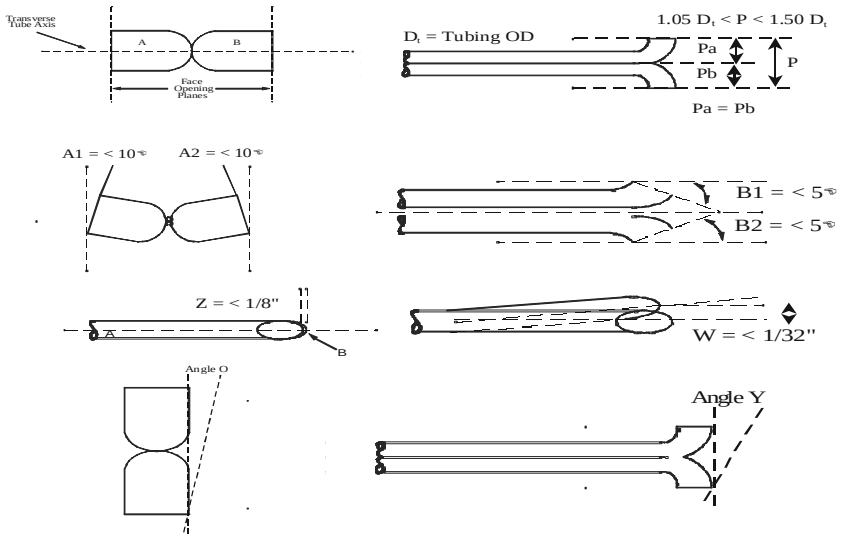
Starke, Florida 32091

PITOT TUBE POST TEST CALIBRATION FORM

Pitot ID	15-1			
Technician	JJ			
Project	Gerdau Jackson			
Date:	7/19/2013			
Pitot Assembly Level	Yes	X	No	
Pitot tube opening damaged or out-of-round	Yes		No	X
If damage is noted, comment below				

Pitot Measurements

Pitot tube outside diameter				**D_t**	0.375				
a1	0			**a2**	1				
b1	2			**b2**	0				
Pa	0.540			**Pb**	0.540				
P	1.08		Max	1.125		Min	0.7875		
Angle Y	0	Degrees	sin	0.000	**Angle O**	0	Degrees	sin	0.000
z = P sin Y	0.000	Inches		w = P sin O	0.000	Inches			
z = < 1/8 Inch				w = < 1/32 inch					



I certify that the measurements contained within this form was conducted correctly and within the guidelines of EPA Method 2.

Technician Signature:	JJ	Date:	7/19/2013
Quality Assurance Signature:	David C. Shelton	Date:	8/1/2013

Pitot Calibration Template
Rev 3, 020112

Ambient Air Services, Inc.

106 Ambient Airway
Starke, Florida 32091

Alternative (EMC ALT-011) Method 2 Thermocouple Calibration

Date	7/19/2013	Reference Thermometer	Type:	Ms in Glass	Manufacturer:	BCR	
Time	13:00		Serial number	208252			
Project	Gerdau Jackson Baghouse No.2	Pyrometer	Manufacturer	Model	Serial number		
Technician	JJ		Jenco	768	JC23838		

Thermocouple ID	Location	Indicated Temperature			Reference Temperature			Difference (must be ± 2°)			Continuity (Pass / Fail)		
9C	Stack		87.0			86			1			Pass	
HB4	Filter		88.0			87			1			Pass	
P	Impinger		86.0			87			1			Pass	
M4-1	Meter In		86.0			85			1			Pass	
M4-2	Meter Out		86.0			85			1			Pass	

Comments:

Technician Signature: JJ Date: 7/19/2013

Quality Assurance signature: David C. Shutter QA date: 8/1/2013

Thermocouple (EMC ALT-011) Calibration
Template
060112

Ambient Air Services, Inc.
106 Ambient Airway
Starke, Florida 32091

Alternative (EMC ALT-011) Method 2 Thermocouple Calibration

Date	7/21/2013	Reference Thermometer	Type:	Ms in Glass	Manufacturer:	BCR	
Time	11:30		Serial number	208252			
Project	Gerdau Jackson Inlet Ducts	Pyrometer	Manufacturer	Model	Serial number		
Technician	JJ		Omega	HH74K	110214		

Thermocouple ID	Location	Indicated Temperature			Reference Temperature			Difference (must be ± 2°)			Continuity (Pass / Fail)		
15-1	Stack		85.0			85			0			Pass	
	Filter												
	Impinger												
	Meter In												
	Meter Out												

Comments:

Technician Signature: JJ Date: 7/21/2013

Quality Assurance signature: David C. Shelton QA date: 8/1/2013

Thermocouple (EMC ALT-011) Calibration
Template
060112

Ambient Air Services, Inc.
106 Ambient Airway
Starke, Florida 32091

Magnehelic Calibration (Source)

Date:	7/21/2013	**Magnehelic serial number**	F78	**Range**	0-1
Standard Manometer ID:	Omega 0-6" IN3	**Calibration Technician:**	DO		
Client	Gerdau Jackson	**Project:**	Gerdau Jackson Baghouse Inlets		

Data Entry

Manometer Standard Value	**Magnehelic** (Display value) **Positive**	**Magnehelic** (Display value) **Negative**	**Percent Difference Positive**	**Percent Difference Negative**
0.3	0.3	0.3	0.0	0.0
0.6	0.6	0.61	0.0	1.7
0.9	0.92	0.91	2.2	1.1
Average % Difference			0.7	0.9

Technician Signature: DO
Date: 7/21/2013

Quality Assurance Review: David C. Shotton
Quality Assurance Date: 8/8/2013

Magnehelic Calibration (Source)
Template
Rev 3, 11/15/11

Ambient Air Services, Inc.
106 Ambient Airway
Starke, Florida 32091

Magnehelic Calibration (Source)

Date:	7/21/2013	**Magnehelic serial number**	R48	**Range**	0-3
Standard Manometer ID:	Omega 0-6" IN3	**Calibration Technician:**	DO		
Client	Gerdau Jackson	**Project:**	Gerdau Jackson Baghouse Inlets		

Data Entry

Manometer Standard Value	**Magnehelic** (Display value) **Positive**	**Magnehelic** (Display value) **Negative**	**Percent Difference Positive**	**Percent Difference Negative**
0.8	0.8	0.8	0.0	0.0
1.6	1.6	1.6	0.0	0.0
2.4	2.4	2.4	0.0	0.0
Average % Difference			0.0	0.0

Technician Signature: DO
Date: 7/21/2013

Quality Assurance Review: David C. Shelton
Quality Assurance Date: 8/8/2013

Magnehelic Calibration (Source)
Template
Rev 3, 11/15/11

Ambient Air Services, Inc.
106 Ambient Airway
Starke, Florida 32091

Magnehelic Calibration (Source)

Date:	7/21/2013	**Magnehelic serial number**	R48	**Range**	0-3
Standard Manometer ID:	Omega 0-6" IN3	**Calibration Technician:**	DO		
Client	Gerdau Jackson	**Project:**	Gerdau Jackson Baghouse Inlets		

Data Entry

Manometer Standard Value	**Magnehelic** (Display value) **Positive**	**Magnehelic** (Display value) **Negative**	**Percent Difference Positive**	**Percent Difference Negative**
0.8	0.8	0.8	0.0	0.0
1.6	1.6	1.6	0.0	0.0
2.4	2.4	2.4	0.0	0.0
Average % Difference			0.0	0.0

Technician Signature: DO
Date: 7/21/2013

Quality Assurance Review: David C. Shelton
Quality Assurance Date: 8/8/2013

Magnehelic Calibration (Source)
Template
Rev 3, 11/15/11

APPENDIX A.3
PARTICULATE MATTER AND LEAD DATA
ALS LABORATORY REPORT

Lead Calculations

ALS Laboratory Report

AASI

Lead (Pb) Calculations

Gerdau Ameristeel US, Inc.
Jackson, Tennessee
Baghouses Number 1 and Number 2
July 10 - 11, 2013

Baghouse 1

	Filter Number	Filter Weight (ug)	Beaker Number	Liquid Volume (ml)	Liquid Concentration (ug/L	Front Half Weight (ug)	Liquid Sample	Liquid Volume (ml)	Liquid Concentration (ug/L	Backhalf Weight (ug)	Blank Correction (ug)	Total Lead Weight (ug)
R-1	5319	63.2	FH-1-BH1	210.85	365	77.0	BH-1-BH1	527.29	53	27.9	0.7	168.1
R-2	5399	11.2	FH-2-BH1	273.38	56	15.3	BH-2-BH1	459.74	22	10.1	0.7	36.6
R-4	5385	5.9	FH-3-BH1	214.71	27	5.8	BH-3-BH1	522.97	27	14.1	0.7	25.8

Baghouse 2

	Filter Number	Filter Weight (ug)	Beaker Number	Liquid Volume (ml)	Liquid Concentration (ug/L	Front Half Weight (ug)	Liquid Sample	Liquid Volume (ml)	Liquid Concentration (ug/L	Backhalf Weight (ug)	Blank Correction (ug)	Total Lead Weight (ug)
R-1	5346	36.2	FH-1-BH2	212.62	84	17.9	BH-1-BH2	399.86	19	7.6	0.8	61.7
R-2	5355	288	FH-2-BH2	238.54	180	42.9	BH-2-BH2	529.05	7	3.7	0.8	334.6
R-3	5383	5.7	FH-3-BH2	246.82	26	6.4	BH-3-BH2	483.3	12	5.8	0.8	17.9

Blank Correction

Liquid Sample	Liquid Volume (ml)	Liquid Concentration (ug/L	Liquid Weight (ug)	Blank Correction (ug)
Pb-Blank BH1	183.45	4	0.7	0.7
Pb-Blank BH2	196.14	4	0.8	0.8

August 05, 2013 Service Request No:J1304264

Mr. Joseph Cooksey
Ambient Air Services, Inc.
106 Ambient Air Way
Starke, FL 32091

Laboratory Results for: Gerdau Jackson

Dear Mr.Cooksey,

Enclosed are the results of the sample(s) submitted to our laboratory July 25, 2013
For your reference, these analyses have been assigned our service request number **J1304264.**

All analyses were performed according to our laboratory's quality assurance program. The test results meet requirements of the NELAP standards except as noted in the case narrative report. All results are intended to be considered in their entirety, and Columbia Analytical Services, Inc. (CAS) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report. In accordance to the NELAC 2003 Standard, a statement on the estimated uncertainty of measurement of any quantitative analysis will be supplied upon request.

Please contact me if you have any questions. My extension is 4410. You may also contact me via email at Jerry.Allen@alsglobal.com.

Respectfully submitted,

ALS Group USA, Corp. dba ALS Environmental

Jerry Allen
Project Manager

ADDRESS 9143 Philips Highway, Suite 200, Jacksonville, FL 32256
PHONE +1 904 739 2277 | FAX +1 904 739 2011
ALS Group USA, Corp.
dba ALS Environmental

State Certifications, Accreditations, and Licenses

Agency	Number	Expire Date
Florida Department of Health	E82502	6/30/2014
North Carolina Department of Environment and Natural Resources	527	12/31/2013
Virginia Environmental Accreditation Program	460191	12/14/2013
Louisiana Department of Environmental Quality	02086	6/30/2014
Georgia Department of Natural Resources	958	6/30/2014
Kentucky Division of Waste Management	63	6/30/2014
South Carolina Department of Health and Environmental Control	96021001	8/31/2013
Texas Commision on Environmental Quality	T104704197-13-5	5/31/2014
Maine Department of Health and Human Services	2011006	2/3/2015
Department of Defense	66206	5/31/2014
Pennsylvania Department of Environmental Protection	68-04835	8/31/2013

Data Qualifiers

CAS Standard

+	Possible Tedlar bag artifact.
A	TIC is a suspected aldol-condensation product
B	Analyte found in the associated method blank as well as in the sample.
BC	Reported results are not blank corrected.
BH	The back section of the tube yielded higher results than the front.
BT	Results indicated possible breakthrough; back section >=10% front section.
C	Result identification confirmed.
D	Compound identified in an analysis at a secondary dilution factor
D	Spike was diluted out
DE	Reported results are corrected for desorption efficiency.
E	Estimated value. Concentration above calibration range
E	The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample.
H1	Sample analysis performed past holding time. See case narrative.
H2	Initial analysis within holding time. Reanalysis for the required dilution was past holding time.
H3	Sample was received and analyzed past holding time.
H4	Sample was extracted past required extraction holding time, but analyzed within analysis holding time. See case narrative.
I	Internal standard not within the specified limits. See case narrative.
J	Estimated Value. Concentration found below MRL.
K	A deflection in the QC ion may indicate interference with the quantitation of this ion. The concentration of this analyte should be considered as an estimate.
K	Analyte was detected above the method reporting limit prior to normalization.
L1	Laboratory control sample recovery outside the specified limits; results may be biased high.
L2	Laboratory control sample recovery outside the specified limits; results may be biased low.
L3	Laboratory control sample recovery outside the specified limits.
M	Matrix interference; results may be biased high.
M	The duplicate injection precision not met.
M1	Matrix interference due to coelution with a non-target compound; results may be biased high.
N	Presumptive evidence of a compound for TICs that have been identified based on a mass spectral library search.
N	The Matrix Spike sample recovery is not within control limits. See case narrative.
P	Indicates chlorodiphenyl ether interference present at the retention time of the target compound.
P	Pesticide/Aroclor target analyte > 40% difference for detected concentrations between GC columns
Q	Indicates as estimated value because the P and P + 2 theoretical abundance ratio does not meet method criteria.
R	Duplicate Precision not met.
R1	Duplicate precision not within the specified limits; however, the results are below the MRL and considered estimated.
S	Surrogate recovery not within specified limits.

Data Qualifiers

CAS Standard

S	The reported value was determined by the Method of Standard Additions (MSA).
T	Analyte is a tentatively identified compound, result is estimated.
U	Compound was analyzed for, but was not detected (ND).
V1	The continuing calibration verification standard was outside (biased high) the specified limits for this compound.
V2	The continuing calibration verification standard was outside (biased low) the specified limits for this compound.
W	Result quantified, but the corresponding peak was detected outside the generated retention time window.
W	The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
X	See case narrative.
Y	Recovery outside limits
Y	The chromatogram resembles a petroleum product but does not match the calibration standard.
Z	The chromatogram does not resemble a petroleum product.
i	The MRL/MDL has been elevated due to a matrix interference.

Acronyms

ASTM	American Society for Testing and Materials
A2LA	American Association for Laboratory Accreditation
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
LUFT	Leaking Underground Fuel Tank
M	Modified
MCL	Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the USEPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
NA	Not Applicable
NC	Not Calculated
NCASI	National Council of the Paper Industry for Air and Stream Improvement
ND	Not Detected
NIOSH	National Institute for Occupational Safety and Health
PQL	Practical Quantitation Limit
RCRA	Resource Conservation and Recovery Act
SIM	Selected Ion Monitoring
TPH	Total Petroleum Hydrocarbons
tr	Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL.

Client: Ambient Air Services, Inc. **Service Request:**J1304264

Project: Gerdau Jackson

SAMPLE CROSS-REFERENCE

SAMPLE #	CLIENT SAMPLE ID	DATE	TIME
J1304264-001	5319	7/11/2013	0000
J1304264-002	FH-1-BH1	7/11/2013	0000
J1304264-003	BH-1-BH1	7/11/2013	0000
J1304264-004	5399	7/12/2013	0000
J1304264-005	FH-3-BH1	7/12/2013	0000
J1304264-006	BH-3-BH1	7/12/2013	0000
J1304264-007	5385	7/12/2013	0000
J1304264-008	FH-4-BH1	7/12/2013	0000
J1304264-009	BH-4-BH1	7/12/2013	0000
J1304264-010	BH1-Blank	7/11/2013	0000
J1304264-011	5346	7/11/2013	0000
J1304264-012	FH-1-BH2	7/11/2013	0000
J1304264-013	BH-1-BH2	7/11/2013	0000
J1304264-014	5355	7/11/2013	0000
J1304264-015	FH-2-BH2	7/11/2013	0000
J1304264-016	BH-2-BH2	7/11/2013	0000
J1304264-017	5383	7/12/2013	0000
J1304264-018	FH-3-BH2	7/12/2013	0000
J1304264-019	BH-3-BH2	7/12/2013	0000
J1304264-020	BH2-Blank	7/11/2013	0000

J1304264 Ambient

Date:7/29/13

Sample ID	Container Type	Initial Weight - with sample (g)	Final Weight - no sample (g)	Sample Volume
J1304264-2	L	585.69	374.84	210.85
J1304264-3	L	902.13	374.84	527.29
J1304264-5	L	648.22	374.84	273.38
J1304264-6	L	834.58	374.84	459.74
J1304264-8	L	589.55	374.84	214.71
J1304264-9	XL	944.66	421.69	522.97
J1304264-10	L	558.29	374.84	183.45
J1304264-12	L	587.46	374.84	212.62
J1304264-13	L	774.70	374.84	399.86
J1304264-15	L	613.38	374.84	238.54
J1304264-16	XL	950.74	421.69	529.05
J1304264-18	L	621.66	374.84	246.82
J1304264-19	XL	904.99	421.69	483.3
J1304264-20	L	570.98	374.84	196.14
				0
				0
				0
				0

Containers weights based on samples:	
XL	J1304264-16
L	J1304264-15
M	
S	

Analytical Report

Client:	Ambient Air Services, Inc.	**Service Request:**	J1304264
Project:	Gerdau Jackson	**Date Collected:**	07/11/13 - 07/12/13
Sample Matrix:	Filter	**Date Received:**	07/25/13
Analysis Method:	6010B	**Units:**	ug/Filter
Prep Method:	EPA 3050B	**Basis:**	As Received

Lead, Total Recoverable

Sample Name	Lab Code	Result	PQL	MDL	Dil.	Date Analyzed	Date Extracted	Q
5319	J1304264-001	**63.2**	0.50	0.50	1	07/31/13 03:58	7/30/13	
5399	J1304264-004	**11.2**	0.50	0.50	1	07/31/13 04:20	7/30/13	
5385	J1304264-007	**5.90**	0.50	0.50	1	07/31/13 04:29	7/30/13	
5346	J1304264-011	**36.2**	0.50	0.50	1	07/31/13 04:38	7/30/13	
5355	J1304264-014	**288**	0.50	0.50	1	07/31/13 04:47	7/30/13	
5383	J1304264-017	**5.70**	0.50	0.50	1	07/31/13 05:12	7/30/13	
Method Blank	J1304264-MB2	0.50 U	0.50	0.50	1	07/31/13 03:36	7/30/13	

Analytical Report

Client:	Ambient Air Services, Inc.	**Service Request:**	J1304264
Project:	Gerdau Jackson	**Date Collected:**	07/11/13 - 07/12/13
Sample Matrix:	Water	**Date Received:**	07/25/13
Analysis Method:	6010B	**Units:**	ug/L
Prep Method:	EPA 3005A	**Basis:**	NA

Lead, Total Recoverable

Sample Name	Lab Code	Result		PQL	MDL	Dil.	Date Analyzed	Date Extracted	Q
FH-1-BH1	J1304264-002	**365**		10	4	1	07/29/13 23:21	7/29/13	
BH-1-BH1	J1304264-003	**53**		10	4	1	07/29/13 23:26	7/29/13	
FH-3-BH1	J1304264-005	**56**		10	4	1	07/29/13 23:40	7/29/13	
BH-3-BH1	J1304264-006	**22**		10	4	1	07/29/13 23:45	7/29/13	
FH-4-BH1	J1304264-008	**27**		10	4	1	07/29/13 23:50	7/29/13	
BH-4-BH1	J1304264-009	**27**		10	4	1	07/30/13 00:11	7/29/13	
BH1-Blank	J1304264-010	**4**	**J**	10	4	1	07/30/13 00:16	7/29/13	
FH-1-BH2	J1304264-012	**84**		10	4	1	07/30/13 00:21	7/29/13	
BH-1-BH2	J1304264-013	**19**		10	4	1	07/30/13 00:35	7/29/13	
FH-2-BH2	J1304264-015	**180**		10	4	1	07/30/13 00:40	7/29/13	
BH-2-BH2	J1304264-016	**7**	**J**	10	4	1	07/30/13 00:45	7/29/13	
FH-3-BH2	J1304264-018	**26**		10	4	1	07/30/13 00:49	7/29/13	
BH-3-BH2	J1304264-019	**12**		10	4	1	07/30/13 00:54	7/29/13	
BH2-Blank	J1304264-020	4	U	10	4	1	07/30/13 00:59	7/29/13	
Method Blank	J1304264-MB1	4	U	10	4	1	07/29/13 23:13	7/29/13	

Client:	Ambient Air Services, Inc.	**Service Request:**	J1304264
Project:	Gerdau Jackson	**Date Collected:**	07/12/13
Sample Matrix:	Water	**Date Received:**	07/25/13
		Date Analyzed:	07/29/13
		Date Extracted:	07/29/13

Duplicate Matrix Spike Summary
Inorganic Parameters

Sample Name:	FH-4-BH1	**Units:**	ug/L
Lab Code:	J1304264-008	**Basis:**	NA
Analysis Method:	6010B		
Prep Method:	EPA 3005A		

		Matrix Spike J1304264-008MS			Duplicate Matrix Spike J1304264-008DMS					
Analyte Name	**Sample Result**	**Result**	**Spike Amount**	**% Rec**	**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**	**RPD Limit**
Lead, Total Recoverable	27	535	500	102	540	500	103	75-125	<1	20

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

Client:	Ambient Air Services, Inc.	**Service Request:**	J1304264
Project:	Gerdau Jackson	**Date Analyzed:**	07/31/13
Sample Matrix:	Filter	**Date Extracted:**	07/30/13

Duplicate Lab Control Sample Summary
Inorganic Parameters

Analysis Method:	6010B	**Units:**	ug/Filter
Prep Method:	EPA 3050B	**Basis:**	As Received
		Analysis Lot:	351480

	Lab Control Sample J1304264-LCS2			Duplicate Lab Control Sample J1304264-DLCS2					
Analyte Name	**Result**	**Spike Amount**	**% Rec**	**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**	**RPD Limit**
Lead, Total Recoverable	24.7	25.0	99	24.8	25.0	99	87-111	<1	20

ALS Environmental

Cooler Receipt Form

Client: Ambient Air Service Request #: J1304264

Project:

Cooler received on 7/26/13 and opened on 7/26/13 by SC

COURIER: ALS UPS FEDEX (Client) Other _____ Airbill # _____

1	Were custody seals on outside of cooler?			Yes	(No)			
	If yes, how many and where?			#:___ on lid		other		
2	Were seals intact and signature and date correct?			Yes	No	(N/A)		
3	Were custody papers properly filled out?			(Yes)	No	N/A		
4	Temperature of cooler(s) upon receipt (Should be > 0°C and < 6°C)	N/A						
5	Thermometer ID							
6	Temperature Blank Present?			Yes	(No)			
7	Were Ice or Ice Packs present			Ice	Ice Packs	(No)		
8	Did all bottles arrive in good condition (unbroken, etc....)?			(Yes)	No	N/A		
9	Type of packing material present			Netting	Vial Holder	Bubble Wrap		
				Paper	Styrofoam	Other	(N/A)	
10	Were all bottle labels complete (sample ID, preservation, etc....)?			(Yes)	No	N/A		
11	Did all bottle labels and tags agree with custody papers?			(Yes)	No	N/A		
12	Were the correct bottles used for the tests indicated?			(Yes)	No	N/A		
13	Were all of the preserved bottles received with the appropriate preservative?			(Yes)	No	N/A		
	(HNO3 pH<2 H2SO4 pH<2 ZnAc2/NaOH pH>9 NaOH pH>12 HCl pH<2							
	Preservative additions noted below							
14	Were all samples received within analysis holding times?			(Yes)	No	N/A		
15	Were all VOA vials free of air bubbles? If present, note below			Yes	No	(N/A)		
16	Where did the bottles originate?			ALS	(Client)			

Sample ID	Reagent	Lot #	ml added	Initials Date/Time

Additional comments and/or explanation of all discrepancies noted above:

Client approval to run samples if discrepancies noted: Date:

Ambient Air Services, Inc
106 Ambient Airway Starke, FL 32091 (904) 964-8440 FAX: (904) 964-6675

No. 1 Baghouse

J1304264

Chain of Custody & Analysis Request

Project Name: Gerdau Jackson Location: Jackson, TN

Laboratory Name: ALS
Address:
Lab Contact: Jerry Aller
Project #

Samplers: DO, WG

Page 1 of 2
RUSH!
Standard X
Date Report Desired:

Sample ID	Sample Date	Source	Run	Method	Type	Matrix	Number of Containers	Gravimetric	Pb	Remarks
5319	7/11/13	No. 1 Baghouse	1	12	Pb	filter	1		X	
FH-1-BH1	"	"	1	"	"	0.1N HNO_3	1		X	Please record volume of liquid
BH-1-BH1	"	"	1	"	"	"	1		X	
5399	7/12/13		3			filter	1		X	
FH-3-BH1	"		3			0.1N HNO_3	1		X	
BH-3-BH1	"		3			"	1		X	
5385	"		4			filter	1		X	
FH-4-BH1	"		4			0.1N HNO_3	1		X	
BH-4-BH1	"	"	4	"	"	"	1		X	
BH1-Blank	7/11/13	"	Blank	12	Pb	0.1N HNO_3	1		X	

J1304264 5
Ambient Air Services, Inc.
Gerdau Jackson

Relinquished by:	Printed Name: Daniel Ochenhouse	Time 1540	Received by:	Printed Name: [illegible] Time 1540
	Signature:	Date 7/25/13		Signature: Date 7/25/13
	Affiliation: AASI			Affiliation: ALS
Relinquished by:	Printed Name:	Time	Received by:	Printed Name: Time
	Signature:	Date		Signature: Date
	Affiliation:			Affiliation:

For Lab Use Only

Sample Integrity: (Note here any damage or loss during transport)	Lab results issued to: By: When:	Remarks:
	Disposition of samples to others:	
	Where stored:	

Chain of Custody Analysis Request Form
Rev 6 020612

Ambient Air Services, Inc
106 Ambient Airway Starke, FL 32091 (904) 964-8440 FAX: (904) 964-6675

No. 2 Baghouse

J1304264

Chain of Custody & Analysis Request

Project Name: Gerdau Jackson — Location: Jackson, TN

Laboratory Name: ALS
Address:
Lab Contact: Jessy Allen
Project #

Samplers: DO, JS

Page 2 of 2
RUSH!
Standard X
Date Report Desired:

Sample ID	Sample Date	Source	Run	Method	Type	Matrix	Number of Containers	Gravimetric	Pb	Remarks
5346	7/11/13	No.2 Baghouse	1	12	Pb	filter	1		X	Please record
FH-1-BH2			1			0.1N HNO_3	1		X	Volume of liquid
BH-1-BH2			1			↓	1		X	
5355			2			filter	1		X	
FH-2-BH2			2			0.1N HNO_3	1		X	
BH-2-BH2	↓		2			↓	1		X	
5383	7/12/13		3			filter	1		X	
FH-3-BH2			3			0.1N HNO_3	1		X	
BH-3-BH2	↓	↓	3		↓	↓	1		X	
				↓						
BH2-Blank	7/11/13	↓	Blank	12	Pb	0.1N HNO_3	1		X	

J1304264 5
Ambient Air Services, Inc.
Gerdau Jackson

Relinquished by:	Printed Name: Daniel Ockenhouse	Time 1540	Received by:	Printed Name: [illegible] ALVAREZ
	Signature: [signature]	Date 7/25/13		Signature: [signature]
	Affiliation: AASI			Affiliation: ALS
Relinquished by:	Printed Name:	Time	Received by:	Printed Name:
	Signature:	Date		Signature:
	Affiliation:			Affiliation:

For Lab Use Only

Sample Integrity:
(Note here any damage or loss during transport)

Lab results issued to:
By: When:

Disposition of samples to others:

Where stored:

Remarks:

Chain of Custody Analysis Request Form
Rev 6 020612

APPENDIX B

GASEOUS AND INSTRUMENT DATA

Appendix B.1	Baghouse Number 1
Appendix B.2	Baghouse Number 2
Appendix B.3	Example Calculations and Gas Certificates

APPENDIX B.1
GASEOUS & INSTRUMENT DATA
BAGHOUSE NUMBER 1

Equipment List

Instrument Calibration Data

Data Printouts and Test Log

NO_x Converter Efficiency Check

Gerdau Ameristeel US, Inc. - Jackson, Tennessee
Number 1 EAF Baghouse
Permit Number: 558867
July 10-11, 2013
Equipment List

Oxides of Nitrogen Instrument:	**Manufacturer -** Thermo Environmental Instruments		**Model -**	42CHL
	Serial Number - 68655-361			
	NO_x Range - zero to 45.15 ppm			
Carbon Monoxide Instrument:	**Manufacturer -** Thermo Environmental Instruments		**Model -**	48C
	Serial Number - 25828-222			
	CO Range - zero to 461.0 ppm			
Sulfur Dioxide Instrument:	**Manufacturer -** Thermo Environmental Instruments		**Model -**	43C
	Serial Number - 60075-325			
	SO_2 Range - zero to 30.6 ppm			

Calibration Gas Standards		Concentration	Manufacturer	Cylinder Number	Expiration Date	Beginning PSI	Ending PSI
Zero	Zero	0.0	N/A	N/A	N/A	N/A	N/A
Mid	NO_x	22.63	Air Gas	CC424674	2/7/2016	1850	1100
High	NO_x	45.15	Air Gas	CC425473	2/4/2016	1800	600
Mid	CO	231.4	Air Gas	SG9147169BAL	4/29/2021	2100	1450
High	CO	461.0	Liquid Technology	CC-158979	6/14/2019	1400	1400
Mid	SO_2	30.6	American	EB0014028	4/2/2014	1600	1000
High	SO_2	16.2	American	EB0022824	8/7/2014	1050	1050

Description of Sampling System :

8' 3/8 SS probe to Tee to H_2O condenser to particulate filter to 200 feet 3/8 Teflon sample line to SS pump to instruments

Test Participants :

Testing - Daniel Ockenhouse, Jack Jory, Will Garabrandt, and David Sholtes - Ambient Air Services, Inc.
William Ownby - Gerdau

Other Comments :

Gerdau Ameristeel US, Inc. - Jackson, Tennessee
Number 1 EAF Baghouse
Permit Number: 558867
July 10-11, 2013

Gas Calibration Data

Excess Flow (lpm) (during calibration checks)	**1**	**Calibration Gas Flow (lpm)**	**5**
Excess Flow (lpm) (during sampling)	**1**		
System Response Time (min:sec)	**2:30**	**Converter Efficiency (if applicable)**	**98.5**

Oxides of Nitrogen (NO_x)

Instrument Information	**Manuf.**	Thermo Environmental		**Model**	**42CHL**				**Serial #**	68655-361		
CALIBRATION GAS VALUE (C_v)	INITIAL CALIBRATION (C_{dir})	ANALYZER CALIBRATION ERROR, (ACE)	PRE RUN 1 (BIAS, C_s)	POST RUN 1 (C_s)	POST RUN 2 (C_s)	POST RUN 3 (C_s)						
0.00	-0.13	-0.3	0.35	-0.15	-0.15	-0.15						
22.63	22.40	-0.5	20.45	21.55	21.70	21.60						
45.15	45.33	0.4	N/A	N/A	N/A	N/A						
SPAN (CS)	45.15											
C_O (Avg of initial and final SB)				0.10	-0.15	-0.15						
C_M (Avg of initial and final SB)				21.00	21.63	21.65						
C_{MA} (Certified upscale gas value)				22.63	22.63	22.63						
SB (System bias % of span)			1.1	0.0	0.0	0.0						
SB (System bias % of span)			-4.3	-1.9	-1.6	-1.8						
D (Drift assessment, % of span)			N/A	-1.1	0.0	0.0						
D (Drift assessment, % of span)			N/A	2.4	0.3	-0.2						

Carbon Monoxide (CO)

Instrument Information	**Manuf.**	Thermo Environmental		**Model**	**48C**				**Serial #**	25828-222		
CALIBRATION GAS VALUE (C_v)	INITIAL CALIBRATION (C_{dir})	ANALYZER CALIBRATION ERROR, (ACE)	PRE RUN 1 (BIAS, C_s)	POST RUN 1 (C_s)	POST RUN 2 (C_s)	POST RUN 3 (C_s)						
0.0	0.0	0.0	0.8	0.3	0.8	0.3						
231.4	231.3	0.0	231.0	230.5	228.5	229.0						
461.0	461.1	0.0	N/A	N/A	N/A	N/A						
SPAN (CS)	461.0											
C_O (Avg of initial and final SB)				0.6	0.6	0.6						
C_M (Avg of initial and final SB)				230.8	229.5	228.8						
C_{MA} (Certified upscale gas value)				231.4	231.4	231.4						
SB (System bias % of span)			0.2	0.1	0.2	0.1						
SB (System bias % of span)			-0.1	-0.2	-0.6	-0.5						
D (Drift assessment, % of span)			N/A	-0.1	0.1	-0.1						
D (Drift assessment, % of span)			N/A	-0.1	-0.4	0.1						

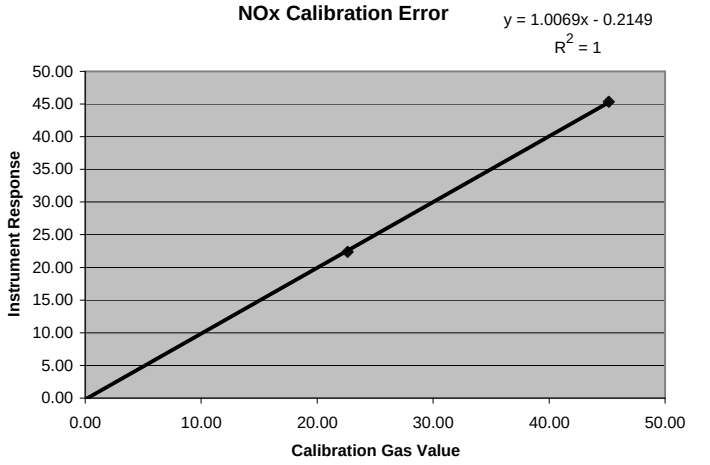
Sulfur Dioxide (SO_2)

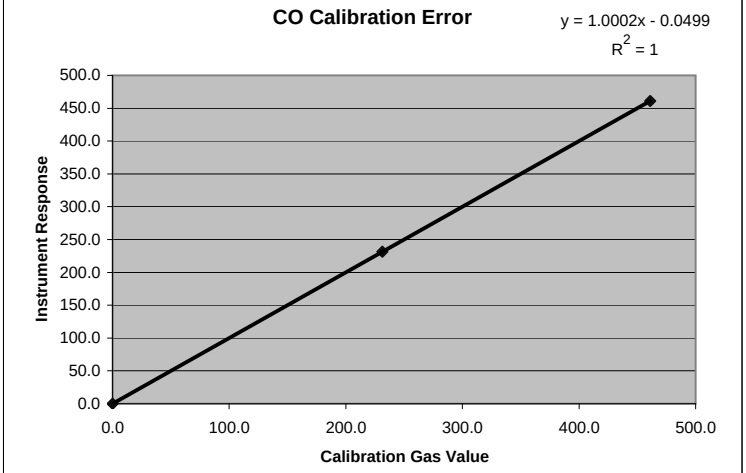
Instrument Information	**Manuf.**	Thermo Environmental		**Model**	**43C**				**Serial #**	60075-325		
CALIBRATION GAS VALUE (C_v)	INITIAL CALIBRATION (C_{dir})	ANALYZER CALIBRATION ERROR, (ACE)	PRE RUN 1 (BIAS, C_s)	POST RUN 1 (C_s)	POST RUN 2 (C_s)	POST RUN 3 (C_s)						
0.0	0.3	1.0	0.2	0.2	0.6	0.8						
30.6	30.3	-1.0	29.7	29.6	29.3	29.9						
16.2	15.9	-1.0	N/A	N/A	N/A	N/A						
SPAN (CS)	30.6											
C_O (Avg of initial and final SB)				0.2	0.4	0.7						
C_M (Avg of initial and final SB)				29.7	29.5	29.6						
C_{MA} (Certified upscale gas value)				30.6	30.6	30.6						
SB (System bias % of span)			-0.3	-0.3	1.0	1.6						
SB (System bias % of span)			-2.0	-2.3	-3.3	-1.3						
D (Drift assessment, % of span)			N/A	0.0	1.3	0.7						
D (Drift assessment, % of span)			N/A	-0.3	-1.0	2.0						

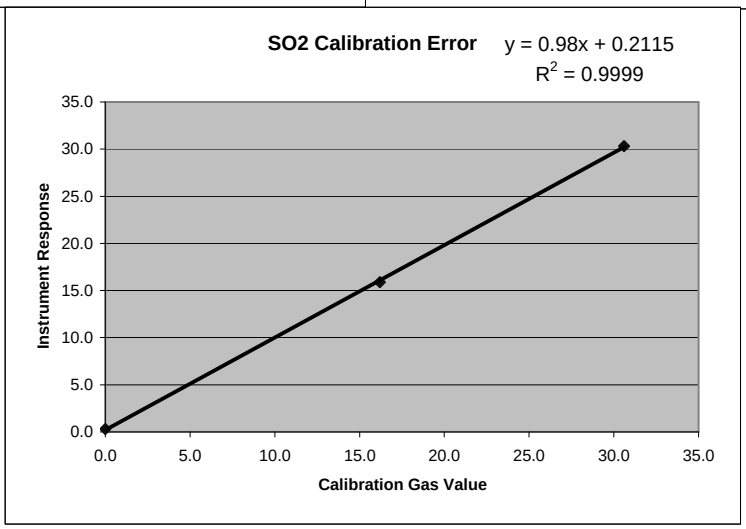
Gerdau Ameristeel US, Inc. - Jackson, Tennessee
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Gas Calibration Data

Excess Flow (lpm) (during calibration checks)	**1**	**Calibration Gas Flow (lpm)**	**5**
Excess Flow (lpm) (during sampling)	**1**		
System Response Time (min:sec)	**2:30**	**Converter Efficiency (if applicable)**	**98.5**







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	Raw Data				Drift Corrected Data									Corrected Data		
TimeStamp (CDT)	NO_x, ppm	CO, ppm	SO_2, ppm	COMMENTS	Co, NO_x	Cm, NO_x	Cma, NO_x	Co, CO	Cm, CO	Cma, CO	Co, SO_2	Cm, SO_2	Cma, SO_2	NO_x, ppm	CO, ppm	SO_2, ppm
7/10/2013 6:36	5.35	0.3	0.4													
7/10/2013 6:37	1.20	1.3	0.6													
7/10/2013 6:38	-0.15	0.8	0.4													
7/10/2013 6:39	-0.15	-0.2	0.3	Zero Nox, Zero CO, Zero SO2 (Direct)												
7/10/2013 6:40	-0.10	0.3	0.3	Zero Nox, Zero CO, Zero SO2 (Direct)												
	-0.13	**0.0**	**0.3**	**Average Zero Nox, Zero CO, Zero SO2 (Direct)**												
7/10/2013 6:42	44.70	0.8	4.4													
7/10/2013 6:43	45.30	0.3	13.9													
7/10/2013 6:44	45.15	0.3	16.7													
7/10/2013 6:45	45.50	0.3	17.3	45.15 Nox (Direct)												
7/10/2013 6:46	45.15	0.3	17.7	45.15 Nox (Direct)												
	45.33			**Average 45.15 Nox (Direct)**												
7/10/2013 6:47	44.70	0.3	18.0													
7/10/2013 6:48	27.05	0.3	13.2													
7/10/2013 6:49	0.30	0.3	22.2													
7/10/2013 6:50	0.30	0.3	29.6													
7/10/2013 6:51	0.30	0.3	30.2													
7/10/2013 6:52	0.30	0.3	30.3	30.2 SO2 (Direct)												
7/10/2013 6:53	0.30	0.3	30.3	30.2 SO2 (Direct)												
7/10/2013 6:54	0.30	0.3	30.3	30.2 SO2 (Direct)												
7/10/2013 6:55	0.30	0.3	30.3	30.2 SO2 (Direct)												
			30.3	**Average 30.2 SO2 (Direct)**												
7/10/2013 6:56	0.40	1.3	29.9													
7/10/2013 6:57	0.05	248.1	6.4													
7/10/2013 6:58	-0.15	459.7	0.5													
7/10/2013 6:59	-0.15	460.7	0.1	461 CO (Direct)												
7/10/2013 7:00	-0.15	461.7	0.1	461 CO (Direct)												
7/10/2013 7:01	-0.15	460.7	0.1	461 CO (Direct)												
		461.1		**Average 461 CO (Direct)**												
7/10/2013 7:02	0.00	398.2	4.1													

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	Raw Data				Drift Corrected Data									Corrected Data		
TimeStamp (CDT)	NO_x, ppm	CO, ppm	SO_2, ppm	COMMENTS	Co, NO_x	Cm, NO_x	Cma, NO_x	Co, CO	Cm, CO	Cma, CO	Co, SO_2	Cm, SO_2	Cma, SO_2	NO_x, ppm	CO, ppm	SO_2, ppm
7/10/2013 7:03	0.05	44.1	13.0													
7/10/2013 7:04	0.10	0.8	14.9													
7/10/2013 7:05	0.10	0.3	16.0	16.2 SO2 (Direct)												
7/10/2013 7:06	2.40	0.3	15.9	16.2 SO2 (Direct)												
			15.9	**Average 16.2 SO2 (Direct)**												
7/10/2013 7:07	22.05	0.3	6.3													
7/10/2013 7:08	22.35	0.3	7.2													
7/10/2013 7:09	22.40	0.3	9.7	22.63 Nox (Direct)												
7/10/2013 7:10	22.40	0.3	10.0	22.63 Nox (Direct)												
	22.40			**Average 22.63 Nox (Direct)**												
7/10/2013 7:11	14.45	11.4	7.1													
7/10/2013 7:12	-0.15	181.6	0.1													
7/10/2013 7:13	-0.15	231.5	0.2													
7/10/2013 7:14	-0.15	231.5	0.3	231.4 CO (Direct)												
7/10/2013 7:15	-0.10	231.0	0.2	231.4 CO (Direct)												
		231.3		**Average 231.4 CO (Direct)**												
7/10/2013 7:16	2.15	219.4	0.4													
7/10/2013 7:17	35.95	48.6	0.4													
7/10/2013 7:18	37.70	0.3	0.2													
7/10/2013 7:19	5.95	4.3	0.2													
7/10/2013 7:20	1.65	73.8	0.1													
7/10/2013 7:21	0.35	193.7	0.1													
7/10/2013 7:22	0.00	206.3	0.1													
7/10/2013 7:23	0.00	224.5	0.2													
7/10/2013 7:24	-0.05	230.5	0.2													
7/10/2013 7:25	0.35	231.0	0.2	Zero Nox, 231.4 CO, Zero SO2 (Bias)												
	0.35	**231.0**	**0.2**	**Average Zero Nox, 231.4 CO, Zero SO2 (Bias)**												
7/10/2013 7:26	9.80	182.1	0.1													
7/10/2013 7:27	17.70	62.8	0.3													
7/10/2013 7:28	19.85	13.9	0.4													

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	Raw Data				Drift Corrected Data									Corrected Data		
TimeStamp (CDT)	NO_x, ppm	CO, ppm	SO_2, ppm	COMMENTS	Co, NO_x	Cm, NO_x	Cma, NO_x	Co, CO	Cm, CO	Cma, CO	Co, SO_2	Cm, SO_2	Cma, SO_2	NO_x, ppm	CO, ppm	SO_2, ppm
7/10/2013 7:29	20.30	3.3	0.4													
7/10/2013 7:30	20.45	1.3	0.4													
7/10/2013 7:31	20.45	0.8	0.4	22.63 Nox, Zero CO (Bias)												
	20.45	**0.8**		**Average 22.63 Nox, Zero CO (Bias)**												
7/10/2013 7:32	19.75	0.3	0.4													
7/10/2013 7:33	7.60	0.3	0.2													
7/10/2013 7:34	1.20	0.3	0.1													
7/10/2013 7:35	0.20	0.3	0.1													
7/10/2013 7:36	0.05	0.3	0.2													
7/10/2013 7:37	0.05	0.8	0.2													
7/10/2013 7:38	0.30	0.8	20.8													
7/10/2013 7:39	0.30	0.3	7.0													
7/10/2013 7:40	0.15	0.3	0.9													
7/10/2013 7:41	0.30	1.3	1.4													
7/10/2013 7:42	2.35	1.8	0.5													
7/10/2013 7:43	0.95	2.3	0.4													
7/10/2013 7:44	0.25	0.8	0.4													
7/10/2013 7:45	0.20	0.3	0.7													
7/10/2013 7:46	0.30	0.3	1.2													
7/10/2013 7:47	0.55	0.3	1.2													
7/10/2013 7:48	0.50	0.3	0.5													
7/10/2013 7:49	0.40	0.3	0.3													
7/10/2013 7:50	0.30	0.3	0.3													
7/10/2013 7:51	0.10	0.3	0.3													
7/10/2013 7:52	0.05	0.3	0.3													
7/10/2013 7:53	0.05	0.3	0.2													
7/10/2013 7:54	0.05	0.3	0.2													
7/10/2013 7:55	0.05	0.3	0.2													
7/10/2013 7:56	0.00	0.8	0.2													
7/10/2013 7:57	-0.05	0.3	0.2													

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	Raw Data				Drift Corrected Data									Corrected Data		
TimeStamp (CDT)	NO_x, ppm	CO, ppm	SO_2, ppm	COMMENTS	Co, NO_x	Cm, NO_x	Cma, NO_x	Co, CO	Cm, CO	Cma, CO	Co, SO_2	Cm, SO_2	Cma, SO_2	NO_x, ppm	CO, ppm	SO_2, ppm
7/10/2013 7:58	-0.05	0.3	0.2													
7/10/2013 7:59	-0.10	0.3	0.1													
7/10/2013 8:00	-0.15	0.3	0.1													
7/10/2013 8:01	-0.15	0.3	0.1													
7/10/2013 8:02	-0.15	0.3	0.1													
7/10/2013 8:03	-0.15	0.3	0.1													
7/10/2013 8:04	0.25	-0.2	0.1													
7/10/2013 8:05	-0.15	0.3	0.1													
7/10/2013 8:06	-0.15	0.3	0.1													
7/10/2013 8:07	-0.15	0.3	0.1													
7/10/2013 8:08	-0.15	0.3	0.1													
7/10/2013 8:09	-0.15	0.3	0.1													
7/10/2013 8:10	-0.10	0.3	0.1													
7/10/2013 8:11	-0.15	0.3	0.1													
7/10/2013 8:12	-0.15	0.3	0.1													
7/10/2013 8:13	-0.15	0.3	0.1													
7/10/2013 8:14	-0.15	0.3	0.2													
7/10/2013 8:15	-0.15	0.3	0.1													
7/10/2013 8:16	-0.10	0.3	0.1													
7/10/2013 8:17	-0.10	0.3	0.1													
7/10/2013 8:18	0.05	0.3	0.2													
7/10/2013 8:19	0.35	43.1	3.3													
7/10/2013 8:20	0.10	149.4	1.3													
7/10/2013 8:21	0.20	67.8	4.6													
7/10/2013 8:22	0.30	8.9	14.6													
7/10/2013 8:23	0.30	1.3	21.2													
7/10/2013 8:24	0.25	0.3	25.2													
7/10/2013 8:25	0.40	9.4	29.7	30.2 SO2 (Bias)												
			29.7	**Average 30.2 SO2 (Bias)**												
7/10/2013 8:26	0.40	171.6	17.1													

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	Raw Data				Drift Corrected Data									Corrected Data		
TimeStamp (CDT)	NO_x, ppm	CO, ppm	SO_2, ppm	COMMENTS	Co, NO_x	Cm, NO_x	Cma, NO_x	Co, CO	Cm, CO	Cma, CO	Co, SO_2	Cm, SO_2	Cma, SO_2	NO_x, ppm	CO, ppm	SO_2, ppm
7/10/2013 8:27	0.45	309.6	6.4													
7/10/2013 8:28	0.75	329.7	3.7													
7/10/2013 8:29	0.70	322.2	2.4													
7/10/2013 8:30	0.60	302.0	1.6													
7/10/2013 8:31	0.45	292.5	1.2													
7/10/2013 8:32	0.20	296.0	1.0													
7/10/2013 8:33	0.05	291.5	0.9													
7/10/2013 8:34	0.05	254.2	0.8													
7/10/2013 8:35	0.05	214.9	0.7													
7/10/2013 8:36	0.05	201.3	0.6													
7/10/2013 8:37	0.20	176.6	0.6													
7/10/2013 8:38	0.20	166.0	0.5													
7/10/2013 8:39	0.20	139.3	0.5													
7/10/2013 8:40	0.20	98.0	0.4													
7/10/2013 8:41	0.40	43.1	0.4													
7/10/2013 8:42	0.50	18.4	0.4													
7/10/2013 8:43	1.10	12.4	0.4													
7/10/2013 8:44	2.80	8.9	0.4													
7/10/2013 8:45	5.15	6.3	0.4													
7/10/2013 8:46	5.50	4.8	0.4													
7/10/2013 8:47	3.30	4.3	0.4													
7/10/2013 8:48	6.55	3.8	0.3													
7/10/2013 8:49	6.35	7.3	0.3													
7/10/2013 8:50	2.35	6.8	0.3													
7/10/2013 8:51	0.90	4.3	0.3													
7/10/2013 8:52	0.40	2.8	0.3													
7/10/2013 8:53	0.30	2.8	0.3													
7/10/2013 8:54	0.20	2.3	0.3													
7/10/2013 8:55	0.15	2.3	0.3													
7/10/2013 8:56	0.15	3.3	0.3													

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	Raw Data				Drift Corrected Data									Corrected Data		
TimeStamp (CDT)	NO_x, ppm	CO, ppm	SO_2, ppm	COMMENTS	Co, NO_x	Cm, NO_x	Cma, NO_x	Co, CO	Cm, CO	Cma, CO	Co, SO_2	Cm, SO_2	Cma, SO_2	NO_x, ppm	CO, ppm	SO_2, ppm
7/10/2013 8:57	0.05	2.8	0.3													
7/10/2013 8:58	0.05	3.3	0.3													
7/10/2013 8:59	0.10	5.8	0.3													
7/10/2013 9:00	0.05	16.9	0.3													
7/10/2013 9:01	0.00	59.2	0.3													
7/10/2013 9:02	-0.05	62.2	0.3													
7/10/2013 9:03	-0.05	55.7	0.3													
7/10/2013 9:04	0.00	96.0	0.3													
7/10/2013 9:05	-0.05	120.7	0.3													
7/10/2013 9:06	0.15	90.0	0.3													
7/10/2013 9:07	3.20	46.1	0.4													
7/10/2013 9:08	1.85	26.0	0.3													
7/10/2013 9:09	0.50	11.4	0.3													
7/10/2013 9:10	0.15	5.3	0.3													
7/10/2013 9:11	0.05	3.8	0.3													
7/10/2013 9:12	-0.05	2.8	0.3													
7/10/2013 9:13	-0.05	2.3	0.3													
7/10/2013 9:14	-0.05	1.8	0.3													
7/10/2013 9:15	-0.05	2.3	0.3													
7/10/2013 9:16	-0.05	6.8	0.3													
7/10/2013 9:17	-0.05	4.8	0.3													
7/10/2013 9:18	-0.05	3.3	0.3													
7/10/2013 9:19	0.00	27.5	0.3													
7/10/2013 9:20	0.00	82.4	0.3													
7/10/2013 9:21	-0.05	76.4	0.3													
7/10/2013 9:22	-0.05	49.2	0.3													
7/10/2013 9:23	0.00	78.9	0.3													
7/10/2013 9:24	0.05	122.2	0.3													
7/10/2013 9:25	0.05	156.4	0.3													
7/10/2013 9:26	0.05	139.8	0.3													

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	Raw Data				Drift Corrected Data									Corrected Data		
TimeStamp (CDT)	NO_x, ppm	CO, ppm	SO_2, ppm	COMMENTS	Co, NO_x	Cm, NO_x	Cma, NO_x	Co, CO	Cm, CO	Cma, CO	Co, SO_2	Cm, SO_2	Cma, SO_2	NO_x, ppm	CO, ppm	SO_2, ppm
7/10/2013 9:27	-0.05	77.4	0.3													
7/10/2013 9:28	-0.05	68.8	0.3													
7/10/2013 9:29	-0.05	170.6	0.2													
7/10/2013 9:30	-0.05	214.9	0.2													
7/10/2013 9:31	-0.05	204.3	0.2													
7/10/2013 9:32	-0.05	154.4	0.2													
7/10/2013 9:33	-0.05	204.3	0.3													
7/10/2013 9:34	-0.05	213.9	0.2													
7/10/2013 9:35	0.15	218.4	0.3													
7/10/2013 9:36	0.65	313.1	0.3													
7/10/2013 9:37	0.90	339.8	0.3													
7/10/2013 9:38	0.80	305.1	0.3													
7/10/2013 9:39	0.60	314.6	0.3													
7/10/2013 9:40	0.50	350.4	0.3													
7/10/2013 9:41	0.50	315.6	0.3													
7/10/2013 9:42	0.45	277.9	0.3													
7/10/2013 9:43	0.45	225.5	0.3													
7/10/2013 9:44	0.50	159.5	0.3													
7/10/2013 9:45	0.45	144.9	0.3													
7/10/2013 9:46	0.30	151.9	0.3													
7/10/2013 9:47	0.15	116.1	0.3													
7/10/2013 9:48	0.10	61.2	0.3													
7/10/2013 9:49	0.15	31.5	0.3													
7/10/2013 9:50	0.25	23.5	0.3													
7/10/2013 9:51	0.40	26.5	0.3													
7/10/2013 9:52	0.80	27.0	0.3	Run 1	0.10	21.00	22.63	0.6	230.8	231.4	0.2	29.7	30.6	0.8	26.5	0.1
7/10/2013 9:53	1.20	24.0	0.3	Run 1	0.10	21.00	22.63	0.6	230.8	231.4	0.2	29.7	30.6	1.2	23.5	0.1
7/10/2013 9:54	1.85	19.4	0.3	Run 1	0.10	21.00	22.63	0.6	230.8	231.4	0.2	29.7	30.6	1.9	18.9	0.1
7/10/2013 9:55	4.35	11.4	0.4	Run 1	0.10	21.00	22.63	0.6	230.8	231.4	0.2	29.7	30.6	4.6	10.8	0.2
7/10/2013 9:56	9.50	6.8	0.4	Run 1	0.10	21.00	22.63	0.6	230.8	231.4	0.2	29.7	30.6	10.2	6.3	0.2

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TimeStamp (CDT)	NO_x, ppm	CO, ppm	SO_2, ppm	COMMENTS	Co, NO_x	Cm, NO_x	Cma, NO_x	Co, CO	Cm, CO	Cma, CO	Co, SO_2	Cm, SO_2	Cma, SO_2	NO_x, ppm	CO, ppm	SO_2, ppm
7/10/2013 9:57	5.60	9.9	0.4	Run 1	0.10	21.00	22.63	0.6	230.8	231.4	0.2	29.7	30.6	6.0	9.3	0.2
7/10/2013 9:58	1.80	6.8	0.4	Run 1	0.10	21.00	22.63	0.6	230.8	231.4	0.2	29.7	30.6	1.8	6.3	0.2
7/10/2013 9:59	0.70	3.8	0.4	Run 1	0.10	21.00	22.63	0.6	230.8	231.4	0.2	29.7	30.6	0.6	3.2	0.2
7/10/2013 10:00	0.35	2.8	0.5	Run 1	0.10	21.00	22.63	0.6	230.8	231.4	0.2	29.7	30.6	0.3	2.2	0.3
7/10/2013 10:01	0.20	2.3	0.5	Run 1	0.10	21.00	22.63	0.6	230.8	231.4	0.2	29.7	30.6	0.1	1.7	0.3
7/10/2013 10:02	0.10	2.3	0.5	Run 1	0.10	21.00	22.63	0.6	230.8	231.4	0.2	29.7	30.6	0.0	1.7	0.3
7/10/2013 10:03	0.05	2.3	0.5	Run 1	0.10	21.00	22.63	0.6	230.8	231.4	0.2	29.7	30.6	-0.1	1.7	0.3
7/10/2013 10:04	0.05	2.3	0.4	Run 1	0.10	21.00	22.63	0.6	230.8	231.4	0.2	29.7	30.6	-0.1	1.7	0.2
7/10/2013 10:05	0.05	5.3	0.4	Run 1	0.10	21.00	22.63	0.6	230.8	231.4	0.2	29.7	30.6	-0.1	4.7	0.2
7/10/2013 10:06	0.05	12.4	0.4	Run 1	0.10	21.00	22.63	0.6	230.8	231.4	0.2	29.7	30.6	-0.1	11.8	0.2
7/10/2013 10:07	0.00	23.0	0.5	Run 1	0.10	21.00	22.63	0.6	230.8	231.4	0.2	29.7	30.6	-0.1	22.5	0.3
7/10/2013 10:08	0.00	29.5	0.5	Run 1	0.10	21.00	22.63	0.6	230.8	231.4	0.2	29.7	30.6	-0.1	29.1	0.3
7/10/2013 10:09	-0.05	39.6	0.5	Run 1	0.10	21.00	22.63	0.6	230.8	231.4	0.2	29.7	30.6	-0.2	39.2	0.3
7/10/2013 10:10	-0.05	62.8	0.6	Run 1	0.10	21.00	22.63	0.6	230.8	231.4	0.2	29.7	30.6	-0.2	62.5	0.4
7/10/2013 10:11	0.00	75.3	0.6	Run 1	0.10	21.00	22.63	0.6	230.8	231.4	0.2	29.7	30.6	-0.1	75.1	0.4
7/10/2013 10:12	0.00	69.8	0.6	Run 1	0.10	21.00	22.63	0.6	230.8	231.4	0.2	29.7	30.6	-0.1	69.6	0.4
7/10/2013 10:13	0.00	55.7	0.6	Run 1	0.10	21.00	22.63	0.6	230.8	231.4	0.2	29.7	30.6	-0.1	55.4	0.4
7/10/2013 10:14	2.65	37.6	0.6	Run 1	0.10	21.00	22.63	0.6	230.8	231.4	0.2	29.7	30.6	2.8	37.2	0.4
7/10/2013 10:15	2.35	15.4	0.6	Run 1	0.10	21.00	22.63	0.6	230.8	231.4	0.2	29.7	30.6	2.4	14.9	0.4
7/10/2013 10:16	0.75	7.3	0.6	Run 1	0.10	21.00	22.63	0.6	230.8	231.4	0.2	29.7	30.6	0.7	6.8	0.4
7/10/2013 10:17	0.20	3.8	0.7	Run 1	0.10	21.00	22.63	0.6	230.8	231.4	0.2	29.7	30.6	0.1	3.2	0.5
7/10/2013 10:18	0.05	2.8	0.7	Run 1	0.10	21.00	22.63	0.6	230.8	231.4	0.2	29.7	30.6	-0.1	2.2	0.5
7/10/2013 10:19	0.00	2.3	0.6	Run 1	0.10	21.00	22.63	0.6	230.8	231.4	0.2	29.7	30.6	-0.1	1.7	0.4
7/10/2013 10:20	-0.05	3.3	0.7	Run 1	0.10	21.00	22.63	0.6	230.8	231.4	0.2	29.7	30.6	-0.2	2.7	0.5
7/10/2013 10:21	-0.05	8.3	0.6	Run 1	0.10	21.00	22.63	0.6	230.8	231.4	0.2	29.7	30.6	-0.2	7.8	0.4
7/10/2013 10:22	-0.05	13.9	0.6	Run 1	0.10	21.00	22.63	0.6	230.8	231.4	0.2	29.7	30.6	-0.2	13.4	0.4
7/10/2013 10:23	-0.05	26.0	0.6	Run 1	0.10	21.00	22.63	0.6	230.8	231.4	0.2	29.7	30.6	-0.2	25.5	0.4
7/10/2013 10:24	-0.05	40.6	0.6	Run 1	0.10	21.00	22.63	0.6	230.8	231.4	0.2	29.7	30.6	-0.2	40.2	0.4
7/10/2013 10:25	0.00	71.3	0.5	Run 1	0.10	21.00	22.63	0.6	230.8	231.4	0.2	29.7	30.6	-0.1	71.1	0.3
7/10/2013 10:26	0.10	102.0	0.5	Run 1	0.10	21.00	22.63	0.6	230.8	231.4	0.2	29.7	30.6	0.0	102.0	0.3

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	Raw Data				Drift Corrected Data									Corrected Data		
TimeStamp (CDT)	NO_x, ppm	CO, ppm	SO_2, ppm	COMMENTS	Co, NO_x	Cm, NO_x	Cma, NO_x	Co, CO	Cm, CO	Cma, CO	Co, SO_2	Cm, SO_2	Cma, SO_2	NO_x, ppm	CO, ppm	SO_2, ppm
7/10/2013 10:27	-0.05	102.0	0.5	Run 1	0.10	21.00	22.63	0.6	230.8	231.4	0.2	29.7	30.6	-0.2	102.0	0.3
7/10/2013 10:28	-0.05	34.5	0.5	Run 1	0.10	21.00	22.63	0.6	230.8	231.4	0.2	29.7	30.6	-0.2	34.1	0.3
7/10/2013 10:29	0.00	12.4	0.5	Run 1	0.10	21.00	22.63	0.6	230.8	231.4	0.2	29.7	30.6	-0.1	11.8	0.3
7/10/2013 10:30	0.05	103.1	0.5	Run 1	0.10	21.00	22.63	0.6	230.8	231.4	0.2	29.7	30.6	-0.1	103.0	0.3
7/10/2013 10:31	0.10	263.2	0.5	Run 1	0.10	21.00	22.63	0.6	230.8	231.4	0.2	29.7	30.6	0.0	264.0	0.3
7/10/2013 10:32	0.15	341.3	0.5	Run 1	0.10	21.00	22.63	0.6	230.8	231.4	0.2	29.7	30.6	0.1	342.5	0.3
7/10/2013 10:33	0.10	293.5	0.5	Run 1	0.10	21.00	22.63	0.6	230.8	231.4	0.2	29.7	30.6	0.0	294.4	0.3
7/10/2013 10:34	0.00	298.0	0.4	Run 1	0.10	21.00	22.63	0.6	230.8	231.4	0.2	29.7	30.6	-0.1	299.0	0.2
7/10/2013 10:35	0.05	268.8	0.4	Run 1	0.10	21.00	22.63	0.6	230.8	231.4	0.2	29.7	30.6	-0.1	269.6	0.2
7/10/2013 10:36	0.20	262.2	0.3	Run 1	0.10	21.00	22.63	0.6	230.8	231.4	0.2	29.7	30.6	0.1	263.0	0.1
7/10/2013 10:37	0.00	253.7	0.4	Run 1	0.10	21.00	22.63	0.6	230.8	231.4	0.2	29.7	30.6	-0.1	254.4	0.2
7/10/2013 10:38	0.00	208.3	0.4	Run 1	0.10	21.00	22.63	0.6	230.8	231.4	0.2	29.7	30.6	-0.1	208.8	0.2
7/10/2013 10:39	0.10	143.9	0.4	Run 1	0.10	21.00	22.63	0.6	230.8	231.4	0.2	29.7	30.6	0.0	144.0	0.2
7/10/2013 10:40	0.05	162.5	0.4	Run 1	0.10	21.00	22.63	0.6	230.8	231.4	0.2	29.7	30.6	-0.1	162.7	0.2
7/10/2013 10:41	0.30	275.8	0.4	Run 1	0.10	21.00	22.63	0.6	230.8	231.4	0.2	29.7	30.6	0.2	276.7	0.2
7/10/2013 10:42	0.25	316.6	0.4	Run 1	0.10	21.00	22.63	0.6	230.8	231.4	0.2	29.7	30.6	0.2	317.7	0.2
7/10/2013 10:43	0.10	284.9	0.4	Run 1	0.10	21.00	22.63	0.6	230.8	231.4	0.2	29.7	30.6	0.0	285.8	0.2
7/10/2013 10:44	0.05	326.2	0.5	Run 1	0.10	21.00	22.63	0.6	230.8	231.4	0.2	29.7	30.6	-0.1	327.3	0.3
7/10/2013 10:45	0.20	318.2	0.5	Run 1	0.10	21.00	22.63	0.6	230.8	231.4	0.2	29.7	30.6	0.1	319.2	0.3
7/10/2013 10:46	0.85	342.3	0.5	Run 1	0.10	21.00	22.63	0.6	230.8	231.4	0.2	29.7	30.6	0.8	343.5	0.3
7/10/2013 10:47	0.80	374.6	0.5	Run 1	0.10	21.00	22.63	0.6	230.8	231.4	0.2	29.7	30.6	0.8	375.9	0.3
7/10/2013 10:48	0.55	335.8	0.5	Run 1	0.10	21.00	22.63	0.6	230.8	231.4	0.2	29.7	30.6	0.5	336.9	0.3
7/10/2013 10:49	0.45	275.3	0.5	Run 1	0.10	21.00	22.63	0.6	230.8	231.4	0.2	29.7	30.6	0.4	276.2	0.3
7/10/2013 10:50	0.40	257.7	0.5	Run 1	0.10	21.00	22.63	0.6	230.8	231.4	0.2	29.7	30.6	0.3	258.4	0.3
7/10/2013 10:51	0.30	256.2	0.6	Run 1	0.10	21.00	22.63	0.6	230.8	231.4	0.2	29.7	30.6	0.2	256.9	0.4
7/10/2013 10:52	0.20	219.9	0.5	Run 1	0.10	21.00	22.63	0.6	230.8	231.4	0.2	29.7	30.6	0.1	220.5	0.3
7/10/2013 10:53	0.20	192.7	0.5	Run 1	0.10	21.00	22.63	0.6	230.8	231.4	0.2	29.7	30.6	0.1	193.1	0.3
7/10/2013 10:54	0.20	147.4	0.5	Run 1	0.10	21.00	22.63	0.6	230.8	231.4	0.2	29.7	30.6	0.1	147.5	0.3
7/10/2013 10:55	0.15	87.9	0.5	Run 1	0.10	21.00	22.63	0.6	230.8	231.4	0.2	29.7	30.6	0.1	87.8	0.3
7/10/2013 10:56	0.05	54.2	0.5	Run 1	0.10	21.00	22.63	0.6	230.8	231.4	0.2	29.7	30.6	-0.1	53.9	0.3

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	Raw Data				Drift Corrected Data									Corrected Data		
TimeStamp (CDT)	NO_x, ppm	CO, ppm	SO_2, ppm	COMMENTS	Co, NO_x	Cm, NO_x	Cma, NO_x	Co, CO	Cm, CO	Cma, CO	Co, SO_2	Cm, SO_2	Cma, SO_2	NO_x, ppm	CO, ppm	SO_2, ppm
7/10/2013 10:57	0.05	43.6	0.5	Run 1	0.10	21.00	22.63	0.6	230.8	231.4	0.2	29.7	30.6	-0.1	43.2	0.3
7/10/2013 10:58	0.00	26.0	0.5	Run 1	0.10	21.00	22.63	0.6	230.8	231.4	0.2	29.7	30.6	-0.1	25.5	0.3
7/10/2013 10:59	0.05	14.9	0.5	Run 1	0.10	21.00	22.63	0.6	230.8	231.4	0.2	29.7	30.6	-0.1	14.4	0.3
7/10/2013 11:00	0.30	14.4	0.5	Run 1	0.10	21.00	22.63	0.6	230.8	231.4	0.2	29.7	30.6	0.2	13.9	0.3
7/10/2013 11:01	0.45	21.9	0.5	Run 1	0.10	21.00	22.63	0.6	230.8	231.4	0.2	29.7	30.6	0.4	21.5	0.3
7/10/2013 11:02	0.70	26.5	0.5	Run 1	0.10	21.00	22.63	0.6	230.8	231.4	0.2	29.7	30.6	0.6	26.0	0.3
7/10/2013 11:03	1.35	24.5	0.5	Run 1	0.10	21.00	22.63	0.6	230.8	231.4	0.2	29.7	30.6	1.4	24.0	0.3
7/10/2013 11:04	2.30	17.4	0.5	Run 1	0.10	21.00	22.63	0.6	230.8	231.4	0.2	29.7	30.6	2.4	16.9	0.3
7/10/2013 11:05	2.45	10.9	0.5	Run 1	0.10	21.00	22.63	0.6	230.8	231.4	0.2	29.7	30.6	2.5	10.3	0.3
7/10/2013 11:06	6.05	7.3	0.5	Run 1	0.10	21.00	22.63	0.6	230.8	231.4	0.2	29.7	30.6	6.4	6.8	0.3
7/10/2013 11:07	6.75	9.4	0.6	Run 1	0.10	21.00	22.63	0.6	230.8	231.4	0.2	29.7	30.6	7.2	8.8	0.4
7/10/2013 11:08	2.35	9.4	0.6	Run 1	0.10	21.00	22.63	0.6	230.8	231.4	0.2	29.7	30.6	2.4	8.8	0.4
7/10/2013 11:09	0.90	4.8	0.6	Run 1	0.10	21.00	22.63	0.6	230.8	231.4	0.2	29.7	30.6	0.9	4.2	0.4
7/10/2013 11:10	0.40	3.8	0.6	Run 1	0.10	21.00	22.63	0.6	230.8	231.4	0.2	29.7	30.6	0.3	3.2	0.4
7/10/2013 11:11	0.25	3.3	0.6	Run 1	0.10	21.00	22.63	0.6	230.8	231.4	0.2	29.7	30.6	0.2	2.7	0.4
7/10/2013 11:12	0.15	3.3	0.6	Run 1	0.10	21.00	22.63	0.6	230.8	231.4	0.2	29.7	30.6	0.1	2.7	0.4
7/10/2013 11:13	0.15	3.3	0.6	Run 1	0.10	21.00	22.63	0.6	230.8	231.4	0.2	29.7	30.6	0.1	2.7	0.4
7/10/2013 11:14	0.10	3.3	0.6	Run 1	0.10	21.00	22.63	0.6	230.8	231.4	0.2	29.7	30.6	0.0	2.7	0.4
7/10/2013 11:15	0.05	3.3	0.5	Run 1	0.10	21.00	22.63	0.6	230.8	231.4	0.2	29.7	30.6	-0.1	2.7	0.3
7/10/2013 11:16	0.05	4.3	0.5	Run 1	0.10	21.00	22.63	0.6	230.8	231.4	0.2	29.7	30.6	-0.1	3.7	0.3
7/10/2013 11:17	0.05	15.4	0.5	Run 1	0.10	21.00	22.63	0.6	230.8	231.4	0.2	29.7	30.6	-0.1	14.9	0.3
7/10/2013 11:18	0.05	26.5	0.5	Run 1	0.10	21.00	22.63	0.6	230.8	231.4	0.2	29.7	30.6	-0.1	26.0	0.3
7/10/2013 11:19	0.05	122.7	0.5	Run 1	0.10	21.00	22.63	0.6	230.8	231.4	0.2	29.7	30.6	-0.1	122.7	0.3
7/10/2013 11:20	0.05	154.4	0.4	Run 1	0.10	21.00	22.63	0.6	230.8	231.4	0.2	29.7	30.6	-0.1	154.6	0.2
7/10/2013 11:21	-0.05	93.0	0.4	Run 1	0.10	21.00	22.63	0.6	230.8	231.4	0.2	29.7	30.6	-0.2	92.9	0.2
7/10/2013 11:22	-0.05	87.9	0.4	Run 1	0.10	21.00	22.63	0.6	230.8	231.4	0.2	29.7	30.6	-0.2	87.8	0.2
7/10/2013 11:23	-0.05	77.4	0.4	Run 1	0.10	21.00	22.63	0.6	230.8	231.4	0.2	29.7	30.6	-0.2	77.2	0.2
7/10/2013 11:24	2.80	60.7	0.5	Run 1	0.10	21.00	22.63	0.6	230.8	231.4	0.2	29.7	30.6	2.9	60.5	0.3
7/10/2013 11:25	3.50	31.5	0.5	Run 1	0.10	21.00	22.63	0.6	230.8	231.4	0.2	29.7	30.6	3.7	31.1	0.3
7/10/2013 11:26	0.80	21.4	0.5	Run 1	0.10	21.00	22.63	0.6	230.8	231.4	0.2	29.7	30.6	0.8	21.0	0.3

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	Raw Data				Drift Corrected Data									Corrected Data		
TimeStamp (CDT)	NO_x, ppm	CO, ppm	SO_2, ppm	COMMENTS	Co, NO_x	Cm, NO_x	Cma, NO_x	Co, CO	Cm, CO	Cma, CO	Co, SO_2	Cm, SO_2	Cma, SO_2	NO_x, ppm	CO, ppm	SO_2, ppm
7/10/2013 11:27	0.20	10.4	0.5	Run 1	0.10	21.00	22.63	0.6	230.8	231.4	0.2	29.7	30.6	0.1	9.8	0.3
7/10/2013 11:28	0.05	6.3	0.5	Run 1	0.10	21.00	22.63	0.6	230.8	231.4	0.2	29.7	30.6	-0.1	5.8	0.3
7/10/2013 11:29	0.00	4.8	0.5	Run 1	0.10	21.00	22.63	0.6	230.8	231.4	0.2	29.7	30.6	-0.1	4.2	0.3
7/10/2013 11:30	-0.05	3.3	0.5	Run 1	0.10	21.00	22.63	0.6	230.8	231.4	0.2	29.7	30.6	-0.2	2.7	0.3
7/10/2013 11:31	-0.05	3.8	0.5	Run 1	0.10	21.00	22.63	0.6	230.8	231.4	0.2	29.7	30.6	-0.2	3.2	0.3
7/10/2013 11:32	-0.05	5.3	0.5	Run 1	0.10	21.00	22.63	0.6	230.8	231.4	0.2	29.7	30.6	-0.2	4.7	0.3
7/10/2013 11:33	-0.05	4.3	0.5	Run 1	0.10	21.00	22.63	0.6	230.8	231.4	0.2	29.7	30.6	-0.2	3.7	0.3
7/10/2013 11:34	-0.05	17.9	0.5	Run 1	0.10	21.00	22.63	0.6	230.8	231.4	0.2	29.7	30.6	-0.2	17.4	0.3
7/10/2013 11:35	-0.05	39.1	0.5	Run 1	0.10	21.00	22.63	0.6	230.8	231.4	0.2	29.7	30.6	-0.2	38.7	0.3
7/10/2013 11:36	0.00	84.4	0.4	Run 1	0.10	21.00	22.63	0.6	230.8	231.4	0.2	29.7	30.6	-0.1	84.3	0.2
7/10/2013 11:37	0.00	89.5	0.4	Run 1	0.10	21.00	22.63	0.6	230.8	231.4	0.2	29.7	30.6	-0.1	89.3	0.2
7/10/2013 11:38	0.05	118.2	0.4	Run 1	0.10	21.00	22.63	0.6	230.8	231.4	0.2	29.7	30.6	-0.1	118.2	0.2
7/10/2013 11:39	0.00	128.7	0.4	Run 1	0.10	21.00	22.63	0.6	230.8	231.4	0.2	29.7	30.6	-0.1	128.8	0.2
7/10/2013 11:40	0.05	185.7	0.4	Run 1	0.10	21.00	22.63	0.6	230.8	231.4	0.2	29.7	30.6	-0.1	186.0	0.2
7/10/2013 11:41	0.05	312.6	0.4	Run 1	0.10	21.00	22.63	0.6	230.8	231.4	0.2	29.7	30.6	-0.1	313.6	0.2
7/10/2013 11:42	0.05	341.8	0.4	Run 1	0.10	21.00	22.63	0.6	230.8	231.4	0.2	29.7	30.6	-0.1	343.0	0.2
7/10/2013 11:43	0.05	396.7	0.4	Run 1	0.10	21.00	22.63	0.6	230.8	231.4	0.2	29.7	30.6	-0.1	398.2	0.2
7/10/2013 11:44	0.05	398.8	0.4	Run 1	0.10	21.00	22.63	0.6	230.8	231.4	0.2	29.7	30.6	-0.1	400.2	0.2
7/10/2013 11:45	0.15	400.8	0.4	Run 1	0.10	21.00	22.63	0.6	230.8	231.4	0.2	29.7	30.6	0.1	402.3	0.2
7/10/2013 11:46	0.25	354.4	0.5	Run 1	0.10	21.00	22.63	0.6	230.8	231.4	0.2	29.7	30.6	0.2	355.7	0.3
7/10/2013 11:47	0.15	361.0	0.4	Run 1	0.10	21.00	22.63	0.6	230.8	231.4	0.2	29.7	30.6	0.1	362.3	0.2
7/10/2013 11:48	-0.05	255.7	0.5	Run 1	0.10	21.00	22.63	0.6	230.8	231.4	0.2	29.7	30.6	-0.2	256.4	0.3
7/10/2013 11:49	-0.05	164.5	0.4	Run 1	0.10	21.00	22.63	0.6	230.8	231.4	0.2	29.7	30.6	-0.2	164.8	0.2
7/10/2013 11:50	0.05	262.7	0.5	Run 1	0.10	21.00	22.63	0.6	230.8	231.4	0.2	29.7	30.6	-0.1	263.5	0.3
7/10/2013 11:51	0.15	397.2	0.5	Run 1	0.10	21.00	22.63	0.6	230.8	231.4	0.2	29.7	30.6	0.1	398.7	0.3
7/10/2013 11:52	0.60	427.5	0.5	Run 1	0.10	21.00	22.63	0.6	230.8	231.4	0.2	29.7	30.6	0.5	429.1	0.3
7/10/2013 11:53	1.35	405.3	0.5	Run 1	0.10	21.00	22.63	0.6	230.8	231.4	0.2	29.7	30.6	1.4	406.8	0.3
7/10/2013 11:54	1.35	352.4	0.5	Run 1	0.10	21.00	22.63	0.6	230.8	231.4	0.2	29.7	30.6	1.4	353.6	0.3
7/10/2013 11:55	1.25	309.6	0.5	Run 1	0.10	21.00	22.63	0.6	230.8	231.4	0.2	29.7	30.6	1.2	310.6	0.3
7/10/2013 11:56	1.20	334.3	0.5	Run 1	0.10	21.00	22.63	0.6	230.8	231.4	0.2	29.7	30.6	1.2	335.4	0.3

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	Raw Data				Drift Corrected Data									Corrected Data		
TimeStamp (CDT)	NO_x, ppm	CO, ppm	SO_2, ppm	COMMENTS	Co, NO_x	Cm, NO_x	Cma, NO_x	Co, CO	Cm, CO	Cma, CO	Co, SO_2	Cm, SO_2	Cma, SO_2	NO_x, ppm	CO, ppm	SO_2, ppm
7/10/2013 11:57	0.95	367.0	0.6	Run 1	0.10	21.00	22.63	0.6	230.8	231.4	0.2	29.7	30.6	0.9	368.3	0.4
7/10/2013 11:58	0.70	309.6	0.6	Run 1	0.10	21.00	22.63	0.6	230.8	231.4	0.2	29.7	30.6	0.6	310.6	0.4
7/10/2013 11:59	0.55	218.9	0.6	Run 1	0.10	21.00	22.63	0.6	230.8	231.4	0.2	29.7	30.6	0.5	219.5	0.4
7/10/2013 12:00	0.45	177.6	0.6	Run 1	0.10	21.00	22.63	0.6	230.8	231.4	0.2	29.7	30.6	0.4	177.9	0.4
7/10/2013 12:01	0.40	178.1	0.6	Run 1	0.10	21.00	22.63	0.6	230.8	231.4	0.2	29.7	30.6	0.3	178.4	0.4
7/10/2013 12:02	0.40	139.8	0.6	Run 1	0.10	21.00	22.63	0.6	230.8	231.4	0.2	29.7	30.6	0.3	140.0	0.4
7/10/2013 12:03	0.35	67.8	0.6	Run 1	0.10	21.00	22.63	0.6	230.8	231.4	0.2	29.7	30.6	0.3	67.5	0.4
7/10/2013 12:04	0.20	21.9	0.6	Run 1	0.10	21.00	22.63	0.6	230.8	231.4	0.2	29.7	30.6	0.1	21.5	0.4
7/10/2013 12:05	0.15	11.4	0.6	Run 1	0.10	21.00	22.63	0.6	230.8	231.4	0.2	29.7	30.6	0.1	10.8	0.4
7/10/2013 12:06	0.05	6.8	0.5	Run 1	0.10	21.00	22.63	0.6	230.8	231.4	0.2	29.7	30.6	-0.1	6.3	0.3
7/10/2013 12:07	0.00	5.3	0.5	Run 1	0.10	21.00	22.63	0.6	230.8	231.4	0.2	29.7	30.6	-0.1	4.7	0.3
7/10/2013 12:08	-0.05	3.8	0.5	Run 1	0.10	21.00	22.63	0.6	230.8	231.4	0.2	29.7	30.6	-0.2	3.2	0.3
7/10/2013 12:09	-0.05	10.9	0.5	Run 1	0.10	21.00	22.63	0.6	230.8	231.4	0.2	29.7	30.6	-0.2	10.3	0.3
7/10/2013 12:10	-0.05	89.5	0.5	Run 1	0.10	21.00	22.63	0.6	230.8	231.4	0.2	29.7	30.6	-0.2	89.3	0.3
7/10/2013 12:11	-0.05	160.5	0.5	Run 1	0.10	21.00	22.63	0.6	230.8	231.4	0.2	29.7	30.6	-0.2	160.7	0.3
7/10/2013 12:12	-0.05	153.4	0.4	Run 1	0.10	21.00	22.63	0.6	230.8	231.4	0.2	29.7	30.6	-0.2	153.6	0.2
7/10/2013 12:13	0.00	64.8	0.4	Run 1	0.10	21.00	22.63	0.6	230.8	231.4	0.2	29.7	30.6	-0.1	64.5	0.2
7/10/2013 12:14	0.25	19.4	0.4	Run 1	0.10	21.00	22.63	0.6	230.8	231.4	0.2	29.7	30.6	0.2	18.9	0.2
7/10/2013 12:15	0.40	8.9	0.4	Run 1	0.10	21.00	22.63	0.6	230.8	231.4	0.2	29.7	30.6	0.3	8.3	0.2
7/10/2013 12:16	0.55	4.8	0.4	Run 1	0.10	21.00	22.63	0.6	230.8	231.4	0.2	29.7	30.6	0.5	4.2	0.2
7/10/2013 12:17	1.30	3.8	0.4	Run 1	0.10	21.00	22.63	0.6	230.8	231.4	0.2	29.7	30.6	1.3	3.2	0.2
	0.57	**115.0**	**0.5**	**Run 1 Average**										**0.5**	**115.0**	**0.3**
7/10/2013 12:18	2.70	4.3	0.4													
7/10/2013 12:19	4.15	5.3	0.5													
7/10/2013 12:20	5.45	3.8	0.5													
7/10/2013 12:21	6.20	3.3	0.5													
7/10/2013 12:22	4.95	3.3	0.5													
7/10/2013 12:23	8.95	3.8	0.5													
7/10/2013 12:24	5.70	13.4	0.5													
7/10/2013 12:25	2.75	38.6	0.6													

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TimeStamp (CDT)	NO_x, ppm	CO, ppm	SO_2, ppm	COMMENTS	Co, NO_x	Cm, NO_x	Cma, NO_x	Co, CO	Cm, CO	Cma, CO	Co, SO_2	Cm, SO_2	Cma, SO_2	NO_x, ppm	CO, ppm	SO_2, ppm
7/10/2013 12:26	1.40	36.1	0.6													
7/10/2013 12:27	0.70	11.4	0.6													
7/10/2013 12:28	0.45	4.8	0.6													
7/10/2013 12:29	0.30	3.3	0.6													
7/10/2013 12:30	0.20	3.3	0.7													
7/10/2013 12:31	0.05	2.3	0.5													
7/10/2013 12:32	-0.05	2.3	0.4													
7/10/2013 12:33	0.10	2.3	3.4													
7/10/2013 12:34	0.25	1.3	15.7													
7/10/2013 12:35	0.30	0.3	23.2													
7/10/2013 12:36	0.20	0.3	26.0													
7/10/2013 12:37	0.15	0.3	27.3													
7/10/2013 12:38	0.20	0.8	28.0													
7/10/2013 12:39	0.15	0.3	28.3													
7/10/2013 12:40	0.15	0.3	29.3													
7/10/2013 12:41	0.15	0.3	29.6	30.2 SO2 (Bias)												
			29.6	**Average 30.2 SO2 (Bias)**												
7/10/2013 12:42	4.35	0.3	28.1													
7/10/2013 12:43	17.25	0.3	16.9													
7/10/2013 12:44	20.95	0.3	7.0													
7/10/2013 12:45	21.50	0.3	4.3													
7/10/2013 12:46	21.55	0.3	3.5													
7/10/2013 12:47	21.55	0.3	3.1	22.63 Nox, Zero CO (Bias)												
	21.55	**0.3**		**Average 22.63 Nox, Zero CO (Bias)**												
7/10/2013 12:48	14.75	16.4	2.0													
7/10/2013 12:49	1.80	152.4	1.0													
7/10/2013 12:50	0.05	221.4	0.7													
7/10/2013 12:51	-0.15	229.5	0.4													
7/10/2013 12:52	-0.15	230.5	0.2	Zero Nox, 231.4 CO, Zero SO2 (Bias)												
	-0.15	**230.5**	**0.2**	**Average Zero Nox, 231.4 CO, Zero SO2 (Bias)**												

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TimeStamp (CDT)	NO_x, ppm	CO, ppm	SO_2, ppm	COMMENTS	Co, NO_x	Cm, NO_x	Cma, NO_x	Co, CO	Cm, CO	Cma, CO	Co, SO_2	Cm, SO_2	Cma, SO_2	NO_x, ppm	CO, ppm	SO_2, ppm
7/10/2013 12:53	-0.10	228.0	0.3													
7/10/2013 12:54	0.10	155.9	2.9													
7/10/2013 12:55	0.05	58.2	2.7													
7/10/2013 12:56	0.05	39.6	2.2													
7/10/2013 12:57	0.05	69.3	1.8													
7/10/2013 12:58	0.00	90.5	1.6													
7/10/2013 12:59	-0.05	151.4	1.5													
7/10/2013 13:00	-0.05	247.1	1.4													
7/10/2013 13:01	-0.05	281.4	1.3													
7/10/2013 13:02	-0.05	224.0	1.3													
7/10/2013 13:03	0.05	178.1	1.2													
7/10/2013 13:04	0.05	271.8	1.2													
7/10/2013 13:05	-0.05	311.1	1.2													
7/10/2013 13:06	0.00	328.2	1.1													
7/10/2013 13:07	0.05	357.4	1.1													
7/10/2013 13:08	0.05	347.9	1.1													
7/10/2013 13:09	0.15	334.3	1.1													
7/10/2013 13:10	0.35	301.5	1.1													
7/10/2013 13:11	0.75	322.2	1.1													
7/10/2013 13:12	0.70	341.8	1.1													
7/10/2013 13:13	0.65	313.6	1.1													
7/10/2013 13:14	0.55	241.6	1.1													
7/10/2013 13:15	0.40	190.7	1.1													
7/10/2013 13:16	0.30	162.0	1.1													
7/10/2013 13:17	0.15	140.3	1.1													
7/10/2013 13:18	0.15	111.6	1.1													
7/10/2013 13:19	0.15	108.6	1.1													
7/10/2013 13:20	0.05	121.2	1.0													
7/10/2013 13:21	0.05	113.6	1.0													
7/10/2013 13:22	0.00	52.7	1.0													

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TimeStamp (CDT)	NO_x, ppm	CO, ppm	SO_2, ppm	COMMENTS	Co, NO_x	Cm, NO_x	Cma, NO_x	Co, CO	Cm, CO	Cma, CO	Co, SO_2	Cm, SO_2	Cma, SO_2	NO_x, ppm	CO, ppm	SO_2, ppm
7/10/2013 13:23	0.00	17.4	0.9													
7/10/2013 13:24	0.60	7.8	0.9													
7/10/2013 13:25	0.80	5.3	0.8													
7/10/2013 13:26	1.20	4.3	0.8													
7/10/2013 13:27	2.40	4.3	0.8													
7/10/2013 13:28	4.15	4.8	0.8													
7/10/2013 13:29	5.80	4.8	0.8	Run 2	-0.15	21.63	22.63	0.6	229.5	231.4	0.4	29.5	30.6	6.2	4.3	0.4
7/10/2013 13:30	6.45	3.8	0.9	Run 2	-0.15	21.63	22.63	0.6	229.5	231.4	0.4	29.5	30.6	6.9	3.2	0.5
7/10/2013 13:31	5.25	3.3	0.9	Run 2	-0.15	21.63	22.63	0.6	229.5	231.4	0.4	29.5	30.6	5.6	2.7	0.5
7/10/2013 13:32	2.65	3.3	0.9	Run 2	-0.15	21.63	22.63	0.6	229.5	231.4	0.4	29.5	30.6	2.9	2.7	0.5
7/10/2013 13:33	3.55	3.3	0.9	Run 2	-0.15	21.63	22.63	0.6	229.5	231.4	0.4	29.5	30.6	3.8	2.7	0.5
7/10/2013 13:34	5.45	4.8	1.0	Run 2	-0.15	21.63	22.63	0.6	229.5	231.4	0.4	29.5	30.6	5.8	4.3	0.6
7/10/2013 13:35	3.00	7.8	1.1	Run 2	-0.15	21.63	22.63	0.6	229.5	231.4	0.4	29.5	30.6	3.3	7.3	0.7
7/10/2013 13:36	1.15	5.3	1.2	Run 2	-0.15	21.63	22.63	0.6	229.5	231.4	0.4	29.5	30.6	1.4	4.8	0.8
7/10/2013 13:37	0.50	3.8	1.2	Run 2	-0.15	21.63	22.63	0.6	229.5	231.4	0.4	29.5	30.6	0.7	3.2	0.9
7/10/2013 13:38	0.30	3.3	1.3	Run 2	-0.15	21.63	22.63	0.6	229.5	231.4	0.4	29.5	30.6	0.5	2.7	0.9
7/10/2013 13:39	0.15	3.3	1.3	Run 2	-0.15	21.63	22.63	0.6	229.5	231.4	0.4	29.5	30.6	0.3	2.7	1.0
7/10/2013 13:40	0.15	3.3	1.4	Run 2	-0.15	21.63	22.63	0.6	229.5	231.4	0.4	29.5	30.6	0.3	2.7	1.0
7/10/2013 13:41	0.10	3.3	1.4	Run 2	-0.15	21.63	22.63	0.6	229.5	231.4	0.4	29.5	30.6	0.3	2.7	1.1
7/10/2013 13:42	0.05	3.8	1.5	Run 2	-0.15	21.63	22.63	0.6	229.5	231.4	0.4	29.5	30.6	0.2	3.2	1.1
7/10/2013 13:43	0.05	4.8	1.5	Run 2	-0.15	21.63	22.63	0.6	229.5	231.4	0.4	29.5	30.6	0.2	4.3	1.2
7/10/2013 13:44	0.00	7.3	1.6	Run 2	-0.15	21.63	22.63	0.6	229.5	231.4	0.4	29.5	30.6	0.2	6.8	1.2
7/10/2013 13:45	-0.05	7.3	1.6	Run 2	-0.15	21.63	22.63	0.6	229.5	231.4	0.4	29.5	30.6	0.1	6.8	1.2
7/10/2013 13:46	-0.05	5.8	1.6	Run 2	-0.15	21.63	22.63	0.6	229.5	231.4	0.4	29.5	30.6	0.1	5.3	1.2
7/10/2013 13:47	-0.05	11.4	1.6	Run 2	-0.15	21.63	22.63	0.6	229.5	231.4	0.4	29.5	30.6	0.1	10.9	1.2
7/10/2013 13:48	-0.05	16.9	1.6	Run 2	-0.15	21.63	22.63	0.6	229.5	231.4	0.4	29.5	30.6	0.1	16.5	1.2
7/10/2013 13:49	0.00	31.5	1.6	Run 2	-0.15	21.63	22.63	0.6	229.5	231.4	0.4	29.5	30.6	0.2	31.3	1.2
7/10/2013 13:50	0.10	58.2	1.6	Run 2	-0.15	21.63	22.63	0.6	229.5	231.4	0.4	29.5	30.6	0.3	58.2	1.2
7/10/2013 13:51	0.15	71.3	1.6	Run 2	-0.15	21.63	22.63	0.6	229.5	231.4	0.4	29.5	30.6	0.3	71.5	1.3
7/10/2013 13:52	0.15	38.6	1.6	Run 2	-0.15	21.63	22.63	0.6	229.5	231.4	0.4	29.5	30.6	0.3	38.4	1.3

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TimeStamp (CDT)	NO_x, ppm	CO, ppm	SO_2, ppm	COMMENTS	Co, NO_x	Cm, NO_x	Cma, NO_x	Co, CO	Cm, CO	Cma, CO	Co, SO_2	Cm, SO_2	Cma, SO_2	NO_x, ppm	CO, ppm	SO_2, ppm
7/10/2013 13:53	1.55	13.4	1.7	Run 2	-0.15	21.63	22.63	0.6	229.5	231.4	0.4	29.5	30.6	1.8	12.9	1.3
7/10/2013 13:54	2.85	16.9	1.8	Run 2	-0.15	21.63	22.63	0.6	229.5	231.4	0.4	29.5	30.6	3.1	16.5	1.4
7/10/2013 13:55	1.90	16.9	2.0	Run 2	-0.15	21.63	22.63	0.6	229.5	231.4	0.4	29.5	30.6	2.1	16.5	1.7
7/10/2013 13:56	0.70	9.4	2.1	Run 2	-0.15	21.63	22.63	0.6	229.5	231.4	0.4	29.5	30.6	0.9	8.9	1.8
7/10/2013 13:57	0.25	4.8	2.2	Run 2	-0.15	21.63	22.63	0.6	229.5	231.4	0.4	29.5	30.6	0.4	4.3	1.8
7/10/2013 13:58	0.10	3.3	2.1	Run 2	-0.15	21.63	22.63	0.6	229.5	231.4	0.4	29.5	30.6	0.3	2.7	1.8
7/10/2013 13:59	0.05	3.3	2.0	Run 2	-0.15	21.63	22.63	0.6	229.5	231.4	0.4	29.5	30.6	0.2	2.7	1.7
7/10/2013 14:00	0.00	3.3	1.9	Run 2	-0.15	21.63	22.63	0.6	229.5	231.4	0.4	29.5	30.6	0.2	2.7	1.5
7/10/2013 14:01	-0.05	5.8	1.7	Run 2	-0.15	21.63	22.63	0.6	229.5	231.4	0.4	29.5	30.6	0.1	5.3	1.4
7/10/2013 14:02	-0.05	6.3	1.6	Run 2	-0.15	21.63	22.63	0.6	229.5	231.4	0.4	29.5	30.6	0.1	5.8	1.3
7/10/2013 14:03	-0.05	9.9	1.5	Run 2	-0.15	21.63	22.63	0.6	229.5	231.4	0.4	29.5	30.6	0.1	9.4	1.2
7/10/2013 14:04	-0.05	15.9	1.4	Run 2	-0.15	21.63	22.63	0.6	229.5	231.4	0.4	29.5	30.6	0.1	15.5	1.1
7/10/2013 14:05	-0.05	35.0	1.4	Run 2	-0.15	21.63	22.63	0.6	229.5	231.4	0.4	29.5	30.6	0.1	34.8	1.0
7/10/2013 14:06	-0.05	49.2	1.3	Run 2	-0.15	21.63	22.63	0.6	229.5	231.4	0.4	29.5	30.6	0.1	49.1	0.9
7/10/2013 14:07	-0.05	61.2	1.3	Run 2	-0.15	21.63	22.63	0.6	229.5	231.4	0.4	29.5	30.6	0.1	61.3	0.9
7/10/2013 14:08	0.00	52.7	1.2	Run 2	-0.15	21.63	22.63	0.6	229.5	231.4	0.4	29.5	30.6	0.2	52.6	0.9
7/10/2013 14:09	0.00	62.2	1.2	Run 2	-0.15	21.63	22.63	0.6	229.5	231.4	0.4	29.5	30.6	0.2	62.3	0.8
7/10/2013 14:10	-0.05	49.2	1.1	Run 2	-0.15	21.63	22.63	0.6	229.5	231.4	0.4	29.5	30.6	0.1	49.1	0.8
7/10/2013 14:11	-0.05	119.2	1.1	Run 2	-0.15	21.63	22.63	0.6	229.5	231.4	0.4	29.5	30.6	0.1	119.9	0.7
7/10/2013 14:12	-0.05	138.8	1.1	Run 2	-0.15	21.63	22.63	0.6	229.5	231.4	0.4	29.5	30.6	0.1	139.7	0.7
7/10/2013 14:13	-0.05	150.9	1.1	Run 2	-0.15	21.63	22.63	0.6	229.5	231.4	0.4	29.5	30.6	0.1	151.9	0.7
7/10/2013 14:14	0.15	153.9	1.1	Run 2	-0.15	21.63	22.63	0.6	229.5	231.4	0.4	29.5	30.6	0.3	155.0	0.7
7/10/2013 14:15	0.20	248.1	1.1	Run 2	-0.15	21.63	22.63	0.6	229.5	231.4	0.4	29.5	30.6	0.4	250.2	0.7
7/10/2013 14:16	0.05	311.1	1.1	Run 2	-0.15	21.63	22.63	0.6	229.5	231.4	0.4	29.5	30.6	0.2	313.9	0.7
7/10/2013 14:17	0.00	323.2	1.1	Run 2	-0.15	21.63	22.63	0.6	229.5	231.4	0.4	29.5	30.6	0.2	326.1	0.7
7/10/2013 14:18	0.00	333.3	1.1	Run 2	-0.15	21.63	22.63	0.6	229.5	231.4	0.4	29.5	30.6	0.2	336.3	0.7
7/10/2013 14:19	0.00	321.7	1.1	Run 2	-0.15	21.63	22.63	0.6	229.5	231.4	0.4	29.5	30.6	0.2	324.6	0.8
7/10/2013 14:20	0.10	314.6	1.1	Run 2	-0.15	21.63	22.63	0.6	229.5	231.4	0.4	29.5	30.6	0.3	317.5	0.8
7/10/2013 14:21	0.25	319.7	1.1	Run 2	-0.15	21.63	22.63	0.6	229.5	231.4	0.4	29.5	30.6	0.4	322.5	0.8
7/10/2013 14:22	0.40	324.7	1.1	Run 2	-0.15	21.63	22.63	0.6	229.5	231.4	0.4	29.5	30.6	0.6	327.6	0.8

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	Raw Data				Drift Corrected Data									Corrected Data		
TimeStamp (CDT)	NO_x, ppm	CO, ppm	SO_2, ppm	COMMENTS	Co, NO_x	Cm, NO_x	Cma, NO_x	Co, CO	Cm, CO	Cma, CO	Co, SO_2	Cm, SO_2	Cma, SO_2	NO_x, ppm	CO, ppm	SO_2, ppm
7/10/2013 14:23	1.15	302.0	1.2	Run 2	-0.15	21.63	22.63	0.6	229.5	231.4	0.4	29.5	30.6	1.4	304.7	0.8
7/10/2013 14:24	1.00	209.3	1.2	Run 2	-0.15	21.63	22.63	0.6	229.5	231.4	0.4	29.5	30.6	1.2	211.0	0.8
7/10/2013 14:25	0.55	185.2	1.2	Run 2	-0.15	21.63	22.63	0.6	229.5	231.4	0.4	29.5	30.6	0.7	186.6	0.9
7/10/2013 14:26	0.40	193.2	1.3	Run 2	-0.15	21.63	22.63	0.6	229.5	231.4	0.4	29.5	30.6	0.6	194.7	0.9
7/10/2013 14:27	0.30	205.8	1.3	Run 2	-0.15	21.63	22.63	0.6	229.5	231.4	0.4	29.5	30.6	0.5	207.5	0.9
7/10/2013 14:28	0.15	189.2	1.2	Run 2	-0.15	21.63	22.63	0.6	229.5	231.4	0.4	29.5	30.6	0.3	190.7	0.9
7/10/2013 14:29	0.05	149.4	1.2	Run 2	-0.15	21.63	22.63	0.6	229.5	231.4	0.4	29.5	30.6	0.2	150.4	0.8
7/10/2013 14:30	0.00	124.2	1.2	Run 2	-0.15	21.63	22.63	0.6	229.5	231.4	0.4	29.5	30.6	0.2	125.0	0.8
7/10/2013 14:31	0.00	109.6	1.1	Run 2	-0.15	21.63	22.63	0.6	229.5	231.4	0.4	29.5	30.6	0.2	110.2	0.8
7/10/2013 14:32	0.05	106.6	1.1	Run 2	-0.15	21.63	22.63	0.6	229.5	231.4	0.4	29.5	30.6	0.2	107.1	0.7
7/10/2013 14:33	0.05	102.5	1.0	Run 2	-0.15	21.63	22.63	0.6	229.5	231.4	0.4	29.5	30.6	0.2	103.1	0.7
7/10/2013 14:34	0.30	85.4	1.0	Run 2	-0.15	21.63	22.63	0.6	229.5	231.4	0.4	29.5	30.6	0.5	85.7	0.6
7/10/2013 14:35	0.40	43.6	1.0	Run 2	-0.15	21.63	22.63	0.6	229.5	231.4	0.4	29.5	30.6	0.6	43.5	0.6
7/10/2013 14:36	0.40	24.5	1.0	Run 2	-0.15	21.63	22.63	0.6	229.5	231.4	0.4	29.5	30.6	0.6	24.1	0.6
7/10/2013 14:37	0.50	24.0	0.9	Run 2	-0.15	21.63	22.63	0.6	229.5	231.4	0.4	29.5	30.6	0.7	23.6	0.6
7/10/2013 14:38	0.55	24.5	1.0	Run 2	-0.15	21.63	22.63	0.6	229.5	231.4	0.4	29.5	30.6	0.7	24.1	0.6
7/10/2013 14:39	1.60	22.5	0.9	Run 2	-0.15	21.63	22.63	0.6	229.5	231.4	0.4	29.5	30.6	1.8	22.1	0.6
7/10/2013 14:40	4.65	14.4	1.0	Run 2	-0.15	21.63	22.63	0.6	229.5	231.4	0.4	29.5	30.6	5.0	13.9	0.6
7/10/2013 14:41	8.55	7.8	1.0	Run 2	-0.15	21.63	22.63	0.6	229.5	231.4	0.4	29.5	30.6	9.0	7.3	0.6
7/10/2013 14:42	5.35	8.9	1.0	Run 2	-0.15	21.63	22.63	0.6	229.5	231.4	0.4	29.5	30.6	5.7	8.3	0.6
7/10/2013 14:43	1.95	6.8	1.0	Run 2	-0.15	21.63	22.63	0.6	229.5	231.4	0.4	29.5	30.6	2.2	6.3	0.6
7/10/2013 14:44	0.75	4.3	1.0	Run 2	-0.15	21.63	22.63	0.6	229.5	231.4	0.4	29.5	30.6	0.9	3.8	0.7
7/10/2013 14:45	0.40	2.8	1.1	Run 2	-0.15	21.63	22.63	0.6	229.5	231.4	0.4	29.5	30.6	0.6	2.2	0.7
7/10/2013 14:46	0.25	2.3	1.1	Run 2	-0.15	21.63	22.63	0.6	229.5	231.4	0.4	29.5	30.6	0.4	1.7	0.8
7/10/2013 14:47	0.15	2.3	1.1	Run 2	-0.15	21.63	22.63	0.6	229.5	231.4	0.4	29.5	30.6	0.3	1.7	0.8
7/10/2013 14:48	0.15	2.3	1.1	Run 2	-0.15	21.63	22.63	0.6	229.5	231.4	0.4	29.5	30.6	0.3	1.7	0.7
7/10/2013 14:49	0.05	3.8	1.1	Run 2	-0.15	21.63	22.63	0.6	229.5	231.4	0.4	29.5	30.6	0.2	3.2	0.7
7/10/2013 14:50	0.05	11.4	1.0	Run 2	-0.15	21.63	22.63	0.6	229.5	231.4	0.4	29.5	30.6	0.2	10.9	0.7
7/10/2013 14:51	0.05	22.5	1.0	Run 2	-0.15	21.63	22.63	0.6	229.5	231.4	0.4	29.5	30.6	0.2	22.1	0.7
7/10/2013 14:52	0.05	36.6	1.0	Run 2	-0.15	21.63	22.63	0.6	229.5	231.4	0.4	29.5	30.6	0.2	36.3	0.6

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TimeStamp (CDT)	NO_x, ppm	CO, ppm	SO_2, ppm	COMMENTS	Co, NO_x	Cm, NO_x	Cma, NO_x	Co, CO	Cm, CO	Cma, CO	Co, SO_2	Cm, SO_2	Cma, SO_2	NO_x, ppm	CO, ppm	SO_2, ppm
7/10/2013 14:53	0.05	45.1	1.0	Run 2	-0.15	21.63	22.63	0.6	229.5	231.4	0.4	29.5	30.6	0.2	45.0	0.6
7/10/2013 14:54	0.05	63.8	0.9	Run 2	-0.15	21.63	22.63	0.6	229.5	231.4	0.4	29.5	30.6	0.2	63.8	0.6
7/10/2013 14:55	0.00	90.5	1.0	Run 2	-0.15	21.63	22.63	0.6	229.5	231.4	0.4	29.5	30.6	0.2	90.8	0.6
7/10/2013 14:56	-0.05	74.8	1.0	Run 2	-0.15	21.63	22.63	0.6	229.5	231.4	0.4	29.5	30.6	0.1	75.1	0.6
7/10/2013 14:57	-0.05	47.1	0.9	Run 2	-0.15	21.63	22.63	0.6	229.5	231.4	0.4	29.5	30.6	0.1	47.0	0.6
7/10/2013 14:58	-0.05	36.6	0.9	Run 2	-0.15	21.63	22.63	0.6	229.5	231.4	0.4	29.5	30.6	0.1	36.3	0.5
7/10/2013 14:59	-0.05	51.2	0.9	Run 2	-0.15	21.63	22.63	0.6	229.5	231.4	0.4	29.5	30.6	0.1	51.1	0.5
7/10/2013 15:00	-0.05	53.7	0.9	Run 2	-0.15	21.63	22.63	0.6	229.5	231.4	0.4	29.5	30.6	0.1	53.7	0.5
7/10/2013 15:01	-0.05	27.5	0.9	Run 2	-0.15	21.63	22.63	0.6	229.5	231.4	0.4	29.5	30.6	0.1	27.2	0.5
7/10/2013 15:02	-0.05	10.4	0.8	Run 2	-0.15	21.63	22.63	0.6	229.5	231.4	0.4	29.5	30.6	0.1	9.9	0.4
7/10/2013 15:03	-0.05	6.3	0.8	Run 2	-0.15	21.63	22.63	0.6	229.5	231.4	0.4	29.5	30.6	0.1	5.8	0.4
7/10/2013 15:04	-0.05	4.8	0.9	Run 2	-0.15	21.63	22.63	0.6	229.5	231.4	0.4	29.5	30.6	0.1	4.3	0.5
7/10/2013 15:05	-0.10	3.3	0.8	Run 2	-0.15	21.63	22.63	0.6	229.5	231.4	0.4	29.5	30.6	0.1	2.7	0.4
7/10/2013 15:06	-0.15	2.8	0.8	Run 2	-0.15	21.63	22.63	0.6	229.5	231.4	0.4	29.5	30.6	0.0	2.2	0.4
7/10/2013 15:07	-0.15	2.3	0.8	Run 2	-0.15	21.63	22.63	0.6	229.5	231.4	0.4	29.5	30.6	0.0	1.7	0.4
7/10/2013 15:08	0.00	2.3	0.8	Run 2	-0.15	21.63	22.63	0.6	229.5	231.4	0.4	29.5	30.6	0.2	1.7	0.4
7/10/2013 15:09	1.90	3.3	0.8	Run 2	-0.15	21.63	22.63	0.6	229.5	231.4	0.4	29.5	30.6	2.1	2.7	0.4
7/10/2013 15:10	1.60	10.4	0.8	Run 2	-0.15	21.63	22.63	0.6	229.5	231.4	0.4	29.5	30.6	1.8	9.9	0.4
7/10/2013 15:11	0.55	7.3	0.8	Run 2	-0.15	21.63	22.63	0.6	229.5	231.4	0.4	29.5	30.6	0.7	6.8	0.4
7/10/2013 15:12	0.20	3.8	0.8	Run 2	-0.15	21.63	22.63	0.6	229.5	231.4	0.4	29.5	30.6	0.4	3.2	0.4
7/10/2013 15:13	0.05	2.3	0.8	Run 2	-0.15	21.63	22.63	0.6	229.5	231.4	0.4	29.5	30.6	0.2	1.7	0.4
7/10/2013 15:14	0.05	2.3	0.8	Run 2	-0.15	21.63	22.63	0.6	229.5	231.4	0.4	29.5	30.6	0.2	1.7	0.4
7/10/2013 15:15	-0.05	1.8	0.8	Run 2	-0.15	21.63	22.63	0.6	229.5	231.4	0.4	29.5	30.6	0.1	1.2	0.4
7/10/2013 15:16	-0.05	1.8	0.8	Run 2	-0.15	21.63	22.63	0.6	229.5	231.4	0.4	29.5	30.6	0.1	1.2	0.4
7/10/2013 15:17	-0.05	4.3	0.7	Run 2	-0.15	21.63	22.63	0.6	229.5	231.4	0.4	29.5	30.6	0.1	3.8	0.3
7/10/2013 15:18	-0.05	8.3	0.7	Run 2	-0.15	21.63	22.63	0.6	229.5	231.4	0.4	29.5	30.6	0.1	7.8	0.3
7/10/2013 15:19	-0.05	15.4	0.7	Run 2	-0.15	21.63	22.63	0.6	229.5	231.4	0.4	29.5	30.6	0.1	15.0	0.3
7/10/2013 15:20	-0.05	19.9	0.7	Run 2	-0.15	21.63	22.63	0.6	229.5	231.4	0.4	29.5	30.6	0.1	19.5	0.3
7/10/2013 15:21	-0.05	33.5	0.7	Run 2	-0.15	21.63	22.63	0.6	229.5	231.4	0.4	29.5	30.6	0.1	33.3	0.3
7/10/2013 15:22	-0.05	84.9	0.7	Run 2	-0.15	21.63	22.63	0.6	229.5	231.4	0.4	29.5	30.6	0.1	85.2	0.3

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TimeStamp (CDT)	NO_x, ppm	CO, ppm	SO_2, ppm	COMMENTS	Co, NO_x	Cm, NO_x	Cma, NO_x	Co, CO	Cm, CO	Cma, CO	Co, SO_2	Cm, SO_2	Cma, SO_2	NO_x, ppm	CO, ppm	SO_2, ppm
7/10/2013 15:23	-0.05	164.5	0.7	Run 2	-0.15	21.63	22.63	0.6	229.5	231.4	0.4	29.5	30.6	0.1	165.7	0.3
7/10/2013 15:24	-0.05	244.6	0.7	Run 2	-0.15	21.63	22.63	0.6	229.5	231.4	0.4	29.5	30.6	0.1	246.7	0.3
7/10/2013 15:25	0.00	322.2	0.7	Run 2	-0.15	21.63	22.63	0.6	229.5	231.4	0.4	29.5	30.6	0.2	325.1	0.3
7/10/2013 15:26	0.05	384.1	0.6	Run 2	-0.15	21.63	22.63	0.6	229.5	231.4	0.4	29.5	30.6	0.2	387.7	0.2
7/10/2013 15:27	0.10	393.7	0.7	Run 2	-0.15	21.63	22.63	0.6	229.5	231.4	0.4	29.5	30.6	0.3	397.4	0.3
7/10/2013 15:28	0.10	352.9	0.7	Run 2	-0.15	21.63	22.63	0.6	229.5	231.4	0.4	29.5	30.6	0.3	356.2	0.3
7/10/2013 15:29	0.05	264.3	0.7	Run 2	-0.15	21.63	22.63	0.6	229.5	231.4	0.4	29.5	30.6	0.2	266.5	0.3
7/10/2013 15:30	-0.05	146.9	0.7	Run 2	-0.15	21.63	22.63	0.6	229.5	231.4	0.4	29.5	30.6	0.1	147.9	0.3
7/10/2013 15:31	-0.05	77.9	0.7	Run 2	-0.15	21.63	22.63	0.6	229.5	231.4	0.4	29.5	30.6	0.1	78.1	0.3
7/10/2013 15:32	-0.05	95.0	0.7	Run 2	-0.15	21.63	22.63	0.6	229.5	231.4	0.4	29.5	30.6	0.1	95.4	0.3
7/10/2013 15:33	-0.05	49.7	0.7	Run 2	-0.15	21.63	22.63	0.6	229.5	231.4	0.4	29.5	30.6	0.1	49.6	0.3
7/10/2013 15:34	-0.05	14.9	0.7	Run 2	-0.15	21.63	22.63	0.6	229.5	231.4	0.4	29.5	30.6	0.1	14.5	0.3
7/10/2013 15:35	-0.05	7.3	0.6	Run 2	-0.15	21.63	22.63	0.6	229.5	231.4	0.4	29.5	30.6	0.1	6.8	0.2
7/10/2013 15:36	-0.05	4.8	0.6	Run 2	-0.15	21.63	22.63	0.6	229.5	231.4	0.4	29.5	30.6	0.1	4.3	0.2
7/10/2013 15:37	0.00	3.8	0.6	Run 2	-0.15	21.63	22.63	0.6	229.5	231.4	0.4	29.5	30.6	0.2	3.2	0.2
7/10/2013 15:38	-0.05	3.3	0.6	Run 2	-0.15	21.63	22.63	0.6	229.5	231.4	0.4	29.5	30.6	0.1	2.7	0.2
7/10/2013 15:39	-0.05	2.3	0.6	Run 2	-0.15	21.63	22.63	0.6	229.5	231.4	0.4	29.5	30.6	0.1	1.7	0.2
7/10/2013 15:40	0.00	2.3	0.6	Run 2	-0.15	21.63	22.63	0.6	229.5	231.4	0.4	29.5	30.6	0.2	1.7	0.2
7/10/2013 15:41	-0.05	2.3	0.6	Run 2	-0.15	21.63	22.63	0.6	229.5	231.4	0.4	29.5	30.6	0.1	1.7	0.2
7/10/2013 15:42	-0.05	2.3	0.6	Run 2	-0.15	21.63	22.63	0.6	229.5	231.4	0.4	29.5	30.6	0.1	1.7	0.2
7/10/2013 15:43	-0.15	4.3	0.6	Run 2	-0.15	21.63	22.63	0.6	229.5	231.4	0.4	29.5	30.6	0.0	3.8	0.2
7/10/2013 15:44	-0.15	22.5	0.5	Run 2	-0.15	21.63	22.63	0.6	229.5	231.4	0.4	29.5	30.6	0.0	22.1	0.1
7/10/2013 15:45	-0.15	39.1	0.5	Run 2	-0.15	21.63	22.63	0.6	229.5	231.4	0.4	29.5	30.6	0.0	38.9	0.1
7/10/2013 15:46	-0.10	53.7	0.5	Run 2	-0.15	21.63	22.63	0.6	229.5	231.4	0.4	29.5	30.6	0.1	53.7	0.1
7/10/2013 15:47	0.50	237.0	0.5	Run 2	-0.15	21.63	22.63	0.6	229.5	231.4	0.4	29.5	30.6	0.7	239.0	0.1
7/10/2013 15:48	0.75	390.7	0.6	Run 2	-0.15	21.63	22.63	0.6	229.5	231.4	0.4	29.5	30.6	0.9	394.4	0.2
7/10/2013 15:49	0.45	332.8	0.5	Run 2	-0.15	21.63	22.63	0.6	229.5	231.4	0.4	29.5	30.6	0.6	335.8	0.1
7/10/2013 15:50	0.35	245.6	0.6	Run 2	-0.15	21.63	22.63	0.6	229.5	231.4	0.4	29.5	30.6	0.5	247.7	0.2
7/10/2013 15:51	0.35	300.0	0.6	Run 2	-0.15	21.63	22.63	0.6	229.5	231.4	0.4	29.5	30.6	0.5	302.7	0.2
7/10/2013 15:52	0.45	429.0	0.6	Run 2	-0.15	21.63	22.63	0.6	229.5	231.4	0.4	29.5	30.6	0.6	433.1	0.2

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	Raw Data				Drift Corrected Data									Corrected Data		
TimeStamp (CDT)	NO_x, ppm	CO, ppm	SO_2, ppm	COMMENTS	Co, NO_x	Cm, NO_x	Cma, NO_x	Co, CO	Cm, CO	Cma, CO	Co, SO_2	Cm, SO_2	Cma, SO_2	NO_x, ppm	CO, ppm	SO_2, ppm
7/10/2013 15:53	0.25	335.3	0.6	Run 2	-0.15	21.63	22.63	0.6	229.5	231.4	0.4	29.5	30.6	0.4	338.3	0.2
7/10/2013 15:54	0.15	254.7	0.6	Run 2	-0.15	21.63	22.63	0.6	229.5	231.4	0.4	29.5	30.6	0.3	256.9	0.2
7/10/2013 15:55	0.15	252.2	0.6	Run 2	-0.15	21.63	22.63	0.6	229.5	231.4	0.4	29.5	30.6	0.3	254.3	0.2
7/10/2013 15:56	0.10	211.4	0.6	Run 2	-0.15	21.63	22.63	0.6	229.5	231.4	0.4	29.5	30.6	0.3	213.1	0.2
7/10/2013 15:57	0.05	171.6	0.6	Run 2	-0.15	21.63	22.63	0.6	229.5	231.4	0.4	29.5	30.6	0.2	172.8	0.2
7/10/2013 15:58	0.15	132.3	0.6	Run 2	-0.15	21.63	22.63	0.6	229.5	231.4	0.4	29.5	30.6	0.3	133.1	0.2
7/10/2013 15:59	0.20	74.8	0.6	Run 2	-0.15	21.63	22.63	0.6	229.5	231.4	0.4	29.5	30.6	0.4	75.1	0.2
7/10/2013 16:00	0.30	53.2	0.6	Run 2	-0.15	21.63	22.63	0.6	229.5	231.4	0.4	29.5	30.6	0.5	53.2	0.2
7/10/2013 16:01	0.65	54.2	0.6	Run 2	-0.15	21.63	22.63	0.6	229.5	231.4	0.4	29.5	30.6	0.8	54.2	0.2
7/10/2013 16:02	0.85	42.6	0.6	Run 2	-0.15	21.63	22.63	0.6	229.5	231.4	0.4	29.5	30.6	1.0	42.5	0.2
	0.52	**83.9**	**1.0**	**Run 2 Average**										**0.7**	**84.2**	**0.6**
7/10/2013 16:03	1.05	34.0	0.6													
7/10/2013 16:04	1.00	26.0	0.6													
7/10/2013 16:05	1.40	21.4	0.6													
7/10/2013 16:06	3.95	15.4	0.6													
7/10/2013 16:07	8.25	9.4	0.7													
7/10/2013 16:08	6.90	12.9	0.7													
7/10/2013 16:09	2.80	13.9	0.7													
7/10/2013 16:10	0.90	7.3	0.8													
7/10/2013 16:11	0.35	4.3	0.8													
7/10/2013 16:12	0.20	3.8	0.8													
7/10/2013 16:13	0.10	3.3	0.9													
7/10/2013 16:14	0.05	3.3	0.9													
7/10/2013 16:15	0.00	3.3	0.8													
7/10/2013 16:16	0.00	3.3	0.8													
7/10/2013 16:17	-0.05	5.8	0.8													
7/10/2013 16:18	-0.05	10.4	0.7													
7/10/2013 16:19	-0.05	23.0	0.7													
7/10/2013 16:20	-0.05	40.6	0.6													
7/10/2013 16:21	-0.05	57.7	0.6													

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TimeStamp (CDT)	NO_x, ppm	CO, ppm	SO_2, ppm	COMMENTS	Co, NO_x	Cm, NO_x	Cma, NO_x	Co, CO	Cm, CO	Cma, CO	Co, SO_2	Cm, SO_2	Cma, SO_2	NO_x, ppm	CO, ppm	SO_2, ppm
7/10/2013 16:22	-0.05	88.9	0.6													
7/10/2013 16:23	-0.05	112.6	0.5													
7/10/2013 16:24	-0.05	139.8	0.6													
7/10/2013 16:25	1.00	92.0	0.6													
7/10/2013 16:26	2.15	40.6	0.7													
7/10/2013 16:27	1.00	18.9	0.8													
7/10/2013 16:28	0.35	8.3	0.8													
7/10/2013 16:29	0.10	4.8	0.9													
7/10/2013 16:30	0.10	5.8	1.5													
7/10/2013 16:31	0.15	9.9	9.8													
7/10/2013 16:32	0.20	2.8	19.4													
7/10/2013 16:33	0.15	0.8	24.1													
7/10/2013 16:34	0.15	0.3	26.1													
7/10/2013 16:35	0.15	0.3	27.0													
7/10/2013 16:36	0.15	0.3	27.6													
7/10/2013 16:37	0.15	0.3	28.0													
7/10/2013 16:38	0.15	0.8	28.3													
7/10/2013 16:39	0.15	0.8	28.7													
7/10/2013 16:40	2.75	0.8	29.3	30.2 SO2 (Bias)												
			29.3	**Average 30.2 SO2 (Bias)**												
7/10/2013 16:41	15.55	0.8	20.5													
7/10/2013 16:42	20.60	0.8	10.0													
7/10/2013 16:43	21.50	0.3	5.7													
7/10/2013 16:44	21.65	0.3	4.2													
7/10/2013 16:45	21.70	0.8	3.4	22.63 Nox, Zero CO (Bias)												
	21.70	**0.8**		**Average 22.63 Nox, Zero CO (Bias)**												
7/10/2013 16:46	17.45	7.8	2.4													
7/10/2013 16:47	3.95	118.7	1.2													
7/10/2013 16:48	0.40	208.3	0.9													
7/10/2013 16:49	-0.10	225.5	0.7													

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TimeStamp (CDT)	NO_x, ppm	CO, ppm	SO_2, ppm	COMMENTS	Co, NO_x	Cm, NO_x	Cma, NO_x	Co, CO	Cm, CO	Cma, CO	Co, SO_2	Cm, SO_2	Cma, SO_2	NO_x, ppm	CO, ppm	SO_2, ppm
7/10/2013 16:50	-0.15	228.5	0.6	Zero Nox, 231.4 CO, Zero SO2 (Bias)												
	-0.15	**228.5**	**0.6**	**Average Zero Nox, 231.4 CO, Zero SO2 (Bias)**												
7/10/2013 16:51	-0.10	228.0	0.6													
7/10/2013 16:52	0.05	237.6	2.4													
7/10/2013 16:53	0.15	324.7	3.4													
7/10/2013 16:54	0.35	442.6	3.1													
7/10/2013 16:55	0.35	444.1	2.7													
7/10/2013 16:56	0.45	397.7	2.4													
7/10/2013 16:57	0.65	405.3	2.1													
7/10/2013 16:58	0.70	417.4	2.0													
7/10/2013 16:59	0.70	371.6	1.8													
7/10/2013 17:00	0.70	189.2	1.7													
7/10/2013 17:01	0.65	58.2	1.6													
7/10/2013 17:02	0.45	24.0	1.5													
7/10/2013 17:03	0.30	13.9	1.4													
7/10/2013 17:04	0.20	9.9	1.4													
7/10/2013 17:05	0.15	12.9	1.3													
7/10/2013 17:06	0.15	73.3	1.3													
7/10/2013 17:07	0.15	161.0	1.2													
7/10/2013 17:08	0.15	192.7	1.2													
7/10/2013 17:09	0.15	212.4	1.2													
7/10/2013 17:10	0.10	159.5	1.2													
7/10/2013 17:11	0.05	98.5	1.1													
7/10/2013 17:12	0.10	48.1	1.1													
7/10/2013 17:13	0.55	17.9	1.1													
7/10/2013 17:14	0.95	8.3	1.1													
7/10/2013 17:15	1.25	6.3	1.0													
7/10/2013 17:16	0.90	4.8	1.0													
7/10/2013 17:17	1.95	4.3	1.0													
7/10/2013 17:18	4.00	4.8	1.0													

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TimeStamp (CDT)	NO_x, ppm	CO, ppm	SO_2, ppm	COMMENTS	Co, NO_x	Cm, NO_x	Cma, NO_x	Co, CO	Cm, CO	Cma, CO	Co, SO_2	Cm, SO_2	Cma, SO_2	NO_x, ppm	CO, ppm	SO_2, ppm
7/10/2013 17:19	6.05	4.8	1.0	Run 3	-0.15	21.65	22.63	0.6	228.8	231.4	0.7	29.6	30.6	6.4	4.3	0.3
7/10/2013 17:20	7.15	3.8	1.0	Run 3	-0.15	21.65	22.63	0.6	228.8	231.4	0.7	29.6	30.6	7.6	3.3	0.3
7/10/2013 17:21	6.90	3.3	1.0	Run 3	-0.15	21.65	22.63	0.6	228.8	231.4	0.7	29.6	30.6	7.3	2.7	0.3
7/10/2013 17:22	5.80	3.3	1.0	Run 3	-0.15	21.65	22.63	0.6	228.8	231.4	0.7	29.6	30.6	6.2	2.7	0.3
7/10/2013 17:23	9.85	4.3	1.1	Run 3	-0.15	21.65	22.63	0.6	228.8	231.4	0.7	29.6	30.6	10.4	3.8	0.4
7/10/2013 17:24	6.95	10.9	1.2	Run 3	-0.15	21.65	22.63	0.6	228.8	231.4	0.7	29.6	30.6	7.4	10.4	0.6
7/10/2013 17:25	2.70	8.3	1.4	Run 3	-0.15	21.65	22.63	0.6	228.8	231.4	0.7	29.6	30.6	3.0	7.9	0.7
7/10/2013 17:26	1.10	4.3	1.5	Run 3	-0.15	21.65	22.63	0.6	228.8	231.4	0.7	29.6	30.6	1.3	3.8	0.9
7/10/2013 17:27	0.65	3.3	1.6	Run 3	-0.15	21.65	22.63	0.6	228.8	231.4	0.7	29.6	30.6	0.8	2.7	1.0
7/10/2013 17:28	0.45	2.3	1.6	Run 3	-0.15	21.65	22.63	0.6	228.8	231.4	0.7	29.6	30.6	0.6	1.7	1.0
7/10/2013 17:29	0.30	2.3	1.6	Run 3	-0.15	21.65	22.63	0.6	228.8	231.4	0.7	29.6	30.6	0.5	1.7	1.0
7/10/2013 17:30	0.20	2.3	1.6	Run 3	-0.15	21.65	22.63	0.6	228.8	231.4	0.7	29.6	30.6	0.4	1.7	1.0
7/10/2013 17:31	0.15	3.3	1.6	Run 3	-0.15	21.65	22.63	0.6	228.8	231.4	0.7	29.6	30.6	0.3	2.7	1.0
7/10/2013 17:32	0.05	3.3	1.6	Run 3	-0.15	21.65	22.63	0.6	228.8	231.4	0.7	29.6	30.6	0.2	2.7	1.0
7/10/2013 17:33	0.05	3.8	1.6	Run 3	-0.15	21.65	22.63	0.6	228.8	231.4	0.7	29.6	30.6	0.2	3.3	1.0
7/10/2013 17:34	0.05	8.3	1.6	Run 3	-0.15	21.65	22.63	0.6	228.8	231.4	0.7	29.6	30.6	0.2	7.9	1.0
7/10/2013 17:35	0.00	19.9	1.7	Run 3	-0.15	21.65	22.63	0.6	228.8	231.4	0.7	29.6	30.6	0.2	19.6	1.1
7/10/2013 17:36	-0.05	54.7	1.8	Run 3	-0.15	21.65	22.63	0.6	228.8	231.4	0.7	29.6	30.6	0.1	54.9	1.1
7/10/2013 17:37	-0.05	130.3	1.8	Run 3	-0.15	21.65	22.63	0.6	228.8	231.4	0.7	29.6	30.6	0.1	131.5	1.2
7/10/2013 17:38	-0.05	162.0	1.8	Run 3	-0.15	21.65	22.63	0.6	228.8	231.4	0.7	29.6	30.6	0.1	163.7	1.2
7/10/2013 17:39	0.00	187.7	1.8	Run 3	-0.15	21.65	22.63	0.6	228.8	231.4	0.7	29.6	30.6	0.2	189.7	1.2
7/10/2013 17:40	-0.05	193.7	1.9	Run 3	-0.15	21.65	22.63	0.6	228.8	231.4	0.7	29.6	30.6	0.1	195.8	1.2
7/10/2013 17:41	1.00	105.6	1.8	Run 3	-0.15	21.65	22.63	0.6	228.8	231.4	0.7	29.6	30.6	1.2	106.4	1.2
7/10/2013 17:42	4.75	46.1	1.9	Run 3	-0.15	21.65	22.63	0.6	228.8	231.4	0.7	29.6	30.6	5.1	46.2	1.2
7/10/2013 17:43	2.40	27.0	1.9	Run 3	-0.15	21.65	22.63	0.6	228.8	231.4	0.7	29.6	30.6	2.6	26.8	1.3
7/10/2013 17:44	0.85	12.9	2.0	Run 3	-0.15	21.65	22.63	0.6	228.8	231.4	0.7	29.6	30.6	1.0	12.5	1.4
7/10/2013 17:45	0.35	7.3	2.0	Run 3	-0.15	21.65	22.63	0.6	228.8	231.4	0.7	29.6	30.6	0.5	6.8	1.4
7/10/2013 17:46	0.15	4.8	2.0	Run 3	-0.15	21.65	22.63	0.6	228.8	231.4	0.7	29.6	30.6	0.3	4.3	1.4
7/10/2013 17:47	0.10	4.3	1.9	Run 3	-0.15	21.65	22.63	0.6	228.8	231.4	0.7	29.6	30.6	0.3	3.8	1.3
7/10/2013 17:48	0.05	3.3	1.9	Run 3	-0.15	21.65	22.63	0.6	228.8	231.4	0.7	29.6	30.6	0.2	2.7	1.2

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TimeStamp (CDT)	NO_x, ppm	CO, ppm	SO_2, ppm	COMMENTS	Co, NO_x	Cm, NO_x	Cma, NO_x	Co, CO	Cm, CO	Cma, CO	Co, SO_2	Cm, SO_2	Cma, SO_2	NO_x, ppm	CO, ppm	SO_2, ppm
7/10/2013 17:49	0.05	3.3	1.8	Run 3	-0.15	21.65	22.63	0.6	228.8	231.4	0.7	29.6	30.6	0.2	2.7	1.1
7/10/2013 17:50	0.05	2.3	1.7	Run 3	-0.15	21.65	22.63	0.6	228.8	231.4	0.7	29.6	30.6	0.2	1.7	1.1
7/10/2013 17:51	0.00	2.3	1.6	Run 3	-0.15	21.65	22.63	0.6	228.8	231.4	0.7	29.6	30.6	0.2	1.7	1.0
7/10/2013 17:52	0.00	2.3	1.6	Run 3	-0.15	21.65	22.63	0.6	228.8	231.4	0.7	29.6	30.6	0.2	1.7	0.9
7/10/2013 17:53	0.05	2.3	1.5	Run 3	-0.15	21.65	22.63	0.6	228.8	231.4	0.7	29.6	30.6	0.2	1.7	0.8
7/10/2013 17:54	0.05	2.3	1.5	Run 3	-0.15	21.65	22.63	0.6	228.8	231.4	0.7	29.6	30.6	0.2	1.7	0.8
7/10/2013 17:55	-0.05	2.3	1.4	Run 3	-0.15	21.65	22.63	0.6	228.8	231.4	0.7	29.6	30.6	0.1	1.7	0.7
7/10/2013 17:56	-0.05	2.3	1.4	Run 3	-0.15	21.65	22.63	0.6	228.8	231.4	0.7	29.6	30.6	0.1	1.7	0.7
7/10/2013 17:57	-0.05	2.3	1.3	Run 3	-0.15	21.65	22.63	0.6	228.8	231.4	0.7	29.6	30.6	0.1	1.7	0.7
7/10/2013 17:58	-0.05	2.3	1.3	Run 3	-0.15	21.65	22.63	0.6	228.8	231.4	0.7	29.6	30.6	0.1	1.7	0.6
7/10/2013 17:59	-0.05	2.3	1.2	Run 3	-0.15	21.65	22.63	0.6	228.8	231.4	0.7	29.6	30.6	0.1	1.7	0.6
7/10/2013 18:00	-0.05	2.3	1.2	Run 3	-0.15	21.65	22.63	0.6	228.8	231.4	0.7	29.6	30.6	0.1	1.7	0.5
7/10/2013 18:01	-0.05	2.3	1.2	Run 3	-0.15	21.65	22.63	0.6	228.8	231.4	0.7	29.6	30.6	0.1	1.7	0.5
7/10/2013 18:02	-0.05	2.3	1.1	Run 3	-0.15	21.65	22.63	0.6	228.8	231.4	0.7	29.6	30.6	0.1	1.7	0.5
7/10/2013 18:03	-0.05	2.3	1.1	Run 3	-0.15	21.65	22.63	0.6	228.8	231.4	0.7	29.6	30.6	0.1	1.7	0.4
7/10/2013 18:04	-0.05	3.8	1.1	Run 3	-0.15	21.65	22.63	0.6	228.8	231.4	0.7	29.6	30.6	0.1	3.3	0.4
7/10/2013 18:05	0.10	4.8	1.1	Run 3	-0.15	21.65	22.63	0.6	228.8	231.4	0.7	29.6	30.6	0.3	4.3	0.4
7/10/2013 18:06	0.30	9.4	1.1	Run 3	-0.15	21.65	22.63	0.6	228.8	231.4	0.7	29.6	30.6	0.5	8.9	0.4
7/10/2013 18:07	0.30	15.9	1.0	Run 3	-0.15	21.65	22.63	0.6	228.8	231.4	0.7	29.6	30.6	0.5	15.5	0.3
7/10/2013 18:08	0.30	18.9	1.0	Run 3	-0.15	21.65	22.63	0.6	228.8	231.4	0.7	29.6	30.6	0.5	18.6	0.3
7/10/2013 18:09	0.40	44.6	1.0	Run 3	-0.15	21.65	22.63	0.6	228.8	231.4	0.7	29.6	30.6	0.6	44.6	0.3
7/10/2013 18:10	0.40	116.1	1.0	Run 3	-0.15	21.65	22.63	0.6	228.8	231.4	0.7	29.6	30.6	0.6	117.2	0.3
7/10/2013 18:11	0.40	144.9	1.0	Run 3	-0.15	21.65	22.63	0.6	228.8	231.4	0.7	29.6	30.6	0.6	146.3	0.3
7/10/2013 18:12	0.30	127.7	1.0	Run 3	-0.15	21.65	22.63	0.6	228.8	231.4	0.7	29.6	30.6	0.5	128.9	0.3
7/10/2013 18:13	0.30	103.6	1.0	Run 3	-0.15	21.65	22.63	0.6	228.8	231.4	0.7	29.6	30.6	0.5	104.4	0.3
7/10/2013 18:14	0.30	186.7	1.0	Run 3	-0.15	21.65	22.63	0.6	228.8	231.4	0.7	29.6	30.6	0.5	188.7	0.3
7/10/2013 18:15	0.30	210.9	1.0	Run 3	-0.15	21.65	22.63	0.6	228.8	231.4	0.7	29.6	30.6	0.5	213.2	0.3
7/10/2013 18:16	0.30	226.0	1.0	Run 3	-0.15	21.65	22.63	0.6	228.8	231.4	0.7	29.6	30.6	0.5	228.5	0.3
7/10/2013 18:17	0.20	286.9	1.0	Run 3	-0.15	21.65	22.63	0.6	228.8	231.4	0.7	29.6	30.6	0.4	290.3	0.3
7/10/2013 18:18	0.30	383.6	1.1	Run 3	-0.15	21.65	22.63	0.6	228.8	231.4	0.7	29.6	30.6	0.5	388.4	0.4

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	Raw Data				Drift Corrected Data									Corrected Data		
TimeStamp (CDT)	NO_x, ppm	CO, ppm	SO_2, ppm	COMMENTS	Co, NO_x	Cm, NO_x	Cma, NO_x	Co, CO	Cm, CO	Cma, CO	Co, SO_2	Cm, SO_2	Cma, SO_2	NO_x, ppm	CO, ppm	SO_2, ppm
7/10/2013 18:19	0.20	396.2	1.1	Run 3	-0.15	21.65	22.63	0.6	228.8	231.4	0.7	29.6	30.6	0.4	401.2	0.4
7/10/2013 18:20	0.10	320.2	1.1	Run 3	-0.15	21.65	22.63	0.6	228.8	231.4	0.7	29.6	30.6	0.3	324.0	0.5
7/10/2013 18:21	0.05	279.4	1.2	Run 3	-0.15	21.65	22.63	0.6	228.8	231.4	0.7	29.6	30.6	0.2	282.7	0.5
7/10/2013 18:22	0.30	285.9	1.2	Run 3	-0.15	21.65	22.63	0.6	228.8	231.4	0.7	29.6	30.6	0.5	289.3	0.5
7/10/2013 18:23	1.60	304.6	1.2	Run 3	-0.15	21.65	22.63	0.6	228.8	231.4	0.7	29.6	30.6	1.8	308.2	0.5
7/10/2013 18:24	1.90	289.4	1.2	Run 3	-0.15	21.65	22.63	0.6	228.8	231.4	0.7	29.6	30.6	2.1	292.9	0.5
7/10/2013 18:25	1.00	284.4	1.2	Run 3	-0.15	21.65	22.63	0.6	228.8	231.4	0.7	29.6	30.6	1.2	287.8	0.5
7/10/2013 18:26	0.85	354.9	1.2	Run 3	-0.15	21.65	22.63	0.6	228.8	231.4	0.7	29.6	30.6	1.0	359.3	0.5
7/10/2013 18:27	1.15	397.2	1.2	Run 3	-0.15	21.65	22.63	0.6	228.8	231.4	0.7	29.6	30.6	1.3	402.2	0.5
7/10/2013 18:28	0.90	292.5	1.2	Run 3	-0.15	21.65	22.63	0.6	228.8	231.4	0.7	29.6	30.6	1.1	296.0	0.5
7/10/2013 18:29	0.60	217.4	1.2	Run 3	-0.15	21.65	22.63	0.6	228.8	231.4	0.7	29.6	30.6	0.8	219.8	0.5
7/10/2013 18:30	0.35	212.4	1.2	Run 3	-0.15	21.65	22.63	0.6	228.8	231.4	0.7	29.6	30.6	0.5	214.7	0.5
7/10/2013 18:31	0.15	197.3	1.2	Run 3	-0.15	21.65	22.63	0.6	228.8	231.4	0.7	29.6	30.6	0.3	199.4	0.5
7/10/2013 18:32	0.15	184.7	1.1	Run 3	-0.15	21.65	22.63	0.6	228.8	231.4	0.7	29.6	30.6	0.3	186.6	0.5
7/10/2013 18:33	0.20	183.7	1.1	Run 3	-0.15	21.65	22.63	0.6	228.8	231.4	0.7	29.6	30.6	0.4	185.6	0.4
7/10/2013 18:34	0.15	157.5	1.1	Run 3	-0.15	21.65	22.63	0.6	228.8	231.4	0.7	29.6	30.6	0.3	159.1	0.4
7/10/2013 18:35	0.05	95.0	1.1	Run 3	-0.15	21.65	22.63	0.6	228.8	231.4	0.7	29.6	30.6	0.2	95.7	0.4
7/10/2013 18:36	0.20	44.1	1.0	Run 3	-0.15	21.65	22.63	0.6	228.8	231.4	0.7	29.6	30.6	0.4	44.1	0.3
7/10/2013 18:37	0.55	21.4	1.0	Run 3	-0.15	21.65	22.63	0.6	228.8	231.4	0.7	29.6	30.6	0.7	21.1	0.3
7/10/2013 18:38	0.95	13.4	1.0	Run 3	-0.15	21.65	22.63	0.6	228.8	231.4	0.7	29.6	30.6	1.1	13.0	0.3
7/10/2013 18:39	2.35	9.9	1.0	Run 3	-0.15	21.65	22.63	0.6	228.8	231.4	0.7	29.6	30.6	2.6	9.4	0.3
7/10/2013 18:40	3.70	8.3	1.0	Run 3	-0.15	21.65	22.63	0.6	228.8	231.4	0.7	29.6	30.6	4.0	7.9	0.3
7/10/2013 18:41	6.00	7.8	1.0	Run 3	-0.15	21.65	22.63	0.6	228.8	231.4	0.7	29.6	30.6	6.4	7.3	0.3
7/10/2013 18:42	7.70	5.8	1.0	Run 3	-0.15	21.65	22.63	0.6	228.8	231.4	0.7	29.6	30.6	8.1	5.3	0.3
7/10/2013 18:43	7.70	4.3	1.0	Run 3	-0.15	21.65	22.63	0.6	228.8	231.4	0.7	29.6	30.6	8.1	3.8	0.3
7/10/2013 18:44	7.30	3.3	1.0	Run 3	-0.15	21.65	22.63	0.6	228.8	231.4	0.7	29.6	30.6	7.7	2.7	0.3
7/10/2013 18:45	8.55	6.8	1.1	Run 3	-0.15	21.65	22.63	0.6	228.8	231.4	0.7	29.6	30.6	9.0	6.3	0.4
7/10/2013 18:46	4.60	12.4	1.1	Run 3	-0.15	21.65	22.63	0.6	228.8	231.4	0.7	29.6	30.6	4.9	11.9	0.5
7/10/2013 18:47	1.85	6.8	1.2	Run 3	-0.15	21.65	22.63	0.6	228.8	231.4	0.7	29.6	30.6	2.1	6.3	0.6
7/10/2013 18:48	0.80	3.8	1.3	Run 3	-0.15	21.65	22.63	0.6	228.8	231.4	0.7	29.6	30.6	1.0	3.3	0.7

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	Raw Data				Drift Corrected Data									Corrected Data		
TimeStamp (CDT)	NO_x, ppm	CO, ppm	SO_2, ppm	COMMENTS	Co, NO_x	Cm, NO_x	Cma, NO_x	Co, CO	Cm, CO	Cma, CO	Co, SO_2	Cm, SO_2	Cma, SO_2	NO_x, ppm	CO, ppm	SO_2, ppm
7/10/2013 18:49	0.50	3.3	1.4	Run 3	-0.15	21.65	22.63	0.6	228.8	231.4	0.7	29.6	30.6	0.7	2.7	0.7
7/10/2013 18:50	0.40	3.8	1.4	Run 3	-0.15	21.65	22.63	0.6	228.8	231.4	0.7	29.6	30.6	0.6	3.3	0.7
7/10/2013 18:51	0.30	7.3	1.4	Run 3	-0.15	21.65	22.63	0.6	228.8	231.4	0.7	29.6	30.6	0.5	6.8	0.7
7/10/2013 18:52	0.25	9.4	1.4	Run 3	-0.15	21.65	22.63	0.6	228.8	231.4	0.7	29.6	30.6	0.4	8.9	0.7
7/10/2013 18:53	0.15	8.3	1.4	Run 3	-0.15	21.65	22.63	0.6	228.8	231.4	0.7	29.6	30.6	0.3	7.9	0.7
7/10/2013 18:54	0.05	15.9	1.4	Run 3	-0.15	21.65	22.63	0.6	228.8	231.4	0.7	29.6	30.6	0.2	15.5	0.7
7/10/2013 18:55	0.10	53.2	1.4	Run 3	-0.15	21.65	22.63	0.6	228.8	231.4	0.7	29.6	30.6	0.3	53.3	0.7
7/10/2013 18:56	0.05	82.4	1.4	Run 3	-0.15	21.65	22.63	0.6	228.8	231.4	0.7	29.6	30.6	0.2	82.9	0.7
7/10/2013 18:57	0.10	162.5	1.4	Run 3	-0.15	21.65	22.63	0.6	228.8	231.4	0.7	29.6	30.6	0.3	164.2	0.7
7/10/2013 18:58	0.15	243.1	1.5	Run 3	-0.15	21.65	22.63	0.6	228.8	231.4	0.7	29.6	30.6	0.3	245.9	0.8
7/10/2013 18:59	0.10	253.2	1.6	Run 3	-0.15	21.65	22.63	0.6	228.8	231.4	0.7	29.6	30.6	0.3	256.1	1.0
7/10/2013 19:00	0.05	220.4	1.7	Run 3	-0.15	21.65	22.63	0.6	228.8	231.4	0.7	29.6	30.6	0.2	222.9	1.1
7/10/2013 19:01	-0.05	206.3	1.9	Run 3	-0.15	21.65	22.63	0.6	228.8	231.4	0.7	29.6	30.6	0.1	208.6	1.2
7/10/2013 19:02	-0.05	228.0	1.9	Run 3	-0.15	21.65	22.63	0.6	228.8	231.4	0.7	29.6	30.6	0.1	230.6	1.3
7/10/2013 19:03	-0.05	231.5	2.0	Run 3	-0.15	21.65	22.63	0.6	228.8	231.4	0.7	29.6	30.6	0.1	234.1	1.4
7/10/2013 19:04	-0.05	216.4	2.0	Run 3	-0.15	21.65	22.63	0.6	228.8	231.4	0.7	29.6	30.6	0.1	218.8	1.4
7/10/2013 19:05	-0.05	103.6	2.0	Run 3	-0.15	21.65	22.63	0.6	228.8	231.4	0.7	29.6	30.6	0.1	104.4	1.4
7/10/2013 19:06	-0.05	22.5	1.9	Run 3	-0.15	21.65	22.63	0.6	228.8	231.4	0.7	29.6	30.6	0.1	22.2	1.3
7/10/2013 19:07	-0.05	5.8	1.8	Run 3	-0.15	21.65	22.63	0.6	228.8	231.4	0.7	29.6	30.6	0.1	5.3	1.2
7/10/2013 19:08	-0.05	3.3	1.8	Run 3	-0.15	21.65	22.63	0.6	228.8	231.4	0.7	29.6	30.6	0.1	2.7	1.1
7/10/2013 19:09	-0.05	2.8	1.7	Run 3	-0.15	21.65	22.63	0.6	228.8	231.4	0.7	29.6	30.6	0.1	2.2	1.0
7/10/2013 19:10	0.05	2.3	1.6	Run 3	-0.15	21.65	22.63	0.6	228.8	231.4	0.7	29.6	30.6	0.2	1.7	0.9
7/10/2013 19:11	2.20	3.8	1.5	Run 3	-0.15	21.65	22.63	0.6	228.8	231.4	0.7	29.6	30.6	2.4	3.3	0.9
7/10/2013 19:12	1.90	12.9	1.5	Run 3	-0.15	21.65	22.63	0.6	228.8	231.4	0.7	29.6	30.6	2.1	12.5	0.9
7/10/2013 19:13	0.80	8.3	1.6	Run 3	-0.15	21.65	22.63	0.6	228.8	231.4	0.7	29.6	30.6	1.0	7.9	0.9
7/10/2013 19:14	0.25	3.8	1.6	Run 3	-0.15	21.65	22.63	0.6	228.8	231.4	0.7	29.6	30.6	0.4	3.3	0.9
7/10/2013 19:15	0.10	2.3	1.6	Run 3	-0.15	21.65	22.63	0.6	228.8	231.4	0.7	29.6	30.6	0.3	1.7	0.9
7/10/2013 19:16	0.10	2.3	1.5	Run 3	-0.15	21.65	22.63	0.6	228.8	231.4	0.7	29.6	30.6	0.3	1.7	0.8
7/10/2013 19:17	0.05	2.3	1.4	Run 3	-0.15	21.65	22.63	0.6	228.8	231.4	0.7	29.6	30.6	0.2	1.7	0.8
7/10/2013 19:18	0.05	2.3	1.4	Run 3	-0.15	21.65	22.63	0.6	228.8	231.4	0.7	29.6	30.6	0.2	1.7	0.7

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	Raw Data				Drift Corrected Data								Corrected Data		
TimeStamp (CDT)	NO_x, ppm	CO, ppm	SO_2, ppm	COMMENTS	Co, NO_x	Cm, NO_x	Cma, NO_x	Co, CO	Cm, CO	Cma, CO	Co, SO_2	Cm, SO_2	Cma, SO_2	NO_x, ppm	CO, ppm	SO_2, ppm
7/10/2013 19:19	0.05	3.3	1.3	Run 3	-0.15	21.65	22.63	0.6	228.8	231.4	0.7	29.6	30.6	0.2	2.7	0.6
7/10/2013 19:20	0.05	9.9	1.3	Run 3	-0.15	21.65	22.63	0.6	228.8	231.4	0.7	29.6	30.6	0.2	9.4	0.6
7/10/2013 19:21	0.05	18.4	1.2	Run 3	-0.15	21.65	22.63	0.6	228.8	231.4	0.7	29.6	30.6	0.2	18.1	0.6
7/10/2013 19:22	0.05	52.2	1.2	Run 3	-0.15	21.65	22.63	0.6	228.8	231.4	0.7	29.6	30.6	0.2	52.3	0.5
7/10/2013 19:23	0.15	149.4	1.1	Run 3	-0.15	21.65	22.63	0.6	228.8	231.4	0.7	29.6	30.6	0.3	150.9	0.5
7/10/2013 19:24	0.15	220.4	1.2	Run 3	-0.15	21.65	22.63	0.6	228.8	231.4	0.7	29.6	30.6	0.3	222.9	0.5
7/10/2013 19:25	0.05	213.9	1.2	Run 3	-0.15	21.65	22.63	0.6	228.8	231.4	0.7	29.6	30.6	0.2	216.3	0.5
7/10/2013 19:26	0.05	284.4	1.2	Run 3	-0.15	21.65	22.63	0.6	228.8	231.4	0.7	29.6	30.6	0.2	287.8	0.5
7/10/2013 19:27	0.05	455.2	1.2	Run 3	-0.15	21.65	22.63	0.6	228.8	231.4	0.7	29.6	30.6	0.2	460.9	0.5
7/10/2013 19:28	0.05	568.0	1.2	Run 3	-0.15	21.65	22.63	0.6	228.8	231.4	0.7	29.6	30.6	0.2	575.4	0.6
7/10/2013 19:29	0.15	624.9	1.3	Run 3	-0.15	21.65	22.63	0.6	228.8	231.4	0.7	29.6	30.6	0.3	633.1	0.6
7/10/2013 19:30	0.10	510.6	1.3	Run 3	-0.15	21.65	22.63	0.6	228.8	231.4	0.7	29.6	30.6	0.3	517.1	0.6
7/10/2013 19:31	0.00	412.9	1.3	Run 3	-0.15	21.65	22.63	0.6	228.8	231.4	0.7	29.6	30.6	0.2	418.0	0.7
7/10/2013 19:32	-0.05	434.0	1.3	Run 3	-0.15	21.65	22.63	0.6	228.8	231.4	0.7	29.6	30.6	0.1	439.5	0.7
7/10/2013 19:33	0.15	504.5	1.3	Run 3	-0.15	21.65	22.63	0.6	228.8	231.4	0.7	29.6	30.6	0.3	511.0	0.7
7/10/2013 19:34	0.10	272.3	1.3	Run 3	-0.15	21.65	22.63	0.6	228.8	231.4	0.7	29.6	30.6	0.3	275.5	0.7
7/10/2013 19:35	0.10	62.2	1.3	Downtime	-0.15	21.65	22.63	0.6	228.8	231.4	0.7	29.6	30.6	0.3	62.5	0.6
7/10/2013 19:36	0.40	16.9	1.3	Downtime	-0.15	21.65	22.63	0.6	228.8	231.4	0.7	29.6	30.6	0.6	16.5	0.6
7/10/2013 19:37	0.80	8.3	1.2	Downtime	-0.15	21.65	22.63	0.6	228.8	231.4	0.7	29.6	30.6	1.0	7.9	0.5
7/10/2013 19:38	1.35	5.8	1.2	Downtime	-0.15	21.65	22.63	0.6	228.8	231.4	0.7	29.6	30.6	1.6	5.3	0.5
7/10/2013 19:39	1.80	4.8	1.1	Downtime	-0.15	21.65	22.63	0.6	228.8	231.4	0.7	29.6	30.6	2.0	4.3	0.5
7/10/2013 19:40	1.85	3.8	1.1	Downtime	-0.15	21.65	22.63	0.6	228.8	231.4	0.7	29.6	30.6	2.1	3.3	0.4
7/10/2013 19:41	1.80	3.3	1.0	Downtime	-0.15	21.65	22.63	0.6	228.8	231.4	0.7	29.6	30.6	2.0	2.7	0.3
7/10/2013 19:42	1.70	2.3	1.0	Downtime	-0.15	21.65	22.63	0.6	228.8	231.4	0.7	29.6	30.6	1.9	1.7	0.3
7/10/2013 19:43	1.50	2.3	1.0	Downtime	-0.15	21.65	22.63	0.6	228.8	231.4	0.7	29.6	30.6	1.7	1.7	0.3
7/10/2013 19:44	1.15	2.3	1.0	Downtime	-0.15	21.65	22.63	0.6	228.8	231.4	0.7	29.6	30.6	1.3	1.7	0.3
7/10/2013 19:45	1.10	2.3	0.9	Downtime	-0.15	21.65	22.63	0.6	228.8	231.4	0.7	29.6	30.6	1.3	1.7	0.2
7/10/2013 19:46	1.10	1.3	0.9	Downtime	-0.15	21.65	22.63	0.6	228.8	231.4	0.7	29.6	30.6	1.3	0.7	0.2
7/10/2013 19:47	1.20	1.3	0.9	Downtime	-0.15	21.65	22.63	0.6	228.8	231.4	0.7	29.6	30.6	1.4	0.7	0.2
7/10/2013 19:48	1.20	1.3	0.9	Downtime	-0.15	21.65	22.63	0.6	228.8	231.4	0.7	29.6	30.6	1.4	0.7	0.2

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TimeStamp (CDT)	NO_x, ppm	CO, ppm	SO_2, ppm	COMMENTS	Co, NO_x	Cm, NO_x	Cma, NO_x	Co, CO	Cm, CO	Cma, CO	Co, SO_2	Cm, SO_2	Cma, SO_2	NO_x, ppm	CO, ppm	SO_2, ppm
7/10/2013 19:49	1.20	1.3	0.8	Downtime	-0.15	21.65	22.63	0.6	228.8	231.4	0.7	29.6	30.6	1.4	0.7	0.1
7/10/2013 19:50	1.25	1.3	0.8	Downtime	-0.15	21.65	22.63	0.6	228.8	231.4	0.7	29.6	30.6	1.5	0.7	0.1
7/10/2013 19:51	1.05	1.3	0.8	Downtime	-0.15	21.65	22.63	0.6	228.8	231.4	0.7	29.6	30.6	1.2	0.7	0.1
7/10/2013 19:52	0.65	12.9	0.8	Downtime	-0.15	21.65	22.63	0.6	228.8	231.4	0.7	29.6	30.6	0.8	12.5	0.1
7/10/2013 19:53	0.65	183.1	0.8	Run 3	-0.15	21.65	22.63	0.6	228.8	231.4	0.7	29.6	30.6	0.8	185.1	0.1
7/10/2013 19:54	0.35	362.0	0.8	Run 3	-0.15	21.65	22.63	0.6	228.8	231.4	0.7	29.6	30.6	0.5	366.4	0.1
7/10/2013 19:55	0.15	279.9	0.8	Run 3	-0.15	21.65	22.63	0.6	228.8	231.4	0.7	29.6	30.6	0.3	283.2	0.1
7/10/2013 19:56	0.10	300.0	0.8	Run 3	-0.15	21.65	22.63	0.6	228.8	231.4	0.7	29.6	30.6	0.3	303.6	0.1
7/10/2013 19:57	0.15	489.4	0.8	Run 3	-0.15	21.65	22.63	0.6	228.8	231.4	0.7	29.6	30.6	0.3	495.7	0.1
7/10/2013 19:58	0.25	580.6	0.9	Run 3	-0.15	21.65	22.63	0.6	228.8	231.4	0.7	29.6	30.6	0.4	588.1	0.2
7/10/2013 19:59	0.30	530.7	0.9	Run 3	-0.15	21.65	22.63	0.6	228.8	231.4	0.7	29.6	30.6	0.5	537.6	0.2
7/10/2013 20:00	0.45	446.1	0.9	Run 3	-0.15	21.65	22.63	0.6	228.8	231.4	0.7	29.6	30.6	0.6	451.8	0.2
7/10/2013 20:01	0.50	380.1	0.9	Run 3	-0.15	21.65	22.63	0.6	228.8	231.4	0.7	29.6	30.6	0.7	384.8	0.2
7/10/2013 20:02	0.50	326.7	0.9	Run 3	-0.15	21.65	22.63	0.6	228.8	231.4	0.7	29.6	30.6	0.7	330.7	0.2
7/10/2013 20:03	0.50	304.0	0.9	Run 3	-0.15	21.65	22.63	0.6	228.8	231.4	0.7	29.6	30.6	0.7	307.7	0.2
7/10/2013 20:04	1.50	359.5	0.9	Run 3	-0.15	21.65	22.63	0.6	228.8	231.4	0.7	29.6	30.6	1.7	363.9	0.2
7/10/2013 20:05	1.70	517.6	0.9	Run 3	-0.15	21.65	22.63	0.6	228.8	231.4	0.7	29.6	30.6	1.9	524.3	0.2
7/10/2013 20:06	1.15	474.8	0.9	Run 3	-0.15	21.65	22.63	0.6	228.8	231.4	0.7	29.6	30.6	1.3	480.9	0.2
7/10/2013 20:07	0.85	303.0	1.0	Run 3	-0.15	21.65	22.63	0.6	228.8	231.4	0.7	29.6	30.6	1.0	306.7	0.3
7/10/2013 20:08	1.10	174.1	1.0	Run 3	-0.15	21.65	22.63	0.6	228.8	231.4	0.7	29.6	30.6	1.3	175.9	0.3
7/10/2013 20:09	3.00	88.4	1.0	Run 3	-0.15	21.65	22.63	0.6	228.8	231.4	0.7	29.6	30.6	3.3	89.1	0.3
7/10/2013 20:10	6.80	29.5	1.0	Run 3	-0.15	21.65	22.63	0.6	228.8	231.4	0.7	29.6	30.6	7.2	29.3	0.3
	0.99	**133.37**	**1.30**	**Run 3 Average**										**1.2**	**134.6**	**0.6**
7/10/2013 20:11	9.60	12.4	1.1													
7/10/2013 20:12	10.25	7.8	1.1													
7/10/2013 20:13	10.25	6.3	1.1													
7/10/2013 20:14	6.50	7.3	1.1													
7/10/2013 20:15	2.90	6.8	1.1													
7/10/2013 20:16	1.50	5.3	1.1													
7/10/2013 20:17	0.90	4.3	1.1													

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Gaseous Emissions Recorder Printout and Test Summary

	Raw Data				Drift Corrected Data									Corrected Data		
TimeStamp (CDT)	NO_x, ppm	CO, ppm	SO_2, ppm	COMMENTS	Co, NO_x	Cm, NO_x	Cma, NO_x	Co, CO	Cm, CO	Cma, CO	Co, SO_2	Cm, SO_2	Cma, SO_2	NO_x, ppm	CO, ppm	SO_2, ppm
7/10/2013 20:18	0.70	4.3	1.0													
7/10/2013 20:19	0.50	3.8	1.0													
7/10/2013 20:20	0.40	3.8	1.0													
7/10/2013 20:21	0.30	3.8	1.0													
7/10/2013 20:22	0.15	3.8	1.0													
7/10/2013 20:23	0.30	3.8	0.9													
7/10/2013 20:24	2.85	3.3	1.0													
7/10/2013 20:25	7.85	3.8	1.0													
7/10/2013 20:26	11.25	3.8	1.0													
7/10/2013 20:27	8.00	3.3	1.0													
7/10/2013 20:28	3.30	3.3	1.0													
7/10/2013 20:29	1.75	4.3	1.0													
7/10/2013 20:30	1.10	5.3	1.0													
7/10/2013 20:31	0.70	6.3	1.1													
7/10/2013 20:32	0.45	6.3	1.1													
7/10/2013 20:33	0.30	6.3	1.2													
7/10/2013 20:34	0.15	5.3	1.2													
7/10/2013 20:35	0.10	5.3	1.2													
7/10/2013 20:36	0.05	5.3	1.3													
7/10/2013 20:37	0.05	5.3	1.3													
7/10/2013 20:38	0.00	5.3	1.3													
7/10/2013 20:39	-0.05	5.3	1.3													
7/10/2013 20:40	0.00	5.8	1.3													
7/10/2013 20:41	-0.05	5.3	1.2													
7/10/2013 20:42	-0.05	5.3	1.2													
7/10/2013 20:43	-0.05	5.8	1.1													
7/10/2013 20:44	-0.10	1.8	0.5													
7/10/2013 20:45	-0.05	4.8	1.1													
7/10/2013 20:46	-0.05	6.3	1.0													
7/10/2013 20:47	-0.05	6.3	0.9													

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Gaseous Emissions Recorder Printout and Test Summary

	Raw Data				Drift Corrected Data									Corrected Data		
TimeStamp (CDT)	NO_x, ppm	CO, ppm	SO_2, ppm	COMMENTS	Co, NO_x	Cm, NO_x	Cma, NO_x	Co, CO	Cm, CO	Cma, CO	Co, SO_2	Cm, SO_2	Cma, SO_2	NO_x, ppm	CO, ppm	SO_2, ppm
7/10/2013 20:48	-0.05	5.8	0.8													
7/10/2013 20:49	-0.05	5.8	0.7													
7/10/2013 20:50	0.00	6.8	0.9													
7/10/2013 20:51	0.15	12.9	8.7													
7/10/2013 20:52	0.20	3.3	20.3													
7/10/2013 20:53	0.20	0.3	25.7													
7/10/2013 20:54	0.20	0.3	27.7													
7/10/2013 20:55	0.20	0.3	28.6													
7/10/2013 20:56	0.20	0.3	29.0													
7/10/2013 20:57	0.20	0.3	29.3													
7/10/2013 20:58	0.15	0.3	29.6													
7/10/2013 20:59	0.20	0.3	29.8													
7/10/2013 21:00	0.20	0.3	29.9	30.2 SO2 (Bias)												
			29.9	**Average 30.2 SO2 (Bias)**												
7/10/2013 21:01	1.20	0.3	29.7													
7/10/2013 21:02	14.50	0.3	22.7													
7/10/2013 21:03	20.85	0.3	10.5													
7/10/2013 21:04	21.55	0.3	5.4													
7/10/2013 21:05	21.60	0.3	3.8	22.63 Nox, Zero CO (Bias)												
	21.60	**0.3**		**Average 22.63 Nox, Zero CO (Bias)**												
7/10/2013 21:06	21.25	0.3	3.0													
7/10/2013 21:07	7.35	61.7	1.7													
7/10/2013 21:08	0.45	197.8	1.1													
7/10/2013 21:09	-0.10	226.0	0.9													
7/10/2013 21:10	-0.15	229.0	0.8	Zero Nox, 231.4 CO, Zero SO2 (Bias)												
	-0.15	**229.0**	**0.8**	**Average Zero Nox, 231.4 CO, Zero SO2 (Bias)**												

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NO_x Instrument Converter Efficiency Test

Date and Time		Highest Observed NO_x Peak Value (ppm v/v)	NO_x Value at end of Efficiency Check (ppm v/v)	Percent Decrease From Peak Value
Date	Time (CDT)			
7/11/2013	12:51 13:21	9.85	9.70	1.5

7/11/2013 12:51	9.80
7/11/2013 12:52	9.80
7/11/2013 12:53	9.80
7/11/2013 12:54	9.85
7/11/2013 12:55	9.85
7/11/2013 12:56	9.80
7/11/2013 12:57	9.80
7/11/2013 12:58	9.80
7/11/2013 12:59	9.80
7/11/2013 13:00	9.80
7/11/2013 13:01	9.80
7/11/2013 13:02	9.80
7/11/2013 13:03	9.80
7/11/2013 13:04	9.80
7/11/2013 13:05	9.80
7/11/2013 13:06	9.80
7/11/2013 13:07	9.80
7/11/2013 13:08	9.80
7/11/2013 13:09	9.80
7/11/2013 13:10	9.80
7/11/2013 13:11	9.80
7/11/2013 13:12	9.75
7/11/2013 13:13	9.70
7/11/2013 13:14	9.70
7/11/2013 13:15	9.70
7/11/2013 13:16	9.70
7/11/2013 13:17	9.70
7/11/2013 13:18	9.70
7/11/2013 13:19	9.70
7/11/2013 13:20	9.70

APPENDIX B.2
GASEOUS & INSTRUMENT DATA
BAGHOUSE NUMBER 2

Equipment List

Instrument Calibration Data

Data Printouts and Test Log

NO_x Converter Efficiency Check

Gerdau Ameristeel US, Inc. - Jackson, Tennessee
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Equipment List

Oxides of Nitrogen Instrument:	**Manufacturer -** Thermo Environmental Instruments		**Model -**	42C
	Serial Number - 818930811			
	NO_x Range - zero to 45.2 ppm			
Carbon Monoxide Instrument:	**Manufacturer -** Thermo Environmental Instruments		**Model -**	48
	Serial Number - 63892-341			
	CO Range - zero to 461.0 ppm			
Sulfur Dioxide Instrument:	**Manufacturer -** Thermo Environmental Instruments		**Model -**	43C
	Serial Number - 55593-309			
	SO_2 Range - zero to 30.6 ppm			

Calibration Gas Standards		Concentration	Manufacturer	Cylinder Number	Expiration Date	Beginning PSI	Ending PSI
Zero	Zero	0.0	N/A	N/A	N/A	N/A	N/A
Mid	NO_x	22.63	Air Gas	CC424674	2/7/2016	1850	1100
High	NO_x	45.15	Air Gas	CC425473	2/4/2016	1800	600
Mid	CO	231.4	Air Gas	SG9147169BAL	4/29/2021	2100	1450
High	CO	461.0	Liquid Technology	CC-158979	6/14/2019	1400	1400
Mid	SO_2	30.6	American	EB0014028	4/2/2014	1600	1000
High	SO_2	16.2	American	EB0022824	8/7/2014	1050	1050

Description of Sampling System :

8' 3/8 SS probe to Tee to H_2O condenser to particulate filter to 250 feet 3/8 Teflon sample line to SS pump to instruments

Test Participants :

Testing - Daniel Ockenhouse, Jack Jory, Will Garabrandt, and David Sholtes - Ambient Air Services, Inc.
William Ownby - Gerdau

Other Comments :

Gerdau Ameristeel US, Inc. - Jackson, Tennessee
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Gas Calibration Data

Excess Flow (lpm) (during calibration checks)	**1**	**Calibration Gas Flow (lpm)**	**5**
Excess Flow (lpm) (during sampling)	**1**		
System Response Time (min:sec)	**3:00**	**Converter Efficiency (if applicable)**	**99.5**

Oxides of Nitrogen (NO_x)

Instrument Information	**Manuf.**	Thermo Environmental	**Model**	**42C**				**Serial #**	818930811		
CALIBRATION GAS VALUE (C_v)	INITIAL CALIBRATION (C_{dir})	ANALYZER CALIBRATION ERROR, (ACE)	PRE RUN 1 (BIAS, C_s)	POST RUN 1 (C_s)	POST RUN 2 (C_s)	POST RUN 3 (C_s)					
0.00	-0.05	-0.1	-0.05	0.05	0.05	0.05					
22.63	22.65	0.0	22.00	22.55	22.05	21.95					
45.15	45.80	1.4	N/A	N/A	N/A	N/A					
SPAN (CS)	45.15										
C_O (Avg of initial and final SB)				0.00	0.05	0.05					
C_M (Avg of initial and final SB)				22.28	22.30	22.00					
C_{MA} (Certified upscale gas value)				22.63	22.63	22.63					
SB (System bias % of span)			0.0	0.2	0.2	0.2					
SB (System bias % of span)			-1.4	-0.2	-1.3	-1.6					
D (Drift assessment, % of span)			N/A	0.2	0.0	0.0					
D (Drift assessment, % of span)			N/A	1.2	-1.1	-0.2					

Carbon Monoxide (CO)

Instrument Information	**Manuf.**	Thermo Environmental	**Model**	**48**				**Serial #**	63892-341		
CALIBRATION GAS VALUE (C_v)	INITIAL CALIBRATION (C_{dir})	ANALYZER CALIBRATION ERROR, (ACE)	PRE RUN 1 (BIAS, C_s)	POST RUN 1 (C_s)	POST RUN 2 (C_s)	POST RUN 3 (C_s)					
0.0	0.8	0.2	-0.7	-1.2	-1.2	-2.2					
231.4	229.8	-0.3	223.2	224.2	223.7	221.7					
461.0	461.8	0.2	N/A	N/A	N/A	N/A					
SPAN (CS)	461.0										
C_O (Avg of initial and final SB)				-1.0	-1.2	-1.7					
C_M (Avg of initial and final SB)				223.7	224.0	222.7					
C_{MA} (Certified upscale gas value)				231.4	231.4	231.4					
SB (System bias % of span)			-0.3	-0.4	-0.4	-0.7					
SB (System bias % of span)			-1.4	-1.2	-1.3	-1.8					
D (Drift assessment, % of span)			N/A	-0.1	0.0	-0.2					
D (Drift assessment, % of span)			N/A	0.2	-0.1	-0.4					

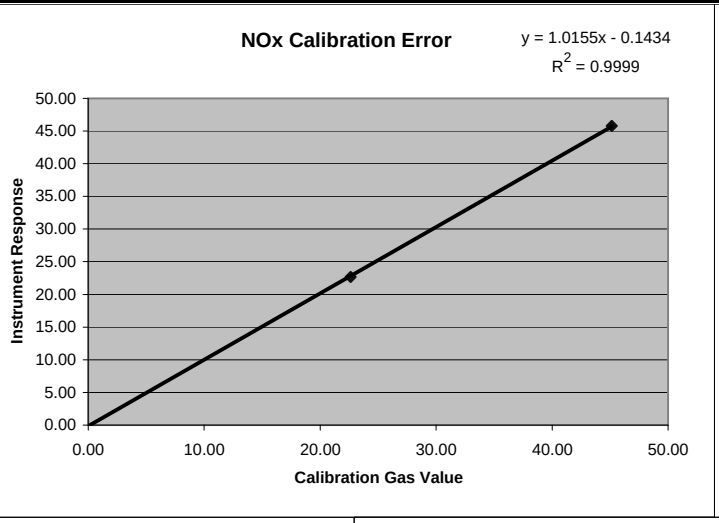
Sulfur Dioxide (SO_2)

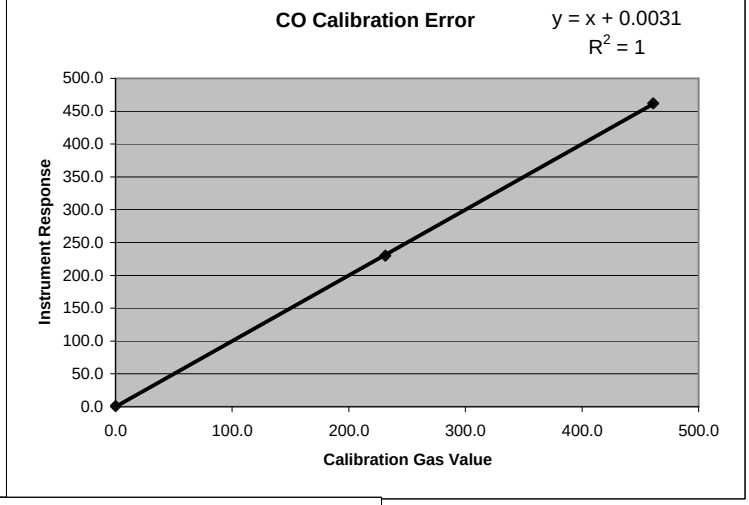
Instrument Information	**Manuf.**	Thermo Environmental	**Model**	**43C**				**Serial #**	55593-309		
CALIBRATION GAS VALUE (C_v)	INITIAL CALIBRATION (C_{dir})	ANALYZER CALIBRATION ERROR, (ACE)	PRE RUN 1 (BIAS, C_s)	POST RUN 1 (C_s)	POST RUN 2 (C_s)	POST RUN 3 (C_s)					
0.0	0.0	0.0	0.1	0.3	1.0	0.3					
30.6	30.6	0.0	29.2	29.8	30.1	29.5					
16.2	16.0	-0.7	N/A	N/A	N/A	N/A					
SPAN (CS)	30.6										
C_O (Avg of initial and final SB)				0.2	0.7	0.7					
C_M (Avg of initial and final SB)				29.5	30.0	29.8					
C_{MA} (Certified upscale gas value)				30.6	30.6	30.6					
SB (System bias % of span)			0.3	1.0	3.3	1.0					
SB (System bias % of span)			-4.6	-2.6	-1.6	-3.8					
D (Drift assessment, % of span)			N/A	0.7	2.3	-2.3					
D (Drift assessment, % of span)			N/A	2.0	1.0	-2.1					

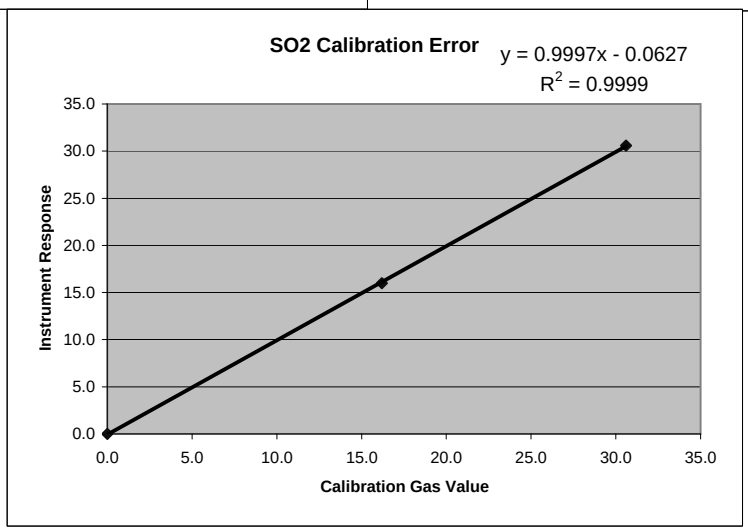
Gerdau Ameristeel US, Inc. - Jackson, Tennessee
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Gas Calibration Data

Excess Flow (lpm) (during calibration checks)	**1**	**Calibration Gas Flow (lpm)**	**5**
Excess Flow (lpm) (during sampling)	**1**		
System Response Time (min:sec)	**3:00**	**Converter Efficiency (if applicable)**	**99.5**







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Gaseous Emissions Recorder Printout and Test Summary

	Raw Data				Drift Corrected Data									Corrected Data		
TimeStamp (CDT)	NO_x, ppm	CO, ppm	SO_2, ppm	COMMENTS	Co, NO_x	Cm, NO_x	Cma, NO_x	Co, CO	Cm, CO	Cma, CO	Co, SO_2	Cm, SO_2	Cma, SO_2	NO_x, ppm	CO, ppm	SO_2, ppm
7/10/2013 6:36	3.10	2.8	0.0													
7/10/2013 6:37	2.20	4.9	0.0													
7/10/2013 6:38	0.70	0.8	0.0													
7/10/2013 6:39	-0.05	0.8	0.0	Zero Nox, Zero CO, Zero SO2 (Direct)												
7/10/2013 6:40	-0.05	0.8	0.0	Zero Nox, Zero CO, Zero SO2 (Direct)												
	-0.05	**0.8**	**0.0**	**Average Zero Nox, Zero CO, Zero SO2 (Direct)**												
7/10/2013 6:41	-0.10	1.8	0.0													
7/10/2013 6:42	12.60	1.3	1.0													
7/10/2013 6:43	40.70	1.3	5.4													
7/10/2013 6:44	44.35	0.8	7.6													
7/10/2013 6:45	45.30	1.3	8.2													
7/10/2013 6:46	45.50	1.3	8.6													
7/10/2013 6:47	45.70	0.8	8.9	45.15 Nox (Direct)												
7/10/2013 6:48	45.90	1.3	6.9	45.15 Nox (Direct)												
	45.80			**Average 45.15 Nox (Direct)**												
7/10/2013 6:49	29.60	1.3	18.9													
7/10/2013 6:50	0.50	1.3	29.4													
7/10/2013 6:51	0.40	1.3	30.5													
7/10/2013 6:52	0.35	1.8	30.4													
7/10/2013 6:53	0.35	1.3	30.5													
7/10/2013 6:54	0.30	1.3	30.6	30.2 SO2 (Direct)												
7/10/2013 6:55	0.30	1.3	30.6	30.2 SO2 (Direct)												
			30.6	**Average 30.2 SO2 (Direct)**												
7/10/2013 6:56	0.30	3.4	30.5													
7/10/2013 6:57	0.40	318.1	10.0													
7/10/2013 6:58	0.05	461.3	1.2													
7/10/2013 6:59	-0.05	461.8	0.3													
7/10/2013 7:00	-0.10	461.8	0.1	461 CO (Direct)												
7/10/2013 7:01	-0.10	461.8	0.1	461 CO (Direct)												
		461.8		**Average 461 CO (Direct)**												

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Gaseous Emissions Recorder Printout and Test Summary

	Raw Data				Drift Corrected Data									Corrected Data		
TimeStamp (CDT)	NO_x, ppm	CO, ppm	SO_2, ppm	COMMENTS	Co, NO_x	Cm, NO_x	Cma, NO_x	Co, CO	Cm, CO	Cma, CO	Co, SO_2	Cm, SO_2	Cma, SO_2	NO_x, ppm	CO, ppm	SO_2, ppm
7/10/2013 7:02	-0.10	358.7	3.1													
7/10/2013 7:03	0.00	13.5	12.4													
7/10/2013 7:04	0.05	1.8	14.8													
7/10/2013 7:05	0.00	1.8	16.0	16.2 SO2 (Direct)												
7/10/2013 7:06	0.05	1.8	16.1	16.2 SO2 (Direct)												
			16.0	**Average 16.2 SO2 (Direct)**												
7/10/2013 7:07	1.50	1.3	8.5													
7/10/2013 7:08	21.80	1.3	3.7													
7/10/2013 7:09	22.50	0.8	5.2													
7/10/2013 7:10	22.60	0.8	5.5	22.63 Nox (Direct)												
7/10/2013 7:11	22.70	23.2	4.2	22.63 Nox (Direct)												
	22.65			**Average 22.63 Nox (Direct)**												
7/10/2013 7:12	15.15	208.5	0.2													
7/10/2013 7:13	0.00	229.3	0.1													
7/10/2013 7:14	-0.05	229.8	0.1	231.4 CO (Direct)												
7/10/2013 7:15	-0.05	229.8	0.1	231.4 CO (Direct)												
		229.8		**Average 231.4 CO (Direct)**												
7/10/2013 7:16	-0.10	214.0	0.3													
7/10/2013 7:17	-0.05	82.0	0.8													
7/10/2013 7:18	0.05	66.3	0.4													
7/10/2013 7:19	0.45	127.2	0.3													
7/10/2013 7:20	10.50	58.7	0.3													
7/10/2013 7:21	6.90	53.1	0.2													
7/10/2013 7:22	1.55	110.0	0.1													
7/10/2013 7:23	0.25	197.3	0.1													
7/10/2013 7:24	0.00	220.1	0.1													
7/10/2013 7:25	-0.05	223.2	0.1	Zero Nox, 231.4 CO, Zero SO2 (Bias)												
	-0.05	**223.2**	**0.1**	**Average Zero Nox, 231.4 CO, Zero SO2 (Bias)**												
7/10/2013 7:26	0.35	204.4	0.1													
7/10/2013 7:27	10.10	83.1	0.1													

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Gaseous Emissions Recorder Printout and Test Summary

	Raw Data				Drift Corrected Data									Corrected Data		
TimeStamp (CDT)	**NO_x, ppm**	**CO, ppm**	**SO_2, ppm**	**COMMENTS**	**Co, NO_x**	**Cm, NO_x**	**Cma, NO_x**	**Co, CO**	**Cm, CO**	**Cma, CO**	**Co, SO_2**	**Cm, SO_2**	**Cma, SO_2**	**NO_x, ppm**	**CO, ppm**	**SO_2, ppm**
7/10/2013 7:28	19.45	15.5	0.2													
7/10/2013 7:29	21.55	3.4	0.3													
7/10/2013 7:30	21.85	1.8	0.3													
7/10/2013 7:31	21.95	1.3	0.3													
7/10/2013 7:32	22.00	1.3	0.3	22.63 Nox (Bias)												
	22.00			**Average 22.63 Nox (Bias)**												
7/10/2013 7:33	21.15	1.3	0.2													
7/10/2013 7:34	9.10	1.3	0.1													
7/10/2013 7:35	1.50	0.8	0.1													
7/10/2013 7:36	0.50	0.8	0.1													
7/10/2013 7:37	0.65	1.3	0.1													
7/10/2013 7:38	0.60	2.3	17.8													
7/10/2013 7:39	0.10	0.8	9.8													
7/10/2013 7:40	1.40	1.3	2.1													
7/10/2013 7:41	0.50	1.8	1.3													
7/10/2013 7:42	0.25	1.3	0.5													
7/10/2013 7:43	2.10	1.8	0.3													
7/10/2013 7:44	1.50	0.8	0.2													
7/10/2013 7:45	0.40	0.8	0.1													
7/10/2013 7:46	0.10	1.3	0.1													
7/10/2013 7:47	0.05	0.3	0.1													
7/10/2013 7:48	0.10	0.8	0.1													
7/10/2013 7:49	0.10	0.8	0.2													
7/10/2013 7:50	0.10	0.8	0.4													
7/10/2013 7:51	0.10	0.8	0.6													
7/10/2013 7:52	0.10	0.8	0.8													
7/10/2013 7:53	0.00	0.3	0.7													
7/10/2013 7:54	-0.05	0.8	0.5													
7/10/2013 7:55	-0.05	0.8	0.4													
7/10/2013 7:56	-0.05	0.8	0.3													

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	Raw Data				Drift Corrected Data									Corrected Data		
TimeStamp (CDT)	NO_x, ppm	CO, ppm	SO_2, ppm	COMMENTS	Co, NO_x	Cm, NO_x	Cma, NO_x	Co, CO	Cm, CO	Cma, CO	Co, SO_2	Cm, SO_2	Cma, SO_2	NO_x, ppm	CO, ppm	SO_2, ppm
7/10/2013 7:57	-0.05	0.3	0.3													
7/10/2013 7:58	-0.05	0.8	0.2													
7/10/2013 7:59	-0.05	0.8	0.2													
7/10/2013 8:00	-0.05	0.8	0.2													
7/10/2013 8:01	-0.05	0.3	0.2													
7/10/2013 8:02	-0.05	0.8	0.1													
7/10/2013 8:03	-0.05	0.3	0.1													
7/10/2013 8:04	-0.10	0.8	0.1													
7/10/2013 8:05	-0.10	0.3	0.1													
7/10/2013 8:06	-0.10	0.3	0.1													
7/10/2013 8:07	-0.10	0.3	0.1													
7/10/2013 8:08	-0.10	0.3	0.1													
7/10/2013 8:09	-0.10	0.3	0.1													
7/10/2013 8:10	-0.10	0.3	0.1													
7/10/2013 8:11	-0.05	0.3	0.1													
7/10/2013 8:12	-0.10	0.3	0.1													
7/10/2013 8:13	-0.10	0.3	0.1													
7/10/2013 8:14	-0.05	-0.2	0.1													
7/10/2013 8:15	-0.10	-0.2	0.1													
7/10/2013 8:16	-0.10	-0.2	0.1													
7/10/2013 8:17	-0.05	0.3	0.1													
7/10/2013 8:18	-0.05	0.8	0.1													
7/10/2013 8:19	0.25	11.5	0.1													
7/10/2013 8:20	0.25	3.4	0.1													
7/10/2013 8:21	0.15	9.4	0.1													
7/10/2013 8:22	0.40	14.0	0.1													
7/10/2013 8:23	0.20	1.8	0.1													
7/10/2013 8:24	0.15	-0.2	0.2													
7/10/2013 8:25	0.15	-0.7	0.2													
7/10/2013 8:26	0.15	-0.7	0.2													

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	Raw Data				Drift Corrected Data									Corrected Data		
TimeStamp (CDT)	NO_x, ppm	CO, ppm	SO_2, ppm	COMMENTS	Co, NO_x	Cm, NO_x	Cma, NO_x	Co, CO	Cm, CO	Cma, CO	Co, SO_2	Cm, SO_2	Cma, SO_2	NO_x, ppm	CO, ppm	SO_2, ppm
7/10/2013 8:27	0.15	-0.7	0.2													
7/10/2013 8:28	0.15	0.3	0.2													
7/10/2013 8:29	0.40	63.8	0.2													
7/10/2013 8:30	0.90	80.5	0.2													
7/10/2013 8:31	0.40	53.1	0.1													
7/10/2013 8:32	1.25	94.2	0.1													
7/10/2013 8:33	1.15	66.8	0.1													
7/10/2013 8:34	0.50	30.8	0.1													
7/10/2013 8:35	0.40	46.5	0.1													
7/10/2013 8:36	0.25	36.4	0.1													
7/10/2013 8:37	0.30	56.2	0.1													
7/10/2013 8:38	0.35	49.6	0.1													
7/10/2013 8:39	0.25	41.9	0.1													
7/10/2013 8:40	0.30	2.8	0.1													
7/10/2013 8:41	0.35	-12.4	0.2													
7/10/2013 8:42	0.20	-6.3	0.2													
7/10/2013 8:43	0.20	-3.8	0.3													
7/10/2013 8:44	0.15	-2.2	0.3													
7/10/2013 8:45	0.80	-0.7	0.3													
7/10/2013 8:46	1.55	-0.2	0.1													
7/10/2013 8:47	-0.05	-0.7	0.1													
7/10/2013 8:48	3.45	0.3	0.5													
7/10/2013 8:49	6.40	0.8	0.9													
7/10/2013 8:50	4.50	1.8	1.1													
7/10/2013 8:51	1.80	0.3	9.4													
7/10/2013 8:52	0.50	-1.2	21.1													
7/10/2013 8:53	0.40	-1.2	25.5													
7/10/2013 8:54	0.35	-1.2	26.7													
7/10/2013 8:55	0.35	-1.2	27.6													
7/10/2013 8:56	0.35	-1.2	28.7													

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TimeStamp (CDT)	NO_x, ppm	CO, ppm	SO_2, ppm	COMMENTS	Co, NO_x	Cm, NO_x	Cma, NO_x	Co, CO	Cm, CO	Cma, CO	Co, SO_2	Cm, SO_2	Cma, SO_2	NO_x, ppm	CO, ppm	SO_2, ppm
7/10/2013 8:57	0.35	-0.7	28.9													
7/10/2013 8:58	0.35	-0.7	29.2	Zero CO, 30.6 SO2 (Bias)												
		-0.7	**29.2**	**Average Zero CO, 30.6 SO2 (Bias)**												
7/10/2013 8:59	1.05	3.9	25.8													
7/10/2013 9:00	3.20	15.5	14.1													
7/10/2013 9:01	3.25	27.2	8.0													
7/10/2013 9:02	2.65	49.6	5.7													
7/10/2013 9:03	1.85	54.1	4.3													
7/10/2013 9:04	1.35	72.9	3.2													
7/10/2013 9:05	1.30	93.7	2.5													
7/10/2013 9:06	1.30	80.5	2.0													
7/10/2013 9:07	1.50	52.1	1.6													
7/10/2013 9:08	2.95	30.3	1.3													
7/10/2013 9:09	3.95	19.6	1.2													
7/10/2013 9:10	5.25	10.5	1.2													
7/10/2013 9:11	6.45	5.9	1.3													
7/10/2013 9:12	6.75	3.9	1.3													
7/10/2013 9:13	6.80	3.4	1.2													
7/10/2013 9:14	6.70	2.8	1.2													
7/10/2013 9:15	6.40	3.4	1.1													
7/10/2013 9:16	6.00	4.4	1.1													
7/10/2013 9:17	5.30	5.9	1.0													
7/10/2013 9:18	4.95	7.4	1.0													
7/10/2013 9:19	4.00	10.0	1.0													
7/10/2013 9:20	3.85	31.8	1.0													
7/10/2013 9:21	3.25	53.6	1.0													
7/10/2013 9:22	2.55	50.1	0.9													
7/10/2013 9:23	2.15	43.0	0.8													
7/10/2013 9:24	1.95	63.3	0.8													
7/10/2013 9:25	2.50	85.1	0.7													

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TimeStamp (CDT)	NO_x, ppm	CO, ppm	SO_2, ppm	COMMENTS	Co, NO_x	Cm, NO_x	Cma, NO_x	Co, CO	Cm, CO	Cma, CO	Co, SO_2	Cm, SO_2	Cma, SO_2	NO_x, ppm	CO, ppm	SO_2, ppm
7/10/2013 9:26	2.75	92.2	0.7													
7/10/2013 9:27	2.40	73.4	0.6													
7/10/2013 9:28	2.10	44.5	0.6													
7/10/2013 9:29	1.95	63.3	0.6													
7/10/2013 9:30	1.70	111.5	0.5													
7/10/2013 9:31	1.60	116.1	0.5													
7/10/2013 9:32	1.55	104.4	0.5													
7/10/2013 9:33	1.10	92.7	0.4													
7/10/2013 9:34	1.20	120.1	0.4													
7/10/2013 9:35	1.15	109.5	0.4													
7/10/2013 9:36	1.00	145.0	0.4													
7/10/2013 9:37	1.20	200.3	0.4													
7/10/2013 9:38	1.40	179.5	0.3													
7/10/2013 9:39	1.20	166.3	0.3													
7/10/2013 9:40	1.20	241.5	0.3													
7/10/2013 9:41	1.00	245.5	0.3													
7/10/2013 9:42	0.85	220.6	0.4													
7/10/2013 9:43	0.80	193.2	0.3													
7/10/2013 9:44	0.75	156.2	0.4													
7/10/2013 9:45	0.75	144.0	0.3													
7/10/2013 9:46	1.20	143.5	0.4													
7/10/2013 9:47	2.25	123.2	0.4													
7/10/2013 9:48	1.25	76.5	0.3													
7/10/2013 9:49	0.55	46.0	0.3													
7/10/2013 9:50	0.55	31.3	0.3													
7/10/2013 9:51	0.65	30.8	0.3													
7/10/2013 9:52	0.60	29.8	0.3	Run 1	0.00	22.28	22.63	-1.0	223.7	231.4	0.2	29.5	30.6	0.6	31.7	0.1
7/10/2013 9:53	0.85	23.7	0.3	Run 1	0.00	22.28	22.63	-1.0	223.7	231.4	0.2	29.5	30.6	0.9	25.4	0.1
7/10/2013 9:54	1.15	17.6	0.3	Run 1	0.00	22.28	22.63	-1.0	223.7	231.4	0.2	29.5	30.6	1.2	19.1	0.1
7/10/2013 9:55	2.55	12.0	0.3	Run 1	0.00	22.28	22.63	-1.0	223.7	231.4	0.2	29.5	30.6	2.6	13.4	0.1

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TimeStamp (CDT)	NO_x, ppm	CO, ppm	SO_2, ppm	COMMENTS	Co, NO_x	Cm, NO_x	Cma, NO_x	Co, CO	Cm, CO	Cma, CO	Co, SO_2	Cm, SO_2	Cma, SO_2	NO_x, ppm	CO, ppm	SO_2, ppm
7/10/2013 9:56	12.35	5.4	0.4	Run 1	0.00	22.28	22.63	-1.0	223.7	231.4	0.2	29.5	30.6	12.5	6.6	0.2
7/10/2013 9:57	11.80	4.9	0.8	Run 1	0.00	22.28	22.63	-1.0	223.7	231.4	0.2	29.5	30.6	12.0	6.1	0.6
7/10/2013 9:58	7.85	14.0	1.6	Run 1	0.00	22.28	22.63	-1.0	223.7	231.4	0.2	29.5	30.6	8.0	15.5	1.5
7/10/2013 9:59	6.10	12.5	2.6	Run 1	0.00	22.28	22.63	-1.0	223.7	231.4	0.2	29.5	30.6	6.2	13.9	2.5
7/10/2013 10:00	7.10	5.9	3.5	Run 1	0.00	22.28	22.63	-1.0	223.7	231.4	0.2	29.5	30.6	7.2	7.1	3.4
7/10/2013 10:01	6.95	9.4	4.1	Run 1	0.00	22.28	22.63	-1.0	223.7	231.4	0.2	29.5	30.6	7.1	10.8	4.0
7/10/2013 10:02	7.05	17.6	4.5	Run 1	0.00	22.28	22.63	-1.0	223.7	231.4	0.2	29.5	30.6	7.2	19.1	4.5
7/10/2013 10:03	7.45	17.1	4.9	Run 1	0.00	22.28	22.63	-1.0	223.7	231.4	0.2	29.5	30.6	7.6	18.6	4.9
7/10/2013 10:04	7.50	15.5	5.7	Run 1	0.00	22.28	22.63	-1.0	223.7	231.4	0.2	29.5	30.6	7.6	17.0	5.8
7/10/2013 10:05	7.25	19.6	7.7	Run 1	0.00	22.28	22.63	-1.0	223.7	231.4	0.2	29.5	30.6	7.4	21.2	7.9
7/10/2013 10:06	5.05	20.1	10.3	Run 1	0.00	22.28	22.63	-1.0	223.7	231.4	0.2	29.5	30.6	5.1	21.7	10.5
7/10/2013 10:07	3.05	21.6	12.3	Run 1	0.00	22.28	22.63	-1.0	223.7	231.4	0.2	29.5	30.6	3.1	23.3	12.6
7/10/2013 10:08	2.40	22.6	12.2	Run 1	0.00	22.28	22.63	-1.0	223.7	231.4	0.2	29.5	30.6	2.4	24.3	12.5
7/10/2013 10:09	2.15	30.8	9.7	Run 1	0.00	22.28	22.63	-1.0	223.7	231.4	0.2	29.5	30.6	2.2	32.7	9.9
7/10/2013 10:10	1.95	46.5	6.8	Run 1	0.00	22.28	22.63	-1.0	223.7	231.4	0.2	29.5	30.6	2.0	48.9	6.9
7/10/2013 10:11	2.65	60.2	4.6	Run 1	0.00	22.28	22.63	-1.0	223.7	231.4	0.2	29.5	30.6	2.7	63.0	4.6
7/10/2013 10:12	2.55	60.2	3.2	Run 1	0.00	22.28	22.63	-1.0	223.7	231.4	0.2	29.5	30.6	2.6	63.0	3.2
7/10/2013 10:13	2.00	52.6	2.4	Run 1	0.00	22.28	22.63	-1.0	223.7	231.4	0.2	29.5	30.6	2.0	55.2	2.2
7/10/2013 10:14	1.90	47.5	1.8	Run 1	0.00	22.28	22.63	-1.0	223.7	231.4	0.2	29.5	30.6	1.9	50.0	1.6
7/10/2013 10:15	4.35	26.2	1.4	Run 1	0.00	22.28	22.63	-1.0	223.7	231.4	0.2	29.5	30.6	4.4	28.0	1.3
7/10/2013 10:16	5.35	16.6	1.3	Run 1	0.00	22.28	22.63	-1.0	223.7	231.4	0.2	29.5	30.6	5.4	18.1	1.1
7/10/2013 10:17	5.55	8.4	1.3	Run 1	0.00	22.28	22.63	-1.0	223.7	231.4	0.2	29.5	30.6	5.6	9.7	1.1
7/10/2013 10:18	6.55	3.9	1.3	Run 1	0.00	22.28	22.63	-1.0	223.7	231.4	0.2	29.5	30.6	6.7	5.0	1.1
7/10/2013 10:19	7.05	3.4	1.3	Run 1	0.00	22.28	22.63	-1.0	223.7	231.4	0.2	29.5	30.6	7.2	4.5	1.2
7/10/2013 10:20	6.70	3.4	1.3	Run 1	0.00	22.28	22.63	-1.0	223.7	231.4	0.2	29.5	30.6	6.8	4.5	1.1
7/10/2013 10:21	5.95	3.9	1.2	Run 1	0.00	22.28	22.63	-1.0	223.7	231.4	0.2	29.5	30.6	6.0	5.0	1.0
7/10/2013 10:22	5.30	6.9	1.1	Run 1	0.00	22.28	22.63	-1.0	223.7	231.4	0.2	29.5	30.6	5.4	8.1	0.9
7/10/2013 10:23	5.10	10.5	1.0	Run 1	0.00	22.28	22.63	-1.0	223.7	231.4	0.2	29.5	30.6	5.2	11.8	0.9
7/10/2013 10:24	5.00	16.6	0.9	Run 1	0.00	22.28	22.63	-1.0	223.7	231.4	0.2	29.5	30.6	5.1	18.1	0.8
7/10/2013 10:25	4.45	34.8	0.9	Run 1	0.00	22.28	22.63	-1.0	223.7	231.4	0.2	29.5	30.6	4.5	36.9	0.7

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TimeStamp (CDT)	NO_x, ppm	CO, ppm	SO_2, ppm	COMMENTS	Co, NO_x	Cm, NO_x	Cma, NO_x	Co, CO	Cm, CO	Cma, CO	Co, SO_2	Cm, SO_2	Cma, SO_2	NO_x, ppm	CO, ppm	SO_2, ppm
7/10/2013 10:26	3.00	49.6	0.8	Run 1	0.00	22.28	22.63	-1.0	223.7	231.4	0.2	29.5	30.6	3.0	52.1	0.7
7/10/2013 10:27	3.10	69.9	0.8	Run 1	0.00	22.28	22.63	-1.0	223.7	231.4	0.2	29.5	30.6	3.1	73.0	0.6
7/10/2013 10:28	3.25	51.1	0.7	Run 1	0.00	22.28	22.63	-1.0	223.7	231.4	0.2	29.5	30.6	3.3	53.6	0.5
7/10/2013 10:29	2.95	61.2	0.7	Run 1	0.00	22.28	22.63	-1.0	223.7	231.4	0.2	29.5	30.6	3.0	64.1	0.5
7/10/2013 10:30	2.30	89.2	0.7	Run 1	0.00	22.28	22.63	-1.0	223.7	231.4	0.2	29.5	30.6	2.3	92.8	0.5
7/10/2013 10:31	2.85	115.6	0.7	Run 1	0.00	22.28	22.63	-1.0	223.7	231.4	0.2	29.5	30.6	2.9	120.0	0.5
7/10/2013 10:32	3.00	190.7	0.7	Run 1	0.00	22.28	22.63	-1.0	223.7	231.4	0.2	29.5	30.6	3.0	197.4	0.5
7/10/2013 10:33	2.45	195.8	0.7	Run 1	0.00	22.28	22.63	-1.0	223.7	231.4	0.2	29.5	30.6	2.5	202.6	0.5
7/10/2013 10:34	1.95	167.3	0.7	Run 1	0.00	22.28	22.63	-1.0	223.7	231.4	0.2	29.5	30.6	2.0	173.4	0.5
7/10/2013 10:35	1.90	167.8	0.6	Run 1	0.00	22.28	22.63	-1.0	223.7	231.4	0.2	29.5	30.6	1.9	173.9	0.4
7/10/2013 10:36	2.20	151.1	0.6	Run 1	0.00	22.28	22.63	-1.0	223.7	231.4	0.2	29.5	30.6	2.2	156.6	0.4
7/10/2013 10:37	2.60	161.2	0.5	Run 1	0.00	22.28	22.63	-1.0	223.7	231.4	0.2	29.5	30.6	2.6	167.1	0.3
7/10/2013 10:38	1.70	146.0	0.5	Run 1	0.00	22.28	22.63	-1.0	223.7	231.4	0.2	29.5	30.6	1.7	151.4	0.3
7/10/2013 10:39	1.10	116.6	0.4	Run 1	0.00	22.28	22.63	-1.0	223.7	231.4	0.2	29.5	30.6	1.1	121.1	0.2
7/10/2013 10:40	1.05	101.8	0.4	Run 1	0.00	22.28	22.63	-1.0	223.7	231.4	0.2	29.5	30.6	1.1	105.9	0.2
7/10/2013 10:41	1.15	133.8	0.4	Run 1	0.00	22.28	22.63	-1.0	223.7	231.4	0.2	29.5	30.6	1.2	138.9	0.2
7/10/2013 10:42	1.85	193.2	0.3	Run 1	0.00	22.28	22.63	-1.0	223.7	231.4	0.2	29.5	30.6	1.9	200.0	0.1
7/10/2013 10:43	1.80	180.5	0.3	Run 1	0.00	22.28	22.63	-1.0	223.7	231.4	0.2	29.5	30.6	1.8	187.0	0.1
7/10/2013 10:44	1.20	181.6	0.3	Run 1	0.00	22.28	22.63	-1.0	223.7	231.4	0.2	29.5	30.6	1.2	188.0	0.1
7/10/2013 10:45	1.10	202.4	0.3	Run 1	0.00	22.28	22.63	-1.0	223.7	231.4	0.2	29.5	30.6	1.1	209.4	0.1
7/10/2013 10:46	1.05	201.4	0.3	Run 1	0.00	22.28	22.63	-1.0	223.7	231.4	0.2	29.5	30.6	1.1	208.4	0.1
7/10/2013 10:47	1.55	218.1	0.3	Run 1	0.00	22.28	22.63	-1.0	223.7	231.4	0.2	29.5	30.6	1.6	225.6	0.1
7/10/2013 10:48	1.50	220.6	0.3	Run 1	0.00	22.28	22.63	-1.0	223.7	231.4	0.2	29.5	30.6	1.5	228.3	0.1
7/10/2013 10:49	0.95	199.3	0.2	Run 1	0.00	22.28	22.63	-1.0	223.7	231.4	0.2	29.5	30.6	1.0	206.3	0.0
7/10/2013 10:50	0.80	165.3	0.2	Run 1	0.00	22.28	22.63	-1.0	223.7	231.4	0.2	29.5	30.6	0.8	171.3	0.0
7/10/2013 10:51	0.75	157.7	0.2	Run 1	0.00	22.28	22.63	-1.0	223.7	231.4	0.2	29.5	30.6	0.8	163.4	0.0
7/10/2013 10:52	0.70	143.5	0.2	Run 1	0.00	22.28	22.63	-1.0	223.7	231.4	0.2	29.5	30.6	0.7	148.8	0.0
7/10/2013 10:53	0.60	132.8	0.2	Run 1	0.00	22.28	22.63	-1.0	223.7	231.4	0.2	29.5	30.6	0.6	137.8	0.0
7/10/2013 10:54	0.60	139.9	0.2	Run 1	0.00	22.28	22.63	-1.0	223.7	231.4	0.2	29.5	30.6	0.6	145.1	0.0
7/10/2013 10:55	0.75	118.1	0.2	Run 1	0.00	22.28	22.63	-1.0	223.7	231.4	0.2	29.5	30.6	0.8	122.6	0.0

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	Raw Data				Drift Corrected Data									Corrected Data		
TimeStamp (CDT)	NO_x, ppm	CO, ppm	SO_2, ppm	COMMENTS	Co, NO_x	Cm, NO_x	Cma, NO_x	Co, CO	Cm, CO	Cma, CO	Co, SO_2	Cm, SO_2	Cma, SO_2	NO_x, ppm	CO, ppm	SO_2, ppm
7/10/2013 10:56	0.50	58.2	0.2	Run 1	0.00	22.28	22.63	-1.0	223.7	231.4	0.2	29.5	30.6	0.5	60.9	0.0
7/10/2013 10:57	0.30	42.4	0.2	Run 1	0.00	22.28	22.63	-1.0	223.7	231.4	0.2	29.5	30.6	0.3	44.7	0.0
7/10/2013 10:58	0.35	30.8	0.2	Run 1	0.00	22.28	22.63	-1.0	223.7	231.4	0.2	29.5	30.6	0.4	32.7	0.0
7/10/2013 10:59	0.40	19.6	0.2	Run 1	0.00	22.28	22.63	-1.0	223.7	231.4	0.2	29.5	30.6	0.4	21.2	0.0
7/10/2013 11:00	0.40	14.5	0.2	Run 1	0.00	22.28	22.63	-1.0	223.7	231.4	0.2	29.5	30.6	0.4	16.0	0.0
7/10/2013 11:01	0.50	17.1	0.2	Run 1	0.00	22.28	22.63	-1.0	223.7	231.4	0.2	29.5	30.6	0.5	18.6	-0.1
7/10/2013 11:02	0.50	20.6	0.2	Run 1	0.00	22.28	22.63	-1.0	223.7	231.4	0.2	29.5	30.6	0.5	22.3	-0.1
7/10/2013 11:03	0.60	19.1	0.2	Run 1	0.00	22.28	22.63	-1.0	223.7	231.4	0.2	29.5	30.6	0.6	20.7	-0.1
7/10/2013 11:04	1.05	15.0	0.2	Run 1	0.00	22.28	22.63	-1.0	223.7	231.4	0.2	29.5	30.6	1.1	16.5	-0.1
7/10/2013 11:05	1.80	9.4	0.2	Run 1	0.00	22.28	22.63	-1.0	223.7	231.4	0.2	29.5	30.6	1.8	10.8	-0.1
7/10/2013 11:06	4.25	6.9	0.2	Run 1	0.00	22.28	22.63	-1.0	223.7	231.4	0.2	29.5	30.6	4.3	8.1	0.0
7/10/2013 11:07	8.00	4.4	0.2	Run 1	0.00	22.28	22.63	-1.0	223.7	231.4	0.2	29.5	30.6	8.1	5.5	0.0
7/10/2013 11:08	6.90	10.0	0.3	Run 1	0.00	22.28	22.63	-1.0	223.7	231.4	0.2	29.5	30.6	7.0	11.3	0.1
7/10/2013 11:09	4.55	24.7	0.4	Run 1	0.00	22.28	22.63	-1.0	223.7	231.4	0.2	29.5	30.6	4.6	26.4	0.2
7/10/2013 11:10	5.35	14.5	0.5	Run 1	0.00	22.28	22.63	-1.0	223.7	231.4	0.2	29.5	30.6	5.4	16.0	0.3
7/10/2013 11:11	6.40	11.5	0.6	Run 1	0.00	22.28	22.63	-1.0	223.7	231.4	0.2	29.5	30.6	6.5	12.8	0.4
7/10/2013 11:12	6.55	31.8	0.6	Run 1	0.00	22.28	22.63	-1.0	223.7	231.4	0.2	29.5	30.6	6.7	33.8	0.4
7/10/2013 11:13	6.65	76.5	0.7	Run 1	0.00	22.28	22.63	-1.0	223.7	231.4	0.2	29.5	30.6	6.8	79.8	0.5
7/10/2013 11:14	7.20	31.8	0.8	Run 1	0.00	22.28	22.63	-1.0	223.7	231.4	0.2	29.5	30.6	7.3	33.8	0.6
7/10/2013 11:15	7.30	22.6	0.9	Run 1	0.00	22.28	22.63	-1.0	223.7	231.4	0.2	29.5	30.6	7.4	24.3	0.7
7/10/2013 11:16	6.80	33.3	1.0	Run 1	0.00	22.28	22.63	-1.0	223.7	231.4	0.2	29.5	30.6	6.9	35.3	0.8
7/10/2013 11:17	4.80	36.9	1.1	Run 1	0.00	22.28	22.63	-1.0	223.7	231.4	0.2	29.5	30.6	4.9	39.0	0.9
7/10/2013 11:18	2.60	29.2	1.3	Run 1	0.00	22.28	22.63	-1.0	223.7	231.4	0.2	29.5	30.6	2.6	31.1	1.1
7/10/2013 11:19	2.35	47.5	1.3	Run 1	0.00	22.28	22.63	-1.0	223.7	231.4	0.2	29.5	30.6	2.4	50.0	1.1
7/10/2013 11:20	2.10	103.4	1.3	Run 1	0.00	22.28	22.63	-1.0	223.7	231.4	0.2	29.5	30.6	2.1	107.5	1.1
7/10/2013 11:21	2.30	94.2	1.2	Run 1	0.00	22.28	22.63	-1.0	223.7	231.4	0.2	29.5	30.6	2.3	98.1	1.0
7/10/2013 11:22	2.55	105.4	1.1	Run 1	0.00	22.28	22.63	-1.0	223.7	231.4	0.2	29.5	30.6	2.6	109.6	0.9
7/10/2013 11:23	2.50	168.9	1.1	Run 1	0.00	22.28	22.63	-1.0	223.7	231.4	0.2	29.5	30.6	2.5	174.9	0.9
7/10/2013 11:24	2.55	151.1	1.0	Run 1	0.00	22.28	22.63	-1.0	223.7	231.4	0.2	29.5	30.6	2.6	156.6	0.8
7/10/2013 11:25	3.40	103.9	0.9	Run 1	0.00	22.28	22.63	-1.0	223.7	231.4	0.2	29.5	30.6	3.5	108.0	0.7

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	Raw Data				Drift Corrected Data									Corrected Data		
TimeStamp (CDT)	NO_x, ppm	CO, ppm	SO_2, ppm	COMMENTS	Co, NO_x	Cm, NO_x	Cma, NO_x	Co, CO	Cm, CO	Cma, CO	Co, SO_2	Cm, SO_2	Cma, SO_2	NO_x, ppm	CO, ppm	SO_2, ppm
7/10/2013 11:26	4.25	40.9	0.8	Run 1	0.00	22.28	22.63	-1.0	223.7	231.4	0.2	29.5	30.6	4.3	43.2	0.6
7/10/2013 11:27	4.85	32.3	0.8	Run 1	0.00	22.28	22.63	-1.0	223.7	231.4	0.2	29.5	30.6	4.9	34.3	0.6
7/10/2013 11:28	6.20	10.5	0.8	Run 1	0.00	22.28	22.63	-1.0	223.7	231.4	0.2	29.5	30.6	6.3	11.8	0.6
7/10/2013 11:29	6.50	5.4	0.7	Run 1	0.00	22.28	22.63	-1.0	223.7	231.4	0.2	29.5	30.6	6.6	6.6	0.5
7/10/2013 11:30	6.25	5.4	0.7	Run 1	0.00	22.28	22.63	-1.0	223.7	231.4	0.2	29.5	30.6	6.3	6.6	0.5
7/10/2013 11:31	6.40	4.4	0.7	Run 1	0.00	22.28	22.63	-1.0	223.7	231.4	0.2	29.5	30.6	6.5	5.5	0.5
7/10/2013 11:32	6.75	5.4	0.6	Run 1	0.00	22.28	22.63	-1.0	223.7	231.4	0.2	29.5	30.6	6.9	6.6	0.4
7/10/2013 11:33	6.65	5.4	0.6	Run 1	0.00	22.28	22.63	-1.0	223.7	231.4	0.2	29.5	30.6	6.8	6.6	0.4
7/10/2013 11:34	6.25	7.9	0.6	Run 1	0.00	22.28	22.63	-1.0	223.7	231.4	0.2	29.5	30.6	6.3	9.2	0.4
7/10/2013 11:35	5.50	14.0	0.6	Run 1	0.00	22.28	22.63	-1.0	223.7	231.4	0.2	29.5	30.6	5.6	15.5	0.4
7/10/2013 11:36	4.80	33.8	0.5	Run 1	0.00	22.28	22.63	-1.0	223.7	231.4	0.2	29.5	30.6	4.9	35.9	0.3
7/10/2013 11:37	4.30	52.1	0.5	Run 1	0.00	22.28	22.63	-1.0	223.7	231.4	0.2	29.5	30.6	4.4	54.7	0.3
7/10/2013 11:38	3.90	61.7	0.5	Run 1	0.00	22.28	22.63	-1.0	223.7	231.4	0.2	29.5	30.6	4.0	64.6	0.3
7/10/2013 11:39	3.70	73.4	0.5	Run 1	0.00	22.28	22.63	-1.0	223.7	231.4	0.2	29.5	30.6	3.8	76.6	0.3
7/10/2013 11:40	3.45	80.0	0.5	Run 1	0.00	22.28	22.63	-1.0	223.7	231.4	0.2	29.5	30.6	3.5	83.4	0.3
7/10/2013 11:41	2.65	136.9	0.4	Run 1	0.00	22.28	22.63	-1.0	223.7	231.4	0.2	29.5	30.6	2.7	142.0	0.2
7/10/2013 11:42	2.25	181.0	0.4	Run 1	0.00	22.28	22.63	-1.0	223.7	231.4	0.2	29.5	30.6	2.3	187.5	0.2
7/10/2013 11:43	2.00	196.3	0.4	Run 1	0.00	22.28	22.63	-1.0	223.7	231.4	0.2	29.5	30.6	2.0	203.2	0.2
7/10/2013 11:44	1.85	209.0	0.4	Run 1	0.00	22.28	22.63	-1.0	223.7	231.4	0.2	29.5	30.6	1.9	216.2	0.2
7/10/2013 11:45	1.80	216.1	0.4	Run 1	0.00	22.28	22.63	-1.0	223.7	231.4	0.2	29.5	30.6	1.8	223.6	0.2
7/10/2013 11:46	2.25	220.1	0.4	Run 1	0.00	22.28	22.63	-1.0	223.7	231.4	0.2	29.5	30.6	2.3	227.7	0.2
7/10/2013 11:47	2.30	197.3	0.4	Run 1	0.00	22.28	22.63	-1.0	223.7	231.4	0.2	29.5	30.6	2.3	204.2	0.2
7/10/2013 11:48	2.30	198.8	0.4	Run 1	0.00	22.28	22.63	-1.0	223.7	231.4	0.2	29.5	30.6	2.3	205.8	0.2
7/10/2013 11:49	2.05	124.2	0.3	Run 1	0.00	22.28	22.63	-1.0	223.7	231.4	0.2	29.5	30.6	2.1	128.9	0.1
7/10/2013 11:50	1.00	114.5	0.3	Run 1	0.00	22.28	22.63	-1.0	223.7	231.4	0.2	29.5	30.6	1.0	119.0	0.1
7/10/2013 11:51	1.05	188.2	0.3	Run 1	0.00	22.28	22.63	-1.0	223.7	231.4	0.2	29.5	30.6	1.1	194.8	0.1
7/10/2013 11:52	1.65	252.6	0.3	Run 1	0.00	22.28	22.63	-1.0	223.7	231.4	0.2	29.5	30.6	1.7	261.2	0.1
7/10/2013 11:53	1.85	226.2	0.3	Run 1	0.00	22.28	22.63	-1.0	223.7	231.4	0.2	29.5	30.6	1.9	234.0	0.1
7/10/2013 11:54	1.45	228.8	0.3	Run 1	0.00	22.28	22.63	-1.0	223.7	231.4	0.2	29.5	30.6	1.5	236.6	0.1
7/10/2013 11:55	1.65	277.5	0.3	Run 1	0.00	22.28	22.63	-1.0	223.7	231.4	0.2	29.5	30.6	1.7	286.8	0.1

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TimeStamp (CDT)	NO_x, ppm	CO, ppm	SO_2, ppm	COMMENTS	Co, NO_x	Cm, NO_x	Cma, NO_x	Co, CO	Cm, CO	Cma, CO	Co, SO_2	Cm, SO_2	Cma, SO_2	NO_x, ppm	CO, ppm	SO_2, ppm
7/10/2013 11:56	1.75	239.9	0.3	Run 1	0.00	22.28	22.63	-1.0	223.7	231.4	0.2	29.5	30.6	1.8	248.1	0.1
7/10/2013 11:57	1.95	252.6	0.3	Run 1	0.00	22.28	22.63	-1.0	223.7	231.4	0.2	29.5	30.6	2.0	261.2	0.1
7/10/2013 11:58	1.85	242.5	0.3	Run 1	0.00	22.28	22.63	-1.0	223.7	231.4	0.2	29.5	30.6	1.9	250.7	0.1
7/10/2013 11:59	1.35	186.1	0.3	Run 1	0.00	22.28	22.63	-1.0	223.7	231.4	0.2	29.5	30.6	1.4	192.7	0.1
7/10/2013 12:00	1.05	151.1	0.3	Run 1	0.00	22.28	22.63	-1.0	223.7	231.4	0.2	29.5	30.6	1.1	156.6	0.1
7/10/2013 12:01	0.90	148.6	0.3	Run 1	0.00	22.28	22.63	-1.0	223.7	231.4	0.2	29.5	30.6	0.9	154.0	0.1
7/10/2013 12:02	1.20	156.2	0.3	Run 1	0.00	22.28	22.63	-1.0	223.7	231.4	0.2	29.5	30.6	1.2	161.9	0.1
7/10/2013 12:03	5.60	94.7	0.3	Run 1	0.00	22.28	22.63	-1.0	223.7	231.4	0.2	29.5	30.6	5.7	98.6	0.1
7/10/2013 12:04	8.35	35.3	0.3	Run 1	0.00	22.28	22.63	-1.0	223.7	231.4	0.2	29.5	30.6	8.5	37.4	0.1
7/10/2013 12:05	9.40	13.5	0.4	Run 1	0.00	22.28	22.63	-1.0	223.7	231.4	0.2	29.5	30.6	9.5	14.9	0.2
7/10/2013 12:06	8.55	23.2	0.5	Run 1	0.00	22.28	22.63	-1.0	223.7	231.4	0.2	29.5	30.6	8.7	24.9	0.3
7/10/2013 12:07	9.60	12.5	0.6	Run 1	0.00	22.28	22.63	-1.0	223.7	231.4	0.2	29.5	30.6	9.8	13.9	0.4
7/10/2013 12:08	11.35	3.4	0.7	Run 1	0.00	22.28	22.63	-1.0	223.7	231.4	0.2	29.5	30.6	11.5	4.5	0.5
7/10/2013 12:09	9.50	24.2	0.8	Run 1	0.00	22.28	22.63	-1.0	223.7	231.4	0.2	29.5	30.6	9.6	25.9	0.7
7/10/2013 12:10	4.05	77.0	1.1	Run 1	0.00	22.28	22.63	-1.0	223.7	231.4	0.2	29.5	30.6	4.1	80.3	0.9
7/10/2013 12:11	1.70	125.2	1.4	Run 1	0.00	22.28	22.63	-1.0	223.7	231.4	0.2	29.5	30.6	1.7	130.0	1.3
7/10/2013 12:12	0.90	133.3	1.6	Run 1	0.00	22.28	22.63	-1.0	223.7	231.4	0.2	29.5	30.6	0.9	138.3	1.5
7/10/2013 12:13	0.85	88.6	1.7	Run 1	0.00	22.28	22.63	-1.0	223.7	231.4	0.2	29.5	30.6	0.9	92.3	1.5
7/10/2013 12:14	1.10	35.3	1.5	Run 1	0.00	22.28	22.63	-1.0	223.7	231.4	0.2	29.5	30.6	1.1	37.4	1.4
7/10/2013 12:15	2.20	15.0	1.3	Run 1	0.00	22.28	22.63	-1.0	223.7	231.4	0.2	29.5	30.6	2.2	16.5	1.1
7/10/2013 12:16	3.55	5.9	1.1	Run 1	0.00	22.28	22.63	-1.0	223.7	231.4	0.2	29.5	30.6	3.6	7.1	0.9
7/10/2013 12:17	4.80	2.8	1.0	Run 1	0.00	22.28	22.63	-1.0	223.7	231.4	0.2	29.5	30.6	4.9	4.0	0.8
	3.59	**81.8**	**1.2**	**Run 1 Average**										**3.6**	**85.3**	**1.0**
7/10/2013 12:18	5.10	1.8	0.9													
7/10/2013 12:19	4.45	3.4	0.8													
7/10/2013 12:20	4.45	2.8	0.8													
7/10/2013 12:21	5.00	1.8	0.8													
7/10/2013 12:22	6.60	1.8	0.8													
7/10/2013 12:23	10.25	1.8	0.8													
7/10/2013 12:24	8.00	1.8	0.7													

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	Raw Data				Drift Corrected Data									Corrected Data		
TimeStamp (CDT)	NO_x, ppm	CO, ppm	SO_2, ppm	COMMENTS	Co, NO_x	Cm, NO_x	Cma, NO_x	Co, CO	Cm, CO	Cma, CO	Co, SO_2	Cm, SO_2	Cma, SO_2	NO_x, ppm	CO, ppm	SO_2, ppm
7/10/2013 12:25	5.60	17.6	1.3													
7/10/2013 12:26	4.20	32.8	1.6													
7/10/2013 12:27	1.90	18.6	1.1													
7/10/2013 12:28	1.00	9.4	1.0													
7/10/2013 12:29	1.05	3.9	0.9													
7/10/2013 12:30	1.85	17.1	1.0													
7/10/2013 12:31	4.00	100.3	1.3													
7/10/2013 12:32	4.85	161.8	1.6													
7/10/2013 12:33	5.25	142.5	2.1													
7/10/2013 12:34	5.35	82.6	6.8													
7/10/2013 12:35	2.00	13.0	17.1													
7/10/2013 12:36	0.75	-0.2	23.7													
7/10/2013 12:37	0.55	-1.2	26.7													
7/10/2013 12:38	0.55	-1.2	28.1													
7/10/2013 12:39	0.50	-1.2	28.9													
7/10/2013 12:40	0.50	-1.2	29.3													
7/10/2013 12:41	0.50	-1.2	29.6													
7/10/2013 12:42	0.45	-1.2	29.8	30.2 SO2 (Bias)												
			29.8	**Average 30.2 SO2 (Bias)**												
7/10/2013 12:43	1.05	-1.2	28.1													
7/10/2013 12:44	12.40	-1.2	19.8													
7/10/2013 12:45	21.10	-1.2	9.0													
7/10/2013 12:46	22.35	-1.2	5.1													
7/10/2013 12:47	22.50	-1.2	3.6													
7/10/2013 12:48	22.55	-1.2	2.8	22.63 Nox, Zero CO (Bias)												
	22.55	**-1.2**		**Average 22.63 Nox, Zero CO (Bias)**												
7/10/2013 12:49	21.00	65.8	1.9													
7/10/2013 12:50	6.55	200.8	1.2													
7/10/2013 12:51	0.65	222.7	0.9													
7/10/2013 12:52	0.10	224.2	0.5													

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TimeStamp (CDT)	NO_x, ppm	CO, ppm	SO_2, ppm	COMMENTS	Co, NO_x	Cm, NO_x	Cma, NO_x	Co, CO	Cm, CO	Cma, CO	Co, SO_2	Cm, SO_2	Cma, SO_2	NO_x, ppm	CO, ppm	SO_2, ppm
7/10/2013 12:53	0.05	224.2	0.3	Zero Nox, 231.4 CO, Zero SO2 (Bias)												
	0.05	**224.2**	**0.3**	**Average Zero Nox, 231.4 CO, Zero SO2 (Bias)**												
7/10/2013 12:54	0.05	206.4	0.9													
7/10/2013 12:55	2.00	85.6	1.4													
7/10/2013 12:56	4.25	32.8	1.5													
7/10/2013 12:57	4.55	50.6	1.4													
7/10/2013 12:58	3.75	68.3	1.2													
7/10/2013 12:59	2.80	89.2	1.1													
7/10/2013 13:00	2.35	160.7	1.1													
7/10/2013 13:01	2.45	205.9	1.0													
7/10/2013 13:02	1.95	194.8	0.9													
7/10/2013 13:03	1.75	132.3	0.9													
7/10/2013 13:04	2.15	160.7	0.9													
7/10/2013 13:05	2.45	219.1	0.9													
7/10/2013 13:06	2.25	212.0	0.8													
7/10/2013 13:07	1.80	245.0	0.8													
7/10/2013 13:08	1.80	254.7	0.8													
7/10/2013 13:09	2.05	249.6	0.8													
7/10/2013 13:10	2.55	235.4	0.8													
7/10/2013 13:11	1.80	237.4	0.8													
7/10/2013 13:12	1.60	269.9	0.8													
7/10/2013 13:13	1.45	272.4	0.8													
7/10/2013 13:14	1.40	229.3	0.8													
7/10/2013 13:15	1.10	168.4	0.8													
7/10/2013 13:16	0.85	138.4	0.8													
7/10/2013 13:17	0.70	121.6	0.8													
7/10/2013 13:18	0.55	101.3	0.8													
7/10/2013 13:19	0.75	98.3	0.9													
7/10/2013 13:20	1.80	109.0	1.0													
7/10/2013 13:21	1.95	128.8	1.1													

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TimeStamp (CDT)	NO_x, ppm	CO, ppm	SO_2, ppm	COMMENTS	Co, NO_x	Cm, NO_x	Cma, NO_x	Co, CO	Cm, CO	Cma, CO	Co, SO_2	Cm, SO_2	Cma, SO_2	NO_x, ppm	CO, ppm	SO_2, ppm
7/10/2013 13:22	2.55	80.0	1.2													
7/10/2013 13:23	6.80	25.2	1.3													
7/10/2013 13:24	12.40	6.9	1.6													
7/10/2013 13:25	12.25	3.9	1.7													
7/10/2013 13:26	7.75	2.8	1.6													
7/10/2013 13:27	6.55	2.3	1.4													
7/10/2013 13:28	6.80	2.8	1.3													
7/10/2013 13:29	6.20	3.4	1.2	Run 2	0.05	22.30	22.63	-1.2	224.0	231.4	0.7	30.0	30.6	6.3	4.7	0.5
7/10/2013 13:30	5.80	2.3	1.2	Run 2	0.05	22.30	22.63	-1.2	224.0	231.4	0.7	30.0	30.6	5.8	3.6	0.5
7/10/2013 13:31	5.85	2.8	1.3	Run 2	0.05	22.30	22.63	-1.2	224.0	231.4	0.7	30.0	30.6	5.9	4.2	0.6
7/10/2013 13:32	6.65	1.8	1.4	Run 2	0.05	22.30	22.63	-1.2	224.0	231.4	0.7	30.0	30.6	6.7	3.1	0.7
7/10/2013 13:33	12.25	1.8	1.8	Run 2	0.05	22.30	22.63	-1.2	224.0	231.4	0.7	30.0	30.6	12.4	3.1	1.1
7/10/2013 13:34	13.05	1.8	2.5	Run 2	0.05	22.30	22.63	-1.2	224.0	231.4	0.7	30.0	30.6	13.2	3.1	1.8
7/10/2013 13:35	8.75	6.4	3.2	Run 2	0.05	22.30	22.63	-1.2	224.0	231.4	0.7	30.0	30.6	8.8	7.8	2.6
7/10/2013 13:36	5.85	19.1	4.0	Run 2	0.05	22.30	22.63	-1.2	224.0	231.4	0.7	30.0	30.6	5.9	20.8	3.4
7/10/2013 13:37	4.70	14.0	4.5	Run 2	0.05	22.30	22.63	-1.2	224.0	231.4	0.7	30.0	30.6	4.7	15.6	3.9
7/10/2013 13:38	5.80	10.0	4.6	Run 2	0.05	22.30	22.63	-1.2	224.0	231.4	0.7	30.0	30.6	5.8	11.5	4.0
7/10/2013 13:39	6.20	24.2	4.6	Run 2	0.05	22.30	22.63	-1.2	224.0	231.4	0.7	30.0	30.6	6.3	26.1	4.0
7/10/2013 13:40	5.85	36.4	4.7	Run 2	0.05	22.30	22.63	-1.2	224.0	231.4	0.7	30.0	30.6	5.9	38.6	4.2
7/10/2013 13:41	7.05	25.2	4.9	Run 2	0.05	22.30	22.63	-1.2	224.0	231.4	0.7	30.0	30.6	7.1	27.1	4.4
7/10/2013 13:42	8.45	27.7	5.1	Run 2	0.05	22.30	22.63	-1.2	224.0	231.4	0.7	30.0	30.6	8.5	29.7	4.5
7/10/2013 13:43	8.10	52.1	5.0	Run 2	0.05	22.30	22.63	-1.2	224.0	231.4	0.7	30.0	30.6	8.2	54.8	4.5
7/10/2013 13:44	7.45	66.3	4.7	Run 2	0.05	22.30	22.63	-1.2	224.0	231.4	0.7	30.0	30.6	7.5	69.4	4.2
7/10/2013 13:45	6.90	28.7	4.5	Run 2	0.05	22.30	22.63	-1.2	224.0	231.4	0.7	30.0	30.6	7.0	30.8	3.9
7/10/2013 13:46	6.40	22.1	4.3	Run 2	0.05	22.30	22.63	-1.2	224.0	231.4	0.7	30.0	30.6	6.5	24.0	3.7
7/10/2013 13:47	6.35	26.2	4.3	Run 2	0.05	22.30	22.63	-1.2	224.0	231.4	0.7	30.0	30.6	6.4	28.2	3.7
7/10/2013 13:48	4.35	31.3	4.4	Run 2	0.05	22.30	22.63	-1.2	224.0	231.4	0.7	30.0	30.6	4.4	33.4	3.8
7/10/2013 13:49	3.80	43.5	4.3	Run 2	0.05	22.30	22.63	-1.2	224.0	231.4	0.7	30.0	30.6	3.8	45.9	3.7
7/10/2013 13:50	3.70	59.7	4.1	Run 2	0.05	22.30	22.63	-1.2	224.0	231.4	0.7	30.0	30.6	3.7	62.6	3.5
7/10/2013 13:51	3.40	72.9	3.8	Run 2	0.05	22.30	22.63	-1.2	224.0	231.4	0.7	30.0	30.6	3.4	76.1	3.3

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TimeStamp (CDT)	NO_x, ppm	CO, ppm	SO_2, ppm	COMMENTS	Co, NO_x	Cm, NO_x	Cma, NO_x	Co, CO	Cm, CO	Cma, CO	Co, SO_2	Cm, SO_2	Cma, SO_2	NO_x, ppm	CO, ppm	SO_2, ppm
7/10/2013 13:52	3.25	59.2	3.5	Run 2	0.05	22.30	22.63	-1.2	224.0	231.4	0.7	30.0	30.6	3.3	62.1	2.9
7/10/2013 13:53	3.60	26.2	3.3	Run 2	0.05	22.30	22.63	-1.2	224.0	231.4	0.7	30.0	30.6	3.6	28.2	2.7
7/10/2013 13:54	5.60	11.5	3.2	Run 2	0.05	22.30	22.63	-1.2	224.0	231.4	0.7	30.0	30.6	5.6	13.0	2.6
7/10/2013 13:55	5.25	17.1	3.2	Run 2	0.05	22.30	22.63	-1.2	224.0	231.4	0.7	30.0	30.6	5.3	18.8	2.6
7/10/2013 13:56	3.75	43.0	2.9	Run 2	0.05	22.30	22.63	-1.2	224.0	231.4	0.7	30.0	30.6	3.8	45.4	2.3
7/10/2013 13:57	5.30	66.3	2.6	Run 2	0.05	22.30	22.63	-1.2	224.0	231.4	0.7	30.0	30.6	5.3	69.4	2.0
7/10/2013 13:58	7.95	16.0	2.5	Run 2	0.05	22.30	22.63	-1.2	224.0	231.4	0.7	30.0	30.6	8.0	17.7	1.8
7/10/2013 13:59	8.10	6.4	2.3	Run 2	0.05	22.30	22.63	-1.2	224.0	231.4	0.7	30.0	30.6	8.2	7.8	1.6
7/10/2013 14:00	7.35	4.9	2.1	Run 2	0.05	22.30	22.63	-1.2	224.0	231.4	0.7	30.0	30.6	7.4	6.2	1.4
7/10/2013 14:01	7.25	4.4	1.9	Run 2	0.05	22.30	22.63	-1.2	224.0	231.4	0.7	30.0	30.6	7.3	5.7	1.3
7/10/2013 14:02	7.75	5.9	1.8	Run 2	0.05	22.30	22.63	-1.2	224.0	231.4	0.7	30.0	30.6	7.8	7.3	1.2
7/10/2013 14:03	7.15	7.4	1.7	Run 2	0.05	22.30	22.63	-1.2	224.0	231.4	0.7	30.0	30.6	7.2	8.9	1.0
7/10/2013 14:04	6.30	11.0	1.5	Run 2	0.05	22.30	22.63	-1.2	224.0	231.4	0.7	30.0	30.6	6.4	12.5	0.9
7/10/2013 14:05	5.80	17.1	1.4	Run 2	0.05	22.30	22.63	-1.2	224.0	231.4	0.7	30.0	30.6	5.8	18.8	0.7
7/10/2013 14:06	5.50	29.2	1.3	Run 2	0.05	22.30	22.63	-1.2	224.0	231.4	0.7	30.0	30.6	5.5	31.3	0.6
7/10/2013 14:07	5.20	36.9	1.2	Run 2	0.05	22.30	22.63	-1.2	224.0	231.4	0.7	30.0	30.6	5.2	39.1	0.5
7/10/2013 14:08	5.25	51.6	1.2	Run 2	0.05	22.30	22.63	-1.2	224.0	231.4	0.7	30.0	30.6	5.3	54.2	0.5
7/10/2013 14:09	4.65	50.1	1.1	Run 2	0.05	22.30	22.63	-1.2	224.0	231.4	0.7	30.0	30.6	4.7	52.7	0.4
7/10/2013 14:10	4.25	63.3	1.1	Run 2	0.05	22.30	22.63	-1.2	224.0	231.4	0.7	30.0	30.6	4.3	66.2	0.4
7/10/2013 14:11	3.15	87.1	1.1	Run 2	0.05	22.30	22.63	-1.2	224.0	231.4	0.7	30.0	30.6	3.2	90.8	0.4
7/10/2013 14:12	2.75	109.0	1.2	Run 2	0.05	22.30	22.63	-1.2	224.0	231.4	0.7	30.0	30.6	2.7	113.2	0.5
7/10/2013 14:13	2.60	102.9	1.2	Run 2	0.05	22.30	22.63	-1.2	224.0	231.4	0.7	30.0	30.6	2.6	106.9	0.5
7/10/2013 14:14	2.55	90.2	1.2	Run 2	0.05	22.30	22.63	-1.2	224.0	231.4	0.7	30.0	30.6	2.5	93.9	0.5
7/10/2013 14:15	2.85	188.2	1.2	Run 2	0.05	22.30	22.63	-1.2	224.0	231.4	0.7	30.0	30.6	2.8	194.6	0.5
7/10/2013 14:16	3.20	228.3	1.1	Run 2	0.05	22.30	22.63	-1.2	224.0	231.4	0.7	30.0	30.6	3.2	235.8	0.4
7/10/2013 14:17	2.00	214.6	1.1	Run 2	0.05	22.30	22.63	-1.2	224.0	231.4	0.7	30.0	30.6	2.0	221.7	0.4
7/10/2013 14:18	1.65	213.0	1.0	Run 2	0.05	22.30	22.63	-1.2	224.0	231.4	0.7	30.0	30.6	1.6	220.1	0.3
7/10/2013 14:19	1.85	224.7	0.9	Run 2	0.05	22.30	22.63	-1.2	224.0	231.4	0.7	30.0	30.6	1.8	232.1	0.2
7/10/2013 14:20	1.55	213.5	0.8	Run 2	0.05	22.30	22.63	-1.2	224.0	231.4	0.7	30.0	30.6	1.5	220.7	0.1
7/10/2013 14:21	1.80	223.2	0.7	Run 2	0.05	22.30	22.63	-1.2	224.0	231.4	0.7	30.0	30.6	1.8	230.6	0.0

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TimeStamp (CDT)	NO_x, ppm	CO, ppm	SO_2, ppm	COMMENTS	Co, NO_x	Cm, NO_x	Cma, NO_x	Co, CO	Cm, CO	Cma, CO	Co, SO_2	Cm, SO_2	Cma, SO_2	NO_x, ppm	CO, ppm	SO_2, ppm
7/10/2013 14:22	2.05	232.3	0.7	Run 2	0.05	22.30	22.63	-1.2	224.0	231.4	0.7	30.0	30.6	2.0	240.0	-0.1
7/10/2013 14:23	2.00	228.3	0.7	Run 2	0.05	22.30	22.63	-1.2	224.0	231.4	0.7	30.0	30.6	2.0	235.8	-0.1
7/10/2013 14:24	2.20	185.1	0.6	Run 2	0.05	22.30	22.63	-1.2	224.0	231.4	0.7	30.0	30.6	2.2	191.4	-0.1
7/10/2013 14:25	2.10	138.9	0.6	Run 2	0.05	22.30	22.63	-1.2	224.0	231.4	0.7	30.0	30.6	2.1	144.0	-0.1
7/10/2013 14:26	1.25	145.0	0.6	Run 2	0.05	22.30	22.63	-1.2	224.0	231.4	0.7	30.0	30.6	1.2	150.2	-0.1
7/10/2013 14:27	1.05	152.6	0.6	Run 2	0.05	22.30	22.63	-1.2	224.0	231.4	0.7	30.0	30.6	1.0	158.1	-0.1
7/10/2013 14:28	1.05	157.2	0.6	Run 2	0.05	22.30	22.63	-1.2	224.0	231.4	0.7	30.0	30.6	1.0	162.7	-0.1
7/10/2013 14:29	0.95	128.8	0.6	Run 2	0.05	22.30	22.63	-1.2	224.0	231.4	0.7	30.0	30.6	0.9	133.5	-0.2
7/10/2013 14:30	0.80	104.4	0.6	Run 2	0.05	22.30	22.63	-1.2	224.0	231.4	0.7	30.0	30.6	0.8	108.5	-0.2
7/10/2013 14:31	0.70	91.2	0.5	Run 2	0.05	22.30	22.63	-1.2	224.0	231.4	0.7	30.0	30.6	0.7	94.9	-0.2
7/10/2013 14:32	0.90	89.2	0.5	Run 2	0.05	22.30	22.63	-1.2	224.0	231.4	0.7	30.0	30.6	0.9	92.8	-0.2
7/10/2013 14:33	1.75	86.6	0.5	Run 2	0.05	22.30	22.63	-1.2	224.0	231.4	0.7	30.0	30.6	1.7	90.2	-0.2
7/10/2013 14:34	2.25	82.6	0.6	Run 2	0.05	22.30	22.63	-1.2	224.0	231.4	0.7	30.0	30.6	2.2	86.1	-0.2
7/10/2013 14:35	1.35	58.2	0.6	Run 2	0.05	22.30	22.63	-1.2	224.0	231.4	0.7	30.0	30.6	1.3	61.0	-0.2
7/10/2013 14:36	0.80	34.8	0.5	Run 2	0.05	22.30	22.63	-1.2	224.0	231.4	0.7	30.0	30.6	0.8	37.0	-0.2
7/10/2013 14:37	0.55	26.2	0.5	Run 2	0.05	22.30	22.63	-1.2	224.0	231.4	0.7	30.0	30.6	0.5	28.2	-0.2
7/10/2013 14:38	0.60	23.2	0.5	Run 2	0.05	22.30	22.63	-1.2	224.0	231.4	0.7	30.0	30.6	0.6	25.0	-0.2
7/10/2013 14:39	0.65	22.1	0.5	Run 2	0.05	22.30	22.63	-1.2	224.0	231.4	0.7	30.0	30.6	0.6	24.0	-0.2
7/10/2013 14:40	1.50	17.6	0.5	Run 2	0.05	22.30	22.63	-1.2	224.0	231.4	0.7	30.0	30.6	1.5	19.3	-0.2
7/10/2013 14:41	9.00	7.9	0.6	Run 2	0.05	22.30	22.63	-1.2	224.0	231.4	0.7	30.0	30.6	9.1	9.4	-0.1
7/10/2013 14:42	11.55	6.4	0.9	Run 2	0.05	22.30	22.63	-1.2	224.0	231.4	0.7	30.0	30.6	11.7	7.8	0.2
7/10/2013 14:43	8.80	14.5	1.4	Run 2	0.05	22.30	22.63	-1.2	224.0	231.4	0.7	30.0	30.6	8.9	16.2	0.7
7/10/2013 14:44	5.35	15.5	1.8	Run 2	0.05	22.30	22.63	-1.2	224.0	231.4	0.7	30.0	30.6	5.4	17.2	1.1
7/10/2013 14:45	5.50	7.4	1.9	Run 2	0.05	22.30	22.63	-1.2	224.0	231.4	0.7	30.0	30.6	5.5	8.9	1.3
7/10/2013 14:46	6.35	6.9	2.0	Run 2	0.05	22.30	22.63	-1.2	224.0	231.4	0.7	30.0	30.6	6.4	8.3	1.3
7/10/2013 14:47	6.80	8.9	1.9	Run 2	0.05	22.30	22.63	-1.2	224.0	231.4	0.7	30.0	30.6	6.9	10.4	1.3
7/10/2013 14:48	6.30	9.4	1.9	Run 2	0.05	22.30	22.63	-1.2	224.0	231.4	0.7	30.0	30.6	6.4	10.9	1.3
7/10/2013 14:49	5.60	8.4	1.9	Run 2	0.05	22.30	22.63	-1.2	224.0	231.4	0.7	30.0	30.6	5.6	9.9	1.3
7/10/2013 14:50	5.55	14.0	2.2	Run 2	0.05	22.30	22.63	-1.2	224.0	231.4	0.7	30.0	30.6	5.6	15.6	1.5
7/10/2013 14:51	5.15	22.6	2.9	Run 2	0.05	22.30	22.63	-1.2	224.0	231.4	0.7	30.0	30.6	5.2	24.5	2.2

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	Raw Data				Drift Corrected Data									Corrected Data		
TimeStamp (CDT)	NO_x, ppm	CO, ppm	SO_2, ppm	COMMENTS	Co, NO_x	Cm, NO_x	Cma, NO_x	Co, CO	Cm, CO	Cma, CO	Co, SO_2	Cm, SO_2	Cma, SO_2	NO_x, ppm	CO, ppm	SO_2, ppm
7/10/2013 14:52	3.95	31.8	3.4	Run 2	0.05	22.30	22.63	-1.2	224.0	231.4	0.7	30.0	30.6	4.0	33.9	2.8
7/10/2013 14:53	2.20	45.5	3.7	Run 2	0.05	22.30	22.63	-1.2	224.0	231.4	0.7	30.0	30.6	2.2	48.0	3.1
7/10/2013 14:54	1.45	46.5	3.6	Run 2	0.05	22.30	22.63	-1.2	224.0	231.4	0.7	30.0	30.6	1.4	49.0	3.1
7/10/2013 14:55	1.35	74.4	3.4	Run 2	0.05	22.30	22.63	-1.2	224.0	231.4	0.7	30.0	30.6	1.3	77.7	2.8
7/10/2013 14:56	1.50	77.0	3.0	Run 2	0.05	22.30	22.63	-1.2	224.0	231.4	0.7	30.0	30.6	1.5	80.3	2.3
7/10/2013 14:57	1.85	58.2	2.7	Run 2	0.05	22.30	22.63	-1.2	224.0	231.4	0.7	30.0	30.6	1.8	61.0	2.0
7/10/2013 14:58	1.40	45.5	2.4	Run 2	0.05	22.30	22.63	-1.2	224.0	231.4	0.7	30.0	30.6	1.4	48.0	1.7
7/10/2013 14:59	1.40	48.5	2.2	Run 2	0.05	22.30	22.63	-1.2	224.0	231.4	0.7	30.0	30.6	1.4	51.1	1.6
7/10/2013 15:00	1.25	53.1	2.0	Run 2	0.05	22.30	22.63	-1.2	224.0	231.4	0.7	30.0	30.6	1.2	55.8	1.4
7/10/2013 15:01	1.10	45.0	1.9	Run 2	0.05	22.30	22.63	-1.2	224.0	231.4	0.7	30.0	30.6	1.1	47.5	1.3
7/10/2013 15:02	1.45	28.2	1.8	Run 2	0.05	22.30	22.63	-1.2	224.0	231.4	0.7	30.0	30.6	1.4	30.2	1.2
7/10/2013 15:03	1.80	10.5	1.7	Run 2	0.05	22.30	22.63	-1.2	224.0	231.4	0.7	30.0	30.6	1.8	12.0	1.0
7/10/2013 15:04	3.15	3.9	1.6	Run 2	0.05	22.30	22.63	-1.2	224.0	231.4	0.7	30.0	30.6	3.2	5.2	0.9
7/10/2013 15:05	5.15	1.8	1.5	Run 2	0.05	22.30	22.63	-1.2	224.0	231.4	0.7	30.0	30.6	5.2	3.1	0.8
7/10/2013 15:06	5.95	1.3	1.4	Run 2	0.05	22.30	22.63	-1.2	224.0	231.4	0.7	30.0	30.6	6.0	2.6	0.7
7/10/2013 15:07	5.90	0.8	1.3	Run 2	0.05	22.30	22.63	-1.2	224.0	231.4	0.7	30.0	30.6	5.9	2.1	0.6
7/10/2013 15:08	6.45	0.8	1.2	Run 2	0.05	22.30	22.63	-1.2	224.0	231.4	0.7	30.0	30.6	6.5	2.1	0.5
7/10/2013 15:09	7.00	0.8	1.1	Run 2	0.05	22.30	22.63	-1.2	224.0	231.4	0.7	30.0	30.6	7.1	2.1	0.4
7/10/2013 15:10	5.80	7.4	1.1	Run 2	0.05	22.30	22.63	-1.2	224.0	231.4	0.7	30.0	30.6	5.8	8.9	0.4
7/10/2013 15:11	3.75	67.8	1.1	Run 2	0.05	22.30	22.63	-1.2	224.0	231.4	0.7	30.0	30.6	3.8	70.9	0.4
7/10/2013 15:12	4.90	53.1	1.3	Run 2	0.05	22.30	22.63	-1.2	224.0	231.4	0.7	30.0	30.6	4.9	55.8	0.6
7/10/2013 15:13	7.30	14.5	1.4	Run 2	0.05	22.30	22.63	-1.2	224.0	231.4	0.7	30.0	30.6	7.4	16.2	0.7
7/10/2013 15:14	7.95	7.4	1.5	Run 2	0.05	22.30	22.63	-1.2	224.0	231.4	0.7	30.0	30.6	8.0	8.9	0.8
7/10/2013 15:15	8.00	7.4	1.6	Run 2	0.05	22.30	22.63	-1.2	224.0	231.4	0.7	30.0	30.6	8.1	8.9	0.9
7/10/2013 15:16	7.65	6.9	1.6	Run 2	0.05	22.30	22.63	-1.2	224.0	231.4	0.7	30.0	30.6	7.7	8.3	1.0
7/10/2013 15:17	6.35	6.4	1.6	Run 2	0.05	22.30	22.63	-1.2	224.0	231.4	0.7	30.0	30.6	6.4	7.8	1.0
7/10/2013 15:18	5.70	6.9	1.6	Run 2	0.05	22.30	22.63	-1.2	224.0	231.4	0.7	30.0	30.6	5.7	8.3	1.0
7/10/2013 15:19	5.55	10.5	1.7	Run 2	0.05	22.30	22.63	-1.2	224.0	231.4	0.7	30.0	30.6	5.6	12.0	1.0
7/10/2013 15:20	5.00	16.0	1.8	Run 2	0.05	22.30	22.63	-1.2	224.0	231.4	0.7	30.0	30.6	5.0	17.7	1.1
7/10/2013 15:21	4.05	19.6	1.8	Run 2	0.05	22.30	22.63	-1.2	224.0	231.4	0.7	30.0	30.6	4.1	21.4	1.1

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	Raw Data				Drift Corrected Data									Corrected Data		
TimeStamp (CDT)	NO_x, ppm	CO, ppm	SO_2, ppm	COMMENTS	Co, NO_x	Cm, NO_x	Cma, NO_x	Co, CO	Cm, CO	Cma, CO	Co, SO_2	Cm, SO_2	Cma, SO_2	NO_x, ppm	CO, ppm	SO_2, ppm
7/10/2013 15:22	3.05	44.0	1.8	Run 2	0.05	22.30	22.63	-1.2	224.0	231.4	0.7	30.0	30.6	3.1	46.4	1.1
7/10/2013 15:23	2.65	96.3	1.7	Run 2	0.05	22.30	22.63	-1.2	224.0	231.4	0.7	30.0	30.6	2.6	100.1	1.0
7/10/2013 15:24	2.60	145.0	1.5	Run 2	0.05	22.30	22.63	-1.2	224.0	231.4	0.7	30.0	30.6	2.6	150.2	0.8
7/10/2013 15:25	2.45	195.3	1.3	Run 2	0.05	22.30	22.63	-1.2	224.0	231.4	0.7	30.0	30.6	2.4	201.9	0.7
7/10/2013 15:26	2.35	259.7	1.2	Run 2	0.05	22.30	22.63	-1.2	224.0	231.4	0.7	30.0	30.6	2.3	268.1	0.5
7/10/2013 15:27	2.75	290.7	1.1	Run 2	0.05	22.30	22.63	-1.2	224.0	231.4	0.7	30.0	30.6	2.7	299.9	0.4
7/10/2013 15:28	2.95	301.4	1.0	Run 2	0.05	22.30	22.63	-1.2	224.0	231.4	0.7	30.0	30.6	2.9	310.9	0.3
7/10/2013 15:29	2.65	261.8	1.0	Run 2	0.05	22.30	22.63	-1.2	224.0	231.4	0.7	30.0	30.6	2.6	270.2	0.3
7/10/2013 15:30	2.35	159.2	0.9	Run 2	0.05	22.30	22.63	-1.2	224.0	231.4	0.7	30.0	30.6	2.3	164.8	0.2
7/10/2013 15:31	1.90	92.2	0.8	Run 2	0.05	22.30	22.63	-1.2	224.0	231.4	0.7	30.0	30.6	1.9	96.0	0.1
7/10/2013 15:32	1.55	79.5	0.8	Run 2	0.05	22.30	22.63	-1.2	224.0	231.4	0.7	30.0	30.6	1.5	82.9	0.1
7/10/2013 15:33	1.30	68.3	0.7	Run 2	0.05	22.30	22.63	-1.2	224.0	231.4	0.7	30.0	30.6	1.3	71.5	0.0
7/10/2013 15:34	1.15	40.9	0.7	Run 2	0.05	22.30	22.63	-1.2	224.0	231.4	0.7	30.0	30.6	1.1	43.3	0.0
7/10/2013 15:35	1.90	39.9	0.7	Run 2	0.05	22.30	22.63	-1.2	224.0	231.4	0.7	30.0	30.6	1.9	42.2	0.0
7/10/2013 15:36	3.40	26.2	0.8	Run 2	0.05	22.30	22.63	-1.2	224.0	231.4	0.7	30.0	30.6	3.4	28.2	0.1
7/10/2013 15:37	4.75	10.0	0.9	Run 2	0.05	22.30	22.63	-1.2	224.0	231.4	0.7	30.0	30.6	4.8	11.5	0.2
7/10/2013 15:38	5.95	3.9	1.0	Run 2	0.05	22.30	22.63	-1.2	224.0	231.4	0.7	30.0	30.6	6.0	5.2	0.3
7/10/2013 15:39	6.55	1.8	1.1	Run 2	0.05	22.30	22.63	-1.2	224.0	231.4	0.7	30.0	30.6	6.6	3.1	0.4
7/10/2013 15:40	7.50	0.8	1.1	Run 2	0.05	22.30	22.63	-1.2	224.0	231.4	0.7	30.0	30.6	7.6	2.1	0.4
7/10/2013 15:41	9.35	0.3	1.2	Run 2	0.05	22.30	22.63	-1.2	224.0	231.4	0.7	30.0	30.6	9.5	1.5	0.5
7/10/2013 15:42	11.90	0.3	1.3	Run 2	0.05	22.30	22.63	-1.2	224.0	231.4	0.7	30.0	30.6	12.1	1.5	0.6
7/10/2013 15:43	9.70	18.1	1.4	Run 2	0.05	22.30	22.63	-1.2	224.0	231.4	0.7	30.0	30.6	9.8	19.8	0.7
7/10/2013 15:44	3.60	57.7	1.4	Run 2	0.05	22.30	22.63	-1.2	224.0	231.4	0.7	30.0	30.6	3.6	60.5	0.8
7/10/2013 15:45	1.00	53.1	1.4	Run 2	0.05	22.30	22.63	-1.2	224.0	231.4	0.7	30.0	30.6	1.0	55.8	0.7
7/10/2013 15:46	0.55	49.0	1.3	Run 2	0.05	22.30	22.63	-1.2	224.0	231.4	0.7	30.0	30.6	0.5	51.6	0.6
7/10/2013 15:47	0.55	105.4	1.2	Run 2	0.05	22.30	22.63	-1.2	224.0	231.4	0.7	30.0	30.6	0.5	109.5	0.5
7/10/2013 15:48	1.95	249.6	1.1	Run 2	0.05	22.30	22.63	-1.2	224.0	231.4	0.7	30.0	30.6	1.9	257.7	0.4
7/10/2013 15:49	2.80	264.3	1.0	Run 2	0.05	22.30	22.63	-1.2	224.0	231.4	0.7	30.0	30.6	2.8	272.8	0.3
7/10/2013 15:50	1.70	232.8	0.9	Run 2	0.05	22.30	22.63	-1.2	224.0	231.4	0.7	30.0	30.6	1.7	240.5	0.2
7/10/2013 15:51	1.30	223.7	0.8	Run 2	0.05	22.30	22.63	-1.2	224.0	231.4	0.7	30.0	30.6	1.3	231.1	0.1

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TimeStamp (CDT)	NO_x, ppm	CO, ppm	SO_2, ppm	COMMENTS	Co, NO_x	Cm, NO_x	Cma, NO_x	Co, CO	Cm, CO	Cma, CO	Co, SO_2	Cm, SO_2	Cma, SO_2	NO_x, ppm	CO, ppm	SO_2, ppm
7/10/2013 15:52	1.20	288.2	0.8	Run 2	0.05	22.30	22.63	-1.2	224.0	231.4	0.7	30.0	30.6	1.2	297.3	0.1
7/10/2013 15:53	1.85	303.9	0.7	Run 2	0.05	22.30	22.63	-1.2	224.0	231.4	0.7	30.0	30.6	1.8	313.5	0.0
7/10/2013 15:54	1.45	251.6	0.7	Run 2	0.05	22.30	22.63	-1.2	224.0	231.4	0.7	30.0	30.6	1.4	259.8	0.0
7/10/2013 15:55	1.20	230.8	0.6	Run 2	0.05	22.30	22.63	-1.2	224.0	231.4	0.7	30.0	30.6	1.2	238.4	-0.1
7/10/2013 15:56	1.00	202.9	0.6	Run 2	0.05	22.30	22.63	-1.2	224.0	231.4	0.7	30.0	30.6	1.0	209.7	-0.1
7/10/2013 15:57	0.90	177.0	0.6	Run 2	0.05	22.30	22.63	-1.2	224.0	231.4	0.7	30.0	30.6	0.9	183.1	-0.1
7/10/2013 15:58	0.60	153.6	0.5	Run 2	0.05	22.30	22.63	-1.2	224.0	231.4	0.7	30.0	30.6	0.6	159.1	-0.2
7/10/2013 15:59	1.40	101.8	0.5	Run 2	0.05	22.30	22.63	-1.2	224.0	231.4	0.7	30.0	30.6	1.4	105.9	-0.2
7/10/2013 16:00	3.85	54.6	0.5	Run 2	0.05	22.30	22.63	-1.2	224.0	231.4	0.7	30.0	30.6	3.9	57.4	-0.2
7/10/2013 16:01	2.85	52.6	0.5	Run 2	0.05	22.30	22.63	-1.2	224.0	231.4	0.7	30.0	30.6	2.8	55.3	-0.2
7/10/2013 16:02	1.55	49.0	0.5	Run 2	0.05	22.30	22.63	-1.2	224.0	231.4	0.7	30.0	30.6	1.5	51.6	-0.2
	4.14	**72.5**	**1.7**	**Run 2 Average**										**4.2**	**75.7**	**1.0**
7/10/2013 16:03	1.20	36.4	0.5													
7/10/2013 16:04	1.15	25.7	0.4													
7/10/2013 16:05	1.10	19.6	0.4													
7/10/2013 16:06	1.30	15.0	0.4													
7/10/2013 16:07	8.35	9.4	0.5													
7/10/2013 16:08	12.70	8.9	0.7													
7/10/2013 16:09	10.15	26.7	1.2													
7/10/2013 16:10	6.95	29.2	1.7													
7/10/2013 16:11	5.65	13.0	1.9													
7/10/2013 16:12	6.40	9.4	1.9													
7/10/2013 16:13	6.95	12.0	1.8													
7/10/2013 16:14	7.10	12.0	1.7													
7/10/2013 16:15	7.05	12.5	1.7													
7/10/2013 16:16	6.85	14.0	1.6													
7/10/2013 16:17	6.55	18.1	1.7													
7/10/2013 16:18	5.35	20.1	2.0													
7/10/2013 16:19	3.60	20.1	2.5													
7/10/2013 16:20	1.55	13.5	2.5													

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TimeStamp (CDT)	NO_x, ppm	CO, ppm	SO_2, ppm	COMMENTS	Co, NO_x	Cm, NO_x	Cma, NO_x	Co, CO	Cm, CO	Cma, CO	Co, SO_2	Cm, SO_2	Cma, SO_2	NO_x, ppm	CO, ppm	SO_2, ppm
7/10/2013 16:21	0.50	11.0	2.1													
7/10/2013 16:22	0.45	27.2	2.0													
7/10/2013 16:23	0.50	36.9	1.9													
7/10/2013 16:24	0.45	44.5	1.6													
7/10/2013 16:25	0.40	44.5	1.4													
7/10/2013 16:26	0.60	33.8	1.2													
7/10/2013 16:27	1.35	16.6	1.0													
7/10/2013 16:28	2.95	13.5	0.9													
7/10/2013 16:29	5.15	5.9	1.1													
7/10/2013 16:30	6.65	3.4	1.3													
7/10/2013 16:31	6.65	14.0	3.7													
7/10/2013 16:32	3.15	7.4	12.2													
7/10/2013 16:33	0.95	0.8	20.0													
7/10/2013 16:34	0.45	-1.2	24.6													
7/10/2013 16:35	0.35	-1.2	27.0													
7/10/2013 16:36	0.35	-1.2	28.3													
7/10/2013 16:37	0.35	-1.2	29.0													
7/10/2013 16:38	0.35	-1.2	29.5													
7/10/2013 16:39	0.35	-1.2	29.8													
7/10/2013 16:40	0.35	-1.2	30.1	30.2 SO2 (Bias)												
			30.1	**Average 30.2 SO2 (Bias)**												
7/10/2013 16:41	0.80	-1.2	28.6													
7/10/2013 16:42	10.00	-1.2	21.5													
7/10/2013 16:43	18.90	-1.2	11.7													
7/10/2013 16:44	21.40	-1.2	6.9													
7/10/2013 16:45	21.90	-1.7	4.9													
7/10/2013 16:46	22.05	-1.2	3.7	22.63 Nox, Zero CO (Bias)												
	22.05	**-1.2**		**Average 22.63 Nox, Zero CO (Bias)**												
7/10/2013 16:47	21.50	38.4	2.6													
7/10/2013 16:48	9.80	176.5	1.7													

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TimeStamp (CDT)	**NO_x, ppm**	**CO, ppm**	**SO_2, ppm**	**COMMENTS**	**Co, NO_x**	**Cm, NO_x**	**Cma, NO_x**	**Co, CO**	**Cm, CO**	**Cma, CO**	**Co, SO_2**	**Cm, SO_2**	**Cma, SO_2**	**NO_x, ppm**	**CO, ppm**	**SO_2, ppm**
7/10/2013 16:49	1.65	217.6	1.4													
7/10/2013 16:50	0.25	222.7	1.1													
7/10/2013 16:51	0.05	223.7	1.0	Zero Nox, 231.4 CO, Zero SO2 (Bias)												
	0.05	**223.7**	**1.0**	**Average Zero Nox, 231.4 CO, Zero SO2 (Bias)**												
7/10/2013 16:52	0.00	219.6	0.9													
7/10/2013 16:53	0.25	202.4	1.0													
7/10/2013 16:54	1.55	268.4	1.0													
7/10/2013 16:55	3.50	305.4	0.9													
7/10/2013 16:56	3.30	276.5	0.8													
7/10/2013 16:57	2.10	270.4	0.8													
7/10/2013 16:58	1.45	287.7	0.7													
7/10/2013 16:59	1.10	286.1	0.7													
7/10/2013 17:00	1.30	207.4	0.7													
7/10/2013 17:01	2.25	89.2	0.7													
7/10/2013 17:02	4.85	33.8	0.7													
7/10/2013 17:03	7.25	13.0	0.7													
7/10/2013 17:04	8.30	17.1	0.7													
7/10/2013 17:05	4.45	53.1	0.7													
7/10/2013 17:06	1.35	79.0	0.7													
7/10/2013 17:07	0.65	139.9	0.7													
7/10/2013 17:08	0.65	169.9	0.7													
7/10/2013 17:09	0.65	171.9	0.7													
7/10/2013 17:10	0.70	148.6	0.6													
7/10/2013 17:11	1.20	106.9	0.6													
7/10/2013 17:12	2.00	65.8	0.7													
7/10/2013 17:13	1.20	28.2	0.7													
7/10/2013 17:14	1.55	10.0	0.7													
7/10/2013 17:15	3.20	4.4	0.7													
7/10/2013 17:16	4.40	2.8	0.7													
7/10/2013 17:17	5.95	2.3	0.6													

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	Raw Data				Drift Corrected Data									Corrected Data		
TimeStamp (CDT)	NO_x, ppm	CO, ppm	SO_2, ppm	COMMENTS	Co, NO_x	Cm, NO_x	Cma, NO_x	Co, CO	Cm, CO	Cma, CO	Co, SO_2	Cm, SO_2	Cma, SO_2	NO_x, ppm	CO, ppm	SO_2, ppm
7/10/2013 17:18	5.40	2.3	0.6													
7/10/2013 17:19	4.80	2.3	0.6	Run 3	0.05	22.00	22.63	-1.7	222.7	231.4	0.7	29.8	30.6	4.9	4.2	-0.1
7/10/2013 17:20	5.00	1.8	0.7	Run 3	0.05	22.00	22.63	-1.7	222.7	231.4	0.7	29.8	30.6	5.1	3.6	-0.1
7/10/2013 17:21	5.90	1.3	0.7	Run 3	0.05	22.00	22.63	-1.7	222.7	231.4	0.7	29.8	30.6	6.0	3.1	0.0
7/10/2013 17:22	6.40	1.8	0.8	Run 3	0.05	22.00	22.63	-1.7	222.7	231.4	0.7	29.8	30.6	6.5	3.6	0.1
7/10/2013 17:23	10.35	0.8	0.9	Run 3	0.05	22.00	22.63	-1.7	222.7	231.4	0.7	29.8	30.6	10.6	2.6	0.2
7/10/2013 17:24	11.70	4.9	1.2	Run 3	0.05	22.00	22.63	-1.7	222.7	231.4	0.7	29.8	30.6	12.0	6.8	0.5
7/10/2013 17:25	9.35	19.6	1.9	Run 3	0.05	22.00	22.63	-1.7	222.7	231.4	0.7	29.8	30.6	9.6	22.0	1.2
7/10/2013 17:26	6.00	26.2	2.6	Run 3	0.05	22.00	22.63	-1.7	222.7	231.4	0.7	29.8	30.6	6.1	28.8	1.9
7/10/2013 17:27	5.90	11.5	2.9	Run 3	0.05	22.00	22.63	-1.7	222.7	231.4	0.7	29.8	30.6	6.0	13.6	2.3
7/10/2013 17:28	6.55	6.9	3.0	Run 3	0.05	22.00	22.63	-1.7	222.7	231.4	0.7	29.8	30.6	6.7	8.9	2.4
7/10/2013 17:29	6.95	7.4	3.2	Run 3	0.05	22.00	22.63	-1.7	222.7	231.4	0.7	29.8	30.6	7.1	9.4	2.6
7/10/2013 17:30	6.95	10.0	3.3	Run 3	0.05	22.00	22.63	-1.7	222.7	231.4	0.7	29.8	30.6	7.1	12.0	2.8
7/10/2013 17:31	6.15	11.0	3.6	Run 3	0.05	22.00	22.63	-1.7	222.7	231.4	0.7	29.8	30.6	6.3	13.1	3.0
7/10/2013 17:32	5.45	16.0	3.8	Run 3	0.05	22.00	22.63	-1.7	222.7	231.4	0.7	29.8	30.6	5.6	18.3	3.3
7/10/2013 17:33	5.00	23.2	4.3	Run 3	0.05	22.00	22.63	-1.7	222.7	231.4	0.7	29.8	30.6	5.1	25.6	3.7
7/10/2013 17:34	3.90	21.1	4.9	Run 3	0.05	22.00	22.63	-1.7	222.7	231.4	0.7	29.8	30.6	4.0	23.5	4.4
7/10/2013 17:35	2.70	21.6	5.9	Run 3	0.05	22.00	22.63	-1.7	222.7	231.4	0.7	29.8	30.6	2.7	24.1	5.4
7/10/2013 17:36	1.70	29.8	6.2	Run 3	0.05	22.00	22.63	-1.7	222.7	231.4	0.7	29.8	30.6	1.7	32.4	5.8
7/10/2013 17:37	0.95	57.2	5.4	Run 3	0.05	22.00	22.63	-1.7	222.7	231.4	0.7	29.8	30.6	0.9	60.7	4.9
7/10/2013 17:38	0.65	90.2	4.3	Run 3	0.05	22.00	22.63	-1.7	222.7	231.4	0.7	29.8	30.6	0.6	94.7	3.8
7/10/2013 17:39	0.90	97.3	3.4	Run 3	0.05	22.00	22.63	-1.7	222.7	231.4	0.7	29.8	30.6	0.9	102.1	2.8
7/10/2013 17:40	1.45	112.0	2.7	Run 3	0.05	22.00	22.63	-1.7	222.7	231.4	0.7	29.8	30.6	1.4	117.2	2.1
7/10/2013 17:41	1.60	85.6	2.2	Run 3	0.05	22.00	22.63	-1.7	222.7	231.4	0.7	29.8	30.6	1.6	90.0	1.6
7/10/2013 17:42	1.25	46.0	1.9	Run 3	0.05	22.00	22.63	-1.7	222.7	231.4	0.7	29.8	30.6	1.2	49.2	1.2
7/10/2013 17:43	3.40	25.7	1.7	Run 3	0.05	22.00	22.63	-1.7	222.7	231.4	0.7	29.8	30.6	3.5	28.2	1.1
7/10/2013 17:44	4.00	16.6	1.8	Run 3	0.05	22.00	22.63	-1.7	222.7	231.4	0.7	29.8	30.6	4.1	18.8	1.1
7/10/2013 17:45	3.55	8.9	1.8	Run 3	0.05	22.00	22.63	-1.7	222.7	231.4	0.7	29.8	30.6	3.6	11.0	1.1
7/10/2013 17:46	2.95	5.4	1.7	Run 3	0.05	22.00	22.63	-1.7	222.7	231.4	0.7	29.8	30.6	3.0	7.3	1.1
7/10/2013 17:47	2.60	4.9	1.7	Run 3	0.05	22.00	22.63	-1.7	222.7	231.4	0.7	29.8	30.6	2.6	6.8	1.1

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TimeStamp (CDT)	NO_x, ppm	CO, ppm	SO_2, ppm	COMMENTS	Co, NO_x	Cm, NO_x	Cma, NO_x	Co, CO	Cm, CO	Cma, CO	Co, SO_2	Cm, SO_2	Cma, SO_2	NO_x, ppm	CO, ppm	SO_2, ppm
7/10/2013 17:48	2.30	4.4	1.7	Run 3	0.05	22.00	22.63	-1.7	222.7	231.4	0.7	29.8	30.6	2.3	6.3	1.1
7/10/2013 17:49	2.20	3.9	1.7	Run 3	0.05	22.00	22.63	-1.7	222.7	231.4	0.7	29.8	30.6	2.2	5.7	1.0
7/10/2013 17:50	2.20	3.4	1.6	Run 3	0.05	22.00	22.63	-1.7	222.7	231.4	0.7	29.8	30.6	2.2	5.2	1.0
7/10/2013 17:51	2.80	3.4	1.6	Run 3	0.05	22.00	22.63	-1.7	222.7	231.4	0.7	29.8	30.6	2.8	5.2	1.0
7/10/2013 17:52	3.05	3.4	1.6	Run 3	0.05	22.00	22.63	-1.7	222.7	231.4	0.7	29.8	30.6	3.1	5.2	1.0
7/10/2013 17:53	3.05	3.4	1.6	Run 3	0.05	22.00	22.63	-1.7	222.7	231.4	0.7	29.8	30.6	3.1	5.2	1.0
7/10/2013 17:54	3.00	3.4	1.6	Run 3	0.05	22.00	22.63	-1.7	222.7	231.4	0.7	29.8	30.6	3.0	5.2	1.0
7/10/2013 17:55	2.90	3.4	1.6	Run 3	0.05	22.00	22.63	-1.7	222.7	231.4	0.7	29.8	30.6	2.9	5.2	0.9
7/10/2013 17:56	2.95	3.4	1.6	Run 3	0.05	22.00	22.63	-1.7	222.7	231.4	0.7	29.8	30.6	3.0	5.2	0.9
7/10/2013 17:57	3.15	3.4	1.5	Run 3	0.05	22.00	22.63	-1.7	222.7	231.4	0.7	29.8	30.6	3.2	5.2	0.9
7/10/2013 17:58	3.20	3.9	1.5	Run 3	0.05	22.00	22.63	-1.7	222.7	231.4	0.7	29.8	30.6	3.2	5.7	0.8
7/10/2013 17:59	3.35	5.4	1.5	Run 3	0.05	22.00	22.63	-1.7	222.7	231.4	0.7	29.8	30.6	3.4	7.3	0.8
7/10/2013 18:00	5.55	25.7	1.5	Run 3	0.05	22.00	22.63	-1.7	222.7	231.4	0.7	29.8	30.6	5.7	28.2	0.9
7/10/2013 18:01	5.70	14.5	1.7	Run 3	0.05	22.00	22.63	-1.7	222.7	231.4	0.7	29.8	30.6	5.8	16.7	1.1
7/10/2013 18:02	4.95	6.4	2.0	Run 3	0.05	22.00	22.63	-1.7	222.7	231.4	0.7	29.8	30.6	5.1	8.4	1.3
7/10/2013 18:03	4.35	5.4	2.1	Run 3	0.05	22.00	22.63	-1.7	222.7	231.4	0.7	29.8	30.6	4.4	7.3	1.5
7/10/2013 18:04	4.25	6.4	2.2	Run 3	0.05	22.00	22.63	-1.7	222.7	231.4	0.7	29.8	30.6	4.3	8.4	1.6
7/10/2013 18:05	4.15	6.4	2.3	Run 3	0.05	22.00	22.63	-1.7	222.7	231.4	0.7	29.8	30.6	4.2	8.4	1.6
7/10/2013 18:06	3.35	8.4	2.3	Run 3	0.05	22.00	22.63	-1.7	222.7	231.4	0.7	29.8	30.6	3.4	10.4	1.7
7/10/2013 18:07	2.80	12.5	2.4	Run 3	0.05	22.00	22.63	-1.7	222.7	231.4	0.7	29.8	30.6	2.8	14.6	1.7
7/10/2013 18:08	2.45	15.5	2.4	Run 3	0.05	22.00	22.63	-1.7	222.7	231.4	0.7	29.8	30.6	2.5	17.8	1.8
7/10/2013 18:09	1.95	23.2	2.4	Run 3	0.05	22.00	22.63	-1.7	222.7	231.4	0.7	29.8	30.6	2.0	25.6	1.8
7/10/2013 18:10	1.45	60.2	2.5	Run 3	0.05	22.00	22.63	-1.7	222.7	231.4	0.7	29.8	30.6	1.4	63.8	1.9
7/10/2013 18:11	1.05	92.7	2.4	Run 3	0.05	22.00	22.63	-1.7	222.7	231.4	0.7	29.8	30.6	1.0	97.4	1.8
7/10/2013 18:12	0.90	97.8	2.2	Run 3	0.05	22.00	22.63	-1.7	222.7	231.4	0.7	29.8	30.6	0.9	102.6	1.5
7/10/2013 18:13	0.80	73.9	1.9	Run 3	0.05	22.00	22.63	-1.7	222.7	231.4	0.7	29.8	30.6	0.8	78.0	1.3
7/10/2013 18:14	0.75	114.0	1.7	Run 3	0.05	22.00	22.63	-1.7	222.7	231.4	0.7	29.8	30.6	0.7	119.3	1.1
7/10/2013 18:15	1.15	150.6	1.6	Run 3	0.05	22.00	22.63	-1.7	222.7	231.4	0.7	29.8	30.6	1.1	157.0	0.9
7/10/2013 18:16	1.80	148.6	1.4	Run 3	0.05	22.00	22.63	-1.7	222.7	231.4	0.7	29.8	30.6	1.8	154.9	0.8
7/10/2013 18:17	2.20	173.4	1.3	Run 3	0.05	22.00	22.63	-1.7	222.7	231.4	0.7	29.8	30.6	2.2	180.6	0.6

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TimeStamp (CDT)	NO_x, ppm	CO, ppm	SO_2, ppm	COMMENTS	Co, NO_x	Cm, NO_x	Cma, NO_x	Co, CO	Cm, CO	Cma, CO	Co, SO_2	Cm, SO_2	Cma, SO_2	NO_x, ppm	CO, ppm	SO_2, ppm
7/10/2013 18:18	2.25	228.3	1.2	Run 3	0.05	22.00	22.63	-1.7	222.7	231.4	0.7	29.8	30.6	2.3	237.1	0.5
7/10/2013 18:19	2.05	272.9	1.1	Run 3	0.05	22.00	22.63	-1.7	222.7	231.4	0.7	29.8	30.6	2.1	283.2	0.4
7/10/2013 18:20	1.70	237.4	1.1	Run 3	0.05	22.00	22.63	-1.7	222.7	231.4	0.7	29.8	30.6	1.7	246.6	0.4
7/10/2013 18:21	1.55	196.3	1.0	Run 3	0.05	22.00	22.63	-1.7	222.7	231.4	0.7	29.8	30.6	1.5	204.2	0.3
7/10/2013 18:22	1.75	188.7	0.9	Run 3	0.05	22.00	22.63	-1.7	222.7	231.4	0.7	29.8	30.6	1.8	196.3	0.2
7/10/2013 18:23	2.05	198.3	0.9	Run 3	0.05	22.00	22.63	-1.7	222.7	231.4	0.7	29.8	30.6	2.1	206.2	0.2
7/10/2013 18:24	2.95	199.8	0.8	Run 3	0.05	22.00	22.63	-1.7	222.7	231.4	0.7	29.8	30.6	3.0	207.8	0.1
7/10/2013 18:25	3.40	184.6	0.8	Run 3	0.05	22.00	22.63	-1.7	222.7	231.4	0.7	29.8	30.6	3.5	192.1	0.1
7/10/2013 18:26	2.70	197.8	0.8	Run 3	0.05	22.00	22.63	-1.7	222.7	231.4	0.7	29.8	30.6	2.7	205.7	0.1
7/10/2013 18:27	2.25	258.7	0.7	Run 3	0.05	22.00	22.63	-1.7	222.7	231.4	0.7	29.8	30.6	2.3	268.5	0.0
7/10/2013 18:28	2.10	234.4	0.7	Run 3	0.05	22.00	22.63	-1.7	222.7	231.4	0.7	29.8	30.6	2.1	243.4	0.0
7/10/2013 18:29	1.55	176.0	0.7	Run 3	0.05	22.00	22.63	-1.7	222.7	231.4	0.7	29.8	30.6	1.5	183.2	0.0
7/10/2013 18:30	1.10	156.2	0.6	Run 3	0.05	22.00	22.63	-1.7	222.7	231.4	0.7	29.8	30.6	1.1	162.8	-0.1
7/10/2013 18:31	0.70	146.0	0.6	Run 3	0.05	22.00	22.63	-1.7	222.7	231.4	0.7	29.8	30.6	0.7	152.3	-0.1
7/10/2013 18:32	0.75	129.8	0.6	Run 3	0.05	22.00	22.63	-1.7	222.7	231.4	0.7	29.8	30.6	0.7	135.6	-0.1
7/10/2013 18:33	0.75	129.3	0.6	Run 3	0.05	22.00	22.63	-1.7	222.7	231.4	0.7	29.8	30.6	0.7	135.0	-0.1
7/10/2013 18:34	0.75	121.6	0.5	Run 3	0.05	22.00	22.63	-1.7	222.7	231.4	0.7	29.8	30.6	0.7	127.2	-0.2
7/10/2013 18:35	0.65	95.2	0.5	Run 3	0.05	22.00	22.63	-1.7	222.7	231.4	0.7	29.8	30.6	0.6	100.0	-0.2
7/10/2013 18:36	0.40	59.7	0.6	Run 3	0.05	22.00	22.63	-1.7	222.7	231.4	0.7	29.8	30.6	0.4	63.3	-0.2
7/10/2013 18:37	1.50	27.7	0.7	Run 3	0.05	22.00	22.63	-1.7	222.7	231.4	0.7	29.8	30.6	1.5	30.3	0.0
7/10/2013 18:38	5.40	12.5	1.1	Run 3	0.05	22.00	22.63	-1.7	222.7	231.4	0.7	29.8	30.6	5.5	14.6	0.4
7/10/2013 18:39	5.95	7.4	1.4	Run 3	0.05	22.00	22.63	-1.7	222.7	231.4	0.7	29.8	30.6	6.1	9.4	0.8
7/10/2013 18:40	5.05	5.9	1.5	Run 3	0.05	22.00	22.63	-1.7	222.7	231.4	0.7	29.8	30.6	5.2	7.8	0.9
7/10/2013 18:41	5.20	4.9	1.5	Run 3	0.05	22.00	22.63	-1.7	222.7	231.4	0.7	29.8	30.6	5.3	6.8	0.8
7/10/2013 18:42	5.80	4.4	1.4	Run 3	0.05	22.00	22.63	-1.7	222.7	231.4	0.7	29.8	30.6	5.9	6.3	0.8
7/10/2013 18:43	6.60	2.8	1.4	Run 3	0.05	22.00	22.63	-1.7	222.7	231.4	0.7	29.8	30.6	6.8	4.7	0.7
7/10/2013 18:44	6.75	1.3	1.4	Run 3	0.05	22.00	22.63	-1.7	222.7	231.4	0.7	29.8	30.6	6.9	3.1	0.7
7/10/2013 18:45	10.35	1.8	1.5	Run 3	0.05	22.00	22.63	-1.7	222.7	231.4	0.7	29.8	30.6	10.6	3.6	0.8
7/10/2013 18:46	10.05	10.0	2.0	Run 3	0.05	22.00	22.63	-1.7	222.7	231.4	0.7	29.8	30.6	10.3	12.0	1.4
7/10/2013 18:47	6.50	18.1	2.7	Run 3	0.05	22.00	22.63	-1.7	222.7	231.4	0.7	29.8	30.6	6.6	20.4	2.1

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7/10/2013 18:48	4.40	10.5	3.2	Run 3	0.05	22.00	22.63	-1.7	222.7	231.4	0.7	29.8	30.6	4.5	12.5	2.6
7/10/2013 18:49	5.65	6.4	3.5	Run 3	0.05	22.00	22.63	-1.7	222.7	231.4	0.7	29.8	30.6	5.8	8.4	3.0
7/10/2013 18:50	6.40	6.9	3.7	Run 3	0.05	22.00	22.63	-1.7	222.7	231.4	0.7	29.8	30.6	6.5	8.9	3.1
7/10/2013 18:51	6.65	7.9	3.7	Run 3	0.05	22.00	22.63	-1.7	222.7	231.4	0.7	29.8	30.6	6.8	9.9	3.1
7/10/2013 18:52	6.65	11.0	3.8	Run 3	0.05	22.00	22.63	-1.7	222.7	231.4	0.7	29.8	30.6	6.8	13.1	3.3
7/10/2013 18:53	6.70	13.0	4.0	Run 3	0.05	22.00	22.63	-1.7	222.7	231.4	0.7	29.8	30.6	6.9	15.2	3.5
7/10/2013 18:54	6.10	16.0	4.3	Run 3	0.05	22.00	22.63	-1.7	222.7	231.4	0.7	29.8	30.6	6.2	18.3	3.8
7/10/2013 18:55	4.65	33.3	5.0	Run 3	0.05	22.00	22.63	-1.7	222.7	231.4	0.7	29.8	30.6	4.7	36.1	4.5
7/10/2013 18:56	3.55	55.1	6.1	Run 3	0.05	22.00	22.63	-1.7	222.7	231.4	0.7	29.8	30.6	3.6	58.6	5.6
7/10/2013 18:57	2.95	85.1	6.6	Run 3	0.05	22.00	22.63	-1.7	222.7	231.4	0.7	29.8	30.6	3.0	89.5	6.2
7/10/2013 18:58	2.15	139.9	6.4	Run 3	0.05	22.00	22.63	-1.7	222.7	231.4	0.7	29.8	30.6	2.2	146.0	6.0
7/10/2013 18:59	1.50	144.5	6.0	Run 3	0.05	22.00	22.63	-1.7	222.7	231.4	0.7	29.8	30.6	1.5	150.8	5.5
7/10/2013 19:00	1.15	134.8	5.5	Run 3	0.05	22.00	22.63	-1.7	222.7	231.4	0.7	29.8	30.6	1.1	140.8	5.1
7/10/2013 19:01	0.75	121.1	5.0	Run 3	0.05	22.00	22.63	-1.7	222.7	231.4	0.7	29.8	30.6	0.7	126.7	4.5
7/10/2013 19:02	0.65	121.1	4.2	Run 3	0.05	22.00	22.63	-1.7	222.7	231.4	0.7	29.8	30.6	0.6	126.7	3.7
7/10/2013 19:03	0.55	124.2	3.4	Run 3	0.05	22.00	22.63	-1.7	222.7	231.4	0.7	29.8	30.6	0.5	129.8	2.9
7/10/2013 19:04	0.65	121.6	2.8	Run 3	0.05	22.00	22.63	-1.7	222.7	231.4	0.7	29.8	30.6	0.6	127.2	2.2
7/10/2013 19:05	1.15	89.7	2.4	Run 3	0.05	22.00	22.63	-1.7	222.7	231.4	0.7	29.8	30.6	1.1	94.2	1.7
7/10/2013 19:06	4.15	29.2	2.1	Run 3	0.05	22.00	22.63	-1.7	222.7	231.4	0.7	29.8	30.6	4.2	31.9	1.5
7/10/2013 19:07	7.85	5.4	2.1	Run 3	0.05	22.00	22.63	-1.7	222.7	231.4	0.7	29.8	30.6	8.0	7.3	1.4
7/10/2013 19:08	8.80	0.8	2.1	Run 3	0.05	22.00	22.63	-1.7	222.7	231.4	0.7	29.8	30.6	9.0	2.6	1.5
7/10/2013 19:09	9.50	-0.2	2.3	Run 3	0.05	22.00	22.63	-1.7	222.7	231.4	0.7	29.8	30.6	9.7	1.5	1.6
7/10/2013 19:10	9.40	-0.2	2.4	Run 3	0.05	22.00	22.63	-1.7	222.7	231.4	0.7	29.8	30.6	9.6	1.5	1.8
7/10/2013 19:11	9.10	-0.7	2.4	Run 3	0.05	22.00	22.63	-1.7	222.7	231.4	0.7	29.8	30.6	9.3	1.0	1.8
7/10/2013 19:12	7.45	6.4	2.4	Run 3	0.05	22.00	22.63	-1.7	222.7	231.4	0.7	29.8	30.6	7.6	8.4	1.8
7/10/2013 19:13	4.20	14.5	2.4	Run 3	0.05	22.00	22.63	-1.7	222.7	231.4	0.7	29.8	30.6	4.3	16.7	1.8
7/10/2013 19:14	3.55	7.9	2.4	Run 3	0.05	22.00	22.63	-1.7	222.7	231.4	0.7	29.8	30.6	3.6	9.9	1.8
7/10/2013 19:15	5.20	3.4	2.4	Run 3	0.05	22.00	22.63	-1.7	222.7	231.4	0.7	29.8	30.6	5.3	5.2	1.7
7/10/2013 19:16	6.10	2.3	2.3	Run 3	0.05	22.00	22.63	-1.7	222.7	231.4	0.7	29.8	30.6	6.2	4.2	1.6
7/10/2013 19:17	6.00	3.4	2.1	Run 3	0.05	22.00	22.63	-1.7	222.7	231.4	0.7	29.8	30.6	6.1	5.2	1.5

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TimeStamp (CDT)	NO_x, ppm	CO, ppm	SO_2, ppm	COMMENTS	Co, NO_x	Cm, NO_x	Cma, NO_x	Co, CO	Cm, CO	Cma, CO	Co, SO_2	Cm, SO_2	Cma, SO_2	NO_x, ppm	CO, ppm	SO_2, ppm
7/10/2013 19:18	5.80	3.9	2.0	Run 3	0.05	22.00	22.63	-1.7	222.7	231.4	0.7	29.8	30.6	5.9	5.7	1.4
7/10/2013 19:19	5.80	4.9	1.9	Run 3	0.05	22.00	22.63	-1.7	222.7	231.4	0.7	29.8	30.6	5.9	6.8	1.3
7/10/2013 19:20	5.50	7.4	1.8	Run 3	0.05	22.00	22.63	-1.7	222.7	231.4	0.7	29.8	30.6	5.6	9.4	1.2
7/10/2013 19:21	4.25	12.5	1.9	Run 3	0.05	22.00	22.63	-1.7	222.7	231.4	0.7	29.8	30.6	4.3	14.6	1.3
7/10/2013 19:22	2.70	22.1	2.0	Run 3	0.05	22.00	22.63	-1.7	222.7	231.4	0.7	29.8	30.6	2.7	24.6	1.4
7/10/2013 19:23	1.80	62.8	2.2	Run 3	0.05	22.00	22.63	-1.7	222.7	231.4	0.7	29.8	30.6	1.8	66.5	1.5
7/10/2013 19:24	1.60	112.5	2.2	Run 3	0.05	22.00	22.63	-1.7	222.7	231.4	0.7	29.8	30.6	1.6	117.8	1.5
7/10/2013 19:25	1.85	115.6	2.0	Run 3	0.05	22.00	22.63	-1.7	222.7	231.4	0.7	29.8	30.6	1.9	120.9	1.4
7/10/2013 19:26	1.80	129.3	1.9	Run 3	0.05	22.00	22.63	-1.7	222.7	231.4	0.7	29.8	30.6	1.8	135.0	1.2
7/10/2013 19:27	1.65	220.1	1.7	Run 3	0.05	22.00	22.63	-1.7	222.7	231.4	0.7	29.8	30.6	1.6	228.8	1.0
7/10/2013 19:28	1.40	312.5	1.5	Run 3	0.05	22.00	22.63	-1.7	222.7	231.4	0.7	29.8	30.6	1.4	324.0	0.8
7/10/2013 19:29	1.35	359.8	1.3	Run 3	0.05	22.00	22.63	-1.7	222.7	231.4	0.7	29.8	30.6	1.3	372.7	0.7
7/10/2013 19:30	1.15	351.1	1.2	Run 3	0.05	22.00	22.63	-1.7	222.7	231.4	0.7	29.8	30.6	1.1	363.8	0.5
7/10/2013 19:31	0.95	264.8	1.1	Run 3	0.05	22.00	22.63	-1.7	222.7	231.4	0.7	29.8	30.6	0.9	274.8	0.4
7/10/2013 19:32	0.90	241.5	1.0	Run 3	0.05	22.00	22.63	-1.7	222.7	231.4	0.7	29.8	30.6	0.9	250.7	0.3
7/10/2013 19:33	1.30	292.2	0.9	Run 3	0.05	22.00	22.63	-1.7	222.7	231.4	0.7	29.8	30.6	1.3	303.1	0.2
7/10/2013 19:34	2.45	255.2	0.8	Run 3	0.05	22.00	22.63	-1.7	222.7	231.4	0.7	29.8	30.6	2.5	264.9	0.1
7/10/2013 19:35	2.40	96.8	0.8	Downtime	0.05	22.00	22.63	-1.7	222.7	231.4	0.7	29.8	30.6	2.4	101.5	0.1
7/10/2013 19:36	2.65	46.0	0.8	Downtime	0.05	22.00	22.63	-1.7	222.7	231.4	0.7	29.8	30.6	2.7	49.2	0.1
7/10/2013 19:37	7.20	14.5	0.8	Downtime	0.05	22.00	22.63	-1.7	222.7	231.4	0.7	29.8	30.6	7.4	16.7	0.1
7/10/2013 19:38	9.65	4.4	1.0	Downtime	0.05	22.00	22.63	-1.7	222.7	231.4	0.7	29.8	30.6	9.9	6.3	0.3
7/10/2013 19:39	10.45	1.8	1.1	Downtime	0.05	22.00	22.63	-1.7	222.7	231.4	0.7	29.8	30.6	10.7	3.6	0.4
7/10/2013 19:40	10.70	0.8	1.3	Downtime	0.05	22.00	22.63	-1.7	222.7	231.4	0.7	29.8	30.6	11.0	2.6	0.6
7/10/2013 19:41	10.50	0.3	1.5	Downtime	0.05	22.00	22.63	-1.7	222.7	231.4	0.7	29.8	30.6	10.8	2.1	0.9
7/10/2013 19:42	10.85	0.3	1.8	Downtime	0.05	22.00	22.63	-1.7	222.7	231.4	0.7	29.8	30.6	11.1	2.1	1.1
7/10/2013 19:43	11.20	-0.2	2.0	Downtime	0.05	22.00	22.63	-1.7	222.7	231.4	0.7	29.8	30.6	11.5	1.5	1.3
7/10/2013 19:44	11.35	-0.2	2.2	Downtime	0.05	22.00	22.63	-1.7	222.7	231.4	0.7	29.8	30.6	11.7	1.5	1.5
7/10/2013 19:45	11.25	-0.2	2.3	Downtime	0.05	22.00	22.63	-1.7	222.7	231.4	0.7	29.8	30.6	11.5	1.5	1.7
7/10/2013 19:46	11.15	-0.7	2.4	Downtime	0.05	22.00	22.63	-1.7	222.7	231.4	0.7	29.8	30.6	11.4	1.0	1.8
7/10/2013 19:47	11.15	-0.7	2.5	Downtime	0.05	22.00	22.63	-1.7	222.7	231.4	0.7	29.8	30.6	11.4	1.0	1.9

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TimeStamp (CDT)	NO_x, ppm	CO, ppm	SO_2, ppm	COMMENTS	Co, NO_x	Cm, NO_x	Cma, NO_x	Co, CO	Cm, CO	Cma, CO	Co, SO_2	Cm, SO_2	Cma, SO_2	NO_x, ppm	CO, ppm	SO_2, ppm
7/10/2013 19:48	11.20	-0.2	2.6	Downtime	0.05	22.00	22.63	-1.7	222.7	231.4	0.7	29.8	30.6	11.5	1.5	1.9
7/10/2013 19:49	10.55	0.8	2.7	Downtime	0.05	22.00	22.63	-1.7	222.7	231.4	0.7	29.8	30.6	10.8	2.6	2.1
7/10/2013 19:50	10.80	-0.2	2.9	Downtime	0.05	22.00	22.63	-1.7	222.7	231.4	0.7	29.8	30.6	11.1	1.5	2.3
7/10/2013 19:51	11.25	-0.2	3.0	Downtime	0.05	22.00	22.63	-1.7	222.7	231.4	0.7	29.8	30.6	11.5	1.5	2.4
7/10/2013 19:52	11.10	16.6	3.0	Downtime	0.05	22.00	22.63	-1.7	222.7	231.4	0.7	29.8	30.6	11.4	18.8	2.4
7/10/2013 19:53	6.40	82.0	2.9	Run 3	0.05	22.00	22.63	-1.7	222.7	231.4	0.7	29.8	30.6	6.5	86.4	2.3
7/10/2013 19:54	4.50	194.2	2.8	Run 3	0.05	22.00	22.63	-1.7	222.7	231.4	0.7	29.8	30.6	4.6	202.1	2.2
7/10/2013 19:55	3.35	202.9	2.6	Run 3	0.05	22.00	22.63	-1.7	222.7	231.4	0.7	29.8	30.6	3.4	211.0	2.0
7/10/2013 19:56	1.35	164.3	2.4	Run 3	0.05	22.00	22.63	-1.7	222.7	231.4	0.7	29.8	30.6	1.3	171.2	1.8
7/10/2013 19:57	0.90	245.0	2.1	Run 3	0.05	22.00	22.63	-1.7	222.7	231.4	0.7	29.8	30.6	0.9	254.4	1.5
7/10/2013 19:58	1.10	351.6	1.9	Run 3	0.05	22.00	22.63	-1.7	222.7	231.4	0.7	29.8	30.6	1.1	364.4	1.2
7/10/2013 19:59	0.85	394.3	1.7	Run 3	0.05	22.00	22.63	-1.7	222.7	231.4	0.7	29.8	30.6	0.8	408.3	1.0
7/10/2013 20:00	0.80	341.0	1.5	Run 3	0.05	22.00	22.63	-1.7	222.7	231.4	0.7	29.8	30.6	0.8	353.4	0.8
7/10/2013 20:01	1.15	299.8	1.4	Run 3	0.05	22.00	22.63	-1.7	222.7	231.4	0.7	29.8	30.6	1.1	311.0	0.7
7/10/2013 20:02	1.40	277.0	1.2	Run 3	0.05	22.00	22.63	-1.7	222.7	231.4	0.7	29.8	30.6	1.4	287.4	0.6
7/10/2013 20:03	1.70	259.7	1.1	Run 3	0.05	22.00	22.63	-1.7	222.7	231.4	0.7	29.8	30.6	1.7	269.6	0.4
7/10/2013 20:04	2.15	245.0	1.1	Run 3	0.05	22.00	22.63	-1.7	222.7	231.4	0.7	29.8	30.6	2.2	254.4	0.4
7/10/2013 20:05	3.50	366.9	1.1	Run 3	0.05	22.00	22.63	-1.7	222.7	231.4	0.7	29.8	30.6	3.6	380.1	0.4
7/10/2013 20:06	3.90	388.2	1.0	Run 3	0.05	22.00	22.63	-1.7	222.7	231.4	0.7	29.8	30.6	4.0	402.1	0.3
7/10/2013 20:07	2.70	297.3	1.0	Run 3	0.05	22.00	22.63	-1.7	222.7	231.4	0.7	29.8	30.6	2.7	308.3	0.3
7/10/2013 20:08	2.90	181.0	1.1	Run 3	0.05	22.00	22.63	-1.7	222.7	231.4	0.7	29.8	30.6	2.9	188.4	0.4
7/10/2013 20:09	3.85	105.4	1.4	Run 3	0.05	22.00	22.63	-1.7	222.7	231.4	0.7	29.8	30.6	3.9	110.4	0.7
7/10/2013 20:10	5.35	41.4	1.5	Run 3	0.05	22.00	22.63	-1.7	222.7	231.4	0.7	29.8	30.6	5.5	44.5	0.8
	3.58	**90.1**	**2.1**	**Run 3 Average**										**3.6**	**94.7**	**1.5**
7/10/2013 20:11	7.85	14.5	1.5													
7/10/2013 20:12	10.35	6.9	1.7													
7/10/2013 20:13	10.15	3.9	1.8													
7/10/2013 20:14	9.70	3.4	1.9													
7/10/2013 20:15	9.20	4.4	2.5													
7/10/2013 20:16	4.60	3.4	3.4													

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TimeStamp (CDT)	NO_x, ppm	CO, ppm	SO_2, ppm	COMMENTS	Co, NO_x	Cm, NO_x	Cma, NO_x	Co, CO	Cm, CO	Cma, CO	Co, SO_2	Cm, SO_2	Cma, SO_2	NO_x, ppm	CO, ppm	SO_2, ppm
7/10/2013 20:17	1.90	2.3	3.9													
7/10/2013 20:18	1.05	1.8	4.0													
7/10/2013 20:19	0.75	1.8	4.0													
7/10/2013 20:20	0.55	2.3	3.9													
7/10/2013 20:21	0.45	1.8	3.7													
7/10/2013 20:22	0.40	1.8	3.5													
7/10/2013 20:23	0.30	2.3	3.3													
7/10/2013 20:24	0.50	1.8	3.2													
7/10/2013 20:25	2.70	0.8	3.0													
7/10/2013 20:26	5.35	0.8	2.9													
7/10/2013 20:27	8.65	0.8	2.9													
7/10/2013 20:28	8.55	0.8	2.8													
7/10/2013 20:29	4.45	1.8	2.8													
7/10/2013 20:30	2.10	2.8	2.7													
7/10/2013 20:31	1.30	3.9	2.6													
7/10/2013 20:32	0.85	4.4	2.5													
7/10/2013 20:33	0.55	4.4	2.3													
7/10/2013 20:34	0.40	3.9	2.2													
7/10/2013 20:35	0.25	3.9	2.0													
7/10/2013 20:36	0.20	3.4	1.8													
7/10/2013 20:37	0.15	3.9	1.6													
7/10/2013 20:38	0.10	3.4	1.5													
7/10/2013 20:39	0.10	3.4	1.4													
7/10/2013 20:40	0.05	3.4	1.3													
7/10/2013 20:41	0.05	3.4	1.2													
7/10/2013 20:42	0.05	3.9	1.1													
7/10/2013 20:43	0.05	3.4	1.0													
7/10/2013 20:44	0.05	4.4	0.9													
7/10/2013 20:45	0.05	4.4	0.9													
7/10/2013 20:46	0.05	3.9	0.8													

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TimeStamp (CDT)	**NO_x, ppm**	**CO, ppm**	**SO_2, ppm**	**COMMENTS**	**Co, NO_x**	**Cm, NO_x**	**Cma, NO_x**	**Co, CO**	**Cm, CO**	**Cma, CO**	**Co, SO_2**	**Cm, SO_2**	**Cma, SO_2**	**NO_x, ppm**	**CO, ppm**	**SO_2, ppm**
7/10/2013 20:47	0.05	4.4	0.8													
7/10/2013 20:48	0.05	3.9	0.7													
7/10/2013 20:49	0.05	3.4	0.7													
7/10/2013 20:50	0.05	2.8	0.6													
7/10/2013 20:51	0.10	11.0	1.7													
7/10/2013 20:52	0.30	5.9	6.9													
7/10/2013 20:53	0.30	-0.7	13.2													
7/10/2013 20:54	0.35	-1.7	18.4													
7/10/2013 20:55	0.35	-1.7	22.1													
7/10/2013 20:56	0.35	-1.7	24.5													
7/10/2013 20:57	0.35	-1.7	26.1													
7/10/2013 20:58	0.30	-1.7	27.9													
7/10/2013 20:59	0.35	-2.2	28.5													
7/10/2013 21:00	0.30	-1.7	28.9													
7/10/2013 21:01	0.35	-1.7	29.5	30.2 SO2 (Bias)												
			29.5	**Average 30.2 SO2 (Bias)**												
7/10/2013 21:02	0.65	-2.2	28.1													
7/10/2013 21:03	9.35	-2.2	23.5													
7/10/2013 21:04	18.40	-2.2	16.0													
7/10/2013 21:05	21.15	-2.2	11.1													
7/10/2013 21:06	21.80	-2.2	7.3	Zero CO (Bias)												
		-2.2		**Average Zero CO (Bias)**												
7/10/2013 21:07	21.95	11.5	5.3	22.63 Nox (Bias)												
	21.95			**Average 22.63 Nox (Bias)**												
7/10/2013 21:08	14.10	144.5	3.4													
7/10/2013 21:09	2.70	212.0	1.3													
7/10/2013 21:10	0.05	221.7	0.3	Zero Nox, 231.4 CO, Zero SO2 (Bias)												
	0.05	**221.7**	**0.3**	**Average Zero Nox, 231.4 CO, Zero SO2 (Bias)**												

Gerdau Ameristeel US, Inc. - Jackson, Tennessee
Number 2 EAF Baghouse
Permit Number: 558867
July 10-11, 2013

NO_x Instrument Converter Efficiency Test

Date and Time		Highest Observed NO_x Peak Value (ppm v/v)	NO_x Value at end of Efficiency Check (ppm v/v)	Percent Decrease From Peak Value
Date	Time (CDT)			
7/11/2013	13:26 13:56	9.25	9.20	0.5

7/11/2013 13:26	9.25
7/11/2013 13:27	9.25
7/11/2013 13:28	9.25
7/11/2013 13:29	9.25
7/11/2013 13:30	9.25
7/11/2013 13:31	9.25
7/11/2013 13:32	9.25
7/11/2013 13:33	9.25
7/11/2013 13:34	9.25
7/11/2013 13:35	9.25
7/11/2013 13:36	9.25
7/11/2013 13:37	9.25
7/11/2013 13:38	9.25
7/11/2013 13:39	9.25
7/11/2013 13:40	9.25
7/11/2013 13:41	9.25
7/11/2013 13:42	9.25
7/11/2013 13:43	9.25
7/11/2013 13:44	9.20
7/11/2013 13:45	9.20
7/11/2013 13:46	9.20
7/11/2013 13:47	9.20
7/11/2013 13:48	9.20
7/11/2013 13:49	9.25
7/11/2013 13:50	9.20
7/11/2013 13:51	9.20
7/11/2013 13:52	9.20
7/11/2013 13:53	9.20
7/11/2013 13:54	9.20
7/11/2013 13:55	9.20

APPENDIX B.3

GASEOUS AND INSTRUMENT DATA

EXAMPLE CALCULATIONS AND GAS CERTIFICATES

Example Calculations (NO_x/CO/SO_2)

Gas Certificates

NO_x	22.6	ppm
	45.2	ppm
CO	231.4	ppm
	461.0	ppm
SO_2	16.2	ppm
	30.6	ppm

Gerdau Ameristeel US, Inc. - Jackson, Tennessee
Number 1 EAF Baghouse
Permit Number: 558867
July 10-11, 2013
EXAMPLE CALCULATIONS FOR GASEOUS EMISSIONS

Calculation for Run 1 of the NO_x Test of Baghouse Number 1

Correction of NO_x Concentrations for Instrument Drift

EPA Method 7E provides an equation for correcting the measured gaseous concentrations over a valid test run for instrument drift during the test run.

The EPA equation presented in Section 12.6 of EPA Method 7E is:

$$C_{gas} = (C_{avg} - C_o)(C_{ma} / (C_m - C_o))$$

Where:

C_{gas} = Effluent gas concentration, dry basis, ppm.

C_{avg} = Average gas concentration indicated by the gas analyzer, ppm.

C_o = Average of initial and final system calibration bias check responses for the zero gas, ppm.

C_m = Average of initial and final system calibration bias check responses for the upscale calibration gas, ppm.

C_{ma} = Actual concentration of the upscale calibration gas, ppm.

Using the average for Run 1 of the NO_x test:

C_{avg} = 0.57

From the Pre test / Post test bias checks:
(Pre test + Post test) / 2

C_o =	0.35	-0.15	2	0.10	ppm
C_m =	20.45	21.55	2	21.00	ppm
C_{ma} =	22.63	ppm			

	Cavg	Co	Cma	Cm	Co
C_{gas} =	0.57	0.10	22.63	21.00	0.10

C_{gas} = 0.5

Gerdau Ameristeel US, Inc. - Jackson, Tennessee
Number 1 EAF Baghouse
Permit Number: 558867
July 10-11, 2013
EXAMPLE CALCULATIONS FOR GASEOUS EMISSIONS

Calculation of the Mass of NO_x Emissions During the Test Run of Baghouse Number 1

The stack gas flow rate for each sampling run was measured using EPA Methods 1 through 4. Flow data in Appendix A.1 presents the measured stack gas parameters and the calculation of the stack gas flow rate for Run 1 of the NO_x test.

The average mass emission rate of a pollutant over a sampling run was calculated by using the following equation:

$$M = \frac{C_{gas(avg)} \times MW \times Q_{d(std)} \times 60}{385.1 \times 10^6}$$

Where:

M = Average mass emission rate of the pollutant over the sampling run in lbs/hr.

$C_{gas(avg)}$ = Average concentration of the stack gas during the sampling run in ppm. This concentration is expressed on a dry stack basis.

MW = Molecular weight of the pollutant in lbs/lb-mole.

$Q_{d(std)}$ = Stack gas flow rate during the sampling run in dry standard cubic feet per minute (scfmd).

385.1 = Number of cubic feet occupied by one pound mole of gas at standard conditions (68º F and 29.92 in. Hg), assuming ideal gas behavior.

10^6 = Conversion constant for parts per million to cubic feet of pollutant (1 ppm = 10^{-6} ft^3 pollutant / ft^3 stack gas)

60 = Conversion constant for minutes to hours (1 hr = 60 Minutes)

For Run 1 of the NO_x test:

$C_{gas(avg)}$ = 0.5 ppm

MW = 46 = 14 + 16 + 16

$Q_{d(std)}$ = 314370 SCFMD

$$M = \frac{C_{gas(avg)} \quad MW \quad Q_{d(std)} \quad 60}{3.851E+08} = \frac{0.5 \quad 46 \quad 314370 \quad 60}{3.851E+08}$$

M = 1.1 lbs/hr

Gerdau Ameristeel US, Inc. - Jackson, Tennessee
Number 1 EAF Baghouse
Permit Number: 558867
July 10-11, 2013
EXAMPLE CALCULATIONS FOR GASEOUS EMISSIONS

Calculation of the Lbs/Ton Steel Produced of NO_x Emissions During the Test Run of Baghouse Number 1

The pounds of NO_x per ton of steel produced is calculated with the following equation:

$$M_t = M / P$$

Where:

M_t = Average emission rate of the pollutant over the sampling run in pounds of pollutant per ton of steel produced.

M = Average mass emission rate of the pollutant over the sampling run in lbs/hr.

P = Average steel production rate over the sampling run in tons/hr.

For the NO_x Test:

M =	1.1	lbs/hr		
P =	111.6	tons/hr		
M_t =	M	/	P	
	1.1		111.6	
M_t =	**0.01**	**lbs/ton**		

Gerdau Ameristeel US, Inc. - Jackson, Tennessee
Number 1 EAF Baghouse
Permit Number: 558867
July 10-11, 2013
EXAMPLE CALCULATIONS FOR GASEOUS EMISSIONS

Calculation for Run 1 of the CO Test of Baghouse Number 1

Correction of CO Concentrations for Instrument Drift

EPA Method 7E provides an equation for correcting the measured gaseous concentrations over a valid test run for instrument drift during the test run.

The EPA equation presented in Section 12.6 of EPA Method 7E is:

$$C_{gas} = (C_{avg} - C_o)(C_{ma} / (C_m - C_o))$$

Where:

C_{gas} = Effluent gas concentration, dry basis, ppm.

C_{avg} = Average gas concentration indicated by the gas analyzer, ppm.

C_o = Average of initial and final system calibration bias check responses for the zero gas, ppm.

C_m = Average of initial and final system calibration bias check responses for the upscale calibration gas, ppm.

C_{ma} = Actual concentration of the upscale calibration gas, ppm.

Using the average for Run 1 of the CO test:

C_{avg} = 115.0

From the Pre test / Post test bias checks:
(Pre test + Post test) / 2

C_o =	0.8	0.3	2.0	0.6	ppm
C_m =	231.0	230.5	2.0	230.8	ppm
C_{ma} =	231.4	ppm			

	Cavg	Co	Cma	Cm	Co
C_{gas} =	115.0	0.6	231.4	230.8	0.6

C_{gas} = 115.0

Gerdau Ameristeel US, Inc. - Jackson, Tennessee
Number 1 EAF Baghouse
Permit Number: 558867
July 10-11, 2013
EXAMPLE CALCULATIONS FOR GASEOUS EMISSIONS

Calculation of the Mass of CO Emissions During the Test Run of Baghouse Number 1

The stack gas flow rate for each sampling run was measured using EPA Methods 1 through 4. Flow data in Appendix A.1 presents the measured stack gas parameters and the calculation of the stack gas flow rate for Run 1 of the CO test.

The average mass emission rate of a pollutant over a sampling run was calculated by using the following equation:

$$M = \frac{C_{gas(avg)} \times MW \times Q_{d(std)} \times 60}{385.1 \times 10^6}$$

Where:

M = Average mass emission rate of the pollutant over the sampling run in lbs/hr.

$C_{gas(avg)}$ = Average concentration of the stack gas during the sampling run in ppm. This concentration is expressed on a dry stack basis.

MW = Molecular weight of the pollutant in lbs/lb-mole.

$Q_{d(std)}$ = Stack gas flow rate during the sampling run in dry standard cubic feet per minute (scfmd).

385.1 = Number of cubic feet occupied by one pound mole of gas at standard conditions (68º F and 29.92 in. Hg), assuming ideal gas behavior.

10^6 = Conversion constant for parts per million to cubic feet of pollutant (1 ppm = 10^{-6} ft^3 pollutant / ft^3 stack gas)

60 = Conversion constant for minutes to hours (1 hr = 60 Minutes)

For Run 1 of the CO test:

$C_{gas(avg)}$ = 115.0 ppm

MW = 28 = 12 + 16

$Q_{d(std)}$ = 314370 SCFMD

	$C_{gas(avg)}$	MW	$Q_{d(std)}$	
M =	115.0	28	314370	60
	3.851E+08			

M = 157.7 lbs/hr

Gerdau Ameristeel US, Inc. - Jackson, Tennessee
Number 1 EAF Baghouse
Permit Number: 558867
July 10-11, 2013
EXAMPLE CALCULATIONS FOR GASEOUS EMISSIONS

Calculation of the Lbs/Ton Steel Produced of CO Emissions During the Test Run of Baghouse Number 1

The pounds of CO per ton of steel produced is calculated with the following equation:

$$M_t = M / P$$

Where:

M_t = Average emission rate of the pollutant over the sampling run in pounds of pollutant per ton of steel produced.

M = Average mass emission rate of the pollutant over the sampling run in lbs/hr.

P = Average steel production rate over the sampling run in tons/hr.

For the CO Test:

M =	157.7	lbs/hr	
P =	111.6	tons/hr	
M_t =	M	/	P
	157.7		111.6
M_t =	**1.41**	**lbs/ton**	

Gerdau Ameristeel US, Inc. - Jackson, Tennessee
Number 1 EAF Baghouse
Permit Number: 558867
July 10-11, 2013
EXAMPLE CALCULATIONS FOR GASEOUS EMISSIONS

Calculation for Run 1 of the SO_2 Test of Baghouse Number 1

Correction of SO_2 Concentrations for Instrument Drift

EPA Method 7E provides an equation for correcting the measured gaseous concentrations over a valid test run for instrument drift during the test run.

The EPA equation presented in Section 12.6 of EPA Method 7E is:

$$C_{gas} = (C_{avg} - C_o)(C_{ma} / (C_m - C_o))$$

Where:

C_{gas} = Effluent gas concentration, dry basis, ppm.

C_{avg} = Average gas concentration indicated by the gas analyzer, ppm.

C_o = Average of initial and final system calibration bias check responses for the zero gas, ppm.

C_m = Average of initial and final system calibration bias check responses for the upscale calibration gas, ppm.

C_{ma} = Actual concentration of the upscale calibration gas, ppm.

Using the average for Run 1 of the SO_2 test:

C_{avg} = 0.5

From the Pre test / Post test bias checks:
(Pre test + Post test) / 2

C_o =	0.2	0.3	2.0	0.3	ppm
C_m =	29.7	29.6	2.0	29.7	ppm
C_{ma} =	30.6	ppm			

	Cavg	Co	Cma	Cm	Co
C_{gas} =	0.5	0.3	30.6	29.7	0.3

C_{gas} = 0.3

Gerdau Ameristeel US, Inc. - Jackson, Tennessee
Number 1 EAF Baghouse
Permit Number: 558867
July 10-11, 2013
EXAMPLE CALCULATIONS FOR GASEOUS EMISSIONS

Calculation of the Mass of SO_2 Emissions During the Test Run of Baghouse Number 1

The stack gas flow rate for each sampling run was measured using EPA Methods 1 through 4. Flow data in Appendix A.1 presents the measured stack gas parameters and the calculation of the stack gas flow rate for Run 1 of the SO_2 test.

The average mass emission rate of a pollutant over a sampling run was calculated by using the following equation:

$$M = \frac{C_{gas(avg)} \times MW \times Q_{d(std)} \times 60}{385.1 \times 10^6}$$

Where:

M = Average mass emission rate of the pollutant over the sampling run in lbs/hr.

$C_{gas(avg)}$ = Average concentration of the stack gas during the sampling run in ppm. This concentration is expressed on a dry stack basis.

MW = Molecular weight of the pollutant in lbs/lb-mole.

$Q_{d(std)}$ = Stack gas flow rate during the sampling run in dry standard cubic feet per minute (scfmd).

385.1 = Number of cubic feet occupied by one pound mole of gas at standard conditions (68º F and 29.92 in. Hg), assuming ideal gas behavior.

10^6 = Conversion constant for parts per million to cubic feet of pollutant (1 ppm = 10^{-6} ft^3 pollutant / ft^3 stack gas)

60 = Conversion constant for minutes to hours (1 hr = 60 Minutes)

For Run 1 of the SO_2 test:

$C_{gas(avg)}$ = 0.3 ppm

MW = 64 = 32 + 16 + 16

$Q_{d(std)}$ = 314370 SCFMD

	$C_{gas(avg)}$	MW	$Q_{d(std)}$	
M =	0.3	64	314370	60
		3.851E+08		

M = 0.9 lbs/hr

Gerdau Ameristeel US, Inc. - Jackson, Tennessee
Number 1 EAF Baghouse
Permit Number: 558867
July 10-11, 2013
EXAMPLE CALCULATIONS FOR GASEOUS EMISSIONS

Calculation of the Lbs/Ton Steel Produced of SO_2 Emissions During the Test Run of Baghouse Number 1

The pounds of SO_2 per ton of steel produced is calculated with the following equation:

$$M_t = M / P$$

Where:

M_t = Average emission rate of the pollutant over the sampling run in pounds of pollutant per ton of steel produced.

M = Average mass emission rate of the pollutant over the sampling run in lbs/hr.

P = Average steel production rate over the sampling run in tons/hr.

For the SO_2 Test:

M =	0.9	lbs/hr	
P =	111.6	tons/hr	
M_t =	M	/	P
	0.9		111.6
M_t =	**0.01**	**lbs/ton**	

Airgas

Airgas Specialty Gases
630 United Drive
Durham, NC 27713
(919)544-3773 Fax: (919)544-3774
www.airgas.com

CERTIFICATE OF ANALYSIS
Grade of Product: EPA Protocol

Part Number:	E02NI99E15AC088	Reference Number:	122-124354838-1
Cylinder Number:	CC424674	Cylinder Volume:	144.3 CF
Laboratory:	ASG - Durham - NC	Cylinder Pressure:	2015 PSIG
PGVP Number:	B22013	Valve Outlet:	660
Gas Code:	NO	Analysis Date:	Feb 07, 2013

Expiration Date: Feb 07, 2016

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
NOX	22.50 PPM	22.63 PPM	G1	+/- 1% NIST Traceable
NITRIC OXIDE	22.50 PPM	22.63 PPM	G1	+/- 1% NIST Traceable
NITROGEN	Balance			

CALIBRATION STANDARDS

Type	Lot ID	Cylinder No	Concentration	Expiration Date
NTRM	12061624	CC344810	20.23 PPM NITRIC OXIDE/NITROGEN	Apr 11, 2015
NTRM	12061624	CC344810 NOX	20.28 PPM NOX/NITROGEN	Apr 11, 2015

ANALYTICAL EQUIPMENT

Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
TECO NO 42C-71463-368	Chemiluminescence	Jan 28, 2013
TECO NOX 42C-71463-368	Chemiluminescence	Jan 28, 2013

Triad Data Available Upon Request

Notes:

Amlin Mann

Approved for Release

Airgas

Airgas Specialty Gases
630 United Drive
Durham, NC 27713
(919)544-3773 Fax: (919)544-3774
www.airgas.com

CERTIFICATE OF ANALYSIS
Grade of Product: EPA Protocol

Part Number:	E02NI99E15AC243	Reference Number:	122-124354837-1
Cylinder Number:	CC425473	Cylinder Volume:	144.3 CF
Laboratory:	ASG - Durham - NC	Cylinder Pressure:	2015 PSIG
PGVP Number:	B22013	Valve Outlet:	660
Gas Code:	NO	Analysis Date:	Feb 04, 2013

Expiration Date: Feb 04, 2016

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
NITRIC OXIDE	45.00 PPM	45.15 PPM	G1	+/- 1% NIST Traceable
NITROGEN	Balance			
Total oxides of nitrogen		45.18 PPM		For Reference Only

CALIBRATION STANDARDS

Type	Lot ID	Cylinder No	Concentration	Expiration Date
NTRM	12060815	CC281111	49.95 PPM NITRIC OXIDE/NITROGEN	Dec 16, 2017

ANALYTICAL EQUIPMENT

Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
Nicolet 6700 AHR0801333 NO	FTIR	Jan 30, 2013

Triad Data Available Upon Request

Notes:

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CERTIFICATE OF ANALYSIS
Grade of Product: EPA Protocol

Part Number:	E02AI99E15A0094	Reference Number:	122-124371703-1
Cylinder Number:	SG9147169BAL	Cylinder Volume:	146.2 CF
Laboratory:	ASG - Durham - NC	Cylinder Pressure:	2015 PSIG
PGVP Number:	B22013	Valve Outlet:	590
Gas Code:	CO,BALA	Certification Date:	Apr 29, 2013

Expiration Date: Apr 29, 2021

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	237.5 PPM	231.4 PPM	G1	+/- 1.0% NIST Traceable	04/29/2013
AIR	Balance				

CALIBRATION STANDARDS

Type	Lot ID	Cylinder No	Concentration	Uncertainty	Expiration Date
NTRM	12060318	CC353951	249.3 PPM CARBON MONOXIDE/NITROGEN	+/- 0.4%	Oct 26, 2017

ANALYTICAL EQUIPMENT

Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
Horiba VIA510 CO RS2EGL6K	Nondispersive Infrared (NDIR)	Apr 12, 2013

Triad Data Available Upon Request

Notes:

Signature on file

Approved for Release

LIQUID TECHNOLOGY CORPORATION

"INDUSTRY LEADER IN SPECIALTY GASES"

Certificate of Analysis

- EPA PROTOCOL GAS -

* Extended Certificate *

Customer	Ambient Air Services (Starke, FL)
Date	June 21, 2011
Delivery Receipt	DR-37678
Gas Standard	400 - 500 ppm Carbon Monoxide/Air - EPA PROTOCOL
Final Analysis Date	June 14, 2011
Expiration Date	June 14, 2019
Component	Carbon Monoxide
Balance Gas	Air

Analytical Data: **DO NOT USE BELOW 150 psig**

EPA Protocol, Section No. 2.2, Procedure G-1

Replicate Concentrations

Carbon Monoxide: 461 ppm +/- 4.6 ppm

Air: Balance

Reference Standards:

SRM/GMIS:	GMIS	GMIS
Cylinder Number:	CC-185111	CC-92958
Concentration:	257.47 ppm CO/Nitrogen	508.66 ppm CO/Nitrogen
Expiration Date	10/22/12	09/23/12

Certification Instrumentation

Component:	Carbon Monoxide
Make/Model:	Horiba - VIA 510
Serial Number:	UUBKWXYV
Principal of Measurement:	NDIR
Last Calibration:	June 08, 2011

Cylinder Data

Cylinder Serial Number:	CC-158979	Cylinder Outlet:	CGA 590
Cylinder Volume:	98 Cubic Feet	Cylinder Pressure:	1400 psig, 70°F

Analytical Uncertainty and NIST Traceability are in compliance with EPA-600/R-12/531.

Certified by: David Scott

PGVP Vendor ID: E12013

* Extended shelf life established February 05, 2013

SPECIALTY GASES OF AMERICA, INC.
AMERICAN INDUSTRIAL GASES, INC.
AMERICAN RARE GASES, INC.

6055 BRENT DR. TOLEDO, OH 43611
419-729-7732 FAX 419-729-2411

THE AMERICAN GAS GROUP

www.americangasgroup.com

ANALYTICAL REPORT

Certificate ID:	072012011	**Date:**	7/20/2012
Customer Name:	Ambient Air Services, Inc		
Customer Address:	106 Ambient Airway		
	Starke FL 32091		
	904-964-8440		
Purchase Order:	DCS030912	**Work Order:**	133520-00
Lot Number:	0313HJ12	**Product Name:**	2-Component Mixture, EPA Protocol
Size:	AS	**Pressure:**	2070 psig @ 74 Deg F
Content:	Ven ID# C12012		
Serial #:	EB0014028		
Analysis Date:	4/2/2012		
Shelf Life:	24 months	**Expiration Date:**	4/2/2014

Component	Nominal	Actual	Accuracy	Method
Sulfur Dioxide	30.0 ppm	30.6 ppm	+/- 2% rel	NDUV
Air	Balance	Balance		

REFERENCE STANDARD	Std Type	Std #	Cyl #	Concentration	Exp Date
	GMIS	0118HI11	EB0024313	51.2000	2/2/2013

INSTRUMENTATION	Instrument / ID	Component
	Ametek WR Series 900	SO2

Note: * ANALYZED ACCORDING TO EPA TRACEABILITY PROTOCOL FOR ASSAY AND CERTIFICATION OF GASEOUS CALIBRATION STANDARDS - SEPTEMBER 1997:G1
* DO NOT USE STANDARD WHEN PRESSURE IS BELOW 150 PSIG

Protocal
Specialty Gases of America, Inc

Issued by: Josh Jones

SPECIALTY GASES OF AMERICA, INC.
AMERICAN INDUSTRIAL GASES, INC.
AMERICAN RARE GASES, INC.

6055 BRENT DR. TOLEDO, OH 43611
419-729-7732 FAX 419-729-2411

THE AMERICAN GAS GROUP

www.americangasgroup.com

ANALYTICAL REPORT

Certificate ID:	080912020	**Date:**	8/9/2012
Customer Name:	Ambient Air Services, Inc		
Customer Address:	106 Ambient Airway		
	Starke FL 32091		
	904-964-8440		
Purchase Order:	DCS 071912-2	**Work Order:**	980771-00
Lot Number:	0724HC12	**Product Name:**	2-Component Mixture, EPA Protocol
Size:	AS	**Pressure:**	2340psig @ 105 Deg F
Content:	Ven ID# C12012		
Serial #:	EB0022824		
Analysis Date:	8/7/2012		
Shelf Life:	24 months	**Expiration Date:**	8/7/2014

Component	Nominal	Actual	Accuracy	Method
Sulfur Dioxide	14-16 ppm	16.2 ppm	+/- 2% rel	NDUV
Air	Balance	Balance		

REFERENCE STANDARD	Std Type	Std #	Cyl #	Concentration	Exp Date
	GMIS	0118HI11	EB0024313	51.2000	2/2/2013

INSTRUMENTATION	Instrument / ID	Component
	Ametek WR Series 900	SO2

Note: * ANALYZED ACCORDING TO EPA TRACEABILITY PROTOCOL FOR ASSAY AND CERTIFICATION OF GASEOUS CALIBRATION STANDARDS - SEPTEMBER 1997:G1
* DO NOT USE STANDARD WHEN PRESSURE IS BELOW 150 PSIG

Protocal
Specialty Gases of America, Inc

Issued by: Josh Jones

Specialty Gases of America, Inc. QF051, Rev 0

APPENDIX C

VISIBLE EMISSIONS

Field Data Sheets

Observer Certificate

AASI
Ambient Air Services, Inc.
Environmental Consulting and Engineering

106 Ambient Airway
Starke, Florida 32091
Phone: (904) 964-8440 Fax: (904) 964-6675
www.ambientairservices.com

PAGE 1 OF 3
START TIME 0854 END TIME 0954
OBSERVATION DATE 7-10-13 TIME ZONE CDT

FACILITY Gerdau Jackson
SOURCE Meltshop Building
ADDRESS 801 Gerdau Ameristeel Road
CITY Jackson STATE TN ZIP 38301
PHONE 731-423-5274 SOURCE ID NO.
PROCESS EAF OPERATING MODE Batch
CONTROL EQUIP. canopy/DEC Ducts OPERATING MODE cont.
DESCRIBE EMISSION POINT meltshop roofline and cupola on top of roof

HEIGHT OF EMISSION POINT
START ~100 FT END same
HEIGHT RELATIVE TO OBSERVER
START ~100 FT END same

DISTANCE TO EMISSIONS POINT
START ~400 FT END same
DIRECTION TO EM. PT.
START 293° END same

VERTICAL ANGLE TO OBS. PT.
START 6° END same

DESCRIBE EMISSIONS
START smoke END same

EMISSION COLOR if any
START white END same
WATER DROPLET PLUME YES / (NO)
ATTACHED DETACHED

DESCRIBE PLUME BACKGROUND
START sky END same

BACKGROUND COLOR
START Blue/Grey END Grey
SKY CONDITION
START overcast to Broken END overcast

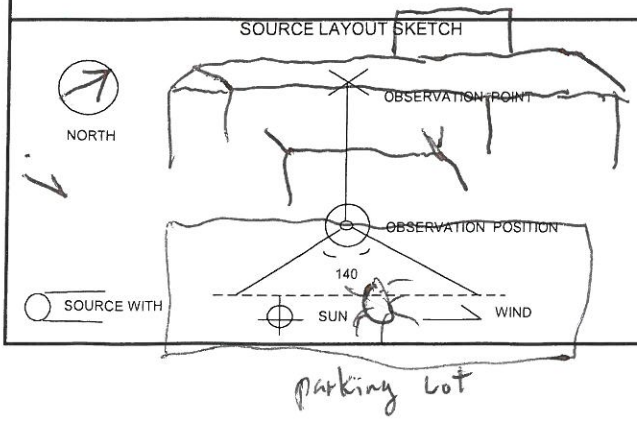
WIND SPEED
START 0-5 END 0-7
WIND DIRECTION
START SW END W

AMBIENT TEMPERATURE
START 85°F END 83°F
WET BULB TEMP —
%RH 76%

COMMENTS..... observer in employee parking lot.

SEC/MIN	0	15	30	45	SEC/MIN	0	15	30	45
1	0	0	0	0	31	0	0	0	0
2	0	0	0	0	32	0	0	0	0
3	0	0	0	0	33	0	0	0	0
4	0	0	0	0	34	0	0	0	0
5	0	0	0	0	35	0	0	0	0
6	0	0	0	0	36	0	0	0	0
7	0	0	0	0	37	0	0	0	0
8	0	0	0	0	38	0	0	0	0
9	0	0	0	0	39	0	0	0	0
10	0	0	0	0	40	0	0	0	0
11	0	0	0	0	41	0	0	0	0
12	0	0	0	0	42	0	0	0	0
13	0	0	0	0	43	0	0	0	0
14	0	0	0	0	44	0	0	0	0
15	0	0	0	0	45	0	0	0	0
16	0	0	0	0	46	0	0	0	0
17	0	0	0	0	47	0	0	0	0
18	0	0	0	0	48	0	0	0	0
19	0	0	0	0	49	0	0	0	0
20	0	0	0	0	50	0	0	0	0
21	0	0	0	0	51	0	0	0	0
22	0	0	0	0	52	0	0	0	0
23	0	0	0	0	53	0	0	0	0
24	0	0	0	0	54	0	0	0	0
25	0	0	0	0	55	0	0	0	0
26	0	0	0	0	56	0	0	0	0
27	0	0	0	0	57	0	0	0	5
28	0	0	0	0	58	5	5	5	5
29	0	0	0	0	59	0	0	0	0
30	0	0	0	0	60	0	0	0	0

SOURCE LAYOUT SKETCH



HIGHEST OPACITY FOR HIGHEST PERIOD: 1%

OBSERVER'S NAME (PRINT) David Sholtes
SIGNATURE David Sholtes DATE 7-10-13
ORGANIZATION AASI
CERTIFIED BY State of Georgia DATE April 16, 2013

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PAGE 2 OF 3

START TIME 0955 END TIME ~~0955~~ 1055

OBSERVATION DATE 7-10-13 TIME ZONE CDT

FACILITY Gerdau Jackson

SOURCE Meltshop Building

ADDRESS

CITY STATE ZIP

PHONE SOURCE ID NO.

PROCESS OPERATING MODE

CONTROL EQUIP. OPERATING MODE

DESCRIBE EMISSION POINT

HEIGHT OF EMISSION POINT START END

HEIGHT RELATIVE TO OBSERVER START END

DISTANCE TO EMISSIONS POINT START END

DIRECTION TO EM. PT. START END

VERTICAL ANGLE TO OBS. PT. START END

DESCRIBE EMISSIONS START END

EMISSION COLOR START END

WATER DROPLET PLUME YES (NO) ATTACHED DETACHED

DESCRIBE PLUME BACKGROUND START END

BACKGROUND COLOR START Gray END same

SKY CONDITION START Overcast END overcast

WIND SPEED START 0-7 END 0-5

WIND DIRECTION START W END W

AMBIENT TEMPERATURE START 83°F END 83°F

WET BULB TEMP —

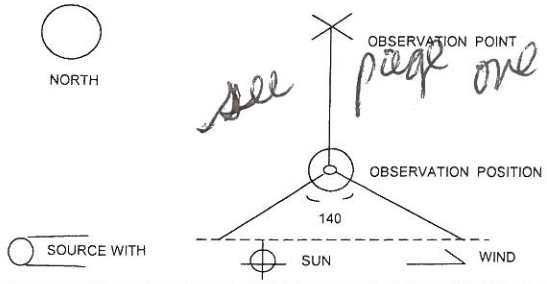
%RH 73%

COMMENTS.....

see page 1 of 3

SEC/MIN	0	15	30	45	SEC/MIN	0	15	30	45
1	15	15	10	10	31	0	0	0	0
2	0	0	0	0	32	0	0	0	0
3	0	0	0	0	33	0	0	0	0
4	0	0	0	0	34	0	0	0	0
5	0	0	0	0	35	0	0	0	0
6	0	0	0	0	36	0	0	0	0
7	0	0	0	0	37	0	0	0	0
8	0	0	0	0	38	0	0	0	0
9	0	0	0	0	39	0	0	0	0
10	0	0	0	0	40	0	0	0	0
11	0	0	0	0	41	0	0	0	0
12	0	0	0	0	42	0	0	0	0
13	0	0	0	0	43	0	0	0	0
14	0	0	0	0	44	0	0	0	0
15	0	0	0	0	45	0	0	0	0
16	0	0	0	0	46	0	0	0	0
17	0	0	0	0	47	0	0	0	0
18	0	0	0	0	48	0	0	0	0
19	0	0	0	0	49	0	0	0	0
20	0	0	0	0	50	0	0	0	0
21	0	0	0	0	51	10	5	5	0
22	0	0	0	0	52	0	0	0	0
23	0	0	0	0	53	0	0	0	0
24	0	0	0	0	54	0	0	0	0
25	0	0	0	0	55	0	0	0	0
26	0	0	0	0	56	0	0	0	0
27	0	0	0	0	57	0	0	0	0
28	0	0	0	0	58	0	0	0	0
29	0	0	0	0	59	0	0	0	0
30	0	0	0	0	60	0	0	0	0

SOURCE LAYOUT SKETCH



see page one of 3

HIGHEST OPACITY FOR HIGHEST PERIOD: 20%

OBSERVER'S NAME (PRINT) David Sholtes

SIGNATURE David Sholtes DATE 7-10-13

ORGANIZATION AASI

CERTIFIED BY State of Georgia DATE April 16, 2013

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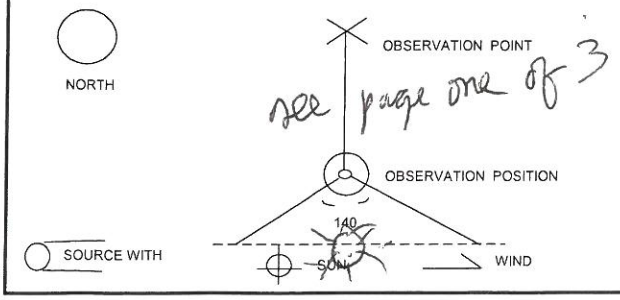
PAGE 3 OF 3
START TIME 1056 END TIME 1156
OBSERVATION DATE 7-10-13 TIME ZONE CDT

FACILITY Gerdau Jackson
SOURCE Meltshop
ADDRESS
CITY STATE ZIP
PHONE SOURCE ID NO.
PROCESS OPERATING MODE
CONTROL EQUIP. OPERATING MODE
DESCRIBE EMISSION POINT

HEIGHT OF EMISSION POINT START END
HEIGHT RELATIVE TO OBSERVER START 1 of 3 END
DISTANCE TO EMISSIONS POINT START END see page
DIRECTION TO EM. PT. START END
VERTICAL ANGLE TO OBS. PT. START SSE END
DESCRIBE EMISSIONS START END
EMISSION COLOR START White END
WATER DROPLET PLUME YES (NO) ATTACHED DETACHED
DESCRIBE PLUME BACKGROUND START END
BACKGROUND COLOR START Gray END Gray
SKY CONDITION START ~~Clear~~ Scattered END Overcast
WIND SPEED START 0-5 END 0-7
WIND DIRECTION START W END WNW
AMBIENT TEMPERATURE START 83°F END 85°F
WET BULB TEMP —
%RH 75%
COMMENTS.....

SEC/MIN	0	15	30	45	SEC/MIN	0	15	30	45
1	0	0	0	0	31	0	0	0	0
2	0	0	0	0	32	0	0	0	0
3	0	0	0	0	33	0	0	0	0
4	0	0	0	0	34	0	0	0	0
5	0	0	0	15	35	0	0	0	0
6	20	20	5	5	36	0	0	0	0
7	0	0	0	0	37	0	0	0	0
8	0	0	0	0	38	0	0	0	0
9	0	0	0	0	39	0	0	0	0
10	0	0	0	5	40	25	15	0	0
11	5	0	0	0	41	0	0	0	0
12	0	0	0	0	42	0	0	0	0
13	0	0	0	0	43	0	0	0	0
14	0	0	0	0	44	0	0	0	0
15	0	0	0	0	45	0	0	0	0
16	0	0	0	0	46	0	0	0	0
17	0	0	0	0	47	0	0	0	0
18	0	0	0	0	48	0	0	0	0
19	0	0	0	0	49	0	0	0	0
20	0	0	0	0	50	0	0	0	0
21	0	0	0	0	51	0	0	0	0
22	0	0	0	0	52	0	0	0	0
23	0	0	0	0	53	0	0	0	0
24	0	0	0	0	54	0	0	0	0
25	0	0	0	0	55	0	0	0	0
26	0	0	0	0	56	0	0	0	0
27	0	0	0	0	57	0	0	0	0
28	0	0	0	0	58	0	0	0	0
29	0	0	0	0	59	0	0	0	0
30	0	0	0	0	60	-			

SOURCE LAYOUT SKETCH



HIGHEST OPACITY FOR HIGHEST PERIOD: 3%
OBSERVER'S NAME (PRINT) David Sholtes
SIGNATURE David Sholtes DATE 7-10-13
ORGANIZATION AASI
CERTIFIED BY State of Georgia DATE April 1, 2013

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PAGE 1 OF 3

START TIME 1445 END TIME 1554

OBSERVATION DATE 7-10-13 TIME ZONE CDT

FACILITY Gerdau Jackson

SOURCE BH#1 outlet

ADDRESS 801 Gerdau Ameristeel Road

CITY Jackson STATE TN ZIP 38301

PHONE 731-423-5274 SOURCE ID NO.

PROCESS EAF OPERATING MODE Batch

CONTROL EQUIP. Baghouse OPERATING MODE Cont.

DESCRIBE EMISSION POINT Rectangular BH with Round cupola type outlet

HEIGHT OF EMISSION POINT START 100FT END Same

HEIGHT RELATIVE TO OBSERVER START 100 END Same

DISTANCE TO EMISSIONS POINT START 100 FT END same

DIRECTION TO EM. PT. START 70° END Same

VERTICAL ANGLE TO OBS. PT. START 18° END Same

DESCRIBE EMISSIONS START none seen END Same

EMISSION COLOR START none seen END Same

WATER DROPLET PLUME YES (NO) ATTACHED DETACHED

DESCRIBE PLUME BACKGROUND START Sky ~~Ductwork BH#1 BH#2~~ END Same (Sky)

BACKGROUND COLOR START Blue/Grey END Blue

SKY CONDITION START Scattered/cloudy END Clear

WIND SPEED START 0-6 END 0-10

WIND DIRECTION START WSW END W

AMBIENT TEMPERATURE START 90°F END 90°F

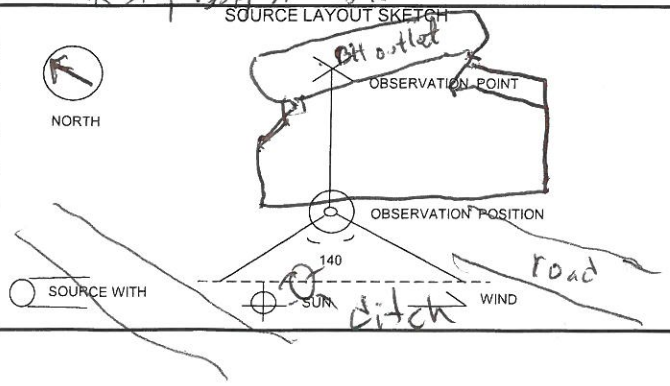
WET BULB TEMP

%RH 57%

COMMENTS..... observer located in ditch between shredder & BHouse.
* stop 1531, start 1541

SEC/MIN	0	15	30	45	SEC/MIN	0	15	30	45
1	0	0	0	0	31	0	0	0	0
2	0	0	0	0	32	0	0	0	0
3	0	0	0	0	33	0	0	0	0
4	0	0	0	0	34	0	0	0	0
5	0	0	0	0	35	0	0	0	0
6	0	0	0	0	36	0	0	0	0
7	0	0	0	0	37	0	0	0	0
8	0	0	0	0	38	0	0	0	0
9	0	0	0	0	39	0	0	0	0
10	0	0	0	0	40	0	0	0	0
11	0	0	0	0	41	0	0	0	0
12	0	0	0	0	42	0	0	0	0
13	0	0	0	0	43	0	0	0	0
14	0	0	0	0	44	0	0	0	0
15	0	0	0	0	45	0	0	0	0
16	0	0	0	0	*46	0	0	0	0
17	0	0	0	0	*47	0	0	0	0
18	0	0	0	0	48	0	0	0	0
19	0	0	0	0	49	0	0	0	0
20	0	0	0	0	50	0	0	0	0
21	0	0	0	0	51	0	0	0	0
22	0	0	0	0	52	0	0	0	0
23	0	0	0	0	53	0	0	0	0
24	0	0	0	0	54	0	0	0	0
25	0	0	0	0	55	0	0	0	0
26	0	0	0	0	56	0	0	0	0
27	0	0	0	0	57	0	0	0	0
28	0	0	0	0	58	0	0	0	0
29	0	0	0	0	59	0	0	0	0
30	0	0	0	0	60	0	0	0	

SOURCE LAYOUT SKETCH



HIGHEST OPACITY FOR HIGHEST PERIOD: 0

OBSERVER'S NAME (PRINT) David Sholtes

SIGNATURE David Sholtes DATE 7-10-13

ORGANIZATION AASI

CERTIFIED BY State of Georgia DATE April 16 2013

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PAGE 2 OF 3

START TIME 1556 END TIME 1656

OBSERVATION DATE 7-10-13 TIME ZONE CDT

FACILITY Gerdau Jackson

SOURCE BH #1 Outlet

ADDRESS

CITY STATE ZIP

PHONE SOURCE ID NO.

PROCESS OPERATING MODE

CONTROL EQUIP. OPERATING MODE

DESCRIBE EMISSION POINT

HEIGHT OF EMISSION POINT START END

HEIGHT RELATIVE TO OBSERVER START END

DISTANCE TO EMISSIONS POINT START END

DIRECTION TO EM. PT. START END

VERTICAL ANGLE TO OBS. PT. START see page 1 of 3 END

DESCRIBE EMISSIONS START END

EMISSION COLOR START END

WATER DROPLET PLUME YES / NO

ATTACHED DETACHED

DESCRIBE PLUME BACKGROUND START END

BACKGROUND COLOR START Blue END Blue/Gray

SKY CONDITION START Clear END Scattered

WIND SPEED START 0-10 END 0-9

WIND DIRECTION START West END SW

AMBIENT TEMPERATURE START 90°F END 90°F

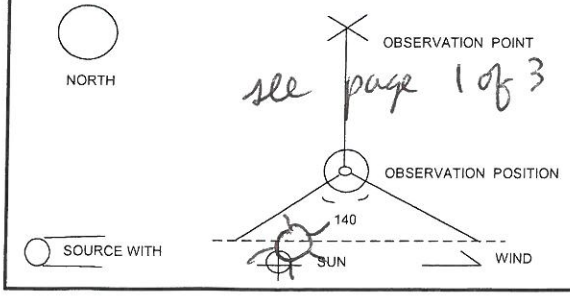
WET BULB TEMP —

%RH 59%

COMMENTS.....

SEC/MIN	0	15	30	45	SEC/MIN	0	15	30	45
1	0	0	0	0	31	0	0	0	0
2	0	0	0	0	32	0	0	0	0
3	0	0	0	0	33	0	0	0	0
4	0	0	0	0	34	0	0	0	0
5	0	0	0	0	35	0	0	0	0
6	0	0	0	0	36	0	0	0	0
7	0	0	0	0	37	0	0	0	0
8	0	0	0	0	38	0	0	0	0
9	0	0	0	0	39	0	0	0	0
10	0	0	0	0	40	0	0	0	0
11	0	0	0	0	41	0	0	0	0
12	0	0	0	0	42	0	0	0	0
13	0	0	0	0	43	0	0	0	0
14	0	0	0	0	44	0	0	0	0
15	0	0	0	0	45	0	0	0	0
16	0	0	0	0	46	0	0	0	0
17	0	0	0	0	47	0	0	0	0
18	0	0	0	0	48	0	0	0	0
19	0	0	0	0	49	0	0	0	0
20	0	0	0	0	50	0	0	0	0
21	0	0	0	0	51	0	0	0	0
22	0	0	0	0	52	0	0	0	0
23	0	0	0	0	53	0	0	0	0
24	0	0	0	0	54	0	0	0	0
25	0	0	0	0	55	0	0	0	0
26	0	0	0	0	56	0	0	0	0
27	0	0	0	0	57	0	0	0	0
28	0	0	0	0	58	0	0	0	0
29	0	0	0	0	59	0	0	0	0
30	0	0	0	0	60	0	0	0	0

SOURCE LAYOUT SKETCH



HIGHEST OPACITY FOR HIGHEST PERIOD: 0

OBSERVER'S NAME (PRINT) David Sholtes

SIGNATURE David Sholtes DATE 7-10-13

ORGANIZATION AASI

CERTIFIED BY State of Georgia DATE Apr 11 2013

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PAGE 3 OF 3

START TIME 1701 END TIME 1806

OBSERVATION DATE 7-10-13 TIME ZONE CDT

FACILITY Gerdau Jackson

SOURCE BH #1 outlet

ADDRESS

CITY STATE ZIP

PHONE SOURCE ID NO.

PROCESS OPERATING MODE

CONTROL EQUIP. OPERATING MODE

DESCRIBE EMISSION POINT

HEIGHT OF EMISSION POINT START END

HEIGHT RELATIVE TO OBSERVER START END

DISTANCE TO EMISSIONS POINT START END

DIRECTION TO EM. PT. START 3 END

VERTICAL ANGLE TO OBS. PT. START see page 1 of END

DESCRIBE EMISSIONS START END

EMISSION COLOR START END

WATER DROPLET PLUME YES / NO ATTACHED DETACHED

DESCRIBE PLUME BACKGROUND START END

BACKGROUND COLOR START Blue/Grey END Same

SKY CONDITION START Scattered END Scattered

WIND SPEED START 0-9 END 0-10

WIND DIRECTION START SW END SW

AMBIENT TEMPERATURE START 90°F END 90°F

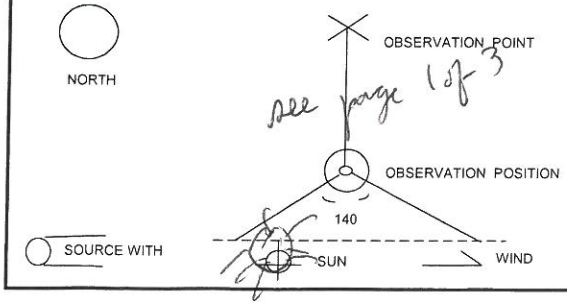
WET BULB TEMP —

%RH 61%

COMMENTS..... * Stop 1752
* Start 1758

SEC/MIN	0	15	30	45	SEC/MIN	0	15	30	45
1	0	0	0	0	31	0	0	0	0
2	0	0	0	0	32	0	0	0	0
3	0	0	0	0	33	0	0	0	0
4	0	0	0	0	34	0	0	0	0
5	0	0	0	0	35	0	0	0	0
6	0	0	0	0	36	0	0	0	0
7	0	0	0	0	37	0	0	0	0
8	0	0	0	0	38	0	0	0	0
9	0	0	0	0	39	0	0	0	0
10	0	0	0	0	40	0	0	0	0
11	0	0	0	0	41	0	0	0	0
12	0	0	0	0	42	0	0	0	0
13	0	0	0	0	43	0	0	0	0
14	0	0	0	0	44	0	0	0	0
15	0	0	0	0	45	0	0	0	0
16	0	0	0	0	46	0	0	0	0
17	0	0	0	0	47	0	0	0	0
18	0	0	0	0	48	0	0	0	0
19	0	0	0	0	49	0	0	0	0
20	0	0	0	0	50	0	0	0	0
21	0	0	0	0	* 51	0	0	0	0
22	0	0	0	0	* 52	0	0	0	0
23	0	0	0	0	53	0	0	0	0
24	0	0	0	0	54	0	0	0	0
25	0	0	0	0	55	0	0	0	0
26	0	0	0	0	56	0	0	0	0
27	0	0	0	0	57	0	0	0	0
28	0	0	0	0	58	0	0	0	0
29	0	0	0	0	59	0	0	0	0
30	0	0	0	0	60	0	0	0	0

SOURCE LAYOUT SKETCH



HIGHEST OPACITY FOR HIGHEST PERIOD: 0

OBSERVER'S NAME (PRINT) David Sholtes

SIGNATURE David Sholtes DATE 7-10-13

ORGANIZATION AASI

CERTIFIED BY State of Georgia DATE April 16, 2013

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PAGE 1 OF 3
START TIME 1445 END TIME 1554
OBSERVATION DATE 7-10-13 TIME ZONE CDT

FACILITY Gerdau Jackson
SOURCE BH #1 Dust Handling System
ADDRESS 801 Gerdau Ameristeel Road
CITY Jackson STATE TN ZIP 38301
PHONE 731-423-5274 SOURCE ID NO.
PROCESS EAF OPERATING MODE Batch
CONTROL EQUIP. Baghouse DHS OPERATING MODE cont.
DESCRIBE EMISSION POINT Brick building next to BH #1 on West side of BH.

HEIGHT OF EMISSION POINT
START ~30 FT END same
HEIGHT RELATIVE TO OBSERVER
START ~30FT END same

DISTANCE TO EMISSIONS POINT
START ~100FT END same
DIRECTION TO EM. PT.
START 50° END same

VERTICAL ANGLE TO OBS. PT.
START 6 END same

DESCRIBE EMISSIONS
START none seen END same

EMISSION COLOR
START none END same
WATER DROPLET PLUME YES (NO)
ATTACHED DETACHED

DESCRIBE PLUME BACKGROUND
START BH #2 ductwork END same

BACKGROUND COLOR
START Grayish white END same
SKY CONDITION
START scattered/cloudy END Clear

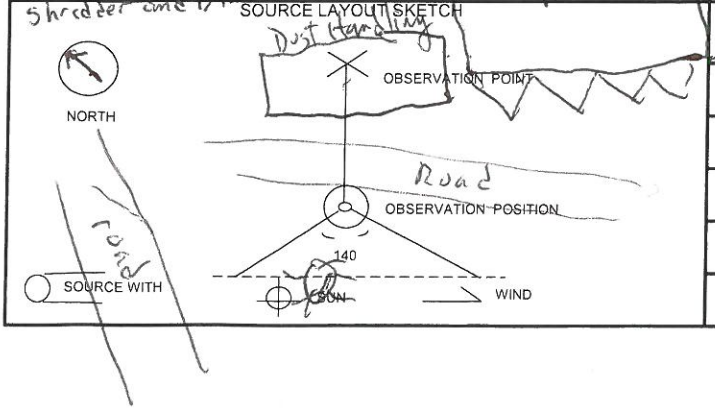
WIND SPEED
START 0-6 END 0-10
WIND DIRECTION
START WSW END W

AMBIENT TEMPERATURE
START 90°F END 90°F
WET BULB TEMP —
%RH 57%

COMMENTS..... observer in Ditch between shredder and BH House
stop 1531 - not enough Ladles
start 1541

SEC/MIN	0	15	30	45	SEC/MIN	0	15	30	45
1	0	0	0	0	31	0	0	0	0
2	0	0	0	0	32	0	0	0	0
3	0	0	0	0	33	0	0	0	0
4	0	0	0	0	34	0	0	0	0
5	0	0	0	0	35	0	0	0	0
6	0	0	0	0	36	0	0	0	0
7	0	0	0	0	37	0	0	0	0
8	0	0	0	0	38	0	0	0	0
9	0	0	0	0	39	0	0	0	0
10	0	0	0	0	40	0	0	0	0
11	0	0	0	0	41	0	0	0	0
12	0	0	0	0	42	0	0	0	0
13	0	0	0	0	43	0	0	0	0
14	0	0	0	0	44	0	0	0	0
15	0	0	0	0	45	0	0	0	0
16	0	0	0	0	*46	0	0	0	0
17	0	0	0	0	*47	0	0	0	0
18	0	0	0	0	48	0	0	0	0
19	0	0	0	0	49	0	0	0	0
20	0	0	0	0	50	0	0	0	0
21	0	0	0	0	51	0	0	0	0
22	0	0	0	0	52	0	0	0	0
23	0	0	0	0	53	0	0	0	0
24	0	0	0	0	54	0	0	0	0
25	0	0	0	0	55	0	0	0	0
26	0	0	0	0	56	0	0	0	0
27	0	0	0	0	57	0	0	0	0
28	0	0	0	0	58	0	0	0	0
29	0	0	0	0	59	0	0	0	0
30	0	0	0	0	60	0	0	0	

SOURCE LAYOUT SKETCH



HIGHEST OPACITY FOR HIGHEST PERIOD: Ø

OBSERVER'S NAME (PRINT) David Shotts
SIGNATURE David Shotts DATE 7-10-13
ORGANIZATION AASI
CERTIFIED BY State of Georgia DATE April 16, 2013

Method 9 VE
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AASI
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PAGE 2 OF 3

START TIME 1556 END TIME 1696

OBSERVATION DATE 7-10-13 TIME ZONE CDT

FACILITY Gerdau Jackson

SOURCE BH #1 Dust Handling System

ADDRESS

CITY STATE ZIP

PHONE SOURCE ID NO.

PROCESS OPERATING MODE

CONTROL EQUIP. OPERATING MODE

DESCRIBE EMISSION POINT

HEIGHT OF EMISSION POINT START END

HEIGHT RELATIVE TO OBSERVER START END

DISTANCE TO EMISSIONS POINT START END

DIRECTION TO EM. PT. START END

VERTICAL ANGLE TO OBS. PT. START see page 1 of 3 END

DESCRIBE EMISSIONS START END

EMISSION COLOR START END

WATER DROPLET PLUME YES / NO ATTACHED DETACHED

DESCRIBE PLUME BACKGROUND START END

BACKGROUND COLOR START Blue END Blue/Gray

SKY CONDITION START Clear END Scattered

WIND SPEED START 0-10 END 0-9

WIND DIRECTION START W END SW

AMBIENT TEMPERATURE START 90 END 90°F

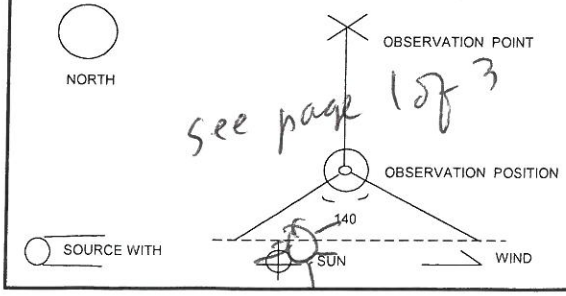
WET BULB TEMP —

%RH 59%

COMMENTS.....

SEC/MIN	0	15	30	45	SEC/MIN	0	15	30	45
1	0	0	0	0	31	0	0	0	0
2	0	0	0	0	32	0	0	0	0
3	0	0	0	0	33	0	0	0	0
4	0	0	0	0	34	0	0	0	0
5	0	0	0	0	35	0	0	0	0
6	0	0	0	0	36	0	0	0	0
7	0	0	0	0	37	0	0	0	0
8	0	0	0	0	38	0	0	0	0
9	0	0	0	0	39	0	0	0	0
10	0	0	0	0	40	0	0	0	0
11	0	0	0	0	41	0	0	0	0
12	0	0	0	0	42	0	0	0	0
13	0	0	0	0	43	0	0	0	0
14	0	0	0	0	44	0	0	0	0
15	0	0	0	0	45	0	0	0	0
16	0	0	0	0	46	0	0	0	0
17	0	0	0	0	47	0	0	0	0
18	0	0	0	0	48	0	0	0	0
19	0	0	0	0	49	0	0	0	0
20	0	0	0	0	50	0	0	0	0
21	0	0	0	0	51	0	0	0	0
22	0	0	0	0	52	0	0	0	0
23	0	0	0	0	53	0	0	0	0
24	0	0	0	0	54	0	0	0	0
25	0	0	0	0	55	0	0	0	0
26	0	0	0	0	56	0	0	0	0
27	0	0	0	0	57	0	0	0	0
28	0	0	0	0	58	0	0	0	0
29	0	0	0	0	59	0	0	0	0
30	0	0	0	0	60	0	0	0	0

SOURCE LAYOUT SKETCH



HIGHEST OPACITY FOR HIGHEST PERIOD: 0

OBSERVER'S NAME (PRINT) David Sholtes

SIGNATURE David Sholtes DATE 7-10-13

ORGANIZATION AASI

CERTIFIED BY State of Georgia DATE April 16, 2013

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PAGE 3 OF 3
START TIME 1701 END TIME 1806
OBSERVATION DATE 7-10-13 TIME ZONE CDT

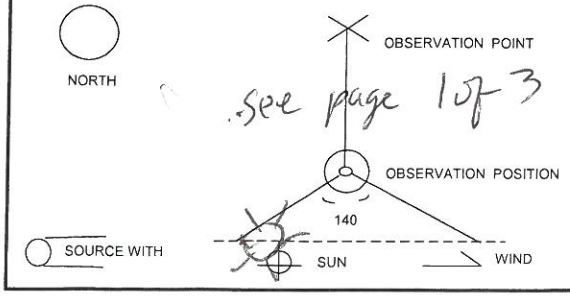
FACILITY Gerdau Jackson
SOURCE BH #1 Dust Handling System
ADDRESS
CITY STATE ZIP
PHONE SOURCE ID NO.
PROCESS OPERATING MODE
CONTROL EQUIP. OPERATING MODE
DESCRIBE EMISSION POINT

HEIGHT OF EMISSION POINT START END
HEIGHT RELATIVE TO OBSERVER START END
DISTANCE TO EMISSIONS POINT START END
DIRECTION TO EM. PT. START END
VERTICAL ANGLE TO OBS. PT. START END
DESCRIBE EMISSIONS START see page 1 of 3 END
EMISSION COLOR START END
WATER DROPLET PLUME YES (NO) ATTACHED DETACHED
DESCRIBE PLUME BACKGROUND START END
BACKGROUND COLOR START Blue/Gray END same
SKY CONDITION START Scattered END same
WIND SPEED START 0-9 END 0-10
WIND DIRECTION START SW END SW
AMBIENT TEMPERATURE START 90°F END 90°F
WET BULB TEMP —
%RH 61%

COMMENTS.....
* Stop 1752
* Start 1758

SEC/MIN	0	15	30	45	SEC/MIN	0	15	30	45
1	0	0	0	0	31	0	0	0	0
2	0	0	0	0	32	0	0	0	0
3	0	0	0	0	33	0	0	0	0
4	0	0	0	0	34	0	0	0	0
5	0	0	0	0	35	0	0	0	0
6	0	0	0	0	36	0	0	0	0
7	0	0	0	0	37	0	0	0	0
8	0	0	0	0	38	0	0	0	0
9	0	0	0	0	39	0	0	0	0
10	0	0	0	0	40	0	0	0	0
11	0	0	0	0	41	0	0	0	0
12	0	0	0	0	42	0	0	0	0
13	0	0	0	0	43	0	0	0	0
14	0	0	0	0	44	0	0	0	0
15	0	0	0	0	45	0	0	0	0
16	0	0	0	0	46	0	0	0	0
17	0	0	0	0	47	0	0	0	0
18	0	0	0	0	48	0	0	0	0
19	0	0	0	0	49	0	0	0	0
20	0	0	0	0	50	0	0	0	0
21	0	0	0	0	X 51	0	0	0	0
22	0	0	0	0	X 52	0	0	0	0
23	0	0	0	0	53	0	0	0	0
24	0	0	0	0	54	0	0	0	0
25	0	0	0	0	55	0	0	0	0
26	0	0	0	0	56	0	0	0	0
27	0	0	0	0	57	0	0	0	0
28	0	0	0	0	58	0	0	0	0
29	0	0	0	0	59	0	0	0	0
30	0	0	0	0	60	0	0	0	0

SOURCE LAYOUT SKETCH



HIGHEST OPACITY FOR HIGHEST PERIOD: 0

OBSERVER'S NAME (PRINT) David Sholtes
SIGNATURE David Sholtes DATE 7-10-13
ORGANIZATION AASI
CERTIFIED BY State of Georgia DATE April 16 2013

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PAGE 1 OF

START TIME 0913 END TIME 1013

OBSERVATION DATE 7-11-13 TIME ZONE CDT

FACILITY Gerdau Jackson

SOURCE BH#2 outlet

ADDRESS 801 Gerdau Ameristeel Road

CITY Jackson STATE TN ZIP

PHONE 731-423-5274 SOURCE ID NO.

PROCESS EAF OPERATING MODE Batch

CONTROL EQUIP. Baghouse OPERATING MODE Cont

DESCRIBE EMISSION POINT Rectangular roof outlet - part of round cupola on top of BH

HEIGHT OF EMISSION POINT START ~100-120FT END Same

HEIGHT RELATIVE TO OBSERVER START ~100-120FT END Same

DISTANCE TO EMISSIONS POINT START ~200FT END Same

DIRECTION TO EM. PT. START 307° END Same

VERTICAL ANGLE TO OBS. PT. START 16° END Same

DESCRIBE EMISSIONS START none seen END Same

EMISSION COLOR START none seen END Same

WATER DROPLET PLUME YES (NO) ATTACHED DETACHED

DESCRIBE PLUME BACKGROUND START Sky END Same

BACKGROUND COLOR START Blue END Same

SKY CONDITION START clear END ~~Same~~ cloudy

WIND SPEED START 0-6 END Same

WIND DIRECTION START NNE END Same

AMBIENT TEMPERATURE START 86°F END

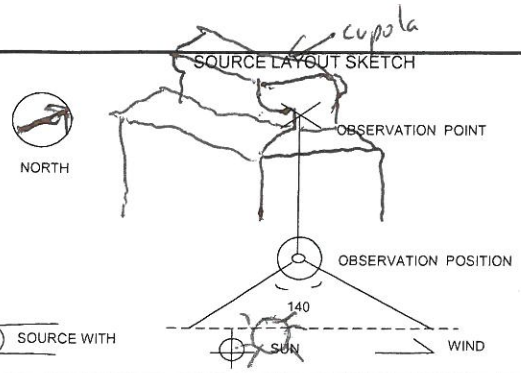
WET BULB TEMP —

%RH 65%

SEC/MIN	0	15	30	45	SEC/MIN	0	15	30	45
1	0	0	0	0	31	0	0	0	0
2	0	0	0	0	32	0	0	0	0
3	0	0	0	0	33	0	0	0	0
4	0	0	0	0	34	0	0	0	0
5	0	0	0	0	35	0	0	0	0
6	0	0	0	0	36	0	0	0	0
7	0	0	0	0	37	0	0	0	0
8	0	0	0	0	38	0	0	0	0
9	0	0	0	0	39	0	0	0	0
10	0	0	0	0	40	0	0	0	0
11	0	0	0	0	41	0	0	0	0
12	0	0	0	0	42	0	0	0	0
13	0	0	0	0	43	0	0	0	0
14	0	0	0	0	44	0	0	0	0
15	0	0	0	0	45	0	0	0	0
16	0	0	0	0	46	0	0	0	0
17	0	0	0	0	47	0	0	0	0
18	0	0	0	0	48	0	0	0	0
19	0	0	0	0	49	0	0	0	0
20	0	0	0	0	50	0	0	0	0
21	0	0	0	0	51	0	0	0	0
22	0	0	0	0	52	0	0	0	0
23	0	0	0	0	53	0	0	0	0
24	0	0	0	0	54	0	0	0	0
25	0	0	0	0	55	0	0	0	0
26	0	0	0	0	56	0	0	0	0
27	0	0	0	0	57	0	0	0	0
28	0	0	0	0	58	0	0	0	0
29	0	0	0	0	59	0	0	0	0
30	0	0	0	0	60	0	0	0	0

COMMENTS.....

SOURCE LAYOUT SKETCH



HIGHEST OPACITY FOR HIGHEST PERIOD: 0

OBSERVER'S NAME (PRINT) David Shotts

SIGNATURE David Shotts DATE 7-11-13

ORGANIZATION AASI

CERTIFIED BY State of Georgia DATE April 16 2013

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PAGE 2 OF 3

START TIME 1018 END TIME 1118

OBSERVATION DATE 7-11-13 TIME ZONE CDT

FACILITY Gerdau Jackson

SOURCE BH #2 Outlet

ADDRESS

CITY STATE ZIP

PHONE SOURCE ID NO.

PROCESS OPERATING MODE

CONTROL EQUIP. OPERATING MODE

DESCRIBE EMISSION POINT

HEIGHT OF EMISSION POINT START END

HEIGHT RELATIVE TO OBSERVER START END

DISTANCE TO EMISSIONS POINT START See END

DIRECTION TO EM. PT. START END

VERTICAL ANGLE TO OBS. PT. START END

page 1 of 3

DESCRIBE EMISSIONS START END

EMISSION COLOR START END

WATER DROPLET PLUME YES / NO ATTACHED DETACHED

DESCRIBE PLUME BACKGROUND START END

BACKGROUND COLOR START END

SKY CONDITION START overcast END overcast

WIND SPEED START 0-6 END 0-4

WIND DIRECTION START NNE END Var.

AMBIENT TEMPERATURE START 87°F END 89°F

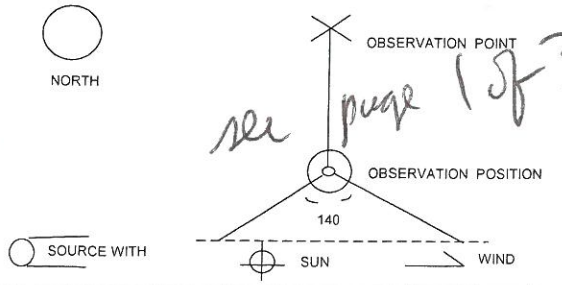
WET BULB TEMP —

%RH 63

COMMENTS.....

SEC/MIN	0	15	30	45	SEC/MIN	0	15	30	45
1	0	0	0	0	31	0	0	0	0
2	0	0	0	0	32	0	0	0	0
3	0	0	0	0	33	0	0	0	0
4	0	0	0	0	34	0	0	0	0
5	0	0	0	0	35	0	0	0	0
6	0	0	0	0	36	0	0	0	0
7	0	0	0	0	37	0	0	0	0
8	0	0	0	0	38	0	0	0	0
9	0	0	0	0	39	0	0	0	0
10	0	0	0	0	40	0	0	0	0
11	0	0	0	0	41	0	0	0	0
12	0	0	0	0	42	0	0	0	0
13	0	0	0	0	43	0	0	0	0
14	0	0	0	0	44	0	0	0	0
15	0	0	0	0	45	0	0	0	0
16	0	0	0	0	46	0	0	0	0
17	0	0	0	0	47	0	0	0	0
18	0	0	0	0	48	0	0	0	0
19	0	0	0	0	49	0	0	0	0
20	0	0	0	0	50	0	0	0	0
21	0	0	0	0	51	0	0	0	0
22	0	0	0	0	52	0	0	0	0
23	0	0	0	0	53	0	0	0	0
24	0	0	0	0	54	0	0	0	0
25	0	0	0	0	55	0	0	0	0
26	0	0	0	0	56	0	0	0	0
27	0	0	0	0	57	0	0	0	0
28	0	0	0	0	58	0	0	0	0
29	0	0	0	0	59	0	0	0	0
30	0	0	0	0	60	0	0	0	0

SOURCE LAYOUT SKETCH



HIGHEST OPACITY FOR HIGHEST PERIOD: 0

OBSERVER'S NAME (PRINT) David Shelter

SIGNATURE David Shelter DATE 7-11-13

ORGANIZATION AASI

CERTIFIED BY State of Georgia DATE April 16, 2013

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PAGE 3 OF 3

START TIME 1132 END TIME 1235

OBSERVATION DATE 7-11-13 TIME ZONE EDT

FACILITY Gerdau Jackson

SOURCE BH #2 Outlet

ADDRESS

CITY STATE ZIP

PHONE SOURCE ID NO.

PROCESS OPERATING MODE

CONTROL EQUIP. OPERATING MODE

DESCRIBE EMISSION POINT Pipe plume 1 of 3

HEIGHT OF EMISSION POINT START END

HEIGHT RELATIVE TO OBSERVER START END

DISTANCE TO EMISSIONS POINT START END

DIRECTION TO EM. PT. START END

VERTICAL ANGLE TO OBS. PT. START 16° END

DESCRIBE EMISSIONS START END

EMISSION COLOR START END

WATER DROPLET PLUME YES / NO ATTACHED DETACHED

DESCRIBE PLUME BACKGROUND START Sky END

BACKGROUND COLOR START Gray END Blue Gray

SKY CONDITION START Cloudy END Broken

WIND SPEED START 0-7 END 0-5

WIND DIRECTION START NNE END NNE

AMBIENT TEMPERATURE START 86°F END 88°F

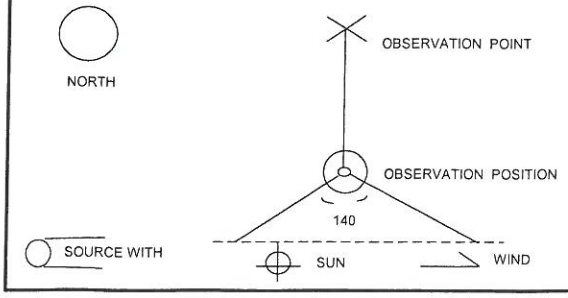
WET BULB TEMP —

%RH 64%

COMMENTS..... Stop 1151
Start 1154

SEC/MIN	0	15	30	45	SEC/MIN	0	15	30	45
1	0	0	0	0	31	0	0	0	0
2	0	0	0	0	32	0	0	0	0
3	0	0	0	0	33	0	0	0	0
4	0	0	0	0	34	0	0	0	0
5	0	0	0	0	35	0	0	0	0
6	0	0	0	0	36	0	0	0	0
7	0	0	0	0	37	0	0	0	0
8	0	0	0	0	38	0	0	0	0
9	0	0	0	0	39	0	0	0	0
10	0	0	0	0	40	0	0	0	0
11	0	0	0	0	41	0	0	0	0
12	0	0	0	0	42	0	0	0	0
13	0	0	0	0	43	0	0	0	0
14	0	0	0	0	44	0	0	0	0
15	0	0	0	0	45	0	0	0	0
16	0	0	0	0	46	0	0	0	0
17	0	0	0	0	47	0	0	0	0
18	0	0	0	0	48	0	0	0	0
19	0	0	0	0	49	0	0	0	0
*20	0	0	0	0	50	0	0	0	0
*21	0	0	0	0	51	0	0	0	0
22	0	0	0	0	52	0	0	0	0
23	0	0	0	0	53	0	0	0	0
24	0	0	0	0	54	0	0	0	0
25	0	0	0	0	55	0	0	0	0
26	0	0	0	0	56	0	0	0	0
27	0	0	0	0	57	0	0	0	0
28	0	0	0	0	58	0	0	0	0
29	0	0	0	0	59	0	0	0	0
30	0	0	0	0	60	0	0	0	0

SOURCE LAYOUT SKETCH



HIGHEST OPACITY FOR HIGHEST PERIOD: 0

OBSERVER'S NAME (PRINT) David Shelter

SIGNATURE David Shelter DATE 7-11-13

ORGANIZATION AASI

CERTIFIED BY State of Georgia DATE Apr. 16 2013

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PAGE 1 OF 3
START TIME 0913 END TIME 1013
OBSERVATION DATE 7-11-13 TIME ZONE CDT

FACILITY Gerdau Jackson
SOURCE BH#2 Dust Handling
ADDRESS 801 Gerdau Ameristeel Road
CITY Jackson STATE TN ZIP 38301
PHONE 731-423-5274 SOURCE ID NO.
PROCESS EAF OPERATING MODE Batch
CONTROL EQUIP. Silo OPERATING MODE cont.
DESCRIBE EMISSION POINT Round, white painted steel silo on building roof, RR car going thru building

HEIGHT OF EMISSION POINT
START ~90FT END same
HEIGHT RELATIVE TO OBSERVER
START ~90FT END same

DISTANCE TO EMISSIONS POINT
START ~200FT END same
DIRECTION TO EM. PT.
START 10° END same

VERTICAL ANGLE TO OBS. PT.
START 18° END same

DESCRIBE EMISSIONS
START none seen END same

EMISSION COLOR
START none END same
WATER DROPLET PLUME YES / (NO)
ATTACHED DETACHED

DESCRIBE PLUME BACKGROUND
START sky END sky

BACKGROUND COLOR
START Blue END Gray
SKY CONDITION
START clear END Broken

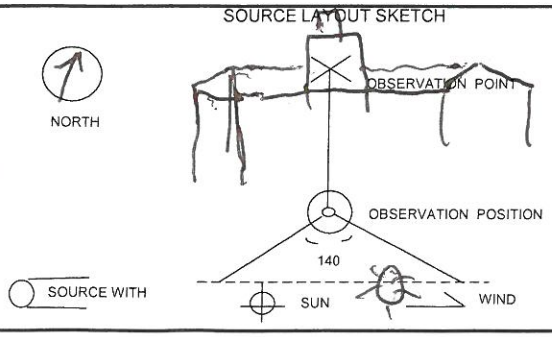
WIND SPEED
START 0 END 0-6
WIND DIRECTION
START Calm END NNW

AMBIENT TEMPERATURE
START 84°F END 89°F
WET BULB TEMP —
%RH 69%

COMMENTS.....

SEC/MIN	0	15	30	45	SEC/MIN	0	15	30	45
1	0	0	0	0	31	0	0	0	0
2	0	0	0	0	32	0	0	0	0
3	0	0	0	0	33	0	0	0	0
4	0	0	0	0	34	0	0	0	0
5	0	0	0	0	35	0	0	0	0
6	0	0	0	0	36	0	0	0	0
7	0	0	0	0	37	0	0	0	0
8	0	0	0	0	38	0	0	0	0
9	0	0	0	0	39	0	0	0	0
10	0	0	0	0	40	0	0	0	0
11	0	0	0	0	41	0	0	0	0
12	0	0	0	0	42	0	0	0	0
13	0	0	0	0	43	0	0	0	0
14	0	0	0	0	44	0	0	0	0
15	0	0	0	0	45	0	0	0	0
16	0	0	0	0	46	0	0	0	0
17	0	0	0	0	47	0	0	0	0
18	0	0	0	0	48	0	0	0	0
19	0	0	0	0	49	0	0	0	0
20	0	0	0	0	50	0	0	0	0
21	0	0	0	0	51	0	0	0	0
22	0	0	0	0	52	0	0	0	0
23	0	0	0	0	53	0	0	0	0
24	0	0	0	0	54	0	0	0	0
25	0	0	0	0	55	0	0	0	0
26	0	0	0	0	56	0	0	0	0
27	0	0	0	0	57	0	0	0	0
28	0	0	0	0	58	0	0	0	0
29	0	0	0	0	59	0	0	0	0
30	0	0	0	0	60	0	0	0	0

SOURCE LAYOUT SKETCH



HIGHEST OPACITY FOR HIGHEST PERIOD: 0

OBSERVER'S NAME (PRINT) David Sholtes
SIGNATURE David Sholtes DATE 7-11-13
ORGANIZATION AASI
CERTIFIED BY State of Georgia DATE Apr. 17 2013

Method 9 VE
Form
021907

AASI
Ambient Air Services, Inc.
Environmental Consulting and Engineering

106 Ambient Airway
Starke, Florida 32091
Phone: (904) 964-8440 Fax: (904) 964-6675
www.ambientairservices.com

PAGE 2 OF 3

START TIME 1018 END TIME 1118

OBSERVATION DATE 7-11-13 TIME ZONE CDT

FACILITY Gerdau Jackson

SOURCE BH #2 Dust Handling

ADDRESS

CITY STATE ZIP

PHONE SOURCE ID NO.

PROCESS OPERATING MODE

CONTROL EQUIP. OPERATING MODE

DESCRIBE EMISSION POINT

HEIGHT OF EMISSION POINT — START END see page 1 of 3

HEIGHT RELATIVE TO OBSERVER — START END

DISTANCE TO EMISSIONS POINT — START END

DIRECTION TO EM. PT. — START END

VERTICAL ANGLE TO OBS. PT. — START END

DESCRIBE EMISSIONS — START END

EMISSION COLOR — START END

WATER DROPLET PLUME YES / NO — ATTACHED DETACHED

DESCRIBE PLUME BACKGROUND — START END

BACKGROUND COLOR — START Blue/Gray END Blue/Gray

SKY CONDITION — START Broken END Broken/Cloudy

WIND SPEED — START 0-6 END 0-7 ~~0-5~~ mph

WIND DIRECTION — START NNW END NNE ~~South~~

AMBIENT TEMPERATURE — START 85°F END 86°F

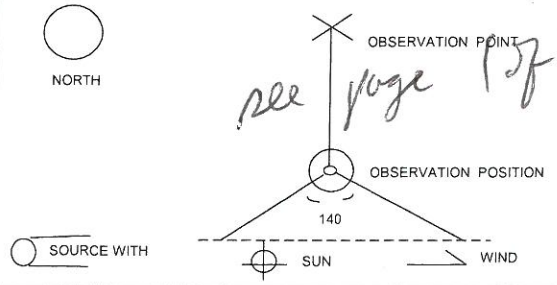
WET BULB TEMP —

%RH 67

COMMENTS.....

SEC/MIN	0	15	30	45	SEC/MIN	0	15	30	45
1	0	0	0	0	31	0	0	0	0
2	0	0	0	0	32	0	0	0	0
3	0	0	0	0	33	0	0	0	0
4	0	0	0	0	34	0	0	0	0
5	0	0	0	0	35	0	0	0	0
6	0	0	0	0	36	0	0	0	0
7	0	0	0	0	37	0	0	0	0
8	0	0	0	0	38	0	0	0	0
9	0	0	0	0	39	0	0	0	0
10	0	0	0	0	40	0	0	0	0
11	0	0	0	0	41	0	0	0	0
12	0	0	0	0	42	0	0	0	0
13	0	0	0	0	43	0	0	0	0
14	0	0	0	0	44	0	0	0	0
15	0	0	0	0	45	0	0	0	0
16	0	0	0	0	46	0	0	0	0
17	0	0	0	0	47	0	0	0	0
18	0	0	0	0	48	0	0	0	0
19	0	0	0	0	49	0	0	0	0
20	0	0	0	0	50	0	0	0	0
21	0	0	0	0	51	0	0	0	0
22	0	0	0	0	52	0	0	0	0
23	0	0	0	0	53	0	0	0	0
24	0	0	0	0	54	0	0	0	0
25	0	0	0	0	55	0	0	0	0
26	0	0	0	0	56	0	0	0	0
27	0	0	0	0	57	0	0	0	0
28	0	0	0	0	58	0	0	0	0
29	0	0	0	0	59	0	0	0	0
30	0	0	0	0	60	0	0	0	0

SOURCE LAYOUT SKETCH



HIGHEST OPACITY FOR HIGHEST PERIOD: 0

OBSERVER'S NAME (PRINT) David Sholtes

SIGNATURE David Sholtes DATE 7-11-13

ORGANIZATION AASI

CERTIFIED BY State of Georgia DATE April 16, 2013

Method 9 VE
Form
021907

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PAGE 3 OF 3

START TIME 1132 END TIME 1235

OBSERVATION DATE 7-11-13 TIME ZONE CDT

FACILITY Gerdau Jackson

SOURCE BH #2 Dust Handling System

ADDRESS

CITY STATE ZIP

PHONE SOURCE ID NO.

PROCESS OPERATING MODE

CONTROL EQUIP. OPERATING MODE

DESCRIBE EMISSION POINT Silo

Page 1 of 3

HEIGHT OF EMISSION POINT START END

HEIGHT RELATIVE TO OBSERVER START END

DISTANCE TO EMISSIONS POINT START 225 END

DIRECTION TO EM. PT. START END

VERTICAL ANGLE TO OBS. PT. START 19° END

DESCRIBE EMISSIONS START END

EMISSION COLOR START END

WATER DROPLET PLUME YES / NO ATTACHED DETACHED

DESCRIBE PLUME BACKGROUND START END

BACKGROUND COLOR START Gray END Blue Gray

SKY CONDITION START Cloudy END Broken

WIND SPEED START 0-7 END 0-5

WIND DIRECTION START NNE END NNE

AMBIENT TEMPERATURE START 86°F END 88°F

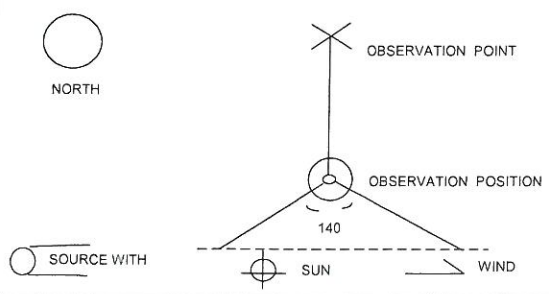
WET BULB TEMP —

%RH 64%

COMMENTS..... Stop 1151 waiting on caster
Start 1154

SEC/MIN	0	15	30	45	SEC/MIN	0	15	30	45
1	0	0	0	0	31	0	0	0	0
2	0	0	0	0	32	0	0	0	0
3	0	0	0	0	33	0	0	0	0
4	0	0	0	0	34	0	0	0	0
5	0	0	0	0	35	0	0	0	0
6	0	0	0	0	36	0	0	0	0
7	0	0	0	0	37	0	0	0	0
8	0	0	0	0	38	0	0	0	0
9	0	0	0	0	39	0	0	0	0
10	0	0	0	0	40	0	0	0	0
11	0	0	0	0	41	0	0	0	0
12	0	0	0	0	42	0	0	0	0
13	0	0	0	0	43	0	0	0	0
14	0	0	0	0	44	0	0	0	0
15	0	0	0	0	45	0	0	0	0
16	0	0	0	0	46	0	0	0	0
17	0	0	0	0	47	0	0	0	0
18	0	0	0	0	48	0	0	0	0
19	0	0	0	0	49	0	0	0	0
* 20	0	0	0	0	50	0	0	0	0
* 21	0	0	0	0	51	0	0	0	0
22	0	0	0	0	52	0	0	0	0
23	0	0	0	0	53	0	0	0	0
24	0	0	0	0	54	0	0	0	0
25	0	0	0	0	55	0	0	0	0
26	0	0	0	0	56	0	0	0	0
27	0	0	0	0	57	0	0	0	0
28	0	0	0	0	58	0	0	0	0
29	0	0	0	0	59	0	0	0	0
30	0	0	0	0	60	0	0	0	0

SOURCE LAYOUT SKETCH



HIGHEST OPACITY FOR HIGHEST PERIOD: 0

OBSERVER'S NAME (PRINT) David Skoltes

SIGNATURE David Skoltes DATE 7-11-13

ORGANIZATION AASI

CERTIFIED BY State of Georgia DATE April 1, 2013

Method 9 VE
Form
021907

Georgia Department of Natural Resources
Environmental Protection Division · Air Protection Branch
4244 International Parkway · Suite 120 · Atlanta · Georgia 30354
Telephone: 404/363-7000 · Fax: 404/363-7100
Judson H. Turner, Director

5/13/2013

Sholtes, David
Ambient Air Services, Inc.
106 Ambient Airway
Starke, FL 32091

Dear David,

Please be advised that you have successfully completed the field certification training of the Georgia Visible Emissions Evaluation Certification Training Course conducted at the Savannah location from Apr-16-2013 thru Apr-18-2013.

Your plume evaluations were within the specifications of Federal Reference Method "9", which qualified you as a visible emissions evaluator. Your average error on black and white smoke did not exceed 7.5 percent opacity and you incurred no single error exceeding 15 percent opacity during your qualifying run.

This letter serves as your official notice of certification, which is valid for six months from the date you qualified 16-Apr-2013, subject to the following visual restrictions:

Prescription Corrective Lenses Required: Yes

It is our hope that the end result of your participation in this course will help in promoting cleaner and healthier air.

Yours for Clean Air,

Arthur D. Hollis
Environmental Specialist
Air Protection Branch
Industrial Source Monitoring Program

ADH

SholtesDavid20130091SAV18-Oct-2013Apr-16-2013 - Apr-18-2013
Georgia Department of Natural Resources
EPD • Air Protection Branch

David Sholtes

met the requirements of Federal Reference Method 9 and qualifies as a visible emissions evaluator. Maximum deviation on white & black smoke did not exceed 7.5% opacity and no single error exceeding 15% opacity was incurred during the certification test conducted by Georgia EPD's Air Protection Branch. This certificate is valid for 6 months from the date of issue and expires on the date below.

18-Oct-2013	Apr-16-2013 - Apr-18-2013	
Expiration Date	School Date	
20130091SAV	Training Instructor	Bearer's Signature
Cert No		

APPENDIX D

TEST PROTOCOL

Site-Specific Test Plan

Gerdau Ameristeel US, Inc.
Jackson, Tennessee

Electric Arc Furnace Baghouse
Numbers 1 and 2

Prepared By:

AASI
Ambient Air Services, Inc.
Environmental Consulting and Engineering

106 Ambient Airway ◆ Starke, FL 32091 ◆ (904) 964-8440 ◆ Fax (904) 964-6675

LELAP ACCREDITED LABORATORY CERTIFICATION NUMBER 04064
LELAP AGENCY INTEREST NUMBER 100329

Ambient Air Services, Inc.

106 Ambient Airway • Starke, FL 32091 • (904) 964-8440 • FAX (904) 964-6675

Gerdau Ameristeel US, Inc.
Jackson, Tennessee

EAF Baghouses Numbers 1 and 2

SITE-SPECIFIC TEST PLAN

May 1, 2013

1.0 INTRODUCTION

Gerdau Ameristeel US, Inc. (Gerdau) located in Jackson, Tennessee has scheduled emissions testing to satisfy requirements of the facility's permit (Title V Permit Number 558867).

The contacts for the testing are:

Mr. William Ownby
Gerdau Ameristeel U.S., Inc.
801 Gerdau Ameristeel Road
Jackson, Tennessee 38301
Phone: (731) 423-5274

Email: William.Ownby@Gerdau.com

Mr. Joseph L. Cooksey
Ambient Air Services, Inc.
106 Ambient Airway
Starke, FL 32091
Phone: (904) 964-8440

Email: joecooksey@ambientairservices.com

The proposed sampling and methodology described in this protocol is based on USEPA required source test methods, pre-test knowledge and assumptions. Schedules, the order of testing, and if necessary, the test methodology and equipment may change. The changes will be based on the actual conditions encountered while on site. Conditions such as weather, process changes, equipment problems or other unforeseen issues will necessitate changes in the test plan. When practical, deviations to the protocol will be discussed with the on site regulatory representative. Deviations from this protocol will be listed in the test report.

1.1 General

Gerdau owns and operates a steel manufacturing facility in Jackson, Tennessee. The testing outlined in this protocol is proposed to satisfy the testing requirements of the facility's Title V Permit Number, 558867. Specifically the testing will include the determination of carbon monoxide (CO), oxides of nitrogen (NO_x), sulfur dioxide (SO_2), particulate matter (PM), lead (Pb) and opacity (VE) emissions from EAF Baghouses Number 1 and 2.

Throughout this project the following will apply:

- Ambient Air Services, Inc. (AASI) will be responsible for preparation of this test plan, conducting the emission testing, and preparation of the final test report. AASI will submit these documents to Gerdau.

- Gerdau will be responsible for all submittals to the required agencies, collection of process information and data for inclusion in the reports, and notifications of any changes in schedules.

1.2 Tentative Test Schedule

June 4. 2013	Arrive on-site, set-up.
June 5, 2013	Conduct 2 runs.
June 6, 2013	Conduct final run, breakdown.
June 7, 2013	Back-up Day.

1.3 Summary of Proposed Testing

Summary of Proposed Testing Gerdau Ameristeel US, Inc. Jackson, Tennessee			
Sources	**Parameters**	**EPA Reference Methods**	**Duration of Tests**
EAF Baghouses No. 1 and 2	Particulate (PM), Lead (Pb), and Flow	40 CFR, Part 60, Appendix A, Methods 1, 2, 3, 4 and 5D/12[(A)]	3 test runs, each run a minimum of 4 hours in duration, 160 dscf and integral number of heats
	Sulfur Dioxide (SO_2)	40 CFR, Part 60, Appendix A, Method 6C	3 test runs, each run a minimum of 2 heat cycles [(B)]
	Oxides of Nitrogen (NO_x)	40 CFR, Part 60, Appendix A, Method 7E	
	Carbon Monoxide (CO)	40 CFR, Part 60, Appendix A, Method 10	
	Opacity (VE)	40 CFR, Part 60, Appendix A, Method 9	Aggregate total of 180 minutes concurrent with PM test (NSPS AAa)
Dust Handling System	Opacity (VE)	40 CFR, Part 60, Appendix A, Method 9	Aggregate total of 180 minutes concurrent with PM test (NSPS AAa)
Meltshop Building	Opacity (VE)	40 CFR, Part 60, Appendix A, Method 9	Aggregate total of 180 minutes concurrent with PM test (NSPS AAa)

[(A)] Methods 5 and 12 will be combined.

[(B)] At Gerdau's discretion; BH 1 and 2 may be measured simultaneously (both baghouses at same time) or sequentially (one baghouse at a time) for CO, NO_x, and SO_2 emissions.

2.0 PROCESS AND CONTROL EQUIPMENT OPERATION CONDITIONS

2.1 Emissions Limits

Emission Limits Gerdau Ameristeel US, Inc. Jackson, Tennessee		
Sources	**Parameters**	**Permit Limits**
EAF Baghouses No. 1 and 2 Combined	Particulate Matter (PM)	0.0041 gr/dscf [(A)] 40.76 lbs/hr
	Lead (Pb)	1.0 lbs/hr
	Sulfur Dioxide (SO_2)	40.5 lbs/hr
	Oxides of Nitrogen (NO_x)	72.9 lbs/hr
	Carbon Monoxide (CO)	945 lbs/hr
	Opacity (VE)	3% Opacity
Meltshop Building	Opacity (VE)	6%
Dust Handling System	Opacity (VE)	10% Opacity

2.2 Process Data

Gerdau will be responsible for collecting all process data during the test and will provide this information to AASI for inclusion in the test report. The following process information will be recorded:

1) Charge weights and materials, and tap weights and materials;

2) Heat times, including start and stop times and a log of process operation, including periods of no operation during testing.

3) Control device operation log; and

4) Continuous opacity monitor or Method 9 data.

2.3 Process Description

Gerdau operates a steel mill in Jackson, Tennessee. This plant recycles scrap steel using an electric arc furnace to produce a variety of products including rebar and merchant carbon steel bars.

Scrap steel is delivered pre-sorted to the site by truck where it is stored in various piles. Pebble limestone, the principal slagging component, is delivered to the site by truck where it is transferred via pneumatic lifts to a lime storage silo. Other steel additives are delivered to the site in drums, sacks, or other containers. The scrap steel, along with properly proportional quantities of additional materials (such as carbon, lime, alloying metals), are loaded to bottom opening charge buckets. The charge buckets enter the meltshop and are picked up by overhead crane and moved to the single electric arc furnace. During charging, the top of the arc furnace is raised and rotated to one side allowing the crane-suspended charge bucket to be positioned directly over the furnace shell. Once in that position, the bottom clamshell halves of the charge bucket are opened allowing the contents to fall into the arc furnace shell. The charge bucket contents are properly sized so that the charge completely fills the furnace shell to that level which will allow the re-positioning of the furnace top without interference. After dropping the charge of scrap, the charge bucket is quickly removed from the arc furnace and refilled. As soon as the arc furnace top is re-positioned, the scrap is melted down by energy input from the three electric electrodes creating an arc and from supplementary natural gas fired burners mounted strategically about the shell. When the initial or first charge has been melted into a molten bath, the charging process is repeated with a second but smaller charge.

An arc submerging foamy slag is created by the injection of carbon and oxygen for the purpose of more efficient energy transfer from the arc to the steel bath and for preservation of refractory lining material in the upper sections of the furnace shell. This refractory would otherwise be directly exposed to the arc. After all scrap has been melted and “flat bath” conditions achieved in the furnace, refining takes place. The molten bath is first sampled to determine the existing chemistry. The chemistry is then adjusted by additions of various materials such as carbon, lime, oxygen and fluorspar. After reaching appropriate chemistry, the bath temperature is elevated above the steel melting temperature to assure continued maintenance of a liquid state as the steel is tapped and subject to further handling.

Shortly before the steel is tapped, excess slag is removed from the top of the molten bath, through the “slag door” in the furnace side which is opposite the tap hole. The molten slag is poured out by slightly tilting the furnace and allowing the material to fall into a slag pot that is removed by overhead crane. A pot carrier transports the slag to an on-site processing plant.

When all conditions are satisfactory, the batch of molten steel or “heat” is tapped into a previously prepared and preheated ladle by opening the EAF tap hole and tilting the EAF. A small quantity of liquid is normally left in the furnace as a “heel”.
During charging and tapping, air pollutant emissions are controlled by canopy hoods. During melting and refining, EAF emissions are captured by the direct evacuation system, (DES). Pollutants which escape the DES are captured by the canopy hoods.

After refining, the ladle of molten steel is transported by overhead crane to the continuous caster. When properly positioned above the caster, a drain hole in the bottom of the ladle is opened and the molten steel empties into a tundish. The tundish is a refractory-lined, elongated trough which has drain holes for the (billet) strands of the continuous caster. As the continuous billet strands emerge from the caster in 4.5 to 6 inch cross-sections, they are automatically cut in equal lengths for handling. The cut lengths are referred to as "billets" and are subsequently stacked and allowed to cool to ambient temperature pending further processing or sale. The limited air pollutant emissions resulting from the casting operations are released into the caster building and captured by the canopy hood.

2.4 Operating Conditions

During this test the meltshop will be operated as close to 100% of permitted capacity (averaged over the period of the test) as possible. This will be documented using production records (heat sheets) by Gerdau personnel.

2.5 Treatment of Delays or Abnormal Conditions

Delays of varying length are normal to the operation. Gerdau will use its discretion to determine when a delay is not normal and is, therefore, considered down time. Testing will be suspended as soon as practical after the plant notifies the test team of such down time. The testing will resume as soon as practical after the plant notifies the test team of restarting normal operation.

Should a delay greater than 6 hours be encountered, the test run in progress will be voided and not used without approval from the permitting agency. Delay time, while both the sampling and process are down, will be subtracted for purposes of calculating production.

3.0 SAMPLING AND ANALYTICAL PROCEDURES

The measuring of particulate matter (PM), lead (Pb), sulfur dioxide (SO_2), oxides of nitrogen (NO_x), carbon monoxide (CO), and opacity (VE) emissions will be conducted in accordance with Title 40 of The Code of Federal Register, Part 60, Appendix A, Methods 1, 2, 3, 4, 5D, 6C, 7E, 9, 10, and 12.

3.1 Sampling Points

USEPA Method 1, as published in 40 CFR, Part 60, Appendix A, will be used at the reference method for the selection of sampling points for flows on each inlet duct. The sampling points for PM will be selected in accordance with USEPA Method 5D with deviations as described in Section 3.8. The gases will be tested from a randomly selected representative point within the baghouse.

3.1.1 Baghouse 2 (Primary)

Baghouse 2 is a positive pressure baghouse without a stack. The filtered air exhausts through a monovent design in the roof structure of the baghouse. The measurement site is 178 feet by 10 feet. This baghouse serves as the furnace's direct evacuation system as well as serving a portion of the canopy exhaust.

The baghouse flow will be determined at the inlet to the baghouse. This flow will be used to determine the measurement location velocity as described in USEPA Method 5D when the velocity of air at the measurement site is less than that which could be measured by Method 2. The assumption will be made that all measurement points have the same velocity.

3.1.2 Baghouse 1 (Canopy/Secondary)

Baghouse 1 is a positive pressure baghouse without a stack. The filtered air exhausts through a monovent design in the roof structure of the baghouse. The measurement site is 85 feet by 12 feet. This baghouse serves as the roof canopy evacuation system. A portion of the gases evacuated by this baghouse originates from the furnace with the other gases originating from other sources within the shop.

The baghouse flow will be determined at the inlet to the baghouse. This flow will be used to determine the measurement location velocity as described in USEPA Method 5D when the velocity of air at the measurement site is less than that which could be measured by Method 2. The assumption will be made that all measurement points have the same velocity.

3.2 Velocity and Volumetric Flow Rate

USEPA Method 2, as published in 40 CFR, Part 60, Appendix A, will be used as the reference method to determine average gas velocity. A type "S" pitot tube will be used for velocity determination. Gas temperature will be measured with a type K thermocouple. Calibration checks will be performed on the pitot tube to verify the face opening alignments, external tubing

diameter, and base-to-opening plane distances. A base-line coefficient of 0.84 will be assigned to each pitot tube.

Flow will be measured at the inlet to each baghouse and prorated to the outlet based on the ratio of the inlet area to the outlet area.

3.3 Oxygen and Carbon Dioxide

USEPA Method 3, as published in 40 CFR, Part 60, Appendix A will be used as the reference method to determine oxygen and carbon dioxide concentrations. A fyrite will be used to determine both O_2 and CO_2 concentrations. The O_2 and CO_2 concentration will be used for the calculation of molecular weight of the exhaust gas.

3.4 Moisture

USEPA Method 4, as published in 40 CFR, Part 60, Appendix A, will be used as the reference method to determine the moisture content. The sample will be collected at a known and regulated rate through a glass condenser. The condenser will consist of the back half of the relevant sampling system. The gas sample will be extracted through the impingers (maintained at below 68° F in an ice bath) with a vacuum pump. The amount of gas sampled will be measured with a calibrated dry gas meter. The amount of moisture collected during the test will be measured and the amount of gas drawn, corrected to dry standard conditions, will be determined.

3.5 Particulate Matter and Lead

USEPA Method 5D will be combined with Method 12 to determine the particulate matter (PM) and lead (Pb) emissions from each baghouse referencing EPA Methods 1-4 for traverse point selection, determination of stack gas molecular weight, stack gas moisture determination, and volumetric flow rate. The following is a synopsis of the method and a list of equipment and specifications. A diagram of the sampling system is presented in Figure 3-5-1.

<u>Sampling Apparatus</u>

1)	Probe Nozzle	Stainless steel with sharp tapered leading edge.
2)	Probe	Stainless steel 5/8” OD.
3)	Pitot Tube	Not used at the PM measurement site. This is addressed in Method 5D, Section 8.3.1.
4)	Filter Holder	The filter holder will be constructed of glass. The gasket will be made of silicone rubber. The filter holder is designed to provide a positive seal against leakage from the outside or around the filter.

A flexible teflon line will be used in between the filter and the impingers.

5) Impingers — Four (4) glass impingers connected in series with glass ball joint fittings. The first, third, and fourth will be of the Greenburg-Smith design modified by replacing the tip with a 1.3 cm (1/2 inch) Id glass tube extending to about ½ inch from the bottom of the flask. The second impinger will be of the Greenburg-Smith design with a standard tip. All will be submerged in an ice bath during the sample runs. The first and second impingers will contain 100 ml of 0.1N HNO_3. The third impinger was empty, and the fourth impinger with approximately 400g of silica gel.

6) Meter Box — Module containing a vacuum gauge, leak free pump, dry gas meter with a minimum of one percent accuracy, valves, and related equipment to maintain isokinetic sampling rate and to determine sample volume.

7) Barometer — Measured atmospheric pressure on-site to ±0.05 inches of mercury.

8) Thermocouples — Type K thermocouples were utilized to monitor temperatures for stack gas, last impinger, and dry gas meter.

9) Filters — Glass fiber filter

3.6 Sulfur Dioxide

USEPA Method 6C, as published in 40 CFR, Part 60, Appendix A, will be used as the reference method for determining SO_2. A gas sample will be continuously extracted from the stack and conveyed to an instrumental analyzer for determination of SO_2 gas concentration. A Thermo Environmental Instruments Model 43C (or equivalent) will be used.

3.7 Oxides of Nitrogen

USEPA Method 7E, as published in 40 CFR, Part 60, Appendix A, will be used as the reference method for determining the oxides of nitrogen (NO_x) concentration in the effluent gas stream. A Thermo Environmental Instrument (TEI) Model 42C chemiluminescence analyzer (or equivalent) will be used.

3.8 Carbon Monoxide

USEPA Method 10, as published in 40 CFR, Part 60, Appendix A, will be used as the reference method for determining carbon monoxide (CO) concentration in the effluent gas stream. A gas sample will be continuously extracted from the source and conveyed to a gas filter correlation,

non dispersive infrared analyzer (GFC-NDIR) for determination of CO concentration. A TEI Model 48 analytical instrument (or equivalent) will be used.

3.9 Opacity

USEPA Method 9, as published in 40 CFR, Part 60, Appendix A, will be used to determine visible emissions. The plume opacity will be observed and recorded every 15 seconds. Opacity will be calculated as the average of the highest concurrent 24 readings over the period of observation.

3.10 Sampling System

A fully extractive sample system will be utilized to convey the stack gas to the analytical instruments. The sample system will consist of the following components; a stainless steel probe, calibration tee, particulate filter, 150 feet of heated sample line (teflon), a sample pump, moisture removal system, and a sample manifold to distribute the sample gas to the analytical instruments. The system will be designed so that all calibration gases can be injected at the probe and pass through the same system as the sample gas. A schematic of the sampling system is shown in Figure 3-10-1.

3.11 Sampling Locations

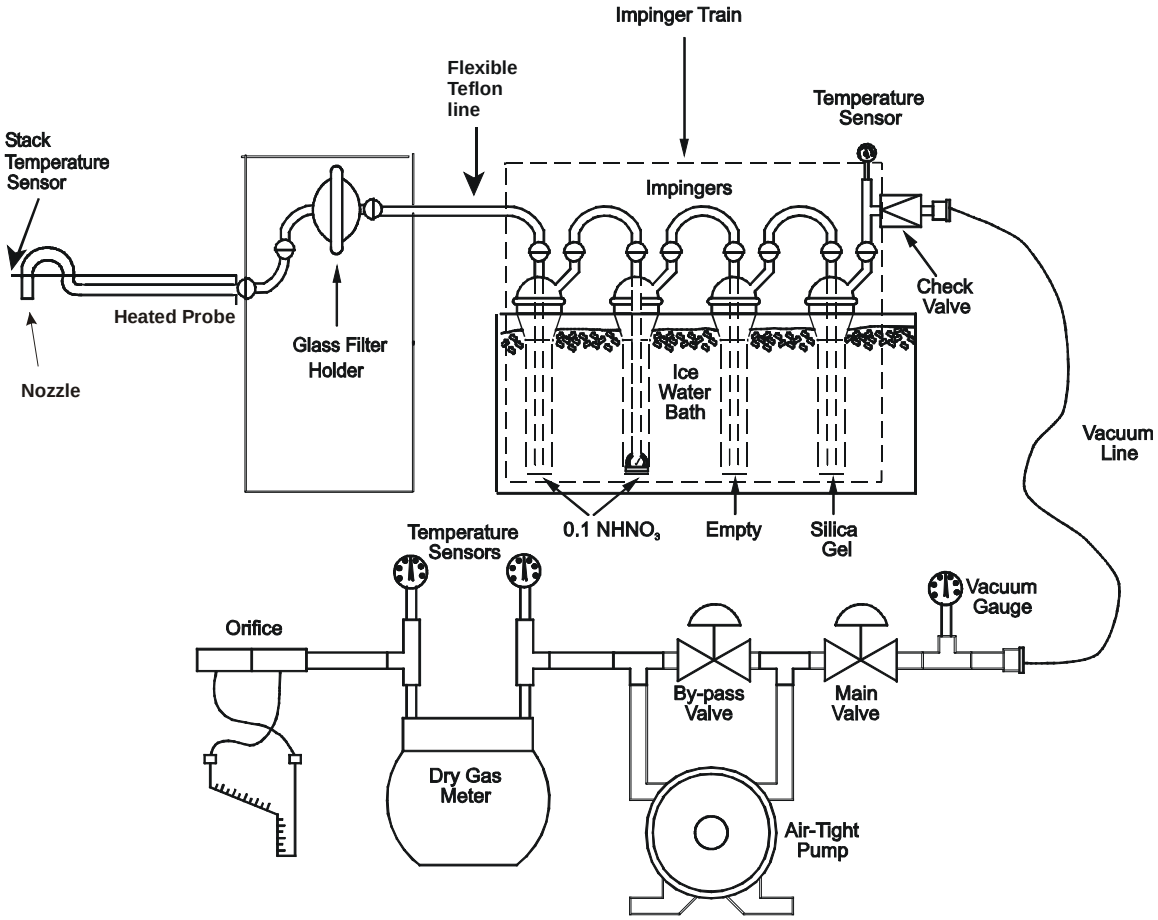
See Figures 3-11-1 through 3-11-6.

3.12 Method Deviations

A flexible line will be used between the probe/filter and the impingers. This line will be rinsed along with the glassware as part of the sample recovery following each run.

Figure 3-5-1

Method 5D/12 Sampling System



Impinger Set-up:

1) Modified tip, 100 ml 0.1N HNO_3
2) Standard tip, 100 ml 0.1N HNO_3
3) Modified tip, empty
4) Modified tip, approximately 400g silica gel

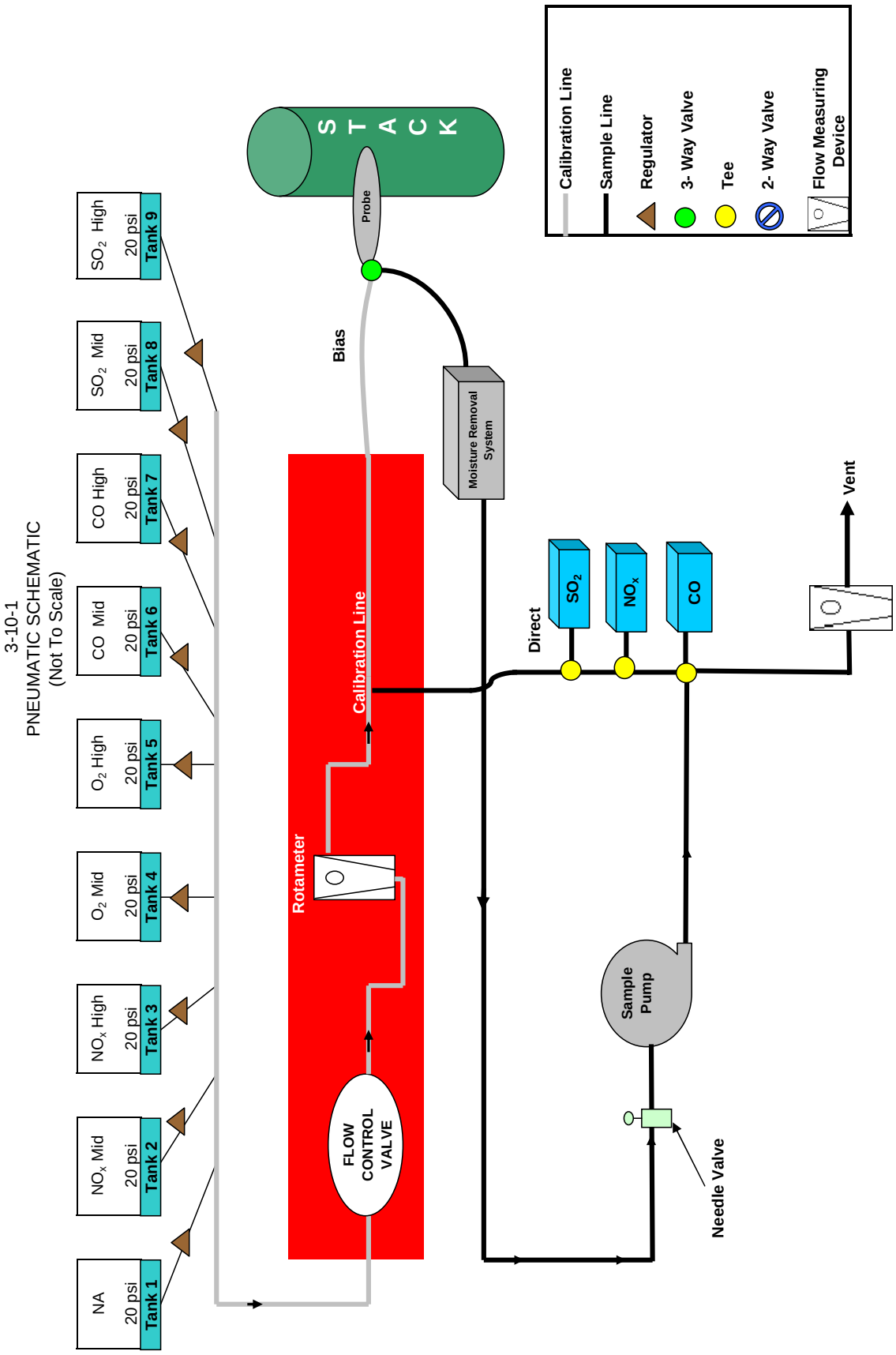
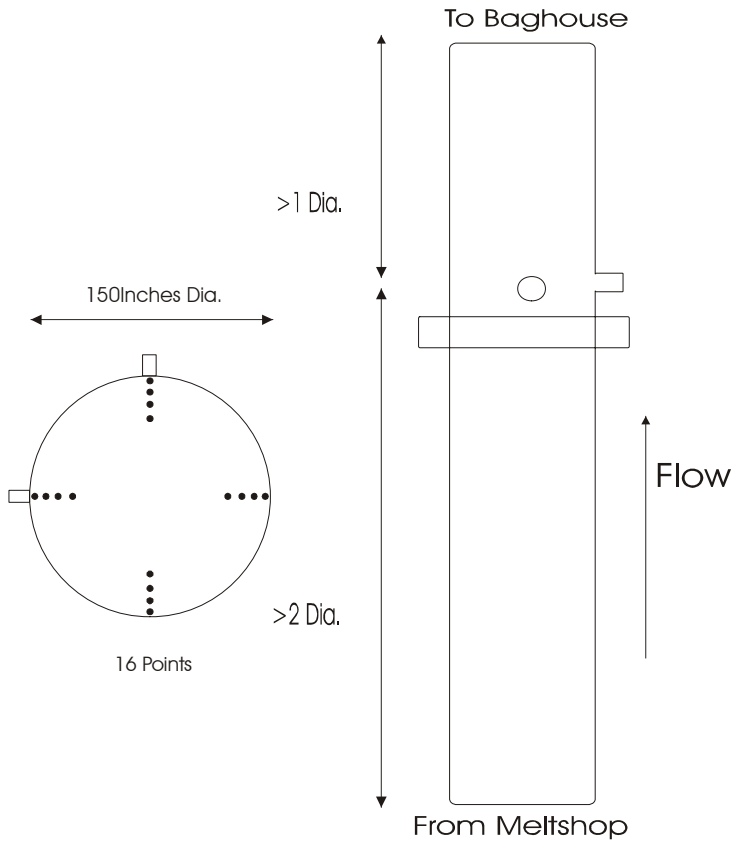

3-10-1
PNEUMATIC SCHEMATIC
(Not To Scale)
NA
20 psi
Tank 1
NOx Mid
20 psi
Tank 2
NOx High
20 psi
Tank 3
O2 Mid
20 psi
Tank 4
O2 High
20 psi
Tank 5
CO Mid
20 psi
Tank 6
CO High
20 psi
Tank 7
SO2 Mid
20 psi
Tank 8
SO2 High
20 psi
Tank 9
STACK
Probe
Bias
Moisture Removal System
Calibration Line
Rotameter
FLOW CONTROL VALVE
Direct
SO2
NOx
CO
Vent
Sample Pump
Needle Valve
Calibration Line
Sample Line
Regulator
3- Way Valve
Tee
2- Way Valve
Flow Measuring Device

Figure 3-11-1

Gerdau Ameristeel US, Inc.
Jackson, Tennessee
Baghouse Number 2 Inlet Traverse Points

Diameters Upstream:	>1	Sampling Points (inches)	
Diameters Downstream	>2	1	4.8”
Stack diameter	150”		15.8”
Drawing Date	04/03/06	3	29.1”
		4	48.5”
		5	101.6”
		6	120.9”
		7	134.3”
		8	145.2”

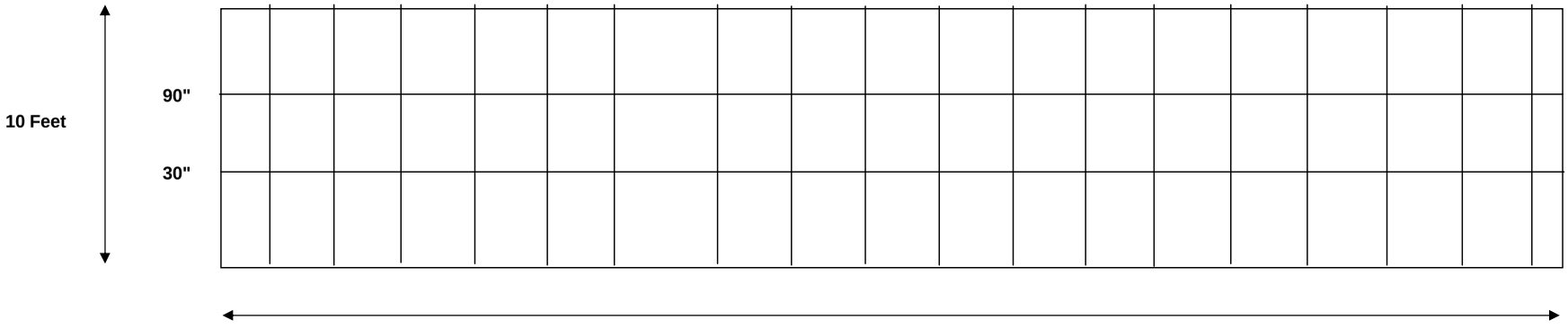
Drawing Not to Scale



Note: All distances are approximate. Duct is overhead approximately 80 feet agl. Access by manlift. 2 test ports, 8 points per port, 16 total points.

Figure 3-11-2

Gerdau Ameristeel US, Inc. - Jackson, Tennessee - EAF Baghouse Number 2 - Sampling Point Diagram



Note: One compartment will be tested for all runs and has a 2 X 4 matrix for a total number of sampling points of 8 at 30 minutes per point for a total of 240 minutes. Baghouse has 48 sampling ports, only 4 will be used. Drawing not to scale.

Figure 3-11-3

Method 5D Considerations Gerdau Ameristeel US, Inc. Jackson, Tennessee Baghouse 2 (Primary)	
Measurement Site Area	1780 ft^2
Portion of Baghouse Tested Per Run (See Figure 3-11-2)	Baghouse divided into 3 portions, 1 portion tested per run
Number of traverse points per run (Method 5D, 8.1.4)	24
Number of Minutes per point	10
Total Run Duration (Minutes)	240*
Number of Test Runs	3
Minimum Sample Volume per run (DSCF)	160
Sample Nozzle Size (Inches) – Nominal	0.320 inches
Probe Length (In stack filter used)	~10 ft
Stack Temperature (estimated)	150° F
Stack Moisture (estimated)	2%
CO_2 Concentration Expected	0.5%
O_2 Concentration Expected	20.5%

NOTE: Method 5D data recorded every 10 minutes.

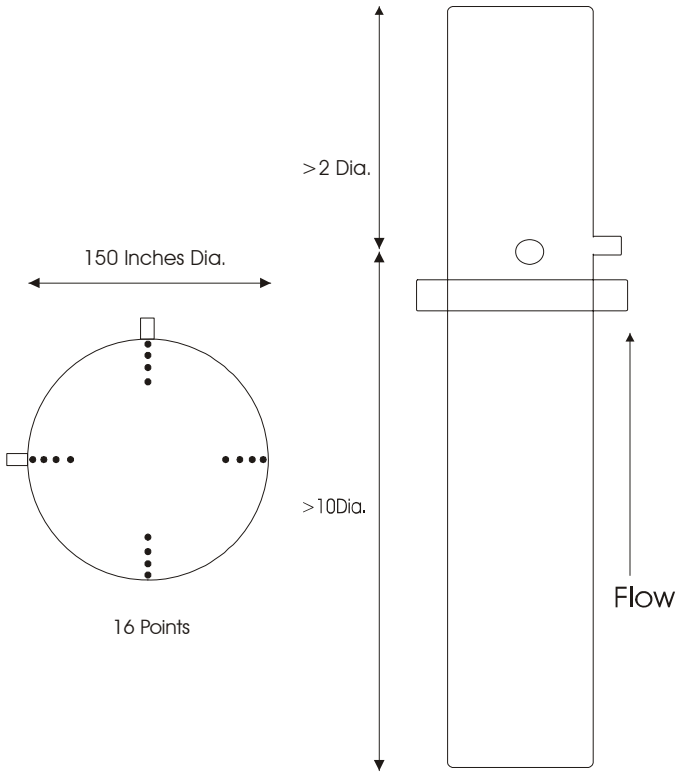
*NOTE: This facility operates a single furnace. For single furnace facilities NSPS AAa (60.275a) requires particulate sampling to include an integral number of furnace heats. If the end of the test run does not correspond with the end (tap) of the furnace heat, the test will be extended through the completion of the furnace heat. The test points will be continued in reverse order until the heat in progress is completed.

Figure 3-11-4

Gerdau Ameristeel US, Inc.
Jackson, Tennessee
Baghouse 1-Inlet Duct (Secondary/Canopy)

Diameters Upstream:	>2
Diameters Downstream	>10
Stack diameter	150”
Drawing Date	9/1/10

Drawing Not to Scale

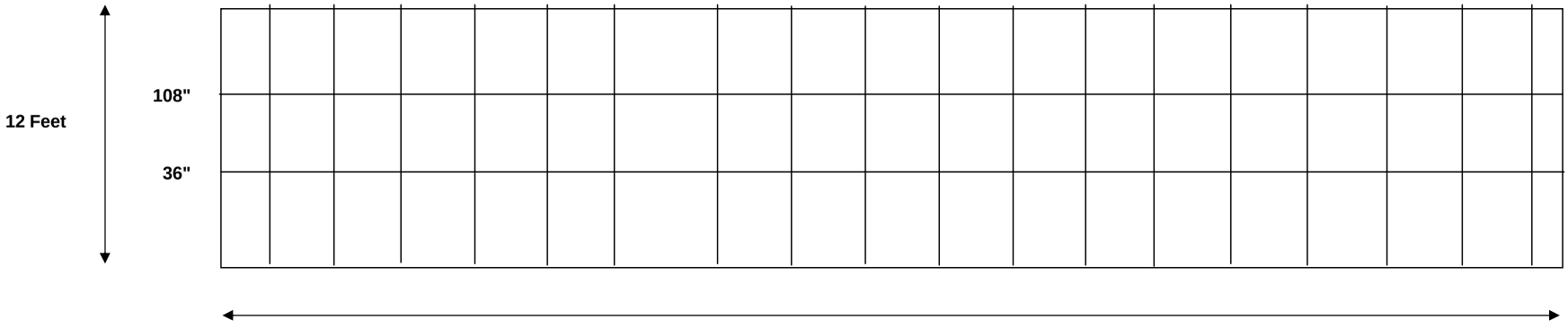


Sampling Points (inches)	
1	4.8”
2	15.8”
3	29.1”
4	48.5”
5	101.6”
6	120.9”
7	134.3”
8	145.2”

Note: Only 1 test port on duct, 2 Diameters will be tested by inserting pitot at an angle.

Figure 3-11-5

Gerdau Ameristeel US, Inc. - Jackson, Tennessee - EAF Baghouse Number 1 - Sampling Point Diagram for



Note: One compartment will be tested for all runs and has a 2 X 4 matrix for a total number of sampling points of 8 at 30 minutes per point for a total of 240 minutes. Baghouse has 24 sampling ports, only 4 will be used. Drawing not to scale.

Figure 3-11-6

EPA Method 5D Considerations Gerdau Ameristeel US, Inc. Jackson, Tennessee Baghouse 1 (Secondary)	
Total Measurement Site Area	1020 Ft^2
Portion of Baghouse Tested Per Run	Baghouse divided into 3 portions, 1 portion tested per run
Number of traverse points per run (Method 5D, 8.1.4)	24
Number of Minutes per point	10
Total Run Duration (Minutes)	240*
Number of Test Runs	3
Minimum Sample Volume per run (DSCF)	160
Sample Nozzle Size (Inches) – Nominal	0.320
Probe Length	~10ft
Stack Temperature (estimated)	80° F
Stack Moisture (estimated)	2%
CO_2 Concentration Expected	0.0%
O_2 Concentration Expected	20.9%

NOTE: Method 5D data recorded every 10 minutes.

*NOTE: This facility operates a single furnace. For single furnace facilities NSPS AAa (60.275a) requires particulate sampling to include an integral number of furnace heats. If the end of the test run does not correspond with the end (tap) of the furnace heat, the test will be extended through the completion of the furnace heat. The test points will be continued in reverse order until the heat in progress is completed.

4.0 QUALITY ASSURANCE

4.1 QA Objectives

The objectives of AASI's QA program are to produce data that are complete, representative, and of known precision and accuracy.

4.2 Completeness

Completeness is the percentage of the required field and laboratory measurements and all necessary documentation that was achieved. It is our policy to promote a systematic, detailed and documented approach to completeness.

4.3 Precision and Accuracy

Internal Quality Assurance activities assure that proper procedures are implemented to assure the precision and accuracy of the data. Precision and Accuracy are measures of data quality. These measures are included in the reference test methods and procedures in the form of equipment, reagent, and performance specifications, e.g., calibration accuracy, precision of triplicate analyses, percent recoveries, and trace abilities to primary standards. AASI has a stated company policy that all staff members are to be dedicated to highest standards of precision and accuracy. Team Leaders and the Project Manager are considered to be precision and accuracy inspectors for the projects they oversee.

External Quality Assurance includes the analysis of performance audit (PA) samples provided by the administrator and analyzed along with the collected samples. AASI requests that the administrator provide any available samples to us during the test. If provided, AASI will analyze the PA samples along with the collected samples.

In addition, as part of our LELAP certification, AASI's source testing and ambient monitoring programs undergo system audits by LELAP and FDEP auditors respectively. These audits cover many aspects of our programs including instrument calibration procedures, data validation and acceptance procedures, sample handling and documentation procedures, equipment maintenance procedures, documentation reporting, sample storage and sample disposal.
.

4.4 Out of Control and/or Unacceptable Data

All of the test methods addressed in this protocol will contain some form of allowable data limits, whether it is in the form of calibration limits or perhaps repeatability limits on a liquid titration. In all cases where these limits are not met, the technician shall document these facts and contact his supervisor for further guidance.
AASI policy is to have the supervisor and technician jointly identify the problem and see a successful alternative to the procedure to enable future results to be within specified tolerances.

If for some reason, such as sample exhaustion, satisfactory results cannot be achieved, the results of the sample run in question will be declared void with proper notations in the project file and/or report as appropriate. For the situation where two of three runs are considered valid, the administrator may be petitioned to consider those two runs as adequate to satisfy the needs dictated by the test. In the event the test team has the foresight to anticipate trouble with one or more runs and collects more than the minimum of three runs, then any set of three or more successful replicate runs may be reported, with the notation however that problems were encountered with data excluded.

In the event that less than two successful runs are realized from an acceptable data perspective; the entire test will be repeated with proper precautions to avoid another set of unacceptable results. Note however that all data, whether acceptable or not, will be retained in project files.

4.5 Representativeness

Representativeness is defined by the "when", "how", and "how many" of measurements taken. These conditions are usually specified within the regulation, e.g., source operating at maximum capacity using high sulfur content fuel, Method 6C for SO_2 at a single point at the centroid of the stack, three 20-minute runs, etc. If not specified in the regulations, all interested parties must agree upon the desired "representative" conditions before any measurement are taken. Special care will be taken to ensure a detailed record of test specifics or other special data testing and processing matrices.

4.6 Organization

Ambient Air Services, Inc. has a designated QA Manager and is responsible to the President of the company. The QA Manager's responsibilities include:

1) Adherence to SOP plan, including stipulated calibration scheduled therein.
2) Organization and conduct of internal training programs.
3) Reviews of reports or other work product prior to release.

4.7 Procedures

Specified procedural steps can be found in the Ambient Air Services, Inc. Quality Manual, which complies with the rules and guidance of the Louisiana Environmental Laboratory Accreditation Program. LELAP Certification Number 04064, LELAP Agency Interest Number 100329. All of AASI's Team Leaders and Project Managers possess a copy of this manual.

4.8 Sample Identification and Custody

The Team Leader/Project Manager will be responsible for the custody control of the samples taken. A custody control form will be filled out and utilized for the samples until the samples can be legally disposed of.

5.0 SAFETY

The AASI Team Leader/Project Manager will be responsible for the safety conduct of all AASI personnel. It is the responsibility of Gerdau to inform and train AASI personnel in their specific safety requirements for their plant including, but not limited to, site-specific safety procedures and guidelines, evacuation procedures, and emergency personnel locations. All emergency contacts should be provided to the project manager or team leader upon arrival. In addition, Gerdau will notify AASI of any areas that have been identified as potential hazards, including confined spaces, that are relevant or in the vicinity of AASI's operations.

APPENDIX E

LABORATORY ACCREDITATION

LELAP Certificate

Scope of Accreditation

STATE OF LOUISIANA
DEPARTMENT OF ENVIRONMENTAL QUALITY

Is hereby granting a Louisiana Environmental Laboratory Accreditation to

Ambient Air Services Inc
106 Ambient Airway
Starke, Florida 32091

Agency Interest No. 100329

According to the Louisiana Administrative Code, Title 33, Part I, Subpart 3, LABORATORY ACCREDITATION, the State of Louisiana formally recognizes that this laboratory is technically competent to perform the environmental analyses listed on the scope of accreditation detailed in the attachment.

The laboratory agrees to perform all analyses listed on this scope of accreditation according to the Part I, Subpart 3 requirements and acknowledges that continued accreditation is dependent on successful ongoing compliance with the applicable requirements of Part I. Please contact the Department of Environmental Quality, Louisiana Environmental Laboratory Accreditation Program (LELAP) to verify the laboratory's scope of accreditation and accreditation status.

Accreditation by the State of Louisiana is not an endorsement or a guarantee of validity of the data generated by the laboratory. To be accredited initially and maintain accreditation, the laboratory agrees to participate in two single-blind, single-concentration PT studies, where available, per year for each field of testing for which it seeks accreditation or maintains accreditation as required in LAC 33:I.4711.

Lourdes Iturralde, Administrator
Notifications and Accreditations Section
Public Participation and Permit Support Services Division

Certificate Number: 04064

Expiration Date: June 30, 2014
Issued On: July 1, 2013

STATE OF LOUISIANA
DEPARTMENT OF ENVIRONMENTAL QUALITY
Issue Date: July 1, 2013

Ambient Air Services Inc
AI Number: 100329
Expiration Date: June 30, 2014

106 Ambient Airway, Starke, Florida 32091

Certificate Number: 04064

Air Emissions

Analyte	Method Name	Method Code	Type	AB
100025 - Sampling	EPA 104	674	State	LA
3880 - Opacity	CEMS Performance Specification 1	753	State	LA
100025 - Sampling	EPA 10A	1232	State	LA
100025 - Sampling	EPA 10B	1233	State	LA
100025 - Sampling	Method 15 40 CFR 60 App. A	1240	State	LA
3885 - Oxides of nitrogen	EPA 20	1250	State	LA
3895 - Oxygen	EPA 20	1250	State	LA
4010 - Sulfur dioxide	EPA 20	1250	State	LA
3995 - Stack gas velocity, volume flow rate	EPA 2B	1272	State	LA
4000 - Stack gas velocity, volume flow rate in small stacks/ducts	EPA 2D	1274	State	LA
3995 - Stack gas velocity, volume flow rate	EPA 2E	1275	State	LA
3995 - Stack gas velocity, volume flow rate	EPA 2F	1276	State	LA
3995 - Stack gas velocity, volume flow rate	EPA 2G	1277	State	LA
3995 - Stack gas velocity, volume flow rate	EPA 2H	1278	State	LA
100025 - Sampling	EPA 21	1844	State	LA
4055 - Visible emissions from coke oven batteries	EPA 22	1846	State	LA
100025 - Sampling	EPA 29	1861	State	LA
100025 - Sampling	NCASI Vents	1971	State	LA
4020 - Sulfuric acid mist, sulfur dioxide	EPA CTM-013B	2740	State	LA
4020 - Sulfuric acid mist, sulfur dioxide	EPA CTM-013A	2741	State	LA
3850 - Moisture content	Oregon Method 4	2841	State	LA
100025 - Sampling	Oregon Method 4	2841	State	LA
100025 - Sampling	EPA CTM-013A	2843	State	LA
100025 - Sampling	EPA CTM-013B	2844	State	LA
100025 - Sampling	EPA 0011	10001806	State	LA
100025 - Sampling	EPA 0061	10003608	State	LA
100025 - Sampling	EPA 18	10011300	State	LA
3885 - Oxides of nitrogen	CEMS Performance Specification 2	10214627	State	LA
4010 - Sulfur dioxide	CEMS Performance Specification 2	10214627	State	LA
3755 - Carbon dioxide	CEMS Performance Specification 3	10214638	State	LA
3895 - Oxygen	CEMS Performance Specification 3	10214638	State	LA
3780 - Carbon monoxide	CEMS Performance Specification 4	10214649	State	LA
3970 - Total reduced sulfur	CEMS Performance Specification 5	10214661	State	LA
3995 - Stack gas velocity, volume flow rate	CEMS Performance Specification 6	10214672	State	LA
100018 - Volatile organics	CEMS Performance Specification 8	10214694	State	LA
100025 - Sampling	EPA CTM-027	10214707	State	LA
100076 - Traverse Points	EPA Method 1	10246614	State	LA
3780 - Carbon monoxide	EPA Method 10	10246625	State	LA
100023 - Total Gaseous Organic Compounds	EPA 18	10246636	State	LA
3885 - Oxides of nitrogen	EPA Method 19	10246647	State	LA
3940 - Particulates, SO2, NOx, sulfur removal efficiency	EPA Method 19	10246647	State	LA
3780 - Carbon monoxide	CEMS Performance Specification 4A	10246650	State	LA
100076 - Traverse Points	EPA Method 1A	10246658	State	LA
3995 - Stack gas velocity, volume flow rate	EPA Method 2	10246669	State	LA
100025 - Sampling	EPA Method 23	10246705	State	LA
100077 - Gaseous Nonmethane Organic	EPA Method 25	10246738	State	LA

Clients and Customers are urged to verify the laboratory's current certification status with the Louisiana Environmental Laboratory Accreditation Program.

Air Emissions

Analyte	Method Name	Method Code	Type	AB
Emissions				
100025 - Sampling	EPA Method 25	10246738	State	LA
100025 - Sampling	EPA Method 25A	10246749	State	LA
100023 - Total Gaseous Organic Compounds	EPA Method 25A	10246749	State	LA
3755 - Carbon dioxide	EPA Method 3A	10247684	State	LA
3895 - Oxygen	EPA Method 3A	10247684	State	LA
100142 - Emission Rate Correction Factors	EPA Method 3B	10247695	State	LA
100025 - Sampling	EPA Method 3B	10247695	State	LA
100024 - Modified Method 5 Sampling Train	EPA 0010	10250201	State	LA
100025 - Sampling	EPA 0010	10250201	State	LA
100025 - Sampling	EPA 308	10274507	State	LA
4815 - Formaldehyde	EPA 323	10274585	State	LA
100025 - Sampling	EPA 101A	10401204	State	LA
100025 - Sampling	EPA 102	10401306	State	LA
100025 - Sampling	EPA 103	10401408	State	LA
100025 - Sampling	EPA 12 (FAA)	10401908	State	LA
100025 - Sampling	EPA 13A	10402003	State	LA
100025 - Sampling	EPA 13B	10402105	State	LA
3845 - Hydrogen sulfide, carbonyl sulfide, carbon disulfide	EPA 15	10402207	State	LA
100025 - Sampling	EPA 15	10402207	State	LA
100025 - Sampling	EPA 15A	10402309	State	LA
3830 - H2S, methyl mercaptan, dimethyl sulfide, dimethyl disulfide	EPA 16	10402401	State	LA
100025 - Sampling	EPA 16	10402401	State	LA
100025 - Sampling	EPA 16A	10402503	State	LA
4010 - Sulfur dioxide	EPA 16A	10402503	State	LA
100025 - Sampling	EPA 16B	10402605	State	LA
100025 - Sampling	EPA 17	10402707	State	LA
3805 - Fine particulates <2.5 um	EPA 201A	10402901	State	LA
100665 - Particulate Matter between 2.5 and 10 um	EPA 201A	10402901	State	LA
3915 - Particulates	EPA 201A	10402901	State	LA
3950 - Particulates <10 um	EPA 201A	10402901	State	LA
100025 - Sampling	EPA 201A	10402901	State	LA
100045 - Condensible Particulate Matter	EPA 202	10403006	State	LA
3915 - Particulates	EPA 202	10403006	State	LA
100025 - Sampling	EPA 202	10403006	State	LA
100025 - Sampling	EPA 26	10403108	State	LA
3835 - Hydrogen halides and halogens	EPA 26A	10403200	State	LA
100025 - Sampling	EPA 26A	10403200	State	LA
4000 - Stack gas velocity, volume flow rate in small stacks/ducts	EPA Method 2A	10403744	State	LA
4000 - Stack gas velocity, volume flow rate in small stacks/ducts	EPA Method 2C	10403755	State	LA
3765 - Carbon dioxide, oxygen, dry molecular weight	EPA Method 3	10403766	State	LA
100025 - Sampling	EPA 306 (ICP)	10403904	State	LA
100025 - Sampling	EPA 30B	10404203	State	LA
3850 - Moisture content	EPA Method 4	10404258	State	LA
100025 - Sampling	EPA 5	10404305	State	LA
100025 - Sampling	EPA 5A	10404407	State	LA
100025 - Sampling	EPA 5B	10404509	State	LA
100025 - Sampling	EPA 5D	10404601	State	LA

Air Emissions

Analyte	Method Name	Method Code	Type	AB
3935 - Particulates from wool fiberglass insulation	EPA 5E	10404703	State	LA
100025 - Sampling	EPA 5E	10404703	State	LA
3915 - Particulates	EPA 5F	10404805	State	LA
3930 - Particulates from wood heaters	EPA 5G	10404907	State	LA
3930 - Particulates from wood heaters	EPA 5H	10405002	State	LA
3915 - Particulates	EPA 5I	10405104	State	LA
100025 - Sampling	EPA 6	10405206	State	LA
100025 - Sampling	EPA 6A	10405308	State	LA
100025 - Sampling	EPA 6B	10405400	State	LA
4010 - Sulfur dioxide	EPA Method 6C	10405411	State	LA
100025 - Sampling	EPA 7	10405502	State	LA
3885 - Oxides of nitrogen	EPA Method 7E	10405911	State	LA
100025 - Sampling	EPA 8	10406005	State	LA
3880 - Opacity	EPA Method 9	10406403	State	LA
100025 - Sampling	NCASI 8A	60031223	State	LA
100143 - Sulfuric acid mist	NCASI 8A	60031223	State	LA
100025 - Sampling	NCASI CI/SG/PULP-94.02	60031245	State	LA

Non Potable Water

Analyte	Method Name	Method Code	Type	AB
NONE	NONE	NONE	NONE	NONE

Solid Chemical Materials

Analyte	Method Name	Method Code	Type	AB
NONE	NONE	NONE	NONE	NONE

Biological Tissue

Analyte	Method Name	Method Code	Type	AB
NONE	NONE	NONE	NONE	NONE

APPENDIX F

PROCESS DATA

(Note: Information in this Appendix was provided to AASI by Gerdau Ameristeel US, Inc. for inclusion in this report)

Production Summaries

Meltshop Daily Report and Heat Sheets

GERDAU AMERISTEEL US, Inc. - Jackson, Tennessee
July 10 - 11, 2013
PRODUCTION SUMMARY - PM Testing

RUN #	TIME START	TIME END	HEAT START	HEAT END	SAMPLED TIME	MINUTES	HEAT NUMBER	CHARGED POUNDS	CAST TONS	TONS PER HOUR
1	8:48	13:31	8:43	9:52	1:04	64	13-1669	281899	122.1	114.5
			9:53	11:02	1:09	69	13-1670	283950	142.1	123.6
			11:03	12:18	1:15	75	13-1671	285349	129.4	103.5
			12:19	13:29	1:10	70	13-1672	281300	123.5	105.9
					AVERAGE / TOTAL	278	minutes		517.10	**111.6**
					Delays	0	minutes			
RUN #	TIME START	TIME END	HEAT START	HEAT END	SAMPLED TIME	MINUTES	HEAT NUMBER	CHARGED POUNDS	CAST TONS	TONS PER HOUR
2	14:41	20:12	14:36	16:03	1:22	82	13-1674	282699	128.0	93.7
			16:04	17:19	1:15	75	13-1675	284501	126.4	101.1
			17:20	18:41	1:21	81	13-1676	284650	132.1	97.9
			18:42	20:11	1:29	89	13-1677	284499	119.6	80.6
					AVERAGE / TOTAL	327	minutes		506.10	**103.3**
					Delays	33	minutes			
RUN #	TIME START	TIME END	HEAT START	HEAT END	SAMPLED TIME	MINUTES	HEAT NUMBER	CHARGED POUNDS	CAST TONS	TONS PER HOUR
3	8:29	13:32	8:25	9:42	1:13	73	13-1686	279551	123.7	101.7
			9:43	10:57	1:14	74	13-1687	278800	115.5	93.6
			10:58	12:17	1:19	79	13-1688	282550	128.7	97.7
			12:18	13:27	1:09	69	13-1689	283499	141.0	122.6
					AVERAGE / TOTAL	295	minutes		508.90	**103.5**
					Delays	0	minutes			
RUN #	TIME START	TIME END	HEAT START	HEAT END	SAMPLED TIME	MINUTES	HEAT NUMBER	CHARGED POUNDS	CAST TONS	TONS PER HOUR
4	14:40	19:50	14:36	15:42	1:02	62	13-1691	281050	121.3	117.4
			15:43	17:10	1:27	87	13-1692	280949	138.4	95.4
			17:11	18:41	1:30	90	13-1693	279549	124.8	83.2
			18:42	19:42	1:00	60	13-1694	281050	124.8	124.8
					AVERAGE / TOTAL	299	minutes		509.30	**116.6**
					Delays	37	minutes			

TEST AVERAGE **108.49**

GERDAU AMERISTEEL US, Inc. - Jackson, Tennessee
July 10, 2013
PRODUCTION SUMMARY
Baghouse Number 1 - NO_x, CO, SO_2 and Baghouse Number 2 - NO_x, CO, SO_2

RUN #	TIME START	TIME END	HEAT START	HEAT END	SAMPLED TIME	MINUTES	HEAT NUMBER	CHARGED POUNDS	CAST TONS	TONS PER HOUR
1	9:52	12:18	9:52	11:02	1:10	70	13-1670	283950	142.1	121.8
			11:02	12:18	1:16	76	13-1671	285349	129.4	102.2
				AVERAGE / TOTAL		146	minutes		271.50	**111.6**
					Delays	0	minutes			
RUN #	TIME START	TIME END	HEAT START	HEAT END	SAMPLED TIME	MINUTES	HEAT NUMBER	CHARGED POUNDS	CAST TONS	TONS PER HOUR
2	13:29	16:03	13:29	14:36	1:07	67	13-1673	282602	118.7	106.3
			14:36	16:03	1:27	87	13-1674	282699	128.0	88.3
				AVERAGE / TOTAL		154	minutes		246.70	**96.1**
					Delays	0	minutes			
RUN #	TIME START	TIME END	HEAT START	HEAT END	SAMPLED TIME	MINUTES	HEAT NUMBER	CHARGED POUNDS	CAST TONS	TONS PER HOUR
3	17:19	20:11	17:19	18:41	1:22	82	13-1676	284650	132.1	96.7
			18:41	20:11	1:30	90	13-1677	284499	119.6	79.7
				AVERAGE / TOTAL		172	minutes		251.70	**97.4**
					Delays	17	minutes			

TEST AVERAGE **101.53**

Log 4

Daily Log Monitoring Operations for Compliance purposes for Source 01

Date: 7/10/2013

	Heat #	Charge 1			Charge 2			Tap			Cont rols	
		Start Time	Stop Time	Total Time	Start Time	Stop Time	Total Time	Start Time	Stop Time	Total Time	Fan Amperes	Damper Position
1	13-1667	6:26	6:29	0:03	6:46	6:48	0:02	7:34	7:39	0:05		
2	13-1668	7:39	7:42	0:03	7:58	8:00	0:02	8:38	8:43	0:05		
3	13-1669	8:43	8:47	0:04	9:04	9:06	0:02	9:47	9:52	0:05		
4	13-1670	9:52	9:55	0:03	10:11	10:13	0:02	10:57	11:02	0:05		
5	13-1671	11:02	11:05	0:03	11:21	11:23	0:02	12:13	12:18	0:05		
6	13-1672	12:18	12:23	0:05	12:40	12:42	0:02	13:24	13:29	0:05		
7	13-1673	13:29	13:33	0:04	13:49	13:53	0:04	14:31	14:36	0:05		
8	13-1674	14:36	14:40	0:04	14:58	15:08	0:10	15:58	16:03	0:05		
9	13-1675	16:03	16:06	0:03	16:22	16:24	0:02	17:14	17:19	0:05		
10	13-1676	17:19	17:22	0:03	17:39	17:57	0:18	18:36	18:41	0:05		
11	13-1677	18:41	18:44	0:03	19:02	19:10	0:08	20:06	20:11	0:05		
12	13-1678	20:11	22:31	2:20	22:48	22:50	0:02	23:34	23:40	0:06		
13	13-1679	23:40	23:43	0:03	0:03	0:05	0:02	0:53	0:58	0:05		
14	13-1680	0:58	1:02	0:04	1:16	1:18	0:02	1:56	2:01	0:05		
15	13-1681	2:01	2:05	0:04	2:22	2:24	0:02	3:03	3:08	0:05		
16	13-1682	3:08	3:12	0:04	3:28	3:30	0:02	4:26	4:30	0:04		
17	13-1683	4:30	4:33	0:03	4:49	4:51	0:02	5:39	5:44	0:05		
18	13-1684	5:44	5:47	0:03	6:04	6:06	0:02	6:39	6:44	0:05		
19		6:44		########			0:00			0:00		
20		0:00		0:00			0:00			0:00		
21		0:00		0:00			0:00			0:00		
22		0:00		0:00			0:00			0:00		
23		0:00		0:00			0:00			0:00		
24		0:00		0:00			0:00			0:00		

*Check and record the control system fan motor amperes and record damper positions once per shift

Log 4

Daily Log Monitoring Operations for Compliance purposes for Source 01

Date: 7/11/2013

	Heat #	Charge 1			Charge 2			Tap			Cont rols	
		Start Time	Stop Time	Total Time	Start Time	Stop Time	Total Time	Start Time	Stop Time	Total Time	Fan Amperes	Damper Position
1	13-1685	6:44	6:48	0:04	7:03	7:05	0:02	8:19	8:25	0:06		
2	13-1686	8:25	8:30	0:05	8:46	8:48	0:02	9:37	9:42	0:05		
3	13-1687	9:42	9:57	0:15	10:13	10:15	0:02	10:52	10:57	0:05		
4	13-1688	10:57	11:00	0:03	11:16	11:19	0:03	12:12	12:17	0:05		
5	13-1689	12:17	12:21	0:04	12:38	12:41	0:03	13:22	13:27	0:05		
6	13-1690	13:27	13:32	0:05	13:49	13:52	0:03	14:31	14:36	0:05		
7	13-1691	14:36	14:40	0:04	14:57	14:59	0:02	15:37	15:42	0:05		
8	13-1692	15:42	15:45	0:03	16:01	16:03	0:02	17:06	17:10	0:04		
9	13-1693	17:10	17:13	0:03	17:29	17:31	0:02	18:36	18:41	0:05		
10	13-1694	18:41	18:45	0:04	19:02	19:06	0:04	19:44	19:48	0:04		
11	13-1695	19:48	19:52	0:04	20:08	20:10	0:02	20:52	20:57	0:05		
12	13-1696	20:57	21:00	0:03	21:16	21:18	0:02	21:55	21:59	0:04		
13	13-1697	21:59	22:15	0:16	22:32	22:34	0:02	23:45	23:50	0:05		
14	13-1698	23:50	0:00	0:10	0:16	0:18	0:02	0:54	0:59	0:05		
15	13-1699	0:59	1:02	0:03	1:19	1:21	0:02	2:03	2:07	0:04		
16	13-1700	2:07	2:11	0:04	2:28	2:30	0:02	3:08	3:13	0:05		
17	13-1701	3:13	3:16	0:03	3:32	3:34	0:02	4:29	4:33	0:04		
18	13-1702	4:33	4:37	0:04	4:54	4:56	0:02	5:34	5:39	0:05		
19	13-1703	5:39	5:42	0:03	5:58	6:00	0:02	6:36	6:41	0:05		
20		6:41		########			0:00			0:00		
21		0:00		0:00			0:00			0:00		
22		0:00		0:00			0:00			0:00		
23		0:00		0:00			0:00			0:00		
24		0:00		0:00			0:00			0:00		

*Check and record the control system fan motor amperes and record damper positions once per shift