lle Mountain Scientific, l



Results of the Compliance Test for Particulates as PM-10 and Opacity

Test Location: Gerdau Ameristeel Old Baghouse (EU001, CE001) 1678 Red Rock Rd. St. Paul, MN 55119

MPCA Permit File #12300055-11

**Prepared for:** 

Mr. Doug Stolowski Gerdau Ameristeel 1678 Red Rock Road St. Paul, Minnesota 55119 Phone: (651) 731-5697 Fax: (651)731-5699 DStolowski@GerdauAmeristeel.com

> Report # 902334 (Old) November 8, 2006

> > **Prepared By:**

Birm Durkgo

Brian Durkop Vice President

### **REPORT CERTIFICATIONS**

### 1.) Certification of sampling procedures by the team leader of the personnel conducting the sampling procedures:

"I certify under penalty of law that the sampling procedures were performed in accordance with the approved test plan and that the data presented in this test report are, to the best of my knowledge and belief, true, accurate, and complete. All exceptions are listed and explained in the test report."

Signature: Bin, Dep Print Name: Brian Dur Kop Title: Vice President Date: 12-21-06

### 2.) Certification of analytical procedures by the person responsible for the laboratory analysis of field samples:

"I certify under penalty of law that the analytical procedures were performed in accordance with the requirements of the test methods and that the data presented for use in this test report were, to the best of my knowledge and belief, true, accurate, and complete. All exceptions are listed and explained in the test report."

Signature: Mark Carlon Print Name: Mark Carlson Title: Field Supervisor Date: 12-21-06

Certification of test report by senior staff person at the testing company who 3.) is responsible for compiling and checking the test report:

"I certify under penalty of law that this test report and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the test information submitted. Based on my inquiry of the person or persons who performed the sampling and analysis related to the performance test, the information submitted in this test report is, to the best of my knowledge and belief, true, accurate, and complete. All exceptions are listed and explained in the test report."

Signature: Biran Duckop Title: U. ce Pres, dent Date: 12-21-06

Certification of test report by owner or operator of the emission facility: 4.) "I certify under penalty of law that the information submitted in this test report accurately reflects the operating conditions at the emission facility during this performance test and describes the date and nature of all operational and maintenance activities that were performed on the process and control equipment during the month prior to the performance test. Based on my inquiry of the person or persons who performed the operational and maintenance activities, the information submitted in this test report is, to the best of my knowledge and belief, true, accurate, and complete. All exceptions are listed and explained in the cover letter or attachments submitted with this report."

Signature: Buttern Title: Environmental Manager
Print Name: Douglas Stolowski Date: 12/21/06

### **TABLE OF CONTENTS**

SECTION 1.0	EXECUTIVE SUMMARY
1.1	Summary of Test Methods1
1.2	Summary of Test Results1
1.3	Summary of Production2
1.4	Summary of Report Organization2
SECTION 2.0	TEST RESULTS
2.1	Particulates
2.2	Opacity
SECTION 3.0	TEST PROCEDURES
3.1	Determination of Sample Point Locations
3.2	Determination of Particulate Matter7
3.3	Determination of Opacity10
Appendix A	Field Data Sheets
Appendix B	Calculated Field Data Results
Appendix C	Process Operations Data
Appendix D	Laboratory Test Analyses
Appendix E	Equipment Calibrations and Opacity Certification
Appendix F	Test Plan

### **SECTION 1.0**

### **EXECUTIVE SUMMARY**

This report presents the results of a source test performed by Eagle Mountain Scientific, Inc. (EMSI) at the Gerdau Ameristeel facility located in St. Paul, Minnesota. The test was performed on November 8, 2006 to quantify particulate matter (to be reported as PM-10) and visible emissions from the Old Baghouse (AAF) (EU001, CE001). The purpose of the test was to meet the requirements set forth in the Gerdau Ameristeel Permit to Operate (151-93-OT-2). EMSI conducted U. S. EPA (EPA) and Minnesota Pollution Control Agency (MPCA) approved testing methods. This report describes the procedures used to complete the testing and the results of these tests.

The testing was performed by Mr. Brian Durkop, Mr. James Wilson, and Mr. Nathan traut. There were no MPCA observers present during this test project. The process operating conditions were recorded by Gerdau Ameristeel plant personnel and EMSI.

### **1.1 Summary of Test Methods**

### Table 1.1 Gerdau Ameristeel - Old Baghouse (EU001, CE001) November 8, 2006

METHOD	PURPOSE	<b>RUN TIME</b>	# OF RUNS
EPA 1	Determination of Traverse Points	NA	1
EPA 2	Determination of Velocity and Volumetric Flow	108 minutes	3
EPA 3	Determination of Molecular Weight	108 minutes	3
EPA 4	Determination of Moisture	108 minutes	3
EPA 5D	Determination of Particulate Matter	108 minutes	3
EPA 9	Determination of Opacity	60 minutes	1
EPA 202	Determination of Condensable Particulate Matter	NA	3

### **1.2 Summary of Test Results**

### Table 1.2 Gerdau Ameristeel - Old Baghouse (EU001, CE001) November 8, 2006

POLLUTANT	RUN 1	RUN 2	RUN 3	AVERAGE	LIMIT	REGULATION
PM-10 (gr/dscf)	0.0034	0.0030	0.0033	0.0033	0.0052	See Footnote 1
Opacity (%)	0	NA	NA	0	3	40 CFR 60.272a

*Footnote 1 – Limit emissions to those used for netting calculations.* 



### **1.3 Summary of Production**

### Table 1.3 Gerdau Ameristeel - Old Baghouse (EU001, CE001) Particulates As PM10 November 8, 2006

PARAMETER	RUN 1	RUN 2	RUN 3	AVERAGE
Production (tons/hr)	84.4	84.4	84.4	84.4

### **1.4 Summary of Report Organization**

This report is organized in the following manner. Section 2.0 provides detailed test results for the individual test runs. Section 3.0 provides a summary of the testing procedures.

The following information is located in appendices A through F, respectfully: copies of the field data sheets, calculated field data results, process operations data, laboratory test analyses, equipment calibrations and opacity certification, and the test plan.



### **SECTION 2.0**

### **TEST RESULTS**

The testing was conducted in conformance to applicable US EPA and MPCA methodologies and rules. The testing project was conducted according to the approved test plan submitted to the MPCA. A copy of the test plan and approval letter are located in Appendix F.

### 2.1 Particulates

The results of the three tests performed for the determination of particulate matter with condensables are reported in Table 2.1. The ladle refining station operates on a batch process, so to achieve a worst case-operating scenario, between heats when the process is down sampling was stopped.

### Table 2.1 Gerdau Ameristeel - Old Baghouse (EU001, CE001) Particulate Test Results November 8, 2006

Client: Gerdau Ameristeel		Plant: St	
<b>Date(s):</b> <i>November</i> 8, 2006		EPA Me	thod(s): 1-5D, 202
Due #	Dur 2	D 2	
Run #:Run 1	Run 2	Run 3	
Date:	11/8/2006	11/8/2006	A
Time:9:54-12:32	13:28-16:14	16:36-18:33	Average
Production			
Steel (tons/hr)	84.4	84.4	84.4
Control Equipment (monovent baghouse)			
DP #1 (inH20)5.32	5.39	5.47	5.39
DP #2 (inH20)	4.37	4.90	4.67
DP #3 (inH20)5.69	5.30	6.05	5.68
DP #4 (inH20)5.34	4.49	4.82	4.88
DP #5 (inH20)5.71	5.72	5.90	5.78
DP #6 (inH20)4.73	4.64	5.21	4.86
DP #7 (inH20)5.17	5.11	5.66	5.31
DP #8 (inH20)5.79	5.53	5.81	5.71
DP #9 (inH20)4.53	4.81	4.76	4.70
DP #10 (inH20)5.40	5.07	6.11	5.53
DP #11 (inH20)5.08	4.50	5.49	5.02
DP #12 (inH20)4.77	4.94	5.01	4.91
Fans #1 (Amps)108.0	108.0	108.0	108.0
Fans #2 (Amps)118.0	118.0	118.0	118.0
Duct Conditions			
Stack Temp (°F)117	135	123	125
Oxygen (%)20.9	20.9	20.8	20.9
Carbon Dioxide (%)0.3	0.3	0.3	0.3
Moisture (%)	1.9	1.9	1.9
Mol Weight, Dry	28.8	28.8	28.8
Stack Press (inH20)	-8.00	-8.00	-8.00
STACK 1 1055 (111120)0.00	-0.00	-0.00	-0.00



Stack Area (ft2)	70.85 49.9 212,276 179,834 176,417	70.85 48.6 206,453 178,595 175,201	70.85 49.5 210,570 181,576 178,125
Baghouse Conditions			
Nozzle (inches) 1.470	1.470	1.470	1.470
Stack Temp (°F)119	131	135	128
Oxygen (%)20.9	20.9	20.9	20.9
Carbon Dioxide (%)0.3	0.3	0.3	0.3
Moisture (%)1.4	1.3	1.4	1.4
Mol Weight, Dry28.9	28.9	28.9	28.9
Stack Press (inH20)0.04	0.04	0.04	0.04
Stack Area (ft2)	3374.92	3374.92	3374.92
Stack Vel (ft/sec) 1.1	1.0	1.1	1.1
Stack Flow (wacfm)218,675	207,082	214,514	213,424
Stack Flow (wscfm)195,959	181,777	187,632	188,456
Stack Flow (dscfm)193,197	179,399	185,044	185,880
<i>Test Results - Total Particulate Matter</i> Sample Gas Vol (dscf)73.888	67.959	70.774	70.873
Sample Gas Vol (dscf)73.888	67.959 100.4	70.774 101.4	70.873 101.1
Sample Gas Vol (dscf)73.888			
Sample Gas Vol (dscf)73.888 Isokinetics (%)101.4	100.4	101.4	101.1
Sample Gas Vol (dscf)	100.4 0.0	101.4 0.1	101.1 0.4
Sample Gas Vol (dscf)73.888         Isokinetics (%)101.4         Filter (mg)1.2         Probe Rinse (mg)7.6         Aqueous (mg)6.5	100.4 0.0 7.8	101.4 0.1 9.0	101.1 0.4 8.1
Sample Gas Vol (dscf)	100.4 0.0 7.8 4.5	101.4 0.1 9.0 4.6	101.1 0.4 8.1 5.2
Sample Gas Vol (dscf)	100.4 0.0 7.8 4.5 1.1	101.4 0.1 9.0 4.6 1.5	101.1 0.4 8.1 5.2 1.3
Sample Gas Vol (dscf)	100.4 0.0 7.8 4.5 1.1	101.4 0.1 9.0 4.6 1.5	101.1 0.4 8.1 5.2 1.3
Sample Gas Vol (dscf)       73.888         Isokinetics (%)       101.4         Filter (mg)       1.2         Probe Rinse (mg)       7.6         Aqueous (mg)       6.5         Organic (mg)       1.2         Total (mg)       16.5	100.4 0.0 7.8 4.5 1.1 13.4	101.4 0.1 9.0 4.6 1.5 15.2	101.1 0.4 8.1 5.2 1.3 15.0
Sample Gas Vol (dscf)       73.888         Isokinetics (%)       101.4         Filter (mg)       1.2         Probe Rinse (mg)       7.6         Aqueous (mg)       6.5         Organic (mg)       1.2         Total (mg)       16.5         Filterable (lbs/hr)       3.043	100.4 0.0 7.8 4.5 1.1 13.4 2.723	101.4 0.1 9.0 4.6 1.5 15.2 3.147	101.1 0.4 8.1 5.2 1.3 15.0 2.971
Sample Gas Vol (dscf)       73.888         Isokinetics (%)       101.4         Filter (mg)       1.2         Probe Rinse (mg)       7.6         Aqueous (mg)       6.5         Organic (mg)       1.2         Total (mg)       16.5         Filterable (lbs/hr)       3.043         Aqueous (lbs/hr)       2.248	100.4 0.0 7.8 4.5 1.1 13.4 2.723 1.571	101.4 0.1 9.0 4.6 1.5 15.2 3.147 1.591	101.1 0.4 8.1 5.2 1.3 15.0 2.971 1.803
Sample Gas Vol (dscf)       73.888         Isokinetics (%)       101.4         Filter (mg)       1.2         Probe Rinse (mg)       7.6         Aqueous (mg)       6.5         Organic (mg)       1.2         Total (mg)       16.5         Filterable (lbs/hr)       3.043         Aqueous (lbs/hr)       2.248         Organic (lbs/hr)       0.415	100.4 0.0 7.8 4.5 1.1 13.4 2.723 1.571 0.384	101.4 0.1 9.0 4.6 1.5 15.2 3.147 1.591 0.519	101.1 0.4 8.1 5.2 1.3 15.0 2.971 1.803 0.439
Sample Gas Vol (dscf)       73.888         Isokinetics (%)       101.4         Filter (mg)       1.2         Probe Rinse (mg)       7.6         Aqueous (mg)       6.5         Organic (mg)       1.2         Total (mg)       16.5         Filterable (lbs/hr)       3.043         Aqueous (lbs/hr)       0.415         Total (lbs/hr)       5.706	100.4 0.0 7.8 4.5 1.1 13.4 2.723 1.571 0.384	101.4 0.1 9.0 4.6 1.5 15.2 3.147 1.591 0.519	101.1 0.4 8.1 5.2 1.3 15.0 2.971 1.803 0.439
Sample Gas Vol (dscf)       73.888         Isokinetics (%)       101.4         Filter (mg)       1.2         Probe Rinse (mg)       7.6         Aqueous (mg)       6.5         Organic (mg)       1.2         Total (mg)       16.5         Filterable (lbs/hr)       3.043         Aqueous (lbs/hr)       2.248         Organic (lbs/hr)       0.415	100.4 0.0 7.8 4.5 1.1 13.4 2.723 1.571 0.384 4.678	101.4 0.1 9.0 4.6 1.5 15.2 3.147 1.591 0.519 5.256	101.1 0.4 8.1 5.2 1.3 15.0 2.971 1.803 0.439 5.214
Sample Gas Vol (dscf)       73.888         Isokinetics (%)       101.4         Filter (mg)       1.2         Probe Rinse (mg)       7.6         Aqueous (mg)       6.5         Organic (mg)       1.2         Total (mg)       16.5         Filterable (lbs/hr)       3.043         Aqueous (lbs/hr)       0.415         Total (lbs/hr)       5.706         Filterable (gr/dscf)       0.0018	100.4 0.0 7.8 4.5 1.1 13.4 2.723 1.571 0.384 4.678 0.0018	101.4 0.1 9.0 4.6 1.5 15.2 3.147 1.591 0.519 5.256 0.0020	101.1 0.4 8.1 5.2 1.3 15.0 2.971 1.803 0.439 5.214 0.0019
Sample Gas Vol (dscf)       73.888         Isokinetics (%)       101.4         Filter (mg)       1.2         Probe Rinse (mg)       7.6         Aqueous (mg)       6.5         Organic (mg)       1.2         Total (mg)       16.5         Filterable (lbs/hr)       3.043         Aqueous (lbs/hr)       0.415         Total (lbs/hr)       5.706         Filterable (gr/dscf)       0.0018         Aqueous (gr/dscf)       0.0014	100.4 0.0 7.8 4.5 1.1 13.4 2.723 1.571 0.384 4.678 0.0018 0.0010	101.4 0.1 9.0 4.6 1.5 15.2 3.147 1.591 0.519 5.256 0.0020 0.0010	101.1 0.4 8.1 5.2 1.3 15.0 2.971 1.803 0.439 5.214 0.0019 0.0011



### 2.2 Opacity

Mr. James Wilson conducted the visible emission observations. Eastern Technical Assoceates certified Mr. Wilson. A copy of his current certification certificate is located in Appendix E.

### Table 2.2 Gerdau Ameristeel - Old Baghouse Opacity Test Results November 8, 2006

	Plant: St. Paul
	EPA Method(s): 9
Average	
84.4	
0.00	
0.00	
0.00	
0.00	
0	
240	
	84.4 0.00 0.00 0.00 0.00 0



### **SECTION 3.0**

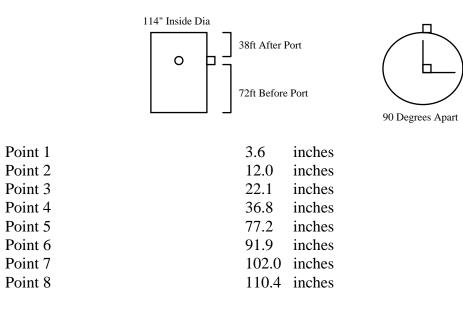
### **TEST PROCEDURES**

### 3.1 Determination of Sample Point Locations

REF: Code of Federal Regulations, Title 40, Part 60, Appendix A, Method 1

### Inlet Duct

Number of Ports:	2
Inside Diameter:	114 inches
Area:	70.85 cubic feet
Distance Upstream of Ports:	72 feet
Distance Downstream of Ports:	38 feet
Total Number of Points:	16
Number of Points per Diameter:	8
Average Cyclonic Flow:	0 %



### **Baghouse** (Outlet)

Each compartment was divided into a 3 x 3 matrix for a total number of points for each compartment being 9. Run 1 sampled at points 1-3 in each of the twelve compartments for a total of 36 points. Run 2 followed by sampling at 4-6 in each compartment, and finally Run 3 sampled at points 7-9.



	Sample Matrix							
3x3		3x3	3x3	3x3	3x3	3x3		
3x3		3x3	3x3	3x3	3x3	3x3		

Number of Compartments: Total Area of Baghouse: Total Number of Points: Number of Points Per Run: Run 1 points: Run 2 points: Run 3 points: 12
3374.92 cubic feet
108
36
1 to 3 in twelve compartments
4 to 6 in twelve compartments
7 to 9 in twelve compartments

Baghouse Dimensions						
Compartment	Compartment	Compartment	Number of	Compartment		
Number	Depth	Width	Doors	Area (ft2)		
1	25'7"	11'0"	1	281.417		
2	25'7"	11'0"	1	281.417		
3	25'7"	11'0"	1	281.417		
4	25'7"	11'0"	1	281.417		
5	25'7"	11'0"	1	281.417		
6	25'7"	11'0"	1	281.417		
7	25'7"	11'0"	1	281.417		
8	25'7"	11'0"	1	281.417		
9	25'7"	11'0"	1	281.417		
10	25'7"	11'0"	1	281.417		
11	25'7"	11'0"	1	281.417		
12	25'7"	11'0"	1	281.417		
	Total Baghous	e Exhaust Area		3,377.004 <sup>1</sup>		

**Baghouse Dimensions** 

<sup>1</sup>The true area is 3374.92 square feet due to obstructions in the compartments.

### **3.2** Determination of Particulate Matter

REF: <u>Code of Federal Regulations</u>, Title 40, Part 60, Appendix A, Methods 2-5D <u>Code of Federal Regulations</u>, Title 40, Part 51, Appendix M, Methods 202

### Sampling System

A curved sample nozzle was connected via a "Swage-Lok" fitting to a heated probe liner. The probe liner was attached to a heated glass filter holder containing a glass fiber filter. The exit to the filter holder was connected to the impinger train which consisted of a set of preweighed impingers connected in series and immersed in an ice bath. The impinger train was followed in series by a carbon vane pump, a dry test meter, and a calibrated orifice connected to an inclined manometer. A Tedlar bag was used to collect an integrated Method 3 sample.



Type K thermocouples were used to measure the following temperatures: probe heater, filter heater, impinger outlet, and dry test meter inlet and outlet.

A combination Stausscheibe (Type S) pitot tube and type K thermocouple were used to measure duct velocity head and temperature. The pitot tube was connected via flexible tubing to an inclined manometer. The thermocouple was connected to a digital potentiometer.

### Sampling Procedure

Prior to sampling, traverse points were selected based on Method 1 requirements. The locations of the traverse points are presented in the reduced field data sheets. A preliminary traverse of the stack was performed to determine stack velocity head, temperature distributions, cyclonic flow, and stack static pressure. If necessary, preliminary runs by Methods 3 and 4 were performed to determine duct moisture and fixed gas content. Based on this information, a sample nozzle of appropriate inside diameter was selected, and the impinger train charged. Sample time per traverse point was estimated in order that a minimum of 30 dscf of sample would be collected.

The apparatus was assembled as completely as possible in the staging area and transported to the sample site. Potential contamination of the sample train was prevented by sealing all openings with aluminum foil. Once in the sampling area, the probe and filter heaters were brought to temperatures of  $250 \pm 25^{\circ}$ F, and the apparatus was leak checked. Upon successful completion of the leak check, the initial dry test meter reading was recorded, and the probe inserted at the first traverse point.

The stack temperature, dry test meter temperature, and the velocity head across the pitot was measured and recorded on the data sheet. The isokinetic sampling rate in terms of pressure drop across the calibrated orifice was calculated and recorded on the data sheet. The pump and timer were turned on, and the sample rate adjusted to correspond to the calculated isokinetic rate. Once the sample rate was set, the following data was recorded:

- Dry Gas Meter Volume
- Dry test meter outlet temperature
- Sample vacuum
- Probe heater temperature
- Filter heater temperature
- Impinger outlet temperature

At the end of the sample time for the first point, the probe was moved to the next point, and the measurements, calculations and recording of data was repeated. Upon completion of sampling from a port, the pump was turned off and the dry test meter reading recorded. The probe was removed from the stack, and placed in the next sample port. The previously described procedure was repeated for each sample port.

When the sample run was completed, the final dry test meter reading was recorded and the probe removed from the port. A post-test leak check was performed at a vacuum higher than the highest sample vacuum measured during the sample run. The final leak rate was recorded on the data sheet. The sample train was sealed from contamination and transported to the staging area for recovery.



### Sample Recovery

Sample was recovered in two fractions: front half and back half. The front half fraction consisted of the filter itself, as well as, acetone rinses and brushings of: the nozzle, the probe liner; and the front half of the filter holder. The filter was recovered to a labeled petri dish made of glass or plastic. Acetone rinses were recovered to a labeled, clean polyethylene bottle. The liquid level in the polyethylene bottle was marked upon completion of recovery.

Prior to recovery of the back half fraction, the exterior of each impingers were cleaned and dried, and the net weight gain of each was determined to the nearest 0.5 gram. The back half fraction consisted of the liquid impinger catch and rinses of the impingers and all connecting glassware. Glassware rinses were recovered to a clean, labeled polyethylene or glass bottle. The liquid level of the bottle was marked upon completion of recovery.

At the conclusion of each day of sampling, reagent and recovery solvent blanks were collected into the same types of containers as were used for sample recovery. The blank containers were clearly labeled, and the liquid levels marked.

### Analytical Procedure

The Method 3 sample was analyzed in the field with a fyrite analyzer. The results of this analysis are presented both in the calculated field data and on the field data sheets.

Prior to analysis, the samples were checked for liquid loss, and the liquid volume of each sample bottle determined. The liquid samples from each run and blanks were transferred to individual tared beakers, and the liquid allowed to evaporate at ambient temperature and pressure. The front half fraction and solvent blanks were analyzed gravimetrically until two consecutive weighings agreed to within 0.5 mg.

Prior to analysis, back half fraction and blanks were checked for liquid loss, and the liquid volume of each sample bottle determined. The back half fraction was extracted with methylene chloride or chloroform/ether and analyzed gravimetrically. Each sample was extracted three times with 200 ml methylene chloride in a separatory funnel. After each extraction, the organic (solvent) fraction was decanted. The organic (solvent) and aqueous (water) fractions were placed in individual tared beakers. The organic fraction was evaporated at ambient temperature and pressure, while the aqueous fraction was evaporated at just below the boiling point. After evaporation, the beakers were desiccated for 24 hours, and weighed until consecutive weighings agreed to within 0.5 mg.



### **3.3** Determination of Opacity

### REF: Code of Federal Regulations, Title 40, Part 60, Appendix A, Method 9

### Positioning of the observer

The opacity of the plume as viewed by the observer can be influenced due to several variables with respect the position of the observer. The position of the observer with respect to the sun. Position of the observer with respect to the observation point. Attached or detached steam plumes. Position of the observer with respect to a rectangular stack with high length to width ratios.

The acceptable criteria for the position the observer is outlined in Method 9 as follows:

1) The observer must maintain a position with the sun located at a  $140^{\circ}$  arc to the observers back.

2) The observer must maintain an angle of  $< 18^{\circ}$  with respect to the observation point.

3) The observer must read the opacity where a steam plume does not interfere. Between the stack and the steam plume if the steam plume in detached from the stack. After the steam plume if the steam plume is attached from the stack.

4) The observer must read a rectangular stack at a point where the stack has the shortest cross sectional diameter.

### Visible Emission Readings

A test for visible emission requires 480 consecutive reading. Each reading is recorded in 15second intervals for 60-minutes. The percent opacity is recorded in 5 percent increments for 0 to 100. The observer must record the results on a data sheet as outlined in Method 9. (ie. position of the observer, date, time, process information, location of the stack, and the 15second opacity readings). The determination of opacity is calculated using a 6-minute rolling average.



Appendix A

**Field Data Sheets** 

Eagle Mountain Scientific Inc.

## **VELOCITY TRAVERSE DATA SHEET**

Stack Pre	ber:In	in. H2O):	$\begin{array}{c c} & \text{Date: } / / - 9 \\ & \text{Unit: } & \text{Ole} \\ & \text{Fuel Type:} \\ & \text{Stack } O_2 (\% \\ / & \text{Stack } O_2 (\% \\ / & \text{Stack } O_2 (\% \\ / & \text{Test Descrip} \\ \end{array}$	d Operato ): <u>20,8</u> ): 0,3	or(s):	
Traver	se Point	Time	$\Delta P$ (in.H <sub>2</sub> O)	T <sub>s</sub> (EF)	Velocity (ft/sec)	Cyclonic Angle
Port	Depth	an an ann an				
a month because	1	830	,56	42		
	2		.62	95		
	3	and the second	. 55	95		
	4		,50	85		
	5		.85	115		
	6		90	112		
	7		187	112		
1	8	· · · · · · · · · · · · · · · · · · ·	1.0	118		
	1		74	99		
	2		. 82	105		
Ň	3		.95	115		
	4		1.05	116	0.000	33 OP
	5		194	116	3 1.4	70 NO22
	6		185	115	1.46	DH
	7		.55	113		
	8	841.	.55	114		
V		anannii Eanna ann an Ann an an Ann		anna an ann an ann an ann ann an Alban ann an Anna ann ann ann ann ann ann a		
		•	en an			

V<sub>S</sub>=85.48 C<sub>P</sub>

/<u>(Ts + 460) ∆P</u>

 $M_{\rm fg} = 0.440 \ (\% CO_2) + 0.320 \ (\% O_2) + 0.280 \ (100 - \% O_2 - \% CO_2)$ 

 $(P_{S}/13.6 + P_{BAR}) M_{fg}$ 





1.23 D.

Client: Job Number:	G	erdau Ameristeel	Date: <b>//</b> {		: <u>St.Paul</u> r(s): <u>5~/77</u> )	
Location:	In	let	Fuel Type:			·
Test Number:	:	2	Stack O <sub>2</sub> (%	5): <u>20.8</u>		n an
Barometric P	ressure	: (in. Hg) <u>- 29</u>	. 43 Stack O2 (%	5): <u>0.</u> ]		
Stack Pressur	e(Ps) (i	in. H2O):	5.9 Test Descrip	ption: Flow		N
Pitot Tube Co	oefficie	nt (Cp):84				
Traverse Po	oint	Time	$\triangle P$ (in.H <sub>2</sub> O)	T <sub>s</sub> (EF)	Velocity (ft/sec)	Cyclonic Angle
Port I	Depth					
1		1300	,60	86		
2			.73	87		

$\begin{array}{c ccccccccccccccccccccccccccccccccccc$		1	1700	,60	86		
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$		2		.73	87		
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$		3		,90	108		
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$		4		.98	195		
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	al contra de la	5		88	1925	0-00029	40
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$		6		84	125	1.470	Work
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$		7		.55	120	1.23	SH
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$		8		:50	119		
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$		1		.55	75		
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$		2		, 58			- Th.
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$		3		,57	84		
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$		4		150	122-		
17 183 125		5		.77	125		
		6		RO	125	· · · ·	
8 1314 185 124		7		125	125		
	V	8	1314	,85	124		
					·		1976) 1977 - 1977 1977 - 1977

Vs=85.48 CP

 $/(T_{\rm S} + 460) \Delta P$ (Ps/13.6 + P<sub>BAR</sub>) M<sub>fg</sub>

 $M_{fg} = 0.440 (\%CO_2) + 0.320 (\%O_2) + 0.280 (100 - \%O_2 - \%CO_2)$ 

## **VELOCITY TRAVERSE DATA SHEET**

,0003/

1.32

Client:	Gerdau Amerist	teel	Date: //	-8-06	Facility:	St.Paul			
Job Number:	-		Unit: 0	ld	Operator(s	):	2-[	<u>sd</u>	
Location:	Inlet		Fuel Type:						
Test Number:	5		Stack O <sub>2</sub> (%	6): <u>9(</u>	5,8				
Barometric Press	sure: (in. Hg)	29.46	Stack O <sub>2</sub> (%	%): <b></b>	9.3				
Stack Pressure(P	s) (in. H2O):	-6.1	Test Descri	iption:Flo	W				
Pitot Tube Coeff	icient (Cp):	.84							

Traver	se Point	Time	$\Delta P$ (in.H <sub>2</sub> O)	T <sub>s</sub> (EF)	Velocity (ft/sec)	Cyclonic Angle
Port	Depth					
	1	1245	,72	89		
	2		185	89		
	3		94	95		
V	4		1.0	115		
	5		.95	120		
	6		TR Q	12-0		
	7		.56	121		
	8		,54	120		
	1			100		
	2		,61	113		
	3		.65	118		
	4		153	118		
	5	-	.79	118		
	6		.85	118		
	7		87	118		
	8	1256	.85	118		
				•		

 $/_{(T_s + 460) \Delta P}$ V<sub>S</sub>=85.48 C<sub>P</sub>

Eagle Mountain Scientific

 $(P_{S}/13.6 + P_{BAR}) M_{fg}$ 

 $M_{fg} = 0.440 (\%CO_2) + 0.320 (\%O_2) + 0.280 (100 - \%O_2 - \%CO_2)$ 

212932	63. ASAR			
2.62.62				
	1. 6. 6. 6 8 8		1378533	
		00.000.03	26425.7	
83.0A	20130	263234	1.0	
22198	3878 STAT		C 1 2 7	
S. S. S. S.	00000.0	11.5.5	2 <b>- 1</b> - 2	1,825
960 Y 201		化氯化化 建化		289.5
		网络萨洛	Par	
		9.5.650	2.1.72	
2002	しつつび	1.2.1.2	Inc.	
		1496	1.2 .	
1978.6		26.132	S	9923
			<b>1</b>	
S.S.M.	203.02	80.63.52	- 18 <b>1</b> -	
1. 1. 1. 1.	640 A B	14	8888 - E	
152.224		× 1111	. I 2000	
832183	5. 5.18.18	- 100 A	. C.W.	QM 2
	1.11		- X.G. C	1.5852
a 30 965.				さだや
111200	110000	- 39 i sa		S 8 2 7
േഷ	11			
C 1388	8 <b>.</b> - 1997 - 197		31284	
1. See 8	A		ANDALL	
· \3	38A \		22535	
2.18	A SERVICE	5.00		
	N NAME IN CO.	33.433	5 A / S. C.	
	NELC	10033	CAX 2	1000
	2 C S S S S	S225-23-1	1990 A. S.	
1251255	87224 83	10 - N. A. A.	Page 1	
		100	1.00	
	990 Y 18	100	1. 1. 1. 1.	
SINAN	10 <b>11</b> 1	NC 24X0	Page 1	
849.8	Sec. 199	1. 199	Sec. 3.	
	in the second	AND NO.	13.123	
ははいてい	S	1000	6.00	00.02
	1.1.1	100	745	
	1 C C C C C C C C C C C C C C C C C C C	1.111	AND	2889
		10.00	3 <b>1</b> 1 1 2 2	
	10.000	10 MJ - 14	1.2.2.171	
	Sec. 193	10 C C	2790 C.	2144
	George 1 1 1	100 C	C 3 .	
	Eagle 4	Mountain	Scientific	いがい
	100000	5.1	4	\$\$\$.9.
812836		1.00 8 3	Ø. 182	5.558
			9.75.337	6266

## STACK TEST DATA SHEET

Client Gerdau Ameristeel	vristeel	Test Method	EPA 5					Date		20-8-	0		
Facility St. Paul		Test Number					)	Job#					
Unit <u>Old Baghouse</u> I ocation Stack	Se	Description Start/Ston Time	TSP Cz		1232			Page Onerator	A A		of	M	
DOULD DIADA			3						2				
PRF-TFST DATA					lon park?	MATERIA	MATERIAL WEIGHT (0)	T (ø)					
Tamb	Ч	Meter Box #	3000	10	Impinger ]	End	Start L		Leak Check	CFM	VAC.	INIT	TIME
Pbar 29.	イス In Hg	Nozzle Dia. (in)	1.47	10 t	#1	T31.3	750.6	I	Pre-Test	Ø	٢	RD	308
K-Factor			150-		#2	8.7%	689.13		Post-Test	Ø	99	8	1235
Mol. WT	g/mole				#3		CON CONTRACT		Kun		7	ç	Avg.
Fstack Sample Time	ш н20 ( <b>О</b> & min	Pitot Coeff.	0	84	Total	1000	0000		02 CO2	8 (r / 0.3			
										5. 			
Sample Time	b del P	del H (In H2O)	Meter	Vacuum	Sector ***		Temperature °F	re °F					
Point (min)	(In H2O)		Reading	(In Hg)	Stack	Probe []	Filter II	Imp Out	Meter				
			(acf)						In	Out	Comment	Comments/Observations	ions
0	(	-	36,955		1.10							-	
1 - 1 3	3 0.00033	37.1	6.65	4	66	とみど	352	んう	67	62			
0			101.2	m	99	246	253	63	C 2	60			
3 ] 9		-	103.1	Å	99	376	245	してつ	& S	ng G			
$\beta$ I 12	2	-	losits	7		278	しみそ	09	68	20			
≥ 15	5	stantena rege	iones	7	(29	249	201	60	69	le c			
	18		169.93S	t	اليوهند. المعروب موهندي	Gre	250	58	10	90			
3 ( 21			112.05	F	2	248	953	27	20	67	-2:50	1055	
Q 24	4	Rad-burnet desse	11435	J	10	Che	351	Re	22	70	22.20	B	6120
3 27		91.0 	116.65	t,	5	she	350	58	1	20	No.	Heart	Kady
イ 1 30	0	8050/ <u>8712</u> 75985	118175	ا لا ا	(32	1646	348	S	er.	10			,
33	3		1.120,85	t L	123	348	350	20	L K	201			
36 36	6   W		12:20	J-	122	Che	350	22	202	22			
Total/Avg. 30	36												
		And the second		Nilition		A Contraction of the	A CONCIL						

Eagle Mountain Scientific	<b>∐nc</b> :	a subjective And a subjective And a subjective	STAC	K TES	T DAT	CK TEST DATA SHEET	E					
t t	risteel	Test Method Test Number	EPA 5					Date Job #	11-8	90		
Unit Old Baghouse Location Stack	22	Description Start/Stop Time	TSP					Page Operator	AD BD		of S	
PRE-TEST DATA						MATERIAL WEIGHT (g)	T WEIGH	HT (g)		· .	ά.	
Tamb	Ч	Meter Box #	Dalo-	$\bar{(}$	pinger	End	Start		Leak Check	CFM	VAC. INIT	TIME
Pbar K-Factor	hHg	Nozzle Dia. (in) Filter #			#1 #	~			Pre-Test Post-Test			3
Mol. WT	g/mole		X	44	£				Run	1	2	3 Avg. 🔌
Pstack Sample Time	In H2O min	Meter Factor Pitot Coeff.		# C	#4 Total	p.e.	8-1 <u>1</u>		02 C02			
					<b>.</b>							
e		del H (In H2O)					erati	ire °F				- M <sub>1</sub> ,
[Point (min)	(In H2O)		Reading ((	(In Hg)	Stack	Probe	Filter	Imp Out	Meter In	out	Comments/Observations	ations
36	ý.		hereel		ter)							
5 1 39	0.0033	1346	125.3	<del>ر</del> ج	PSA	250	320	54	-61	12		
A 42				5	40	348	250	SS	73	70		
3 45			129.862	7	135	570	250	6	13	7		-
6 t 48	~		132,1	7		540	Sec.	5	13	2		
51 51			134,2	7	20 M	25	625	26	25			-
54	+		130.54	3	220	5570	250	50	42	77		
				-J	32	<u>85.55</u>	0.Se	S	1			
			143.25	- J	- Are	353	しんで	26	-73	5		
8 / 80				5	(93:	ઝ્ડ્ર	248	Se Se	242	2		
			147.8		501	िंडि	जिर	5	223			
2 22 2	2		(50,001	2	131	251	250	51	73	R		
Total/Avg. 72	5											

14 C

Eagle Mountain Scientific	Inc.			STAC	)K TE	CK TEST DATA SHEE1	TA SH	EET						
Client Gerdau Facility St.Paul	Gerdau Ameristeel St.Paul	eel	Test Method Test Number	EPA 5		4 			Date Job #		90-8-11	0	sên e L	
Unit Old Ba Location Stack	Old Baghouse Stack		Description Start/Stop Time	TSP (328		614			Page Operator	30		of	M	
PRE-TEST DATA Tamb	TA	°.	Meter Box #	-0/00	1	Impinger		MATERIAL WEIGHT (g) End Start Dif.	HT (g) Dif.	Leak Check CFM		VAC.	INIT	TIME
Pbar V Ecotor	64.96	A In Hg	Nozzle Dia. (in)		02.4-1	C	7.87	2125		Pre-Test	0	La	B	1941
Mol. WT		g/mole	ruter# del H @	121-4	33	#7 #3	545 5415	575.3		Post-rest Run		2		3 Avg.
Pstack		In H2O	) Meter Factor	0.96	11	#4	NG.O	1564		02	30.9			
Sample Time	2	og min	Pitot Coeff.	0.8	Ļ	Total				C02	0.3			
Camila	Time	dal D		Matar	Warmon			Tamnanatura <sup>o</sup> F	oF 0					
Point	(min)	(In H2O)		ත		Stack	Probe	Filter	Imp Out	Meter	er			
				(acf)						In	Out	Comment	Comments/Observations	tions
	0		-	77.333										<u>11 - 11</u>
1	3	0.00099	1.23	9.9%	R	S)1 💈	LAC	asi	ક્સ	73	22			
S	9		ton	S. S.	3	124	Stre	ese	25	34	92	Del	law.	
4						8			All and a second second	.0			Ye	

÷

(

$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	Eagle Mountain Scientific	Inc.	·		STA	STACK TEST DATA SHEET	ST DA	LA SH	E.E.T				and a start of the		
Old Brightonic     Description     Enc.     Description       1 Stack     StartStop Time     Ent     Page     Image       StartStop Time     StartStop Time     StartStop Time     Page     Operator       StartStop Time     Pilet #     Page     Page     Operator       StartStop Time     Pilet #     Page     Page     Operator       StartStop Time     Pilet #     Page     Page     Page       Image     Pilet #     Page     Page     Page       Page     Matter     Page     Page     Page       Image     Page     Page     Page     Page       Page     Matter     Page     Page     Page       Image     Page     Page     Page     Page       Page     Page		au Amerist <sup>u</sup> ul	eel	Test Method Test Number						Date Job #	- 11		Z		
EST DATA The first fi	· · ·	Baghouse		Description Start/Stop Time	TSP					Page . Operator	42		of	M	
BET DATA     TERTALL WEIGHT (g)       MATERAL WEIGHT (g)       In Hg     MATERAL WEIGHT (g)       In H20     Meter Factor       In H20     Meter Factor       In H20     Meter Factor       In H20     Meter Factor       In H20       Meter Factor       In H20       Meter Factor       In H20       Meter Factor       In H20       Meter Factor       In H20       Meter Factor       In H20       Meter Factor       In H20       Meter Factor       In H20       Meter Factor       In H20       Meter Factor       In H20       Meter Factor       In Mater       In Mater       In Mater       In Mater </td <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>5</td> <td></td> <td></td> <td></td> <td></td> <td></td>										5					
The Meter Box # $-30/6 - 5$ Implies Find         Start         Diff.         LINT           In Hg         Nozale Dia (m) $-11$ Nozale Dia (m) $-11$ Nozale Dia (m)         Nozale Dia (m) $-11$ $-11$ $-11$ $-12$ $-11$ $-12$ </td <td>PRE-TEST DA</td> <td>TA</td> <td></td> <td></td> <td>-</td> <td>n galandi. T</td> <td></td> <td>MATERL</td> <td>AL WEIGI</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>	PRE-TEST DA	TA			-	n galandi. T		MATERL	AL WEIGI						
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	Tamb	ander MCD, and provide a set of the set of t	Ho	Meter Box #	2010	ý	Impinger	End	State States		Leak Check	CFM	VAC.	INIT	TIME
Filter #       #       Post-Test       Post-Test         nin 2 mid del H (3       #       *       Post-Test       Post-Test         nin 2 mid del H (3       *	Pbar		In Hg	Nozzle Dia. (in)			#1				Pre-Test				
Image: contract fraction function in the contract fraction in the contract fract fraction in the contract fract fraction in the contract fract	K-Factor						#2				Post-Test				_
In H2O Meter Factor     4     02       In H2O Meter Factor     1041       Time     del P     colspan="2">02       (min)     (n H2O)     Meter     Vacuum     Temperature °F       (min)     (n H2O)     Meter     Vacuum     Temperature °F       (min)     (n H2O)     Meter     Vacuum     Temperature °F       (a)     (n H2O)     (n H2O)     (n H2O)     (n H2O)       (b)     (a)     (a)     (a)     (a)     (a)       (b)     (a)     (a)     (a)	Mol. WT		g/mole				#3				Kun		7		
Image: Control of the product of t	Pstack		In H2O				#4				02				
ic         Time         del P         del H (ln H2O)         Meter         Vacuum         Temperature $^{T}$ 36         (in H2O)         (in H2)         Reading         (in H2)         Stack         Probe         Filter         Imp Out         Meter           36         (in H2O)         (in H2)         Reading         (in H2)         Stack         Probe         Filter         Imp Out         Imp Out         Meter           36         (in H2O)         (in H2)         (in H2)         (in H2)         Stack         Probe         Filter         Imp Out         Imp Out         Meter           43         (in H2)         (in H2)         (in H2)         2         4         100         Imp Out         Imp Out         Meter           (in H2)         (in H2)         (in H2)         (in H2)         2         4         2	Sample Time	× -	min	Pitot Coeff.			Total				C02				
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	Sample	Time	del P	del H (In H2O)	Meter	Vacuum			Temperatu	Ire °F					
4 $36$ $(acf)$ <	Point	(min)	(In H2O)		Reading			Probe	Filter	Imp Out	Mei	er			
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$					(acf)						In	Out	Commen	tts/Observa	tions
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$		36			619.601										
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	ゴ	39	0.00029	a	, °o	7	00	र्भूत	zeo	8	Ś	20			
$ \begin{pmatrix} 4 \\ 4 \\ 4 \\ 4 \\ 4 \\ 4 \\ 4 \\ 4 \\ 4 \\ 4$		42	<	~	$\sim$	لا لا	130			09	d's	20			
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$			2011. 01	1129410412	129.00	Ŕ	133	SX	350	6	3	30			
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	5			1	111.30	Ċ.	1.33	,000,	289	SS	22	60			
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	2		and the second		115.2	4	133	255	250	54	3	0 20			
4       57       4       57       35       35       35       35         5       60       66       65       35       4       132       35       35       55       55         4       66       63       65       35       4       137       35       35       55       55         5       69       1       133       34       137       35       35       55       55       55         5       69       1       133       34       137       35       34       55       57 <td< td=""><td></td><td></td><td></td><td></td><td>115.2</td><td>Z</td><td>133</td><td>250</td><td>249</td><td>S S</td><td>To So</td><td>Z</td><td></td><td></td><td></td></td<>					115.2	Z	133	250	249	S S	To So	Z			
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	ゴート		an the state of th			3	132	251	255	な	3	Ś			
V       63       64       65       35/1       4       1.3/1       250       251       54       63       8         5       69       V       123/5       4       1.30       23/5       34/5       56       8         7       V       123/5       4       1.30       23/5       57       85       8         6       72       V       V       123/5       4       1.33       34/5       55/5       8         72       V       V       123/6       4       1.33       34/4       25/1       85       8	2	60	999 (ant) - 27 B	guigostatata	Klad	z	137	351	250	54	3	200			
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$		63	gagtatoriello	4.002403307	iar 7	7	5	250	351	24	3	2			-
5 69 U V 12517 4 170 251 246 57 85 6 72 V V 127660 4 173 244 351 57 85	لر مر	99		organismith <sup>is</sup>	123.5	Ċ	1.30	220	348	30	32	30			
6 72 V/ V 127,060 t 133 244 351 57 85	<b>V</b>	69		and a	13517	3	0	32	346	3	88	L B			
	Strend Bills	72	Z	V	20	ť	623	う 次	351	S	22	23			
	Total/Avg.	72													

				INC.	
N	1000				
Ň		•2	5 C	1	
1		•	5 (	۵.	
			5.5	3	
	Ń	, io	2	3	
		tai		111	
	1	tai		110	
	6	tai	19 m	1)11	
	10 1	ntai	1.6.	20/11	
	le /	mtan	1.6.	77677	
	sle /	untain	and for	11620	
	210	untai	and from	1121960	
	iele /	untai	The second second	creef w	
<b>`</b>	aple /	ountain	Section of	cuntur	
` `	aple	ountai	Contister.	cruiter	
	aple	auntai	Sand Street	renter	
	Eaple /	lountai	"interfer	renter	
	Fagle /	Mountai	or antific	remine	
	Faple /	Mauntai	vioni 60	remine	
	Eavle /	Mauntain	Convertigo	scientific	
ľ	Faple /	Mauntai	Contractifico	ocientific	
X	Eagle /	Mauntai	Colonific	ocientific	

# STACK TEST DATA SHEET

									29						
Client	Gerdau .	Gerdau Ameristeel	el	Test Method	EPA 5				1	Date	11-8	- 06			
Facility	St.Paul			Test Number	6				ý.	Job#					
Unit	Old Baghouse	shouse		Description	TSP		a status da constata da con La constata da c			Page	M		of	M	
Location				Start/Stop Time		7				Operator	80				
					areas										
PRE-TEST DATA	T DATA				an a			MATERIA	MATERIAL WEIGHT (g)	HT (g)					
Tamb		<u>7</u> 1	oF	Meter Box #			Impinger ]	End	Start		Leak Check CFM	CFM	VAC.	INIT	TIME
Pbar			Th Hg	Nozzle Dia. (in)	с						Pre-Test				
K-Factor				Filter #			#2				Post-Test			-	
Mol. WT			g/mole	del H @			#3				Run	1	2	3	Avg.
Pstack			In H2O	Meter Factor			#4				02				
Sample Time	Sime		min	Pitot Coeff.	J.		Total [				CO2				
				1. sec.									_		
Sample			del P	del H (In H2O)	Meter	Vacuum			Temperature °F	ire °F			-		
Point		(min)	(In H2O)		Reading	(In Hg)	Stack	Probe	Filter	Imp Out	Meter	er	-		
				1	(acf)						In	Out	Commen	Comments/Observations	ions
		72		No se este	127,66										
8	$\mathcal{F}$	75	0.00029	(.23	1300	5	132	251	346	69	RG	SY			
a.	8	78	4	-	131.8	Ý	133	250	247	S	86	Sel			
	Ç	81	ante a state a		133.910	4,	134	asr	SXC	SS.	Sle	84			
10	ų	84	435 CALE & CAL	ontonanto para	136.0	ł	133	250	249	54	87	Ś			
	ر ج	87			6.861	Ţ	.0	ろうん	ろよの	53	87	52			
- <u>-</u>	2	90	2003 STATE	80000000	IL SI	な	135	346	250	0	8	y V			
Anno anno anno anno anno anno anno anno	ų	93		a formation	で、てわし	Ļ	ACK	Sef 7	249	54	87	2			
	2	96			I i i i i i i i i i i i i i i i i i i i	ţ	134	Ste	348	S K	e V	26			
	٩	.99			it6.31	Ľ,	134	040	248	54	86	52			
3	7	102	anata ka si daga		148.5	5		246	348	20	86	6			
	2	105			(50.5)	.J	and the second	346	343	25	80	52			
	ی	108	>	Paya	isa.su	J	PHC)	2	248	26	Ł	25			
Total/Avg.	50	108		10 - 11 - 12 - 12 - 12 - 12 - 12 - 12 -		5									

Eagle Mountain Scientific	in Inc.			STAC	<b>X I</b> E	STACK TEST DATA SHEET	IA SHI	<b>3ET</b>			612	10 g	1 2 2 2	
Client Ger Facility St.I	Gerdau Ameristeel St.Paul	cel	Test Method Test Number	EPA 5		т. 			Date Job #	11-1	9-0			
	Old Baghouse		Description	TSP					Page	1		of	Μ	
Location Stack	ck		Start/Stop Time	163	6	18 3			Operator	BC				
PRE-TEST DATA	ATA						MATERIA	MATERIAL WEIGHT (0)	IT (0)					
Tamb		Ч°	Meter Box #	2010-	5	Inpinger	End	Start	Dif.	Leak Check	CFM	VAC.	INIT	TIME
Pbar	Chips	) In Hg		C. F. ? 1	õ	#	76.5	750		Pre-Test	Ø	<u></u>	92	1630
K-Factor Mol WT		o/mole	Filter #		20		(H.C.	Les S		Post-Test Run		5/	) (	Ave
Pstack		In H2O			172	#47261	R	192.01		03	20.9	1		0
Sample Time	10	s min	Pitot Coeff.	Ý V	3	Total				C02	0.3			
Sample	Time	del P	del H (In H2O)	Meter	Vacuum	والمحاول المراجع والمحاول والم	-	Temperature <sup>oF</sup>	re °F					
Point	(min)	(In H2O)		Reading	(In Hg)	Stack	Probe 1	Filter	Imp Out	Meter	er			
			-	acf)						ul -	Out	Comment	Comments/Observations	ions
	0		9	SJ. RY										
	3	0,0003	100	54.9	5	193.00	351	249	65	502	85		~	
	8 e e			57,15	2	127	Ø 20	250	B	SS	X			
	6		Ningestions.	59,337	Ķ	22	r SS	249	ze	85	38			
7 ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~	2 12	American		le la fe	K.	136	250	348	Se	S	M Co			
	<u>ς 15</u>			63.7	Ś	128	àsr	249	6	83	S			
G	7 18			65,77	F	1. 2. S.	Z	348	25	Z	S.			
I m	7 21	ana antina di	Na Garage	67.9	3	129	SS	369	R	25	83		-	-
	8 24	Mangle Commo		70.2	7	\$ 131	250	83C	SS	8	3			
2	oy 27			12.2	ť,	130	250	Å	96	5	ê S			
2	7 30		MD CREASE	ア、ア	Ł	(32	250	380	R	53	3			
× 1	8 33			み、み	5	1 29	251	20	d	8	84			
		2		78,770	F	139	353	X8	Se	Sh	Z			
Total/Avg.	36	an Angela												
			11			μ	4	11. 683						

1280 912 CI

	Inc.	
Eagle 🖌	Mountain Scientific	4

## STACK TEST DATA SHEET

Client	Gerdau Ameristeel	isteel , *	Test Method	EPA 5					Date	-)]	8-06	J		
Facility	St.Paul		Test Number	5					Job#					
Unit	Old Baghouse	0	Description	TSP					Page	9		of	2	
Location	Stack		Start/Stop Time					-	Operator _	22				
PRF.TEST DATA	T DATA	  					MATERIAL WEIGHT (0)	L WEIGE	IT (o)					
Tamb		Ч.	Meter Box #		Π	Impinger I	End	Start		Leak Check CFM	CFM	VAC.	TINI	TIME
Pbar		In Hg	Nozzle Dia. (in)		-++-	#1				Pre-Test				
K-Factor		i Source S	Filter #		++	#2				Post-Test			- -	
Mol. WT	/	g/mole	del H @		++	#3				Run		2		3 Avg.
Pstack	and and	In H2O	Meter Factor		-++-	#4				02				
Sample Time	ime	min	Pitot Coeff.			Total				C02				
						H								
Sample	Time	del P	del H (ln H2O)	Meter	Vacuum			Temperature °F	re °F					
Point	(min)	(In H2O)		Reading	(In Hg)	Stack	Probe I	Filter	Imp Out	Meter	er			
				(acf)						In	Out	Comment	Comments/Observations	ations
	36			78.770					1					
, 6	39	0.00031	1.32	80.9	L,	NG	250	221	01	Je Je	Ż			
	\$ 42			82.4	4	140	721	222	6	Le Pe	Co Co			
	Q 45	and considerate	Terratiogen	85,2	3	140	asi	250	5	20 12	b			
(h = 1)	7 48	and according to the		81.2	\$	:34	BS X	200	8	22	SS			
	S 51		Nonsesting	Ruy	¢.	14.0	250	255	Ŝ	62	S			
	9 54		Wares and constant	1/10	5	NA	262	348	69	87	S.S			
\ []	7 57			937	t,	140	NS3	247	28	62	SS			
	8 60		Varmagentag	9. C.	<b>&gt;</b>	۲.	251	248	59	23	26			
	9 63		a	0, \$,01	Υ.	1 CUC	251	248	28	87	S S			
8	· 7 66			1.00,11	4		250	346	57	27	S			
	E 69			IND.U	3	ίζЪ!	250	247	R	S	8 80			
	9 72			1001.1001	テ	<b>MUO</b>	250	SUG	E,	Ŕ	S.			
Total/Avg.	g. 72													-

Eagle Mountain Scientific	Inc.			STAC		CK TEST DATA SHEET	LA SHI	BET						
	Gerdau Ameristeel St.Paul	sel	Test Method Test Number	EPA 5					Date Job #	8-11	20-			
ion	Old Baghouse Stack		Description Start/Stop Time	TSP					Page Operator	BD S		of	N	
PRE-TEST DATA Tamb	ΓA	Ϋ́	Meter Box #	2010.	ب	Impinger	MATERIA End	MATERIAL WEIGHT (g) End Start Dif.	HT (g) Dif.	Leak Check CFM	CFM CFM	VAC.	INI	TIME
Pbar		In Hg	Nozzle Dia. (in)			#1				Pre-Test				
Mol. WT		g/mole	ruter # del H @			#2				Post-1est Run	1	2		1 3 Avg.
Pstack Sample Time		In H2O min	Meter Factor Pitot Coeff.			#4 Total				02 C02	4			
					. 8	-				· · · ·				
Sample		del P	del H (In H2O)	Meter	<u> </u>			erati	ıre °F					
Point	(min)	(In H2O)		Reading (acf)	(In Hg)	Stack	Probe	Filter	Imp Out	Meter In	er Out	Commen	Comments/Observations	ttions
	72			Toy Mar								And the second s		
7. 6	75	0.00031	L.32	1062	か	140	350	346	29	86	SS		1.0.1	
ۍ ب	78	e interna		10920	<i>3</i> 2,	(में)	351	242	60	22	22			
γ_ε   {   {	81			100	<u>אל</u>	2000	2 2 2 2 2 3 2 3 2 3 2 3 2 3 3 3 3 3 3 3	550	36	2 V	Bà		8-14 -	
	87		Alice Researce of		5	1234	348	255	Se	22	500			
6	90			1775	3	133	Chre	300	20	ક્લ	SN/			
<u>11 7</u>	93			Varit	ŗ	(39	SAE	ISE	22	85	84			
<b>بلان</b> 	96			12116	3	139	247	252	Ś	22	<i>S</i>			
5/ 	66			123.681	3	30	S	NSS.	2	55	X			
19	102	<u>yerner</u> ana an	2008-180014 75	125.8	37	25	いた	PSR.	h	2	K Go			
2002 	105			13xro	t t	200	sine	- 52	22	50	24			
	108		X	2013	7	Ż	250	420	75	Re	25			
TOUGUILIE.	TVU													

	E	PA				Form NL	iedm	Т
VISIBLE EMIS	SION C	BSERV	'Atic	ON FORM	11	Continu	ied on Vi	50
Meilboot Lised (Circle One)		and the second	ana ang ang ang ang ang ang ang ang ang		-	Cbserve	ation Dat	le
Method 9 203.	A 2038	Other_		ور میں اور		11-	<u> </u>	2
Comporty Norne	۰Λ	and the f	7	an ang an ang an ang an ang ang ang ang	1	Mn	0	
Facility Name	Hre	riste	<u>el</u>	a an		1	JAG	泽
Street Address			$\frac{1}{1}$	anna an	_	2	Vc	7
any and	dro	lagae 1	<u>&lt;                                    </u>	Zp		3 (	96/	Ŧ
L ST. FAUL		IFIN	~ \	55119		4	10/	Z
Process Refer Pro	scess	PLC J	nitoreq( 3M	scural		5	95/	
Control Equipment	Aghor	es	nitorieq	) Mode		6	26/0	Z
Describe Emission Point	9 					7	ØJ.	L
otore B	aghons	ie Ve	1- <u>1-</u>	5		8	90%	4
and a second	and the second				1		010	Ł
Height of Erniss. Pt.	Looft			H. to Observer	34	8	<u>Ú</u>	ž
Distance to Emiss. Pt.	All and a second second	Direction to E		(Degrees)	4	10	946	S
Start End	na na fan de service de service ante a service service service service service service service service service Na service servi	Start		Brd		11	940	9
Vertical Angle to Obs. Pt. Start End Distance and Direction to O		Direction to C Start		Degrees) End		12	70/	3
Stort E-600+	Servation Point	End (				13	940	R
Descebe Emissions	an an an an a she had	The state of the	and the second			14	94L	10
Stort Emission Color	****	End Water Drople	t Pluma	and all when an order to the data and address of the state		15	d L	É
Start End	in the second	Attoched	1	ched None (		16	<u>190</u> 061	k
Describe Plume Background	AND A CONTRACTOR OF A CONTRACTOR O	c L				17	77	<u>k</u>
Bockgieupid Color	212	End Sky Condition	s Z	FALAC	-		<u>/0/0</u> ~%	Ł
Start CALEnd	24at	Start 646 Wind Direction	<u>n (1-</u>	End UCH	_	18	<u>19</u> p	Ľ
Start S End	2-2	Start 5 Wet Bulb Terry	0	End S	_	19	<u>190,</u>	Z
start 65 End	6.5					20	70/0	
and the second	A		a an	Drow North Arrow		21	70/0	C
	Source Lay	out Skeich				22	70/2	5
		Statistics of the second				23	101	9
1 million	7	1111		$\bigcirc$		24	700	C
	ttovreedOX6	on point the	in the second	3		25	10/	Ĉ
Mad 1=	í hand a star	La M	 [		-	25	5/6/	é
NONF	[	vea				27 (	964	Ó
Consequences and a second second	4	· ·				28	5/5/	$\overline{c}$
	Observers	Position	Ľ	Side View 1 Stack		29	177	ľ
	-140			Plume	~	30	<u>\$7</u>	
Sun L		~	$\geq$	Sin $\phi$		4	10/01	<u>0</u> 7
longitude	Latitude		Declino	Wind	4	Observer's		
	:					a reviezdo	191	Lar"

196 1

Page Ø <u>i</u> enco form Number Time Zone Cent Start Time End Time 6 9 45 15 30 Comments H . % G 2 Ason 6 Date -8-06 L eci Þ Cedified By (A 7 Date 4 ÷.

Ó.

Additional Information

### EPA

Form Number

VISIBLE EMISSION OBSERVATION FORM 1

THE OWNER AND A DESCRIPTION OF		
Method Lass (Qrde One)		
(Kethod 9) 203A 2038	Office	anna an
	ay analika a constitution in the constant	and the second
Company Nome	eristee	
	ELISTER	
Facility Name		
	and the second	ĸ ĸ
Street Address		
	Lou 1.	1
atty CL DDr 1	Siche	Zip
LULLIUL	T A KKZT	
Process	Unit # Operating	1 Lada
FIOCESS	CARTE Operant	TINCATO
Control Equipment	Operating	Mode
	1	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,
Commence and the second s	£	and a second
Describe Emission Point	<del>6</del>	
	1	
Height of Emiss. Pt.	Height of Erriss. PT. Re	I. to Observer
Start End	Start	End
Distorice to Emiss. Pt.	Direction to Emiss. Pt.	
Start End	Start	End /
Vertical Angle to Obs. Pt.	Direction to Obe Pt. (	Degrees)
Stort End	Istor \	Bhal
Distance and Direction to Observation Main	trom Emission, Point	T
Stort	Bha X	
	V/	V
	N. C.	
Descabe Emissions		
start	End	
Stort Emission Color	End Water Droplet Plume	Particular (and and
start	1/1 7	
Start Emission Color Start End		Particular (and and
Start Emission Color Start End Describe Plume Background	Attraction Detr	Particular (and and
Start Enssion Color Start End Describe Piume Background Start	Attoched Det	Particular (and and
Start Emission Color Start End Describe Piume Background Start Background Color	Attoched Det	oched None
Start Emission Color Start End Describe Piume Background Start Background Color Start End	End Sky Conditions Start	Particular (and and
Stort Emission Color Start End Describe Piume Background Stort Background Color Stort End Wind Speed	End End Sky Conditions Stat Wind Dijection	End
Start Emission Color Start End Describe Plume Background Start Background Color Start End Wind Speed Start End	End Sky Conditions Start Wind Direction Start	End
Start Emission Color Start End Describe Piume Background Start Background Color Start End Wind Speed Start End Amblent Temp.	End End Sky Conditions Stat Wind Dijection	End
Start Emission Color Start End Describe Plume Background Start Background Color Start End Wind Speed Start End Ambient Temp. Start End	End Sky Conditions Start Wind Direction Start	End
Start Emission Color Start End Describe Piume Background Start Background Color Start End Wind Speed Start End Amblent Temp.	End Sky Conditions Start Wind Direction Start	End End RH Percent
Start       Emission Color       Start       End       Describe Plume Background       Start       Background Color       Start       End       Wind Speed       Start       End       Start       End	End Sky Conditions Stat Wind Direction Stat Wet Bulls Temp.	End
Start       Emission Color       Start       End       Describe Plume Background       Start       Background Color       Start       End       Wind Speed       Start       End       Start       End	End Sky Conditions Start Wind Direction Start	End End RH Percent
Start       Emission Color       Start       End       Describe Plume Background       Start       Background Color       Start       End       Wind Speed       Start       End       Start       End	End Sky Conditions Stat Wind Direction Stat Wet Bulls Temp.	End End RH Percent Draw North Arrow
Start       Emission Color       Start       End       Describe Plume Background       Start       Background Color       Start       End       Wind Speed       Start       End       Start       End	End Sky Conditions Stat Wind Direction Stat Wet Bulls Temp.	End End RH Percent Draw North Arrow
Start       Emission Color       Start       End       Describe Plume Background       Start       Background Color       Start       End       Wind Speed       Start       End       Start       End	End Sky Conditions Stat Wind Direction Stat Wet Bulls Temp.	End End RH Percent Draw North Arrow
Start       Emission Color       Start       End       Describe Plume Background       Start       Background Color       Start       End       Wind Speed       Start       End       Start       End	End Sky Conditions Stat Wind Direction Stat Wet Bulls Temp.	End End RH Percent Draw North Arrow
Start Emission Color Start End Describe Piume Background Start Background Color Start End Mind Speed Start End Amblent Temp. Start End Source La	End Sky Conditions Stat Wind Direction Stat Wet Bulls Temp.	End End RH Percent Draw North Arrow
Start       Emission Color       Start       End       Describe Plume Background       Start       Background Color       Start       End       Wind Speed       Start       End       Start       End	End Sky Conditions Stat Wind Direction Stat Wet Bulls Temp.	End End RH Percent Draw North Arrow
Start Emission Color Start End Describe Piume Background Start Background Color Start End Mind Speed Start End Amblent Temp. Start End Source La	End Sky Conditions Stat Wind Direction Stat Wet Bulls Temp.	End End RH Percent Draw North Arrow
Start Emission Color Start End Describe Piume Background Start Background Color Start End Mind Speed Start End Amblent Temp. Start End Source La	End Sky Conditions Stat Wind Direction Stat Wet Bulls Temp.	End End End RH Percent Draw North Arrow ITN MN
Start Emission Color Start End Describe Piume Background Start Background Color Start End Mind Speed Start End Amblent Temp. Start End Source La	End Sky Conditions Stat Wind Direction Stat Wet Bulls Temp.	End End RH Percent Draw North Arrow
Start Emission Color Start End Describe Piume Background Start Background Color Start End Mind Speed Start End Amblent Temp. Start End Source La	End Sky Conditions Stat Wind Direction Stat Wet Bulls Temp.	End End Fill Percent Draw North Arrow ITN MIN FIE FEE
Start Emission Color Start End Describe Piume Background Start Background Color Start End Mind Speed Start End Amblent Temp. Start End Source La	End Sky Conditions Stat Wind Direction Stat Wet Bulls Temp.	End End End RH Percent Draw North Arrow ITN MN
Start Emission Color Start End Describe Plume Background Start End Wind Speed Start End Amblerst Temp. Start End Source La	Attrached Determined Determined	End End RH Percent Draw North Arrow ITN MN
Start Emission Color Start End Describe Piume Background Start Background Color Start End Mind Speed Start End Amblent Temp. Start End Source La	Attrached Determined Determined	End End End End Fel
Start Emission Color Start End Describe Plume Background Start End Wind Speed Start End Amblerst Temp. Start End Source La	Attrached Determined Determined	End End RH Percent Draw North Arrow ITN MN

9.n

Wind

Declination

Ð

Continu	ed on Vi	O for	mN	mber	and a second				Nugarativ		T	Τ		
Lufternitions.com	and the state of the	ntarii riviiria		rier in constant Paperso	and the second	محدوديون			an çi <b>e da R</b> eferencia			]	<u> </u>	
Observo	tion Dat	0		Time Zc	ກຄູ	6	Start Ti	me	• •		End	Time	~ (	
Hadarawaki	The second division of	<u> </u>		Ce	<u>~</u>	r	16	5	9			17	$\underline{\partial}$	7
Sec Mn	0	1	5	30		45				Con	ment	\$		•
 1	9al	0	m	C/a	10	Joh-						û de se	and a second	(Freedown)
	010	10	44	R.	2	<u>-10</u>			0*************************************		nin ny wala	947mmaaraacaa		
2	79 <u>e</u>	170	10	<u>99e</u>		<u>40</u>			-		Construction of the		- BART Balan	
3	96/	s A	$\mathcal{A}$	9e/r	55	Ł								
4	g/s/	16/	X	S.	6	1			terion granit		917223429-93	and the second secon		alle agr ann an
an	20	18	$\frac{70}{27}$	<u>690</u>		V de	ļ			. Non-Pingan and	ainain <del>for p</del> ha			
5	10/0	57	E	<u> Voj</u>	47	20			****			ر مربع المساحية في الم		
6	940	9	A	901	19	Sfr	(							
7 (	6/7	107		7/	5	7	,	*****		and the second	<b>Balling an and</b>		*******	
	190	14	0	<u>40</u>	26	40								
8	940	99	O	7£		46								
9	ØN,	0/		91	10	6/								
10	62	1	9	<u>140</u> X	16	$\frac{10}{2}$						a promo y conjeta		
10	70%	79	$\mathcal{O}$	<u>70</u>	Z	26								-1800-1992-0
11	901	92	3/2	94	55	H	(							
12	S.	TS,	Z	On l	10	27					ale a subsection of the subsec	ATTESO	1996 (Calendaria)	percent/filmer
and of Manage	<u>140</u>	K	$\underline{O}$	¥	26	40				CTABLE STORE	- Consequences	a da de como de cale	tanaharangkana.	Contraction of the
13	20/6	YC	6	1 de	2	0/								
14	196/	R	e por	H	19	5/~								
15	1	ł	1	-ford	10	6/		**** D-677	il évernesit	16(33602)+F2	der Prova lankaa	KENDOM/NATION	den de la companya d	newsaulation
(0	740	24	$\underline{O}$	<u>14</u>	X	Þ	 	-						10 Providence in the local section of the local sec
16	96/6	X	6	70/	12	5/0								Andre
17	Gel.	P/		Ø/	19	5/		R9148-4884					******	
	44	100	49	al 1	$\frac{1}{2}$	<u>l fing</u>							7.73N-9	
18	YΩ	Z	76	<u> 10/e</u>	$2$ $\mathcal{M}$	<u>40</u>								******
19	126	9a	No.	Ú,	,G	K/								۰ ،
20	ÓŻ.	ĠŹ	Ž	T/	Ő				*****	wije ok on op of the	*******			per-transfe
	74		B	7010	270	40		****					-	
21	140	12	6	40 f.	391	20								
22 (	S/A	$\langle \rangle$	$\nabla$	ŔŹ	P	5L								·-
~~~	0/	ĥZ	4	R I	X	$\varphi$						64-44-54-5-57-54-44-		
23	790	$\overline{\mathcal{G}}$	Ø	<u>10</u> e	XC	$\mathcal{O}$				1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.				
24	96/	R	A	H	R	56	3							
25	92	194	6	77.	0	5/								*****
	7 <i>4c</i>	1	4	40	XCZ	9	>				ang say that is the	ich@hitorot.view	******	
25	146	19	6	70/	39	de la								
27 (	×	96	10	H	9	5/								
28	67	1er	Å	- <u>7</u> Sa 1	Б	69	/			97.00 F				*********
	<u> 44</u> 0	X	þ	<u>14</u> 0	120	26			ana ana amin'ny sora				<b>77</b> 77 (1999) 1999	
29 (	201,	JX	ÌÅ	He	19	5/								
30	961	S/	s/	Yol	\$	2								
¢	146	4/~	<u>as</u>	<u>e 40</u>	<u>V</u> G	$\mathcal{O}$			urie tra-					Chanadistane
overdo	<u>rsNome</u> AV	<del>.</del> ලද්ධ ල	)	S	. \.	e	~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~							rigg starting
Observe	sSona	Ure					$\sim$	1	Date			80		
	Sugar for	1		<u>s</u>	<u>_</u>	and the second s			1	1-2	-	ÕĞ	2	
Organiza	TION	M	7	$\leq 7$			-				_			
Centred			-						Date					

÷.,

Page

Additional Information

Longitude

Sun Location Li

Latitude (

194

Appendix B

**Calculated Field Data Results** 

### EPA REFERENCE METHOD 2 Determination of Stack Gas Velocity & Volumetric Flow Rate

Client	Gerdau Amerist	eel	Date	8-Nov-06
Facility	St. Paul		Job Number	
Unit	Old Baghouse		Operator	JW / BD
Location	Inlet Duct		Test No.	1
Bar. Press	ure (inHg)	29.42	Fuel Type	None
Stack Pres	sure (inH20)	-4.3	Stack % O2	20.9
Pitot Tube	Coef. (Cp)	0.84	Stack % CO2	0.3
Flue Gas N	Ioisure (%)	1.3	Area (ft2)	70.85
Stack MW	Dry	28.85	Stack MW Wet	28.52
Ref Pres (i	n.Hg)	29.92	<b>Ref Temp _F</b>	68

'raverse Point Port	Depth	Time	Delta P (in.H2O)	Ts (_F)	Velocity (ft/sec)	Cyclonic (Deg.)
Н	1	8:30 AM	0.56	92	43.82	0
Н	2		0.62	95	46.24	0
Н	3		0.55	95	43.55	0
Н	4		0.50	95	41.52	0
Н	5		0.85	115	55.10	0
Н	6		0.90	112	56.55	0
Н	7		0.87	112	55.60	0
Н	8		1.00	118	59.93	0
V	1		0.74	99	50.70	0
V	2		0.82	105	53.65	0
V	3		0.95	115	58.26	0
V	4		1.05	116	61.30	0
V	5		0.94	116	58.00	0
V	6		0.85	116	55.15	0
V	7		0.55	113	44.25	0
V	8	8:41 AM	0.55	114	44.29	0
Averages			0.77	108	51.74	0

Abs. Stack Pres.	29.10	in.Hg Absol	ute		
Stack Velocity	51.71	feet/second			
	3103	feet/minute			
Stack Volumetric Flow	219821	WACFM			
	198767	WSCFM			
	196183	DSCFM			
	3664	WACFS			
	Area (ft2)		ft/sec	Delta P	
	3374.92		1.070	0.00033	
	Baghouse		H20 Pres Stack	Stk Temp _F	
			0.0400	100	
			29.422941	560	

### EPA REFERENCE METHOD 2 Determination of Stack Gas Velocity & Volumetric Flow Rate

Client	Gerdau Amerist	eel	Date	8-Nov-06
Facility	St. Paul		Job Number	
Unit	Old Baghouse		Operator	JW / BD
Location	Inlet Duct		Test No.	2
Bar. Press	ure (inHg)	29.42	Fuel Type	None
Stack Pres	sure (inH20)	-4.3	Stack % O2	20.9
Pitot Tube	Coef. (Cp)	0.84	Stack % CO2	0.3
Flue Gas N	Aoisure (%)	1.3	Area (ft2)	70.85
Stack MW	Dry	28.85	Stack MW Wet	28.52
Ref Pres (i	n.Hg)	29.92	<b>Ref Temp _F</b>	68

raverse Point Port	Depth	Time	Delta P (in.H2O)	Ts (_F)	Velocity (ft/sec)	Cyclonic (Deg.)
V	1	12:45 PM	0.60	56	43.86	0
V	2		0.72	57	48.09	0
V	3		0.90	708	80.81	0
V	4		0.98	115	59.17	0
V	5		0.88	115	56.07	0
V	6		0.84	125	55.25	0
V	7		0.55	120	44.52	0
V	8		0.50	119	42.41	0
Н	1		0.55	75	42.76	0
Н	2		0.58	79	44.07	0
Н	3		0.57	84	43.89	0
Н	4		0.50	122	42.52	0
Н	5		0.77	125	52.90	0
Н	6		0.80	125	53.92	0
Н	7		0.83	125	54.92	0
Н	8	13:14	0.85	124	55.53	0
Averages			0.71	142	51.29	0

Abs. Stack Pres.	29.10	in.Hg Absol	ute		
Stack Velocity	51.36	feet/second			
	3082	feet/minute			
<b>Stack Volumetric Flow</b>	218326	WACFM			
	186227	WSCFM			
	183806	DSCFM			
	3639	WACFS			
	Area (ft2)		ft/sec	Delta P	
	3374.92		1.003	0.000	029
	Baghouse		H20 Pres Stack	Stk Temp _	F
			0.0400		100
			29.422941	4	560

### **EPA REFERENCE METHOD 2** Determination of Stack Gas Velocity & Volumetric Flow Rate

Client	Gerdau Amerist	eel	Date	8-Nov-06
Facility	St. Paul		Job Number	
Unit	Old Baghouse		Operator	JW / BD
Location	Inlet Duct		Test No.	3
Bar. Press	ure (inHg)	29.42	Fuel Type	None
Stack Pres	sure (inH20)	6.1	Stack % O2	20.9
Pitot Tube	Coef. (Cp)	0.84	Stack % CO2	0.3
Flue Gas N	Aoisure (%)	1.3	Area (ft2)	70.85
Stack MW	Dry	28.85	Stack MW Wet	28.52
Ref Pres (i	n.Hg)	29.92	<b>Ref Temp _F</b>	68

raverse Point Port	Depth	Time	Delta P (in.H2O)	Ts (_F)	Velocity (ft/sec)	Cyclonic (Deg.)	
Н	1	12:45 PM	0.72	89	48.92	0	
Н	2		0.85	89	53.15	0	
Н	3		0.94	95	56.20	0	
Н	4		1.00	115	59.00	0	
Н	5		0.95	120	57.75	0	
Н	6		0.76	120	51.66	0	
Н	7		0.56	121	44.38	0	
Н	8		0.54	120	43.54	0	
V	1		0.55	100	43.18	0	
V	2		0.61	113	46.00	0	
V	3		0.55	118	43.87	0	
V	4		0.53	118	43.06	0	
V	5		0.79	118	52.58	0	
V	6		0.85	118	54.54	0	
V	7		0.87	118	55.17	0	
V	8	12:56 PM	0.85	118	54.54	0	
Averages			0.75	112	50.47	0	

Abs. Stack Pres.	29.87	in.Hg Absol	ute		
Stack Velocity	50.48	feet/second			
	3029	feet/minute			
<b>Stack Volumetric Flow</b>	214597	WACFM			
	197792	WSCFM			
	195220	DSCFM			
	3577	WACFS			
	Area (ft2)		ft/sec	Delta	Р
	3374.92		1.038		0.00031
	Baghouse		H20 Pres Stack	Stk T	emp _F
			0.0400		100
			29.422941		560

Client :	Gerdau Ameristeel	Unit:	Old Baghouse	Location:	Outlet		
Test # :	1	Date :	8-Nov-06	Job # :	902,334		
Cp =	0.84	Noz Diam =	1.470 in.	Pbar =	29.42 in. Hg		
Dry MW =	28.9	Ps =	0.04 in. H2O	Yd =	0.941		
Stack Area=	3374.92 sq. ft.	Condensate =	22.4 g	Ref Tmp =	68 _F		
Avg. O2 =	20.9 %	Avg. CO2 =	0.3 %				

Data	Time	D	el P	Del H	Meter	Va	acuum			Temperati	ires (_F)		
Point	(min)	(ii	n. H2O)	(in. H2O)	(ACF)	(ir	n. Hg)	Stack	Probe	Filter	Dryer	Meter In	Meter Out
Old-0		0				96.955							
Old-1		3	0.0003	3 1.4	6	99.200	4	99	242	258	62	2 6	7 65
Old-2		6	0.0003	3 1.4	6	101.200	3	99	246	253	63	6	7 65
Old-3		9	0.0003	3 1.4	6	103.100	4	99	248	245	62	2 6	8 65
Old-4		12	0.0003	3 1.4	6	105.145	4	106	248	247	60	) 6	8 66
Old-5		15	0.0003	3 1.4	6	107.650	4	109	249	251	60	) 6	9 66
Old-6		18	0.0003	3 1.4	6	109.935	4	111	249	250	58	3 7	0 66
Old-7		21	0.0003	3 1.4	6	112.050	4	115	248	252	57	77	0 67
Old-8		24	0.0003	3 1.4	6	114.350	4	110	247	251	56	5 7	2 70
Old-9		27	0.0003	3 1.4	6	116.650	4	115	248	250	58	5 7	2 70
Old-10		30	0.0003	3 1.4	6	118.750	4	122	247	248	59	) 7	2 70
Old-11		33	0.0003	3 1.4	6	120.850	4	123	248	250	59	) 7	3 70
Old-12		36	0.0003	3 1.4	6	123.211	4	122	247	250	59	) 7	2 70
Old-13		39	0.0003	3 1.4	6	125.300	4	122	250	248	59	) 7	3 71
Old-14		42	0.0003	3 1.4	6	127.700	4	122	248	250	58	5 7	3 70
Old-15		45	0.0003	3 1.4	6	129.862	4	125	249	250	59	) 7	3 71
Old-16		48	0.0003	3 1.4	6	132.100	4	128	249	249	57	' 7	3 71
Old-17		51	0.0003	3 1.4	6	134.200	4	130	249	249	56	5 7	3 71
Old-18		54	0.0003	3 1.4	6	135.540	4	125	249	251	57	' 7	2 71
Old-19		57	0.0003	3 1.4	6	138.750	4	128	249	250	56	5 7	3 71
Old-20		60	0.0003	3 1.4	6	141.000	4	127	253	250	55	5 7	3 71
Old-21		63	0.0003	3 1.4	6	143.250	4	124	252	247	56	5 7	3 71
Old-22		66	0.0003	3 1.4	6	145.300	4	123	254	248	56	5 7	3 71
Old-23		69	0.0003	3 1.4	6	147.800	4	125	254	249	57	' 7	3 71
Old-24		72	0.0003	3 1.4	6	150.001	4	126	251	250	57	' 7	3 71
Old-25		75	0.0003	3 1.4	6	152.200	4	125	250	250	62	2 7	3 71
Old-26		78	0.0003	3 1.4	6	154.500	4	125	243	250	60	) 7	3 71
Old-27		81	0.0003	3 1.4	6	156.750	4	124	243	250	60	) 7	3 71
Old-28		84	0.0003	3 1.4	6	158.900	4	120	242	249	58	3 7	3 71
Old-29		87	0.0003	3 1.4	6	161.200	4	117	244	249	57	' 7	3 71
Old-30		90	0.0003	3 1.4	6	163.428	4	117	245	249	58	5 7	3 71
Old-31		93	0.0003	3 1.4	6	165.700	4	120	246	249	59	) 7	3 71
Old-32		96	0.0003	3 1.4	6	168.000	4	122	247	249	60	) 7	3 71
Old-33		99	0.0003	3 1.4	6	170.235	4	122	247	248	58	3 7	3 71
Old-34		102	0.0003	3 1.4	6	172.400	4	123	248	249	57	' 7	3 71
Old-35		105	0.0003	3 1.4	6	174.700	4	125	248	250	55	5 7	3 71
Old-36		108	0.0003	3 1.4	6	176.955	4	123	247	251	56	5 7	3 71
Ave./Total		108	0.00033	0 1.4	6	80.000	4	119	248	250	58		

Calculated Data and Test Results :

Sample Gas Volume = Water Vapor = Moisture Content = Average Stack Velocity = Stack Flow =	73.888 DSCF 1.056 SCF 1.41 % 1.1 ft/sec 218675 WACFM 195959 WSCFM 193197 DSCFM	
% Isokinetic =	101.4 %	
Wet MW (actual) = Wet MW (assumed) =	28.7306083 % 28.66632 %	

Concentration of Species in Sampled Gas :

Mass Flow Rate of Species :

Client :	Gerdau Ameristeel	Unit:	Old Baghouse	Location:	Outlet		
Test # :	2	Date :	8-Nov-06	Job # :	902,334		
Cp =	0.84	Noz Diam =	1.470 in.	Pbar =	29.42 in. Hg		
Dry MW =	28.9	Ps =	0.04 in. H2O	Yd =	0.941		
Stack Area=	3374.92 sq. ft.	Condensate =	19.1 g	Ref Tmp =	68 _F		
Avg. O2 =	20.9 %	Avg. CO2 =	0.3 %				

Data	Time	D	el P	Del H	Meter		Vacuum				Temperati	ures (_F)		
Point	(min)	(ii	n. H2O)	(in. H2O)	(ACF)		(in. Hg)	St	ack	Probe	Filter	Dryer	Meter In	Meter Out
Old-0		0				77.333								
Old-1		3	0.0002	9 1.2	3	79.600		3	110	247	251	59	) 7	3 73
Old-2		6	0.0002	9 1.2	3	82.000		3	124	248	252	56	67	5 76
Old-3		9	0.0002	9 1.2	3	84.470		3	112	251	251	55	; 8	0 77
Old-4		12	0.0002	9 1.2	3	86.200		3	130	250	250	56	8 8	0 78
Old-5		15	0.0002	9 1.2	3	88.300		3	132	249	249	55	; 8	0 78
Old-6		18	0.0002	9 1.2	3	90.400		3	132	244	251	55	; 8	1 78
Old-7		21	0.0002	9 1.2	3	92.500		3	135	250	250	56	8 8	1 79
Old-8		24	0.0002	9 1.2	3	94.600		3	136	251	248	55	5 8	1 79
Old-9		27	0.0002	9 1.2	3	96.748		3	134	246	249	56	8 8	1 79
Old-10		30	0.0002	9 1.2	3	98.100		3	134	249	252	54	8	1 79
Old-11		33	0.0002	9 1.2	3	100.800		3	133	249	250	55	; 8	1 79
Old-12		36	0.0002	9 1.2	3	102.612		3	132	249	249	54	8	2 79
Old-13		39	0.0002	9 1.2	3	105.200		4	130	249	250	68	8 8	2 80
Old-14		42	0.0002	9 1.2	3	107.600		4	130	251	251	60	) 8	2 80
Old-15		45	0.0002	9 1.2	3	109.000		4	132	251	250	55	5 8	2 80
Old-16		48	0.0002	9 1.2	3	111.200		4	133	250	249	55	5 8	2 80
Old-17		51	0.0002	9 1.2	3	113.200		4	133	251	250	54	8	2 80
Old-18		54	0.0002	9 1.2	3	115.200		4	133	250	249	54	8	3 80
Old-19		57	0.0002	9 1.2	3	117.300		4	132	251	250	54	8	3 81
Old-20		60	0.0002	9 1.2	3	119.400		4	132	251	250	54	8	3 81
Old-21		63	0.0002	9 1.2	3	121.700		4	132	250	251	54	8	5 81
Old-22		66	0.0002	9 1.2	3	123.500		4	131	250	248	56	8 8	5 82
Old-23		69	0.0002	9 1.2	3	125.700		4	130	251	246	57	' 8	5 82
Old-24		72	0.0002	9 1.2	3	127.660		4	133	244	251	57	' 8	6 82
Old-25		75	0.0002	9 1.2	3	130.000		4	132	251	246	59	8 8	6 84
Old-26		78	0.0002	9 1.2	3	131.800		4	133	250	247	58	8 8	6 84
Old-27		81	0.0002	9 1.2	3	133.910		4	134	251	248	55	5 8	7 84
Old-28		84	0.0002	9 1.2	3	136.000		4	133	250	249	54	8	7 85
Old-29		87	0.0002	9 1.2	3	138.300		4	136	244	249	53	8 8	7 85
Old-30		90	0.0002	9 1.2	3	140.100		4	135	246	250	53	8 8	7 85
Old-31		93	0.0002	9 1.2	3	142.200		4	134	247	249	54	8	6 85
Old-32		96	0.0002	9 1.2	3	144.400		4	134	248	248	54	8	6 86
Old-33		99	0.0002	9 1.2	3	146.310		4	134	247	248	54	8	6 85
Old-34		102	0.0002	9 1.2	3	148.800		4	135	246	248	56	8 8	6 85
Old-35		105	0.0002	9 1.2	3	150.500		4	134	246	247	56	8 8	5 85
Old-36		108	0.0002	9 1.2	3	152.511		4	134	247	248	58	8 8	5 85
Ave./Total		108	0.00029	0 1.2	3	75.178		4	131	249	249			3 81

Calculated Data and Test Results :

Sample Gas Volume = Water Vapor = Moisture Content = Average Stack Velocity = Stack Flow =	67.959 DSCF 0.901 SCF 1.31 % 1.0 ft/sec 207082 WACFM 181777 WSCFM 179399 DSCFM
% Isokinetic =	100.4 %
Wet MW (actual) = Wet MW (assumed) =	28.7416488 % 28.55748 %

Concentration of Species in Sampled Gas :

Mass Flow Rate of Species :

Client :	Gerdau Ameristeel	Unit:	Old Baghouse	Location:	Outlet
Test # :	3	Date :	8-Nov-06	Job # :	902,334
Cp =	0.84	Noz Diam =	1.470 in.	Pbar =	29.47 in. Hg
Dry MW =	28.9	Ps =	0.04 in. H2O	Yd =	0.941
Stack Area=	3374.92 sq. ft.	Condensate =	21.0 g	Ref Tmp =	68 _F
Avg. O2 =	20.9 %	Avg. CO2 =	0.3 %		

Data	Time	D	el P	Del H	Meter		Vacuum				Temperatu	ures (_F)		
Point	(min)	(i	n. H2O)	(in. H2O)	(ACF)		(in. Hg)	Sta	ck	Probe	Filter	Dryer	Meter In	Meter Out
Old-0		0				52.884								
Old-1		3	0.00031	1.3	2	54.900		4	128	251	249	59	8	5 84
Old-2		6	0.00031	1.3	2	57.150		4	127	250	250	58	8	5 84
Old-3		9	0.00031	1.3	2	59.330		4	126	251	249	56	8	5 84
Old-4		12	0.00031	1.3	2	51.600		4	126	250	248	56	8	4 83
Old-5		15	0.00031	1.3	2	63.700		4	128	251	249	55	8	3 83
Old-6		18	0.00031	1.3	2	65.770		4	128	251	248	54	. 8	4 83
Old-7		21	0.00031	1.3	2	67.900		4	129	250	249	56	8	4 83
Old-8		24	0.00031	1.3	2	70.200		4	131	250	248	55	8	4 83
Old-9		27	0.00031	1.3	2	72.200		4	130	250	249	56	8	5 83
Old-10		30	0.00031	1.3	2	74.400		4	132	250	245	55	8	5 83
Old-11		33	0.00031	1.3	2	76.600		4	129	251	247	56	8	5 84
Old-12		36	0.00031	1.3	2	78.770		4	124	252	248	56	8	6 84
Old-13		39	0.00031	1.3	2	80.900		4	140	250	251	57	8	6 84
Old-14		42	0.00031	1.3	2	82.600		4	140	251	250	57	8	6 84
Old-15		45	0.00031	1.3	2	85.200		4	140	251	250	57	8	7 85
Old-16		48	0.00031	1.3	2	87.200		4	139	254	247	58	8	7 85
Old-17		51	0.00031	1.3	2	89.400		4	140	250	255	58	8	7 85
Old-18		54	0.00031	1.3	2	91.700		4	142	252	248	59	8	7 85
Old-19		57	0.00031	1.3	2	93.700		4	140	252	247	58	8	7 85
Old-20		60	0.00031	1.3	2	96.100		4	141	251	248	59	8	7 86
Old-21		63	0.00031	1.3	2	98.011		4	140	251	248	58	8	7 86
Old-22		66	0.00031	1.3	2	100.110		4	141	250	246	57	8	7 86
Old-23		69	0.00031	1.3	2	102.400		4	143	250	247	56	8	6 85
Old-24		72	0.00031	1.3	2	104.401		4	140	250	246	55	8	6 85
Old-25		75	0.00031	1.3	2	106.600		4	140	250	246	59	8	6 85
Old-26		78	0.00031	1.3	2	109.000		4	140	251	247	60	8	5 84
Old-27		81	0.00031	1.3	2	110.800		4	138	254	249	60	8	5 85
Old-28		84	0.00031	1.3	2	112.950		4	134	249	249	57	8	5 84
Old-29		87	0.00031	1.3	2	115.100		4	132	248	245	56	8	4 84
Old-30		90	0.00031	1.3	2	117.250		4	132	247	250	56	8	4 84
Old-31		93	0.00031	1.3	2	119.400		4	139	248	251	55	8	5 84
Old-32		96	0.00031	1.3	2	121.600		4	139	247	250	55	8	5 84
Old-33		99	0.00031	1.3	2	123.681		4	136	250	251	54	8	5 84
Old-34		102	0.00031			125.800		4	132	249				
Old-35		105	0.00031			128.000		4	130	248	251			
Old-36		108	0.00031			130.135		4	129	250				
Ave./Total		108	0.000310			78.535		4	135	250	249			

Calculated Data and Test Results :

Sample Gas Volume = Water Vapor = Moisture Content = Average Stack Velocity = Stack Flow =	70.774 DSCF 0.990 SCF 1.38 % 1.1 ft/sec 214514 WACFM 187632 WSCFM 185044 DSCFM
% Isokinetic =	101.4 %
Wet MW (actual) = Wet MW (assumed) =	28.7338234 % 28.55748 %

Concentration of Species in Sampled Gas :

Mass Flow Rate of Species :

### **METHOD 9 REDUCED FIELD DATA**

Client:	Gergau Ameristeel		
Facility:	St. Paul		
Unit:	Old Baghouse		
Location:	Vents		

### **Test Results:**

Maximum 6 Minute Average:	0.0 %
Average Opacity:	0.0 %
Maximum Opacity:	0.0 %
Minimum Opacity:	0.0 %
# of Readings >20%:	0
Number of Readings:	240

Interval	0	15	30	45
1	0	0	0	0
2	0	0	0	0
3	0	0	0	0
4	0	0	0	0
5	0	0	0	0
6	0	0	0	0
7	0	0	0	0
8	0	0	0	0
9	0	0	0	0
10	0	0	0	0
11	0	0	0	0
12	0	0	0	0
13	0	0	0	0
14	0	0	0	0
15	0	0	0	0
16	0	0	0	0
17	0	0	0	0
18	0	0	0	0
19	0	0	0	0
20	0	0	0	0
21	0	0	0	0
22	0	0	0	0
23	0	0	0	0
24	0	0	0	0
25	0	0	0	0
26	0	0	0	0
27	0	0	0	0
28	0	0	0	0
29	0	0	0	0
30	0	0	0	0

Date:	11-08-06
Time:	16:29-17:29
Project #:	902334
Comments:	

Interval	0	15	30	45
31	0	0	0	0
32	0	0	0	0
33	0	0	0	0
34	0	0	0	0
35	0	0	0	0
36	0	0	0	0
37	0	0	0	0
38	0	0	0	0
39	0	0	0	0
40	0	0	0	0
41	0	0	0	0
42	0	0	0	0
43	0	0	0	0
44	0	0	0	0
45	0	0	0	0
46	0	0	0	0
47	0	0	0	0
48	0	0	0	0
49	0	0	0	0
50	0	0	0	0
51	0	0	0	0
52	0	0	0	0
53	0	0	0	0
54	0	0	0	0
55	0	0	0	0
56	0	0	0	0
57	0	0	0	0
58	0	0	0	0
59	0	0	0	0
60	0	0	0	0

# **METHOD 9 REDUCED FIELD DATA**

Client:	Gergau Ameristeel
Facility:	St. Paul
Unit:	Old Baghouse
Location:	Vents

#### **Test Results:**

Maximum 6 Minute Average:	0.0 %
Average Opacity:	0.0 %
Maximum Opacity:	0.0 %
Minimum Opacity:	0.0 %
# of Readings >20%:	0
Number of Readings:	240

Interval	0	15	30	45
1	0	0	0	0
2	0	0	0	0
3	0	0	0	0
4	0	0	0	0
5	0	0	0	0
6	0	0	0	0
7	0	0	0	0
8	0	0	0	0
9	0	0	0	0
10	0	0	0	0
11	0	0	0	0
12	0	0	0	0
13	0	0	0	0
14	0	0	0	0
15	0	0	0	0
16	0	0	0	0
17	0	0	0	0
18	0	0	0	0
19	0	0	0	0
20	0	0	0	0
21	0	0	0	0
22	0	0	0	0
23	0	0	0	0
24	0	0	0	0
25	0	0	0	0
26	0	0	0	0
27	0	0	0	0
28	0	0	0	0
29	0	0	0	0
30	0	0	0	0

Date:	11-08-06
Time:	16:29-17:29
Project #:	902334
Comments:	

Interval	0	15	30	45
31	0	0	0	0
32	0	0	0	0
33	0	0	0	0
34	0	0	0	0
35	0	0	0	0
36	0	0	0	0
37	0	0	0	0
38	0	0	0	0
39	0	0	0	0
40	0	0	0	0
41	0	0	0	0
42	0	0	0	0
43	0	0	0	0
44	0	0	0	0
45	0	0	0	0
46	0	0	0	0
47	0	0	0	0
48	0	0	0	0
49	0	0	0	0
50	0	0	0	0
51	0	0	0	0
52	0	0	0	0
53	0	0	0	0
54	0	0	0	0
55	0	0	0	0
56	0	0	0	0
57	0	0	0	0
58	0	0	0	0
59	0	0	0	0
60	0	0	0	0

Appendix C

**Process Operations Data** 





Minnesota Pollution Control Agency

520 Lafayette Rd. N. Saint Paul, MN 55155-4194 (651)-296-6300

Test Date(s):	
Company Name:	

Process Equipment Number/Identification:

#### **Equipment & Operating Data**

- 1. Process Equipment Description:
- 2. Were the process and control equipment operated consistent with normal procedures? YES NO If no, explain:
- 3. Include copy of production records or instrumentation which indicates rate of production or operation of the equipment, i.e. units per hour, pounds per hour, pressure, air flow, etc.
- 4. Date(s) and procedure(s) of last maintenance/cleaning within 6 months: 🗌 Remains unchanged from info. provided in test plan
- 5. Process rate (amount of raw material or finished product per hour, wet or dry basis) while combusting (list fuel type(s) and ratios as appropriate)\_\_\_\_\_\_

Process Parameter: list type and units	Run 1	Run 2	Run 3
Fuel Input (list units)			
Heat Input (10 <sup>6</sup> British thermal units/hour)			

6. Summarize control equipment operating data documented during testing. Values reported should reflect maximum, minimum, averages, or as approved in the test plan. (See test plan and approval letter)

-	PC equipment and paramet	•			
	type of scrubber): $\Delta P$ (in. w.c.) a			ghouse, Cyclone, and Mul	
	<b>herator</b> : $(^{\circ}F_{in}, ^{\circ}F_{out})$ and Therm	nal Incinerator: (		<b>P:</b> Number and identity of o	
APC and para	meter monitored		Run 1	Run 2	Run 3
List pollutant	& averaging basisshould r	eflect permit	Run 1	Run 1	Run 1
Continuous O	pacity Monitor(list hourly av	verage)			
<u> </u>	(list averaging basis):				
Monitor	(list averaging basis:				
Abbreviations:	APC-air pollution control lbspounds	gpmgallons	per minute per square inch gau		s of water column drop
	103-Poulus	psig-pressure	per square men gau	$\Delta I = pressure$	urop

**Note:** This form provides only a summary of the operating conditions during the performance test. Additional and more detailed records are required to meet the requirements of Minn. R. 7017.2035, subp. 3. This form is to be submitted as part of the performance test report.

Rouse 1509 OID the second T- 2 T-1 5.47 5.39 TOP-1 5.32 64,90 4.77 4.75 234567 6.05 5.30 5.69 4.82 4.49 5.34 5.90 5.72 5.71 5.21 4.64 4.73 5.66 5.11 5.17 5:81 5,53 5.79 8 4, 765 4,800 4.53 9 6.11 5,67 5.4 5.49 10 4.5 5,08 5.01 4.94 ( 4.77 12 T-1-108 T-2-108 T-3/08 \_T-1/18 AMP T-2-118-T-3-118 west

Nov-06		MTD #		MTD			MTD	Daily	Daily			Total Tap			Ava	Schedule	Total	- 1
	# OF		TONS	TONS		Adjusted	Adjusted	Operating	Matrix	Adjusted	Matrix	to Tap	Avg Tap	Power on	Power on Power on		Power off Avg Power	
DATE	HEAT	HEATS	PLANNED	σ	Tons	Tons	Tons	Hours	Hours	TPH	TPH	Time	to Tap	Time	Time		time	
L	17	17	1620	1620	1519.9	1519.9	1519.9	24	24	63.6		1434.51	84.4	760.15		1440.00	674.36	
2	6	26		2565	796.41	796.4	2316.31	14	24	71.9	33.2	664.62	73.8	413.35		840.00	251.27	
ω	16	42	1620	4185	1437.5	1437.5	3753.81	24	24	58.9		1465.43	91.6	733.59		1440.00	731.84	
4	19	61	1620	5085	1631.9	1631.9	5385.71	24	24	67.8	68.0	1445.03	76.1	892.54		1440.00	552.49	
л л	19	80	1620	7425	1721.5	1721.5	7107.21	24	24	68.4	71.7	1510.31	79.5	841.34	44.28	1440.00	668.97	
6	21	101	1620	9045	1834.5	1834.5	8941.71	24	24	78.4	76.4	1403.21	66.8	872.35	41.54	1440.00		
7	19	120	1620	10665	1726.3	1726.3	10668.01	24	24	74.6	71.9	1389.29	73.1	840	44.21	1440.00	549.29	
8	22	142	1620	12285	2026.1	2026.1	12694.11	24	24	80.1	84.4	1518.12	69.0	900.22	40.92	1440.00		
6	16	158	1620	13905	1457.8	1457.8	14151.91	24	24	67.8		1289.25	80.6	667	41.69	1440.00		
10	14	172	1140.75	15045.75	1291.4	1291.4	15443.31	16.9	24	66.3		1169.52	83.5	628.21	44.87	1014.00		
11	2	174	189	15234.75	157.1	157.1	15600.41	2.8	24	53.5	6.5	176.3	88.2	80.4	40.20	168.00		
12	0	174	0	15234.75	0	0.0	15600.41	0	24	0.0		0	0.0	0	0.00	0.00		
13	0	174	0	15234.75	0	0.0	15600.41	0	24	0.0		0	0.0	0	0.00	0.00		1
14	0	174	0	15234.75	0	0.0	15600.41	0	24	0.0		0	0.0	0	0.00	0.00	0.00	- 1
15	0	174	0	15234.75	0	0.0	15600.41	0	24	0.0		0	0.0	0	0.00	0.00		-
16	0	174	0	15234.75	0	0.0	15600.41	0	24	0.0	0.0	0	0.0	0	0.00	0.00		
17	0	174	0	15234.75	0	0.0	15600.41	0	24	0.0		0	0.0	0	00.0	0.00		_
18	ω	177	540	15774.75	248.8	248.8	15849.21	8	24	36.4		410.6	136.9	215.33		4	195.27	
19		192	1620	17394.75	1282.1	1282.1	17131.31	24	24	53.0	53.4	1450.44	96.7	860.21	57.35	1440.00		_
20	12	204	1620	19014.75	1063.8	1063.8	18195.11	24	24	44,4		1438.49	119.9	588.38	49.03	1440.00	850.11	
21	14	218	1620	20634.75	1192.3	1192.3	19387.41	24	24	50.6		1414	101.0	651.21	46.52	1440.00		
22	13	231	1620	<b>—</b> —	1177.8	1177.8	20565.21	24	24	56.0		1262.58	97.1	624.04		1440.00		
23	0	231	0	22254.75	0	0.0	20565.21	0	0	0.0	0.0	0	0.0		0.0	0.00		_
24	0	231	0	22254.75	0	0.0	20565.21	0	0	0.0		0	0.0		0.0	0.00	0.00	
25	0	231	0	22254.75	0	0.0	20565.21	0	0	0.0		0	0.0		0.0	0.00		
26	0	231	0	22254.75	0	0.0	20565.21	0	0	0.0		0	0.0		0.0	0.00		-
27	12	243		1620 23874.75	1049.3	1049.3	1049.3 21614.51	24	24	51.7	43.7	1216.83	101.4	560.14	46.68	1440.00	656.69	
28	14	257		1620 25494.75	1273.77	1273.8	1273.8 22888.28	24	24	48.2		1585.77	113.3	646.33	46.17	1440.00	939.44	-
29	19	276	1	620 27114.75	1716.2	1716.2	1716.2 24604.48	24	24	72.8		1413.92	74.4	872.4	45.92	1440.00	541.52	
30	16		1	620 28734.75	1445.8	1445.8	1445.8 26050.28	24	24	58.2	60.2	1491.19	93.2	785.05		1440.00	706.14	
TOTAL	292.0	292.0	<u> </u>	620 28734.75	26050.3	26050.3	26050.3	24	624.0	62.1	135.7	25149.4	86.1	13432.2	46.00	25542.00	11717.17	

Appendix D

Laboratory test Analyses

# **Particulate Weight Analysis**

<b>Client:</b>	Gerdau Ameristeel
<b>Facility</b> :	St. Paul
Project #:	902334
Unit:	Old Baghouse
Date:	11-8-06

Type:	TSP	PM10	PM2.5
Test #:	1 2	3 Bla	nk

Mg

Analyst: MC

HHTOP	
HIITer	
ID#:	

Filter	Initial	Date	8-28-04	8-18-04			
<b>ID#:</b>	Weight (g)	Time	920	1417		A 2010	
770		Weight	0.3015	0.3013		0.2019	
1285	Final	Date	12-13-00	12-14-06			Total:
	Weight (g)	Time	819	do		12026	112
		Weight	0.3026	0.3026		0.7	1.6
					NATES AND A STATE AND A STATE OF A DESCRIPTION OF A DESCRIP		

				Sample Vol	ume: 125 /	2	이 방송 동물 가격한 것
Acetone	Initial	Date	16-27-06	10-27-06			
<b>ID#:</b>	Weight (g)	Time	906	1328		116,2762	
N/		Weight	116:274	1142700		116,000	
H-0	Final	Date	12-13-06	12-13-06			Total:
	Weight (g)	Time	Ma	1720		16.2775	
		Weight	111.2775	116.2780			🖉 Mg
	I	weight	116.6115	1110.6100	<u> </u>		

rganic	Initial	Date	10-27-06	40-27-04		
ID#:	Weight (g)	Time	908	330	81. 4824	
1		Weight	86.4823	86.4824	יישטך	
6	Final	Date	12.13-66	12-13-04		Total:
	Weight (g)	Time	1121	1722	86.4836	1-7
		Weight	86.4835	86.4838		

				Sample Volu	ime: 250+2	50+175+50	201
Aqueous	Initial	Date	10-27-010	10-27-06			
ID#:	Weight (g)	Time	910	1333		117.6649	
		Weight	117.6650	117.6648		111.00001	
AFIL	Final	Date	12-13-06	12-13-02			Total:
	Weight (g)	Time	1123	1724		17.614	15
		Weight	117.173	117.6715		ų	(0 Mg

Notes:

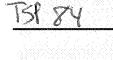
# Particulate Weight Analysis

Client:	Gerdau Ameriste	el		ŕ	Type: TS	P PM10	PM2.5
Facility:	St. Paul		- y			5997. h.	
Project #:	902334			r	<b>Fest #:</b> 1 (	<b>2</b> ] <b>3</b> Blan	ık
Unit:	Old Baghouse					$\sim$	
Date:	11-8-06				Analyst: MC		
Filter	Initial	Date	8-28-04	9-23-06			
<b>ID#:</b>	Weight (g)	Time	921	1419		0,3015	
17 000	사람이가 주말 것은 것이 같다. 사람이는 것이 가지 않는 것이	Weight	0.3015	0.3015		0,000	
BPR	- Final	Date	12-13-04	12-14-06			] Total:
	Weight (g)	Time	821	1013		0,2992	0.6 Mg
		Weight	0.2994	0.2991			
Acetone	Initial	Date	16-27-06	Sample Volu	1me: 15a-		1
ID#:	Weight (g)	Time	912	1335		88.4632	
4-manife	Weight		88.4031		00,1030		
5 Fina	Final	Date	12-13-06	12-13-06			Total:
	Weight (g)		1125	1726		88.4110	
	Weight (6)	Weight	88.411	88.469		00.110	7.8 Mg
Organic	Initial	Date	342.22-00	Sample Volu	<u>ime: 206, </u>	$\lambda$	
ID#:	Weight (g)	Time	914	1337		117 2022	
<b>μ</b> <i>π</i> .	Weight (g)		113.3830	1337		1133830	
A-9	Final	Date	12-13-06	12-13-04			Total:
<u>()  </u>	Weight (g)		127	1728		11 20///	7 1
	, eight (g)	Weight	113.3834	113.3843		113.3841	h, Mg
			<u> </u>		1me: 250 t2	50+100+12	<u></u>
Aqueous	Initial	Date	10-27-00	10-27-06		<u>-</u>	
ID#:	Weight (g)	Time	916	1338		852512	
¥ I		Weight	858512	85.8511			
	Final	Date	12-13-06	12-13:06			Total:
	Weight (g)	Time	1129	1730		85.8557	uc
,		Weight	85.855Le	85.8558			

Notes:\_\_\_\_

# Particulate Weight Analysis

<b>Client:</b>	Gerdau Ameristee	əl		Type: TSP PM10 PM2.5
Facility:	St. Paul			
Project #:	902334			<b>Test #: 1 2</b> (3) Blank
Unit:	Old Baghouse			
Date:	11-8-06			Analyst: MC
Filter	Initial	Date	7-28-06	× X-2X-04
ID#:	Weight (g)		azz	1421 1 1 207.2



	Weight (g)	Time	azz	1421	- 12000	
	weight (g)		0.3022	0,3024	- 0,5043	
ng kina sang Sang kina sang Sang kina sang	Final	Date	12-13-06	12-14-06		Total:
	Weight (g)		823	1018	7 0.3024	A 1
			0.3021	0.3026		0.1 Mg

	di kana kan			Sample Vol	ume: 225	ml	
Acetone	Initial	Date	10-27-06	16-27-06			
<b>ID#:</b>	Weight (g)		919	1340		761694	
		Weight	86.1694	86.165			
10	Final	Date	12-13-06	12-13-06			Total:
	Weight (g)	Time	1130	1732		71.584	0~
		Weight	865783	86.1786		100.	90 Mg

ganic	Initial	Date	10-27-06	10-27-06		Program.
ID#:	Weight (g)	Time	920	1342	1122317	
Provent's a		Weight	112.2315	112.2319		
ES 👘	Final	Date	12-13-06	12-13-06	in noo	Total:
	Weight (g)	Time	1132	1734	1116.6352	115
		Weight	112.2334	112.2330		1.5

				Sample Volume: 🏷	0+250+75+16	Ó
Aqueous	Initial	Date	10-27-06	40-75-01		
<b>ID#:</b>	Weight (g)	Time	922	1343	105.8174	
57/1		Weight	105.8176	105.8172	1-5/2/11	
<u> </u>	Final	Date	12-13-06	12-13-04		Total:
	Weight (g)	Time	1135	iBL	105.82.20	41
		Weight	WS.5218	105.8222		l. C Mg

Notes:\_

**Determination of Particulate Emissions from Stationary Sources** 

**Organic Condensable Emissions** 

Client (	Gerdau Ameristeel	Analyst	MAC	
Facility S	St. Paul	Job Number	902334	
Unit (	Old Baghouse	Description	Particulate	s
Location S	Stack			
TEST 1	Time	9:54-12:32	Date	11/8/2006
Organic Ne	t Gain (Solvent)	<u>1.2</u> mg	20.90	% Oxygen
Sample Gas	s Volume	73.888 dscf	NA	F-factor
Stack Volu	metric Flow	193197 dscfm		
Particulate	Concentration		NA	lbs/mmBtu
Particulate	Concentration		0.0162	mg/dscf
Particulate	Emission Rate		0.4150	lbs/hr
Particulate	Concentration		0.00025	gr/dscf
Particulate	Concentration		#DIV/0!	gr/dscf @7% Oxygen
TEST 2	Time	13:28-16:14	Date	11/8/2006
Organic Ne	t Gain (Solvent)	<u> </u>	20.90	% Oxygen
Sample Gas	s Volume	67.959 dscf	NA	F-factor
Stack Volu	metric Flow	179399 dscfm		
Particulate	Concentration		NA	lbs/mmBtu
Particulate	Concentration		0.0162	mg/dscf
Particulate	Emission Rate		0.3841	lbs/hr
Particulate	Concentration		0.00025	gr/dscf
Particulate	Concentration		#DIV/0!	gr/dscf @7% Oxygen
TEST 3	Time	16:36-18:33	Date	11/8/2006
Organic Ne	t Gain (Solvent)	<u>1.5</u> mg	20.90	% Oxygen
Sample Ga	s Volume	70.774 dscf	NA	F-factor
Stack Volu	metric Flow	<u>185044</u> dscfm		
	Concentration		NA	lbs/mmBtu
Particulate	Concentration		0.0212	mg/dscf
Particulate	Emission Rate			lbs/hr
	Concentration		0.00033	gr/dscf
Particulate	Concentration		#DIV/0!	gr/dscf @7% Oxygen
	VERAGE TEST 1-3			
	Concentration		NA	lbs/mmBtu
	Concentration			mg/dscf
	Emission Rate			lbs/hr
	Concentration			gr/dscf
Particulate	Concentration		#DIV/0!	gr/dscf @7% Oxygen

# Determination of Particulate Emissions from Stationary Sources

Aqueous Condensable Emissions

		queous Condensable Emis		
	North Star Steel	Analyst	MAC	
•	St. Paul	Job Number		
Unit	Old Baghouse	Description	Particulate	2S
Location	Stack			
TEST 1	Time	9:54-12:32	Date	11/8/2006
	ple Net Gain	6.5 mg		% Oxygen
	let Gain (H20)	<u>6.5 mg</u>	NA	Sulfates (mg/ml)
Sample Ga		73.888 dscf	NA	Impinger Volume (ml)
•	imetric Flow	193197 dscfm	NA	Sulfate Aliquot Vol (ml)
Stack Von		uselii	NA	F-factor
Particulat	e Concentration		NA	lbs/mmBtu
	e Concentration			mg/dscf
	e Emission Rate			b lbs/hr
				-
	e Concentration			gr/dscf
rarticulat	e Concentration		#DIV/0!	_gr/dscf @7% Oxygen
TEST 2	Time	13:28-16:14	Date	11/8/2006
Dried Sam	ple Net Gain	4.5 mg	20.90	% Oxygen
Aqueous N	let Gain (H20)	4.5 mg	NA	Sulfates (mg/ml)
Sample Ga	as Volume	67.959 dscf	NA	Impinger Volume (ml)
Stack Volu	metric Flow	179399 dscfm	NA	Sulfate Aliquot Vol (ml)
			NA	F-factor
Particulat	e Concentration		NA	
Particulat	e Concentration		0.066	mg/dscf
Particulat	e Emission Rate		-	lbs/hr
Particulat	e Concentration			gr/dscf
Particulat	e Concentration		-	gr/dscf @7% Oxygen
TECT 2	Time	16:36-18:33	Dete	11/0/2007
TEST 3			Date 20.00	11/8/2006
	ple Net Gain	<u>4.6 mg</u>		) % Oxygen
•	let Gain (H20)	<u>4.6 mg</u>	NA	Sulfates (mg/ml)
Sample Ga		<u>70.774</u> dscf	NA	Impinger Volume (ml)
Stack Volu	imetric Flow	<u>185044</u> dscfm	NA	Sulfate Aliquot Vol (ml)
	~		NA	F-factor
	e Concentration		NA	lbs/mmBtu
	e Concentration			<u>mg/dscf</u>
	e Emission Rate			lbs/hr
	e Concentration			gr/dscf
Particulat	e Concentration		#DIV/0!	gr/dscf @7% Oxygen
RESULT	AVERAGE TEST 1-3			
Particulat	e Concentration		NA	lbs/mmBtu
Particulat	e Concentration		0.073	B mg/dscf
Particulat	e Emission Rate		1.803	3 lbs/hr
Particulat	e Concentration		0.001	gr/dscf
Particulat	e Concentration			gr/dscf @7% Oxygen

# Determination of Particulate Emissions from Stationary Sources

Filterable Emissions

Client	Gerdau Ameristeel	Analyst	МАС	
Facility	St. Paul	Job Number	(	
Unit	Old Baghouse		Particulates	
Location	Ű	<b>I</b>		
TEST 1	Time	9:54-12:32	Date 11/8/2006	
Filter Net	Gain	1.2 mg	20.90 % Oxygen	
Probe Rin	se Net Gain	7.6 mg	NA F-factor	
Sample G	as Volume	73.888 dscf		
Stack Vol	umetric Flow	193197 dscfm		
Particulat	e Concentration		NA lbs/mmBtu	
Particulat	e Concentration		0.119 mg/dscf	
Particulat	e Emission Rate		3.043 lbs/hr	
Particulat	e Concentration		0.002 gr/dscf	
Particulat	e Concentration		#DIV/0! gr/dscf @7% Oxyge	n
TEST 2	Time	13:28-16:14	Date 11/8/2006	
Filter Net	Gain	0.0 mg	20.90 % Oxygen	
Probe Rin	se Net Gain	7.8 mg	NA F-factor	
Sample G	as Volume	67.959 dscf	<u> </u>	
•	umetric Flow	179399 dscfm		
	e Concentration		NA lbs/mmBtu	
	e Concentration		0.115 mg/dscf	
	e Emission Rate		2.723 lbs/hr	
	e Concentration		0.002 gr/dscf	
	e Concentration		#DIV/0! gr/dscf @7% Oxyge	n
		14 04 10 00	D	
TEST 3	Time	16:36-18:33	Date 11/8/2006	
Filter Net		<u>0.1</u> mg	20.90 % Oxygen	
	se Net Gain	<u>9.0</u> mg	NA F-factor	
-	as Volume	<u>70.774</u> dscf		
	umetric Flow	<u>185044</u> dscfm		
	e Concentration		NA lbs/mmBtu	
	e Concentration		0.129 mg/dscf	
	e Emission Rate		<u>3.147</u> lbs/hr	
	e Concentration		0.002 gr/dscf	
Particulat	e Concentration		#DIV/0! gr/dscf @7% Oxyge	n
RESULT	AVERAGE TEST 1-3			
Particulat	e Concentration		NA lbs/mmBtu	
Particulat	e Concentration		0.121 mg/dscf	
Particulat	e Emission Rate		2.971 lbs/hr	
Particulat	e Concentration		0.002 gr/dscf	
Particulat	e Concentration		#DIV/0! gr/dscf @7% Oxyge	n

#### **Determination of Particulate Emissions from Stationary Sources**

**Total Emissions** Gerdau Ameristeel MAC Client Analyst Facility St. Paul 902334 Job Number Unit Old Baghouse **Description Particulates** Location Stack TEST 1 Time 9:54-12:32 Date 11/8/2006 **Filterable Net Gain** 20.90 % Oxygen 8.8 mg 7.7 mg **Condensable Net Gain** NA F-factor Sample Gas Volume 73.888 dscf 193197 dscfm Stack Volumetric Flow **Particulate Concentration** lbs/mmBtu NA 0.223 mg/dscf **Particulate Concentration** Particulate Emission Rate 5.706 lbs/hr **Particulate Concentration** 0.003 gr/dscf #DIV/0! gr/dscf @7% Oxygen **Particulate Concentration** Total Particulate Gain (mg) 16.50 mg 11/8/2006 TEST 2 Time 13:28-16:14 Date **Filterable Net Gain** 20.90 % Oxygen 7.8 mg **Condensable Net Gain** 5.6 mg **F**-factor NA 67.959 dscf Sample Gas Volume 179399 dscfm Stack Volumetric Flow **Particulate Concentration** lbs/mmBtu NA 0.197 mg/dscf **Particulate Concentration Particulate Emission Rate** 4.678 lbs/hr **Particulate Concentration** 0.003 gr/dscf **Particulate Concentration** #DIV/0! gr/dscf @7% Oxygen 13.40 mg **Total Particulate Gain (mg)** TEST 3 Time 16:36-18:33 Date 11/8/2006 20.90 % Oxygen **Filterable Net Gain** 9.1 mg **Condensable Net Gain** 6.1 mg NA **F**-factor Sample Gas Volume 70.774 dscf 185044 dscfm Stack Volumetric Flow **Particulate Concentration** lbs/mmBtu NA **Particulate Concentration** 0.215 mg/dscf 5.256 lbs/hr **Particulate Emission Rate Particulate Concentration** 0.003 gr/dscf **Particulate Concentration** #DIV/0! gr/dscf @7% Oxygen 15.20 mg **Total Particulate Gain (mg) RESULT AVERAGE TEST 1-3 Particulate Concentration** NA lbs/mmBtu **Particulate Concentration** 0.212 mg/dscf **Particulate Emission Rate** 5.214 lbs/hr 0.003 gr/dscf **Particulate Concentration Particulate Concentration** #DIV/0! gr/dscf @7% Oxygen Appendix E

**Equipment Calibrations and Opacity Certification** 

APEX INSTRUMENTS METHOD 5 PRE-TEST CONSOLE CALIBRATION

# **USING CALIBRATED CRITICAL ORIFICES**

# 5-POINT ENGLISH UNITS

Meter Console Information	tion
Console Model Number	2010-5
Console Serial Number	
DGM Model Number	2010-4
DGM Serial Number	

	Calibration	<b>Calibration Conditions</b>	
Date	Time	24-Aug-06	10:45
Barometric Pressure	re	28.8	in Hg
Theoretical Critical Vacuum	Vacuum	13.6	in Hg
Calibration Technician	cian	nt	

	Factors/Conversions	s
Std Temp	528	Å
Std Press	29.92	in Hg
K,	17.647	oR/in Hg

<sup>1</sup> For valid test results, the Actual Vacuum should be 1 to 2 in. Hg greater than the Theoretical Critical Vacuum shown above. <sup>2</sup>The Critical Orifice Coefficient, K', must be entered in English units, <sup>(</sup>fr<sup>21/2</sup>)/(in.Hg<sup>\*</sup>min).

		Actual	Vacuum		in Hg	15	15	15	15	12
		Amb Temp	Final	(t <sub>amb</sub> )	۴	72	72	72	72	72
	Critical Orifice	Amb Temp	Initial	(t <sub>amb</sub> )	J,	72	72	72	72	72
		Coefficient		¥.	see above2	0.2305	0.3354	0.4352	0.6001	0.7928
		Serial	Number			TA 40	TA 48	TA 55	TA 63	TA 73
Calibration Data		Outlet Temp	Final	(t <sub>mr</sub> )	۶	74	75	76	76	78
- (		Outlet Temp	Initial	(t <sub>mi</sub> )	۴	73	74	75	76	76
	Metering Console	Volume	Final	(V <sub>mf</sub> )	cubic feet	826.328	831.000	837.076	845.454	856.452
		Volume	Initial	(V <sub>mi</sub> )	cubic feet	823.120	826.328	831.000	837.076	845.454
dinus Bringht, sight factors maniferentia an anna factor fai famharthan anna a start		DGM Orifice	HΔ	(P <sub>m</sub> )	in H <sub>2</sub> O	0.2	0.6	1.0	1.9	3.3
	Run Time		Elapsed	(0)	min	10.0	10.0	10.0	10.0	10.0

S	Dry Gas Meter	Calibration Factor Flowrate AH @	Variation Std & Corr 0.75 SCFM Variation	(ΔY) (Q <sub>m(stal/corr</sub> )) (ΔH@) (ΔΔH@)	cfm in H2O	0.000 0.287 1.558 -0.175	0.001 0.418 1.686 -0.047	-0.001 0.543 1.766 0.034	-0.002 0.748 1.826 0.094	0.002 0.989 1.827 0.094	Y Average 1.733 AM@ Average	V. Howell® 84 the cooling of the collinguistic meters to the deriver economically telescore of individual values from the conservation ( ) 000							
		AH	ΗΔ	0.75 SCFM	(@HV)	in H2O	1.558	1.686	1.766	1.826	1.827	1.733							
	Dry Gas Meter	Flowrate	Std & Corr	(Qm(std)(corr))	cfm	0.287	0.418	0.543	0.748	0.989		dividual voluco from 4							
	zed Data	on Factor	Variation	(A∆)		0.000	0.001	-0.001	-0.002	0.002	Y Average	at the second of the second of the second seco							
Results		Calibrati	Value	(٨)		0.941	0.941	0.940	0.939	0.943	0.941	day one meter poor							
			Critical Orifice	(Q <sub>cr(std)</sub> )	cfm	0.287	0.418	0.543	0.748	0.989									
					Critical	(Vcr <sub>(std)</sub> )	cubic feet	2.874	4.182	5.427	7.483	9.885		the reading of the or					
	Standardized Data								Stariuaruiz	s Meter	(Q <sub>m(std)</sub> )	cfm	0.305	0.444	0.577	0.797	1.048		
			Dry Gas Meter	(V <sub>m(std)</sub> )	cubic feet	3.054	4.442	5.773	7.972	10.482		Noto- Ear Calibration Easter							

8-14-06

I certify that the above Dry Gas Meter was calibrated in accordance with USEPA Methods, CFR Title 40, Part 60, Appendix A-3, Method 5, 16.2.3

CAU Signature

Date

1-5-6			endix A-3, Method 5	The 40, Part 60, App	PA Methods, CER.T	ordance with USE	as calibrated in acco	I certify that the above Dry Gas Meter was calibrated in accordance with USEPA Methods, CFR Title 40, Part 60, Appendix A-3, Method 5, 16.2.3	I certify that the abc
	1	e average is +-0.02.	lividual values from th	ptable tolerance of ind	dry gas meter, accep	bration meter to the	the reading of the call	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	Note: For Calibration
∆H@ Average		1.841		Y Average	0.992				
0.090		1.931	0.992	0.000	0.992	0.992	9.923	1.000	10.000
0.071		1.912	0.751	-0.003	0.989	0.751	7.515	0.760	7.596
-0.033		1.808	0.545	-0.001	0.991	0.545	5.452	0.550	5.500
-0.018	-	1.823	0.421	0.003	0.995	0.421	4.206	0.423	4.225
-0.110	+	1.731	0.289	0.000	0.992	0.289	2.895	0.292	2.918
		in H2O	cfm			cfm	cubic feet	cſm	cubic feet
		(AH@)	(Q <sub>m(std)(corr)</sub> )		(Y)	(Q <sub>cr(std)</sub> )		(Q <sub>m(std)</sub> )	
AH @ Variation	-년폰		Flowrate	Calibration Factor	Calibratio				
			Dry Gas Meter				ed Data	Standardized Data	
					Results				
8 80 81	8	0.7928	TA73	82	81	32.957	22.505	3.5	10.0
80 80	1-	0.6001	TA63	81	81	22.505	14.543	2.0	10.0
2 79 80	N	0.4352	TA55	81	80	14.543	8.769	1.0	10.0
54 78 79	54	0.3354	TA48	80	79	8.769	4.337	0.6	10.0
305 76 78	305	0.2305	TA40	79	79	4.337	1.276	0.3	10.0
۴		see above2		±,	۴	cubic feet	cubic feet	in H <sub>2</sub> O	min
(t <sub>amb</sub> )		z		(t <sub>mf</sub> )	(t <sub>mi</sub> )	(V <sub>mt</sub> )	(V <sub>mi</sub> )	(P <sub>m</sub> )	(0)
tt Amb Temp Amb Temp Initial Final		Coefficient	Serial	Outlet Temp Final	Outlet Temp	Final	Volume	DGM Orifice	Elapsed
-						Metering Console			Run Time
				Calibration Data	ŭ		ŭ		
			shown above.	al Critical Vacuum :	han the Theoretic: in Ho*min).	2 In. Hg greater t sh units. (ft <sup>3</sup> *°R <sup>1/2</sup> //	um should be 1 to be entered in Englis	<sup>1</sup> For valid test results, the Actual Vacuum should be 1 to 2 in. Hg greater than the Theoretical Critical Vacuum shown above. <sup>2</sup> The Critical Orifice Coefficient. K <sup>1</sup> . must be entered in English units. (ft <sup>3.o</sup> R <sup>12</sup> Win.Hg*min).	<sup>1</sup> For valld test resu <sup>2</sup> The Critical Orifice
			TN	lian	<b>Calibration Technician</b>				DGM Serial Number
5		in Hg	13.7	Vacuum <sup>1</sup>	Theoretical Critical Vacuum <sup>1</sup>		2010-7		DGM Model Number
Std Press		in Hg	29.1	G	Barometric Pressure			ber	Console Serial Number
Std Temp	1	1:30	5-Sep-06	Time	Date		2010-07		Console Model Number
			Calibration Conditions	Calibration			on	Meter Console Information	Met
			LISH UNITS	5-POINT ENGLISH UNITS					
		CES	USING CALIBRATED CRITICAL ORIFICES	VG CALIBRATED	USIN				
N	U 1	LE CALIBRATIC	APEX INSTRUMENTS METHOD 5 PRE-TEST CONSOLE CALIBRATION	ITS METHOD 5 PI	EX INSTRUMEN	AF			

°R in Hg oR/in Hg

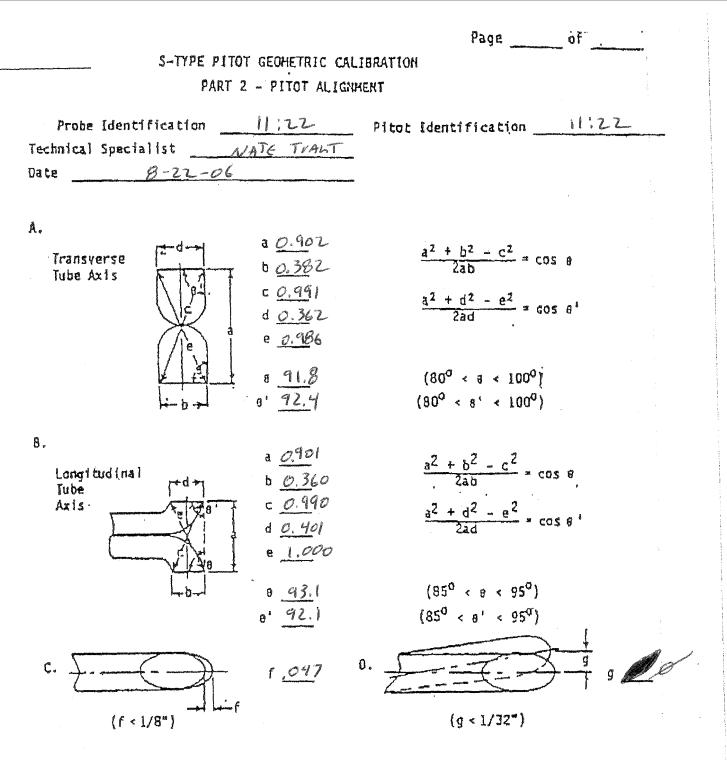
# VISIBLE EMISSIONS EVALUATOR

This is to certify that

James Wilson

met the specifications of Federal Reference Method 9 and qualified as a visible emissions evaluator. Maximum deviation on white and black smoke did not exceed 7.5% opacity and no single error exceeding 15% opacity was incurred during the certification test conducted by Eastern Technical Associates of Raleigh, North Carolina. This certificate is valid for six months from date of issue.

344906	Minneapolis, Minnesota	October 4, 2006
Sertificate Number		Date of Issue
~/ ~/	) a service and the service of the s	

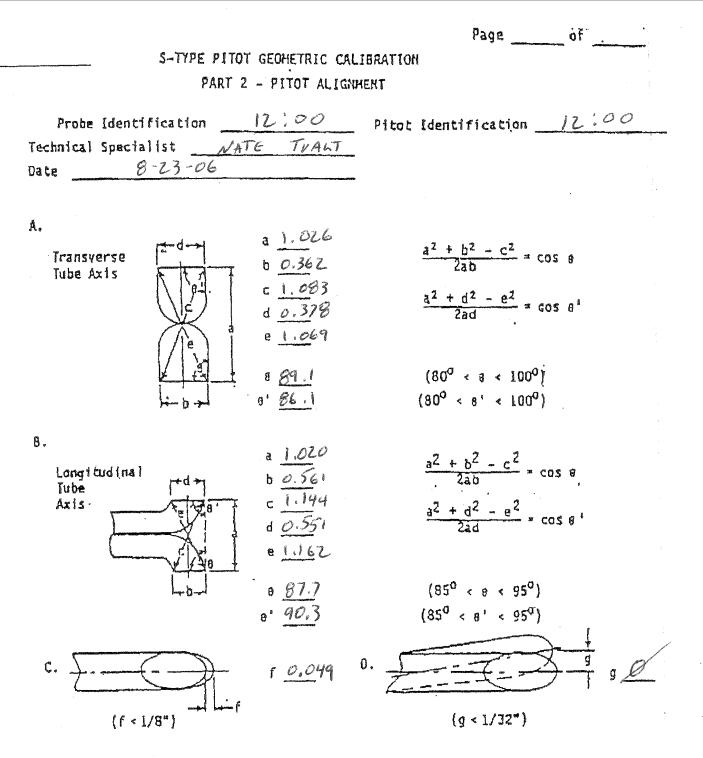


NOTE: values in parentheses are EPA Method 2 specifications.

PROBE THERMOCOUPLE CALL	BRATION	Tolerances	
Expected Stack Temperature (T <sub>s</sub> ) _ Mereury Thermometer (T <sub>ref</sub> ) _ Thermocouple Readout	<sup>0</sup> R 72.7 <sup>0</sup> R 72.0 <sup>0</sup> R	$(T_{s} \pm 10\%)$ $(T_{ref} \pm 1.5\%)$	0.96%
Probe Identification 11:2 Technician New Text	Date	8-22-06	

-811-2

)ate



NOTE: values in parentheses are EPA Method 2 specifications.

PROBE THERMOCOUPLE CALIBRATIONTolerancesExpected Stack Temperature  $(T_s)$ OROR(T\_s ± 10%)Inermoneter  $(T_{ref})$ 72.7OR(T\_s ± 10%)Inermocouple Readout71.3OR(T\_ref ± 1.5%)Date0.23-06

<u>\_811-2</u>

)ate

Appendix F

**Test Plan and Approval Letter** 

# **Performance Test Report Completeness Criteria**

03/24/06

**Minnesota Pollution Control Agency** 520 Lafayette Rd. N. Saint Paul, MN 55155-4194 (651)-296-6300

Minnesota Pollution

Control

Agency

The owner or operator of an emissions facility is responsible for submitting a complete test report as defined by Minn. R. 7017.2035. A test report may be rejected if it is deemed incomplete. As a result, this form is designed to ensure that your submittal is complete.

1)	) Facility Nat	me:	G	erdau Ameriste	el					
2)	AQ Facility	ID Nur	<b>nber</b> (fi	rst 8 digits of peri	mit nu	mber):	1230005	5		
3)	AQ File Nu	mber:					1230055	-11		
4)	) Facility Lo	cation A	ddress:							
			1678	Red Rock Road						
			City:	St.Paul		State:	MN		ZIP Code:	55119
_		e	T (				Neuropeire			
5)	Date of Per	Iorman	ce Test:			-	Novembe	er 8. 2006		
6)	this test):			ndividual who is	0		C			
	Mr./Ms:		as Stolo						651-731-50	
	Title:	Regio	nal Env	ironmental Affai	rs ma	nager		Fax:	651-731-56	699
	Mailing Ad	dress:	1678	Red Rock Road						
			City:	St. Paul		State:	Mn		ZIP Code:	55119
	e-mail	address	: dst	olowski@gerda	uame	risteel.co	om			
7)	Test Re	oort Ch	eck Lis	st:						
Cove	-	<u> </u>								
•	Name and locat facility	tion (addr	ress) of th	e emission	•	Date(s) o	of the perfor	mance test		
	1									

	Identification of emission unit(s) tested (i.e. GP002, EU031, SV028, or CE001 – Identification of the tested unit which has the emission limit as designated by your permit (source designators))	•	Name and address of the testing company or agency
•	AQ Facility ID Number (first 8 digits of permit number) and AQ File Number	•	Facility contact person (individual designated to receive agency correspondence), and contact information including title, address, phone number, fax number, and email address



Agency

# **Performance Test Report Completeness Criteria**

Minnesota Pollution Control Agency 520 Lafayette Rd. N. Saint Paul, MN 55155-4194 (651)-296-6300

03/24/06

# **Certification:**

<b>v</b>	Signed and dated certification statements as defined by Minn R. 7017.2040 (An exact duplicate must be included in the CD-
	ROM copy of the test report)

# **Introduction:**

	Reason for testing (i.e. Permit condition, notice of violation, etc., including permit number or name of other applicable compliance document, include correct Rule citation as outlined in permit)	Pollutants tested (for each emission unit tested)
•	Test location and type of process including source designators as outlined in permit	Observers names including industry and agency observers
•	Test date(s)	Changes from test plan, problems experienced during test and any other relevant background information

# Summary of Results: (see attached Table 1: Summary of Performance Test Results)

•	Emission results expressed in the same units as the emission limits	V	Description of collected samples
V	Process data as related to determination of compliance (must include process rates, process parameters and pollution control equipment parameters that will be used to determine worst case operating conditions and pollution control equipment limitations during the test (see the relevant operator data forms at http://www.pca.state.mn.us/air/performancetest.ht ml))	V	Visible emissions summary if applicable
•	Emission limits (as stated in your permit or applicable regulations) and applicable regulations citations as stated in your permit		Discussion of errors, both real and apparent (If no errors occurred, verify by including statement)

# **Operating Parameters:** (see the relevant operator data forms at <u>http://www.pca.state.mn.us/air/performancetest.html</u>)

**\*Note:** Readings of discrete data from monitoring instruments must be recorded at least every 15 minutes, or other reasonable time interval as approved, during the test and strip charts or retrieved electronic data from continuous monitors must be included in the



Agency

# **Performance Test Report Completeness Criteria**

Minnesota Pollution Control Agency 520 Lafayette Rd. N. Saint Paul, MN 55155-4194 (651)-296-6300

03/24/06

	eport.		
	Description of process and air pollution control devices including emission unit(s) tested (i.e. GP002, EU031, SV028, or CE001 – Identification of the tested unit which has the emission limit as designated by your permit (source designators))		Process data and results, with example calculations (Process data must be collected and averaged for each test run and averaged for each series of tests for each unit tested. Process data must be displayed in the same units that were used to determine worst case operating conditions during the test. Process data must be easily understood by personnel not familiar with the process.)
•	Process and control equipment flow diagrams		Any specially required operation demonstrations
Mai	ntenance:	1	1
		mpone	onal inspections, including major cleaning operations and ents of process or control equipment done in the month prior to the )
Sam	pling and Analysis Procedures:		
7	Sampling port location and dimensioned cross section showing all flow disturbances including fans, elbows, dampers, constrictions and pollution control equipment. Measurements should be included on diagram(s).		Brief description of sampling procedures and analytical methods, with discussion of deviations from standard methods (include a statement if no deviations were made), including a statement of source methods used, but not including complete copies of reference methods
~	Description of sampling point (including duct orientation, number of test ports, number of sampling points, distances to upstream and downstream flow disturbances)	•	If a method other than a US EPA reference method was used: a statement of the detection limit and the level of accuracy of the method under the conditions of the test and at the concentration of air pollutant that is reported.
	Description of sampling train		
•			
	endix:	<u> </u>	
	endix: Complete results, including any fuel analysis, with example calculations, showing equations used and actual results in equation form on same or adjacent pages, using applicable equations shown in the reference method		Test log (include test times, test interruptions and causes, and any other significant events related to the testing)



Control

Agency

# **Performance Test Report Completeness Criteria**

			method used and calibration values must be displayed on the same data recorder from which emissions results are calculated.
•	Laboratory report with chain of custody record	•	Project participants and titles
	Raw production data, signed by plant official who can interpret, and be held accountable for the data		A copy of the most recent version of the test plan and a copy of the commissioner's written approval of the test plan

# **Additional Information:**

Any other special requirement of the test method, test plan, applicable requirement or compliance document		Any other information necessary to evaluate compliance with Minn R. parts 7017.2020 and 7017.2025 as requested by the commissioner.
------------------------------------------------------------------------------------------------------------------	--	-------------------------------------------------------------------------------------------------------------------------------------

# **REFERENCED TABLE**

<b>1</b> (a)	1(b)	1(c)	1(d)
<b>Emission Unit Tested</b>	Limitation Basis	Pollutant and Emission Limit	Test Result
EXAMPLE	Minn. Stat. 116.07,	Particulate (B):	Particulate (B):
	subd. 4a	12 lbs/hour	4.1 lbs/hour
Boiler No. 3		VOC:	VOC:
(EU 042/		13 lbs/hour as carbon	2.3 lbs/hour as carbon
SV 440)	Title I Condition: 40	Carbon Monoxide:	Carbon Monoxide:
	CFR § 52.21(j) (BACT	0.090 lbs/MMBtu	0.00078 lbs/MMBtu
	limit); Minn. R.	Volatile Organic Compounds:	Volatile Organic
	7007.3000	0.0090 lbs/MMBtu	Compounds:
			0.00050 lbs/MMBtu
	Title I Condition: 40	Carbon Monoxide:	Carbon Monoxide:
	CFR § 52.21(k)	33.6 lbs/hour	0.26 lbs/hour
	(modeling); Minn. R.		
	7007.3000		

# **Table 1: Summary of Performance Test Results**

Table References:

(A) Filterable particulate matter as determined by U.S. Environmental Protection Agency (EPA) Method 5.

(B) Filterable plus organic condensable particulate matter as determined by EPA Method 5 and Method 202/Minn. R. 7011.0725.

(C) Particles with an aerodynamic diameter less than or equal to a nominal ten micrometers  $(PM_{10})$  as determined by EPA Methods 5 and 202.



# **Performance Test Report Completeness Criteria**

Minnesota Pollution Control Agency 520 Lafayette Rd. N. Saint Paul, MN 55155-4194 (651)-296-6300

# INSTRUCTIONS FOR COMPLETING THIS FORM

1) Facility Name -- Enter your facility name.

2) AQ Facility ID No. -- Fill in your Air Quality Facility ID Number. This is the first eight digits of the permit number for all new permits issued under the new operating permit program. In the future, this number will replace the AQ File Number in item 3) below.

**3**) **AQ File No. --** Fill in your AQ File Number. This is the first group of characters in your current Air Emission Facility Permit. For example, for permit number 1899AB-93-OT-1, the AQ Facility ID number would be 1899AB. Can be found in the upper right hand corner of the Test Plan Approval.

**4)** Facility Location -- Fill in the facility's street address and the city and county where the facility is located.

5) Date of Performance Test -- Enter the date of your performance test.

**6**) **Facility Contact Person --** Fill in the contact information for the person that the MPCA may contact regarding this performance test.

7) **Test Report Check List:** This checklist is to ensures that your test submittal includes all of the required information.

# **REFERENCED TABLE:**

# 1) Summary of Performance Test Results:

- 1a) Emission Unit Tested: As designated by permit (i.e. EU, SV, etc.)
- **1b)** Limitation Basis: All applicable rule citations from permit that apply to tested unit(s).
- 1c) Pollutant and Emission Limit: Pollutant to be tested and emission limit as outlined in permit
- 1d) Test Result: State test result.

# **Brian Durkop**

From:	Stock, Curtis [Curtis.Stock@state.mn.us]
Sent:	Wednesday, November 01, 2006 3:05 PM
То:	dstolowski@gerdauameristeel.com; bdurkop@eagle-msi.com
Cc:	Parr, Scott
Subject:	TPAL for Gerdau Ameristeel Nov06

Attachments:

TPAL for Gerdau Ameristeel Nov06.doc; PTRCC Mar06ver.doc





TPAL for Gerdau PTRCC Ameristeel Nov... ar06ver.doc (242 Ki Douglas,

Attached is the Test Plan Approval Letter (TPAL) for the particulate matter testing to be conducted on the Ladle Refining Station and Electric Arc Furnace baghouses on November 8, 2006.

Please include a copy of the test plan, TPAL and this email in the final report.

Also attached is the Performance Test Report Completeness Criteria form. Please use this to review the report prior to submitting it to the agency. The form is designed to help assure completeness of test reports and aid in efficient MPCA report review and compliance determination.

Contact me if you have any questions.

Curt Stock Performance Test Coordinator Minnesota Pollution Control Agency 520 Lafayette Road St. Paul, MN 55155-4194

(651) 297-8480 (651) 296-8717 (fax)

\_ NOD32 1.1846 (20061031) Information \_\_\_\_\_

This message was checked by NOD32 antivirus system. http://www.eset.com



# **Performance Test Plan Approval**

Minnesota Pollution Control Agency 520 Lafayette Rd. N. Saint Paul, MN 55155-4194 (651) 296-6300 www.pca.state.mn.us

Gerdau Ameristeel - St. Paul

AQ# 151

Facility Name: Gerdau Ameristeel – St. Paul
Facility Contact: Douglas Stolowski
Address: 1678 Red Rock Road St. Paul, Minnesota 55119
Phone: (651) 731-5697
Emission Unit(s): Ladle Refining Station (EU001, CE001) and Electric Arc Furnace (EU002, CE002)
Scheduled For: November 8, 2006, at your facility located in St. Paul, Minnesota.

## Your test plan submitted on September 25, 2006, has been approved by the Minnesota Pollution Control Agency (MPCA) as follows:

Shortened test notification approved

Test plan approved without modification

Test plan approved with the following provisions:

Particulate matter and  $PM_{10}$  emissions measured by Method 5D and 202 and opacity determined using Method 9.

Include in the final test report(s) all process and pollution control equipment operating data collected at 15 minute intervals and averaged for each test period. This information should be easily understood by individuals not familiar with the process.

Include in the final test report and CD-ROM copy; a signed certifications form, the test plan, this test plan approval letter (TPAL) and the email to which the TPAL was attached. The CD-ROM test report copy must be labeled with the AQ File Number, Company Name, Emission Unit Tested and Test Dates as stated on the submittal form. Only one paper copy and one CD-ROM/Microfiche copy of the test report are to be submitted.

Include in the final test report a simplified drawing of the test locations including pollution control equipment, stack orientation and test port locations.

Use of the PTRCC form will help assure that a complete test report is submitted to the agency

Obtain the required submittal and operating data forms from the website noted below.

## **Required Forms:**

- Operating Data Summary- Combustion Sources
- Operating Data Summary- Process Sources
- Certifications Form

Performance Test Report Completeness
 Criteria (PTRCC) (attached to email)
 Operating Data Summary- Asphalt Plants
 Microfiche/CD-ROM Submittal Form

Note: Forms are also available at: www.pca.state.mn.us/air/performancetest.html

Approved by:

Cut of to

Curtis Stock Performance Test Coordinator Compliance and Enforcement Section Industrial Division

#### Please contact me at (651) 297-8480 if you have any questions regarding this approval.

Please be aware that enforcement action will be taken for performance test failures indicating emissions above applicable limits (excess actual emissions to the environment). Failures commonly result in assessment of a monetary penalty. Upon the first test failure, the Company should take immediate measures to minimize emissions. The measures taken should be documented, as they will become part of the record of corrective actions.

Hard Copy Performance Test Reports and Microfiche or CD Copy submittals will be addressed to: Compliance Tracking Coordinator, Compliance and Enforcement Unit, Industrial Division, Minnesota Pollution Control Agency, 520 Lafayette Road North, St. Paul, Minnesota 55155-4194

cc: Douglas Stolowski, Gerdau Ameristeel (email) Drian Durkop, Eagle Mountain Scientific, Inc. (email) Scott Parr, MPCA St. Paul (email) AQ Correspondence File No. 151

# **TEST PLAN FOR MISCELLANEOUS SOURCES**

Proposed test date(s): *November 8, 2006* Date Test Plan Written: *September 20, 2006* 

# PART I. GENERAL INFORMATION

 Name and street address of emission facility: *Gerdau Ameristeel*  1678 Red Rock Road *St. Paul, Minnesota 55119*

Name, Title, Telephone and Facsimile number of contact person at emission facility: Mr. Douglas Stolowski Regional Environmental Affairs Manager Phone: (612) 731-5697 Fax: (612) 731-5699

- 2. Permit File Number: #12300055-11
- 3. Reason the emission unit(s) is (are) to be tested: *To demonstrate compliance with emission limitations set forth in the MPCA Permit #12300055-11.*
- 4. Physical description and location layout of emission unit(s) to be tested: See Below

Emission Point #1 Old Baghouse (Inlet duct) - 16 Points Volumetric Flow Rate

See Attachment 1

Old Baghouse (Baghouse) - 108 Points 36 points per test Particulate Sampling 3x3 Matrix in each of 12 compartments

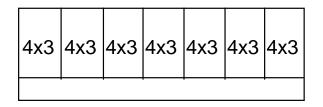
3x3	3x3	3x3	3x3	3x3	3x3
3x3	3x3	3x3	3x3	3x3	3x3

Emission Point #2 New Baghouse (Inlet Duct) - 16 Points Volumetric Flow Rate

See Attachment 2

New Baghouse (Baghouse) - 84 Points 28 points per test Particulate Sampling

4x3 Matrix in each of seven compartments



5. Name of Independent Testing Company, contact person, and telephone number: *Eagle Mountain Scientific, Inc. Brian Durkop Phone:* (763) 477-4462 *Fax:* (763) 477-5991 *Email: bdurkop@eagle-msi.com* 

# PART II. TESTING REQUIREMENTS

1. The following is a description of the Pollutant(s) to be tested, and the applicable emission limit(s), and the applicable rule(s) or regulation(s) for each emission limit:

<u>Pt.</u> #	Limitation Basis	Pollutant Tested/Limit	Specific Methods
1	* See Footnote 1	PM, 0.0052 gr/dscf	EPA Method 5D and 202
1	* See Footnote 1	PM10, 0.0052 gr/dscf	EPA Method 5D and 202
1	40 CFR 60.272a	Opacity, 3%	EPA Method 9
2	40 CFR 60.272a	PM, 0.0052 gr/dscf	EPA Method 5D and 202
2	* See Footnote 2	PM10, 0.0052 gr/dscf	EPA Method 5D and 202
2	40 CFR 60.272a	Opacity, 3%	EPA Method 9

*Footnote 1 – Limit emissions to those used for netting calculations. Footnote 2 – Minnesota SIP modeled PM10 ambient air quality standard compliance.* 

Operating Data to be recorded during the Test:

1. Operating conditions of each source tested and its associated pollution control equipment will be documented in the test report. Documentation of operating conditions includes all parameters listed in Part III.

*Process conditions including baghouse pressure drops and fan amps will be recorded every 15 minutes during each test.* 

2. The following is a detailed description of the procedure for fuel sampling and analysis to be followed for the applicable emission unit. *NA* 

# PART III. OPERATING CONDITIONS

1. The following contains a detailed description of the emission unit(s) to be tested:

Detailed descriptions of record keeping that include the specific time interval, and other parameters listed that will determine production, operating capacity, and/or operating conditions during testing are also included:

# Emission Point No. 01: Old Baghouse (Ladle Refining Station)

## **Process Equipment Description for units to be tested:**

Ladle Refining Station Type: Ladle Refining Furnace Mfr: Voest-Alpine Industries, Inc. Capacity: 90 to 100 tons per heat Continuous Casting Machine Mfr: Mini-Castco Capacity: 700,000 tons/year

# **Process Equipment Parameter Monitoring During Performance Test:**

*Tons per heat Heat duration* 

# **Process Rates/Operating Conditions During Testing:**

Batch process Normal

# **Control Equipment Description:**

Type: Fabric filter baghouse - positive pressure Mfr: American Air Filter Air Flow: 250,000 to 360,000 acfm Pressure Drop: 2.5-8.0 inches of water per compartment Gas Temperature: 100 to 140 degrees F

# **Control Equipment Operating Parameter During Test:** (15 minute Intervals)

Air Flow: 250,000 to 300,000 acfm Pressure Drop: 2.5-8.0 inches of water per compartment Continuous Cleaning Cycle

# Emission Point No. 02: New Baghouse (Electric Arc Furnace)

## **Process Equipment Description for units to be tested:**

*Type: Electric Arc Furnace Mfr: Voest Capacity: 90 to 100 ton heat size* 

## **Process Equipment Parameter Monitoring During Performance Test:**

*Tons per heat Heat duration* 

#### **Process Rates/Operating Conditions During Testing:**

Batch process Normal

## **Control Equipment Description:**

Type: Fabric filter baghouse - positive pressure Mfr: Amerex Air Flow: 450,000 to 850,000 acfm Pressure Drop: 2.5-8.0 inches of water per compartment Gas Temperature: 125 to 250 degrees F

### **Control Equipment Operating Parameter During Test:** (15 minute Intervals)

Air Flow: 500,000 to 700,000 acfm Pressure Drop: 2.5-8.0 inches of water per compartment Continuous Cleaning Cycle

2. For each process unit listed in Part III, Item 1, the normal range of process or operating rates for each emission unit are listed below. The proposed test conditions listed in Part III, Item

1, are considered worst case in accordance with Minn. R. 7017.2025, subpart 2 as indicated below:

# Emission Point No. 01: Old Baghouse (Ladle Refining Station)

Normal Range of Process or Operating Rates Rationale For Worst Case Batch Process – Heat duration is highly specific to the type of product in production. To achieve worst case scenario testing is conducted when process is in operation only by suspending testing during downtime.

90 to 100 tons per heat Maximum production rate

# Emission Point No. 02: New Baghouse (Electric Arc Furnace)

Normal Range of Process or Operating Rates Rationale For Worst Case Batch Process – Heat duration is highly specific to the type of product in production. To achieve worst case scenario testing is conducted when process is in operation only by suspending testing during downtime.

90 to 100 tons per heat Maximum production rate

# PART IV. TEST METHODS

- 1. The following is a description of the methods, number of test runs, length of test runs, and sampling rate of each pollutant:
  - A. EPA Method 1 for the location of sampling ports and points.
  - B. EPA Method 2 for velocity and volumetric flow rate. One measurement just prior to each test run for TSP as PM10.
  - *C. EPA Method 3 for gas analysis. One test run on an integrated sample taken concurrently with each run for velocity and volumetric flow rate.*
  - D. EPA Method 4 for the determination of moisture in the flue gases. One test run concurrently with each test run for TSP as PM10.
  - E. EPA Method 5D and 202 (TSP) for the concentration of particulate matter including organic condensable. Results are to be reported both as filterable particulate matter containing organic condensable (where the limit includes organic condensable), and as filterable particulate matter excluding organic condensable (where the limit does not include organic condensable). Run time: 120 minutes, Sample volume: 60 dscf (1.70 dscm) No. Runs: 3. TSP values will be reported as PM10 to meet the permits applicable emission standard.
  - F. EPA Method 9 as amended by Minn. R. 7017.2060 for visual determination of opacity. One-hour observation, concurrent with one test run for TSP as PM10.

# Justification for EPA 5D testing verses PM10 testing using EPA 201A

The emission points proposed to be tested are the old and new baghouses. These baghouses are of the single monovent positive pressure design. Flow determination at the sample location in

the baghouse compartments is not measurable using conventional testing equipment. In order to determine the flow in the baghouses, the inlet ducts must be measured prior to particulate sampling. These numbers are used to back calculate the flow in the baghouses at each sample point assuming that the flow is uniformly distributed throughout the baghouse.

Conducting method 201A using the cyclone is not technically possible due to limitations in its design. Prior to testing, the proper nozzle must be determined based on duct flow and other preliminary measurements. The cyclone design is based on 10 nozzles of various sizes. The proper nozzle necessary to conduct these tests is far larger than any nozzle provided with the cyclone.

# PART V. CEM - Not Applicable

# PART VI. OTHER

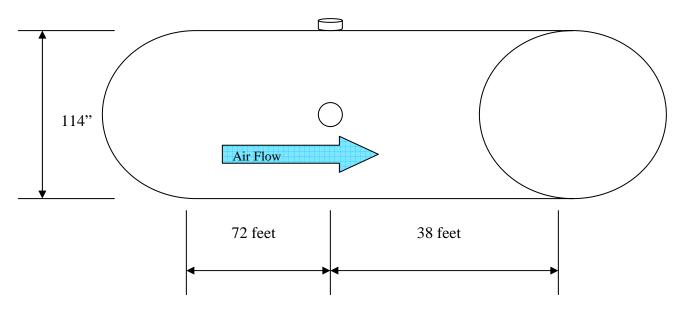
- 1. Pollutant(s) to be tested will be reported in terms of the applicable emission limit units.
- 2. Testing schedules and testing firm.

Setup Test EP1, EP2

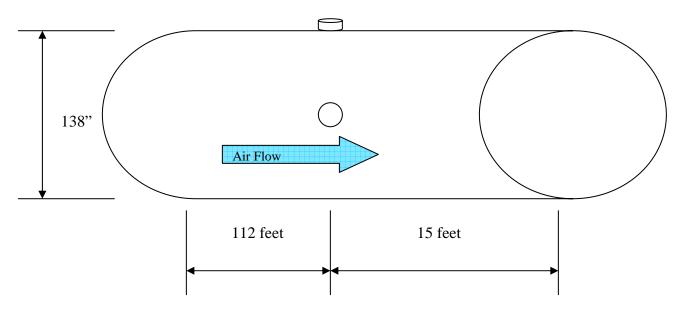
- 3. Description and date of last maintenance work done before the test: A *description of any maintenance work done before the test and the normal schedule followed will be included as part of the report.*
- 4. One complete test report (one hard copy) shall be submitted within 45 days after the date of the test. A copy of the report on CD-ROM (Upon Approval \*.tif format) shall be submitted within 105 days after the date of the test.

5.	Test Plans, Hard Copy Reports,	Supervisor, Compliance Determination Unit
	and Microfiche Copy submittals	Compliance & Enforcement Section/AQD
	will be addressed to:	Minnesota Pollution Control Agency
		520 Lafayette Road
		St. Paul, Minnesota 55155-4194

# Attachment 1 Emission Point #1 Old Baghouse Inlet Duct



Attachment 2 Emission Point #2 New Baghouse Inlet Duct



# Scienti lle Mountain



Results of the Compliance Test for Particulates as PM-10 and Opacity Gerdau Ameristeel, St. Paul Amerex (New) Baghouse

MPCA Permit File #12300055-11

**Prepared for:** 

Mr. Doug Stankowski Gerdau Ameristeel 1678 Red Rock Road St. Paul, Minnesota 55119

Report # 902264(New) October 4, 2005

**Prepared By:** 

Birm Durkgp

Brian Durkop Project Manager

820-COMMONWEALTH DR •WARRENDALE • PENNSYLVANIA • 15086 PHONE: 724.742.2060 • FAX: 724.742.2066 8905 AUTUMN OAKS DRIVE • SUITE 2 • ROCKFORD • MINNESOTA • 55373 PHONE: 763.477.4462 • FAX: 763.477.5991

#### 1.) Certification of sampling procedures by the team leader of the personnel conducting the sampling procedures:

"I certify under penalty of law that the sampling procedures were performed in accordance with the approved test plan and that the data presented in this test report are, to the best of my knowledge and belief, true, accurate, and complete. All exceptions are listed and explained in the test report."

Signature: Blight Drig Print Name: Brian Durkeys Title: Dice President Date: 11-14-05

#### 2.) Certification of analytical procedures by the person responsible for the laboratory analysis of field samples:

"I certify under penalty of law that the analytical procedures were performed in accordance with the requirements of the test methods and that the data presented for use in this test report were, to the best of my knowledge and belief, true, accurate, and complete. All exceptions are listed and explained in the test report."

Signature: Mark Conlorn Print Name: Mark Carlson Title: Lab Analyst Date: 11-14-05

3.) Certification of test report by senior staff person at the testing company who is responsible for compiling and checking the test report:

"I certify under penalty of law that this test report and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the test information submitted. Based on my inquiry of the person or persons who performed the sampling and analysis related to the performance test, the information submitted in this test report is, to the best of my knowledge and belief, true, accurate, and complete. All exceptions are listed and explained in the test report."

Signature: Brian Durkon Title: Vice Presidence Date: 11-14-05

#### 4.) Certification of test report by owner or operator of the emission facility:

"I certify under penalty of law that the information submitted in this test report accurately reflects the operating conditions at the emission facility during this performance test and describes the date and nature of all operational and maintenance activities that were performed on the process and control equipment during the month prior to the performance test. Based on my inquiry of the person or persons who performed the operational and maintenance activities, the information submitted in this test report is, to the best of my knowledge and belief, true, accurate, and complete. All exceptions are listed and explained in the cover letter or attachments submitted with this report."

Signature: Douglas Altown Print Name: Douglas Gtolowshi Title: Environmental Date: 11-17-05

#### TABLE OF CONTENTS

SECTION 1.0	EXECUTIVE SUMMARY	
1.1	Summary of Test Methods	1
1.2	Summary of Test Results	1
1.3	Summary of Operating Conditions	
1.4	Summary of Report Organization	2
SECTION 2.0	TEST RESULTS	
2.1	Particulates	3
2.2	Opacity	5
SECTION 3.0	TEST PROCEDURES	
3.1	Determination of Sample Point Locations	6
3.2	Determination of Particulate Matter	7
Appendix A	Field Data Sheets	
Appendix B	Calculated Field Data Results	
Appendix C	Process Operations Data	
Appendix D	Laboratory Test Analyses	
Appendix E	Equipment Calibrations	
Appendix F	Test Plan and Approval Letter	

#### **SECTION 1.0**

#### **EXECUTIVE SUMMARY**

This report presents the results of a source test performed by Eagle Mountain Scientific, Inc. (EMSI) at the Gerdau Ameristeel facility located in St. Paul, Minnesota. The test was performed on October 4, 2005 to quantify particulate matter (to be reported as PM-10) and visible emissions from the New Baghouse (Amerex). The purpose of the test was to meet the requirements set forth in the Gerdau Ameristeel Permit to Operate (12300055-11). EMSI conducted U. S. EPA (EPA) and Minnesota Pollution Control Agency (MPCA) approved testing methods. This report describes the procedures used to complete the testing and the results of these tests.

The testing was performed by Mr. Brian Durkop, Mr. James Wilson, Mr. Mark Carlson, and Mr. Jerry Bovee. The process operating conditions were recorded by Gerdau Ameristeel plant personnel and EMSI.

#### **1.1 Summary of Test Methods**

METHOD	PURPOSE	<b>RUN TIME</b>	# OF RUNS
EPA 1	Determination of Traverse Points	NA	1
EPA 2	Determination of Velocity and Volumetric Flow	112 minutes	3
EPA 3	Determination of Molecular Weight	112 minutes	3
EPA 4	Determination of Moisture	112 minutes	3
EPA 5D	Determination of Particulate Matter	112 minutes	3
EPA 9	Determination of Opacity	60 minutes	1
EPA 202	Determination of Condensable Particulate Matter	NA	3

#### Table 1.1 Gerdau Ameristeel - New Baghouse October 4, 2005

#### **1.2 Summary of Test Results**

#### Table 1.2 Gerdau Ameristeel - New Baghouse October 4, 2005

POLLUTANT	RUN 1	RUN 2	RUN 3	AVERAGE	LIMIT
PM-10 (gr/dscf)	0.0014	0.0028	0.0005	0.0016	0.0052
Opacity (%)	0	NA	NA	0	3



#### **1.3** Summary of Production

#### Table 1.3 Gerdau Ameristeel - New Baghouse Particulates As PM10 October 4, 2005

PARAMETER	RUN 1	RUN 2	RUN 3	AVERAGE
Production (tons/hr)	98.0	100.6	92.3	97.0

#### **1.4 Summary of Report Organization**

This report is organized in the following manner. Section 2.0 provides detailed test results for the individual test runs. Section 3.0 provides a summary of the testing procedures.

The following information is located in appendices A through F, respectfully: copies of the field data sheets, calculated field data results, process operations data, laboratory test analyses, equipment calibrations and opacity certification, and the test plan.



#### **SECTION 2.0**

#### **TEST RESULTS**

The testing was conducted in conformance to applicable US EPA and MPCA methodologies and rules. The testing project was conducted according to the approved test plan submitted to the MPCA. A copy of the test plan and approval letter are located in Appendix F.

#### 2.1 Particulates

The results of the three tests performed for the determination of particulate matter with condensables are reported in Table 2.1. The electric arc furnace operates on a batch process, so to achieve a worst case-operating scenario, between heats when the process is down sampling was stopped.

#### Table 2.1 Gerdau Ameristeel- New Baghouse Particulate Test Results October 4, 2005

Client: Gerdau Ameristeel	Plant: S	St. Paul	
Date(s): October 4, 2005	EPA M	[ethod(s): 1-5D, 202	
Run #:Run 1 Date:	Run 2 10/4/2005 15:09-17:22	Run 3 10/4/2005 17:44-20:04	Average
Production Steel (tons/hr)	100.6	92.3	97.0
Control Equipment (monovent baghouse)         DP 1 (inH20)         DP 2 (inH20)         3.62         DP 3 (inH20)         5.24         DP 4 (inH20)         Cleaning         DP 5 (inH20)         5.65         DP 6 (inH20)         5.99         DP 7 (inH20)         4.14         Fan #1 (Amps)         0.00         Fan #2 (Amps)	6.25	5.61	6.66
	3.60	3.61	3.61
	4.74	4.62	4.87
	3.70	4.06	3.88
	4.96	4.30	4.97
	5.10	4.44	5.18
	3.37	3.05	3.52
	0.00	0.00	0.00
	163.00	183.00	172.00
Fan #3 (Amps)       171.00         Duct Conditions       172         Stack Temp (°F)       172         Oxygen (%)       19.8         Carbon Dioxide (%)       1.1         Moisture (%)       1.9         Mol Weight, Dry       28.9         Stack Press (inH20)       -11.00         Stack Area (ft2)       103.87         Stack Flow (wacfm)       587,369         Stack Flow (wscfm)       465,470         Stack Flow (dscfm)       456,626	163.00	181.00	171.67
	232	166	190
	19.8	19.8	19.8
	1.1	1.1	1.1
	1.9	1.9	1.9
	28.9	28.9	28.9
	-11.00	-11.00	-11.00
	103.87	103.87	103.87
	93.5	87.4	91.7
	582,886	544,559	571,605
	421,879	435,075	440,808
	413,864	426,808	432,433



Baghouse Conditions			
Nozzle (inches) 1.215	1.215	1.215	1.215
Stack Temp (°F)184	188	200	191
Oxygen (%)19.8	19.8	19.7	19.8
Carbon Dioxide (%)1.1	1.2	1.2	1.2
Moisture (%)2.6	2.9	3.1	2.9
Mol Weight, Dry29.0	29.0	29.0	29.0
Stack Press (inH20)0.18	0.19	0.30	0.10
Stack Area (ft2)4914.76	4914.76	4914.76	4914.76
Stack Vel (ft/sec)2.0	1.8	1.9	1.9
Stack Flow (wacfm)596,303	540,105	564,616	567,008
Stack Flow (wscfm)476,528	429,186	439,505	448,406
Stack Flow (dscfm)463,947	416,918	425,779	435,548
Test Results - Total Particulate Matter			
Sample Gas Vol (dscf)	75.316	78.536	78.989
Isokinetics (%)	98.5	100.5	98.9
130kmettes (70)	20.5	100.5	<i>J</i> 0. <i>J</i>
Filter (mg)0.0	0.0	0.0	0.0
Probe Rinse (mg)2.7	5.4	0.0	2.7
Aqueous (mg)5.0	8.4	2.3	5.2
Organic (mg)0.0	0.0	0.0	0.0
Total (mg)7.7	13.8	2.3	7.9
	2.052	0.000	1.000
Filterable (lbs/hr) 1.993	3.953	0.000	1.982
Aqueous (lbs/hr)	6.150	1.649	3.830
Organic (lbs/hr)0.000	0.000	0.000	0.000
Total (lbs/hr)5.685	10.103	1.649	5.812
Filterable (gr/dscf)0.0005	0.0011	0.0000	0.0005
Aqueous (gr/dscf)0.0009	0.0017	0.0005	0.0010
Organic (gr/dscf)0.0000	0.0000	0.0000	0.0000
Total (gr/dscf)	0.0028	0.0005	0.0016



## 2.2 Opacity

Mr. Mark Carlson conducted the visible emission observations. Whitlow Enterprises certified Mr. Carlson. A copy of his current certification certificate is located in Appendix E.

#### Table 2.2 Gerdau Ameristeel- New Baghouse Opacity Test Results October 4, 2005

Client:	Gerdau Ameristeel
Date(s):	October 4, 2005

Plant: St. Paul EPA Method(s): 9

Run #:	Run 1
Date:	
Time:	

#### Production

Steel (tons/hr)......98.0

#### Control Equipment (monovent baghouse)

DP 1 (inH20)	8.11
DP 2 (inH20)	3.62
DP 3 (inH20)	5.24
DP 4 (inH20)	Cleaning
DP 5 (inH20)	5.65
DP 6 (inH20)	5.99
DP 7 (inH20)	4.14
Fan #1 (Amps)	0.00
Fan #2 (Amps)	170.00
Fan #3 (Amps)	171.00



#### **SECTION 3.0**

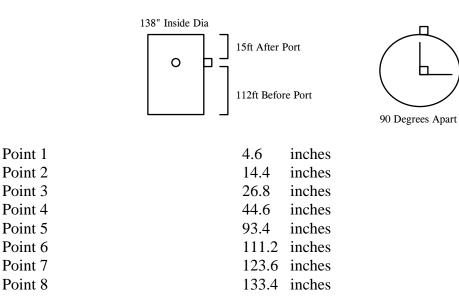
#### **TEST PROCEDURES**

#### 3.1 Determination of Sample Point Locations

REF: Code of Federal Regulations, Title 40, Part 60, Appendix A, Method 1

#### Inlet Duct

Number of Ports:	2
Inside Diameter:	138 inches
Area:	103.866 cubic feet
Distance Upstream of Ports:	112 feet
Distance Downstream of Ports:	15 feet
Total Number of Points:	16
Number of Points per Diameter:	8



#### **Baghouse** (Outlet)

Each compartment was divided into a 4 x 3 matrix for a total number of points for each compartment being 12. Run 1 sampled at points 1-4 in each of the seven compartments for a total of 28 points. Run 2 followed by sampling at 5-8 in each compartment, and finally Run 3 sampled at points 9-12.

Sample Matrix						
4x3	4x3	4x3	4x3	4x3	4x3	4x3



Number of Compartments:	7
Total Area of Baghouse:	4914.76 cubic feet
Total Number of Points:	84
Number of Points Per Run:	28
Run 1 points:	1 to 4 in seven compartments
Run 2 points:	5 to 8 in seven compartments
Run 3 points:	9 to 12 in seven compartments

#### **Baghouse Dimensions**

Compartment Number	Compartment Depth	Compartment Width	Number of Beams	Number of Doors	Compartment Area (ft2)
1	28'11"	24'10.5"	5	1	717.213
2	28'11"	23'11.5"	4	1	690.805
3	28'11"	24'0"	4	1	692.011
4	28'11"	23'11.5"	4	1	690.805
5	28'11"	24'0.5"	4	1	693.217
6	28'11"	23'11.5"	4	1	690.805
7	28'11"	25'8"	7	1	739.906
	Total	Baghouse Exhaust	Area		4,914.762

#### **3.2 Determination of Particulate Matter**

REF: <u>Code of Federal Regulations</u>, Title 40, Part 60, Appendix A, Methods 2-5D <u>Code of Federal Regulations</u>, Title 40, Part 51, Appendix M, Methods 202

#### Sampling System

A curved sample nozzle was connected via a "Swage-Lok" fitting to a heated probe liner. The probe liner was attached to a heated glass filter holder containing a glass fiber filter. The exit to the filter holder was connected to the impinger train which consisted of a set of preweighed impingers connected in series and immersed in an ice bath. The impinger train was followed in series by a carbon vane pump, a dry test meter, and a calibrated orifice connected to an inclined manometer. A Tedlar bag was used to collect an integrated Method 3 sample. Type K thermocouples were used to measure the following temperatures: probe heater, filter heater, impinger outlet, and dry test meter inlet and outlet.

A combination Stausscheibe (Type S) pitot tube and type K thermocouple were used to measure duct velocity head and temperature. The pitot tube was connected via flexible tubing to an inclined manometer. The thermocouple was connected to a digital potentiometer.

#### Sampling Procedure

Prior to sampling, traverse points were selected based on Method 1 requirements. The locations of the traverse points are presented in the reduced field data sheets. A preliminary traverse of the stack was performed to determine stack velocity head, temperature distributions, cyclonic flow, and stack static pressure. If necessary, preliminary runs by Methods 3 and 4 were performed to determine duct moisture and fixed gas content. Based on this information, a sample nozzle of appropriate inside diameter was selected, and the impinger train charged. Sample time per traverse point was estimated in order that a minimum of 30 dscf of sample would be collected.



The apparatus was assembled as completely as possible in the staging area and transported to the sample site. Potential contamination of the sample train was prevented by sealing all openings with aluminum foil. Once in the sampling area, the probe and filter heaters were brought to temperatures of  $250 \pm 25^{\circ}$ F, and the apparatus was leak checked. Upon successful completion of the leak check, the initial dry test meter reading was recorded, and the probe inserted at the first traverse point.

The stack temperature, dry test meter temperature, and the velocity head across the pitot was measured and recorded on the data sheet. The isokinetic sampling rate in terms of pressure drop across the calibrated orifice was calculated and recorded on the data sheet. The pump and timer were turned on, and the sample rate adjusted to correspond to the calculated isokinetic rate. Once the sample rate was set, the following data was recorded:

- Dry Gas Meter Volume
- Dry test meter outlet temperature
- Sample vacuum
- Probe heater temperature
- Filter heater temperature
- Impinger outlet temperature

At the end of the sample time for the first point, the probe was moved to the next point, and the measurements, calculations and recording of data was repeated. Upon completion of sampling from a port, the pump was turned off and the dry test meter reading recorded. The probe was removed from the stack, and placed in the next sample port. The previously described procedure was repeated for each sample port.

When the sample run was completed, the final dry test meter reading was recorded and the probe removed from the port. A post-test leak check was performed at a vacuum higher than the highest sample vacuum measured during the sample run. The final leak rate was recorded on the data sheet. The sample train was sealed from contamination and transported to the staging area for recovery.

#### Sample Recovery

Sample was recovered in two fractions: front half and back half. The front half fraction consisted of the filter itself, as well as, acetone rinses and brushings of: the nozzle, the probe liner; and the front half of the filter holder. The filter was recovered to a labeled petri dish made of glass or plastic. Acetone rinses were recovered to a labeled, clean polyethylene bottle. The liquid level in the polyethylene bottle was marked upon completion of recovery.

Prior to recovery of the back half fraction, the exterior of each impingers were cleaned and dried, and the net weight gain of each was determined to the nearest 0.5 gram. The back half fraction consisted of the liquid impinger catch and rinses of the impingers and all connecting glassware. Glassware rinses were recovered to a clean, labeled polyethylene or glass bottle. The liquid level of the bottle was marked upon completion of recovery.



At the conclusion of each day of sampling, reagent and recovery solvent blanks were collected into the same types of containers as were used for sample recovery. The blank containers were clearly labeled, and the liquid levels marked.

#### Analytical Procedure

The Method 3 sample was analyzed in the field with a fyrite analyzer. The results of this analysis are presented both in the calculated field data and on the field data sheets.

Prior to analysis, the samples were checked for liquid loss, and the liquid volume of each sample bottle determined. The liquid samples from each run and blanks were transferred to individual tared beakers, and the liquid allowed to evaporate at ambient temperature and pressure. The front half fraction and solvent blanks were analyzed gravimetrically until two consecutive weighings agreed to within 0.5 mg.

Prior to analysis, back half fraction and blanks were checked for liquid loss, and the liquid volume of each sample bottle determined. The back half fraction was extracted with methylene chloride or chloroform/ether and analyzed gravimetrically. Each sample was extracted three times with 25 ml of methylene chloride or 75ml chloroform/ 75ml ether in a separatory funnel. After each extraction, the organic (solvent) fraction was decanted. The organic (solvent) and aqueous (water) fractions were placed in individual tared beakers. The organic fraction was evaporated at ambient temperature and pressure, while the aqueous fraction was evaporated at just below the boiling point. After evaporation, the beakers were desiccated for 24 hours, and weighed until consecutive weighings agreed to within 0.5 mg.

#### **3.3** Determination of Opacity

REF: Code of Federal Regulations, Title 40, Part 60, Appendix A, Method 9

#### Positioning of the observer

The opacity of the plume as viewed by the observer can be influenced due to several variables with respect the position of the observer. The position of the observer with respect to the sun. Position of the observer with respect to the observation point. Attached or detached steam plumes. Position of the observer with respect to a rectangular stack with high length to width ratios.

The acceptable criteria for the position the observer is outlined in Method 9 as follows:

1) The observer must maintain a position with the sun located at a  $140^{\circ}$  arc to the observers back.

2) The observer must maintain an angle of  $< 18^{\circ}$  with respect to the observation point.

3) The observer must read the opacity where a steam plume does not interfere. Between the stack and the steam plume if the steam plume in detached from the stack. After the steam plume if the steam plume is attached from the stack.

4) The observer must read a rectangular stack at a point where the stack has the shortest cross sectional diameter.



## Visible Emission Readings

A test for visible emission requires 480 consecutive reading. Each reading is recorded in 15second intervals for 60-minutes. The percent opacity is recorded in 5 percent increments for 0 to 100. The observer must record the results on a data sheet as outlined in Method 9. (ie. position of the observer, date, time, process information, location of the stack, and the 15second opacity readings). The determination of opacity is calculated using a 6-minute rolling average.



Appendix A

**Field Data Sheets** 

	-			1.								-																		
	Total/Avg.	3	3 3	ω	ω	2	2	2	2	-	<b>I</b>		1		Star .	Point	Sample	Sample Time	Pstack	Mol. WT	K-Factor	Pbar	Tamb	PRE-TEST DATA	Location	Unit	Facility	Client	Eagle Mountaii Scientific	
	Åå.	4	ω	2		4	3	2		4	3	2						Time			Ľ.			ST DAT		B	St. Paul	Gerda	Eagle Mountain Scientific	2
	48	48	44 🚿	40	36	32	28	24	20	16	12	8	4	0		(min)	Time	112	~ O. (			C1.66		ſA	Compar	New Baghouse	ul	Gerdau Ameristeel	Inc.	
				2	non the same of	energen allen	instanting		-				0.00			(In H2O)	del P		R In	űα		II	٥F		MARCA			)el		
													00103					min	In H2O			In Hg	-1]		3					
			2	aar aar					nijionionjus -				51:1				del H (In H2O)	Pitot Coeff.	Meter Factor	del H @	Filter #	Nozzle Dia. (in)	Meter Box #		Start/Stop 1 Ime	Description	Test Number	Test Method		
		.70	6	C.C.	600	57.63	5.45	5	48.0	5	4	38	5,55	32.35	3)		_					n)	2		ne	TSP	<b></b>	EPA Sア		
		10.45	A 120	6400	Ś	632	Ĵ.	60	0	600	~	59.82	N	553		Reading ()	Meter V	62.0	0.96	1.59		E CO.	2010-		6	. 5		ğ	STAC	
		Ú	Ø	R	n	3	9	UT 1	M	Ó	Ś	9	N				Vacuum		4			9	Z	l					KTE	
(ter	n tayle Ta	205	LOC	361	153	190	901	196	187	191	L 83	172	149			Stack		Total	.#4	#3	#2	#1	Impinger	SCJ K	22421			- 7%	STACK TEST DAT	
		251	247	825	arg	348	She	249	242	247	She	556	246			Probe			763.0	635.3	771.2	692.9	End	MATERI		Co.			TA SHEET	
		280	245	245	252	156	1.56	ちいか	es s	151	とい	1.52	250			Filter	Temperature °F		K 621	6.80	715.0	6278	Start	MATERIAL WEIGHT (2)					EET	
		26 26	5	54	S	54	55	4S	5	SC	26	LS	25		I ,	Imp Out	ure °F						Dif.	HT (g)	Operator	Page	Job #	Date		
		63	5	K	8	3	ЪГ	77	22	いい	イト	12	)[		In	Ň		C02	02	Run	Post-Test	Pre-Test	Leak Check			1	902264	<b>1</b> .		
		<u></u>	52	86	LL L	SL	PL 1	44	22	01	<u>ି</u> (୦୦)	67	63		Out	Meter		94) 2 2	<i>1</i> 9,7		0 6	0.0	ck CFM		150			10-4-		
		- 14							0/ 10	AL .				,		in an			- 	1	3	01 12	VAC.			of		с С С		
									37 0	PROJY					Comments/Observations					2		<u> </u>	I.			ω				
									er S	FR		9/ K	SI 7	R	servation					3 Avg.	R V V R V	80 68								
										E	14		19]		NS N	1				âġ	526	SYR	TIME		·					

Scientific	Inc.			STAC	KTE	STACK TEST DATA		SHEET					
Client Gerdau	Gerdau Ameristeel	<u>e</u>	Test Method	EPA.5 D		955 2014 - 2014 2014 2014			Date	0	20-2-05	N.	
ই	11		Test Number	1		с. 2747				902264			
Unit New B Location	New Baghouse		Description Start/Stop Time	TSP					Page Operator	2		of <u>3</u>	
PRE-TEST DATA	Ă.						MATERI	TERIAL WEIGHT (g)	HT (g)				
Tamb		oF	Meter Box #			Impinger	End	Start	Dif.	Leak Check	CFM	VAC. IN	INIT TIME
Pbar	a	In Hg	Nozzle Dia. (in)			#1				Pre-Test			
K-Factor			Filter #			#2				Post-Test			
Mol. WT		g/mole	del H @			#3				Run	]	2	3 Avg.
LSLAUN						] ≓ -				02	-		•
Sample I IIIIc	112	TITIE	τ Ιωι Ουεπ.			IULAI				202			
Sample	Time	del P	del H (In H2O)	Meter	Vacuum	30 		Temperature °F	ure °F				
Point	(min)	(In H2O)		Reading	(In Hg)	Stack	Probe	Filter	Imp Out	Meter	Dt	Commonte/Obconvisione	hearistione
	48												
4 1	52	6 910010	54.7	73.20	Ű,	506	いち	250	63	- CS-	79		
4 . 2	56			76,75	R	204	246	156	600	82	29		
4 3	60			20,0	G	693	1-56	NS K	2	220	26	ben -	AHC
4 4	64	a anestekijast	Trans a day of	6, 63	R	P	251	253	52	50	25	HUSS	3
5 1	89			22.2	01	152	250	775	50	000	2		
5 2	72	Rinn y Career		2 m 2 m	ηh		325	225	10	080	5	*	
	08	- - -	NUCESSION AND	20.04	ak		220	Pro P	3	200	26		
5 5 4		ALCONANCE OF	Basining and	580	Ň	196	156	848	S	80	25		
	84	alden turn occup		1,601	R	201	221	250	2	ŜO	36		
	84 88			105 16	Ц	204	252	3.51	56	08	36		
	84 92	E S S			T	200 200	25	n N	2	D S S C	SL		

	· // ·		****		STAC	XK TE	STACK TEST DATA SHEET	FA SH	EET	j 		2	2	
Client Facility	Gerdau . St. Paul	Gerdau Ameristeel St. Paul	el	Test Method Test Number	EPA 5 D					Date Job #	(b- 902264	4-05		
Unit Location	New B:	New Baghouse		Description Start/Stop Time	TSP					Page Operator	ω		of	3
PRE-TEST DATA Tamb	T DAT.	A	٩	Meter Box #			Impinger	MATERIAL WEIGHT (g) End Start Dif.	AL WEIG Start	iHT (g) Dif.	Leak Check	CFM	VAC.	INIT
Pbar K-Factor			In Hg	Nozzle Dia. (in) Filter #			#2 #1				Pre-Test Post-Test			
Mol. WT		·.	g/mole	del H @			#3				Run	1	2	
Pstack			In H2O	Meter Factor			#4				02			
		Ð	4 <u>21</u> D		Motor	Vaanna			Tomporturo OF	OF			ŵ.	2
Point		(min)	(In H2O)		űφ		Stack	Probe	Filter	Imp Out	Meter		-	
		96			( /									
7		100	0.00103	52.7	11.95	G(	109	BAC	3	57	40	36		
7	2	104		eatroi	ersn	N	160	C hc	249	60	79	77		1. 1. 1.
7	ω	108	- contractor		18.4	Ŋ	166	bhc	250	57	79	77		1. S.
7	4	112	×.	Ų	124.628	4	2	PX P	245	26	Ta	5	•	
					-									
							5							
														-
-														
a.														

ĝ.

ta	Mountain Scientific	<i>Mountain</i> <i>cientific</i>				STAC	K TE	STACK TEST DAT	<b>FA SHEET</b>	EET					and a second	
Client Facilit	У.	Gerdau Ameristeel St. Paul	eristeel		Test Method Test Number	EPA 5 D 2					Date Job #	902264	7-0-4-	5		
Unit Loca	tion	New Baghouse	Ľ	ment	Description Start/Stop Time	TSP ISØ	9-	6011			Page Operator	1	ST.	of	ζ	
PRE-7 Tamb	PRE-TEST DATA Tamb	DATA		۰F	Meter Box #	2-0106		Impinger	MATERI End	MATERIAL WEIGHT (g) End Start Dif.	HT (g) Dif.	Leak Check	ĊFM	VAC.	TINI	TIME
Pbar K_F3	Pbar V-Factor	291,1	J	In Hg	Nozzle Dia. (in) Filter #	1.215		2# 1#	1025	17.80	1414	Pre-Test Post-Test	0,015	30	282	0/2/2
Mo	Mol. WT			g/mole	del H @	6451)	ũ	#3	5803	577,6	1100	Run		2	3 1	Avg.
San	Pstack Sample Time	ē	112	In H2O	Meter Factor Pitot Coeff.	12.V	1968	.#4 Total	826.3	8054		CO2	A A			2 2 C
Point	Point	(min)		(In H2O)		Reading	(In Hg)	Stack	Probe	Filter Imp C	Imp Out	Meter	ter		e en surger	
			⊃ 			(aci)						111 .	Out	Comment		OIIS
				0,00084	Ch'I	0.50	4	149	250	250	66	60	79	Ļ		
			; ∞ 			28.65		12%	254	0.56	132	32	2 L 2 a		- 9	
	-	4 0	16	OdTaada, Agti taada	400 Lance 1	33.5	-f-	240	656	253	56	5	80.			-
	2	-	20		Manalacky Provide Strategy	36.5	÷	193	12/2	226	A 5 57	283	202	Π		
	2 1	ω r 	28	North View Color		42.3	<i>c</i>	195	135	249	(S) .	84	\$		4	40000
	- 2	4	32			145.2	£	288	949	253	S	24	28	r	13	
	ω		36		Section of the sectio	5.3	f	22	hre	056	53	257	52			
	ວ ເວັ		40	analonin allandari 497	Discreting sufficiency	2015		56	245	And	202	X X V V	とく			
	ເມ		48	Æ	Ŵ	57.0	¢,	153	aus	248	Ser	28	3			
To	Total/Avg.		48													
							kalahirin T			*						
							-									

Eagle Mountain Scientific	Inc.			STAC	XK TE	ST DA	STACK TEST DATA SHEET	EET	×	*	,	*, 	
Client Gerdau	Gerdau Ameristeel	<u>e</u> ]	Test Method	EPA 5D					Date	<i>C</i>	20-V	Ч	
< ,	11		Test Number	2					" Job #	902264			
и.я	New Baghouse		Description Start/Stop Time	TSP				-	Page Operator	2 ロブ		of 3	
Location													
PRE-TEST DATA	Â						MATERI	MATERIAL WEIGHT (g)	HT (g)				
Tamb		Ho	Meter Box #			Impinger	End	Start	Dif.	Leak Check	CFM	VAC. INIT	TIME
Pbar		In Hg	Nozzle Dia. (in)			#1				Pre-Test			
K-Factor			Filter #			#2				Post-Test			
Mol. WT		g/mole	del H @			#3				Run	1	2	3 Avg.
Pstack		In H2O	Meter Factor			#4				02			
Sample Time	112	2 min	Pitot Coeff.			Total				CO2			
Sample	Time	del P	del H (In H2O)	Meter	Vacuum			Temperature °F	ure °F				
Point	(min)	(In H2O)		Reading	(In Hg)	Stack	Probe	Filter	Imp Out	Meter		2	
4. 2	10		-	(act)						In	Out	Comments/Observations	ations
1	5 40	N WWSY	ζ¢.		C	5	222	470	22	2	22		
	56		a No.	62.9	C	5	ع ب ب	35	r C	·	30	and the second	
4 3	60	and a second	and and a second	6.5	C	177	248	249	Ś	36	(کی میں		
4 4	64			816189	~	156	1247	248	<b>\$</b> \$	56	3		2.3
5 1	68			うに. そ	£	851	254	251	SY	26	20		
5 2	72	-		8 HL	4	091	254	920	SS	: 18	83		
5 3	76			771.55	L	20	155	250	45	90 D	S		
5 4	80		- 1706733562386	120,03	4	Sot	251	250	54	30	33		
6 1	84	autorenismus,	- Caracteria	53,5	-(C	22	12 K	126	2	アウ	48		
6 2	88	1440-1442		56.2	C	818	251	250	54	87	25		
	2	and the second s	enter ander	43,4	C	234	156	250	Si.	68	2		
	76	¢	Z	ふい	¢	221	250	286	52	R	55		
	96 76	The submittee strange and submittee and submittee strange and submittee submitte					-		× .				

$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$
St. Paul       Test Number       2         New Baghouse       Description       TSP         1       Start/Stop Time       TSP         ST DATA $^{\circ}$ F       Meter Box #       0       Impinger         r       In Hg       Nozzle Dia. (in)       #1       #1         r       g/mole       del H @       #2       #3         Time       112       min       Pitot Coeff.       Total         1       100       0:0:0:0:SH       1:.4(3)       4:.4(3)       4:.4(3)         2       104       1:.4(3)       4:.4(3)       4:.4(3)       4:.4(3)       4:.4(3)         3       108       1:.4(3)       4:.4(3)       4:.4(3)       4:.4(3)       4:.4(3)
New BaghouseDescriptionTSP1Start/Stop TimeStart/Stop TimeST DATA $^{\circ}$ FMeter Box #21In HgNozzle Dia. (in)#1Tg/moledel H @#1Time112minPitot Coeff.#2Time112minPitot Coeff.Total1100 $\bigcirc$ . $\bigcirc$ . $\bigcirc$ . $\bigcirc$ GardyMeter21041.4.2961.4.29631081.4.21.4.3101.04.1.441121.1.41.4.31.63.4454.1.64
$\begin{array}{c c c c c c c c c c c c c c c c c c c $
or       F       Meter Box #       D       Impinger       End         r       In Hg       Nozzle Dia. (in)       #1       #1       #1         T       g/mole       del H @       #1       #1       #1         Time       112       min       Pitot Coeff.       Total       #3         Time       112       min       del H (In H2O)       Meter       Vacuum       #4         1       100 $\bigcirc$ $\bigcirc$ $\bigcirc$ Total       Filer         2       104       1.4       1.4       1.4       1.4       1.4       1.4       1.4       1.4       1.4       1.4       1.4       1.4       1.4       1.4       1.4       1.4       1.4       1.4       1.4       1.4       1.4       1.4       1.4       1.4       1.4       1.4       1.4       1.4       1.4       1.4       1.4       1.4       1.4       1.4       1.4       1.4       1.4       1.4       1.4       1.4       1.4       1.4       1.4       1.4       1.4       1.4       1.4       1.4       1.4       1.4       1.4       1.4       1.4       1.4       1.4       1.4       1.4       1
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$
Tg/moledel H ( $\widehat{a}$ )#3In H2OMeter Factor#4Time112minPitot Coeff.#4Timedel Pdel H (In H2O)MeterVacuum(min)(In H2O)del H (In H2O)Reading(In Hg)1100( $\Im$ , $O$ , $G$ , $G$ 110021041, $\mathcal{A}$ $\Im$ , $\Im$ $\Im$ 3108110 $O$ , $O$ , $O$ , $G$ , $G$ $\mathcal{A}$ 4112 $\mathcal{A}$ $\mathcal{A}$ $\mathcal{A}$ $\mathcal{A}$
$\begin{array}{c c c c c c c c c c c c c c c c c c c $
Time112minPitot Coeff.TotalTime (min)del P (In H2O)del H (In H2O)Meter Reading (acf)Vacuum (In Hg)9696(In H2O)Reading (In Hg)(In Hg)1100 $\bigcirc, \bigcirc, \bigcirc, \Im, \Im$ (In Hg)21041, (J) $\Im, \Im, \Im$ (In Hg)31081102 $\Im, \Im, \Im$ 4112 $\bigvee, \bigvee, \bigvee, \bigvee, \bigcup, \Im, \Im, \Im$ 163, G45 $\downarrow, \bigcup, \Im, \Im, \Im$
Time (min)del P (In H2O)del H (In H2O)Meter ReadingVacuum (In Hg)9696(acf)(In Hg)1100 $\Im \circ \circ \circ \Im $ $\Im \circ \circ \circ \Im $ 21041/43 $\Im \circ \circ \Im $ 310896 $\Im \circ \circ \Im $ 4112 $\Im \circ \odot \odot \Im $ $\Im \circ \Im $
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$
1 100 0.00084 1.43 95,2 4 194 249 2 104 1.43 95,2 4 194 249 3 108 101 0 101,0 4 199 248 4 112 1 10 103,945 4 199 248
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$
4   112   W   W   163,945   4   169   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   207   20
Total/Avg. 112

				_	,		<b>1</b> ******		:		proven i ser			1		يبينين	العتية				·		v 4 - 4		8		<u>ث</u> .			~	226				
	Total/Avg.	ယ	ω	ω	ယ	2	2	- 2	2	-	1	1	1			Point	Sample	r orthmo	Samnle Time	Petack	Mol. WT	K-Factor	Pbar	Tamb	PRE-TEST DATA		Location	Unit	Facility	Client			Mountai	Eagle 🌽	
	άð	4	ω.	2		4	ω	2	_	4	ω	2							ime				0		T DAT			New I	St. Paul	Gerda		eyec	ntain	le 🍆	) }
	48	48	44	40	36	32	28	24	20	16	- 12	∞	4	0		(min)	Time	711		F . 3	Х.»		29,17		ГА	100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100	VUMBUN V	New Baghouse	ul	Gerdau Ameristeel		- 111c.	Inc		<b>,</b>
		C									4 Valuestarto	P	0,00090			(In H2O)	del P 👘			In H2O	g/mole		In Hg	۰F		l'estant	star at some	4	4	el					
		<		-				<u>erros</u> (6) (10					5				del H (In H2O)		Pitot Coeff	Meter Factor	del H @	Filter #	Nozzle Dia. (in)	Meter Box #			Start/Stop Time	Description	Test Number	Test Method	Ŕ.				
		41.061	37.60	34,50	31,45	2(hige	253	22.4	h'r!	16.243	13.2	5) ' 01	7,30	4,13		09	Meter	0-0		C	, U		1.21	2010-			48770	TSP	ω	EPA 5		ALV			
		<u>_</u>	£	L.	L	L	LC.	£	C	£	£	£	£			(In Hg)	Vacuum			SI S	L'S		N	ſΛ	-		771				L NI	W TH			
		203	Z	200	204	207	906	206	ET	209	210	205	301			Stack			Total	#4	巷3	#2	1#	Impinger			200	4		a 1.999 at 14		STACK THET DATA	· · ·		
		C JY	946	nne	348	155	252	35	50	252	256	t Sil	251			Probe				2 67 5	~ `I	2,502	729.2	End	MATERI	-	24				ζ	Ω			
		250	249	249	545	276	542	She	40	745	251	ESE	656			Filter	Temperature °F		1010	2020	0129	692.4	717.8	Start	MATERIAL WEIGHT (g)										
		6 S	HC HC	56	29	rs V	56	57	SP	S3	Sw	S	56			Imp Out	ure °F							Dif.	HT (g)		Operator	Page	Job #	Date					
		49 19	52	72 24	7.8	5.S	28	28	25	3	55	25	25		In	Meter				03	Run	Post-Test	Pre-Test	Leak Check		4	ž		902264	io	2				
		C.S	ES	S	30	, <u>h</u> S	fa S	48	A3	7.8 1	7.5	48	48		Out	er					1		6004	CFM						50-2-					
and the second second		n an Alina Maria													Comme	n mark							10	VAC.			8	of		N.					
											-2-2	1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1			Comments/Observations		e <sup>i</sup>				2	-	30	INIT				ω							
															ations			() )	, ., / , ., /		3 Avg.	<i></i>	C>11	TIME											

	$ \begin{array}{ c c c c c } \hline \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ $
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	STACK TEST DATA SHEET         Gerdan Ameristeel       Test Method       EPA 5 $D$ Date         St. Paul       °F       Meter Box #       Impinger       Matrix Data Start/Stop Time       Date         n $OF$ Nozie Dox $OF$
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	STACK TEST DATA SHEET         Gerdau Ameristeel       Test Method       EPA 5 D       Date         St. Paul       Test Method       EPA 5 D       Test Method       St. Paul       Date         New Baghouse       Description       Start/Stop Time       Description       Job #       Job #         ST DATA       °F       Meter Box #       Impinger End       Start/Stop Time       MATERIAL WEIGHT (g)       Page         r       In Hg       Nozzle Dia. (in)       #1       #1       MATERIAL WEIGHT (g)       Page       Page       Operator         r       In       H2       Mozzle Dia. (in)       #1       #1       #1       MATERIAL WEIGHT (g)       Page         r       In       Page       In H2O       Meter Factor       #1       #1       #1       Import End       Start       Dif.         r       In       Start Cooff.       Filter       Import       Temperature 'F       Temperature 'F       Temperature 'F       Imp Out         1       52       0.000/9C       (1.53       47.1       4       20.0       24.6       25.1       52.       4.0         2       72       56       47.1       4
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	ST CK TEST DATA SHEET         Gerdian Ameristeel       Test Method       EPA 5 $D$ Date         St. Paul       Test Number       Description       Time       Date         New Baghouse       Start/Stop Time       Description       Time       Date         ST DATA       F       Meter Box #       Impinger       Impinger       MATERIAL WEIGHT (g)       Page         Trime       112       nin H20       Meter Factor       #1       #1       #2       #3         Time       112       min       Pilot Coeff.       Meter Factor       #3       #4       Temperature °F         Time       del P       del H (In H20)       Meter Factor       Temperature °F       Temperature °F         Material       Gold H (In H20)       Meter Gater       Vacuum       Temperature °F       Temperature °F         Material       Gata       Gata       Gata       Gata       Gata       Gata       Gata       Gata       Gata         1       52       0.000/9D       (1.5°3       4'3.1       4       2.4(1       3.5(2       2.5(1       2.5(2       2.5(1       2.5(2       2.5(1       2.5(2       2.5(1       2.5(2       2.5(1       2.5(2       2.5(1
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	ST CK TEST DATA SHEET         Gerdau Ameristeel       Test Method       EPA 5 b       Date         St. Paul       Test Method       St. Paul       Date       Date         New Baghouse       Description       Time       Date       Date       Date         St. Paul       Operation       St. Paul       Date       Date       Date       Date         New Baghouse       Start/Stop Time       Description       Time       Date       Date       Date       Date         ST DATA       °F       Meter Box #       Meter Box #       Impinger End Start Df. Box       MATERIAL WEIGHT (g)       MATERIAL WEIGHT (g)       Mater Df. Bat       Mater       Mater       #1       #2       #4       #1       #1       #1       #1       #1       #1       #1       #1       #1       #1       #1       #1       #1       #1       #1       #1       #1       #1       #1       #1       #1       #1       #1       #1       #1       #1       #1       #1       #1       #1       #1       #1       #1       #1       #1       #1       #1       #1       #1       #1       #1       #1       #1       #1       #1       #1 <th< td=""></th<>
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	STACK TEST DATA SHEET         Gerdia Ameristeel       Test Method       EPA 5 $D$ Date         St. Paul       Test Number       Test Number       Test Number       Date       Job #         New Baghouse       OF       Description       Test Number       Test Number       Test Number       Mater Start Stop Time       Date         T       OF       Description       Meter Box #       Impinger       Impinger       MATERIAL WEIGHT (g)         ST DATA       In Hg       Nozzle Dia. (in)       #1       #2       MATERIAL WEIGHT (g)       MATERIAL WEIGHT (g)         T       Inn       Nozzle Dia. (in)       #1       #2       MATERIAL WEIGHT (g)         Time       I12       In H2O       Meter Factor       #1       #1         Time       I12       In H2O       Meter Factor       Total       #3       Important       Temperature °F         Innin       del H       (h H2O)       Meter       Vacuum       Temperature °F       Important       Temperature °F         Innin       del H       (h H2O)       Reading       (in Hg)       Stack       Probe       Filter       Imp Out         A       40       20       20       20       20
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	STACK TEST DATA SHEET         Gerdia Ameristeel       Test Method       EPA 5 $D$ Date         St. Paul       Test Number       Description       Tisp       Date         New Baghouse       Description       Meter Box #       Impinger       MATERIAL WEIGHT (2)       Page         ST DATA       °F       Meter Box #       Impinger End       Start/Stop Time       MATERIAL WEIGHT (2)       MATERIAL WEIGHT (2)         Time       I12       In H2O       Meter Factor       Total       #1       MATERIAL WEIGHT (2)         Time       I12       Min       Model H (20)       Meter       Vacuum       #1       MATERIAL WEIGHT (2)         Time       I12       Min       Model H (20)       Meter       Vacuum       #1       MATERIAL WEIGHT (2)         Time       I12       min       Proto Coeff.       Total       #1       Material       Diff.         1       52       0000/9D       L, S-3       U(1, H2O)       Meter       Total       Temperature °F         48       0000/9D       L, S-3       U(1, L       Q       Q       Q       Q       Q       Q       Q       Q       Q       Q       Q       Q       Q
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	STACK TEST DATA SHEET         Gerda Ameristeel       Test Method       EPA 5 $D$ Date         St. Paul       Test Number       Description       TSP       Job #         New Baghouse       Description       TSP       Page       Operator         St. Paul       °F       Meter Box #       Impringer       End Start/Stop Time       MattERIAL WEIGHT (g)         ST DATA       °F       Meter Box #       Impringer       MattERIAL WEIGHT (g)       Page         r       In Hg       Nozzle Dia. (in)       #1       #2       MattERIAL WEIGHT (g)       Matter Diff.         r       In Hg       Nozzle Dia. (in)       #1       #1       Matter Total       Matter Diff.         r       In H2O       Meter Factor       #4       Impringer       End Start       Diff.         r       In H2O       Meter Factor       #4       Important       Important       Important         r       In H2O       Meter Factor       #4       Important       Important       Important         r       In H2O       Meter Totoeff.       Total       Important       Important       Important         s       60       I, S3       (43.7)       Value       S5.4
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	STACK TEST DATA SHEET         Gerdia Ameristeel       Test Method       EPA 5 p       Date         St. Paul       Test Number       Test Number       TSP       Date         New Baghouse       Description       TSP       page       page         ST DATA       of       Meter Box #       Impinger End       MATERIAL WEIGHT (g)         r       In Hg       Nozzle Dia (in)       #1       #2       mare       page         r       In H20       Meter Factor       #1       #3       MATERIAL WEIGHT (g)       MATERIAL WEIGHT (g)         r       In H20       Meter Factor       #1       #4       In H20       Meter Factor       #4       In H20       Meter Factor       #4       In H20       Meter Factor       In H20
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	ST CRT Pail       Test Method       EPA 5 $D$ Date 3 $3$ St. Paul       Test Number       Test Number       Test Number       Test Number       Test Number       Test Number       Date 3 $0$
	STACK TEST DATA SHEET         Gerdia Ameristeel       Test Method       EPA 5 $\mathbb{D}$ Date         St. Paul       Test Number       Test Number       Bascription       TSP       Date         New Baghouse       Start/Stop Time       Time       The       Matter Box #       Impinger       Matter A start       Dite         ST DATA       °F       Meter Box #       Impinger       Impinger       End       Start       Dite         Trime       112       min       Mozle Dia. (in)       Impinger       End       Start       Dite         Time       112       min       Matter Factor       Meter Factor       Temperature °F       Temperature °F         Mater Factor       Gending       (In H2O)       Meter       Meter       Vacuum       Temperature °F         Mater       Gath       Gath       Gath       Gath       Filter       Imp Out         1       52       0.000/GD       1.523       43.53       25.51       25.51       25.51
Gerdau AmeristeelTest MethodEPA 5 $D$ DateSt. PaulTest NumberTest NumberJob # $902264$ New BaghouseDescriptionTSPPage $2$ ST DATA°FMeter Box #ImpingerImpingerMATERIAL WEIGHT (g)rIn HgNozzle Dia. (in)#1HitPre-TestrIn HgNozzle Dia. (in)#1#2MATERIAL WEIGHT (g)rIn HgNozle Dia. (in)#1#1Pre-TestrIn HgMeter Factor#1InPre-TestrIn H2OMeter Factor#4InInrIn H2OMeter FactorTotalInProberIn H2OMeter FactorTotalInO2rIn H2OMeter FactorTotalInO2rIn H2OMeter FactorTotalInO2rIn H2OMeter FactorTotalInO2rIn H2OIn H2OMeterTotalInrIn H2OIn H2OMeterIn H2OIn H2OrIn H2OIn H2OMeterVacuumTemperature °FrIn H2OIn H2OIn H2OIn H2OIn H2OrIn H2OIn H2OIn H2OIn H2OIn H2OrIn H2OIn H2OIn H2OIn H2OrIn H2OIn H2OIn H2OIn H2OrIn H2OIn H2OIn H2OIn H2O<	STACK TEST DATA SHEET         Gerdau Ameristeel       Test Method       EPA 5 $\mathfrak{H}$ Date         St. Paul       Test Number       Test Number       3       Job #         New Baghouse       Description       TSP       Page       Date         New Baghouse       Operator       Start/Stop Time       TSP       Page       Job #         ST DATA       °F       Meter Box #       Impinger End       MATERIAL WEIGHT (g)         r       In Hg       Nozzle Dia. (in)       #1       #1       MATERIAL WEIGHT (g)         r       In Hg       Nozzle Dia. (in)       #1       #1       MATERIAL WEIGHT (g)         rime       I12       In Hg       Nozzle Dia. (in)       #1       #2       Impinger End       Start       Dif.         rime       I12       In Hg       Neter Factor       Total       #2       Impinger End       Start       Dif.         rime       I12       min       Pitot Coeff.       Total       #3       Impinger Total       Imp Out         4       48       0.00070       I. 53       43.7       4       3-1 (1       3-2 (20)
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	ST CK TEST DATA SHEET         Gerdau Ameristeel       Test Method       EPA 5 $\mathbb{D}$ Date         St. Paul       Test Number       Bescription       TSP       Date         New Baghouse       OF       Meter Box #       Impinger       Matter Bot #       Matter Bot #
	Inc.       STACK TEST DATA SHEET         Gerdau Ameristeel       Test Method $EPA 5 \ D$ Date         St. Paul       Test Number       3       Date       Job #         New Baghouse       Description       TSP       Page       Date         ST DATA       °F       Meter Box #       Impinger       MATERIAL WEIGHT (g)       MATERIAL WEIGHT (g)         ST DATA       °F       Meter Box #       Impinger       MATERIAL WEIGHT (g)       MATERIAL WEIGHT (g)         In       gymole       del H ( $\widehat{@}$ Meter Factor       #1       MATERIAL WEIGHT (g)       MATERIAL WEIGHT (g)         In       gymole       del H ( $\widehat{@}$ Meter Factor       #1       Material       Impinger       End       Start       Dif.         Time       112       min       Pitot Coeff.       Meter       Fotal       Impinger       Temperature °F         (min)       del H (In H2O)       Meter       Meter       Temperature °F       Impinger       Impinger       Temperature °F         (acf)       Meter       Yacum       Temperature °F       Temperature °F       Temperature °F       Temperature °F
Gerdau AmeristeelTest MethodEPA 5 $\mathfrak{D}$ DateDateSt. PaulTest NumberTest NumberJob #902264New BaghouseDescriptionTSPPage2New BaghouseStart/Stop TimeDescriptionPage2ST DATA°FMeter Box #Impinger End StartDif.Leak ChTg/moledel H @#1MATERIAL WEIGHT (g)Leak ChTime112minPitot Coeff.#2Post-TestTimedel Pdel H (ln H2O)MeterVacuumTemperature °FMaterIn H2Odel H (ln H2O)MeterVacuumTemperature °F	STACK TEST DATA SHEET         Gerdau Ameristeel       Test Method       EPA 5 $D$ Date         St. Paul       Test Number       Description       TSP       Date         New Baghouse       Description       TSP       Date       Job #         New Baghouse       Start/Stop Time       Description       MATERIAL WEIGHT (g)       Date         ST DATA       °F       Meter Box #       Impinger       MATERIAL WEIGHT (g)       MATERIAL WEIGHT (g)         Tr       g/mole       del H @       Meter Factor       #1       MATERIAL WEIGHT (g)         Time       I12       min       Weiter Factor       #1       MATERIAL WEIGHT (g)         Time       In H2O       Meter Factor       #1       MATERIAL WEIGHT (g)         Time       In H2O       Meter Factor       #1       Total       Impinger End Start       Dif.         Total       del H (n H2O)       Meter       Vacuum       Total       Temperature °F         Temperature °F       Meter       Vacuum       Temperature °F       Temperature °F
Gerdau AmeristeelTest MethodEPA 5 $\rarbox$ DateSt. PaulTest Number3Job #New BaghouseDescriptionTSPJob #New BaghouseStart/Stop TimeTSPPageSST DATA°FMeter Box #ImpingerMATERIAL WEIGHT (g)TIn HgNozle Dia. (in)#1#1Filter #Filter ##2#1#2Time112minPiot Coeff.TotalTotalTimedel H (In H2O)MeterVacuumTemperature °F	Implifie       Inc.       STACK TEST DATA SHEET         Gerdau Ameristeel       Test Method       EPA 5 $\mathfrak{d}$ Date         St. Paul       Test Mumber       Test Number       3       Date         New Baghouse       Description       TSP       Date       Job #         New Baghouse       Start/Stop Time       TSP       Page       Page         SST DATA       °F       Meter Box #       Impinger       MATERIAL WEIGHT (g)         Tr       In Hg       Nozzle Dia. (in)       #1       #1       MATERIAL WEIGHT (g)         Time       I12       min       Meter Factor       #3       MATERIAL WEIGHT (g)       Impinger End Start       Dif.         Time       I12       min       Pitot Coeff.       #1       Impinger       End Start       Dif.         Temperature °F       Meter Factor       #4       Impinger       Total       Impinger       Temperature °F
Gerdau AmeristeelTest MethodEPA 5 $\$ DateSt. PaulTest Number3Job #New BaghouseDescriptionTSPJob #nStart/Stop TimeTSPPageor°FMeter Box #Impinger End Start Dif.orIn HgNozzle Dia. (in)#1Filter #Filter ##21orIn HgMeter Factor#3orIn HgNozzle Dia. (in)#1Filter #Filter ##2In H2OMeter Factor#3In H2OMeter Factor#4In H2OMeter FactorIn H2OIn	Gerdau Ameristeel       Test Method       EPA 5 D       Date         New Baghouse       Description       3       Job #         New Baghouse       Description       TSP       Job #         St. Paul       Test Number       Start/Stop Time       Date         St. Paul       OP       Description       Job #         New Baghouse       Start/Stop Time       Description       Page         Or       F       Meter Box #       Impinger       Page         TT       g/mole       del H @       H1       H1       H1         Time       112       min       Pitot Coeff.       #4       H1       H1
	Gerdau Ameristeel       Test Method       EPA 5 b       Date         St. Paul       Test Number       3       Job #         New Baghouse       Description       TSP       Job #         New Baghouse       Start/Stop Time       TSP       Page         or       OF       Meter Box #       Impinger End Start       Dif.         In Hg       Nozzle Dia. (in)       #1       #1       Impinger End Start       Dif.         In H2O       Meter Factor       #4       Impinger End Start       Dif.
Gerdau AmeristeelTest MethodEPA 5 $\mathbf{D}$ DateSt. PaulTest Number3Job #New BaghouseDescriptionTSPJob #New BaghouseStart/Stop TimeTSPPageST DATA°FMeter Box #ImpingerMATERIAL WEIGHT (g)In HgNozzle Dia. (in)#1#2Impingerrg/moledel H @#3Impinger	Inc.       STACK TEST DATA SHEET         Gerdau Ameristeel       Test Method $\underline{3}$ Date         St. Paul       Test Number $\underline{3}$ Date         New Baghouse       Description $\underline{TSP}$ Date         ST DATA $^{\circ}$ F       Meter Box #       Impinger End Start       MATERIAL WEIGHT (g)         Tr $_{\circ}$ Mole $_{\circ}$ Meter Box # $_{\circ}$ Filter # <th< td=""></th<>
Gerdau AmeristeelTest Method Test NumberEPA 5 bDate Test NumberDate Job #St. PaulTest Number3Job #New BaghouseDescriptionTSPPagenStart/Stop TimeTsPPagestart/Stop TimeStart/Stop TimeMATERIAL WEIGHT (g)ST DATA°FMeter Box #Impingern HgNozzle Dia. (in)#1#1Filter ##2Impinger	Implifie       Implifie       Implifie       Implifie       STACK TEST DATA SHEET         Gerdau Ameristeel       Test Method       EPA 5 0       Date       Date         St. Paul       Test Number       Test Number       Date       Job #         New Baghouse       Description       TSP       Page       Page         New Baghouse       Start/Stop Time       Start/Stop Time       MATERIAL WEIGHT (g)         SST DATA       °F       Meter Box #       Implifier       MATERIAL WEIGHT (g)         In Hg       Nozzle Dia. (in)       #1       Implifier       End       Start         Tr       In Hg       Nozzle Dia. (in)       #1       Implifier       Implifier       Implifier
Gerdau AmeristeelTest MethodEPA 5 7DateSt. PaulTest Number3Job #New BaghouseDescriptionTSPJob #New BaghouseStart/Stop TimeTSPPageStrT/ATAStart/Stop TimeMATERIAL WEIGHT (g)ST DATAoFMeter Box #ImpingerIn HgNozzle Dia. (in)#1Impinger	Image: milling       Image: milling       STACK TEST DATA SHEET         St. Paul       Test Method       EPA 5 ()       Date         New Baghouse       Test Number       TSP       Date         New Baghouse       Start/Stop Time       TSP       Page         New Baghouse       Start/Stop Time       Page       Page         New Baghouse       Meter Box #       Impinger       End       Start (g)         In Hg       Nozzle Dia. (in)       #1       MATERIAL WEIGHT (g)
Gerdau AmeristeelTest MethodEPA 5 bDateSt. PaulTest Number3Job #New BaghouseDescriptionTSPPagenStart/Stop TimeTsPPageST DATA°FMeter Box #ImpingerMATERIAL WEIGHT (g)	Intrin     Inc.       St. Paul     Test Method       St. Paul     Test Number       Description     TSP       Start/Stop Time     TSP       ST DATA     °F       Meter Box #     Impinger       End     Start
Gerdau AmeristeelTest MethodEPA 5 bDateSt. PaulTest Number3Job #90226New BaghouseDescriptionTSPPage2nStart/Stop TimeStart/Stop TimeOperator	Inc.       STACK TEST DATA SHEET         Gerdau Ameristeel       Test Method         St. Paul       Test Number         New Baghouse       Description         Start/Stop Time       TSP         Test Number       Test Number         Operator       Test Number         Operator       Test Number         Test Number       Test Number         Test Number       Test Number         Test Number       Operator
Gerdau AmeristeelTest MethodEPA 5 )DateSt. PaulTest Number3Job #90226New BaghouseDescriptionTSPPage2	Inc.STACK TEST DATA SHEETGerdau AmeristeelTest MethodSt. PaulTest NumberNew BaghouseDescriptionTSPTest
Gerdau AmeristeelTest MethodEPA 5 )DateSt. PaulTest Number3Job #	Inc.       STACK TEST DATA SHEET         Gerdau Ameristeel       Test Method       EPA 5 b       Date         St. Paul       Test Number       3       Job #
Gerdau Ameristeel Test Method EPA 5 D	Gerdau Ameristeel Test Method EPA 5 D

Client FacilityGerdau Ameristeel New Baghouse LocationUnitNew Baghouse New BaghousePRE-TEST DATA Tamb Pbar Mol. WT Pstackor PfineSample TimeTime (min)or (fin H2O)Sample 71100 (fin H2O)72104 (fin H2O)73108 (fin H2O)74112 (fin H2O)74112 (fin H2O)7112112Total/Avg.112		STA	STACK TEST DAT	ST DA	<b>FA SHEET</b>	EET				
New Baghouse 1 ST DATA r r T T T T T T T T T T T T T	Test Method Test Number	EPA 5D					Date	ر چ <i>ا</i> 002264	4-05	
$\begin{array}{c c} \text{TEST DATA} \\ \text{FEST DATA} \\ \text{tor} \\ \text{wT} \\ \text{wT} \\ \text{v} \\ \text{I} \\ \text$	Description	TSP					for	- <b>3</b>		ି ପ୍ର
FEST DATA         vtor         WT         c         le         Time         1         2         100         2         108         3         108         112	aini t doné nizie		. 1				1 410			
ttor WT le Time 112 le Time del 1 100 (In 2 104 (In 3 108 112 4 112 112 112 112				han sent	MATERIAL WEIGHT (g)	AL WEIG				
tor WT le Time 112 le Time del 1 100 (In 2 104 (In 4 112 4 112 Avg. 112	°F Meter Box #			pinger	End	Start	Dif.	Leak Check	CFM	VAC. INIT
ttor WT le Time 112 le Time del (min) (In 2 104 3 108 4 112 4 112 Avg. 112	In Hg Nozzle Dia. (in)			#1				Pre-Test		
WT c Ile Time 112 le Time del (min) (In 2 104 (In 3 108 ) 4 112 ) Avg. 112 )				#2				Post-Test		
c le Time 112 le Time del (min) (In 2 104 3 108 4 112 4 112 Avg. 112				#3				Run		2
le Time 112 le Time del (min) (In 96 1 100 (I 2 104 3 108 4 112 Avg. 112 112	In H2O Meter Factor			#4				02		
le Time del (min) (In 2 104 ( 3 108 ( 4 112 ( Avg. 112 ( 112 ( 112 ( 112 ( 112 ( 112 ( 112 ( 112 ( 112 ()))))))))))))))))))))))))))))))))))	min Pitot Coeii.	-		10141		Constant of the second seco	-			
(11111) 1 100 ( 2 104 ( 3 108 ( 4 112 ( Avg. 112 ( 112 ( 1	del H (In H2O)		-		Draka	erati	Ire °F	Mot		
96 1 100 ( 2 104 3 108 4 112 4 112 112	1112O)	(acf)	(11115)	DIAUN		1 IIICI	un dun		Out	Comments/Observations
1     100     (       2     104     (       3     108     (       4     112     (       112     (     (       112     (     (							b			
4 3 3	0,00090 1,53	SC:35	L	194	249	245	S.S.	0	S	
4 3		63.4	f	And	250	246	45	l es	2	
4		36.4	jo,	210	25	056	Se Se	18		
	R	SUN-492	N	20	SS.	R	25	2	8	
				anti-anta anti-anta anti-			-			
										. W.
		2		-						
	1. A 1899						in.			
								997 	14 	
			β.				A.S			
		and the second secon					14			
						ç.				



# **VELOCITY TRAVERSE DATA SHEET**

Client Gerdau Ameristeel	Date	05	FacilitySt.Pa	<u>ul</u>
Job Number 902264	Unit	New Baghouse	Operator(s)	-/JB
LocationInlet	Fuel Type	. ·	-1	· ·
Test No.		Stack %O2	250	28
Barometric Pressure (in.Hg)	9.17	Stack %CO2	GFA	1.1
Stack Pressure (Ps) (in. H2O)	11.0	Test Description	Flow	-
Pitot Tube Coefficient (Cp)	.84			

Traver	se Point	Time	∆P (in.H2O)	Ts(°F)	Velocity (ft/sec)	Cyclonic Angle
Port	Depth		ې د د			
4	l	839	6.8	144		
	2	· · ·	1.8	1.48	<u></u>	
	3		2.1	172		
	4	9.712	2.5	175	and the second sec	
1 	5		2.3	173		
	6		2.2	185	andra 1997 - Nga	
	· unang		2.3	182		
	8		2.1	189		
V			2.3	144		
	3		2.2	166		
	3	·	2.5	173		
	4		2	174		
	5		24	178		
	6		2,3	180		
	-7		2.3	174		
	8	848	1,8	191		

Vs=85.48 CP

 $\sqrt{\frac{(T_s + 460) \Delta P}{(P_s/13.6 + P_{BAR}) M_{fg}} }$ 

 $M_{fg} = 0.440 (\% CO_2) + 0.320 (\% O_2) + 0.280 (100 - \% O_2 - \% CO_2)$ 



# VELOCITY TRAVERSE DATA SHEET

Client	Gerdau A	meristeel	_ Date 10-4-06	Facili	tySt.Paul	
Job Numbe	er <u> </u>	54	Unit	lew Baghouse Ope	rator(s) MC/JI	3
Location		· · · · · · · · · · · · · · · · · · ·				
Test No.		in.Hg) 29.	2 want		8.	
	Pressure (i		A A	ack %CO2	<u>k</u>	
	sure (Ps) (in Coefficient		<u>84</u>	est Description	0	
	Coefficient	. (CD)				
Traver	se Point	Time	∆P (in.H2O)	" Ts(°F)	Velocity (ft/sec)	Cyclonic Angle
Port	Depth	) 	·**			
¥.		192	1.9	223		·
	2_		2	243		
	3		2.0	249		
	4		2.2	260		
	5		2-0	2.63		
	1º		1.9	264		
	2		1.9	262		
	Ŕ			261		
H	İ		2.0	187		
	2		2.1	197		
Star .	2		2.2	210		
	~		2-2			
	5		2.0	214		
	6		2.1	216		
	7	· · · · · · · · · · · · · · · · · · ·	1,8	217		
V	Ś	1037	A A A A A A A A A A A A A A A A A A A	216		7
		: #	ę.			
						Š.,

Vs=85.48 Cp

√ <u>(Ts + 460)</u> △P (Ps/13.6 + Pbar) Mfg

 $M_{fg} = 0.440 (\%CO_2) + 0.320 (\%O_2) + 0.280 (100 - \%O_2 - \%CO_2)$ 



Client _	Gerdau A	meristeel	Date 0-4-05	Facili	ty <u>St.Paul</u>	
		<u>64</u>		Vew BaghouseOpe		B
Location	Inlet	·	Fuel Type			
Test No.		in.Hg) Z9	a company	ack %O2	R 19.8	
	Pressure (i		6 American	ack %CO2	<u>ə I.Y</u>	
	sure (Ps) (in Coefficient		<u> </u>	est Description	p- land	
Thot Tube	Coemeicia	(CD)				
Traver	se Point	Time	∆P (in.H2O)	Ts(°F)	Velocity (ft/sec)	Cyclonic Angle
Port	Depth					, ,
H		1534	2.1	173		
l î	2		1.9	81		
	3			187		
	4		21	183		
	5		2.0	176		
	6		1.8	171		
	7		18	169		
V	5		1.6	177		
V	l		1.9	145	1000 Carrows	
	2		2.0	155		
	3		2.2	157		
	4		2.1	156		
	5		1.6	154		
			1.9	157		
	5		2.	162		
	5	1542	1.4	160	~	
			<b>B</b>			· · · · · · · · · · · · · · · · · · ·
						7

Vs=85.48 CP

Eagle Mountain Scientific

Inc.

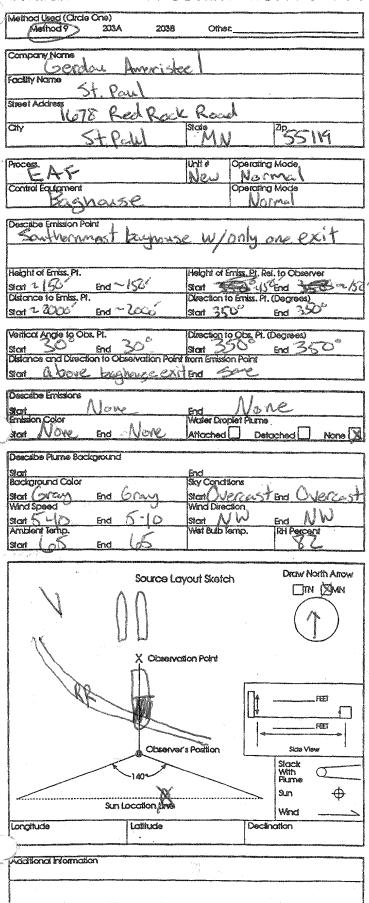
 $\sqrt{\frac{(Ts + 460) \Delta P}{(Ps/13.6 + Pbar) M_{fg}} }$ 

 $M_{fg} = 0.440 (\%CO_2) + 0.320 (\%O_2) + 0.280 (100 - \%O_2 - \%CO_2)$ 

### EPA

Form Number		3 0		POGe	l	<u> </u>	2	terren er se s	
Continued on VE	O Form Num	ber	(	502					

VISIBLE EMISSION OBSERVATION FORM 1



		~~~		C	<u> </u>				Tertwork		
Observa	tion Date		Tirge Zor	Barl	Start Time	· }	End Ti			******	
Sec	0	15	<u>(es</u> 30	tour 1			nnents	<u>10</u>			
1	6	Δ	0	$\cap$	- Filmen and Balance						I
2	Ō	ð	Õ	6		eta del Charles de Carlos de Ca	******	no <b>r 2</b> 120 Manage			7
3	0	0	0	0			-P-Taursalibido	inas-0122nn	an en de la competition de la	A La Romon	
4	0	Ò	$\bigcirc$	$\bigcirc$							
5	0	0	8	6					iman niste king		
6	0	0	0	Ò	4	1974 sector and some state	Charles and the second			ab (Princense), a	
7	0	Ó	0	6		······	<b></b>				
8	Ò	Q	0	0						2 Million	
<b>9</b>	0	O	0	$\bigcirc$		*****	CONTRACTOR OF STREET	manang si kata sa	- Discourse in pla	LATT POPULATION	_
10	Ø	0	0	0						×484	_
11	0	S	$\bigcirc$	0		5.17.494-1.0051.0057.004	MORAL CONTRACTOR			0.1000 <u>110-</u>	
12	0	0	O	6			and also as the part of the second	Managers of Parameters	aladaan geba		
13	Ø	0	0	0		an and the second second	949-00-00-00-0-0	a ang ang ang ang ang ang ang ang ang an		w	_
14	$\triangle$	0	0	0		and the second	oon an	Mark Bollow			
15	6	0	$\underline{O}$	0		leann at she water the	-	att-forma	-	774 and a 1943	ŀ
16	0	0	0	8				-		-	1
17	6	0	0	0	•					nno-Meror	
18	0	0	6	0			- TSIAN dawn	un gannie			
19	0	6	6	0		**************************************			<del>476-7-54</del>		
20	0	$\square$	0	O				-			_
21		<u> </u>	Q :	6		ov lotate@f077				din mene	Ţ
22	<u>8</u>	0	0	0		2011 B. M. & T. 40 (1) C. M.	The second s	140.49,000.444	-		
23	0	0	0	6			<u>eid</u>	8+10000-17-17	10-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-		
24	$\mathcal{O}$	0	0	<u> </u>		ť					
25	8	0	0	0				Estante e famili			
25	<u>U</u>	0	Q	0					2779144 UNA	a ana ana ana ang	
27	Q	<u>Ø</u>	$\frac{\mathcal{O}}{\mathcal{O}}$	<u> </u>	1			and the second	5	,	
28	<u> </u>	0 M	0	0			************************				_
29	0	<u>U</u>		0						/	
30	» <u>O</u>	U	0	0	· · · · ·	- -					1
Observe	ísplarna Mar	(Print)	orly	30							
l "	s Sonah	E C	ala		0	de 10-	-4-a	5			
Organiza	<u>= M:</u>	SI.									
Contrad	Jhitl	62 G	terar	3C	٥	ale 3	15 -	<u>.0</u> ,	)		
			ġ								

## EPA

## VISIBLE EMISSION OBSERVATION FORM 1

	**************************************	2038	Oine	)£	an a
Company Name	hand and the second second		A	Kalikan ang ang ang ang ang ang ang ang ang a	
Facility Name			$\vdash$		a a construction de la construction
Street Acidness				<u> </u>	
		/		/	
City	<i></i>		Stote		Zip
And a s	anna an t-				
Process			CERE &	Charcing	, woos
Control Equipment				Operating	) Mode
Describe Emission Pr	olat	an and a start to the start of		an da ana ang kanang kanan Manang kanang	n fer sen en e
Height of Emiss. Pt.	Con al	annan marana ingeresia di da	11 -	Erriss. Pt. Re	I. to Observer
Start Distance to Emiss. P	End I.	Theorem With an array is a support	Start Direction 1	lo Emilss. Pl.	End (Degrees)
Slot	End	and the second	Stort	10100000000000000000000000000000000000	Brd
Vertical Angle to Ot		internetin marriaterender		io Obs. Pi. (	Degrees)
Start Distance and Direct	End Ion to Obse	ivation Point	listant I from Emiss	on Point	End
stan	200028-000-WDF Dawson-1900	ylanaaaaa aa ahaa ahaa ahaa ahaa ahaa aha	End	$\Delta$	andormorphics (Manager Participation
Desceloe Emissions	<del>aan aan aan aan aan aan aan aan aan aan</del>	1897 Tanihanapapaté Pisternanapa	<u>}</u>	hanghamman	
Stort Embsion Color			And	plet Purne	TO THE OWNER THE TAXABLE AND A DECEMBER OF A DECEMBER
Xon	End	L	Attoched	·	ached None
		· 8 \	Sky Cond	tions .	
Start Wind Speed Start Ambient Temp.	End End	Pat	Stort Stort Stort Wet Bub	ction	End End RH Percent
Wind Speed Start		Pat	Statt Whatevis	ction	End
Wind Speed Start Amblent Temp. Start	End		Stott Windletre Stort Wet Bulb	ction femp.	End End RH Percent
Wind Speed Start Amblent Temp. Start	End	Par Source La	Stott Windletre Stort Wet Bulb	ction femp.	End
Wind Speed Start Amblent Temp. Start	End		Stott Windletre Stort Wet Bulb	ction femp.	End End RH Percent Draw North Arro
Wind Speed Start Amblent Temp. Start	End		Stott Windletre Stort Wet Bulb	ction femp.	End End RH Percent Draw North Arro
Wind Speed Start Amblent Temp. Start	End		Sign Witcletre Stort Weit Bulb	ction femp.	End End RH Percent Draw North Arro
Wind Speed Start Amblent Temp. Start	End	Source Le	Sign Witcletre Stort Weit Bulb	ction femp.	End End RH Percent Draw North Arro
Wind Speed Start Amblent Temp. Start	End	Source Le	Sign Witcletre Stort Weit Bulb	ction femp.	End End RH Percent Draw North Arro
Wind Speed Start Amblent Temp. Start	End	Source Le	Sign Witcletre Stort Weit Bulb	ction femp.	End End RH Percent Drow North Arro Drow North Arro TN MN
Wind Speed Start Amblent Temp. Start	End	Source Le	Sign Witcletre Stort Weit Bulb	ction femp.	End End RH Percent Drow North Arro Drow North Arro
Wind Speed Start Amblent Temp. Start	End	Source La	Sign Witcletre Stort Weit Bulb	ction femp.	End End RH Percent Drow North Ano ITN MN FET FET Scie View
Wind Speed Start Amblent Temp. Start	End	Source La	Stort WhickPire Stort Wet Bulb 1	ction femp.	End End RH Percent Draw North Ano ITN MN FEET FEET FRET
Wind Speed Start Amblent Temp. Start	End	Source Lor X Observa	Stort WhickPire Stort Wet Bulb 1	ction femp.	End End RH Percent Drow North Ano ITN MN FEET FEET Side Visw Stock With
Wind Speed Start Amblent Temp. Start	End End Sun Loo	X Observer	Stort WhickPire Stort Wet Bulb 1	ction femp.	End
Wind Speed Start Amblent Temp. Start	End End Sun Loo	Source Lor X Observa	Stort WhickPire Stort Wet Bulb 1	ction femp.	End End RH Percent Drow North Ano ITN MN FREI FEET Stock With Plume Sun
Wind Speed Start Amblent Temp. Start	End End Sun Loc	X Observer	Stort WhickPire Stort Wet Bulb 1	ction femp.	End

Form Nu	mbar			~10	Poge	122000760 (Marcall	a		7	Procession of the second
	1	D Form N		32		4			kananan T	
			Pizzina di Tili da sult		650		THE REAL PROPERTY.		a an	
Observa 1/1	tion Date	05		n Treal	Start Time : 1210	an a	End I	<u>mę</u> V	6	ininiaanna inina
Sec	0	15	30	45		Ca	mmente		in (Bolenne	r y (p. 5, er 26) (Para).
1	$\wedge$	0	Ø	Õ						-Thomas I wood and
2	0	0	Ø	0						in on an
3	Ø	Ø	Ô	0				10360		
4	0	0	0	0		ang				
5	6	0	0	0			tak designa talaman			Contraction
6	U	Ő	0	Q			1-01-01-01-01-01-01-01-01-01-01-01-01-01			
7	0	0.	0	Q			the second second	anadoan	ana ana ang ang ang ang ang ang ang ang	Prozent-po
8	Q	0	0	$\bigcirc$		Contraction in the local data in the				
9	0	0	6	6					Himmon	an de set transferent and
10	<u>B</u>	0	0	0						ومعالية
11		0	$\left  \begin{array}{c} 0 \\ \hat{0} \end{array} \right $	0				or and a dispersion of		
12	0	0	$\bigcirc$	6		و و ساره از مربع می مربع		NIG CONTRACTOR	Patrong turns	
13	0	6	0	6		yy, anticidaya, myyyy,		*****		II. toggapoing
14	0	0	0	0			- and a second second	00.0544-0750		10-10-10-10-10-10-10-10-10-10-10-10-10-1
15	0	0		8	-	s-of-shoorage as			a de de ser a s	Theorem and the second
16	0	0	0	$  \bigcirc$					-7-18-19-19-0	<u>.</u>
17	0	Ô	0	0	-		••••••••••••••••••••••••••••••••••••••			•••
18		0	6	G			and the state of the state of the			
19	$\frac{0}{0}$	0	$\overline{\mathbf{Q}}$	0			a a a a a a a a a a a a a a a a a a a	11903-00100-004	9.20-gionna	
20	$\frac{0}{0}$			0			ferrenzen die Konstant			
21 22	$\mathcal{Q}$	0	$ 0\rangle$	$\left  \begin{array}{c} 0 \\ 0 \end{array} \right $			nye e de References			
22		0	Q.	0		ann he fin a fin an a stara	tran teaterness			
23 24	N	0	À.	$\frac{0}{h}$			ant the second secon		Ke over dasses	
25		$\frac{0}{2}$	0	0						
26	0	0	0	Λ.			ana ya mushada (Paya)	and the second		
	8		0	$\frac{0}{2}$						
28	Ň	2	8	$\frac{U}{\Lambda}$						
29	Ň	Ň	Ъ	<u></u>						- West West and an open
30	ň	B	$\overline{\mathbb{A}}$	U ^\		ىلىتىتىيىتى <u>تەرىپۇنىيىتىتە</u>			131 Hore	
Obsanso	s Norma	(Bilot)		<u></u>	) Linux constant from the second state	0.000,000,000,000,000			ananonan	
Observer's Name (Print) Mark Can ban Observer's Signature										
Organiza	M	ank-	_Co	loo	n ľ	10	-4-	05		
	EM!	57.								

Date 3-25-05

. --

Centrod by

Whitlow

VEOF1.1

Appendix B

**Calculated Field Data Results** 

Client :	NSS	Unit:	New Baghouse	Location:	Outlet
Test # :	1	Date :	4-Oct-05	Job # :	902,264
Cp =	0.84	Noz Diam =	1.215 in.	Pbar =	29.17
Dry MW =	29.0	Ps =	-0.18 in. H2O	Yd =	0.97
Stack Area=	4914.76 sq. ft.	Condensate =	47.8 g	Ref Tmp =	68
Avg. O2 =	19.8 %	Avg. CO2 =	1.1 %		

Data	Time	Del P	Del H	Meter	Vacuum			Tempera	tures (_F	)
Point	(min)	(in. H2O)	(in. H2O)	(ACF)	(in. Hg)	Stack	Probe	Filter	Dryer	Meter In
New-0	C			32.353	5					
New-1	4	0.00103	3 1.75	35.500	5	149	246	250	58	71
New-2	8	0.00103	3 1.75	38.650	5	173	239	251	57	71
New-3	12	0.00103	3 1.75	41.800	5	189	245	251	56	72
New-4	16	0.00103	3 1.75	45.000	5	191	247	251	56	72
New-5	20	0.00103	3 1.75	48.000	5	187	248	253	58	77
New-6	24	0.00103	3 1.75	51.200	5	196	249	252	54	79
New-7	28	0.00103	3 1.75	54.400	-		248	251	55	79
New-8	32	0.00103	3 1.75	57.632	5	190	248	251	54	81
New-9	36	0.00103	3 1.75	60.900	5	153	249	252	55	82
New-10	40	0.00103	3 1.75	64.000	5	178	248	248	54	83
New-11	44	0.00103	3 1.75	67.200	5	202	247	248	55	83
New-12	48	0.00103	3 1.75	70.451	5	205	251	250	56	83
New-13	52	0.00103	3 1.75	73.200	5	205	247	250	63	82
New-14	56	0.00103	3 1.75	76.750	5	200	246	251	60	82
New-15	60	0.00103	3 1.75	80.000	5	193	251	254	57	80
New-16	64	0.00103	3 1.75	83.200			251	253	55	80
New-17	68	0.00103	3 1.75	86.500	5	159	250	246	58	80
New-18	72	0.00103	3 1.75	89.800	5	175	252	251	56	80
New-19	76	0.00103			-		250		55	80
New-20	80	0.00103	3 1.75	96.014	- 5	191	250	249	56	80
New-21	84	0.00103	-				251	248	59	80
New-22	88	0.00103	3 1.75	102.400	5	201	251	250	58	80
New-23	92	0.00103	3 1.75	105.600	5	204	252	251	56	80
New-24	96	0.00103	3 1.75	107.211	5	188	252	251	57	80
New-25	100	0.00103	3 1.75	111.950	-		248	251	62	79
New-26	104	0.00103					247		60	79
New-27	108	0.00103	3 1.75	118.400	) 5	166	249	250	57	79
New-28	112		3 1.75	121.628			-		56	79
Ave./Total	112	0.00103	3 1.75	89.275	5	184	249	250	57	79

Calculated Data and Test Results :

Sample Gas Volume =	83.116 DSCF
Water Vapor =	2.254 SCF
Moisture Content =	2.64 %
Average Stack Velocity =	2.0 ft/sec
Stack Flow =	596303 WACFM
	476528 WSCFM
	463947 DSCFM

Concentration of Species in Sampled Gas :

Mass Flow Rate of Species :

% Isokinetic =

97.6 %

Client :	NSS	Unit:	New Baghouse	Location:	Outlet
Test # :	2	Date :	4-Oct-05	Job # :	902,264
Cp =	0.84	Noz Diam =	1.215 in.	Pbar =	29.17
Dry MW =	29.0	Ps =	0.19 in. H2O	Yd =	0.97
Stack Area=	4914.76 sq. ft.	Condensate =	47.0 g	Ref Tmp =	68
Avg. O2 =	19.8 %	Avg. CO2 =	1.2 %		

Data	Time	Del P	Del H	Meter	Vacuum	า			Tempera	tures (_F	)
Point	(min)	(in. H2O)	(in. H2O)	(ACF)	(in. Hg)		Stack	Probe	Filter	Dryer	Meter In
New-0	(	)			22.007						
New-1	2	0.00084	1.42		25.000	4	149	250	250	66	80
New-2	8	0.00084	1.42		27.850	4	207	254	250	56	81
New-3	12	2 0.00084	1.42		30.600	4	213	251	255	57	82
New-4	16	6 0.0008 <sub>4</sub>	1.42		33.500	4	224	252	253	56	82
New-5	20	0.00084	1.42		36.500	4	193	251	252	55	83
New-6	24	0.00084	1.42		39.400	4	202	251	249	56	84
New-7	28	0.00084			42.300	4	195	252		56	84
New-8	32	2 0.00084	1.42		45.200	4	185	249	253	55	84
New-9	36	0.00084	1.42		48.300	4	159	244	250	59	85
New-10	40	0.00084	1.42		51.050	4	163	245	249	53	85
New-11	44	0.00084	1.42		54.000	4	161	245	249	53	85
New-12	48	0.00084	1.42		57.171	4	153	245	248	55	85
New-13	52	2 0.00084	1.42		60.100	4	147	250	248	62	85
New-14	56	6 0.0008 <sub>4</sub>	1.42		62.900	4	158	244	250	57	85
New-15	60	0.00084	1.42		66.500	4	177	248	249	55	86
New-16	64	0.00084	1.42		68.918	4	156	247	248	59	86
New-17	68	0.00084	1.42		71.200	4	158	256	251	54	86
New-18	72	2 0.00084	1.42		74.800	4	190	254	250	55	86
New-19	76	6 0.0008 <sub>4</sub>	1.42		77.550	4	199	251	250	54	86
New-20	80	0.00084	1.42		80.211	4	205	251	250	54	86
New-21	84	0.00084	1.42		83.500	4	215	252	251	58	87
New-22	88	0.00084	1.42		86.300	4	218	251	250	54	87
New-23	92	0.00084	1.42		89.400	4	224	251	250	55	87
New-24	96	0.00084	1.42		92.200	4	221	250	253	58	88
New-25	100	0.00084	1.42		95.200	4	194	249	251	58	88
New-26	104	0.00084	1.42		98.100	4	201	248	251	54	88
New-27	108	0.00084	l 1.42	! 1	101.000	4	199	248	251	54	88
New-28	112	0.00084	l 1.42	! 1	103.945	4	199	247	252	58	88
Ave./Total	112	0.00084	1.42	2	81.938	4	188	250	250	56	85

Calculated Data and Test Results :

Sample Gas Volume =	75.316 DSCF
Water Vapor =	2.216 SCF
Moisture Content =	2.86 %
Average Stack Velocity =	1.8 ft/sec
Stack Flow =	540105 WACFM
	429186 WSCFM
	416918 DSCFM

98.5 %

% Isokinetic =

Concentration of Species in Sampled Gas :

Mass Flow Rate of Species :

Client :	NSS	Unit:	New Baghouse	Location:	Outlet
Test # :	3	Date :	4-Oct-05	Job # :	902,264
Cp =	0.84	Noz Diam =	1.215 in.	Pbar =	29.17
Dry MW =	29.0	Ps =	0.30 in. H2O	Yd =	0.97
Stack Area=	4914.76 sq. ft.	Condensate =	53.8 g	Ref Tmp =	68
Avg. O2 =	19.7 %	Avg. CO2 =	1.2 %		

Data	Time	Del P	Del H	Meter	Vacuum			Tempera	tures (_F	)
Point	(min)	(in. H2O)	(in. H2O)	(ACF)	(in. Hg)	Stack	Probe	Filter	Dryer	Meter In
New-0	0			4.13 <sup>2</sup>	1					
New-1	4	0.0009	) 1.53	7.300	) 4	179	251	252	56	85
New-2	8	0.0009	9 1.53	10.150	) 4	205	252	253	52	85
New-3	12	0.0009	) 1.53	13.200	) 4	210	256	251	53	85
New-4	16	0.0009	9 1.53	16.243	3 4	209	253	247	53	85
New-5	20	0.0009	) 1.53	19.400	) 4	173	250	249	58	85
New-6	24	0.0009	9 1.53	22.400	) 4	206	251	248	57	85
New-7	28	0.0009	) 1.53	25.300	) 4	206	252	247	56	85
New-8	32	0.0009	9 1.53	28.410	) 4	207	251	248	52	85
New-9	36	0.0009	) 1.53	31.450	) 4	206	248	243	59	84
New-10	40	0.0009	9 1.53	34.500	) 4	200	247	249	56	84
New-11	44	0.0009	9 1.53	37.600	) 4	191	246	249	54	84
New-12	48	0.0009	9 1.53	41.00	1 4	203	247	250	56	84
New-13	52	0.0009	9 1.53	43.700	) 4	211	251	252	60	84
New-14	56	0.0009	9 1.53	47.100	) 4	212	250	251	52	84
New-15	60	0.0009	9 1.53	49.800	) 4	220	248	251	53	84
New-16	64	0.0009	9 1.53	52.883	3 4	225	247	250	54	84
New-17	68	0.0009	9 1.53	55.610	) 4	187	247	251	52	81
New-18	72	0.0009	9 1.53	59.100	) 4	196	248	251	56	81
New-19	76	0.0009	9 1.53	62.100	) 4	199	249	251	55	
New-20	80	0.0009	9 1.53	65.100			248	246	52	81
New-21	84	0.0009					-	-	59	81
New-22	88	0.0009	9 1.53	71.200			248	250	51	81
New-23	92	0.0009	9 1.53	74.400	) 5	5 183	245	249	53	81
New-24	96	0.0009	9 1.53	77.300	) 5	5 195	248	249	54	81
New-25	100	0.0009	9 1.53	80.350	) 4	196	249	248	53	81
New-26	104	0.0009	9 1.53	83.400			250	249	54	81
New-27	108	0.0009	1.53	86.400	) 5	5 210	251	250	56	81
New-28	112	0.0009	1.53	89.49	5 5	5 201	250	251	55	81
Ave./Total	112	0.00090	) 1.53	85.364	1 4	200	249	249	55	83

#### Calculated Data and Test Results :

Sample Gas Volume =	78.536 DSCF
Water Vapor =	2.532 SCF
Moisture Content =	3.12 %
Average Stack Velocity =	1.9 ft/sec
Stack Flow =	564616 WACFM
	439505 WSCFM
	425779 DSCFM

% Isokinetic = 100.5 %

Concentration of Species in Sampled Gas :

Mass Flow Rate of Species :

#### EPA REFERENCE METHOD 2 Determination of Stack Gas Velocity & Volumetric Flow Rate

Client	NSS		Date	10-4-05
Facility	St. Paul		Job Number	902264
Unit	New Baghouse		Operator	MC, JB
Location	Inlet Duct		Test No.	1
Bar. Press	ure (inHg)	29.17	Fuel Type	None
Stack Pres	sure (inH20)	-11	Stack % O2	19.8
Pitot Tube	Coef. (Cp)	0.84	Stack % CO2	1.1
Flue Gas N	Ioisure (%)	1.9	Area (ft2)	103.866
Stack MW	Dry	28.85	Stack MW Wet	28.52
Ref Pres (i	n.Hg)	29.92	Ref Temp _F	68

'raverse Point Port	t Depth	Time	Delta P (in.H2O)	Ts (_F)	Velocity (ft/sec)	Cyclonic (Deg.)	Flow (DSCFM)	SqRoot Delta P
	_ · <b>F</b> ····		(		()	(8.)	(= 2 = = = = )	
Н	1		1.80	144	83.26	C	421760	1.342
Н	2		1.80	148	83.53	0	420371	1.342
Н	3		2.10	172	91.99	0	445348	1.449
Н	4		2.50	175	100.60	0	484765	1.581
Н	5		2.30	173	96.34	0	465704	1.517
Н	6		2.20	182	94.89	0	452264	1.483
Н	7		2.30	182	97.03	(	462428	1.517
Н	8		2.10	189	93.22	0	439476	1.449
V	1		2.30	144	94.11	0	476753	1.517
V	2		2.20	166	93.70	0	458007	1.483
V	3		2.50	173	100.45	(	485530	1.581
V	4		2.50	174	100.52	0	485147	1.581
V	5		2.40	178	98.80	0	473853	1.549
V	6		2.30	180	96.87	(	463150	1.517
V	7		2.30	174	96.42	0	465337	1.517
V	8		1.80	191	86.43	C	406250	1.342
Averages			2.21	172	94.26	0	456634	1.485

Abs. Stack Pres.	28.36 in	.Hg Absolute		
Stack Velocity	94.25 fe	et/second		
	5655 fe	et/minute		
Stack Volumetric Flow	587369 <b>W</b>	ACFM		
	465470 <b>W</b>	SCFM		
	456626 <b>D</b>	SCFM		
	9789 <b>W</b>	ACFS		
	Area (ft2)	ft/sec	Delta P	Proof
	4914.762	2.018	0.00103	2.018
	Baghouse	H20 Pres Stack	stk Temp _F	
		0.3	180	
		29.189118	640	

#### EPA REFERENCE METHOD 2 Determination of Stack Gas Velocity & Volumetric Flow Rate

Client	NSS		Date	10-4-05
Facility	St. Paul		Job Number	902264
Unit	New Baghouse		Operator	MC, JB
Location	Inlet Duct		Test No.	2
Bar. Press	ure (inHg)	29.17	Fuel Type	None
Stack Pres	sure (inH20)	-11	Stack % O2	19.8
Pitot Tube	Coef. (Cp)	0.84	Stack % CO2	1.1
Flue Gas N	Ioisure (%)	1.9	Area (ft2)	103.866
Stack MW	Dry	28.85	Stack MW Wet	28.52
Ref Pres (i	n.Hg)	29.92	Ref Temp _F	68

raverse Poin Port	t Depth	Time	Delta P (in.H2O)	<b>Ts</b> (_ <b>F</b> )	Velocity (ft/sec)	Cyclonic (Deg.)	Flow (DSCFM)	SqRoot Delta P
v	1	10:28 AM	1.90	223	90.96	0	407488	1.378
v	2		2.10	243	97.02	0	422260	1.449
v	3		2.00	249	95.08	0	410336	1.414
v	4		2.20	260	100.49	0	427064	1.483
v	5		2.00	263	96.02	0	406344	1.414
v	6		1.90	264	93.65	0	395781	1.378
v	7		1.90	262	93.52	0	396329	1.378
v	8		1.70	261	88.40	0	375150	1.304
h	1		2.00	187	90.83	0	429547	1.414
h	2		2.10	197	93.79	0	436792	1.449
h	3		2.20	210	96.94	0	442713	1.483
h	4		2.20	222	97.81	0	438801	1.483
h	5		2.00	214	92.70	0	420856	1.414
h	6		2.10	216	95.14	0	430610	1.449
h	7		1.80	217	88.14	0	398373	1.342
h	8	10:37 AM	1.70	216	85.60	0	387435	1.304
Averages			1.99	232	93.50	C	414117	1.409
Abs. Stack P Stack Veloci		93.53	in.Hg Absolu feet/second feet/minute	te				
Stack Volun	netric Flow	421879 413864	WACFM WSCFM DSCFM WACFS					

Area (ft2)	ft/sec	Delta P	Proof
4914.762	1.829	0.00084	1.829
Baghouse	H20 Pres Stack	Stk Temp _F	
	0.3	180	
	29.189118	640	

#### EPA REFERENCE METHOD 2 Determination of Stack Gas Velocity & Volumetric Flow Rate

Client	NSS		Date	10-4-05
Facility	St. Paul		Job Number	902264
Unit	New Baghouse		Operator	MC, JB
Location	Inlet Duct		Test No.	3
Bar. Press	ure (inHg)	29.17	Fuel Type	None
Stack Pres	sure (inH20)	-11	Stack % O2	19.8
Pitot Tube	Coef. (Cp)	0.84	Stack % CO2	1.1
Flue Gas N	Ioisure (%)	1.9	Area (ft2)	103.866
Stack MW	Dry	28.85	Stack MW Wet	28.52
Ref Pres (i	n.Hg)	29.92	Ref Temp _F	68

'raverse Point Port	Depth	Time	Delta P (in.H2O)	Ts (_F)	Velocity (ft/sec)	Cyclonic (Deg.)	Flow (DSCFM)	SqRoot Delta P
V	1	3:34 PM	2.10	173	92.06	0	444996	1.449
v	2		1.90	181	88.12	0	420626	1.378
V	3		2.20	187	95.26	0	450513	1.483
v	4		2.10	183	92.78	0	441522	1.449
v	5		2.00	176	90.05	0	433246	1.414
V	6		1.80	171	85.10	0	412638	1.342
V	7		1.80	169	84.96	0	413294	1.342
V	8		1.60	177	80.61	0	387203	1.265
h	1		1.90	145	85.61	0	432959	1.378
h	2		2.00	155	88.55	0	440581	1.414
h	3		2.20	157	93.03	0	461335	1.483
h	4		2.10	156	90.82	0	451094	1.449
h	5		1.60	154	79.14	0	394388	1.265
h	6		1.90	157	86.45	0	428728	1.378
h	7		2.10	162	91.26	0	448913	1.449
h	8	3:42 PM	1.40	160	74.39	0	367127	1.183
Averages			1.92	166	87.39	0	426823	1.383
Abs. Stack Pr Stack Velocity		87.38	in.Hg Absolu feet/second foot/minuto	te				

Stack Velocity	87.38 fee	et/second		
	5243 fee	et/minute		
Stack Volumetric Flow	544559 <b>W</b>	ACFM		
	435075 W	SCFM		
	426808 <b>D</b> S	SCFM		
	9076 W	ACFS		
	Area (ft2)	ft/sec	Delta P	Proof
	4914.762	1.887	0.00090	1.887
	Baghouse	H20 Pres Stack	Stk Temp _F	
		0.3	180	
		29.189118	640	

#### **METHOD 9 REDUCED FIELD DATA**

Client:	Gerdau Ameristeel		
Facility:	St. Paul		
Unit:	New Baghouse		
Location:	Baghouse vents		

#### **Test Results:**

Maximum 6 Minute Average:	0.0 %
Average Opacity:	0.0 %
Maximum Opacity:	0.0 %
Minimum Opacity:	0.0 %
# of Readings $> 20\%$ :	0
Number of Readings:	240

Interval	0	15	30	45
1	0	0	0	0
2	0	0	0	0
3	0	0	0	0
4	0	0	0	0
5	0	0	0	0
6	0	0	0	0
7	0	0	0	0
8	0	0	0	0
9	0	0	0	0
10	0	0	0	0
11	0	0	0	0
12	0	0	0	0
13	0	0	0	0
14	0	0	0	0
15	0	0	0	0
16	0	0	0	0
17	0	0	0	0
18	0	0	0	0
19	0	0	0	0
20	0	0	0	0
21	0	0	0	0
22	0	0	0	0
23	0	0	0	0
24	0	0	0	0
25	0	0	0	0
26	0	0	0	0
27	0	0	0	0
28	0	0	0	0
29	0	0	0	0
30	0	0	0	0

Date:	10-4-05
Time:	11:40-12:40
Project #:	902264
Comments:	

Interval	0	15	30	45
31	0	0	0	0
32	0	0	0	0
33	0	0	0	0
34	0	0	0	0
35	0	0	0	0
36	0	0	0	0
37	0	0	0	0
38	0	0	0	0
39	0	0	0	0
40	0	0	0	0
41	0	0	0	0
42	0	0	0	0
43	0	0	0	0
44	0	0	0	0
45	0	0	0	0
46	0	0	0	0
47	0	0	0	0
48	0	0	0	0
49	0	0	0	0
50	0	0	0	0
51	0	0	0	0
52	0	0	0	0
53	0	0	0	0
54	0	0	0	0
55	0	0	0	0
56	0	0	0	0
57	0	0	0	0
58	0	0	0	0
59	0	0	0	0
60	0	0	0	0

Appendix C

**Process Operations Data** 

												Form S
		<b>^</b>		<b></b>	~				$\sim$			
		Inor	ating	llata	Summ	10 MAZ	INP P	VACA		NI KOA	C	
	$\simeq$	Upu	aung	Data	Junn	IALV I		IUUU	33 NU	JUILE	3	
		L	0	a ann an a					경영경영영영		17	
Po	lution		a Pollution (					1990 - State Sola			승규가 지난 것이	
	adion	Minnesots	a Pollution (	Control Age	nev							
		TURNER		~~~~~~~~								(10) The COMPLEMENT CONTRACTOR

520 Lafayette Rd. N. Saint Paul, MN 55155-4194 (651)-296-6300

Tes Co	Cest Date(s): 10-4-05 Company Name: <u>Gerdan Amerisfeel</u> Process Equipment Number/Identification: <u>E</u>	P-00 Z
Eq 1. 2.		f no, explain:
3.	. Include copy of production records or instrumentation which indicates rate of production or operation of units per hour, pounds per hour, pressure, air flow, etc.	f the equipment, i.e.

- 4. Date(s) and procedure(s) of last maintenance/cleaning within 6 months: 🗌 Remains unchanged from info. provided in test plan <u>Rentire</u> <u>Maintenance</u> 5. Process rate (amount of raw material or finished product per hour, wet or dry basis) while combusting (list fuel type(s) and
- ratios as appropriate)

Process Parameter: list type and units	Run 1	Run 2	Run 3
Steel (Tons/hr)	98.0	106.6	92.3
Fuel Input (list units)	NA	NA	NA
Heat Input (10 <sup>6</sup> British thermal units/hour)	ŃÀ	NA	NA

6. Summarize control equipment operating data documented during testing. Values reported should reflect maximum, minimum, averages, or as approved in the test plan. (See test plan and approval letter)

Examples of A	PC equipment and parameter	ers generally m	onitored. Monito	or as in test plan and/or a	pproval letter.
	type of scrubber): $\Delta P$ (in. w.c.) a			aghouse, Cyclone, and Mul	ti-clone: ΔP (in. w.c.)
Catalytic Incin	erator :(°F <sub>in</sub> , °F <sub>out</sub> ) and Therm	al Incinerator: (	°F <sub>temperature</sub> ) • Et	SP: Number and identity of a	operating field(s)
	meter monitored		Run 1	Run 2	Run 3
D217P	Average Throughout	- Bayhouse	5.46	4.53	4.24
		le d			
List pollutant &	& averaging basisshould r	eflect permit	Run 1	Run 1	Run 1
Continuous Op	acity Monitor(list hourly av	erage)			
Monitor	(list averaging basis):				
Monitor	(list averaging basis:				
Abbreviations:	APC-air pollution control lbspounds	gpmgallons psig-pressure	per minute per square inch gau		s of water column drop

Note: This form provides only a summary of the operating conditions during the performance test. Additional and more detailed records are required to meet the requirements of Minn. R. 7017.2035, subp. 3. This form is to be submitted as part of the performance test report.

Control

Agency

Γ-05

12/01/04

Douglas Stolowski Environmental Manager 1678 Red Rock Road St. Paul, MN 55119 p. 651.731.5697 f. 651.731.5699 m. 214.334.5498

----Original Message----From: Brian Durkop [mailto:bwdurkop@tds.net] Sent: Sunday, November 13, 2005 10:02 PM To: Stolowski, Douglas Subject: RE: meltshop heat #'s

Doug,

I am trying to get this report finalized but cannot understand the process data you sent.

Maybe you could calculate what I need for each run.

Thanks

10-4-05	Run 1	Run 2	Run 3
New Baghouse	1013-1248	1509-1722	1744-2004
Steel tons/hr 6:03 # of Heats Amps Fan 1 0 Amps Fan 2 170 Amps Fan 3 171	a.m. 98 0 163 163	100.6 0 183 181 12:56 (Time)	92.3 0 160 158
Delta P #1 8.11	6.25	5.61	
Delta P #2 3.62	3.6	3.61	
Delta P #3 5.24	4.74	4.62	
Delta P #4 cleaning	3.7	4.06	
Delta P #5 5.65	4.96	4.3	
Delta P #6 5.99	5.1	4.44	
Delta P #7 4.14	3.37	3.05	
Avg. 5.46	4.53	4.24	

Please provide information about any maintanence done to the Amerex Baghouse in the last 6 months for the report

10-4-05 Old Baghouse Steel tons/hr	Run 1 957-1206		Run 2 1245~1553	Run 3 1615-1910 100.6
# of Heats	98	95.	/	100.0
Time	6:03 a.m.	Time 6:59 a.m.	12:55 p.m.	
Amps Fan 1	110	110 109		
Amps Fan 2	110	110 104		
	4 50	3.93 3.7	1	
Delta P #1	4.50			
Delta P #2	4.00			
Delta P #3	4.00	3.94 3.7		
Delta P #4	4.00	3.18 2.9		
Delta P #5	4.00	4.08 4.0	)2	
Delta P #6	4.00	3.78 3.5	6	
Delta P #7	4.00	3.82 3.	1	
Delta P #8	4.00	3.40 3.2	2	
			2	

Delta P #9	3.50	3.80	3.67
Delta P #10	4.00	3.30	3.05
Delta P #11	4.00	3.93	3.59
Delta P #12	4.00	3.65	3.21
Avg.	4.00	3.69	3.47

Please provide information about any maintanence done to the Amerex Baghouse in the last 6 months for the report

----Original Message----From: Stolowski, Douglas [mailto:DStolowski@GerdauAmeriSteel.com] Sent: Tuesday, November 01, 2005 4:39 PM To: Brian Durkop Subject: meltshop heat #'s

Brian-Attached are the meltshop heat #'s.

Please let me know if you have any questions.

Douglas Stolowski Environmental Manager 1678 Red Rock Road St. Paul, MN 55119 p. 651.731.5697 f. 651.731.5699 m. 214.334.5498 Appendix D

Laboratory Test Analyses

### **Determination of Particulate Emissions from Stationary Sources**

Client	North Star Ste	el	Analyst	MAC	
Facility	St. Paul		Job Number	902264	
Unit	New Baghouse		Description	Particulate	5
Location	Stack				
TEST 1		Time	10:13-12:48	Date	10/4/2005
Filterable	Net Gain		<u>2.7</u> mg	19.80	% Oxygen
Condensa	ble Net Gain		<u>5.0</u> mg	NA	F-factor
•	as Volume		83.116 dscf		
	umetric Flow		463947 dscfm		
	e Concentration			NA	lbs/mmBtu
Particulat	e Concentration	1		0.093	mg/dscf
	e Emission Rate				lbs/hr
	e Concentration	-			gr/dscf
	e Concentration				gr/dscf @7% Oxygen
Total Part	ticulate Gain (m	ng)		7.70	mg
TEST 2		Time	15:09-17:22	Date	10/4/2005
Filterable	Net Gain		<u>5.4</u> mg	19.80	% Oxygen
Condensa	ble Net Gain		<u>8.4</u> mg	NA	F-factor
Sample G	as Volume		75.316 dscf		
Stack Volu	umetric Flow		416918 dscfm		
Particulat	e Concentration	ı		NA	lbs/mmBtu
Particulat	e Concentration	ı		0.183	mg/dscf
Particulat	e Emission Rate	e		10.103	lbs/hr
Particulat	e Concentration	ı		0.003	gr/dscf
Particulat	e Concentration	ı		0.036	gr/dscf @7% Oxygen
Total Part	ticulate Gain (m	ng)		13.80	mg
TEST 3		Time	17:44-20:04	Date	10/4/2005
Filterable			<u>0.0</u> mg		% Oxygen
	ble Net Gain		<u>2.3</u> mg	NA	F-factor
•	as Volume		78.536 dscf		
	umetric Flow		425779 dscfm		
	e Concentration			NA	lbs/mmBtu
	e Concentration				mg/dscf
	e Emission Rate				lbs/hr
	e Concentration				gr/dscf
	e Concentration				gr/dscf @7% Oxygen
Total Part	ticulate Gain (m	6/		2.30	mg
DEGENE -	AVERAGE TE	-		<b>N7</b> A	11 / D/
		1		NA	lbs/mmBtu
Particulat	e Concentration			A 4 6 4	/1 0
Particulat Particulat	e Concentration				mg/dscf
Particulat Particulat Particulat		e		5.812	mg/dscf lbs/hr gr/dscf

### Determination of Particulate Emissions from Stationary Sources

Filterable Emissions

Client	North Star Ste	el	Analyst	MAC	
Facility	St. Paul		Job Number	r 902264	
Unit	New Baghouse	e	Description	Particula	ites
Location	Stack				
TEST 1		Time	10:13-12:48	Date	10/4/2005
Filter Net	Gain		<u>0.0</u> mg	19.	80 % Oxygen
Probe Rin	se Net Gain		<u>2.7</u> mg	NA	F-factor
Sample G	as Volume		83.116 dscf		
Stack Volu	umetric Flow		463947 dscfm		
Particulat	e Concentratio	n		NA	lbs/mmBtu
Particulat	e Concentration	n		0.0	32 mg/dscf
Particulat	e Emission Rat	e		1.9	93 lbs/hr
Particulat	e Concentration	n		0.0	01 gr/dscf
Particulat	e Concentration	n		0.0	06 gr/dscf @7% Oxygen
TEST 2		Time	15:09-17:22	Date	10/4/2005
Filter Net	Gain	1	0.0 mg		80 % Oxygen
	se Net Gain		5.4 mg	NA	F-factor
	as Volume		75.316 dscf	1111	
	umetric Flow		416918 dscfm		
	e Concentration	n	410/18 usefili	NA	lbs/mmBtu
	e Concentration				72 mg/dscf
	e Emission Rat				53 lbs/hr
	e Concentration				
	e Concentration				01 gr/dscf
rarticulat	e Concentration	0		0.0	14 gr/dscf @7% Oxygen
TEST 3		Time	17:44-20:04	Date	10/4/2005
Filter Net	Gain		<u>0.0</u> mg	19.	70 % Oxygen
Probe Rin	se Net Gain		0.0 mg	NA	F-factor
Sample G	as Volume		78.536 dscf		
Stack Volu	umetric Flow		425779 dscfm		
Particulat	e Concentration	n		NA	lbs/mmBtu
Particulat	e Concentratio	n		0.0	00 mg/dscf
Particulat	e Emission Rat	e		0.0	00 lbs/hr
Particulate Concentration				0.0	00 gr/dscf
Particulat	e Concentratio	n		0.0	00 gr/dscf @7% Oxygen
RESULT	AVERAGE TE	ST 1-3			
	e Concentration	-		NA	lbs/mmBtu
	e Concentration				35 mg/dscf
	e Emission Rat				82 lbs/hr
	e Concentration				01 gr/dscf
arucuidt	e Concentration				01 gr/dscf @7% Oxygen

### Determination of Particulate Emissions from Stationary Sources

Aqueous Condensable Emissions

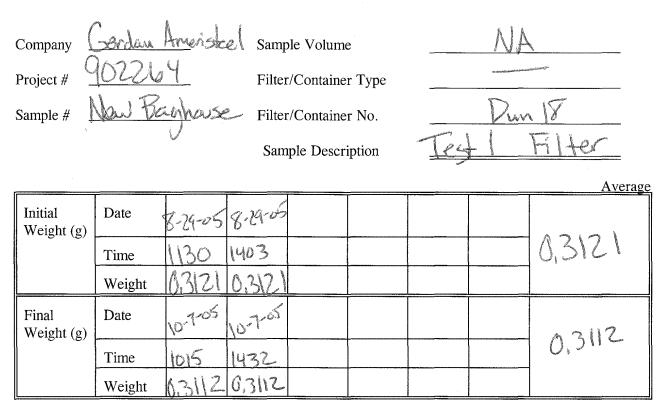
Aqu	eous Condensable Emis	ssions
Client North Star Steel	Analyst	MAC
Facility St. Paul	Job Number	902264
Unit New Baghouse	Description	Particulates
Location Stack		
TEST 1 Time	10:13-12:48	Date 10/4/2005
Dried Sample Net Gain	5.0 mg	19.80 % Oxygen
Aqueous Net Gain (H20)	5.0 mg	NA Sulfates (mg/ml)
Sample Gas Volume	83.116 dscf	NA Impinger Volume (ml)
Stack Volumetric Flow	463947 dscfm	NA Sulfate Aliquot Vol (ml)
		NA F-factor
Particulate Concentration		NA lbs/mmBtu
Particulate Concentration		0.060 mg/dscf
Particulate Emission Rate		3.691 lbs/hr
Particulate Concentration		0.001 gr/dscf
Particulate Concentration		0.012 gr/dscf @7% Oxygen
TEST 2 Time	15:09-17:22	Date 10/4/2005
Dried Sample Net Gain	<u>8.4</u> mg	<u>19.80</u> % Oxygen
Aqueous Net Gain (H20)	<u>8.4</u> mg	NA Sulfates (mg/ml)
Sample Gas Volume	75.316 dscf	NA Impinger Volume (ml)
Stack Volumetric Flow	416918 dscfm	NA Sulfate Aliquot Vol (ml)
		NA F-factor
Particulate Concentration		NA lbs/mmBtu
Particulate Concentration		0.112 mg/dscf
Particulate Emission Rate		<u>6.150</u> lbs/hr
Particulate Concentration		0.002 gr/dscf
Particulate Concentration		0.022 gr/dscf @7% Oxygen
TEST 3 Time	17:44-20:04	Date 10/4/2005
Dried Sample Net Gain	2.3 mg	19.70 % Oxygen
Aqueous Net Gain (H20)	2.3 mg	NA Sulfates (mg/ml)
Sample Gas Volume	78.536 dscf	NA         Impinger Volume (ml)
Stack Volumetric Flow	425779 dscfm	NA         Sulfate Aliquot Vol (ml)
Stack volumetric 110w	<u>423777</u> usem	NA F-factor
Particulate Concentration		NA lbs/mmBtu
Particulate Concentration		0.029 mg/dscf
Particulate Emission Rate		1.649 lbs/hr
Particulate Concentration		0.000 gr/dscf
Particulate Concentration		0.005 gr/dscf @7% Oxygen
		0
RESULT AVERAGE TEST 1-3		
Particulate Concentration		NTA II / Thi
		NA lbs/mmBtu
Particulate Concentration		0.067 mg/dscf
Particulate Concentration Particulate Emission Rate		0.067 mg/dscf 3.830 lbs/hr
Particulate Concentration		0.067 mg/dscf

**Determination of Particulate Emissions from Stationary Sources** 

**Organic Condensable Emissions** 

Client Nor	th Star Steel	Analyst	MAC	
Facility St.	Paul	Job Number	902264	
Unit Nev	v Baghouse	Description	Particulates	S
Location Sta	:k			
TEST 1	Time	10:13-12:48	Date	10/4/2005
Organic Net G	ain (Solvent)	0.0 mg	19.80	% Oxygen
Sample Gas V	olume	83.116 dscf	NA	F-factor
Stack Volume	ric Flow	463947 dscfm		-
Particulate Co	ncentration		NA	lbs/mmBtu
Particulate Co	ncentration		0.0000	mg/dscf
Particulate En	nission Rate		0.0000	lbs/hr
Particulate Co	ncentration		0.00000	gr/dscf
Particulate Co	ncentration		0.00000	gr/dscf @7% Oxygen
TEST 2	Time	15:09-17:22	Date	10/4/2005
Organic Net G	ain (Solvent)	<u>0.0</u> mg	19.80	% Oxygen
Sample Gas V	olume	75.316 dscf	NA	F-factor
Stack Volume	ric Flow	416918 dscfm		-
Particulate Co	ncentration		NA	lbs/mmBtu
Particulate Co	ncentration		0.0000	mg/dscf
Particulate En	nission Rate		0.0000	lbs/hr
Particulate Co	ncentration		0.00000	gr/dscf
Particulate Co	ncentration		0.00000	gr/dscf @7% Oxygen
TEST 3	Time	17:44-20:04	Date	10/4/2005
Organic Net G	ain (Solvent)	<u>0.0</u> mg	19.70	% Oxygen
Sample Gas V	olume	78.536 dscf	NA	F-factor
Stack Volume	ric Flow	425779 dscfm		
Particulate Co	ncentration		NA	lbs/mmBtu
Particulate Co	ncentration		0.0000	mg/dscf
Particulate En	nission Rate		0.0000	lbs/hr
Particulate Co	ncentration		0.00000	gr/dscf
Particulate Co	ncentration		0.00000	gr/dscf @7% Oxygen
	CRAGE TEST 1-3			
Particulate Co			NA	lbs/mmBtu
Particulate Co				mg/dscf
Particulate En			0.0000	
Particulate Co			0.00000	0
Particulate Co	ncentration		0.00000	gr/dscf @7% Oxygen





Weight Gain (mg)

Blank Correction

Aliquot Correction

Particulate Weight (mg)

0, 0

0,9



GOLL

Gerdan Ameristeel

### PARTICULATE WEIGHT ANALYSIS

Company

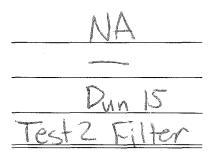
Sample Volume

Project #

Sample #

Filter/Container Type Bachouse Filter/Container No.

Sample Description



Initial Date 8-29-05/1.29-05 Weight (g) 6.3114 1124 1407 Time 0.3114 6.315 Weight 10-7-05 10-7-05 Final Date Weight (g) 0,3086 1614 1431 Time Weight 0,2088 0.3083

Weight Gain (mg)

Blank Correction

Aliquot Correction

Particulate Weight (mg)

(), ()

8

-7

 Analyst
 :\_\_\_\_\_\_

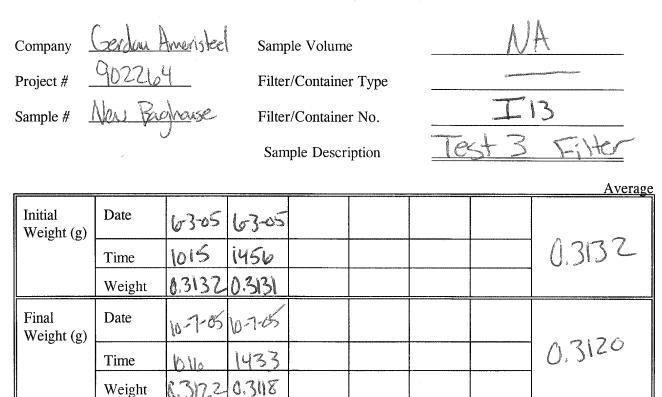
 Approved by
 :\_\_\_\_\_\_

 Method
 :\_\_\_\_\_\_

 Date
 :\_\_\_\_\_\_

Average





Weight Gain (mg)

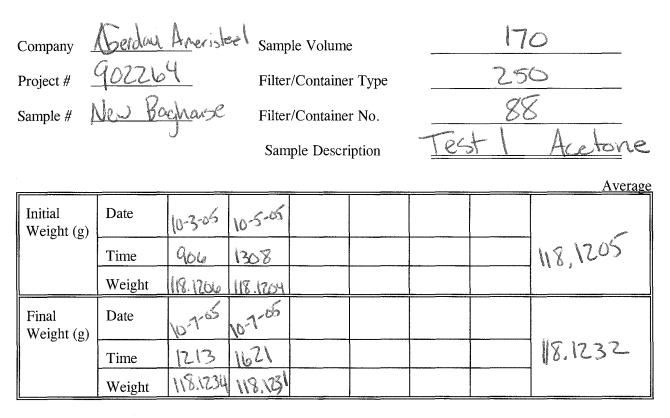
Blank Correction

Aliquot Correction

Particulate Weight (mg)

2





Weight Gain (mg)

2.7

Blank Correction

Aliquot Correction

Particulate Weight (mg)

2.7

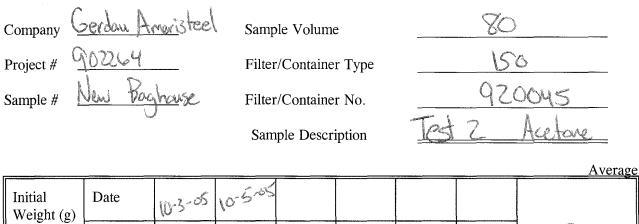
 Analyst
 :\_\_\_\_\_\_

 Approved by
 :\_\_\_\_\_\_

 Method
 :\_\_\_\_\_\_

 Date
 :\_\_\_\_\_\_





Weight (g)		10 -	9			
	Time	916	1316	 	 	68.8942
	Weight	68.8944	683940			
Final Weight (g)	Date	10-7-05	10-7-05			10000
8 (8)	Time	1154	1621			68.8996
	Weight	68,8998	68.8493			

Weight Gain (mg)

5.4

Blank Correction

Aliquot Correction

Particulate Weight (mg)

5.4

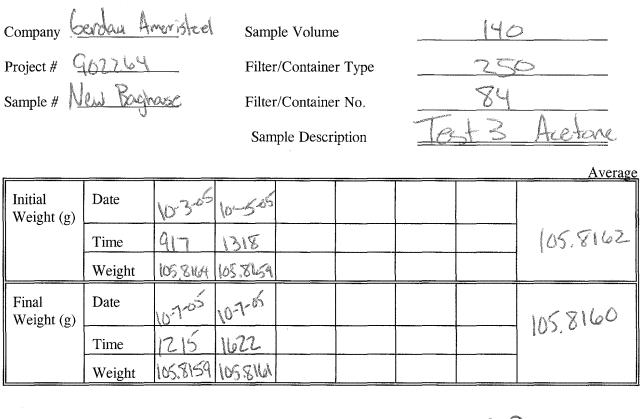
 Analyst
 :\_\_\_\_\_\_

 Approved by
 :\_\_\_\_\_\_

 Method
 :\_\_\_\_\_\_

 Date
 :\_\_\_\_\_\_





Weight Gain (mg)

- 0.2

Blank Correction

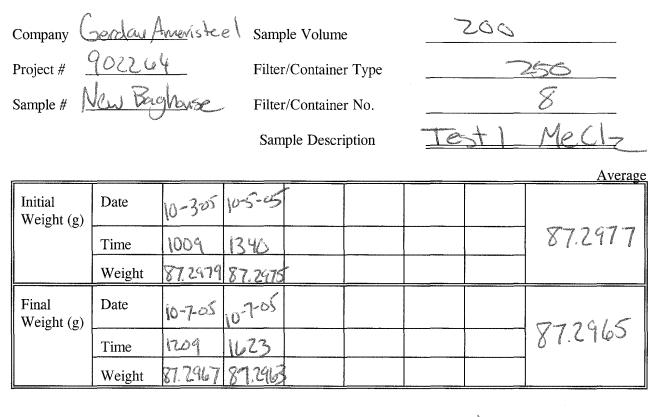
Aliquot Correction

Particulate Weight (mg)

0.0

Analyst	• •
Approved by	:
Method	•
Date	





Weight Gain (mg)

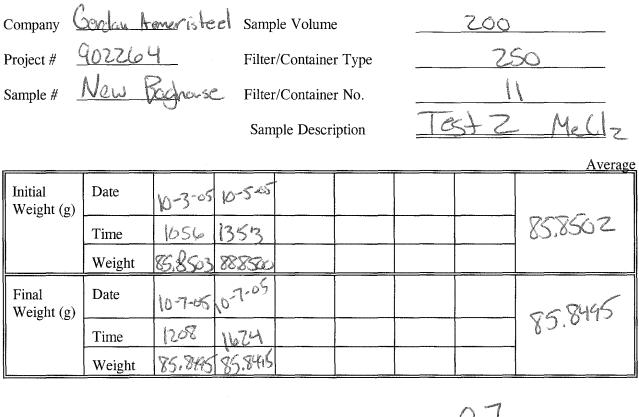
Blank Correction

Aliquot Correction

Particulate Weight (mg)

0.0





Weight Gain (mg)

- 0.7

Blank Correction

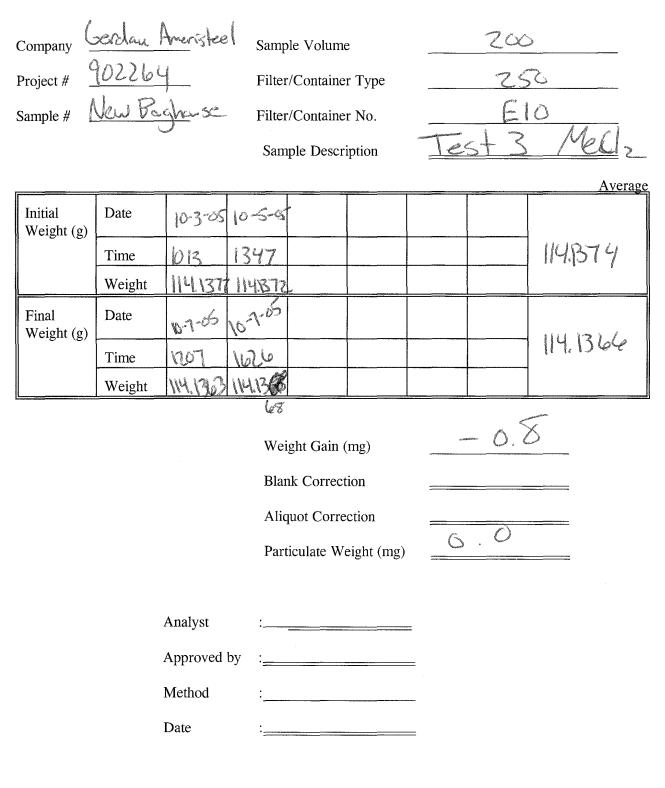
Aliquot Correction

Particulate Weight (mg)

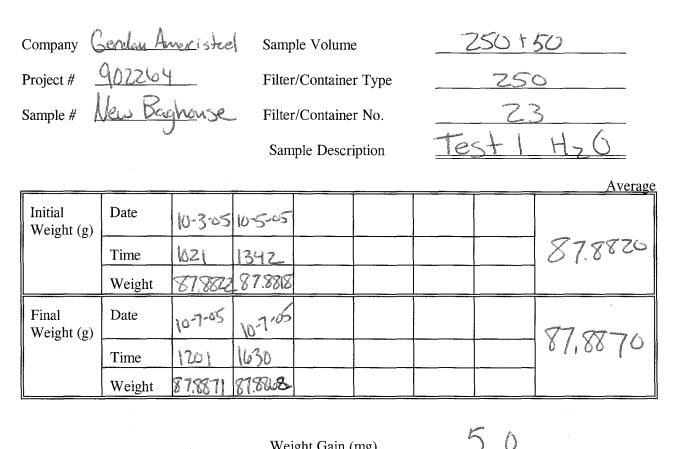
0.0

Analyst	•
Approved by	•
Method	:
Date	









Weight Gain (mg)

Blank Correction

Aliquot Correction

Particulate Weight (mg)

()

Analyst Approved by Method Date



Company

Project #

Sample #

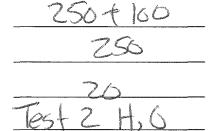
<u>Gerdan Ameristel</u> <u>902264</u> <u>New Bagharse</u>

Sample Volume

Filter/Container Type

Filter/Container No.

Sample Description



<u>Average</u> Initial Date 10-3-05 0-5-05 Weight (g) 86.7394 1834 1348 Time Weight 867398 86,7394 Final Date 10-7-05 10-7-05 86.7480 Weight (g) 1205 1637 Time 86.7478 86.7481 Weight

Weight Gain (mg)

8

Blank Correction

Aliquot Correction

Particulate Weight (mg)

74

 Analyst
 :\_\_\_\_\_\_

 Approved by
 :\_\_\_\_\_\_

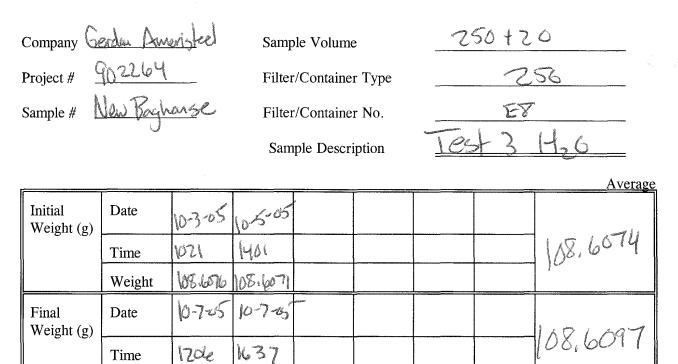
 Method
 :\_\_\_\_\_\_

 Date
 :\_\_\_\_\_\_



Weight

### PARTICULATE WEIGHT ANALYSIS



Weight Gain (mg)

108,6098

108.6096

Lan .

Blank Correction

Aliquot Correction

Particulate Weight (mg)

Analyst	:
Approved by	•
Method	:
Date	•

Appendix E

**Equipment Calibrations** 

EMSI

Dry Gas Mete Pump #: Bp: Date:	er #:	2010-5 2010-5 29.03 8/25/2005	5	Ref. Co Standa	nce Std.: orrection: ard Temp.: ard Pres.:	1	Standard .000 68 9.92						
		Reference	e Std. Data		-						Field Dry	Gas Met	
Final	Initial	Total	Initial	Meter Initial	Temperatur Final	es Final	Delt	2	Final	Initial	Total	Initial	N Ir
	Volume	Volume	Inlet	Outlet	Inlet	Outlet		a	Volume	Volume	Volume	Inlet	C
495.010	486.251	8.759	9 6	8	68	69	68	1.00	14.184	5.075	9.109	)	70
503.777	495.010	8.767	' 6	9	69	70	69	1.00	23.322	14.184	9.138	5	72

503.777	495.010	8.767	69	69	70	69	1.00	23.322	14.184	9.138	72	70	73	71	15
510.952	503.777	7.175	70	69	70	70	1.50	30.765	23.322	7.443	73	71	75	72	10
518.118	510.952	7.166	71	70	71	70	1.50	38.207	30.765	7.442	76	72	76	73	10
526.478	518.118	8.360	71	70	71	70	2.00	46.865	38.207	8.658	75	73	76	73	10
535.089	526.478	8.611	71	70	71	70	2.00	55.774	46.865	8.909	75	74	76	74	10.3
544.414	535.089	9.325	71	70	72	70	2.50	65.394	55.774	9.620	76	74	77	74	10
553.718	544.414	9.304	72	70	72	70	2.50	74.902	65.394	9.508	76	75	77	75	10

Meter Temperatures

70

Final

Inlet

Final

71

Outlet

Run

70

Times

15

Initial

Outlet

Dry Gas Meter Calibrations Dry Gas Meter #: 2010-5 Reference Std.: Gold Standard Pump #: 2010-5 Ref. Correction: 1.0047 Bp: Standard Temp.: 29.03 68 8/25/2005 Standard Pres.: 29.92 Date: Delta Run Yd Error Delta Error Н +/-0.20 Times +/-0.02 Н@ 0.963 0.01 -0.01 1.00 15.00 1.61 1.00 15.00 0.961 0.01 1.61 -0.01 10.00 0.966 0.00 1.60 0.00 1.50 1.50 10.00 0.966 0.00 1.61 -0.01 2.00 10.00 0.968 0.00 1.57 0.01 2.00 0.970 10.30 0.00 1.57 0.01 2.50 10.00 0.972 0.00 1.58 0.01 2.50 0.981 1.59 0.00 10.00 -0.01 Average 0.968 0.00 1.592 0.00



## Whitlow Enterprises, LLC

www.smokeschool.net Certifies that

# Mark Carlson of Eagle Mountain Scientific Inc.

Has met all of the requirements of EPA Reference Method 9 and 22 This certificate is valid for 6 months after the above date And is qualified as a Visible Emissions Observer Date: March 25, 2005

George Artie "Butch" Whitlow

Certificate Number 923

Appendix F

Test Plan and Approval Letter



## **Performance Test Plan Approval**

Minnesota Pollution Control Agency 520 Lafayette Rd. N. Saint Paul, MN 55155-4194 (651) 296-6300 www.pca.state.mn.us

AQ#151

<ul> <li>Yacility Name: Gerdau Ameristeel St. Paul Mill</li> <li>Yacility Contact: Douglas Stolowski</li> <li>Address: 1678 Red Rock Road</li> <li>St. Paul, Minnesota 55119</li> <li>Phone: (651) 731-5697</li> <li>Comission Unit(s): Ladle Refining Station (EU001) and Electric Arc Furnace (EU002)</li> <li>Scheduled For: October 4, 2005, at your Facility located in St. Paul, Minnesota.</li> </ul>						
Your test plan submitted on August 29, 2005, and discussed on September 27, 2005, has been approved by the Minnesota Pollution Control Agency (MPCA) as follows:						
Shortened test notification approved						
Test plan approved without modification						
Test plan approved with the following provisions:						
<ul> <li>Particulate matter and PM<sub>10</sub> emissions measured by Method 5D and opacity determined using Method 9.</li> <li>Include in the final test report(s) all process and pollution control equipment operating data collected at 15 minute intervals and averaged for each test period. This information should be easily understood by individuals not familiar with the process.</li> <li>Include in the final test report and CD-ROM copy; a signed certifications form, the test plan, this test plan approval letter (TPAL) and the email to which the TPAL was attached.</li> <li>Include in the final test report a simplified drawing of the test locations including pollution control equipment, stack orientation and test port locations.</li> <li>Obtain the required submittal and operating data forms from the website noted below.</li> </ul>						
Attached Forms:						
<ul> <li>Operating Data Summary- Combustion Sources</li> <li>Operating Data Summary- Process Sources</li> <li>Operating Data Summary- Process Sources</li> <li>Operating Data Summary- Asphalt Plants</li> <li>Microfiche/CD-ROM Submittal Form</li> </ul>						

Note: Forms are also available at: www.pca.state.mn.us/air/performancetest.html

Approved by: Cut HE

Curtis Stock Performance Test Coordinator Compliance and Enforcement Section Industrial Division Date: 9/27/05

### **Mark Carlson**

From: Sent: To: Subject: Brian Durkop [bdurkop@eagle-msi.com] Friday, October 14, 2005 8:11 AM Mark Carlson FW: TPAL for Gerdau Ameristeel



TPAL for Gerdau Ameristeel Oct...

-----Original Message-----From: Stock, Curtis [mailto:Curtis.Stock@state.mn.us] Sent: Tuesday, September 27, 2005 4:13 PM To: bdurkop@eagle-msi.com Cc: Berg, Robert C. Subject: TPAL for Gerdau Ameristeel

Brian,

Attached is the test plan approval letter (TPAL) for the  $\rm PM/PM10$  testing to be performed at the Gerdau Ameristeel facility located in St. Paul, Minnesota.

Please include a copy of the test plan, TPAL and this email in the final test report.

Please forward a copy to Douglas Stolowski at Gerdau Ameristeel.

Contact me if you have any questions.

Curt Stock Performance Test Coordinator Minnesota Pollution Control Agency 520 Lafayette Road St. Paul, MN 55155-4194

(651) 297-8480 (651) 296-8717 (fax)

### Please contact me at (651) 297-8480 if you have any questions regarding this approval.

Please be aware that enforcement action will be taken for performance test failures indicating emissions above applicable limits (excess actual emissions to the environment). Failures commonly result in assessment of a monetary penalty. Upon the first test failure, the Company should take immediate measures to minimize emissions. The measures taken should be documented, as they will become part of the record of corrective actions.

Hard Copy Performance Test Reports and Microfiche or CD Copy submittals will be addressed to: Compliance Tracking Coordinator, Compliance and Enforcement Unit, Industrial Division, Minnesota Pollution Control Agency, 520 Lafayette Road North, St. Paul, Minnesota 55155-4194

cc: Douglas Stolowski, Gerdau Ameristeel (email) Brian Durkop, Eagle Mountain(email) Robert Berg, MPCA St. Paul (email) AQ Correspondense File No. 151

### **TEST PLAN FOR MISCELLANEOUS SOURCES**

Proposed test date(s): *October 3-4, 2005* Date Test Plan Written: *August 22, 2005* 

### PART I. GENERAL INFORMATION

 Name and street address of emission facility: *Gerdau Ameristeel*  1678 Red Rock Road *St. Paul, Minnesota 55119*

 Name, Title, Telephone and Facsimile number of contact person at emission facility: Mr. Douglas Stolowski Regional Environmental Affairs Manager Phone: (612) 731-5697 Fax: (612) 731-5699

- 2. Permit File Number: #12300055-11
- 3. Reason the emission unit(s) is (are) to be tested: *To demonstrate compliance with emission limitations set forth in the MPCA Permit #12300055-11.*
- 4. Physical description and location layout of emission unit(s) to be tested: See Below

Emission Point #1 Old Baghouse (Inlet duct) - 16 Points Volumetric Flow Rate

See Attachment 1

Old Baghouse (Baghouse) - 108 Points 36 points per test Particulate Sampling 3x3 Matrix in each of 12 compartments

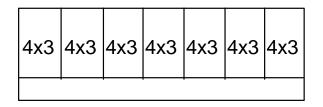
3x3	3x3	3x3	3x3	3x3	3x3
3x3	3x3	3x3	3x3	3x3	3x3

Emission Point #2 New Baghouse (Inlet Duct) - 16 Points Volumetric Flow Rate

See Attachment 2

New Baghouse (Baghouse) - 84 Points 28 points per test Particulate Sampling

4x3 Matrix in each of seven compartments



5. Name of Independent Testing Company, contact person, and telephone number: *Eagle Mountain Scientific, Inc. Brian Durkop Phone:* (763) 477-4462 *Fax:* (763) 477-5991 *Email: bdurkop@eagle-msi.com* 

### PART II. TESTING REQUIREMENTS

1. The following is a description of the Pollutant(s) to be tested, and the applicable emission limit(s), and the applicable rule(s) or regulation(s) for each emission limit:

<u>Pt.</u> #	Limitation Basis	Pollutant Tested/Limit	Specific Methods
1	* See Footnote 1	PM, 0.0052 gr/dscf	EPA Method 5D and 202
1	* See Footnote 1	PM10, 0.0052 gr/dscf	EPA Method 5D and 202
1	40 CFR 60.272a	Opacity, 3%	EPA Method 9
2	40 CFR 60.272a	PM, 0.0052 gr/dscf	EPA Method 5D and 202
2	* See Footnote 2	PM10, 0.0052 gr/dscf	EPA Method 5D and 202
2	40 CFR 60.272a	Opacity, 3%	EPA Method 9

*Footnote 1 – Limit emissions to those used for netting calculations. Footnote 2 – Minnesota SIP modeled PM10 ambient air quality standard compliance.* 

Operating Data to be recorded during the Test:

1. Operating conditions of each source tested and its associated pollution control equipment will be documented in the test report. Documentation of operating conditions includes all parameters listed in Part III.

*Process conditions including baghouse pressure drops and fan amps will be recorded every 15 minutes during each test.* 

2. The following is a detailed description of the procedure for fuel sampling and analysis to be followed for the applicable emission unit. *NA* 

### PART III. OPERATING CONDITIONS

1. The following contains a detailed description of the emission unit(s) to be tested:

Detailed descriptions of record keeping that include the specific time interval, and other parameters listed that will determine production, operating capacity, and/or operating conditions during testing are also included:

### Emission Point No. 01: Old Baghouse (Ladle Refining Station)

### **Process Equipment Description for units to be tested:**

Ladle Refining Station Type: Ladle Refining Furnace Mfr: Voest-Alpine Industries, Inc. Capacity: 90 to 100 tons per heat Continuous Casting Machine Mfr: Mini-Castco Capacity: 700,000 tons/year

### **Process Equipment Parameter Monitoring During Performance Test:**

*Tons per heat Heat duration* 

### **Process Rates/Operating Conditions During Testing:**

Batch process Normal

### **Control Equipment Description:**

Type: Fabric filter baghouse - positive pressure Mfr: American Air Filter Air Flow: 250,000 to 360,000 acfm Pressure Drop: 2.5-8.0 inches of water per compartment Gas Temperature: 100 to 140 degrees F

### **Control Equipment Operating Parameter During Test:** (15 minute Intervals)

Air Flow: 250,000 to 300,000 acfm Pressure Drop: 2.5-8.0 inches of water per compartment Continuous Cleaning Cycle

### Emission Point No. 02: New Baghouse (Electric Arc Furnace)

### **Process Equipment Description for units to be tested:**

*Type: Electric Arc Furnace Mfr: Voest Capacity: 90 to 100 ton heat size* 

### **Process Equipment Parameter Monitoring During Performance Test:**

*Tons per heat Heat duration* 

### **Process Rates/Operating Conditions During Testing:**

Batch process Normal

### **Control Equipment Description:**

Type: Fabric filter baghouse - positive pressure Mfr: Amerex Air Flow: 450,000 to 850,000 acfm Pressure Drop: 2.5-8.0 inches of water per compartment Gas Temperature: 125 to 250 degrees F

### **Control Equipment Operating Parameter During Test:** (15 minute Intervals)

Air Flow: 500,000 to 700,000 acfm Pressure Drop: 2.5-8.0 inches of water per compartment Continuous Cleaning Cycle

2. For each process unit listed in Part III, Item 1, the normal range of process or operating rates for each emission unit are listed below. The proposed test conditions listed in Part III, Item

1, are considered worst case in accordance with Minn. R. 7017.2025, subpart 2 as indicated below:

### Emission Point No. 01: Old Baghouse (Ladle Refining Station)

Normal Range of Process or Operating Rates Rationale For Worst Case Batch Process – Heat duration is highly specific to the type of product in production. To achieve worst case scenario testing is conducted when process is in operation only by suspending testing during downtime.

90 to 100 tons per heat Maximum production rate

### Emission Point No. 02: New Baghouse (Electric Arc Furnace)

Normal Range of Process or Operating Rates Rationale For Worst Case Batch Process – Heat duration is highly specific to the type of product in production. To achieve worst case scenario testing is conducted when process is in operation only by suspending testing during downtime.

90 to 100 tons per heat Maximum production rate

### PART IV. TEST METHODS

- 1. The following is a description of the methods, number of test runs, length of test runs, and sampling rate of each pollutant:
  - A. EPA Method 1 for the location of sampling ports and points.
  - B. EPA Method 2 for velocity and volumetric flow rate. One measurement just prior to each test run for TSP as PM10.
  - *C. EPA Method 3 for gas analysis. One test run on an integrated sample taken concurrently with each run for velocity and volumetric flow rate.*
  - D. EPA Method 4 for the determination of moisture in the flue gases. One test run concurrently with each test run for TSP as PM10.
  - E. EPA Method 5D and 202 (TSP) for the concentration of particulate matter including organic condensable. Results are to be reported both as filterable particulate matter containing organic condensable (where the limit includes organic condensable), and as filterable particulate matter excluding organic condensable (where the limit does not include organic condensable). Run time: 120 minutes, Sample volume: 60 dscf (1.70 dscm) No. Runs: 3. TSP values will be reported as PM10 to meet the permits applicable emission standard.
  - F. EPA Method 9 as amended by Minn. R. 7017.2060 for visual determination of opacity. One-hour observation, concurrent with one test run for TSP as PM10.

### Justification for EPA 5D testing verses PM10 testing using EPA 201A

The emission points proposed to be tested are the old and new baghouses. These baghouses are of the single monovent positive pressure design. Flow determination at the sample location in

the baghouse compartments is not measurable using conventional testing equipment. In order to determine the flow in the baghouses, the inlet ducts must be measured prior to particulate sampling. These numbers are used to back calculate the flow in the baghouses at each sample point assuming that the flow is uniformly distributed throughout the baghouse.

Conducting method 201A using the cyclone is not technically possible due to limitations in its design. Prior to testing, the proper nozzle must be determined based on duct flow and other preliminary measurements. The cyclone design is based on 10 nozzles of various sizes. The proper nozzle necessary to conduct these tests is far larger than any nozzle provided with the cyclone.

### PART V. CEM - Not Applicable

### PART VI. OTHER

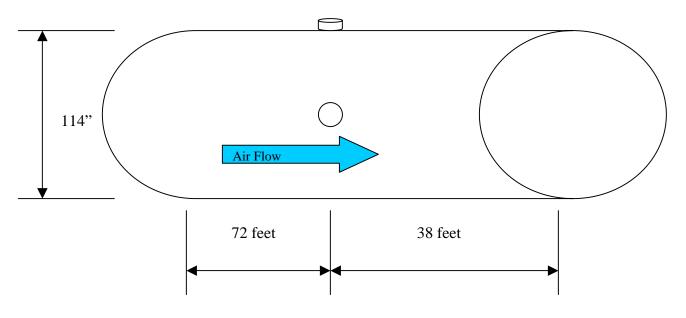
1. Pollutant(s) to be tested will be reported in terms of the applicable emission limit units.

2.	Testing schedules and	l testing firm.
	10/3/05 - Tuesday	10/4/05 - Wednesday
	Setup	Test EP1, EP2

- 3. Description and date of last maintenance work done before the test: A description of any maintenance work done before the test and the normal schedule followed will be included as part of the report.
- 4. One complete test report (one hard copy) shall be submitted within 45 days after the date of the test. A copy of the report on CD-ROM (Upon Approval \*.tif format) shall be submitted within 105 days after the date of the test.

5.	Test Plans, Hard Copy Reports,	Supervisor, Compliance Determination Unit
	and Microfiche Copy submittals	Compliance & Enforcement Section/AQD
	will be addressed to:	Minnesota Pollution Control Agency
		520 Lafayette Road
		St. Paul, Minnesota 55155-4194

### Attachment 1 Emission Point #1 Old Baghouse Inlet Duct



Attachment 2 Emission Point #2 New Baghouse Inlet Duct

