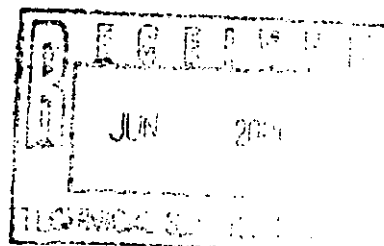


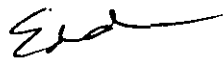
Note: This is a reference cited in *AP 42, Compilation of Air Pollutant Emission Factors, Volume I Stationary Point and Area Sources*. AP42 is located on the EPA web site at www.epa.gov/ttn/chief/ap42/

The file name refers to the reference number, the AP42 chapter and section. The file name "ref02_c01s02.pdf" would mean the reference is from AP42 chapter 1 section 2. The reference may be from a previous version of the section and no longer cited. The primary source should always be checked.

AP32 Section:	12.5.1
Background Chapter	3
Reference:	32
Title:	Emissions Test Report for Sulfur Dioxide and Oxides of Nitrogen, Gallatin Steel Company, Ghent, KY (Permit Number V-99-003). May 3, 2001. Ambient Air Services, Inc., Starke, FL.

interoffice
MEMORANDUM



to: Jerry Slucher
from: Edd Frazier 
subject: Stack test review
date: June 8, 2001

Re: Gallatin Steel
21-077-00018/5

Please review the attached test report. This test was performed on May 3, 2001, and the NOx and SO2 emissions from the baghouse for the EAF were determined. Please inform me of your findings when your review is done.

attachment



GALLATIN
STEEL

ISO 9002 CERTIFIED
QS 9000 CERTIFIED

5 3 8 6 9

May 31, 2001

RECEIVED

JUN 4 2001

Mr. Edd Frazier
Permit Review Branch
Division for Air Quality
803 Schenkel Lane
Frankfort, KY 40601-1403

PERMIT REVIEW BRANCH
DIVISION FOR AIR QUALITY

RE: Air Emissions Performance Testing – May 2001
Gallatin Steel Company, Warsaw, Kentucky
AFS Plant I.D. # 21-077-00018, Permit # V-99-003

Dear Edd:

Enclosed is the test report prepared by Ambient Air Services, Inc. for the air emissions performance testing conducted at Gallatin Steel Company on May 3, 2001 for SO₂ and NO_x.

Data sheets for the baghouse pressure drops, furnace shell pressures, fan amperes and damper positions are included in Appendix F of the report with the production data. The sulfur content of the charge carbon used during the test was 0.54%.

The amount of injection carbon used per heat was requested by the DAQ to be collected during the testing and Gallatin Steel considers this information confidential information. Gallatin Steel Company requests that this information be afforded confidential treatment pursuant to the provisions of 400 KAR 1:060. This information is enclosed on a separate sheet and is marked "Confidential Information, Property of Gallatin Steel". Gallatin Steel is furnishing the enclosed "Statement of Basis for Claim of Confidentiality, Air Emissions Testing" as provided by 400 KAR 1:060 Section 3.

If you have any questions regarding the request for confidential treatment of information or if you have any questions regarding the test report, please feel free to contact me at (859) 567-3141.

Sincerely yours,

Valerie A. Hudson

Valerie A. Hudson, P.E.
Process Manager – Environmental Systems

R.R. 1 Box 320
Ghent, Ky 41045-9704
859.567.3100
859.567.3165 fax
www.gallatinsteel.com

**EMISSIONS TEST REPORT FOR
SULFUR DIOXIDE AND OXIDES OF NITROGEN**

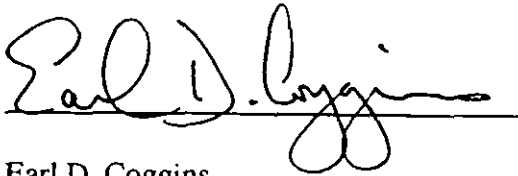
**GALLATIN STEEL COMPANY
GHENT, KENTUCKY
(PERMIT NUMBER V-99-003)**

MAY 3, 2001

**AMBIENT AIR SERVICES, INC.
106 AMBIENT AIR WAY
STARKE, FLORIDA 32091
(904) 964-8440**

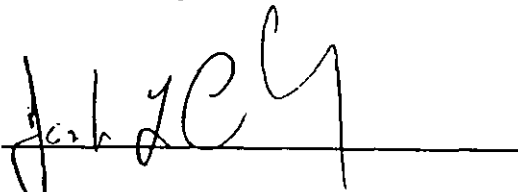
Ambient Air Services, Inc. of Starke, Florida, has completed the testing described in this report for the Gallatin Steel Company, Ghent, Kentucky facility. To the best of our knowledge and abilities we certify that all information, facts and test data are true and correct. Information supplied to AASI for use in this report from Gallatin Steel is perceived to be accurate and is used as such where necessary.

Test Team Leader:

A handwritten signature in black ink, appearing to read "Earl D. Coggins", written over a horizontal line.

Earl D. Coggins

Project Manager:

A handwritten signature in black ink, appearing to read "Joseph L. Cooksey", written over a horizontal line.

Joseph L. Cooksey

GALSTLEAF

Facility Gallatin Steel
 Source Type Electric Arc Furnace
 Performed By Ambient Air Services Req. by E. Frazier Rvwed. By Slucher
 Date Performed 5/3/2001 Received 6/8/01 Reviewed 6/19/01

 =====
 PARTICULATE

	Run #1	Run #2	Run #3
Cp	0.84	0.84	0.84
Theta,min.	252	252	252
Cold Duct 1			
As1,ft2	201.062	201.062	201.062
Ts1,degF	100.5	136.6	118.3
Ps1,in.Hg.	29.49	29.37	29.38
DELP1sqr	1.3743	1.4183	1.4069
Cold Duct 2			
As2,ft2	78.54	78.54	78.54
Ts2,degF	100.1	106.2	95.5
Ps2,in.Hg.	29.59	29.48	29.48
DELP2sqr	0.3707	0.0713	0.0213
LMF Duct			
As3,ft2	19.635	19.635	19.635
Ts3,degF	158.3	159	177.3
Ps3,in.Hg.	29.43	29.32	29.35
DELP3sqr	0.3272	0.2231	0.3519
Furnace A Duct			
As4,ft2	63.617	63.617	63.617
Ts4,degF	544.1	123.5	50.6
Ps4,in.Hg.	29.42	29.39	29.23
DELP4sqr	0.875	0.2356	0.2735
Furnace C Duct			
As5,ft2	78.54	78.54	78.54
Ts5,degF	103.4	510.2	504.3
Ps5,in.Hg.	29.42	29.37	29.35
DELP5sqr	0.3462	0.7997	0.8919
Asout,ft2	12069.79	12069.79	12069.79
Gamma	0.992	0.992	0.992
Tm,degF	77.3	535.6	76.5
Ps,in.Hg.	29.74	29.66	29.66
Pbar,in.Hg.	29.74	29.66	29.66
Vlc,ml.	28.1	16.5	16.3
Vm,ft3.	64.155	31.921	32.081
DELH,in.H2O	1.741	1.9	1.9
CO2%	0	0	0
O2%	20.9	20.9	20.9
CO%	0	0	0
N2%	79.1	79.1	79.1
Vwstd,ft3	1.32351	0.77715	0.76773
Vmstd,ft3.	62.4065649	16.719136	31.181744
Bws	0.02076743	0.044418	0.0240295
Md	28.836	28.836	28.836
Ms	28.6109641	28.3546866	28.5756163

GALSTLEAF

vs1,ft/sec	80.4378262	86.2064839	83.8514796
vs2,ft/sec	21.6526595	4.21398418	1.24209466
vs3,ft/sec	20.1347455	13.8243617	22.0284517
vs4,ft/sec	68.6283503	14.1572239	15.3560716
vs5,ft/sec	20.3396047	61.9851898	68.6775818
Q1std,dscf/hr.	52935706.7	51800264.3	53106710.7
Q2std,dscf/hr.	5589085.74	1046123.02	320995.604
Q3std,dscf/hr.	1170650.62	780531.905	1235063.09
Q4std,dscf/hr.	7957958.71	2753920.25	3467459.48
Q5std,dscf/hr.	5189415.75	8946699.62	10179159.2
Qtotal,dscf/min	1214046.96	1088792.32	1138489.8
vs,out ft/sec	0.02794044	0.02505779	0.02620155

NITROGEN OXIDES

ppm	1.8	1.7	1.6
tons/hr	184.8	195	191.6
lb/scf	2.15E-07	2.0308E-07	1.911E-07
lb/hr	15.663239	13.2668418	13.056378
lbs/ton	0.0847578	0.06803509	0.0681439

Avg lbs/ton 0.0736456

SULFUR DIOXIDE

ppm	2.615	2.3	3.635
tons/hr	184.8	195	191.6
lb/scf	4.349E-07	3.8255E-07	6.046E-07
lb/hr	31.682209	24.990858	41.299219
lb/ton	0.1714405	0.12815825	0.2155492

Avg lbs/ton 0.171716

1.0 EXECUTIVE SUMMARY

On May 3, 2001 emission tests were conducted at the Gallatin Steel mill located in Warsaw, Kentucky. The emission testing was conducted in accordance with the requirements listed in the Kentucky Department of Environmental Protection, Division of Air Quality, PSD Permit V-99-003. In accordance with Permit V-99-003 Gallatin Steel was required to test for NO_x and SO₂ emissions. Based on results from testing conducted in 1998 and 1999, testing was not required for VOC, PM, CO and lead emissions. The results from this test indicate compliance with the NO_x and SO₂ permit limitations. Table 1 summarizes the results of these testing efforts.

TABLE 1

SUMMARY OF EMISSION TEST RESULTS			
GALLATIN STEEL COMPANY - WARSAW, KENTUCKY MILL			
GHENT, KENTUCKY			
May 3, 2001			
EMISSION POINT	PARAMETER	PERMIT LIMIT	TEST RESULTS
EAF/CASTER LMF Baghouse Emission Point E1 (01)	Sulfur Dioxide (SO ₂)	0.20 lbs/ton 40 lbs/hr.	0.18 lbs/ton 33.70 lbs/hr.
	Oxides of Nitrogen	0.51 lbs/ton 102.0 lbs/hr.	0.075 lbs/ton 14.19 lbs/hr.

TABLE OF CONTENTS

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3.0 PROCESS DESCRIPTION	2
4.0 EAF/BAGHOUSE SO ₂ EMISSIONS SAMPLING	3
4.1 Methodology	3
4.2 Results	14
4.3 Testing Compromises	16

APPENDICES

APPENDIX A - Sample Calculations - Gaseous Emissions
APPENDIX B - Instrument Calibration Data - Baghouse Testing
APPENDIX C - Gaseous Emission Data - Baghouse Testing
APPENDIX D - Flow Rates
APPENDIX E - Field Data Sheets
APPENDIX F - Production Data, Test Notification Letter
APPENDIX G - Project Participants

2.0 INTRODUCTION

On May 3, 2001 Ambient Air Services, Inc. conducted air emission testing at Gallatin Steel Company's, Ghent, Kentucky mill. Prior to starting these tests, Kentucky Department of Environmental Protection personnel were notified of the testing schedule and provided a testing protocol for review. A copy of the Notification Letter is included in the Appendix section of this report.

Testing methods and time duration are summarized in Table 2.

TABLE 2

SUMMARY OF TESTING METHODS		
GALLATIN STEEL COMPANY		
GHENT, KENTUCKY		
MAY 3, 2001		
POLLUTANT-SOURCE	EPA REFERENCE METHOD	TIME DURATION
Sulfur Dioxide - E1 (01)	Method 6C	3 runs, 3 heats each, 2 compartments tested simultaneously per run
Oxides of Nitrogen - E1 (01)	Method 7E	3 runs, 3 heats each All tests conducted in Compartment 7

3.0 PROCESS DESCRIPTION

At the Ghent, Kentucky facility of Gallatin Steel, the overall objective is to reclaim scrap steel of various forms, refining this material to create rolled steel coils. This type of mill is commonly referred to as a "mini" mill. The particular aspect of this mill examined by these testing efforts were the Electric Arc Furnace (EAF) operations. The EAF by introducing heat primarily in the form of an electric arc provides the energy necessary to melt the scrap steel. Once melted and refined, the furnace is tapped and the product is transferred to the caster/tunnel furnace to be formed into rolled steel. To control the amount of particulate escaping from the melt shop building, during all operations, a baghouse filter system is employed. This system exhausts the furnace directly through fourth hole and canopy hood ducts.

4.0 GASEOUS EMISSION SAMPLING

4.1 Methodology

Continuous instruments were used to measure SO_2 and NO_x emissions. The arc furnace shop sample was obtained from the baghouse. A dilution extraction system was utilized to convey the sulfur dioxide sample gas to the sulfur dioxide analytical instruments. A fully extractive system was utilized for the NO_x instrument. The sample was obtained from a representative middle point among the bag filter banks on the clean side of the baghouse. The sample probe for the NO_x instrument was positioned in Compartment 7 of the baghouse for the duration of the test. The probe for the SO_2 sample was positioned in 6 different compartments, 2 per test run.

Gaseous emission sampling consisted of three runs, each run covering three furnace "heats". Utilizing the flow rates (SCFM) measured during each run, mass emissions were calculated in lbs/hr. and in lbs/ton.

As described in the test protocol, in order to sample a maximum number of compartments per test run, two SO_2 instruments were utilized. The sample probe for each instrument was positioned in separate compartments. Thus, a total of six compartments were tested for three heats each over the test period. The compartments were selected so that one inner and one outer compartment were sampled during each run. The compartments were randomly selected.

Historically all SO_2 measurements were conducted in Compartment Number 7. This originated at the request of the State of Kentucky. Compartment 7 was selected by the State due to the location of the installed CEMS probe. Through a baghouse consultant, Gallatin learned that the sulfur

dioxide may be different in concentration in different compartments within the baghouse. This stratification is due in part to the design of the duct work and fan configuration.

As can be seen in the results summary, SO_2 concentrations vary considerably from compartment to compartment within the baghouse. In order to achieve a more statistically valid average, compartments were selected so that one "inner" and one "outer" compartment were sampled per test run. The inner and outer compartments were selected to achieve a cross-sectional average of all compartments based on engineering judgements.

Example of Dilution Withdrawl System

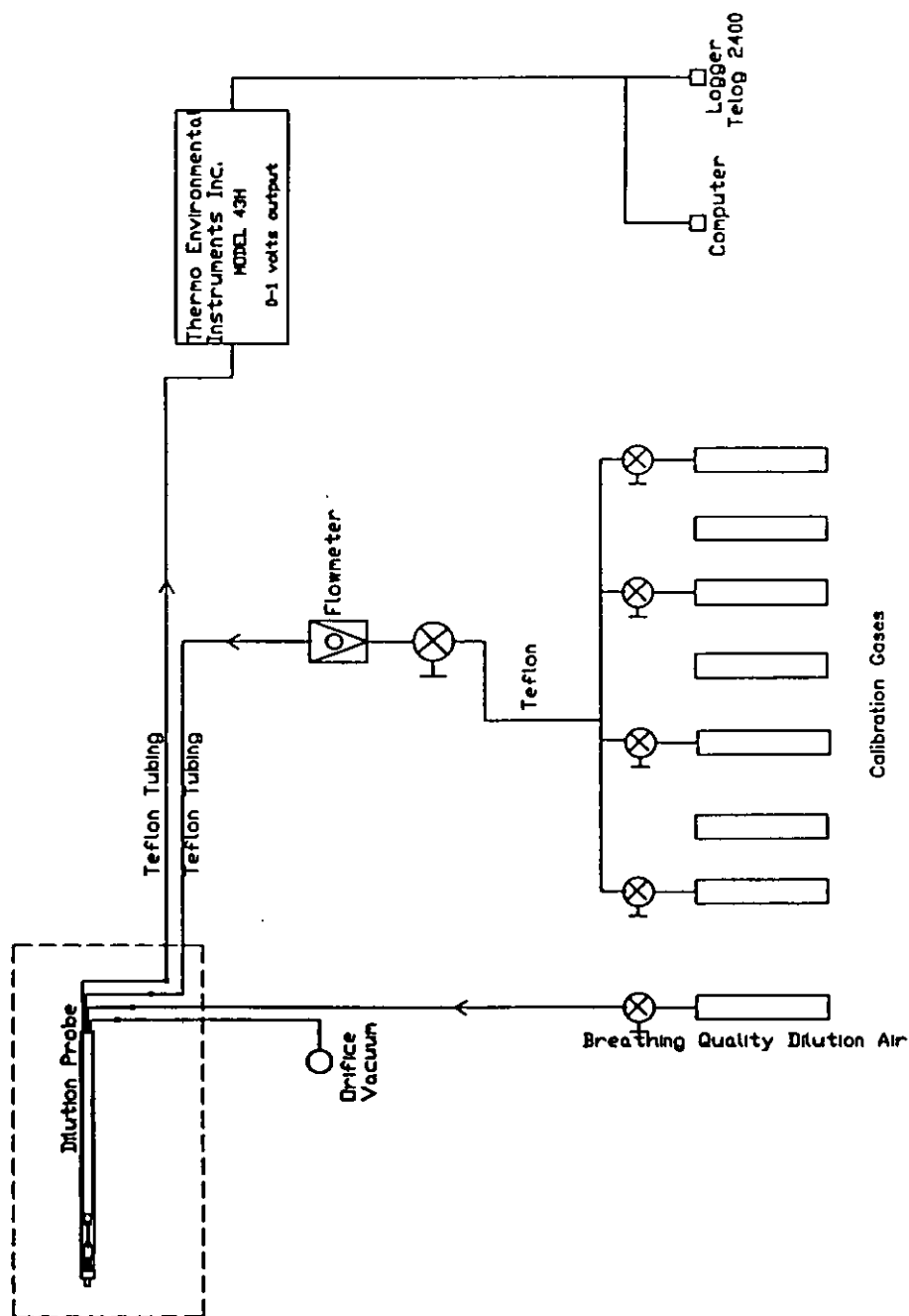


FIGURE 4-1

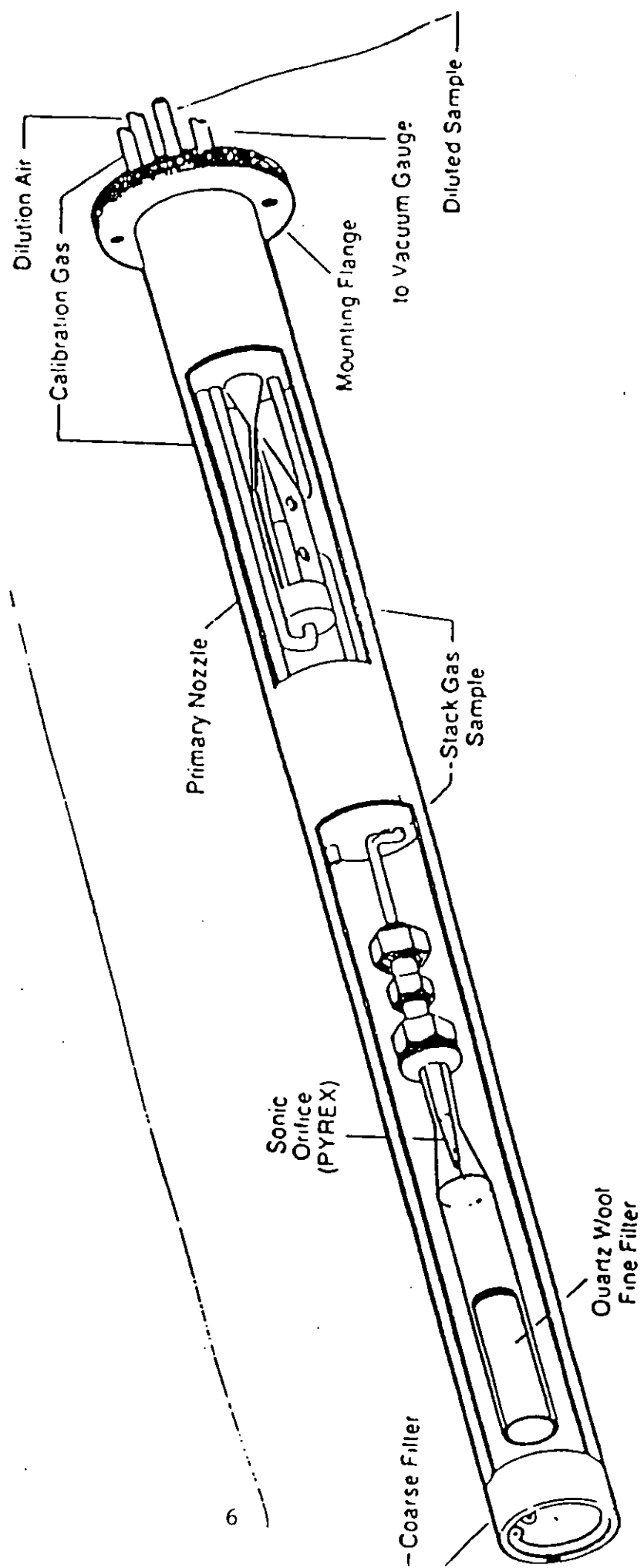


FIGURE 4-2

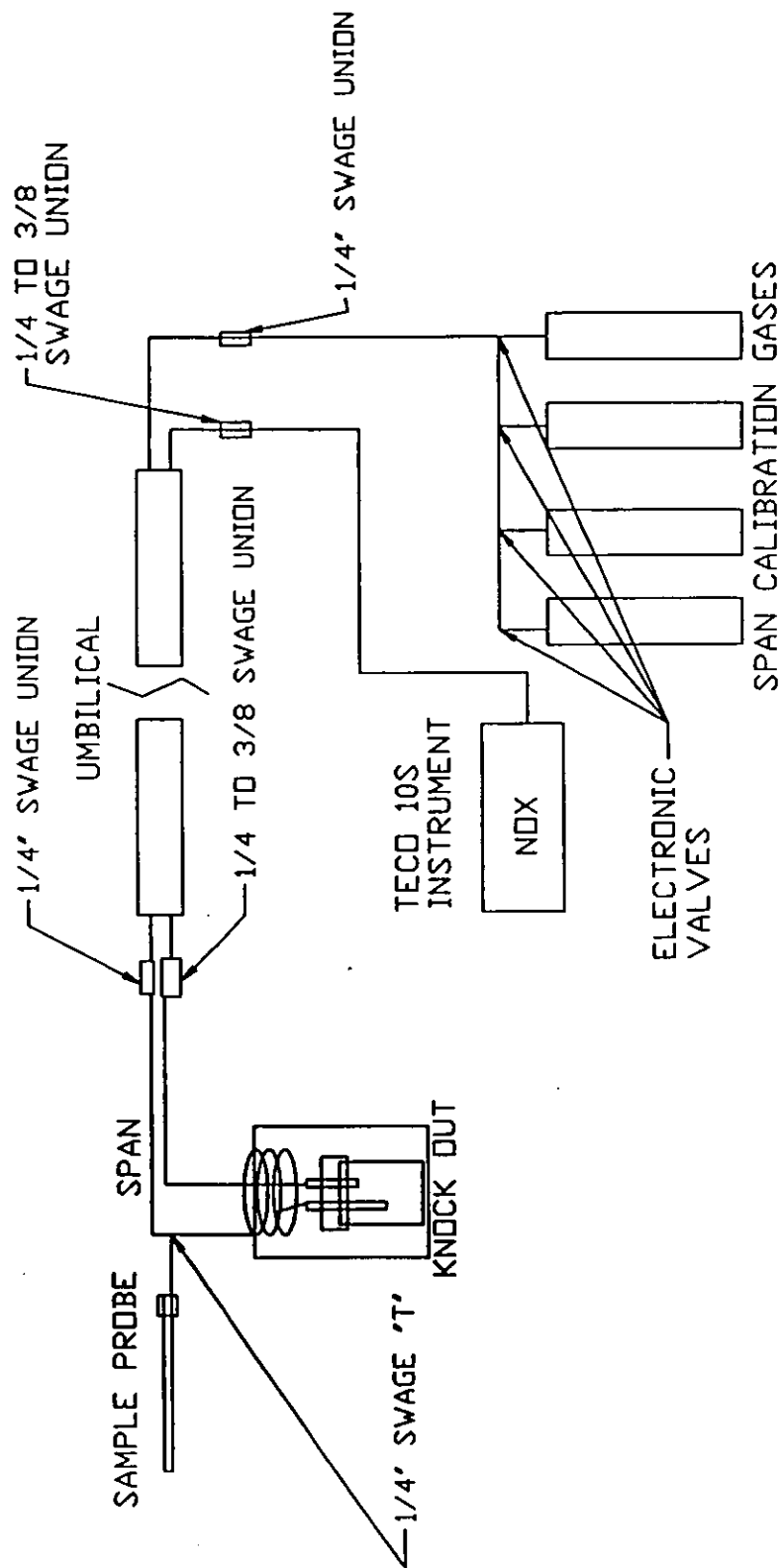


FIGURE 4-3
FULLY EXTRACTIVE WITHDRAWAL SYSTEM - NOx

Data Recording

The primary data recorder was a Telog Model 3314 electronic data recorder which is based on micro-processor technology. This recorder interrogates each analytical instrument signal on a once-every-one-second basis and for this test was instructed to accumulate 60 of these one-second readings and store the average into recorder memory. The data bank consists of a series of one minute averages. In retrieving the data from the computerized database, scaling factors were entered to reflect the appropriate calibrations which occurred immediately before and after collecting the data set of current interest. The analysis of SO₂ gaseous species was carried out as follows:

Sulfur Dioxide

Sulfur Dioxide concentrations were determined by EPA Method 6C. Two Thermo Environmental Instruments (TEI) Model 43H instruments were used. EPA protocol calibration gases of SO₂ in air were used at nominal levels of 0, 6, and 12.0 ppm (instrument range 0-15 ppm). Calibrations were performed before and after each test run. EPA Method 6C required correction factors were applied to the data based on the results of the calibrations.

Table 4-1 summarizes the TEI Model 43H versus those required by Method 6C.

TABLE 4-1

SULFUR DIOXIDE SYSTEM PERFORMANCE SPECIFICATIONS METHOD 6C VS THERMO ENVIRONMENTAL INSTRUMENTS MODEL 43H		
	METHOD 6C	TECO 43H
Calibration error zero, mid and high gases	Less than $\pm 2\%$ span	$\pm 1\%$ of full scale
Sampling system bias for zero, mid and high gases	Less than $\pm 5\%$ span	$\pm 1\%$ of full scale
Interference Check	Less than $\pm 7\%$ of Method 6 result	NO < 3 ppb M-Xylene < 2 ppb H ₂ O < 2% of reading
Calibration Drift	Less than $\pm 3\%$ of span over the run period	$\pm 1\%$ of full scale

Oxides of Nitrogen - Oxides of Nitrogen were measured using EPA Method 7E. Table 4-2 relates the required performance specifications of Method 7E to those presented by the manufacturer of the TEI Model 10S used in these tests. The instrument was calibrated over a nominal range of 0-100 ppm.

Results from the test are expressed in mass per unit time with all NO_x converted to the species NO₂.

At the beginning of the test series zero gas plus two calibration gases were used to perform calibration checks. At the conclusion of each of the three runs, zero gas plus one calibration gas was used as a calibration check.

TABLE 4-2

OXIDES OF NITROGEN SYSTEM PERFORMANCE SPECIFICATIONS METHOD 7E VS THERMO ENVIRONMENTAL INSTRUMENTS MODEL 10S		
	METHOD 7E	TECO 10S
Calibration error zero, mid and high gases	Less than $\pm 2\%$ span	$\pm 1\%$ of full scale
Sampling system bias for zero, mid and high gases	Less than $\pm 5\%$ span	$\pm 1\%$ of full scale
Zero Drift	Less than $\pm 3\%$ of span over the run period	Negligible
Calibration Drift	Less than $\pm 3\%$ of span over the run period	$\pm 1\%$ of full scale

Flow, Moisture, Oxygen and Carbon Dioxide - In order to convert concentration values of parts per million NO_x and SO_2 into pounds per hour it was necessary to determine the effluent flow rate. The effluent flow rate was determined in accordance with EPA Methods 1-4.

Since the baghouse exhaust does not meet the criteria of Method 1, the flow was determined on the baghouse inlet. Specifically, there are five inlet ducts to the baghouse. Flow was measured on each of the inlet ducts and added together to get the total flow. All fresh air inlets to the compartments tested were blocked during the test. This prevented the influence of dilution air on the gas emission concentrations. Figures 4-4 through 4-8 depict the traverse points used.

In addition to the traverse data, moisture runs were conducted in accordance with EPA Method 4.

Oxygen and carbon dioxide levels were confirmed to be essentially ambient air ($0\% \text{CO}_2$, $20.9\% \text{O}_2$) using Method 3. A fyrite type analyzer was used for this purpose.

FURNACE DUCT "A" – DIAMETER = 108.0", 12 TRAVERSE POINTS

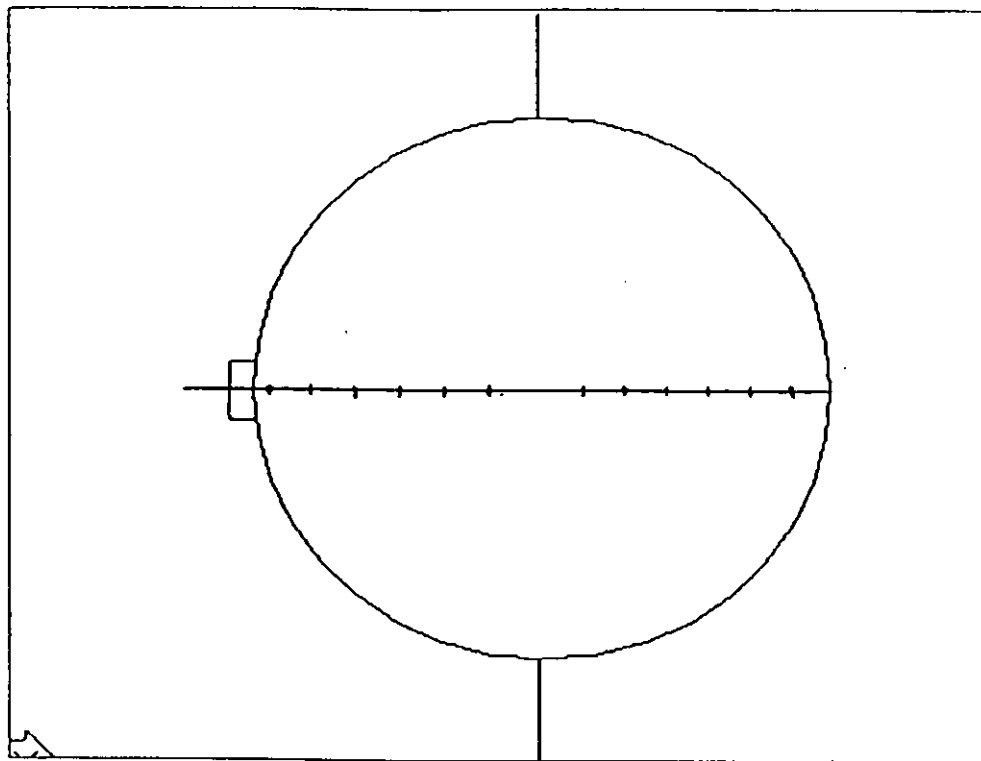


FIGURE 4-4

POINT	DISTANCE FROM WALL	POINT	DISTANCE FROM WALL
1	2.3"	7	69.6"
2	7.2"	8	81.0"
3	12.7"	9	88.9"
4	19.1"	10	95.3"
5	27.0"	11	100.8"
6	38.4"	12	105.7"

FURNACE DUCT "A" TRAVERSE POINTS

FURNACE DUCT "C" – DIAMETER = 120", 16 TRAVERSE POINTS

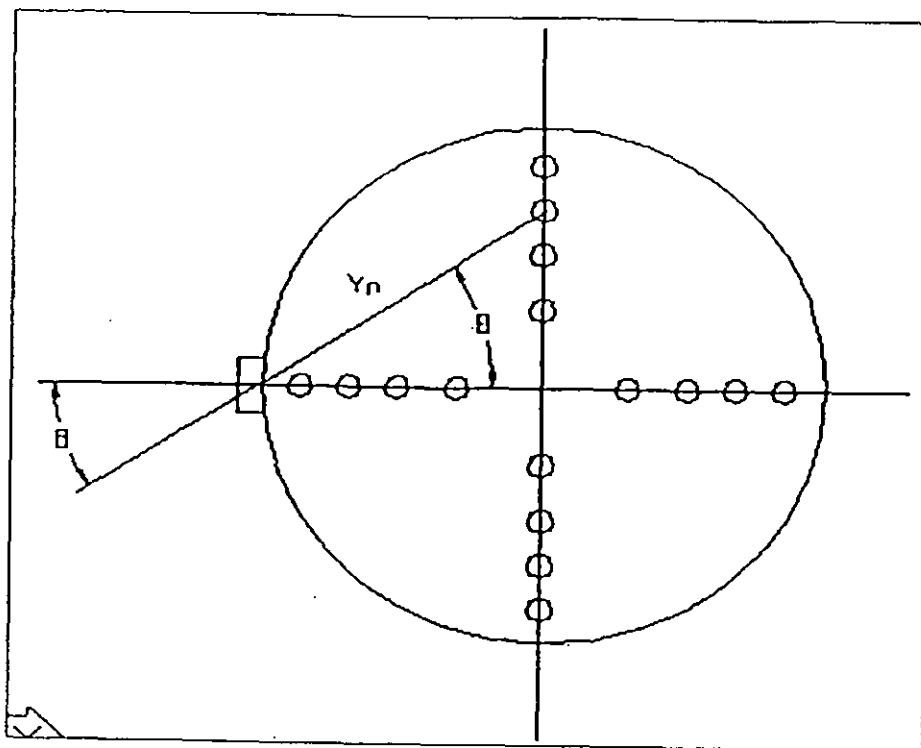


FIGURE 4-5

VERTICAL TRAVERSE		HORIZONTAL TRAVERSE		
POINT	DISTANCE FROM WALL	POINT	θ	Y_n
1	3.84	1	43.1	82.2
2	12.6	2	38.3	76.5
3	23.3	3	31.5	70.3
4	38.76	4	19.5	63.6
5	81.24	5	-19.5	63.6
6	96.72	6	-31.5	70.3
7	107.4	7	-38.3	76.5
8	116.16	8	-43.1	82.2

FURNACE DUCT "C" TRAVERSE POINTS

LMF DUCT -- DIAMETER = 60.0", 12 TRAVERSE POINTS

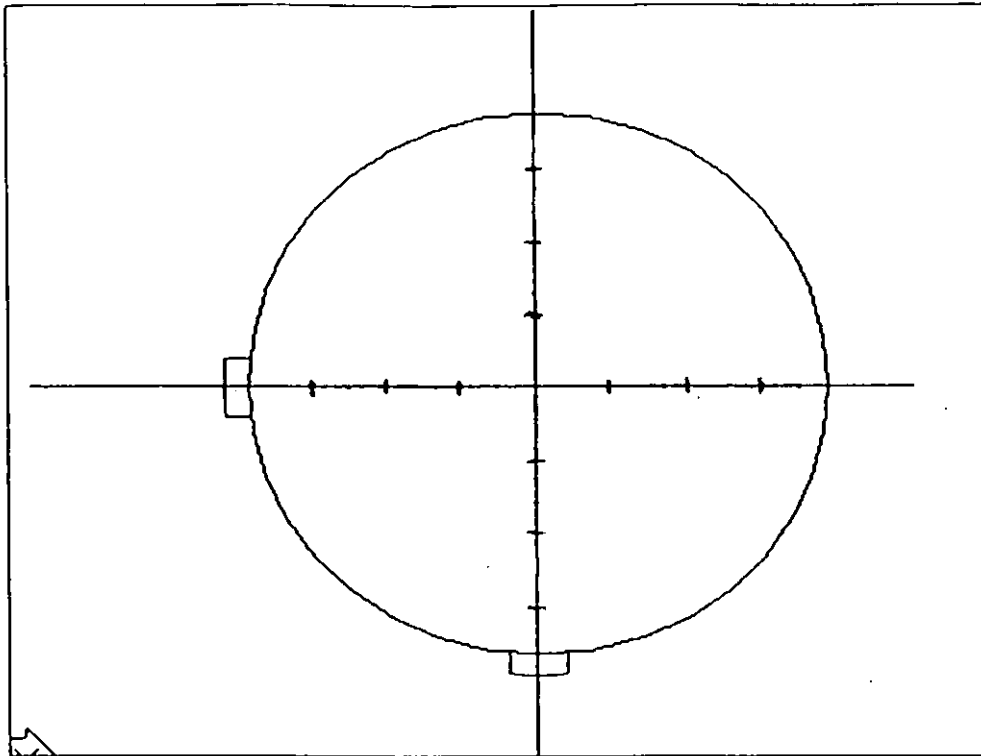


FIGURE 4-6

POINT	DISTANCE FROM WALL
1	2.6"
2	8.8"
3	17.8"
4	42.2"
5	51.2"
6	57.4"

LMF DUCT TRAVERSE POINTS

NO. 1 COLD DUCT – DIAMETER = 192", 12 TRAVERSE POINTS

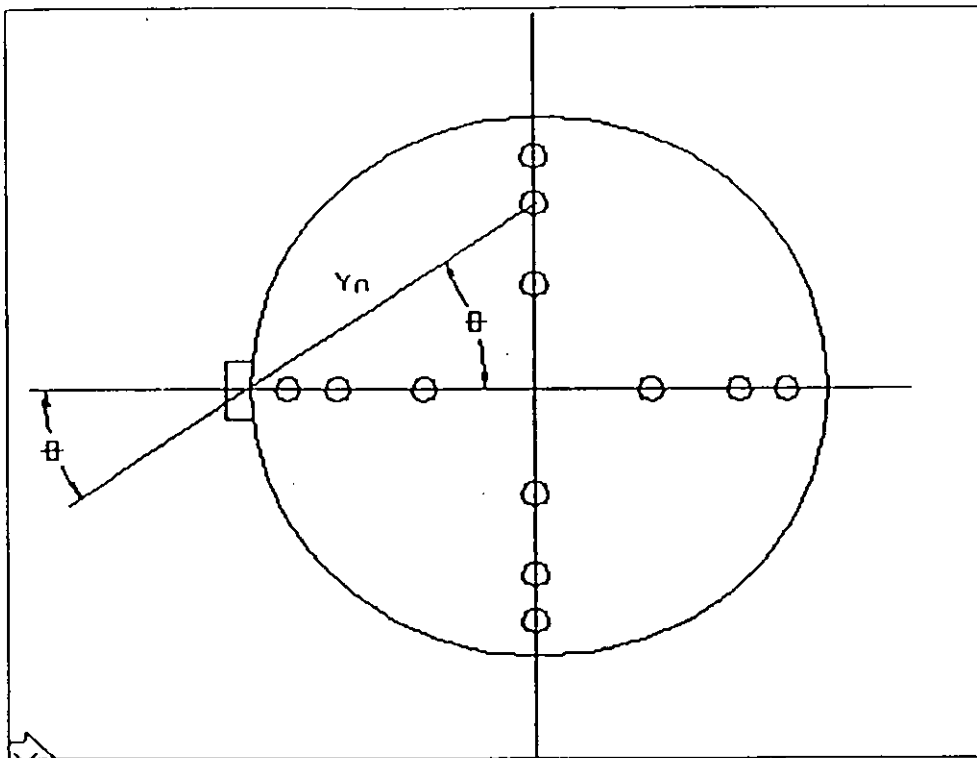


FIGURE 4-7

VERTICAL TRAVERSE		HORIZONTAL TRAVERSE		
POINT	DISTANCE FROM WALL	POINT	θ	Y_n
1	8.45	1	42.4	129.9
2	28.42	2	35.2	117.4
3	56.83	3	22.2	103.7
4	135.17	4	22.2	103.7
5	163.97	5	35.2	117.4
6	183.55	6	42.4	129.9

NO. 1 COLD DUCT TRAVERSE POINTS

NO. 2 COLD DUCT -- DIAMETER = 120", 16 TRAVERSE POINTS

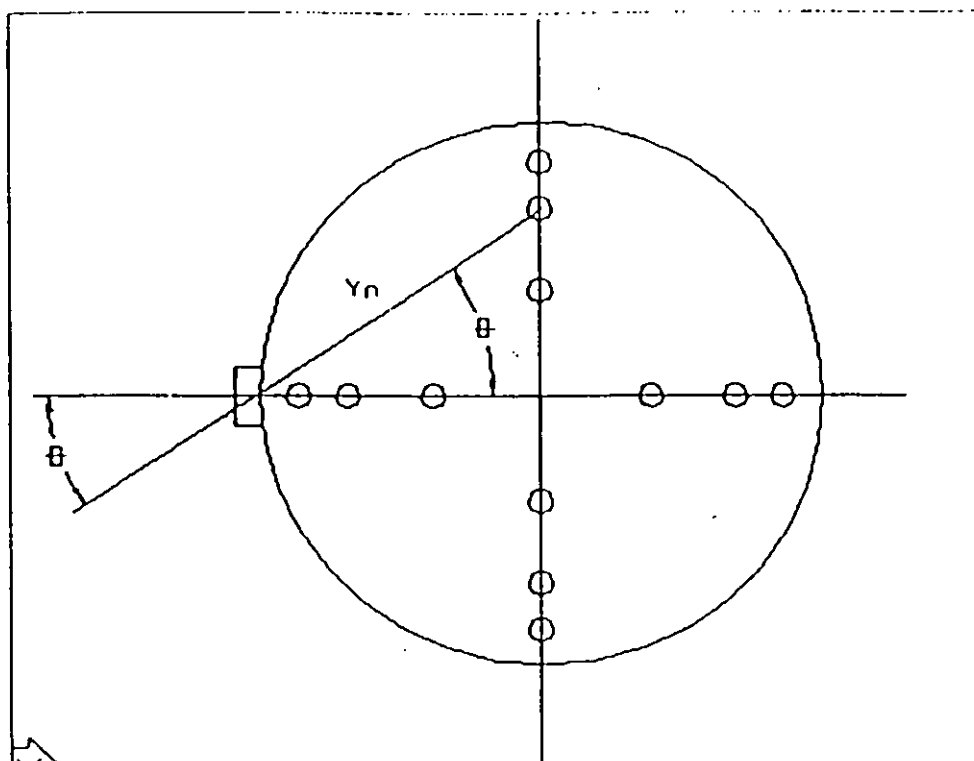


FIGURE 4-8

VERTICAL TRAVERSE		HORIZONTAL TRAVERSE		
POINT	DISTANCE FROM WALL	POINT	θ	Y_n
1	3.84	1	43.1	82.2
2	12.6	2	38.3	76.5
3	23.3	3	31.5	70.3
4	38.76	4	19.5	63.6
5	81.24	5	-19.5	63.6
6	96.72	6	-31.5	70.3
7	107.4	7	-38.3	76.5
8	116.16	8	-43.1	82.2

NO. 2 COLD DUCT TRAVERSE POINTS

4.2 Test Results

The results of the instrumental testing for gaseous emissions are as follows:

TABLE 4-3

SUMMARY OF OXIDES OF NITROGEN EMISSION MEASUREMENTS							
GALLATIN STEEL COMPANY GHENT, KENTUCKY							
EAF/LMF/CASTER BAGHOUSE May 3, 2001							
RUN NUMBER	HEAT NUMBERS	PRODUCTION	TEST TIME	OXIDES OF NITROGEN (as NO ₂)			OXIDES OF NITROGEN PERMIT LIMITS (as NO ₂)
				TONS PER HOUR	Minutes	ppm	
1	A17462, C16853, A17463	184.8	196	1.8	15.4	0.08	0.51 lbs/ton and 102 lbs/hr.
2	A17465, C16856, A17466	195.0	180	1.7	13.8	0.07	
3	A17467, C16858, A17468	191.6	198	1.6	13.3	0.07	
Averages ¹			574	1.71	14.19	0.075	

¹ Time Weighted Average

Notes: PPM = Parts per Million V.V

Lbs/Hr = Pounds per Hour

Lbs/Ton = Pounds per ton cast

All emissions measurements taken in compartment number 7 (per prior agreement/request from State of Kentucky)

TABLE 4-4

SUMMARY OF SULFUR DIOXIDE EMISSION MEASUREMENTS

GALLATIN STEEL COMPANY
GHENT, KENTUCKY

EAF/LMF/CASTER BAGHOUSE

May 3, 2001

RUN NUMBER	HEAT NUMBERS	PRODUCTION	TEST TIME	INNER COMPARTMENT SO ₂		OUTER COMPARTMENT SO ₂		AVERAGE	
				ppm	Lb/Hr	ppm	Lb/Hr	Lb/Hr	Lb/Ton
1	A17462, C16853, A17463	184.8	196	3.20	39.7	2.03	25.2	32.4	0.18
2	A17465, C16856, A17466	195.0	180	2.67	30.2	1.93	21.8	26.0	0.13
3	A17467, C16858, A17468	191.6	198	4.55	52.6	2.72	31.5	42.0	0.22
Averages ¹		190.35	574	3.50	41.13	2.24	26.27	33.70	0.18

¹ Time Weighted Average

Notes: PPM = Parts per Million V.V

Lb/Hr = Pounds per Hour

Lb/Ton = Pounds per ton cast

Run 1 = Compartments 7 (outer) and 19 (inner)

Run 2 = Compartments 2 (outer) and 14 (inner)

Run 3 = Compartments 4 (outer) and 16 (inner)

4.3 Testing Compromises

During performance of the velocity measurements of the baghouse inlet ducts, Ambient Air personnel encountered a port location error on Furnace "A" duct. Although the ports were located at positions 90 degrees from each other, one of these ports was located too close to Furnace Duct "C" and therefore inaccessible. After performing a traverse across the only accessible port on Furnace "A" duct, it was apparent that the velocity measurements were so similar as to negate any concerns of flow stratification. This test compromise at the time of the test and in the opinion of the test team would not affect the integrity of the test data and therefore testing was not halted.

APPENDICES

APPENDIX A - Sample Calculations - Gaseous Emissions

APPENDIX B - Instrument Calibration Data - Baghouse Testing

APPENDIX C - Gaseous Emission Data - Baghouse Testing

APPENDIX D - Flow Rates

APPENDIX E - Field Data Sheets

APPENDIX F - Production Data, Test Notification Letter

APPENDIX G - Project Participants

APPENDIX A
SAMPLE CALCULATIONS

Gaseous Emissions Sample Calculations

I. Concentrations as calculated from method 6c

- A. Co, Average of initial and final system calibration bias check responses for the zero gas, ppm.

Run 1, SO2

$$Co = (0.0+0.0)/2 = 0.0$$

- B. Cm, Average of initial and final system calibration bias check responses for the upscale calibration gas.

Run 1, SO2

$$Cm = (5.9+5.9)/2 = 5.9$$

- C. Cma, Actual concentration of the upscale calibration gas ppm.

Run 1, SO2 - 5/3/01 @ 0931 (Point 1 of Run 1)

$$C = 1.61$$

- D. Cgas, Effluent gas concentration, dry basis, ppm.

Run 1, SO2

$$\begin{aligned} C_{gas} &= (C_{bar}-Co)(Cma/(Cm-Co)) \\ &= (1.61-0.0) \times 5.9/(5.9 - 0.0) \\ &= 1.61 \end{aligned}$$

A. SO2 Emissions

$$lb/hr. = \frac{(ppm) * (Mol. Wt.)}{385e6} * (flowrate)(60 \text{ min/hr})$$

Example: Mol. Wt. = 64, ppm = 1.61, flowrate = 121875 SCFMD

$$lb/hr \text{ SO}_2 = 19.9$$

IV. Emission Rates (lb/ton)

$$\begin{aligned} Lb/ton &= (inner \text{ SO}_2 \text{ lbs/hr.} + outer \text{ SO}_2 \text{ lbs/hr.}) / 2 / (\text{tons per hour produced}) \\ &= (19.9 + 18.2) / 2 / 184.8 \\ &= 0.10 \end{aligned}$$

Note: The average of the inner and outer SO₂ emissions was used as the reported pounds per hour emitted.

Ambient Air Services, Inc.
Environmental Consultants

106 Ambient Air Way
Starke, Florida 32091

(904) 964 - 8440
(904) 964 - 6675 fax

EXAMPLE CALCULATIONS

Plant	Gallatin Steel
Location	Ghent, Kentucky
Stack	Cold Duct No. 1
Run Date	5-3-01
Run Number	1

1. Stack Pressure, PS

Where: PB = Barometric Pressure, inches Hg
PG = Static Pressure, stack, inches H₂O

$$PS = PB + (PG \div 13.6)$$

$$PB = 29.74$$

$$PG = -3.45$$

$$PS = 29.49$$

2. Meter Pressure, PM

Where: DH = Average meter orifice pressure differential, inches H₂O

$$PM = PB + (DH \div 13.6)$$

$$DH = 1.741$$

$$PM = 29.87$$

3. Volume Water Vapor, VWV

Where: VC = Volume condensate, liquid volume plus gain in silica gel weight, grams

$$VWV = 0.04707 \times VC$$

$$VWV = 1.323$$

4. Metered Volume corrected to standard condition, Vstpd

Where: VM = Metered volume, meter conditions
PM = See equation 2
TM = Temperature of meter, degrees Rankin
Y = Meter correction factor

$$Vstpd = \frac{17.65 \times VM \times PM \times Y}{TM}$$

$$Vstpd = 62.442$$

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EXAMPLE CALCULATIONS - CONTINUED

Plant	Gallatin Steel
Location	Ghent, Kentucky
Stack	Cold Duct No. 1
Run Date	5-3-01
Run Number	1

5. Total Volume of sample, VT

Where: VWV = See equation 3
Vstpd = See equation 4

$$VT = VWV + Vstpd$$

$$VT = 63.765$$

6. Fraction water vapor in gas stream, W

Where: VWV = See equation 3
VT = See equation 5

$$W = VWV \div VT$$

$$W = 0.021$$

7. Fraction Dry Air, FDA

Where: W = See equation 6

$$FDA = 1.0 - W$$

$$FDA = 0.979$$

8. Molecular Weight of stack gas, dry, MD

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

$$CO_2 = 0.0$$

$$O_2 = 20.9$$

$$N_2 = 79.1$$

$$CO = 0.0$$

$$MD = 28.84$$

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EXAMPLE CALCULATIONS - CONTINUED

Plant	Gallatin Steel
Location	Ghent, Kentucky
Stack	Cold Duct No. 1
Run Date	5-3-01
Run Number	1

9. Molecular weight of stack
gas, stack conditions, MS

Where: MD = See equation 8
W = See equation 6
FDA = See equation 7

$$MS = (MD \times FDA) + (18 \times W)$$

MD= 28.84

FDA= 0.979

W= 0.021

MS= 28.61

10. Specific Gravity of Gas,
relative to air, GS

Where: MS = See equation 9

$$GS = MS \div 28.99$$

GS= 0.987

11. Velocity of stack gas, feet
per minute, U

Where: CP = Pitot Coefficient
 $\sqrt{H}$ = Average of the square roots of
the velocity heads, in. H₂O
TS = Temperature of the stack,
degrees Rankin
PS = See equation 1
GS = See equation 10

$$U = 174 \times CP \times \sqrt{H} \times \sqrt{\frac{TS \times 29.92}{GS \times PS}}$$

U= 4821.5 FPM

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EXAMPLE CALCULATIONS - CONTINUED

Plant
Location
Stack
Run Date
Run Number

Gallatin Steel
Ghent, Kentucky
Cold Duct No. 1
5-3-01
1

12. Stack Gas Flow Rate,
Stack conditions, cfm, QS

Where:

AS = Cross sectional area of stack
at sampling location, sq.ft.
U = See equation 11

$$QS = U \times AS$$

$$QS = 969420 \text{ ACFM}$$

13. Stack Gas Flow Rate,
dry, QD

Where:

QS = See equation 12
FDA = See equation 7

$$QD = QS \times FDA$$

$$QD = 949306 \text{ ACFMD}$$

14. Stack Gas Flow Rate, STP,
dry, Qstpd

Where:

QD = See equation 13
PS = See equation 1
TS = Temperature of stack,
degrees Rankin

$$Qstpd = \frac{528 \times QD \times PS}{TS \times 29.92}$$

$$Qstpd = 881409 \text{ SCFMD}$$

15. Stack Gas Flow Rate, STP,
wet, Qstpw

Where:

Qstpd = See equation 14
FDA = See equation 7

$$Qstpw = \frac{Qstpd}{FDA}$$

$$Qstpw = 900084 \text{ SCFMW}$$

APPENDIX B

INSTRUMENT CALIBRATION DATA

- Calibration Gas Certificates

93.8 ppm NO_x
54.2 ppm NO_x
24.9 ppm NO_x
10.21 ppm NO_x
5.94 ppm SO₂
12.07 ppm SO₂

- Calibration Drift/Error

NO_x Compartment 7
SO₂ Inner Compartments
SO₂ Outer Compartments

- Field Test Log



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CERTIFICATE OF ANALYSIS

EPA PROTOCOL MIXTURE PROCEDURE #: G1

CUSTOMER: Ambient Air Service
SGI ORDER #: 157906
ITEM#: 1
P.O.#: 82100-1

CYLINDER #: CC18332
CYLINDER PRES: 2000 PSIG
CGA OUTLET: 680

CERTIFICATION DATE: 9/7/2000

EXPIRATION DATE: 9/8/2002

CERTIFICATION HISTORY

COMPONENT	DATE OF ASSAY	MEAN CONCENTRATION	CERTIFIED CONCENTRATION	ANALYTICAL ACCURACY
Carbon Monoxide	8/25/2000	9.953 ppm	10.00 ppm	+/- 1%
	9/7/2000	10.04 ppm		
Nitric Oxide	8/26/2000	10.20 ppm	10.21 ppm	+/- 1%
	9/6/2000	10.22 ppm		
NOx			10.21 ppm	Reference Value Only

BALANCE

Nitrogen

PREVIOUS CERTIFICATION DATES: None

REFERENCE STANDARDS

COMPONENT	SRM/NTRM#	CYLINDER#	CONCENTRATION
Carbon Monoxide	GMIS-1	CC118636	9.93 ppm
Nitric Oxide	GMIS-1	CC117561	20.16 ppm

INSTRUMENTATION

COMPONENT	MAKE/MODEL	SERIAL #	DETECTOR	CALIBRATION DATE(S)
Carbon Monoxide	Nicolet 560	ADL9600109	FTIR	8/30/2000
Nitric Oxide	Teco 42C	42C-64942-345	Cheml	8/15/2000

THIS STANDARD IS NIST TRACEABLE. IT WAS CERTIFIED ACCORDING TO THE EPA PROTOCOL PROCEDURES.
DO NOT USE THIS STANDARD IF THE CYLINDER PRESSURE IS LESS THAN 150 PSIG.

ANALYST:

FRED PIKULA

DATE: 9/7/2000



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CERTIFICATE OF ANALYSIS

EPA PROTOCOL MIXTURE PROCEDURE #: G1

CUSTOMER: Gallatin Steel Company
SGI ORDER #: 144936
ITEM#: 2
P.O.#: 72399-1

CYLINDER #: CC109962
CYLINDER PRES: 2000 PSIG
CGA OUTLET: 660

CERTIFICATION DATE: 8/10/99
EXPIRATION DATE: 8/10/2001

CERTIFICATION HISTORY

COMPONENT	DATE OF ASSAY	MEAN CONCENTRATION	CERTIFIED CONCENTRATION	ANALYTICAL ACCURACY
Carbon Monoxide	8/2/99	24.97 ppm	25.1 ppm	+/- 1%
	8/10/99	25.13 ppm		
Nitric Oxide	8/2/99	24.79 ppm	24.8 ppm	+/- 1%
	8/10/99	24.88 ppm		
NOx			24.9 ppm	Reference Value Only

BALANCE Nitrogen

PREVIOUS CERTIFICATION DATES: None

REFERENCE STANDARDS

COMPONENT	SRM/NTRM#	CYLINDER#	CONCENTRATION
Carbon Monoxide	NTRM-81679	CC88366	97.4 ppm
Nitric Oxide	NTRM-81684	CC78984	98.6 ppm

INSTRUMENTATION

COMPONENT	MAKE/MODEL	SERIAL #	DETECTOR	CALIBRATION DATE(S)
Carbon Monoxide	Horiba VIA-510	570423011	NDIR	7/23/99
Nitric Oxide	Teco 10	10AR-34979-249	Chemil	7/20/99

THIS STANDARD WAS CERTIFIED ACCORDING TO THE EPA PROTOCOL PROCEDURES.
DO NOT USE THIS STANDARD IF THE CYLINDER PRESSURE IS LESS THAN 160 PSIG.

ANALYST:

FRED PIKULA

DATE: 8/10/99



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CERTIFICATE OF ANALYSIS

EPA PROTOCOL MIXTURE PROCEDURE #: G1

CUSTOMER: Gallatin Steel Company
SGI ORDER #: 144936
ITEM#: 4
P.O.#: 72300-1

CYLINDER #: CC110128
CYLINDER PRES: 2000 PSIG
CGA OUTLET: 660

CERTIFICATION DATE: 8/10/99
EXPIRATION DATE: 8/10/2001

CERTIFICATION HISTORY

COMPONENT	DATE OF ASSAY	MEAN CONCENTRATION	CERTIFIED CONCENTRATION	ANALYTICAL ACCURACY
Carbon Monoxide	8/2/99	54.89 ppm	54.7 ppm	+/- 1%
	8/10/99	54.70 ppm		
Nitric Oxide	8/2/99	53.74 ppm	53.9 ppm	+/- 1%
	8/10/99	54.15 ppm		
NOx			54.2 ppm	Reference Value Only

BALANCE Nitrogen

PREVIOUS CERTIFICATION DATES: None

REFERENCE STANDARDS

COMPONENT	SRM/NTRM#	CYLINDER#	CONCENTRATION
Carbon Monoxide	NTRM-81670	CC88366	87.4 ppm
Nitric Oxide	NTRM-81884	CC78984	98.6 ppm

INSTRUMENTATION

COMPONENT	MAKE/MODEL	SERIAL #	DETECTOR	CALIBRATION DATE(S)
Carbon Monoxide	Horiba VIA-510	570423011	NDIR	7/23/99
Nitric Oxide	Teco 10	10AR-34878-249	Chem	7/20/99

THIS STANDARD WAS CERTIFIED ACCORDING TO THE EPA PROTOCOL PROCEDURES.
DO NOT USE THIS STANDARD IF THE CYLINDER PRESSURE IS LESS THAN 150 PSIG.

ANALYST: FRED PIKULA

DATE: 8/10/99

For Technical Information Call
1-800-752-1597



NOX

Air Products and Chemicals, Inc. • 12722 S. Wentworth Avenue, Chicago, IL 60628

ISO CERTIFICATION: 9002

CERTIFICATE OF ANALYSIS: EPA PROTOCOL GAS STANDARD

PERFORMED ACCORDING TO EPA TRACEABILITY PROTOCOL FOR ASSAY AND CERTIFICATION OF GASEOUS CALIBRATION STANDARDS (PROCEDURE #G1)

Customer: Order No: 854-054914-01
AIR PRODUCTS & CHEMICALS, INC. Batch No: 861-59188
DORRAN JENSEN PO:
5837 W. 5TH STREET Release:
JACKSONVILLE FL 32254-1509

Cylinder No: 809110934
Bar Code No: DUB853
Cylinder Pressure: 2000 psig
Certification Date: 06/29/1999
Expiration Date: 06/29/2001

CERTIFIED CONCENTRATION			REFERENCE STANDARDS			ANALYTICAL INSTRUMENTATION			
Component	Certified Concentration	Cylinder Number	Standard Type	Standard Concentration	Instrument Make/Model	Serial Number	Last Calibration	Measurement	Principal
NITRIC OXIDE	79.5 ± 1.2 PPM	SG9120616BAL	GH15	150.1 PPM	THERMO ENVIRO	52829293	06/18/99	CHEMILUMINESCENCE	
SULFUR DIOXIDE	79.5 ± 1.2 PPM	SG9150992BAL	MTN	169.7 PPM	BOYAR 721R PRO	8327-3	06/12/99	NON DISPERSIVE ULTRAVIOLET	

NO2 (Reference Value Only): .800 PPM

NITROGEN Balance Gas

* STANDARD SHOULD NOT BE USED BELOW 150 PSIG

NOx = 93.8

Analyst:

(16921)

Julian K. Seggau
JULIAN K. SEGGAU

Approved By:

James Lee
James Lee

PUB. NO. 320-8702



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CERTIFICATE OF ANALYSIS

EPA PROTOCOL MIXTURE PROCEDURE #: G1

CUSTOMER: Ambient Air Services
SGI ORDER #: 160806
ITEM#: 1
P.O.#: Verbal

CYLINDER #: CC20230
CYLINDER PRES: 1500 PSIG
CGA OUTLET: 660

CERTIFICATION DATE: 11/13/2000
EXPIRATION DATE: 5/13/2001

CERTIFICATION HISTORY

COMPONENT	DATE OF ASSAY	MEAN CONCENTRATION	CERTIFIED CONCENTRATION	ANALYTICAL ACCURACY
Sulfur Dioxide	10/23/2000 11/13/2000	5.916 ppm 5.966 ppm	5.94 ppm	+/- 2%

BALANCE Air

PREVIOUS CERTIFICATION DATES: None

REFERENCE STANDARDS

COMPONENT	SRM/NTRM#	CYLINDER#	CONCENTRATION
Sulfur Dioxide	GMIS-1	CC106646	24.67 ppm

INSTRUMENTATION

COMPONENT	MAKE/MODEL	SERIAL #	DETECTOR	CALIBRATION DATE(S)
Sulfur Dioxide	Nicolet 560	ADL9600109	FTIR	10/24/2000

THIS STANDARD IS NIST TRACEABLE. IT WAS CERTIFIED ACCORDING TO THE EPA PROTOCOL PROCEDURES.
DO NOT USE THIS STANDARD IF THE CYLINDER PRESSURE IS LESS THAN 150 PSIG.

ANALYST: FRED PIKULA

DATE: 11/13/2000



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CERTIFICATE OF ANALYSIS

EPA PROTOCOL MIXTURE PROCEDURE # : G1

CUSTOMER: Ambient Air Services
SGI ORDER # : 0005686
ITEM# : 1
P.O.# : 9589

CYLINDER # : CC85129
CYLINDER PRES: 2000 PSIG
CGA OUTLET: 660

CERTIFICATION DATE: 4/27/2001
EXPIRATION DATE: 10/27/2001

CERTIFICATION HISTORY

COMPONENT	DATE OF ASSAY	MEAN CONCENTRATION	CERTIFIED CONCENTRATION	ANALYTICAL ACCURACY
Sulfur Dioxide	6/29/2000 4/27/2001	12.12 ppm 12.03 ppm	12.07 ppm	+/- 1%

BALANCE Nitrogen

PREVIOUS CERTIFICATION DATES: None

REFERENCE STANDARDS

COMPONENT	SRM/NTRM#	CYLINDER#	CONCENTRATION
Sulfur Dioxide	GMIS-1	CC113875	19.78 ppm

INSTRUMENTATION

COMPONENT	MAKE/MODEL	SERIAL #	DETECTOR	CALIBRATION DATE(S)
Sulfur Dioxide	Horiba VIA-510	851221093	NDIR	4/19/2001

THIS STANDARD WAS CERTIFIED ACCORDING TO THE EPA PROTOCOL PROCEDURES.
DO NOT USE THIS STANDARD IF THE CYLINDER PRESSURE IS LESS THAN 150 PSIG.

ANALYST: FP
FRED PIKULA

DATE: 4/27/2001

GALLATIN STEEL COMPANY

GHENT, KENTUCKY

SUMMARY OF NOX CALIBRATIONS

3-May-01

INSTRUMENT RANGE, PPM					
100					
CALIBRATION GAS PPM		5/3/2001 8:00 INITIAL CALIBRATION	5/3/2001 13:05 END RN 1	5/3/2001 18:10 END RUN 2	5/3/01 22:17 END RUN 3
0.0		-0.7	-0.7	-0.7	-0.8
93.8		92.5	N/A	N/A	N/A
54.2		56.0	56.2	53.3	54.3
24.9		25.4	N/A	N/A	N/A
10.0		9.8	N/A	N/A	N/A
CALIBRATION ERROR		((INSTRUMENT RESPONSE-CALIBRATION GAS VALUE\NSTRUMENT RANGE)X100			
0.0		-0.7	-0.7	-0.7	-0.8
93.8		-1.3	N/A	N/A	N/A
54.2		1.8	2.0	-2.7	0.1
24.9		0.5	N/A	N/A	N/A
10.0		-0.2	N/A	N/A	N/A
CALIBRATION DRIFT		((FINAL CALIBRATION - INITIAL CALIBRATION)\NSTRUMENT RANGE)X100			
0.0		N/A	0.0	0.0	0.0
93.8		N/A	N/A	N/A	N/A
54.2		N/A	0.1	-2.9	-1.7
24.9		N/A	N/A	N/A	N/A
10.0		N/A	N/A	N/A	N/A
ZERO BIAS CHECKS		(SAMPLE SYSTEM-DIRECT)/RANGEX100			
SAMPLE ZERO	DIRECT ZERO	BIAS			
N/A	N/A	N/A	N/A	INITIAL	ALL CAL
N/A	N/A	N/A	N/A	FINAL	
CALIBRATION BIAS CHECKS		GASES INJECTED			
CALIBRATION GAS, PPM		TO PROBE TIP ONLY			
SAMPLE	DIRECT	BIAS			
N/A	N/A	N/A	N/A	INITIAL	
N/A	N/A	N/A	N/A	FINAL	

GALLATIN STEEL COMPANY

GHENT, KENTUCKY

SUMMARY OF SO2 CALIBRATIONS - INNER COMPARTMENTS

3-May-01

INSTRUMENT RANGE, PPM		15	
CALIBRATION GAS PPM	5/3/2001 8:30 INITIAL CALIBRATION	5/3/2001 7:10 PRE RUN 1	5/3/2001 12:45 END RUN 1
	0.0	0.0	0.1
	12.1	N/A	N/A
	5.9	5.9	5.8
((INSTRUMENT RESPONSE-CALIBRATION GAS VALUE)/(INSTRUMENT RANGE)X100			
CALIBRATION ERROR			
0.0	-0.1	-0.1	0.3
12.1	1.5	N/A	N/A
5.9	-0.1	-0.1	-0.7
((FINAL CALIBRATION - INITIAL CALIBRATION)/(INSTRUMENT RANGE)X100			
CALIBRATION DRIFT			
0.0	N/A	0.0	-0.1
12.1	N/A	N/A	N/A
5.9	N/A	-0.1	0.1
(SAMPLE SYSTEM-DIRECT)/(RANGE)X100			
ZERO BIAS CHECKS			
SAMPLE ZERO	DIRECT ZERO	BIAS	
N/A	N/A	N/A	INITIAL
N/A	N/A	N/A	FINAL
ALL CAL			
GASES INJECTED			
TO PROBE TIP ONLY			
BIAS			
SAMPLE	DIRECT	N/A	INITIAL
N/A	N/A	N/A	INITIAL
N/A	N/A	N/A	FINAL

GALLATIN STEEL COMPANY

GHENT, KENTUCKY

SUMMARY OF SO2 CALIBRATIONS - INNER COMPARTMENTS

3-May-01

INSTRUMENT RANGE, PPM		15	
CALIBRATION GAS PPM		5/3/2001 8:30 INITIAL CALIBRATION	5/3/2001 21:50 END RUN 3
0.0		0.0	0.0
12.1		12.3	N/A
5.9		5.9	5.9
CALIBRATION ERROR		((INSTRUMENT RESPONSE-CALIBRATION GAS VALUE)/(INSTRUMENT RANGE)X100	
0.0		-0.1	0.1
12.1		1.5	N/A
5.9		-0.1	0.0
CALIBRATION DRIFT		((FINAL CALIBRATION - INITIAL CALIBRATION)/(INSTRUMENT RANGE)X100	
0.0		N/A	0.2
12.1		N/A	N/A
5.9		N/A	0.1
ZERO BIAS CHECKS		(SAMPLE SYSTEM-DIRECT)/RANGEX100	
SAMPLE ZERO		DIRECT ZERO	BIAS
N/A		N/A	INITIAL
N/A		N/A	FINAL
CALIBRATION BIAS CHECKS		ALL CAL	
CALIBRATION GAS, PPM		GASES INJECTED TO PROBE TIP ONLY	
SAMPLE		DIRECT	BIAS
N/A		N/A	INITIAL
N/A		N/A	FINAL

GALLATIN STEEL COMPANY

GHENT, KENTUCKY

SUMMARY OF SO2 CALIBRATIONS - OUTER COMPARTMENTS

3-May-01

INSTRUMENT RANGE, PPM						15	
CALIBRATION GAS PPM		5/3/2001 8:30 INITIAL CALIBRATION	5/3/2001 7:10 PRE RUN 1	5/3/2001 12:45 END RUN 1	5/3/01 17:50 END RUN 2		
0.0		-0.2	-0.1	-0.1	-0.1		
12.1		12.4	N/A	N/A	N/A		
5.9		5.9	5.9	5.7	5.8		
CALIBRATION ERROR		((INSTRUMENT RESPONSE-CALIBRATION GAS VALUE)/(INSTRUMENT RANGE)X100					
0.0		-1.1	-0.3	-0.9	-0.3		
12.1		2.1	N/A	N/A	N/A		
5.9		-0.3	-0.5	-1.5	-0.7		
CALIBRATION DRIFT		((FINAL CALIBRATION - INITIAL CALIBRATION)/(INSTRUMENT RANGE)X100					
0.0		N/A	0.7	-0.5	0.5		
12.1		N/A	N/A	N/A	N/A		
5.9		N/A	-0.2	-1.0	0.8		
ZERO BIAS CHECKS		(SAMPLE SYSTEM-DIRECT)/RANGEX100					
SAMPLE ZERO	DIRECT ZERO	BIAS					
N/A	N/A	N/A	N/A	INITIAL			
N/A	N/A	N/A	N/A	FINAL	ALL CAL		
CALIBRATION BIAS CHECKS		GASES INJECTED					
CALIBRATION GAS, PPM		TO PROBE TIP ONLY					
SAMPLE	DIRECT	BIAS					
N/A	N/A	N/A	N/A	INITIAL			
N/A	N/A	N/A	N/A	FINAL			

GALLATIN STEEL COMPANY

GHENT, KENTUCKY

SUMMARY OF SO2 CALIBRATIONS - OUTER COMPARTMENTS

3-May-01

INSTRUMENT RANGE, PPM		15		
CALIBRATION GAS PPM		5/3/2001 8:30 INITIAL CALIBRATION	5/3/2001 21:50 END RUN 3	
0.0	-0.2		-0.1	N/A
12.1	12.4		N/A	N/A
5.9	5.9		5.8	N/A
CALIBRATION ERROR ((INSTRUMENT RESPONSE-CALIBRATION GAS VALUE)/(INSTRUMENT RANGE)X100				
0.0	-1.1		-0.8	N/A
12.1	2.1		N/A	N/A
5.9	-0.3		-0.7	N/A
CALIBRATION DRIFT ((FINAL CALIBRATION - INITIAL CALIBRATION)/(INSTRUMENT RANGE)X100				
0.0	N/A		0.3	N/A
12.1	N/A		N/A	N/A
5.9	N/A		-0.3	N/A
ZERO BIAS CHECKS (SAMPLE SYSTEM-DIRECT)/RANGEX100				
SAMPLE ZERO	DIRECT ZERO	BIAS		
N/A	N/A	N/A	INITIAL	
N/A	N/A	N/A	FINAL	
CALIBRATION BIAS CHECKS ALL CAL				
GASES INJECTED TO PROBE TIP ONLY				
SAMPLE	DIRECT	BIAS		
N/A	N/A	N/A	INITIAL	
N/A	N/A	N/A	FINAL	

GALLATIN

yellow
 SO_2 : 0-15 ppm CH 3+7, 4+8
 NO_x : 0-100 ppm CH 2+6
 CO : 0-100 ppm CH 1+5
 black

5-3-01 ASL

TIME	PARAM	STD. CONC	Data Logger	Notes
0530	SO_2 -1	$\emptyset$	0.025 V	channel #7
0530	SO_2 -2	$\emptyset$	0.025 V	" #8
0558	SO_2 -1	5.94	0.401 V	
0558	SO_2 -2	5.94	0.400 V	
0645	SO_2 -1	12.07	0.810 V	
0645	SO_2 -2	12.07	0.812 V	
0800	Both SO_2 -ONLINE		{ SO_2 -1: Comp. 7, yellow SO_2 -2: Comp. 19, black	
0830	NO_x	93.8	9.60 V = 92.6	Channel #6
0855	NO_x	54.2	5.95 = 56.0	
0855	CO	54.7	0.531 = 55.1	Channel #5
0908	CO	25.1	0.252 = 24.4	
0908	NO_x	24.9	2.872 = 25.3	
0916	CO	10.0	0.115 = 9.3	CO - NO_x
0916	NO_x	10.21	1.317 = 9.8	
0920	CO	$\emptyset$	0.039 = 1.0	
0920	NO_x	$\emptyset$	0.265 = -1.0	
0925	NO_x	— ONLINE	—	
0925	CO	— ONLINE	—	
0938-1243	(RUN 1)		3 Heats	
1248	SO_2 -1	$\emptyset$	0.02 ppm	
1248	SO_2 -2	$\emptyset$	-0.15 ppm	
1255	SO_2 -1	5.94	5.75	
1255	SO_2 -2	5.94	5.51	
1302	Both SO_2 — ONLINE		(still scenario #1)	
1310	NO_x	$\emptyset$	0.10 = 0.7	
1310	CO	$\emptyset$	0.33 = 0.2	

Yellow dilution umbilical =
Black dilution umbilical =

TIME	PARAM	STD. CONC.	Data Logger	Notes
1320	CO	54.7	52.6 56.2	
1317	NO _x	54.2	57.0 ✓	
1325	CO	—	ONLINE	
1325	NO _x	—	ONLINE	
1430	SO ₂ -1	∅	0.028	Recheck
1430	SO ₂ -2	∅	0.0	"
1442	SO ₂ -1 YELLOW	5.94	5.98	"
1442	SO ₂ -2 BLACK	5.44	5.88	"
1453	SO ₂ -1	—	ONLINE	{ Comp. 2 Comp. 14
1453	SO ₂ -2			
1458	Start Run 2			
1752	END "			
1756	SO ₂ -1	∅	0.024	
1756	SO ₂ -2	∅	-0.056	
1804	SO ₂ -2	5.94	5.92	
1804	SO ₂ -2	5.94	5.84	
1811	CO	54.7	54.05 58.8	
1810	NO _x	54.2	54.2 53.3	
1815	CO	∅	0.15 -0.2	
1815	NO _x	∅	0.07 -0.8	
1836	SO ₂ -1	—	ONLINE	{ Comp. 4 yellow Comp. 16 black
1836	SO ₂ -2			
Start Run 3				
End Run 3				
2142				

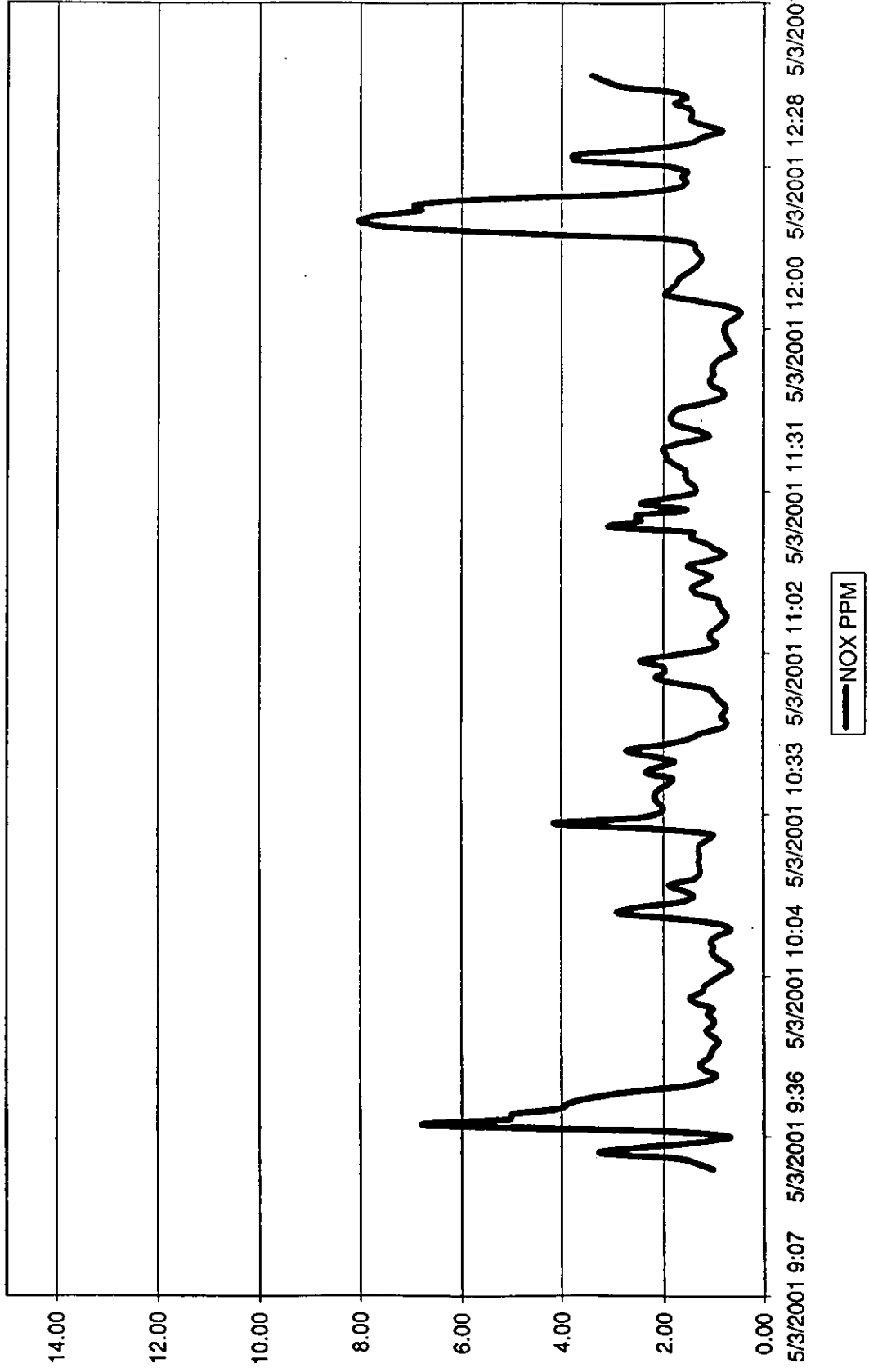
<u>TIME</u>	<u>PARAM</u>	<u>STD. CONC</u>	<u>Data Logger</u>	<u>Notes</u>
2200	SO ₂ -1	Ø	-0.024	
2200	SO ₂ -2	Ø	-0.176	
2210	SO ₂ -1	5.94	5.95	
2210	SO ₂ -2	5.94	5.83	
2217	CO	54.7	54.2	58.3
2217	NO _x	54.2	55.2	54.3
2221	CO	Ø	-0.15	-0.6
2221	NO _x	Ø	0.12	-0.7

APPENDIX C

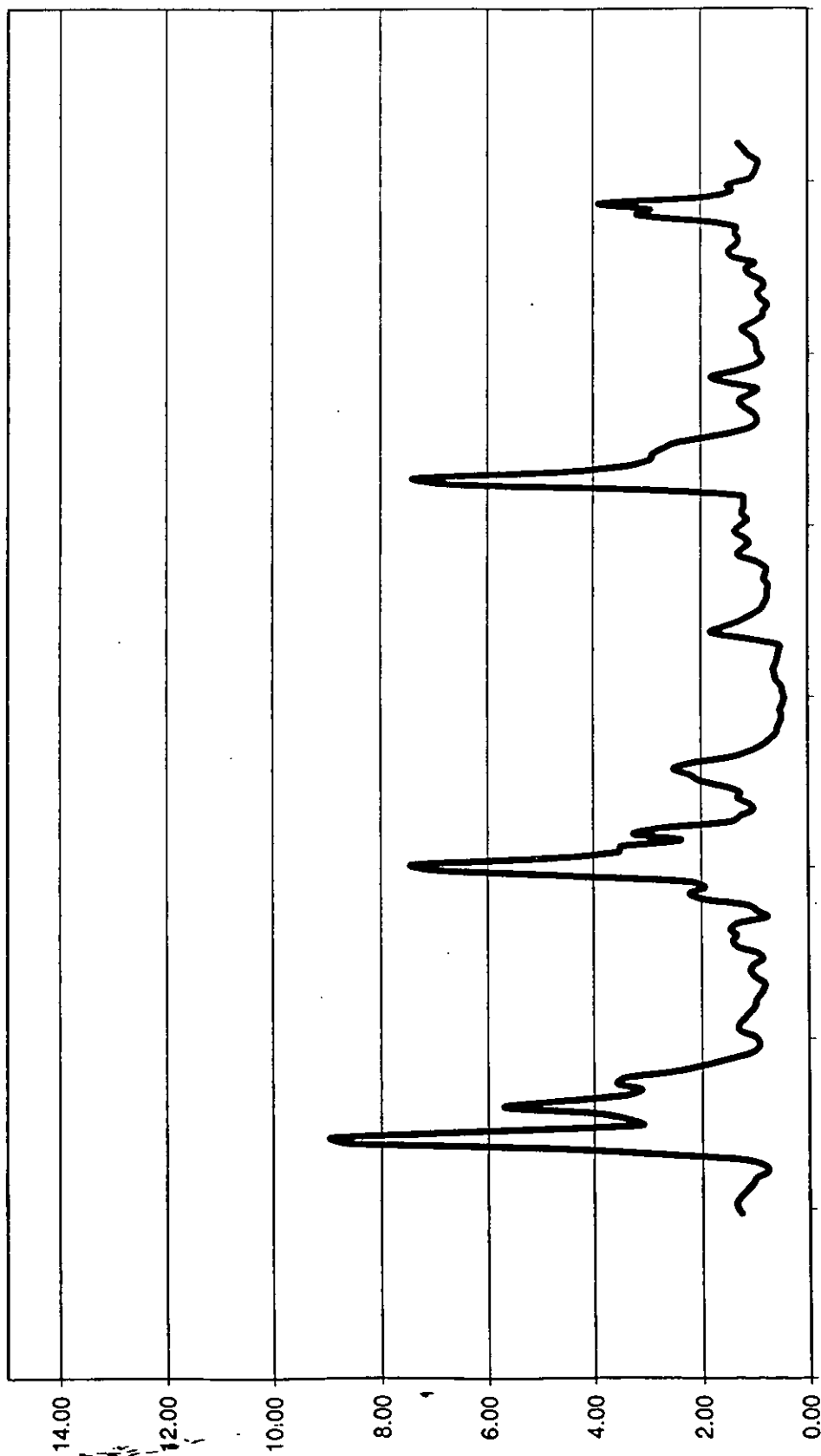
GASEOUS EMISSION DATA SO₂ and NO_x

- DATA GRAPHS
 - NO_x - Run 1, Run 2, Run 3
 - SO₂ - Run 1, Run 2, Run 3
- DATA SUMMARY
 - 5/3/01 05:00 - 5/3/01 22:45

GALLATIN STEEL NOX
RUN 1

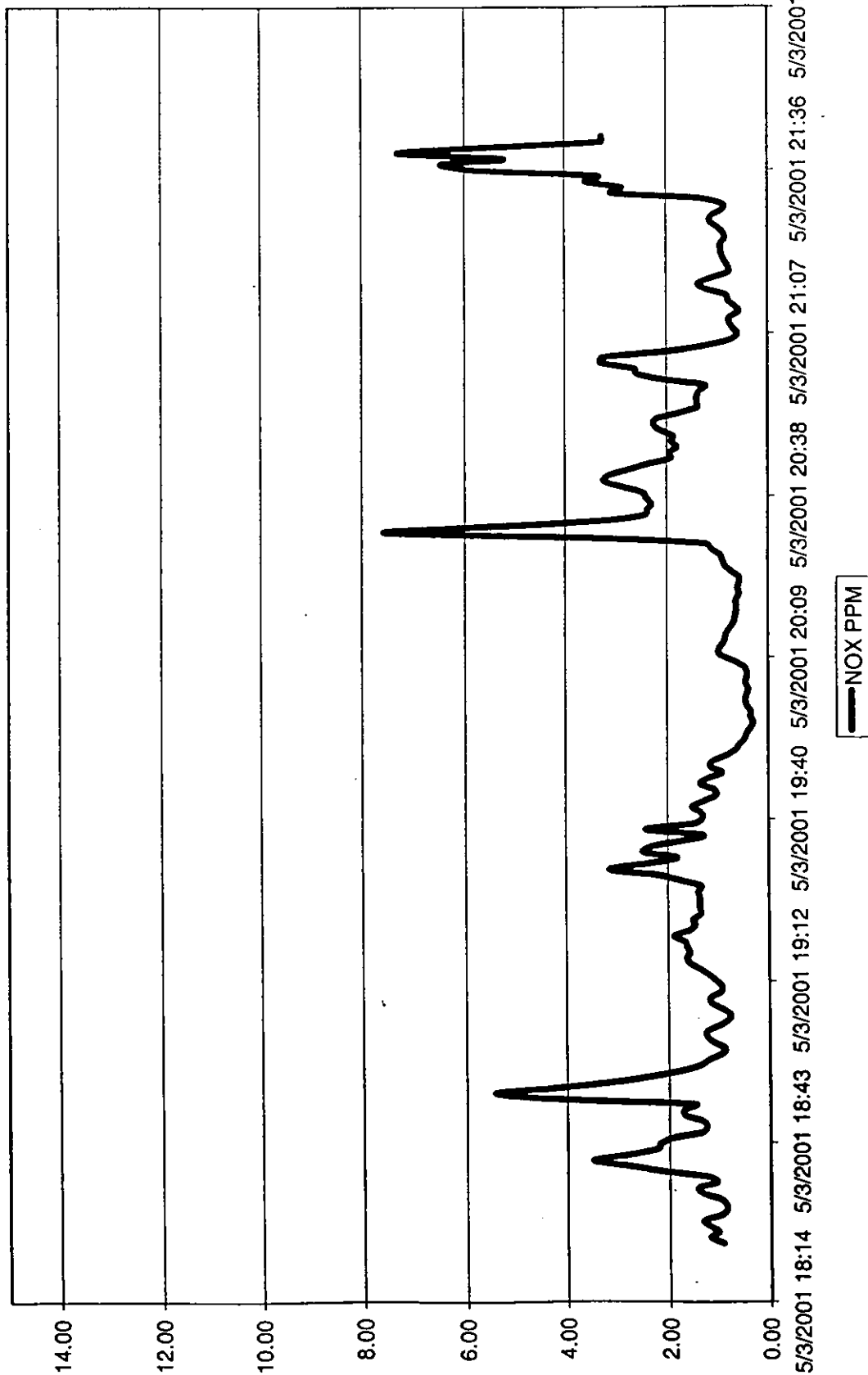


GALLATIN STEEL NOX
RUN 2

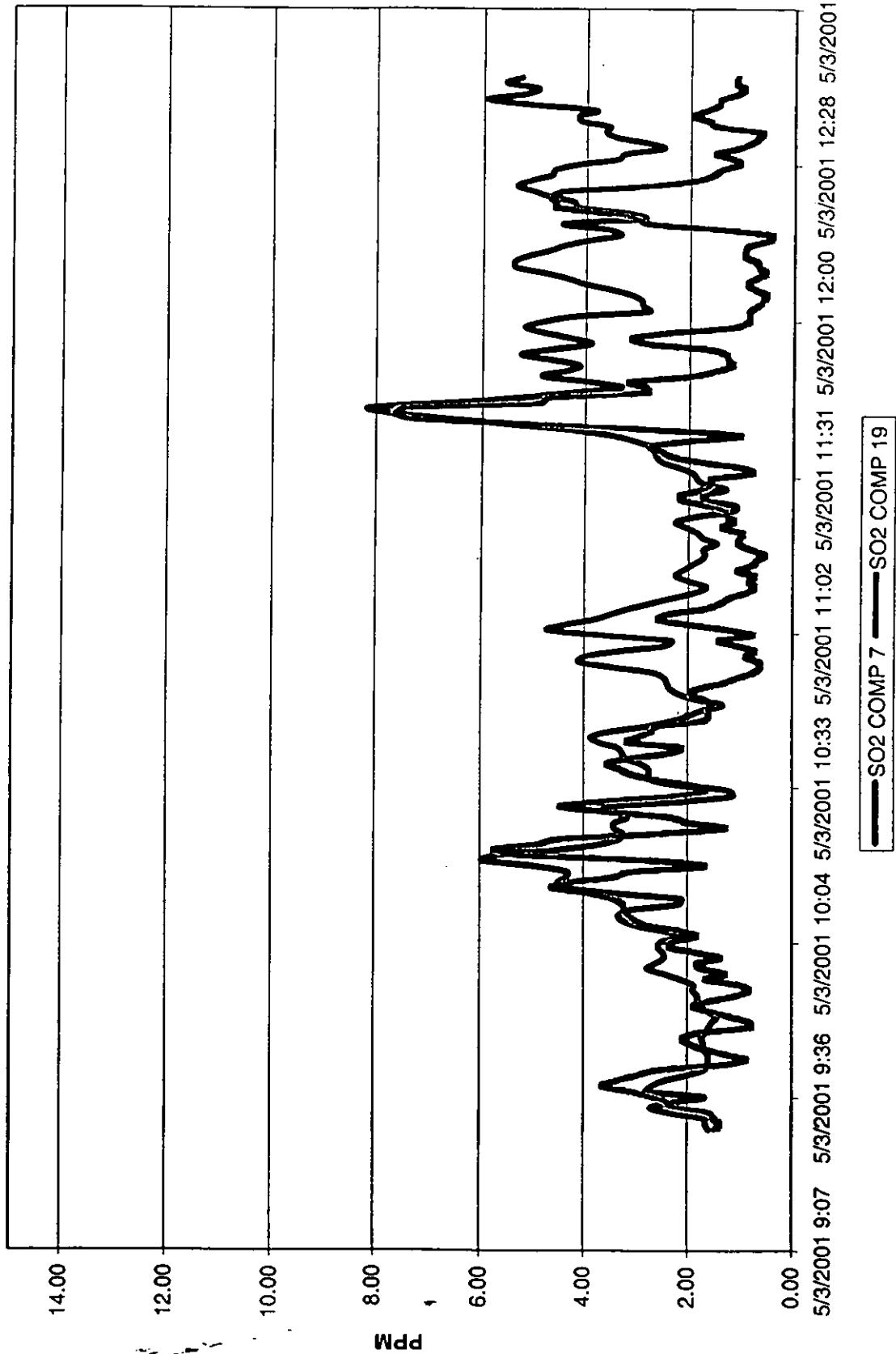


— NOX PPM

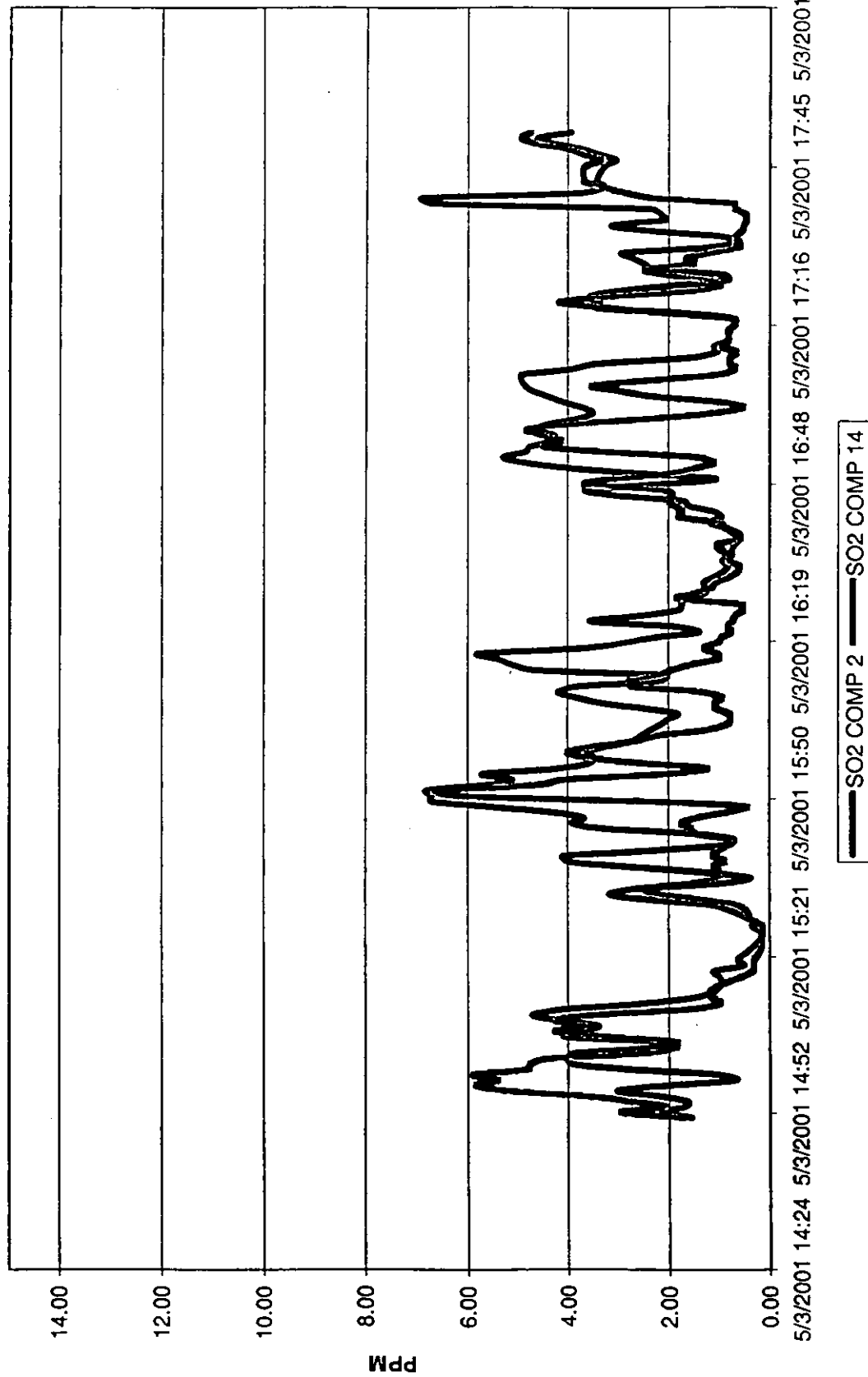
GALLATIN STEEL NOX
RUN 3



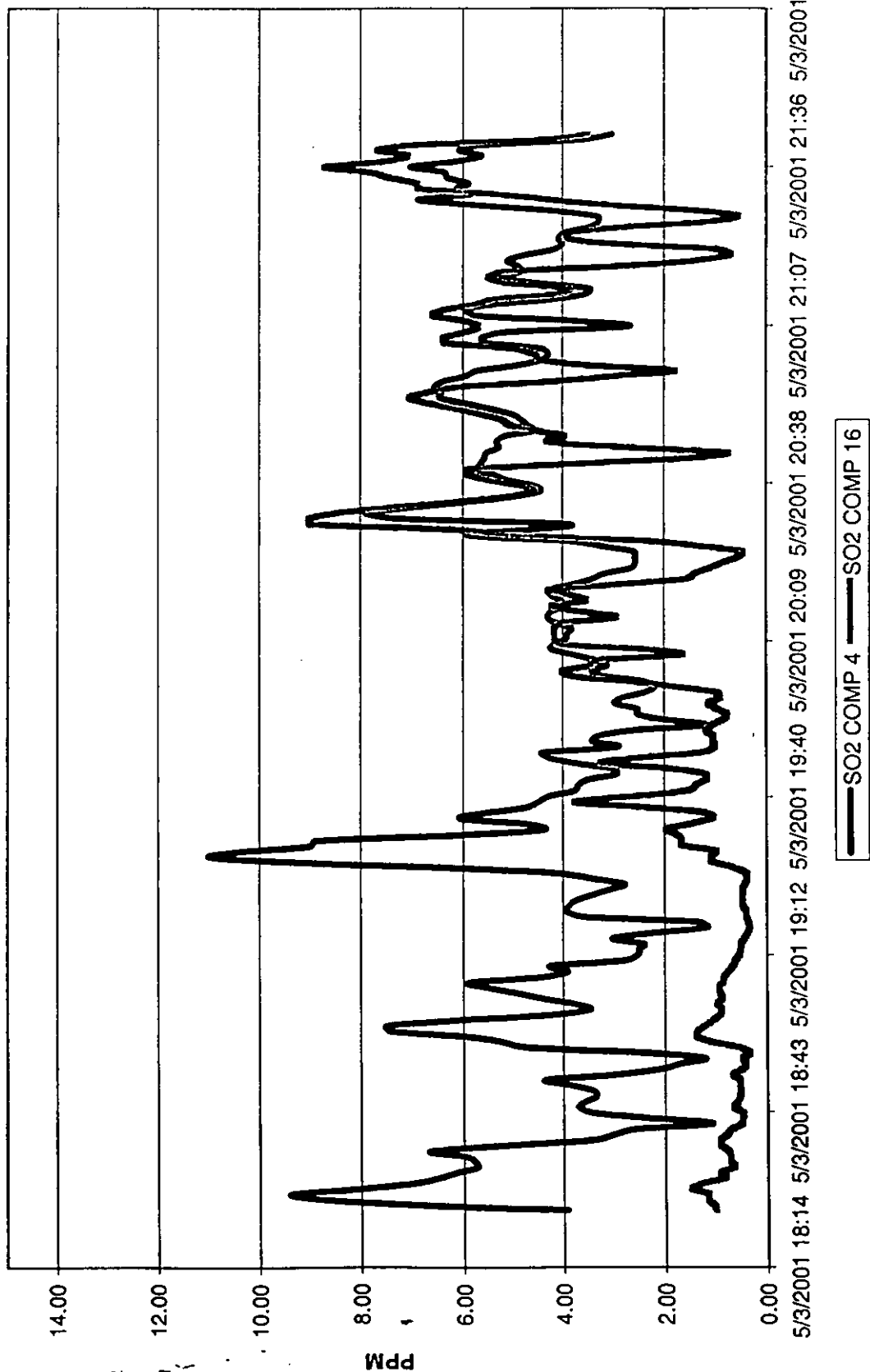
GALLATIN STEEL SO2 RUN 1



GALLATIN STEEL SO2
RUN 2



GALLATIN STEEL SO2
RUN 3



TIME	OBSERVED CONCENTRATION PPM			COMMENTS		CALIBRATION CORRECTIONS					FLOW MEASUREMENTS SCFM							MASS EMISSIONS					EMISSION FACTOR				
	NOX COMP 7	NOX IN	NOX OUT	NOX	NOX	NOX 7	NOX IN	NOX OUT	NOX	NOX	COLD-1	COLD-2	LOW	PURGE A	PURGE C	TOTAL	NOX LB/HR	NOX IN LB/HR	NOX OUT LB/HR	AVERAGE NOX LB/HR	PRODUCTION	NOX	NOX	NOX	NOX	NOX	
5/9/2001 13:13	-1.83	6.1	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9																	
5/9/2001 13:14	-1.83	6.1	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9																	
5/9/2001 13:15	-1.83	6.1	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9																	
5/9/2001 13:16	-1.83	6.1	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9																	
5/9/2001 13:17	-1.83	6.1	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9																	
5/9/2001 13:18	-1.83	6.1	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9																	
5/9/2001 13:19	-1.83	6.1	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9																	
5/9/2001 13:20	-1.83	6.1	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9																	
5/9/2001 13:21	-1.83	6.1	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9																	
5/9/2001 13:22	-1.83	6.1	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9																	
5/9/2001 13:23	-1.83	6.1	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9																	
5/9/2001 13:24	-1.83	6.1	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9																	
5/9/2001 13:25	-1.83	6.1	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9																	
5/9/2001 13:26	-1.83	6.1	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9																	
5/9/2001 13:27	-1.83	6.1	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9																	
5/9/2001 13:28	-1.83	6.1	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9																	
5/9/2001 13:29	-1.83	6.1	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9																	
5/9/2001 13:30	-1.83	6.1	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9																	
5/9/2001 13:31	-1.83	6.1	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9																	
5/9/2001 13:32	-1.83	6.1	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9																	
5/9/2001 13:33	-1.83	6.1	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9																	
5/9/2001 13:34	-1.83	6.1	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9																	
5/9/2001 13:35	-1.83	6.1	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9																	
5/9/2001 13:36	-1.83	6.1	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9																	
5/9/2001 13:37	-1.83	6.1	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9																	
5/9/2001 13:38	-1.83	6.1	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9																	
5/9/2001 13:39	-1.83	6.1	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9																	
5/9/2001 13:40	-1.83	6.1	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9																	
5/9/2001 13:41	-1.83	6.1	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9																	
5/9/2001 13:42	-1.83	6.1	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9																	
5/9/2001 13:43	-1.83	6.1	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9																	
5/9/2001 13:44	-1.83	6.1	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9																	
5/9/2001 13:45	-1.83	6.1	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9																	
5/9/2001 13:46	-1.83	6.1	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9																	
5/9/2001 13:47	-1.83	6.1	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9																	
5/9/2001 13:48	-1.83	6.1	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9																	
5/9/2001 13:49	-1.83	6.1	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9																	
5/9/2001 13:50	-1.83	6.1	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9																	
5/9/2001 13:51	-1.83	6.1	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9																	
5/9/2001 13:52	-1.83	6.1	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9																	
5/9/2001 13:53	-1.83	6.1	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9																	
5/9/2001 13:54	-1.83	6.1	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9																	
5/9/2001 13:55	-1.83	6.1	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9																	
5/9/2001 13:56	-1.83	6.1	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9																	
5/9/2001 13:57	-1.83	6.1	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9																	
5/9/2001 13:58	-1.83	6.1	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9																	
5/9/2001 13:59	-1.83	6.1	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9																	
5/9/2001 14:00	-1.83	6.1	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9																	

GALLATIN STEEL SO₂ TEST
FLOW AVERAGES

Cold Duct 1		ACFM	SCFMD	SCFMW
	R1	952974.	834555.	846113.
	R2	962283.	834826.	851927.
	R3	<u>932043.</u>	<u>831991.</u>	<u>848086.</u>
	Avg.	949100.	833791.	848709.

Cold Duct 2		ACFMD	SCFMD	SCFMW
	R1	93541.	77357.	78428.
	R2	76467.	69720.	71148.
	R3	<u>83826.</u>	<u>77680.</u>	<u>79183.</u>
	Avg.	84611.	74919.	76253.

Hot Duct		ACFM	SCFMD	SCFMW
	R1	395103.	219690.	222732.
	R2	402313.	219601.	224099.
	R3	<u>378720.</u>	<u>237330.</u>	<u>241921.</u>
	Avg.	392045.	225540.	229584.

Total Flow		ACFM	SCFMD	SCFMW
		1,425,756.	1,134,250.	1,154,546.

APPENDIX D

FLOW RATES

EPA METHODS 1-4

GALLATIN STEEL COMPANY - SUMMARY OF BAGHOUSE FLOW RATES

	COLD 1			COLD 2			LMF			FURNACE A			FURNACE C			TOTAL	
	ACFM	SCFMD	SCFMW	ACFM	SCFMD	SCFMW	ACFM	SCFMD	SCFMW	ACFM	SCFMD	SCFMW	ACFM	SCFMD	SCFMW	ACFM	SCFMD
RUN 1	969420	881409	900084	101937	93063	95035	23697	19491	19904	261695	132503	135310	95756	86409	88240	1452505	1212875
RUN 2	1034806	877068	898983	19761	17714	18157	16205	13215	13545	52458	46628	47793	290645	151482	155267	1413875	1106107
RUN 3	1010457	884181	905918	5843	5341	5472	25924	20563	21069	64024	52789	54087	323278	169471	173637	1429526	1132345
AVERAGE	1004894	880886	901662	42514	38706	39555	21942	17756	18173	126059	77307	79063	236560	135787	139048	1431969	1150442

NOTE - SCFMD TOTAL USED FOR NOX CONVERSION OF PPM TO POUNDS PER HOUR. SCFMW USED FOR SO2.

Ambient Air Services, Inc.
Environmental Consultants

106 Ambient Air Way
Starke, Florida 32091

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Volumetric Air-Flow Rates

Plant	Gallatin Steel		
Location	Ghent, Kentucky		
Stack	Cold Duct No. 1		
Run Date	5-3-01		
Run Number	1	Volume Metered	64.155
Start Time	1137	Meter Temp (Deg R)	537.3
Finish Time	1142	Orsat CO2 %	0
Barometric Pressure	29.74	Orsat O2 %	20.9
Stack Diameter (in.)	192	Orsat CO %	0
Stack Area sq. ft.	201.062	Orsat N %	79.1
Number of Points	16	Condensate Volume	28.1
Avg of SQRT of V.H.	1.3743	Delta H (inches H2O)	1.741
Meter Correction (Y)	0.992	Stack Pressure	29.49
Pitot Correction Factor	0.84	Stack Temp (Deg R)	560.5

=====

Moisture in stack gas, volume fraction	0.021
Dry Stack Gas, volume fraction	0.979
Molecular Weight of Stack Gas (Dry Basis)	28.84
Molecular Weight of Stack Gas (Stack conditions)	28.610
Specific gravity of Stack Gas Relative to Air	0.987
Excess Air (%)	
Average Stack Velocity, FPM	4821.5
Actual Stack Gas Flow Rate, ACFM	969420
Actual Stack Gas Flow Rate, (Dry) ACFMD	949306
Stack Gas Flow Rate (Standard conditions), SCFMD	881409
Stack Gas Flow Rate (Standard conditions), SCFMW	900084

GALLATIN STEEL SO₂ TEST
FLOW AVERAGES

Cold Duct 1		ACFM	SCFMD	SCFMW
	R1	952974.	834555.	846113.
	R2	962283.	834826.	851927.
	R3	<u>932043.</u>	<u>831991.</u>	<u>848086.</u>
	Avg.	949100.	833791.	848709.
Cold Duct 2		ACFMD	SCFMD	SCFMW
	R1	93541.	77357.	78428.
	R2	76467.	69720.	71148.
	R3	<u>83826.</u>	<u>77680.</u>	<u>79183.</u>
	Avg.	84611.	74919.	76253.
Hot Duct		ACFM	SCFMD	SCFMW
	R1	395103.	219690.	222732.
	R2	402313.	219601.	224099.
	R3	<u>378720.</u>	<u>237330.</u>	<u>241921.</u>
	Avg.	392045.	225540.	229584.
Total Flow		ACFM	SCFMD	SCFMW
		1,425,756.	1,134,250.	1,154,546.

APPENDIX D

FLOW RATES
EPA METHODS 1-4

GALLATIN STEEL COMPANY - SUMMARY OF BAGHOUSE FLOW RATES

	COLD 1			COLD 2			LMF			FURNACE A			FURNACE C			TOTAL		
	ACFM	SCFMD	SCFMW	ACFM	SCFMD	SCFMW	ACFM	SCFMD	SCFMW	ACFM	SCFMD	SCFMW	ACFM	SCFMD	SCFMW	ACFM	SCFMD	SCFMW
RUN 1	969420	881409	900084	101937	93063	95035	23697	19491	19904	261695	132503	135310	95756	86409	88240	1452505	1212875	1238573
RUN 2	1034806	877068	898983	19761	17714	18157	16205	13215	13545	52458	46628	47793	290845	151482	155267	1413875	1106107	1133745
RUN 3	1010457	884181	905918	5843	5341	5472	25924	20563	21069	64024	52789	54087	323278	169471	173637	1429526	1132345	1160183
AVERAGE	1004694	880888	901682	42514	38706	39555	21942	17756	18173	126059	77307	79053	236560	135787	139048	1431969	1150442	1177500

NOTE - SCFMD TOTAL USED FOR NOX CONVERSION OF PPM TO POUNDS PER HOUR, SCFMW USED FOR SO2.

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Volumetric Air-Flow Rates

Plant	Gallatin Steel		
Location	Ghent, Kentucky		
Stack	Cold Duct No. 1		
Run Date	5-3-01		
Run Number	1	Volume Metered	64.155
Start Time	1137	Meter Temp (Deg R)	537.3
Finish Time	1142	Orsat CO2 %	0
Barometric Pressure	29.74	Orsat O2 %	20.9
Stack Diameter (in.)	192	Orsat CO %	0
Stack Area sq. ft.	201.062	Orsat N %	79.1
Number of Points	16	Condensate Volume	28.1
Avg of SQRT of V.H.	1.3743	Delta H (inches H2O)	1.741
Meter Correction (Y)	0.992	Stack Pressure	29.49
Pitot Correction Factor	0.84	Stack Temp (Deg R)	560.5

=====

Moisture in stack gas, volume fraction	0.021
Dry Stack Gas, volume fraction	0.979
Molecular Weight of Stack Gas (Dry Basis)	28.84
Molecular Weight of Stack Gas (Stack conditions)	28.610
Specific gravity of Stack Gas Relative to Air	0.987
Excess Air (%)	
Average Stack Velocity, FPM	4821.5
Actual Stack Gas Flow Rate, ACFM	969420
Actual Stack Gas Flow Rate, (Dry) ACFMD	949306
Stack Gas Flow Rate (Standard conditions), SCFMD	881409
Stack Gas Flow Rate (Standard conditions), SCFMW	900084

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Volumetric Air-Flow Rates

Plant	Gallatin Steel		
Location	Ghent, Kentucky		
Stack	Cold Duct No. 2		
Run Date	5-3-01		
Run Number	1	Volume Metered	64.155
Start Time	1150	Meter Temp (Deg R)	537.3
Finish Time	1157	Orsat CO2 %	0
Barometric Pressure	29.74	Orsat O2 %	20.9
Stack Diameter (in.)	120	Orsat CO %	0
Stack Area sq. ft.	78.540	Orsat N %	79.1
Number of Points	16	Condensate Volume	28.1
Avg of SQRT of V.H.	0.3707	Delta H (inches H2O)	1.741
Meter Correction (Y)	0.992	Stack Pressure	29.59
Pitot Correction Factor	0.84	Stack Temp (Deg R)	560.1

=====

Moisture in stack gas, volume fraction	0.021
Dry Stack Gas, volume fraction	0.979
Molecular Weight of Stack Gas (Dry Basis)	28.84
Molecular Weight of Stack Gas (Stack conditions)	28.610
Specific gravity of Stack Gas Relative to Air	0.987
Excess Air (%)	
Average Stack Velocity, FPM	1297.9
Actual Stack Gas Flow Rate, ACFM	101937
Actual Stack Gas Flow Rate, (Dry) ACFMD	99822
Stack Gas Flow Rate (Standard conditions), SCFMD	93063
Stack Gas Flow Rate (Standard conditions), SCFMW	95035

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Volumetric Air-Flow Rates

Plant	Gallatin Steel		
Location	Ghent, Kentucky		
Stack	LMF		
Run Date	5-3-01		
Run Number	1	Volume Metered	64.155
Start Time	1045	Meter Temp (Deg R)	537.3
Finish Time	1053	Orsat CO2 %	0
Barometric Pressure	29.74	Orsat O2 %	20.9
Stack Diameter (in.)	60	Orsat CO %	0
Stack Area sq. ft.	19.635	Orsat N %	79.1
Number of Points	12	Condensate Volume	28.1
Avg of SQRT of V.H.	0.3272	Delta H (Inches H2O)	1.741
Meter Correction (Y)	0.992	Stack Pressure	29.43
Pitot Correction Factor	0.84	Stack Temp (Deg R)	618.3

=====

Moisture in stack gas, volume fraction	0.021
Dry Stack Gas, volume fraction	0.979
Molecular Weight of Stack Gas (Dry Basis)	28.84
Molecular Weight of Stack Gas (Stack conditions)	28.610
Specific gravity of Stack Gas Relative to Air	0.987
Excess Air (%)	
Average Stack Velocity, FPM	1206.9
Actual Stack Gas Flow Rate, ACFM	23697
Actual Stack Gas Flow Rate, (Dry) ACFMD	23205
Stack Gas Flow Rate (Standard conditions), SCFMD	19491
Stack Gas Flow Rate (Standard conditions), SCFMW	19904

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Volumetric Air-Flow Rates

Plant	Gallatin Steel		
Location	Ghent, Kentucky		
Stack	Furnace A		
Run Date	5-3-01		
Run Number	1	Volume Metered	64.155
Start Time	1009	Meter Temp (Deg R)	537.3
Finish Time	1017	Orsat CO2 %	0
Barometric Pressure	29.74	Orsat O2 %	20.9
Stack Diameter (in.)	108	Orsat CO %	0
Stack Area sq. ft.	63.617	Orsat N %	79.1
Number of Points	12	Condensate Volume	28.1
Avg of SQRT of V.H.	0.8750	Delta H (inches H2O)	1.741
Meter Correction (Y)	0.992	Stack Pressure	29.42
Pitot Correction Factor	0.84	Stack Temp (Deg R)	1004.1

=====

Moisture in stack gas, volume fraction	0.021
Dry Stack Gas, volume fraction	0.979
Molecular Weight of Stack Gas (Dry Basis)	28.84
Molecular Weight of Stack Gas (Stack conditions)	28.610
Specific gravity of Stack Gas Relative to Air	0.987
Excess Air (%)	
Average Stack Velocity, FPM	4113.6
Actual Stack Gas Flow Rate, ACFM	261695
Actual Stack Gas Flow Rate, (Dry) ACFMD	256265
Stack Gas Flow Rate (Standard conditions), SCFMD	132503
Stack Gas Flow Rate (Standard conditions), SCFMW	135310

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Volumetric Air-Flow Rates

Plant	Gallatin Steel		
Location	Ghent, Kentucky		
Stack	Furnace C		
Run Date	5-3-01		
Run Number	1	Volume Metered	64.155
Start Time	1020	Meter Temp (Deg R)	537.3
Finish Time	1027	Orsat CO2 %	0
Barometric Pressure	29.74	Orsat O2 %	20.9
Stack Diameter (in.)	120	Orsat CO %	0
Stack Area sq. ft.	78.540	Orsat N %	79.1
Number of Points	16	Condensate Volume	28.1
Avg of SQRT of V.H.	0.3462	Delta H (inches H2O)	1.741
Meter Correction (Y)	0.992	Stack Pressure	29.42
Pitot Correction Factor	0.84	Stack Temp (Deg R)	563.4

=====

Moisture in stack gas, volume fraction	0.021
Dry Stack Gas, volume fraction	0.979
Molecular Weight of Stack Gas (Dry Basis)	28.84
Molecular Weight of Stack Gas (Stack conditions)	28.610
Specific gravity of Stack Gas Relative to Air	0.987
Excess Air (%)	
Average Stack Velocity, FPM	1219.2
Actual Stack Gas Flow Rate, ACFM	95756
Actual Stack Gas Flow Rate, (Dry) ACFMD	93769
Stack Gas Flow Rate (Standard conditions), SCFMD	86409
Stack Gas Flow Rate (Standard conditions), SCFMW	88240

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Volumetric Air-Flow Rates

Plant	Gallatin Steel		
Location	Ghent, Kentucky		
Stack	Cold Duct No. 1		
Run Date	5-3-01		
Run Number	2	Volume Metered	31.921
Start Time	1606	Meter Temp (Deg R)	535.6
Finish Time	1612	Orsat CO2 %	0
Barometric Pressure	29.66	Orsat O2 %	20.9
Stack Diameter (in.)	192	Orsat CO %	0
Stack Area sq. ft.	201.062	Orsat N %	79.1
Number of Points	16	Condensate Volume	16.5
Avg of SQRT of V.H.	1.4183	Delta H (inches H2O)	1.9
Meter Correction (Y)	0.992	Stack Pressure	29.37
Pitot Correction Factor	0.84	Stack Temp (Deg R)	596.6

=====

Moisture in stack gas, volume fraction	0.024
Dry Stack Gas, volume fraction	0.976
Molecular Weight of Stack Gas (Dry Basis)	28.84
Molecular Weight of Stack Gas (Stack conditions)	28.570
Specific gravity of Stack Gas Relative to Air	0.986
Excess Air (%)	
Average Stack Velocity, FPM	5146.7
Actual Stack Gas Flow Rate, ACFM	1034806
Actual Stack Gas Flow Rate, (Dry) ACFMD	1009579
Stack Gas Flow Rate (Standard conditions), SCFMD	877068
Stack Gas Flow Rate (Standard conditions), SCFMW	898983

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Volumetric Air-Flow Rates

Plant	Gallatin Steel		
Location	Ghent, Kentucky		
Stack	Cold Duct No. 2		
Run Date	5-3-01		
Run Number	2	Volume Metered	31.921
Start Time	1555	Meter Temp (Deg R)	535.6
Finish Time	1604	Orsat CO2 %	0
Barometric Pressure	29.66	Orsat O2 %	20.9
Stack Diameter (in.)	120	Orsat CO %	0
Stack Area sq. ft.	78.540	Orsat N %	79.1
Number of Points	16	Condensate Volume	16.5
Avg of SQRT of V.H.	0.0713	Delta H (inches H2O)	1.9
Meter Correction (Y)	0.992	Stack Pressure	29.48
Pitot Correction Factor	0.84	Stack Temp (Deg R)	566.2

=====

Moisture in stack gas, volume fraction	0.024
Dry Stack Gas, volume fraction	0.976
Molecular Weight of Stack Gas (Dry Basis)	28.84
Molecular Weight of Stack Gas (Stack conditions)	28.570
Specific gravity of Stack Gas Relative to Air	0.986
Excess Air (%)	
Average Stack Velocity, FPM	251.6
Actual Stack Gas Flow Rate, ACFM	19761
Actual Stack Gas Flow Rate, (Dry) ACFMD	19279
Stack Gas Flow Rate (Standard conditions), SCFMD	17714
Stack Gas Flow Rate (Standard conditions), SCFMW	18157

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Volumetric Air-Flow Rates

Plant	Gallatin Steel		
Location	Ghent, Kentucky		
Stack	LMF		
Run Date	5-3-01		
Run Number	2	Volume Metered	31.921
Start Time	1649	Meter Temp (Deg R)	535.6
Finish Time	1657	Orsat CO2 %	0
Barometric Pressure	29.66	Orsat O2 %	20.9
Stack Diameter (in.)	60	Orsat CO %	0
Stack Area sq. ft.	19.635	Orsat N %	79.1
Number of Points	12	Condensate Volume	16.5
Avg of SQRT of V.H.	0.2231	Delta H (inches H2O)	1.9
Meter Correction (Y)	0.992	Stack Pressure	29.32
Pitot Correction Factor	0.84	Stack Temp (Deg R)	619

=====

Moisture in stack gas, volume fraction	0.024
Dry Stack Gas, volume fraction	0.976
Molecular Weight of Stack Gas (Dry Basis)	28.84
Molecular Weight of Stack Gas (Stack conditions)	28.570
Specific gravity of Stack Gas Relative to Air	0.986
Excess Air (%)	
Average Stack Velocity, FPM	825.3
Actual Stack Gas Flow Rate, ACFM	16205
Actual Stack Gas Flow Rate, (Dry) ACFMD	15810
Stack Gas Flow Rate (Standard conditions), SCFMD	13215
Stack Gas Flow Rate (Standard conditions), SCFMW	13545

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Volumetric Air-Flow Rates

Plant	Gallatin Steel		
Location	Ghent, Kentucky		
Stack	Furnace A		
Run Date	5-3-01		
Run Number	2	Volume Metered	31.921
Start Time	1632	Meter Temp (Deg R)	535.6
Finish Time	1640	Orsat CO2 %	0
Barometric Pressure	29.66	Orsat O2 %	20.9
Stack Diameter (in.)	108	Orsat CO %	0
Stack Area sq. ft.	63.617	Orsat N %	79.1
Number of Points	12	Condensate Volume	16.5
Avg of SQRT of V.H.	0.2356	Delta H (inches H2O)	1.9
Meter Correction (Y)	0.992	Stack Pressure	29.39
Pitot Correction Factor	0.84	Stack Temp (Deg R)	583.5

=====

Moisture in stack gas, volume fraction	0.024
Dry Stack Gas, volume fraction	0.976
Molecular Weight of Stack Gas (Dry Basis)	28.84
Molecular Weight of Stack Gas (Stack conditions)	28.570
Specific gravity of Stack Gas Relative to Air	0.986
Excess Air (%)	
Average Stack Velocity, FPM	845.2
Actual Stack Gas Flow Rate, ACFM	53769
Actual Stack Gas Flow Rate, (Dry) ACFMD	52458
Stack Gas Flow Rate (Standard conditions), SCFMD	46628
Stack Gas Flow Rate (Standard conditions), SCFMW	47793

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Volumetric Air-Flow Rates

Plant	Gallatin Steel		
Location	Ghent, Kentucky		
Stack	Furnace C		
Run Date	5-3-01		
Run Number	2	Volume Metered	31.921
Start Time	1620	Meter Temp (Deg R)	535.6
Finish Time	1629	Orsat CO2 %	0
Barometric Pressure	29.66	Orsat O2 %	20.9
Stack Diameter (in.)	120	Orsat CO %	0
Stack Area sq. ft.	78.540	Orsat N %	79.1
Number of Points	12	Condensate Volume	16.5
Avg of SQRT of V.H.	0.7997	Delta H (inches H2O)	1.9
Meter Correction (Y)	0.992	Stack Pressure	29.37
Pitot Correction Factor	0.84	Stack Temp (Deg R)	970.2

=====

Moisture in stack gas, volume fraction	0.024
Dry Stack Gas, volume fraction	0.976
Molecular Weight of Stack Gas (Dry Basis)	28.84
Molecular Weight of Stack Gas (Stack conditions)	28.570
Specific gravity of Stack Gas Relative to Air	0.986
Excess Air (%)	
Average Stack Velocity, FPM	3700.6
Actual Stack Gas Flow Rate, ACFM	290645
Actual Stack Gas Flow Rate, (Dry) ACFMD	283560
Stack Gas Flow Rate (Standard conditions), SCFMD	151482
Stack Gas Flow Rate (Standard conditions), SCFMW	155267

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Volumetric Air-Flow Rates

Plant	Gallatin Steel		
Location	Ghent, Kentucky		
Stack	Cold Duct No. 1		
Run Date	5-3-01		
Run Number	3	Volume Metered	32.081
Start Time	2009	Meter Temp (Deg R)	536.5
Finish Time	2019	Orsat CO2 %	0
Barometric Pressure	29.66	Orsat O2 %	20.9
Stack Diameter (in.)	192	Orsat CO %	0
Stack Area sq. ft.	201.062	Orsat N %	79.1
Number of Points	16	Condensate Volume	16.3
Avg of SQRT of V.H.	1.4069	Delta H (Inches H2O)	1.9
Meter Correction (Y)	0.992	Stack Pressure	29.38
Pitot Correction Factor	0.84	Stack Temp (Deg R)	578.3

=====

Moisture in stack gas, volume fraction	0.024
Dry Stack Gas, volume fraction	0.976
Molecular Weight of Stack Gas (Dry Basis)	28.84
Molecular Weight of Stack Gas (Stack conditions)	28.580
Specific gravity of Stack Gas Relative to Air	0.986
Excess Air (%)	
Average Stack Velocity, FPM	5025.6
Actual Stack Gas Flow Rate, ACFM	1010457
Actual Stack Gas Flow Rate, (Dry) ACFMD	986212
Stack Gas Flow Rate (Standard conditions), SCFMD	884181
Stack Gas Flow Rate (Standard conditions), SCFMW	905918

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Volumetric Air-Flow Rates

Plant	Gallatin Steel		
Location	Ghent, Kentucky		
Stack	Cold Duct No. 2		
Run Date	5-3-01		
Run Number	3	Volume Metered	32.081
Start Time	2021	Meter Temp (Deg R)	536.5
Finish Time	2029	Orsat CO2 %	0
Barometric Pressure	29.66	Orsat O2 %	20.9
Stack Diameter (in.)	120	Orsat CO %	0
Stack Area sq. ft.	78.540	Orsat N %	79.1
Number of Points	16	Condensate Volume	16.3
Avg of SQRT of V.H.	0.0213	Delta H (inches H2O)	1.9
Meter Correction (Y)	0.992	Stack Pressure	29.48
Pitot Correction Factor	0.84	Stack Temp (Deg R)	555.5

=====

Moisture in stack gas, volume fraction	0.024
Dry Stack Gas, volume fraction	0.976
Molecular Weight of Stack Gas (Dry Basis)	28.84
Molecular Weight of Stack Gas (Stack conditions)	28.580
Specific gravity of Stack Gas Relative to Air	0.986
Excess Air (%)	
Average Stack Velocity, FPM	74.4
Actual Stack Gas Flow Rate, ACFM	5843
Actual Stack Gas Flow Rate, (Dry) ACFMD	5703
Stack Gas Flow Rate (Standard conditions), SCFMD	5341
Stack Gas Flow Rate (Standard conditions), SCFMW	5472

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Volumetric Air-Flow Rates

Plant	Gallatin Steel		
Location	Ghent, Kentucky		
Stack	Furnace A LMF		
Run Date	5-3-01		
Run Number	3	Volume Metered	32.081
Start Time	1932	Meter Temp (Deg R)	536.5
Finish Time	1940	Orsat CO2 %	0
Barometric Pressure	29.66	Orsat O2 %	20.9
Stack Diameter (in.)	60	Orsat CO %	0
Stack Area sq. ft.	19.635	Orsat N %	79.1
Number of Points	12	Condensate Volume	16.3
Avg of SQRT of V.H.	0.3519	Delta H (inches H2O)	1.9
Meter Correction (Y)	0.992	Stack Pressure	29.35
Pitot Correction Factor	0.84	Stack Temp (Deg R)	637.3

=====

Moisture in stack gas, volume fraction	0.024
Dry Stack Gas, volume fraction	0.976
Molecular Weight of Stack Gas (Dry Basis)	28.84
Molecular Weight of Stack Gas (Stack conditions)	28.580
Specific gravity of Stack Gas Relative to Air	0.986
Excess Air (%)	
Average Stack Velocity, FPM	1320.3
Actual Stack Gas Flow Rate, ACFM	25924
Actual Stack Gas Flow Rate, (Dry) ACFMD	25302
Stack Gas Flow Rate (Standard conditions), SCFMD	20563
Stack Gas Flow Rate (Standard conditions), SCFMW	21069

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Volumetric Air-Flow Rates

Plant	Gallatin Steel		
Location	Ghent, Kentucky		
Stack	Furnace A		
Run Date	5-3-01		
Run Number	3	Volume Metered	32.081
Start Time	1948	Meter Temp (Deg R)	536.5
Finish Time	1956	Orsat CO2 %	0
Barometric Pressure	29.66	Orsat O2 %	20.9
Stack Diameter (in.)	108	Orsat CO %	0
Stack Area sq. ft.	63.617	Orsat N %	79.1
Number of Points	12	Condensate Volume	16.3
Avg of SQRT of V.H.	0.2735	Delta H (Inches H2O)	1.9
Meter Correction (Y)	0.992	Stack Pressure	29.23
Pitot Correction Factor	0.84	Stack Temp (Deg R)	610.6

=====

Moisture in stack gas, volume fraction	0.024
Dry Stack Gas, volume fraction	0.976
Molecular Weight of Stack Gas (Dry Basis)	28.84
Molecular Weight of Stack Gas (Stack conditions)	28.580
Specific gravity of Stack Gas Relative to Air	0.986
Excess Air (%)	
Average Stack Velocity, FPM	1006.4
Actual Stack Gas Flow Rate, ACFM	64024
Actual Stack Gas Flow Rate, (Dry) ACFMD	62488
Stack Gas Flow Rate (Standard conditions), SCFMD	52789
Stack Gas Flow Rate (Standard conditions), SCFMW	54087

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Volumetric Air-Flow Rates

Plant	Gallatin Steel		
Location	Ghent, Kentucky		
Stack	Furnace C		
Run Date	5-3-01		
Run Number	3	Volume Metered	32.081
Start Time	1959	Meter Temp (Deg R)	536.5
Finish Time	2005	Orsat CO2 %	0
Barometric Pressure	29.66	Orsat O2 %	20.9
Stack Diameter (in.)	120	Orsat CO %	0
Stack Area sq. ft.	78.540	Orsat N %	79.1
Number of Points	16	Condensate Volume	16.3
Avg of SQRT of V.H.	0.8919	Delta H (inches H2O)	1.9
Meter Correction (Y)	0.992	Stack Pressure	29.35
Pitot Correction Factor	0.84	Stack Temp (Deg R)	964.3

=====

Moisture in stack gas, volume fraction	0.024
Dry Stack Gas, volume fraction	0.976
Molecular Weight of Stack Gas (Dry Basis)	28.84
Molecular Weight of Stack Gas (Stack conditions)	28.580
Specific gravity of Stack Gas Relative to Air	0.986
Excess Air (%)	
Average Stack Velocity, FPM	4116.1
Actual Stack Gas Flow Rate, ACFM	323278
Actual Stack Gas Flow Rate, (Dry) ACFMD	315521
Stack Gas Flow Rate (Standard conditions), SCFMD	169471
Stack Gas Flow Rate (Standard conditions), SCFMW	173637

APPENDIX E

- MOISTURE RUN DATA SHEETS**
- FLOW TRAVERSE DATA SHEETS**
- PITOT TUBES - POST TEST CALIBRATION CHECK**
- THERMOCOUPLE - POST TEST CALIBRATION CHECK**
- GAS METER POST TEST CALIBRATION**

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EPA METHOD 4 MOISTURE RUN DATA SHEET

TEST ID _____ PAGE 1 OF _____

Plant Callatin Steel Source Bayhous
 Plant Location Grant Kentucky
 Type of Sampling Train EPA Method 4
 Type of Samples Moisture
 Date 5-3-01 Run No. 1
 Time Start 0940 Time End 1105
 Sample Time 5.0 min/pt
 Bar. Pressure 29.74 "Hg Stack Pressure _____ "Hg
 Assumed Moisture 2.0 % FDA 0.98
 Weather Scattered Temperature 78 °F
 Meter Box No. 4 AH 1.85 Y 0.992
 Stack Dimensions Single Compartment (7)
 Stack Area _____ (ft²)
 Stack Height 80.78 ft
 Stack Diameter: Upstream NA Downstream NA
 Port Size NA in Nipple Length NA
 U Cord Length 200 feet

Mater'l Processing Rate _____
 Gas Meter Readings: Final 502.492 (ft³)
 Initial 438.337 (ft³)
 Net 64.155 (ft³)
 Impingers Vol. Gain 18
 Silica Gel No. 881 Wt. Gain 10.1 g
 Total Condensate 2.81 ml
 Leak Checks: Meter Box/Pump OK
 Pre-Test 0.008 CFM 10 "Hg Post-Test 0.004 CFM
 Box Operator COGGINS Probe Holder COGGINS
 Pyrometer No. 4 Thermocouple No. TT2
 Comments: _____

PORT AND TRAVERSE POINT NUMBER	DISTANCE FROM INSIDE STACK WALL (IN)	CLOCK TIME	GAS METER READING (FT³)	METER ORIFICE PRESS. DIFF		LAST IMPINGER TEMP. (°F)	DRY GAS METER TEMP. (°F)	VACUUM ON SAMPLE TRAIN ("Hg)
				CALC.	ACTUAL			
1	—	5.0	472.2	—	1.9	62	73	5
2	—	10.0	466.1	—	1.9	51	74	5
3	—	15.0	499.9	—	1.9	51	74	5
4	—	20.0	53.7	—	1.9	51	75	5
5	—	25.0	57.5	—	1.8	51	75	5
6	—	30.0	61.3	—	1.8	51	76	5
7	—	35.0	65.1	—	1.8	51	76	5
8	—	40.0	69.7	—	1.8	51	77	5
9	—	45.0	72.5	—	1.7	51	77	5
10	—	50.0	76.2	—	1.7	51	78	5
11	—	55.0	80.0	—	1.7	51	78	5
12	—	60.0	83.8	—	1.7	51	79	5

[illegible]

Plant Callatin Steel Source Seayhouse
 Plant Location Ghent Kentucky
 Type of Sampling Irain EPA Method 4
 Type of Samples Moisture
 Date 5-3-01 Run No. 2
 Time Start 1635 Time End 1715
 Sample Time 5.0 min/pt 40.0 Total Min
 Bar. Pressure 29.64 "Hg Slack Pressure 29.66 "Hg
 Assumed Moisture 2.0% FDA 0.98
 Weather Scattered Temperature 75 °F
 Meter Box No. 4 ΔH 1.85 Y 0.992
 Slack Dimensions Single Component
 Slack Area Effective (ft²)
 Slack Height Approx 75 ft
 Slack Diameter: Upstream NA Downstream NA
 Port Size NA in Nipple Length NA
 U Cord Length 200 feet

EPA METHOD 4 MOISTURE RUN DATA SHEET

TEST ID _____ PAGE _____ OF _____

Mal'l Processing Rate _____
 Gas Meter Readings: Final 536.948 ft³
 Initial 505.037 ft³
 Net 31.921 ft³
 Impingers Vol. Gain 9 ml
 Silica Gel No. 842 Wt. Gain 7.5 g
 Total Condensate 16.5 ml
 Leak Checks: Meter Box/Pump OK
 Pre-Test 0.008 CFM 10 "Hg Post-Test 0.004 CFM
 Box Operator COLOMBS Probe Holder COLOMBS
 Pyrometer No. 4 Thermocouple No. 112
 Comments:

PORT AND TRAVERSE POINT NUMBER	DISTANCE FROM INSIDE STACK WALL (IN)	CLOCK TIME	GAS METER READING (FT³)	METER ORIFICE PRESS. DIFF		LAST IMPINGER TEMP. (°F)	DRY GAS METER TEMP. (°F)	VACUUM ON SAMPLE TRAIN ("Hg)
				CALC.	ACTUAL			
		5.0	9.0	—	1.9	66	75	5
		10.0	13.1	—	1.9	62	75	5
		15.0	16.9	—	1.9	59	75	5
		20.0	20.9	—	1.9	59	75	5
		25.0	24.9	—	1.9	58	76	5
		30.0	28.9	—	1.9	57	76	5
		35.0	32.9	—	1.9	57	76	5
		40.0	36.948	—	1.9	57	77	5

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EPA METHOD 4 MOISTURE RUN DATA SHEET

TEST ID _____ PAGE _____ OF _____

Plant Callotim Steel Source Birmingham
 Plant Location Grant Kentucky
 Type of Sampling Irrig EPA Method 4
 Type of Samples Moisture
 Date 5-3-01 Run No. 3
 Time Start 2035 Time End 2115
 Sample Time 2035 min/pl 40.0 Total Min
 Bar. Pressure 29.60 "Hg Stack Pressure _____ "Hg
 Assumed Moisture 2.0 % FDA 0.98
 Weather Scattered Temperature 70 °F
 Meter Box No. 4 ΔH 1.85 Y0992
 Stack Dimensions Single Compartment
 Stack Area _____ (ft²)
 Stack Height 75 ft
 Stack Diameter Upstream NA Downstream NA
 Port Size NA in Nipple Length NA
 U Cord Length 200 feet

Mat'l Processing Rate _____
 Gas Meter Readings: Final 569.697 ft³
 Initial 537.616 ft³
 Net _____ ft³
 Impingers Vol. Gain 10 ml
 Silica Gel No. _____ Wt. Gain 0.3 g
 Total Condensate 116.3 ml

Leak Checks: Meter Box/Pump OK
 Pre-Test 0.008 CFM 12 "Hg Post-Test 0.005 CFM 5 "Hg
 Box Operator COG GINS Probe Holder COG GINS
 Pyrometer No. 4 Thermocouple No. 112
 Comments: _____

PORT AND TRAVERSE POINT NUMBER	DISTANCE FROM INSIDE STACK WALL (IN)	CLOCK TIME	GAS METER READING (ft³)	METER ORIFICE PRESS. DIFF		LAST IMPINGER TEMP. (°F)	DRY GAS METER TEMP. (°F)	VACUUM ON SAMPLE TRAIN ("Hg)
				CALC.	ACTUAL			
		5.0	41.6	—	1.9	64	76	5
		10.0	45.5	—	1.9	61	76	5
		15.0	49.5	—	1.9	59	76	5
		20.0	53.5	—	1.9	58	76	5
		25.0	57.5	—	1.9	58	77	5
		30.0	61.6	—	1.9	59	77	5
		35.0	65.6	—	1.9	59	77	5
		40.0	69.697	—	1.9	59	77	5

PRELIMINARY VELOCITY TRAVERSE

PLANT Gallatin Steel
 DATE 5-3-01
 LOCATION Cold Duct No. 1
 STACK I.D. 192.0" (4 side diameter)
 BAROMETRIC PRESSURE, in. Hg 29.14 29.66 (R2+R3)
 STACK GAUGE PRESSURE, in. H₂O See each run
 OPERATORS COGGINS LUTHER

CO₂ = 0.0
 O₂ = 20.9

SCHEMATIC OF TRAVERSE POINT LAYOUT

TRAVERSE POINT NUMBER	VELOCITY HEAD (Δps), in. H ₂ O	STACK TEMPERATURE (T _s), °F
Run 1		
1	1.89	99
2	1.90	99
3	1.81	99
4	1.88	99
5	2.06	100
6	2.188	100
7	1.81	101
8	1.79	101
1	1.80	102
2	1.95	101
3	1.91	99
4	1.88	100
5	1.95	101
6	1.89	102
7	1.89	102
8	1.94	103
Run 3		
1	1.90	120
2	1.92	120
3	1.90	120
4	1.75	120
5	2.10	118
6	2.05	118
7	1.90	117
8	1.89	117

TRAVERSE POINT NUMBER	VELOCITY HEAD (Δps), in. H ₂ O	STACK TEMPERATURE (T _s), °F
Run 2		
1	1.85	135
2	1.83	134
3	1.91	135
4	2.00	136
5	2.22	135
6	2.25	136
7	2.03	137
8	1.98	136
1	2.02	138
2	2.15	139
3	2.04	138
4	2.05	138
5	2.00	137
6	1.93	137
7	2.01	137
8	1.94	137
1	2.05	118
2	2.19	117
3	2.07	116
4	2.23	115
5	1.84	117
6	1.96	119
7	1.95	120
8	2.00	121

Q1137

(static = 3.45)

(static = -3.90)

Q1612

(static = -3.75)

Run 3

Q2019

PRELIMINARY VELOCITY TRAVERSE

PLANT Gallatin SteelDATE 5-3-01LOCATION Cold Duct No. 2STACK I.D. 120.0"BAROMETRIC PRESSURE, in.Hg 30.44 29.74/29.66 (R2+R3)STACK GAUGE PRESSURE, in.H₂OOPERATORS COGGINS/LUTHER

SCHEMATIC OF TRAVERSE POINT LAYOUT

@ 1150 (static = -2.06)

TRAVERSE POINT NUMBER	VELOCITY HEAD (Δp_s), in.H ₂ O	STACK TEMPERATURE (T_s), °F
1	0.40	100
2	0.22	101
3	0.13	101
4	0.09	101
5	0.08	101
6	0.05	101
7	0.05	101
8	0.10	98
1	0.06	99
2	0.11	100
3	0.11	100
4	0.12	100
5	0.17	100
6	0.21	100
7	0.22	99
8	0.28	100
1	0.00	92
2	0.00	93
3	0.00	93
4	0.00	93
5	0.00	93
6	0.00	93
7	0.01	94
8	0.02	100

@ 2029

@ 1604 (static = -2.51)

(static = -2.43)

TRAVERSE POINT NUMBER	VELOCITY HEAD (Δp_s), in.H ₂ O	STACK TEMPERATURE (T_s), °F
1	0.01	103
2	0.01	103
3	0.01	107
4	0.02	108
5	0.01	109
6	0.01	110
7	0.00	110
8	0.00	109
1	0.01	109
2	0.01	110
3	0.00	110
4	0.01	110
5	0.01	100
6	0.00	100
7	0.00	100
8	0.01	101
1	0.00	99
2	0.00	100
3	0.00	100
4	0.00	101
5	0.00	95
6	0.01	94
7	0.00	94
8	0.00	94

PRELIMINARY VELOCITY TRAVERSE

PLANT Gallatin Steel
 DATE 8-3-01
 LOCATION Furnace A
 STACK I.D. 108.0" Inside diameter
 BAROMETRIC PRESSURE, in. Hg 29.74 / 29.66 / 29.64
 STACK GAUGE PRESSURE, in. H₂O _____
 OPERATORS Coggins / Lufkin

SCHEMATIC OF TRAVERSE POINT LAYOUT

@1009 (Static = 7.4)

TRAVERSE POINT NUMBER	VELOCITY HEAD (Δp_s), in. H ₂ O	STACK TEMPERATURE (T_s), °F
1	0.79	546
2	0.81	548
3	0.77	557
4	0.82	558
5	0.83	540
6	0.81	526
7	0.75	531
8	0.80	547
9	0.65	554
10	0.66	548
11	0.73	530
12	0.78	544
1	0.08	151
2	0.09	150
3	0.08	149
4	0.08	150
5	0.07	151
6	0.07	151
7	0.07	151
8	0.08	151
9	0.07	151
10	0.08	151
11	0.06	151
12	0.07	150

@1956 (Static = 5.9)

@1640 (Static = 3.7)

TRAVERSE POINT NUMBER	VELOCITY HEAD (Δp_s), in. H ₂ O	STACK TEMPERATURE (T_s), °F
1	0.05 0.71	123 540
2	0.06 0.79	123 544
3	0.07 0.83	124 546
4	0.06 0.87	124 542
5	0.05 0.89	124 545
6	0.05 0.91	124 535
7	0.05 0.88	124 546
8	0.04 0.84	123 553
9	0.06 0.87	124 529
10	0.07	123
11	0.06	123
12	0.05	123

PRELIMINARY VELOCITY TRAVERSE

PLANT Gallatin Steel
DATE 5-3-01
LOCATION Furnace C
STACK I.D. 120.0" Inside diameter
BAROMETRIC PRESSURE, in. Hg 29.74/29.66/29.66
STACK GAUGE PRESSURE, in. H₂O _____
OPERATORS Coggins/Luther SC _____

SCHEMATIC OF TRAVERSE POINT LAYOUT

TRAVERSE POINT NUMBER	VELOCITY HEAD (Δp_s), in. H ₂ O	STACK TEMPERATURE (T_s), °F
1	0.16	103
2	0.14	103
3	0.16	103
4	0.17	103
5	0.14	103
6	0.15	103
7	0.11	103
8	0.08	104
1	0.10	104
2	0.10	104
3	0.10	104
4	0.11	103
5	0.11	104
6	0.10	104
7	0.10	104
8	0.11	102
1	0.76	453
2	0.79	457
3	0.82	473
4	0.88	469
5	0.89	488
6	0.85	494
7	0.88	486
8	0.81	482

[illegible]

PRELIMINARY VELOCITY TRAVERSE

PLANT Gallatin Steel
 DATE 5-2-01
 LOCATION LNF
 STACK I.D. 60.0" Inside Diameter
 BAROMETRIC PRESSURE, in. Hg 29.74 / 29.64 / 29.66
 STACK GAUGE PRESSURE, in. H₂O
 OPERATORS COGGINS / LUTHER

SCHEMATIC OF TRAVERSE POINT LAYOUT

@ 1045 (static = -4.15')

TRAVERSE POINT NUMBER	VELOCITY HEAD (Δp_s), in. H ₂ O	STACK TEMPERATURE (T_s), °F
1	0.06	156
2	0.09	157
3	0.10	158
4	0.10	159
5	0.12	157
6	0.08	144
1	0.11	152
2	0.13	157
3	0.12	162
4	0.13	166
5	0.12	167
6	0.14	164
1	0.10	173
2	0.10	175
3	0.11	176
4	0.10	178
5	0.11	178
6	0.12	179
1	0.20	167
2	0.17	176
3	0.20	182
4	0.17	185
5	0.09	183
6	0.06	176

@ 1940 (static = -4.20')

@ 1657 (static = -4.61')

TRAVERSE POINT NUMBER	VELOCITY HEAD (Δp_s), in. H ₂ O	STACK TEMPERATURE (T_s), °F
1	0.21	173
2	0.08	169
3	0.08	168
4	0.08	168
5	0.09	166
6	0.08	164
1	0.03	144
2	0.01	149
3	0.03	154
4	0.02	153
5	0.01	150
6	0.01	150

AAS Inc.

AMBIENT AIR SERVICES INCORPORATED
ENVIRONMENTAL CONSULTANTS

PITOT TUBE CALIBRATION MEASUREMENTS

DATE CALIBRATED 5-10-01 PITOT TUBE Furnace "C" Duct

Pitot tube assembly level? ✓ Yes No

Pitot tube openings damaged? Yes (explain below) ✓ No

$\alpha_1 = \underline{2.0}^\circ (<10^\circ)$, $\alpha_2 = \underline{2.0}^\circ (<10^\circ)$, $\beta_1 = \underline{1.5}^\circ (<5^\circ)$,

$\beta_2 = \underline{1.0}^\circ (<5^\circ)$

$\gamma = \underline{1.0}^\circ$, $\theta = \underline{1.0}^\circ$, $A = \underline{1.076}$ in. = (Pa + Pb)

$z = A \sin \gamma = \underline{0.019}$ in.; <0.32 / $<1/8$ in.

$w = A \sin \theta = \underline{0.019}$ in.; <0.08 / $<1/32$ in.

$P_a = \underline{0.538}$ in. $P_b = \underline{0.538}$ in. $D_c = \underline{0.375''}$

Calibration required? Yes ✓ No

AAS Inc.

AMBIENT AIR SERVICES INCORPORATED
ENVIRONMENTAL CONSULTANTS

PITOT TUBE CALIBRATION MEASUREMENTS

DATE CALIBRATED 5-10-01 PITOT TUBE Furnace "A" Duct

Pitot tube assembly level? ✓ Yes No

Pitot tube openings damaged? Yes (explain below) ✓ No

$\alpha_1 = \underline{1.0}^\circ (<10^\circ)$, $\alpha_2 = \underline{1.0}^\circ (<10^\circ)$, $\beta_1 = \underline{1.0}^\circ (<5^\circ)$,

$\beta_2 = \underline{1.0}^\circ (<5^\circ)$

$\gamma = \underline{1.0}^\circ$, $\theta = \underline{1.0}^\circ$, $A = \underline{1.078}$ in. = $(P_a + P_b)$

$z = A \sin \gamma = \underline{0.019}$ in.; <0.32 / $<1/8$ in.

$w = A \sin \theta = \underline{0.019}$ in.; <0.08 / $<1/32$ in.

$P_a \underline{0.539}$ in. $P_b \underline{0.539}$ in. $D_c = \underline{0.375}$ "

Calibration required? Yes ✓ No

AAS Inc.

AMBIENT AIR SERVICES INCORPORATED
ENVIRONMENTAL CONSULTANTS

PITOT TUBE CALIBRATION MEASUREMENTS

DATE CALIBRATED 5-10-01 PITOT TUBE Cold Duct No. 2

Pitot tube assembly level? ✓ Yes No

Pitot tube openings damaged? Yes (explain below) ✓ No

$\alpha_1 = \underline{2.0}^\circ (<10^\circ)$, $\alpha_2 = \underline{2.0}^\circ (<10^\circ)$, $\beta_1 = \underline{1.0}^\circ (<5^\circ)$,

$\beta_2 = \underline{1.0}^\circ (<5^\circ)$

$\gamma = \underline{1.0}^\circ$, $\theta = \underline{2.0}^\circ$, $A = \underline{1.058}$ in. = $(P_a + P_b)$

$z = A \sin \gamma = \underline{\hspace{2cm}}$ in.; <0.32 / $<1/8$ in.

$w = A \sin \theta = \underline{\hspace{2cm}}$ in.; <0.08 / $<1/32$ in.

$P_a \underline{0.529}$ in. $P_b \underline{0.529}$ in. $D_c = \underline{0.375}''$

Calibration required? Yes ✓ No

AAS Inc.

AMBIENT AIR SERVICES INCORPORATED
ENVIRONMENTAL CONSULTANTS

PITOT TUBE CALIBRATION MEASUREMENTS

DATE CALIBRATED 5-9-01 PITOT TUBE Cold Duct No. 1

Pitot tube assembly level? ✓ Yes No

Pitot tube openings damaged? Yes (explain below) ✓ No

$\alpha_1 = \underline{1.0}^\circ (<10^\circ)$, $\alpha_2 = \underline{4.0}^\circ (<10^\circ)$, $\beta_1 = \underline{1.0}^\circ (<5^\circ)$,

$\beta_2 = \underline{1.0}^\circ (<5^\circ)$

$\gamma = \underline{1.0}^\circ$, $\theta = \underline{1.0}^\circ$, $A = \underline{1.069}$ in. - (Pa + Pb)

$z = A \sin \gamma = \underline{0.019}$ in.; <0.32 / $<1/8$ in.

$w = A \sin \theta = \underline{0.019}$ in.; <0.08 / $<1/32$ in.

$P_a = \underline{0.534}$ in. $P_b = \underline{0.535}$ in. $D_c = \underline{0.375''}$

Calibration required? Yes ✓ No

AAS Inc.

AMBIENT AIR SERVICES INCORPORATED
ENVIRONMENTAL CONSULTANTS

PITOT TUBE CALIBRATION MEASUREMENTS

DATE CALIBRATED 5-9-01 PITOT TUBE LMF DUCT

Pitot tube assembly level? ✓ Yes No

Pitot tube openings damaged? Yes (explain below) ✓ No

$\alpha_1 = \underline{1.0}^\circ (<10^\circ)$, $\alpha_2 = \underline{1.0}^\circ (<10^\circ)$, $\beta_1 = \underline{1.0}^\circ (<5^\circ)$,

$\beta_2 = \underline{1.0}^\circ (<5^\circ)$

$\gamma = \underline{3.0}^\circ$, $\theta = \underline{1.0}^\circ$, $A = \underline{1.106}$ in. = $(P_a + P_b)$

$z = A \sin \gamma = \underline{0.058}$ in.; <0.32 / $<1/8$ in.

$w = A \sin \theta = \underline{0.019}$ in.; <0.08 / $<1/32$ in.

$P_a \underline{0.553}$ in. $P_b \underline{0.553}$ in. $D_c = \underline{0.375}$ "

Calibration required? Yes ✓ No

AMBIENT AIR SERVICES, INC.
106 Ambient Air Way
Starks, Florida

THERMOCOUPLE CALIBRATION FORM

Date 5-10-01 Time 1D30
Ambient Temperature 75°F Source Lab
Barometric Pressure 30.05 Source Lab
Technician's Signature Earl Cozzine

Standard Thermometer Type ERT-64619
Manufacturer Mercury in glass
Serial Number 64619
Pyrometer Manufacturer Atkins Model 386
Serial Number 386-2 Meter Box

TEMPERATURE SOURCE (A)		Crushed Ice		Ambient Air		Boiling H ₂ O		Hot Oil	
REFERENCE THERMOMETER	Actual Reading	32°F		75°F		212°F		510°F	
	Corrected Temperature								
CALIBRATED THERMOCOUPLE		Indicated Temp.		Difference (B)		Percent Diff. (C)			
Serial Number	Location								
	Furnace A								
	Furnace C								
1	Cold Duct 1	32	0	74	1	212	0	513	3
	Cold Duct 2	32	0	74	1	212	0	514	4
	LMF	32	0	74	1	212	0		

Comments: Hot oil reference temperatures were obtained utilizing Mercury in glass, Curtin Matheson Scientific, model 09302

THERMOCOUPLE CALIBRATION FORM

Comments:

Calibration Tolerances

Stack = 1.5% of value, Filter Box = $\pm 5.4^{\circ}\text{F}$, Impinger = $\pm 2^{\circ}\text{F}$, Meter = $\pm 5.4^{\circ}\text{F}$ (40CFR Pt 60, App. A Method 5, and QA Handbook Section 3.4, Method 5, page 13, Rev. O)

$$\left[\frac{(\text{ref. temp. } ^\circ\text{F} + 460) \cdot (\text{indicated temp. } ^\circ\text{F} + 460)}{(\text{reference temp. } ^\circ\text{F} + 460)} \right] \times 100$$

POSTTEST DRY GAS METER CALIBRATION DATA (ENGLISH UNITS)

Test numbers: All _____ Date: 5-9-01 _____ Meter Box number: _____ 4

Barometric Pressure: _____ 29.99 inches Hg. Dry Gas Meter Number: _____ 4 Pretest Y: _____ 0.99

Plant: Gallatin Steel _____ Location: Ghent, Kentucky _____

Orifice manometr setting (DH), inches H2O	Gas volume		Temperature				Time in minutes	Vacuum setting inches Hg	Yi
	Wet test meter (Vw), cu.ft.	Dry gas meter (Vd), cu.ft.	Wet test meter (Tw), deg F	Dry gas meter		Average (Td), deg F			
				Inlet (Tdi), deg F	Outlet (Tdo), deg F				
1.90	10.320	10.764	77.50	112.5	89.5	101.00	13.38	5.0	0.9960
1.90	10.768	11.282	78.75	114.0	91.5	102.75	14.01	5.0	0.9923
1.90	12.983	13.613	79.75	112.5	91.5	102.00	16.87	5.0	0.9884
									0.992

If there is only one thermometer on the dry gas meter, record the temperature under T_d

- V_w= Gas volume passing through the wet test meter, in cubic feet
- V_d= Gas volume passing through the dry gas meter, in cubic feet
- T_w= Temperature of the gas in the wet test meter, degrees fahrenheit
- T_{di}= Temperature of the inlet gas of the dry gas meter, degrees fahrenheit
- T_{do}= Temperature of the outlet gas of the dry gas meter, degrees fahrenheit
- T_d= Average temperature of the gas in the dry gs meter, obtained by the average of T_{di} and T_{do}, degrees fahrenheit
- DH= Pressure differential across orifice, inches H₂O
- Y_i= Ratio of accuracy of wet test meter to dry gas meter for each run.
- Y= Average ratio of accuracy of wet test meter to dry gas meter for all three runs; tolerance = pretest Y plus/minus 0.05Y
- P_b= Barometric pressure, inches Mercury
- Time= Time of calibration run, in minutes.

APPENDIX F

- PRODUCTION DATA**
- TEST NOTIFICATION LETTER**

Gallatin Steel Company - Fan Amps, Damper Positions and Furnace Static Pressure Readings for May 3, 2001

	MA 1 RUNNING AMPS	DP14A % OPEN	MA 2 RUNNING AMPS	DP14B % OPEN	MA 3 RUNNING AMPS	DP14C % OPEN	MA 4 RUNNING AMPS	DP14D % OPEN	MA 5 RUNNING AMPS	DP14E % OPEN	HG 1 RUNNING AMPS	DP13A % OPEN	HG 2 RUNNING AMPS	DP13B % OPEN	HG 3 RUNNING AMPS	DP13C % OPEN	DP 1A % OPEN	DP 2A % OPEN	DP 2 % OPEN	DP 1 % OPEN	DP 4 % OPEN	DP 4A % OPEN	DP 7A % OPEN	DP 7C % OPEN	DP 8 % OPEN	DP 7B % OPEN	DP 3 C&D % OPEN	DP 3 A&B % OPEN	DP 6 % OPEN	DP 5 % OPEN	DP 9 % OPEN	EAF C ROOF PRESSURE PT 2 inches / 100	EAF A ROOF PRESSURE PT 1 inches / 100	
RUN 1:																																		
9:38	125	76	116	71	128	77	122	74	128	77	53	67	0	0	46	58	41	0	0	0	40	43	0	0	0	0	0	100	100	0	23	0	0.00	-0.13
9:52	121	74	114	70	124	76	121	74	121	74	46	58	0	0	41	52	10	0	0	0	99	21	0	0	0	0	0	100	100	0	12	0	0.00	-0.03
10:07	120	73	111	68	122	74	121	74	121	74	45	57	0	0	41	52	20	0	0	0	99	98	0	0	0	0	0	100	100	0	22	0	0.01	-0.03
10:22	118	72	114	70	124	76	122	74	123	75	47	59	0	0	43	54	20	0	0	0	96	60	0	0	0	0	0	100	100	0	22	0	0.02	-0.07
10:37	125	76	116	71	128	78	124	74	124	76	50	63	0	0	46	58	91	0	0	0	19	21	0	0	0	0	0	100	100	0	22	67	0.20	-0.05
10:52	118	72	111	68	121	74	119	73	120	73	47	59	0	0	42	53	91	0	0	0	0	43	0	0	0	0	0	100	100	0	12	67	0.20	-0.02
11:07	118	72	111	68	121	74	119	73	121	74	46	58	0	0	41	52	91	0	0	0	19	21	0	0	0	0	0	100	100	0	23	0	0.10	-0.05
11:22	118	72	111	68	121	74	119	73	121	74	47	59	0	0	41	52	91	0	0	0	19	43	0	0	0	0	0	100	100	0	23	0	-0.04	-0.05
11:37	120	73	114	70	124	76	121	74	121	74	50	63	0	0	46	58	11	0	0	0	55	21	0	0	0	0	0	100	100	0	13	68	0.06	-0.1
11:52	115	70	110	67	121	74	119	73	118	72	45	57	0	0	41	52	20	0	0	0	99	21	0	0	0	0	0	100	100	0	23	68	0.00	-0.01
12:07	115	70	107	65	118	72	116	71	116	71	45	57	0	0	41	52	21	0	0	0	99	21	0	0	0	0	0	100	100	0	12	0	0.02	-0.05
12:22	120	73	114	70	124	76	121	74	121	74	49	62	0	0	44	56	77	0	0	0	39	43	0	0	0	0	0	100	100	0	22	0	-0.02	-0.06
12:37	118	72	111	68	121	74	119	73	121	74	46	58	0	0	42	53	41	0	0	0	99	21	0	0	0	0	0	100	100	0	22	0	-0.02	-0.06
12:47	118	72	111	68	119	73	116	71	116	71	46	58	0	0	42	53	91	0	0	0	0	43	0	0	0	0	0	100	100	0	22	0	0.16	-0.04
RUN 2:																																		
15:03	121	74	114	70	122	74	121	74	121	74	51	85	0	0	46	58	21	0	0	0	39	21	0	0	0	0	0	100	100	0	22	0	0.04	-0.11
15:18	113	70	110	67	118	72	118	71	116	71	45	57	0	0	41	52	11	0	0	0	99	21	0	0	0	0	0	100	100	0	23	0	0.01	-0.05
15:33	115	70	111	68	118	72	118	72	116	71	45	57	0	0	41	52	11	0	0	0	99	21	0	0	0	0	0	100	100	0	11	0	0.05	-0.04
15:48	115	70	110	67	119	73	119	73	116	71	45	57	0	0	41	52	20	0	0	0	83	43	0	0	0	0	0	100	100	0	22	0	0.02	-0.06
16:03	121	74	116	71	128	77	124	76	126	77	55	70	0	0	46	58	91	0	0	0	20	36	0	0	0	0	0	100	100	0	22	0	0.04	-0.05
16:18	117	71	111	68	119	73	119	73	118	72	46	58	0	0	42	53	91	0	0	0	0	21	0	0	0	0	0	100	100	0	13	0	0.20	-0.03
16:33	115	70	107	65	118	71	116	71	116	71	47	59	0	0	42	53	91	0	0	0	19	60	0	0	0	0	0	100	100	0	13	0	0.17	-0.04
16:48	118	72	111	68	119	74	119	73	121	74	47	59	0	0	42	53	91	0	0	0	19	43	0	0	0	0	0	100	100	0	23	0	0	-0.04
17:03	120	73	114	70	121	74	121	74	121	74	50	63	0	0	46	58	11	0	0	0	72	43	0	0	0	0	0	100	100	0	22	0	-0.01	-0.05
17:18	118	72	113	69	122	74	119	73	121	74	47	59	0	0	43	54	20	0	0	0	99	21	0	0	0	0	0	100	100	0	22	0	0.01	-0.04
17:33	115	70	110	67	118	72	119	73	116	71	45	57	0	0	41	52	20	0	0	0	99	43	0	0	0	0	0	100	100	0	23	0	0.02	-0.02
17:48	123	75	116	71	124	76	124	76	123	75	51	83	0	0	48	61	41	0	0	0	0	21	0	0	0	0	0	100	100	0	13	67	-0.03	-0.05
17:55	121	74	114	70	124	76	122	74	121	74	50	83	0	0	45	57	91	0	0	0	0	21	0	0	0	0	0	100	100	0	22	67	0.2	-0.04

Gallatin Steel Company - Fan Amps, Damper Positions and Furnace Static Pressure Readings for May 3, 2001

RUN 1:	MA 1 RUNNING AMPS	DP14A % OPEN	MA 2 RUNNING AMPS	DP14B % OPEN	MA 3 RUNNING AMPS	DP14C % OPEN	MA 4 RUNNING AMPS	DP14D % OPEN	MA 5 RUNNING AMPS	DP14E % OPEN	HG 1 RUNNING AMPS	DP13A % OPEN	HG 2 RUNNING AMPS	DP13B % OPEN	HG 3 RUNNING AMPS	DP13C % OPEN	DP 1A % OPEN	DP 2A % OPEN	DP 2 % OPEN	DP 1 % OPEN	DP 4 % OPEN	DP 4A % OPEN	DP 7A % OPEN	DP 7C % OPEN	DP 8 % OPEN	DP 7B % OPEN	DP 3 C&D % OPEN	DP 3 A&B % OPEN	DP 6 % OPEN	DP 5 % OPEN	DP 9 % OPEN	EAF C ROOF PRESSURE PT 2 inches / 100	EAF A ROOF PRESSURE PT 1 inches / 100	
	18:39	121	74	114	70	122	74	121	74	121	50	63	0	0	46	58	21	0	0	39	21	0	0	0	0	0	100	100	0	22	0	-0.01	-0.12	
	18:54	115	70	111	68	116	71	116	71	116	47	59	0	0	43	54	11	0	0	85	21	0	0	0	0	0	100	100	0	12	0	0	-0.09	
	19:09	118	72	113	69	121	74	121	74	120	46	58	0	0	42	53	20	0	0	99	21	0	0	0	0	0	100	100	0	22	0	0	-0.02	
	19:24	118	72	110	67	118	72	116	71	118	45	57	0	0	41	52	20	0	0	99	21	0	0	0	0	0	100	100	0	22	0	0.00	0.02	
	19:39	121	74	116	71	124	76	122	74	123	50	63	0	0	46	58	41	0	0	12	43	0	0	0	0	0	100	100	0	11	68	0.06	-0.06	
	19:54	120	73	114	70	124	76	122	74	121	50	63	0	0	43	54	91	0	0	19	21	0	0	0	0	0	100	100	0	12	68	0.2	-0.08	
	20:09	121	74	114	70	124	76	122	74	121	74	49	82	0	0	43	54	91	0	0	19	99	0	0	0	0	0	100	100	0	22	0	0.12	-0.07
	20:24	121	74	113	69	122	74	121	74	121	74	47	59	0	0	41	52	91	0	0	19	21	0	0	0	0	0	100	100	0	22	0	0.01	-0.07
	20:39	123	75	116	71	126	77	124	76	121	74	50	63	0	0	46	58	11	0	0	43	21	0	0	0	0	0	100	100	0	12	0	-0.01	-0.08
	20:54	121	73	114	70	122	74	119	73	121	74	47	59	0	0	41	52	10	0	0	98	43	0	0	0	0	0	100	100	0	12	0	0.01	-0.03
21:09	118	72	111	68	121	73	119	73	120	73	45	57	0	0	41	52	20	0	0	99	99	0	0	0	0	0	100	100	0	23	0	0.02	-0.04	
21:24	118	72	113	69	121	74	119	73	121	74	45	57	0	0	41	52	20	0	0	99	21	0	0	0	0	0	100	100	0	23	0	0.02	-0.06	
21:39	121	73	114	70	124	76	122	74	123	75	47	59	0	0	43	54	20	0	0	88	43	0	0	67	0	0	100	100	0	23	0	0.02	-0.13	
21:54	121	74	116	71	124	76	122	74	123	75	55	70	0	0	47	59	71	0	0	0	43	0	0	67	0	0	100	100	0	22	0	-0.07	-0.04	

Damper Legend

DP1A	C Shell water cooled damper
DP2A	C Shell slag damper
DP2	A Shell slag damper
DP1	A Shell water cooled damper
DP4	LMF roof
DP4A	LMF dilution air
DP7A	Ladle tearout
DP7C	Ladle drying
DP8	Ladle dump
DP7B	Ladle preheat
DP3D/DP3C	C Shell canopy
DP3B/DP3A	A Shell canopy
DP5	Caster canopy
DP9	Tundish deskull

MONTH <u>May</u>		MAGNAHELIC CHECKS				YEAR <u>2001</u>
COMP. NUMBER	PRESSURE DIFFERENTIAL IN COMPARTMENTS					
	DATE <u>5-3-01</u>		Run # <u>1</u>			
TIME	<u>09:38</u>	<u>9:52</u>	<u>10:07</u>	<u>10:22</u>	<u>10:37</u>	<u>10:52</u>
1	<u>6.4</u>	<u>6.1</u>	<u>CL 6.3</u>	<u>6.0</u>	<u>6.1</u>	<u>6.4</u>
2	<u>5.6</u>	<u>5.5</u>	<u>CL 5.6</u>	<u>5.5</u>	<u>5.6</u>	<u>5.6</u>
3	<u>5.7</u>	<u>5.7</u>	<u>6.2</u>	<u>5.6</u>	<u>5.7</u>	<u>5.7</u>
4	<u>5.3</u>	<u>5.3</u>	<u>5.7</u>	<u>5.4</u>	<u>5.5</u>	<u>5.3</u>
5	<u>5.5</u>	<u>5.6</u>	<u>6.1</u>	<u>5.5</u>	<u>5.7</u>	<u>5.5</u>
6	<u>5.5</u>	<u>5.7</u>	<u>6.3</u>	<u>5.7</u>	<u>5.8</u>	<u>5.5</u>
7	<u>5.5</u>	<u>5.4</u>	<u>5.9</u>	<u>5.4</u>	<u>5.5</u>	<u>5.4</u>
8	<u>5.4</u>	<u>5.5</u>	<u>6.1</u>	<u>5.5</u>	<u>5.6</u>	<u>5.5</u>
9	<u>clearing 5.1</u>	<u>5.5</u>	<u>6.0</u>	<u>5.4</u>	<u>5.6</u>	<u>5.3</u>
10	<u>4.5</u>	<u>5.4</u>	<u>6.0</u>	<u>5.1</u>	<u>5.3</u>	<u>CL 5.1</u>
11	<u>5.5</u>	<u>5.0</u>	<u>5.8</u>	<u>5.0</u>	<u>5.2</u>	<u>5.5</u>
12	<u>6.0</u>	<u>5.5</u>	<u>6.0</u>	<u>5.4</u>	<u>5.7</u>	<u>6.0</u>
13	<u>5.8</u>	<u>5.4</u>	<u>5.6</u>	<u>5.1</u>	<u>5.2</u>	<u>5.7</u>
14	<u>4.9</u>	<u>5.0</u>	<u>5.5</u>	<u>5.0</u>	<u>5.0</u>	<u>5.5</u>
15	<u>5.4</u>	<u>5.0</u>	<u>5.3</u>	<u>5.0</u>	<u>5.0</u>	<u>5.3</u>
16	<u>5.7</u>	<u>5.5</u>	<u>5.7</u>	<u>5.1</u>	<u>5.3</u>	<u>5.7</u>
17	<u>6.1</u>	<u>5.8</u>	<u>6.3</u>	<u>CL 5.5</u>	<u>5.7</u>	<u>6.0</u>
18	<u>6.0</u>	<u>5.8</u>	<u>6.1</u>	<u>6.4</u>	<u>5.5</u>	<u>6.0</u>
19	<u>5.5</u>	<u>5.3</u>	<u>5.5</u>	<u>5.6</u>	<u>5.0</u>	<u>5.5</u>
20	<u>5.5</u>	<u>5.3</u>	<u>5.5</u>	<u>5.7</u>	<u>5.0</u>	<u>5.5</u>
21	<u>5.6</u>	<u>5.2</u>	<u>5.6</u>	<u>5.8</u>	<u>5.0</u>	<u>5.6</u>
22	<u>5.8</u>	<u>5.3</u>	<u>5.8</u>	<u>6.1</u>	<u>5.2</u>	<u>5.7</u>
23	<u>5.7</u>	<u>5.0</u>	<u>5.6</u>	<u>6.0</u>	<u>5.2</u>	<u>5.6</u>
24	<u>5.7</u>	<u>CL 5.0</u>	<u>5.5</u>	<u>6.0</u>	<u>5.3</u>	<u>5.6</u>

MONTH <u>May</u>		MAGNAHELIC CHECKS				YEAR <u>2001</u>	
COMP. NUMBER	PRESSURE DIFFERENTIAL IN COMPARTMENTS						
	DATE <u>5-3-01</u>		Run # <u>1</u>				
TIME	<u>11:22</u>	<u>11:37</u>	<u>11:52</u>	<u>12:07</u>	<u>12:22</u>	<u>12:37</u>	<u>12:47</u>
1	<u>6.5</u>	<u>6.0</u>	<u>6.3</u>	<u>6.5</u>	<u>6.4</u>	<u>6.5</u>	<u>6.3</u>
2	<u>5.6</u>	<u>5.4</u>	<u>5.6</u>	<u>5.8</u>	<u>5.8</u>	<u>5.8</u>	<u>5.7</u>
3	<u>6.5.8</u>	<u>5.5</u>	<u>5.8</u>	<u>6.1</u>	<u>5.9</u>	<u>6.0</u>	<u>5.9</u>
4	<u>6.0</u>	<u>5.3</u>	<u>5.5</u>	<u>5.8</u>	<u>5.7</u>	<u>5.4</u>	<u>5.6</u>
5	<u>5.7</u>	<u>5.5</u>	<u>5.9</u>	<u>6.0</u>	<u>6.0</u>	<u>6.5.5</u>	<u>5.8</u>
6	<u>6.4</u>	<u>5.6</u>	<u>6.0</u>	<u>6.0</u>	<u>6.0</u>	<u>6.5</u>	<u>5.9</u>
7	<u>5.9</u>	<u>5.3</u>	<u>5.5</u>	<u>5.7</u>	<u>5.6</u>	<u>5.9</u>	<u>5.5</u>
8	<u>6.1</u>	<u>5.2</u>	<u>5.6</u>	<u>5.9</u>	<u>5.7</u>	<u>6.2</u>	<u>5.6</u>
9	<u>6.1</u>	<u>5.3</u>	<u>5.7</u>	<u>5.7</u>	<u>5.8</u>	<u>6.1</u>	<u>5.6</u>
10	<u>4.9</u>	<u>5.1</u>	<u>5.6</u>	<u>5.5</u>	<u>5.5</u>	<u>6.0</u>	<u>5.4</u>
11	<u>5.7</u>	<u>4.8</u>	<u>5.3</u>	<u>5.0</u>	<u>5.3</u>	<u>5.7</u>	<u>5.0</u>
12	<u>6.1</u>	<u>5.3</u>	<u>5.7</u>	<u>6.5.5</u>	<u>5.8</u>	<u>6.0</u>	<u>5.5</u>
13	<u>5.7</u>	<u>5.1</u>	<u>5.4</u>	<u>6.0</u>	<u>5.3</u>	<u>5.8</u>	<u>5.7</u>
14	<u>5.4</u>	<u>5.0</u>	<u>5.4</u>	<u>5.8</u>	<u>5.1</u>	<u>5.5</u>	<u>5.3</u>
15	<u>5.3</u>	<u>4.9</u>	<u>5.1</u>	<u>5.6</u>	<u>4.9</u>	<u>5.3</u>	<u>5.1</u>
16	<u>5.7</u>	<u>5.2</u>	<u>5.6</u>	<u>6.1</u>	<u>5.2</u>	<u>5.7</u>	<u>6.5.4</u>
17	<u>6.2</u>	<u>5.5</u>	<u>6.0</u>	<u>6.5</u>	<u>5.7</u>	<u>6.3</u>	<u>6.5</u>
18	<u>6.0</u>	<u>6.5.3</u>	<u>5.7</u>	<u>6.3</u>	<u>5.7</u>	<u>6.3</u>	<u>6.5</u>
19	<u>5.5</u>	<u>5.5</u>	<u>5.4</u>	<u>5.8</u>	<u>5.1</u>	<u>5.6</u>	<u>6.0</u>
20	<u>5.5</u>	<u>5.5</u>	<u>5.5</u>	<u>5.9</u>	<u>5.2</u>	<u>5.6</u>	<u>6.0</u>
21	<u>5.6</u>	<u>5.6</u>	<u>5.4</u>	<u>6.0</u>	<u>5.1</u>	<u>5.6</u>	<u>6.0</u>
22	<u>5.9</u>	<u>6.0</u>	<u>5.6</u>	<u>6.2</u>	<u>5.3</u>	<u>6.0</u>	<u>6.4</u>
23	<u>5.7</u>	<u>5.6</u>	<u>5.4</u>	<u>6.0</u>	<u>5.2</u>	<u>5.8</u>	<u>6.0</u>
24	<u>5.5</u>	<u>5.5</u>	<u>5.5</u>	<u>5.8</u>	<u>5.1</u>	<u>5.8</u>	<u>5.9</u>

MAGNAHELIC CHECKS

MONTH May

YEAR 2001

COMP. NUMBER	PRESSURE DIFFERENTIAL IN COMPARTMENTS							
	DATE 05/03/01		Run # 2					
TIME	15:03	15:18	15:33	15:48	16:03	16:18	16:33	
1	6.5	6.5	6.9	5.9	6.5	6.6	6.7	
2	6.0	5.7	6.1	6.0	5.9	5.7	6.0	
3	6.1	6.0	6.3	6.1	6.0	6.0	6.2	
4	5.6	5.7	6.0	5.9	5.8	5.5	5.8	
5	4.5.7	6.8	6.2	6.1	5.9	5.7	6.2	
6	6.8	6.2	6.5	6.3	6.0	4.5.7	6.3	
7	6.2	5.7	6.0	5.9	5.6	6.0	5.9	
8	6.4	5.9	6.2	6.0	5.8	6.0	6.1	
9	6.5	5.9	6.1	5.9	5.9	6.1	6.0	
10	6.3	5.8	6.0	5.5	5.1	4.8	5.9	
11	6.0	5.5	5.8	5.3	5.3	5.7	5.8	
12	6.3	5.8	6.0	5.6	5.7	6.2	6.0	
13	6.0	5.8	6.0	4.5.8	5.4	5.9	6.0	
14	5.7	5.4	5.7	4.3	4.8	5.0	5.5	
15	5.7	5.3	5.5	6.1	5.0	5.5	5.4	
16	6.1	5.5	5.9	4.5	5.3	5.9	5.7	
17	6.5	6.0	6.3	4.8	5.0	5.5	5.3	
18	6.4	5.7	6.2	4.8	5.7	6.3	6.1	
19	5.8	5.5	5.7	6.5	5.2	5.7	5.8	
20	5.5	4.5.5	5.6	6.0	5.0	5.5	5.3	
21	6.3	6.0	5.9	6.4	5.2	5.8	4.5.5	
22	6.3	6.3	6.1	6.7	5.4	6.1	6.4	
23	6.0	6.3	5.9	4.5	5.3	5.9	6.3	
24	5.8	5.9	5.5	6.2	5.0	5.7	6.0	

MONTH <u>May</u>		MAGNAHELIC CHECKS				YEAR <u>2001</u>
COMP. NUMBER	PRESSURE DIFFERENTIAL IN COMPARTMENTS					
	DATE <u>05/03/01</u>		Run # <u>2</u>			
TIME	<u>16:48</u>	<u>17:03</u>	<u>17:18</u>	<u>17:33</u>	<u>17:48</u>	<u>17:55</u>
1	<u>5.9</u>	<u>6.4</u>	<u>6.7</u>	<u>7.0</u>	<u>6.7</u>	<u>6.5</u>
2	<u>6.0</u>	<u>5.7</u>	<u>6.0</u>	<u>6.0</u>	<u>5.9</u>	<u>5.7</u>
3	<u>6.4</u>	<u>5.8</u>	<u>6.1</u>	<u>6.0</u>	<u>6.0</u>	<u>6.0</u>
4	<u>6.0</u>	<u>5.5</u>	<u>5.8</u>	<u>5.7</u>	<u>5.8</u>	<u>5.7</u>
5	<u>6.3</u>	<u>5.7</u>	<u>6.2</u>	<u>6.0</u>	<u>6.0</u>	<u>6.0</u>
6	<u>6.5</u>	<u>6.0</u>	<u>6.3</u>	<u>5.9</u>	<u>6.1</u>	<u>6.0</u>
7	<u>6.1</u>	<u>5.5</u>	<u>5.9</u>	<u>5.6</u>	<u>5.7</u>	<u>5.6</u>
8	<u>6.5</u>	<u>5.6</u>	<u>6.0</u>	<u>6.6.0</u>	<u>6.0</u>	<u>5.7</u>
9	<u>6.5</u>	<u>5.6</u>	<u>6.0</u>	<u>6.4</u>	<u>5.9</u>	<u>5.7</u>
10	<u>6.6</u>	<u>5.2</u>	<u>4.8</u>	<u>4.9</u>	<u>5.5</u>	<u>5.5</u>
11	<u>6.0</u>	<u>4.8</u>	<u>5.2</u>	<u>5.7</u>	<u>5.3</u>	<u>5.3</u>
12	<u>6.3</u>	<u>5.3</u>	<u>6.0</u>	<u>6.3</u>	<u>5.8</u>	<u>5.7</u>
13	<u>6.0</u>	<u>5.5</u>	<u>5.8</u>	<u>6.3</u>	<u>5.6</u>	<u>5.4</u>
14	<u>5.7</u>	<u>5.0</u>	<u>5.5</u>	<u>6.0</u>	<u>5.4</u>	<u>5.3</u>
15	<u>5.6</u>	<u>6.5.0</u>	<u>5.3</u>	<u>6.0</u>	<u>5.3</u>	<u>5.1</u>
16	<u>5.9</u>	<u>6.0</u>	<u>5.7</u>	<u>6.2</u>	<u>5.5</u>	<u>5.5</u>
17	<u>5.5</u>	<u>5.5</u>	<u>5.5</u>	<u>5.7</u>	<u>5.2</u>	<u>5.0</u>
18	<u>6.5</u>	<u>6.3</u>	<u>6.1</u>	<u>6.7</u>	<u>5.9</u>	<u>5.8</u>
19	<u>5.8</u>	<u>6.0</u>	<u>5.5</u>	<u>6.0</u>	<u>5.5</u>	<u>5.3</u>
20	<u>5.5</u>	<u>5.8</u>	<u>5.2</u>	<u>5.9</u>	<u>5.1</u>	<u>5.1</u>
21	<u>5.9</u>	<u>6.0</u>	<u>5.5</u>	<u>6.1</u>	<u>5.2</u>	<u>5.2</u>
22	<u>6.3</u>	<u>6.2</u>	<u>5.7</u>	<u>6.5</u>	<u>5.7</u>	<u>5.6</u>
23	<u>6.0</u>	<u>6.0</u>	<u>5.8</u>	<u>4.3</u>	<u>6.5.0</u>	<u>5.5</u>
24	<u>5.8</u>	<u>5.9</u>	<u>5.5</u>	<u>6.0</u>	<u>6.0</u>	<u>5.3</u>

MONTH <u>MAY</u>		MAGNAHELIC CHECKS				YEAR <u>2001</u>	
COMP. NUMBER	PRESSURE DIFFERENTIAL IN COMPARTMENTS						
	DATE <u>5/03/01</u>		Run # <u>3</u>				
TIME	18:39	18:54	19:09	19:24	19:39	19:54	20:09
1	7.0	6.8	6.6	7.0	7.0	7.0	6.5
2	CLEANING	5.8	5.8	6.0	6.0	5.9	5.6
3	6.5	6.0	6.0	6.0	6.0	CLEANING	5.9
4	6.0	5.5	5.5	5.6	5.8	6.0	5.6
5	6.5	6.0	6.0	6.0	6.0	6.2	5.9
6	6.5	6.0	6.0	6.0	6.2	6.4	5.9
7	6.0	5.6	5.6	5.8	5.8	6.0	5.5
8	6.5	5.8	5.8	6.0	6.0	6.4	5.7
9	6.4	5.8	5.8	5.6	6.0	6.4	5.6
10	5.0	5.5	5.5	CLEANING	5.5	6.0	4.4
11	5.9	5.2	5.4	6.0	5.5	5.6	4.5
12	6.2	5.5	5.6	6.2	5.8	6.0	5.5
13	6.0	5.6	5.5	6.2	5.7	6.0	5.5
14	5.6	5.5	5.4	6.0	5.5	5.5	5.4
15	5.5	5.2	5.2	6.0	5.5	5.5	5.0
16	5.9	CLEANING	5.5	6.0	5.7	6.0	5.4
17	5.4	5.5	5.0	5.5	6.0	6.2	5.6
18	6.0	6.5	5.9	6.5	6.0	6.0	5.4
19	5.6	6.0	5.4	6.0	5.2	5.5	CL 5.3
20	5.5	6.0	5.0	5.6	5.0	5.5	5.6
21	5.6	6.0	5.5	6.0	5.0	5.7	5.9
22	6.0	6.5	5.8	6.5	5.5	6.0	6.1
23	5.9	6.0	5.5	6.0	5.2	5.7	6.0
24	5.6	6.0	5.2	6.0	5.0	5.9	5.9

MONTH <u>MAY</u>		MAGNAHELIC CHECKS				YEAR <u>2001</u>	
COMP. NUMBER	PRESSURE DIFFERENTIAL IN COMPARTMENTS						
	DATE <u>5/03/01</u>		Run # <u>3</u>				
TIME	20:24	20:39	20:54	21:09	21:24	21:39	21:54
1	6.8	6.5	6.5	6.9	6.5	6.7	6.7
2	6.0	5.5	5.7	6.9	5.6	6.0	5.7
3	6.0	5.6	5.9	6.0	6.0	6.0	5.7
4	5.6	5.5	5.5	5.4	5.5	5.7	5.2
5	6.0	5.5	5.7	CLEANING	5.9	6.0	CLEANING
6	6.2	5.6	5.9	5.5	6.0	6.2	6.5
7	5.8	5.4	5.5	6.0	5.6	5.9	6.0
8	6.0	5.5	5.6	6.1	5.9	6.0	6.2
9	6.0	5.5	5.6	6.1	5.7	6.0	6.2
10	4.5	4.2	4.2	4.7	5.5	5.8	6.0
11	5.0	4.9	5.2	5.7	5.0	5.2	5.5
12	5.8	CLEANING	5.6	6.0	5.6	5.9	6.0
13	5.6	5.9	5.2	6.0	5.6	5.7	5.8
14	5.5	5.5	5.0	5.6	5.4	5.5	5.5
15	5.0	5.3	5.0	5.5	5.0	5.2	5.5
16	5.5	5.6	5.2	5.9	5.5	5.5	5.7
17	5.0	5.2	4.6	5.2	6.0	6.0	6.2
18	6.0	6.0	5.5	6.0	5.6	5.8	6.0
19	5.5	5.8	5.0	5.6	5.5	5.5	5.5
20	5.5	5.8	5.0	5.8	CLEANING	5.5	5.6
21	5.5	5.9	5.0	5.8	6.0	5.5	5.7
22	5.9	6.0	5.4	6.0	6.5	6.0	6.0
23	5.5	5.8	5.0	5.6	6.0	5.5	5.8
24	5.5	5.6	5.0	5.5	6.0	5.5	5.6



GALLATIN
STEEL

ISO 9002 CERTIFIED
QS 9000 CERTIFIED

March 28, 2001

Mr. Gerald Slucher
Source Sampling and Data Management
Section
Technical Services Branch
Division for Air Quality
803 Schenkel Lane
Frankfort, KY 40601-1403

RE: Gallatin Steel Company, Warsaw, KY, ID # 079-1380-0018
Permit Number V-99-003
Compliance Test Protocol for Emissions Testing

Dear Mr. Slucher:

Gallatin Steel's air testing firm, Ambient Air Services, Inc., is scheduled to be at Gallatin Steel the first week of May to conduct emissions testing on emission point E1 (01) for NO_x and SO₂. In accordance with the conditions in our permit, we are not required to conduct testing for VOC, PM, CO, and lead emissions this year based on our test results for the 1998 and 1999.

The protocol submitted to your attention on January 7, 1998 will be followed for the testing of NO_x and SO₂ with the following listed changes:

- 1) For NO_x, three runs each of three heat cycles in duration will be performed with the inlet probe being positioned in the discharge plenum of the baghouse.
- 2) For SO₂, in order to obtain statistically valid sampling of levels in the baghouse (since there is not homogeneity in the baghouse), we will be testing compartments in pairs (instead of testing one single compartment) over a total of four runs, each run consisting of three heats. We are requesting to test 8 of the 24 compartments during the four runs, two compartments tested during each run. The results of the sampling will provide more accurate information and will produce an average ppm level for the baghouse emissions. Please note that 40 CFR 60 supports and addresses multiple measurement sites for correctly testing particulate emissions. This same logic is also applicable to SO₂ emissions, and supports the use of an "alternate" method to produce more accurate results. Mr. Frazier approved the use of this procedure for the annual SO₂ testing that occurred last year on May 5.

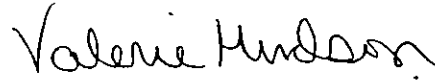
The performance testing is tentatively scheduled to begin on Thursday, May 3 and we will provide you with notification of the exact test date and start time at least 10 days prior to the testing. A source testing report that presents the results of the performance tests will be submitted to the DAQ within 45 days after the completion of the fieldwork in accordance with the permit.

R.R. 1 Box 320
Ghent, Ky 41045-9704
859.567.3100
859.567.3165 fax
www.gallatinsteel.com

Letter to Gerald Slucher
March 28, 2001
Page Two

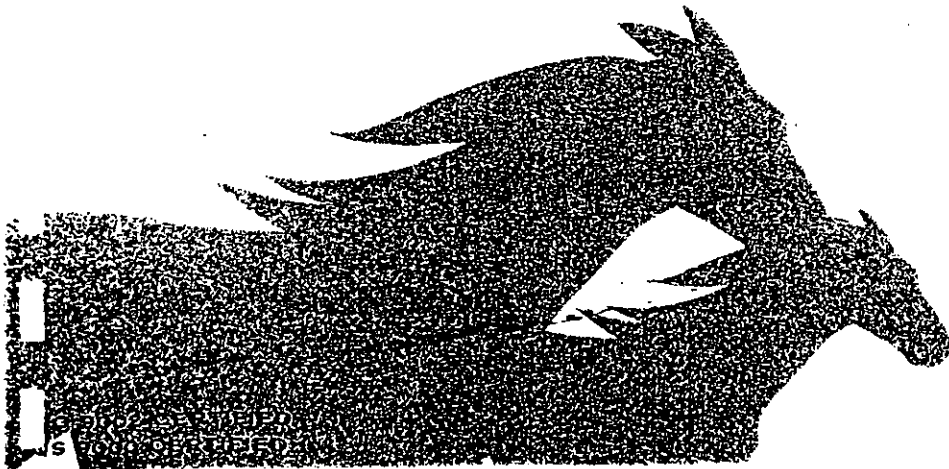
If you have any questions or comments, please contact me at RR# 1, Box 320, Ghent, KY 41045 or by telephone at 859-567-3141.

Sincerely yours,



Valerie A. Hudson, P.E.
Process Manager - Environmental Systems

cc: Edd Frazier, DAQ - Permit Review Branch
Clay Redmond, DAQ - Florence Regional Office
Joe Cooksey, Ambient Air Services, Inc.



APPENDIX G
PROJECT PARTICIPANTS

PROJECT PARTICIPANTS

AMBIENT AIR SERVICES, INC.

Joe Cooksey
Earl Coggins
Alan Luther

GALLATIN STEEL

Valerie Hudson
Joe Dougherty

STATE OBSERVER

Gerald Slucher



GALLATIN
STEEL

ISO 9002 CERTIFIED
QS 9000 CERTIFIED

March 28, 2001

Mr. Gerald Slucher
Source Sampling and Data Management
Section
Technical Services Branch
Division for Air Quality
803 Schenkel Lane
Frankfort, KY 40601-1403

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Permit Number V-99-003
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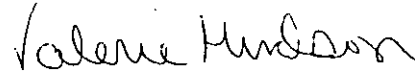
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Valerie A. Hudson, P.E.
Process Manager - Environmental Systems

cc: Edd Frazier, DAQ - Permit Review Branch
Clay Redmond, DAQ - Florence Regional Office
Joe Cooksey, Ambient Air Services, Inc.