Georgia-Pacific

Palatka Pulp and Paper Operations
Consumer Products Division

P.O. Box 919
Palatka, FL 32178-0919
(386) 325-2001

June 19, 2008

Mr. Jeffery F. Koerner, Air Permitting North Section
Bureau of Air Regulation
Florida Department of Environmental Protection
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Re: Project No. 1070005-038-AC/PSD-FL-380
EU I.D. 018 - #4 Recovery Boiler
Condition 3.D.7.a. - BLS Fuel Factor Protocol

Dear Mr. Koerner:

Submitted for your review is the report of the study conducted to establish a site-specific fuel factor (F-factor) for black liquor solids (BLS). In accordance with the referenced permit condition, the F-factor has been developed for use in determining stack flow rates in lieu of a stack flow meter. The stack flow rates predicted by the proposed F-factor (6527 scf/mmbtu) differed from the measured flows by less than 10 percent under all three test conditions, and by less than 1% during the high-load condition where the boiler is operated most frequently. We request that, if you are in agreement with this proposal, a written approval be provided as stated in the permit requirement.

If there are any questions regarding this response, please do not hesitate to contact Ron Reynolds at 386-329-0967.

Sincerely,

Keith Wahoske

Keith W. Wahoske, Vice-President
Palatka Operations

Enclosures

Cc: T. Champion, S. Matchett, M. Curtis - GP

EXECUTIVE SUMMARY
NO. 4 RECOVERY BOILER (EU-018)
APRIL 7 AND 11, 2008

BLACK LIQUOR SOLIDS FUEL FACTOR STUDY

Stack testing (flow rate and %O2) and fuel analyses were conducted on the above-referenced Emissions Unit in accordance with the protocol approved by DEP for the purpose of determining a site-specific F-factor for BLS.

The study results are summarized in the table below.

Load Condition	Test Date	BLS (lbs/hr)	BLS GCV (Btu/lb)	Measured Stack Flow (SDCFM)	F-Factor (SCF/ mmBtu	Calculated Stack Flow (SDCFM)	% Diff.
High	4/7	208,546	6232	184,984	6511	185,451	0.3
Mid	4/7	182,491	6187	156,233	6078	167,779	6.9
Low	4/11	167,088	6070	160,092	6992	149,474	-6.6
Average			**6163**	**167,103**	**6527**	**167,566**	**0.3**

The BLS lab results (Btu content and other requested analyses) of samples collected during the test are included in the enclosed report by AASI under Appendix A.

The BLS test results from the GP-Neenah Technical Center for 2007 and YTD-2008 are shown in attached tables.

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Black Liquor Testing Results* - 2008 YTD					
Sampling Date	Solids, %	Density, g/ml	Ash, %	H. value, Btu/lb (dry)	Total Sulfur,% as S
1/7/2008	66.17	1.410	39.94	5,610	4.46
1/14/2008	67.78	1.403	37.39	5,950	3.98
1/21/2008	67.28	1.410	38.56	5,840	3.99
1/28/2008	68.1	1.408	39.94	5,770	3.72
2/4/2008	67.17	1.391	36.26	5,870	3.70
2/12/2008	68.14	1.435	41.19	5,780	4.35
2/18/2008	68.91	1.411	37.44	5,930	4.03
2/25/2008	67.09	1.404	39.13	5,900	4.41
3/3/2008	68.85	1.419	41.2	5,830	4.50
3/10/2008	69.31	1.434	40.04	5,860	4.30
3/17/2008	68.39	1.417	40.07	5,730	4.46
3/24/2008	64.39	1.401	38.34	5,890	4.10
3/31/2008	66.13	1.356	35.45	5,980	3.68
4/7/2008	67.94	1.405	41.09	5,820	4.10
4/14/2008	68.31	1.403	40.09	5,780	4.41
4/21/2008	66.97	1.388	37	5,890	4.56
4/28/2008	65.91	1.411	40.42	5,720	4.30
5/5/2008	65.67	1.394	41.16	5,780	4.39
5/12/2008	68.41	1.422	40.76	5,750	4.48
5/19/2008	68.88	1.414	41.22	5,680	4.79
Average	67.49	1.407	39.3345	5,818	4.24

* All analyses conducted at GP - Neenah Technical Center

Georgia-Pacific, Palatka Operations

Black Liquor Testing Results * - 2007					
Sampling Date	Solids, %	Density, g/ml	Ash, %	H. value, Btu/lb (dry)	Total Sulfur,% as S
1/4/2007	67.19	1.396	37.44	5,930	3.99
1/9/2007	65.76	1.401	41.18	5,700	3.99
1/15/2007	67.29	1.419	41.66	5,650	4.79
1/22/2007	66.48	1.387	36.5	6,070	4.10
1/29/2007	67.17	1.427	38.4	5,900	4.31
2/6/2007	66.46	1.408	39.62	5,920	4.53
2/13/2007	67.75	1.406	37.88	5,780	4.99
2/19/2007	67.13	1.398	38.59	5,970	4.80
2/26/2007	67.74	1.405	39.84	5,830	4.95
3/5/2007	68.86	1.435	41.69	5,540	5.39
3/16/2007	67.43	1.407	34.04	5,920	4.33
3/19/2007	64.33	1.384	35.67	5,830	4.13
3/27/2007	66.16	1.400	35.41	5,890	4.00
4/3/2007	65.32	1.369	34.76	6,210	3.62
4/9/2007	65.78	1.394	37.96	5,900	4.00
4/16/2007	69.00	1.434	38.03	5,620	4.41
4/23/2007	65.67	1.379	39.22	6,130	3.71
4/30/2007	66.36	1.413	38.48	5,660	4.00
5/7/2007	65.03	1.379	38.11	5,900	3.93
5/10/2007	67.63	1.412	42.01	5,550	4.75
5/14/2007	67.09	1.413	41.48	5,690	4.67
5/21/2007	65.74	1.395	40.04	5,760	4.36
5/25/2007	66.00	1.418	37.63	5,770	4.20
5/28/2007	65.47	1.399	38.34	5,700	4.20
6/5/2007	66.02	1.404	37.13	5,880	3.76
6/11/2007	67.22	1.414	39.18	5,660	4.03
6/18/2007	63.14	1.382	37.98	5,790	3.84
6/25/2007	67.03	1.381	36.3	6,000	3.62
7/2/2007	65.96	1.405	38.56	5,740	4.00
8/13/2007	67.52	1.389	34.02	6,420	3.14
8/20/2007	68.92	1.419	39.24	5,520	3.85
8/28/2007	66.49	1.409	37.61	5,800	3.47
9/4/2007	66.91	1.426	39.02	5,680	3.52
9/10/2007	68.11	1.406	35.58	6,100	3.10
9/17/2007	66.69	1.405	37.48	5,710	3.85
9/24/2007	65.04	1.386	37.26	5,790	3.96
10/1/2007	65.52	1.382	34.73	6,100	3.64
10/8/2007	66.18	1.423	39.73	5,570	4.30
10/15/2007	65.92	1.402	37.69	5,850	3.54
10/22/2007	65.41	1.358	34.4	6,260	3.55
10/29/2007	66.03	1.367	35.08	6,310	3.28
11/5/2007	67.25	1.417	40.19	5,570	4.44
11/12/2007	67.91	1.407	36.56	5,850	3.95
11/19/2007	64.99	1.372	37.7	5,930	3.87
11/26/2007	65.54	1.410	39.96	5,960	4.08
12/3/2007	67.44	1.404	38.47	5,850	4.17
12/10/2007	66.28	1.417	39.77	5,720	4.42
12/17/2007	68.60	1.409	36.19	6,070	3.74
Average	66.56	1.401	37.996	5,853	4.07

Black Liquor Solids Fuel Factor Study

Georgia-Pacific Consumer Operations, LLC
Palatka, Florida

Number 4 Recovery Boiler (EU-018)

Permit Number 1070005-038-AC
PSD-FL-380

April 7 and 11, 2008

Prepared By:

AASI
Ambient Air Services, Inc.
Environmental Consulting and Engineering

106 Ambient Airway • Starke, FL 32091 • (904) 964-8440 • Fax (904) 964-6675

LELAP ACCREDITED LABORATORY CERTIFICATION NUMBER 04064
LELAP AGENCY INTEREST NUMBER 100329

Black Liquor Solids Fuel Factor Study

Georgia-Pacific Consumer Operations, LLC
Palatka, Florida

Number 4 Recovery Boiler (EU-018)

Permit Number 1070005-038-AC
PSD-FL-380

April 7 and 11, 2008

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JUN 24 2008
BUREAU OF AIR REGULATION

Prepared by:

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106 AMBIENT AIRWAY
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(904) 964-8440
LELAP Accredited Laboratory Certification Number: 04064
LELAP Agency Interest Number: 100329

CERTIFICATION

Ambient Air Services, Inc. (AASI) of Starke, Florida has completed testing as described in this report for Georgia-Pacific Consumer Operations, LLC (GP) located in Palatka, Florida. To the best of our knowledge and abilities, all information, facts, and test data are true and correct. Information supplied to AASI for use in this report from GP is perceived to be accurate and is used as such where necessary.

This report contains pages 1 through 131.

This report was reviewed by:

Joseph L. Cooksey, Technical Director — Date: 6/11/08

David C. Sholtes, Quality Assurance Manager — Date: 6/11/08

Questions and or comments regarding this report or process conditions should be directed to:

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Georgia-Pacific Consumer Operations, LLC
215 County Road 216
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Phone: 386-329-0967
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EXECUTIVE SUMMARY

Ambient Air Services, Inc. (AASI) conducted emissions testing on the Number 4 Recovery Boiler (EU-018) at Georgia-Pacific Consumer Operations, LLC located in Palatka, Florida on April 7 and April 11, 2008 as specified in Section 3, Condition D.7 a-d of the construction permit. The purpose of the testing was to develop a site specific fuel factor for Black Liquor Solids (BLS). The fuel factor is to be used in place of a flow monitor on the CEMS (Permit Section 3 Condition D.7). A summary of the results is presented in the table below:

Executive Summary

Georgia-Pacific Consumer Operations, LLC
Palatka, Florida

April 7 and 11, 2008

Source	Parameter	Test Results
Number 4 Recovery Boiler (EU-018)	BLS Fuel Factor (scf/million Btu)	6527 scf/million Btu

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Revision History

Revision	Comments	Issue Date
0	Final report to Ron Reynolds	June 11, 2008

1.0 INTRODUCTION

1.1 General

Georgia-Pacific Consumer Operations, LLC (GP) contracted with Ambient Air Services, Inc. (AASI) to conduct testing on the Number 4 Recovery Boiler as specified in Section 3, Condition D.7.a-d of the construction permit. The purpose of the testing was to develop a site specific fuel factor for Black Liquor Solids (BLS). The fuel factor is to be used in place of a flow monitor on the CEMS (Permit Section 3, Condition D.7). The testing was conducted on April 7 and April 11, 2008. A summary of the testing performed is presented in Table 1-1-1.

Table 1-1-1

Summary of Testing

Georgia-Pacific Consumer Operations, LLC
Palatka, Florida

April 7 and 11, 2008

Source	Parameters	EPA Reference Methods	Duration of tests
Number 4 Recovery Boiler (EU-018)	Flow, oxygen and fuel analysis/rate	40 CFR, Part 60, Appendix A, Methods 1, 2, 3A, and 4, and Fuel analysis for Btu content	3, 1 hour runs per test condition (3 test conditions)

1.2 Test Participants

The personnel indicated in Table 1-2-1 participated in this project:

Table 1-2-1

Name	Affiliation	Responsibility
David Pate	Ambient Air Services, Inc.	Project Manager, Field Testing
Randy Weston	Ambient Air Services, Inc.	Field Testing
Ray Younkin	Ambient Air Services, Inc.	Field Testing
Joe Elliott	Ambient Air Services, Inc.	Field Testing
Susan H. Anderson	Ambient Air Services, Inc.	Report Preparation
Joseph L. Cooksey	Ambient Air Services, Inc.	Technical Director
David C. Sholtes	Ambient Air Services, Inc.	Field Testing and Quality Assurance Manager
Ron Reynolds	Georgia-Pacific Consumer Operations, LLC	Environmental Representative

2.0 PROCESS DESCRIPTION

2.1 Emission Unit Process

Number 4 Recovery Boiler: This unit fires black liquor solids (BLS) as the primary fuel to facilitate the recovery of the cooking liquor. Residual fuel oil is fired as a start-up and supplemental fuel. The maximum steam production rate is 789,000 lb/hour (24-hour average) for steam conditions of 850° F to 900° F at 1250 psi. Particulate matter emissions are controlled by an electrostatic precipitator (ESP) with automatic voltage control, 2-chambers, and 6 electric fields per chamber. Total reduced sulfur emissions are reduced by the low-odor design. NO_x emissions are controlled by good combustion design and operating practices. CO, NO_x, SO_2, TRS, and opacity are continuously monitored and recorded. At permitted capacity, the exhaust gas flow rate is 294,000 dscfm at 8% oxygen with an exit temperature of 400° F. Exhaust gasses exit a stack that is 12 feet in diameter and 230 feet tall.

3.0 SUMMARY AND DISCUSSION OF RESULTS

Results of testing are presented in the following tables:

Table 3-1 presents a summary of testing.

Table 3-2 presents a summary of the fuel analysis of the BLS.

Table 3-1

Summary of Test Results Georgia-Pacific Consumer Operations, LLC Palatka, Florida April 7 and 11, 2008		
Source	**Parameter**	**Test Results**
Number 4 Recovery Boiler (EU-018)	BLS Fuel Factor (scf/million Btu)	6527 scf/million Btu

Table 3-2

AASI

Black Liquor Solids Fuel Factor Emissions Summary

Georgia-Pacific Consumer Operations, LLC
Palatka, Florida
No. 4 Recovery Boiler
April 7, 11, 2008

Run			Fuel Analysis			Reference Method Oxygen	Reference Method Volumetric Flow Rates	Fuel Factor Predicted Volumetric Flow Rate	Difference	Fuel Factor
Date	Number	Time (EDT)	Feed Rate (Lbs BLS/Hr)	Fuel Analysis (BTU/Lb)	Heat Input (mmBtu/Hr)	Percent	SCFM-Dry	SCFM-Dry	Percent	SCF/mmBtu
4/7/2008	1 - High	9:00 - 10:00	209563	6251	1306.0	5.0	185910 187426 187351 **186896**	186743	-0.1	6532
4/7/2008	2 - High	10:10 - 11:10	208244	6087	1297.8	5.0	182800 182118 182813 **182577**	185568	1.6	6422
4/7/2008	3 - High	13:00 - 14:00	207830	6359	1295.2	4.9	186320 184351 185771 **185481**	184041	-0.8	6578
Average - High			**208546**	**6232**	**1299.7**	**5.0**	**184984**	**185451**	**0.3**	**6511**

Run			Fuel Analysis			Reference Method Oxygen	Reference Method Volumetric Flow Rates	Fuel Factor Predicted Volumetric Flow Rate	Difference	Fuel Factor
Date	Number	Time (EDT)	Feed Rate (Lbs BLS/Hr)	Fuel Analysis (BTU/Lb)	Heat Input (mmBtu/Hr)	Percent	SCFM-Dry	SCFM-Dry	Percent	SCF/mmBtu
4/7/2008	1 - Mid	14:40 - 15:40	182285	6065	1127.8	5.7	152916 153535 157643 **154698**	168689	9.0	5986
4/7/2008	2 - Mid	15:50 - 16:50	182045	6279	1126.3	5.6	156220 160234 157315 **157923**	167366	6.0	6159
4/7/2008	3 - Mid	17:00 - 18:00	183142	6218	1133.1	5.5	155722 156274 156239 **156078**	167281	7.2	6090
Average - Mid			**182491**	**6187**	**1129.1**	**5.6**	**156233**	**167779**	**7.4**	**6078**

Run			Fuel Analysis			Reference Method Oxygen	Reference Method Volumetric Flow Rates	Fuel Factor Predicted Volumetric Flow Rate	Difference	Fuel Factor
Date	Number	Time (EDT)	Feed Rate (Lbs BLS/Hr)	Fuel Analysis (BTU/Lb)	Heat Input (mmBtu/Hr)	Percent	SCFM-Dry	SCFM-Dry	Percent	SCF/mmBtu
4/11/2008	1 - Low	13:10 - 14:15	166800	6219	1012.5	5.9	167602 160461 159158 **162407**	153459	-5.5	6907
4/11/2008	2 - Low	14:25 - 15:25	167031	5782	1013.9	5.1	156659 157121 161469 **158416**	145891	-7.9	7087
4/11/2008	3 - Low	15:35 - 16:35	167432	6210	1016.3	5.4	160812 157340 160208 **159453**	149072	-6.5	6981
Average - Low			**167088**	**6070**	**1014.2**	**5.5**	**160092**	**149474**	**-6.6**	**6992**

Average - Overall	**186041**	**6163**	**1147.6**	**5.3**	**167103**	**167568**	**0.3**	**6527**

4.0 TESTING METHODOLOGY AND PROCEDURES

4.1 Flow

Sample and Velocity Traverse

USEPA Method 1, as published in 40 CFR, Part 60, Appendix A, was used as the reference method to determine the location of the traverse points for velocity measurements.

Velocity and Volumetric Flow Rate

USEPA Method 2, as published in 40 CFR, Part 60, Appendix A, was used as the reference method to determine average gas velocity. A type "S" pitot tube and an oil manometer were used for velocity determination. Gas temperature was measured with a type K thermocouple. Calibration checks were performed on the pitot tube to verify the face opening alignments, external tubing diameter, and base-to-opening plane distances. A base-line coefficient of 0.84 was assigned to the pitot tube. Three flow traverses were conducted during each test run.

Oxygen and Carbon Dioxide

USEPA Method 3A, as published in 40 CFR, Part 60, Appendix A, was used as the reference method for determining oxygen and carbon dioxide levels in the effluent gas stream. A Servomex 1440 was used. Calibrations were performed before and after each test run.

Moisture Content

USEPA Method 4, as published in 40 CFR, Part 60, Appendix A, was used as the reference method to determine the moisture content of the gas stream by extracting the gas sample at a known and regulated rate through a glass condenser train. The condenser train consisted of four glass impingers connected in series with leak free U-tube connectors. The gas sample was extracted through the impinger train (maintained at below 68° F in an ice bath) with a vacuum

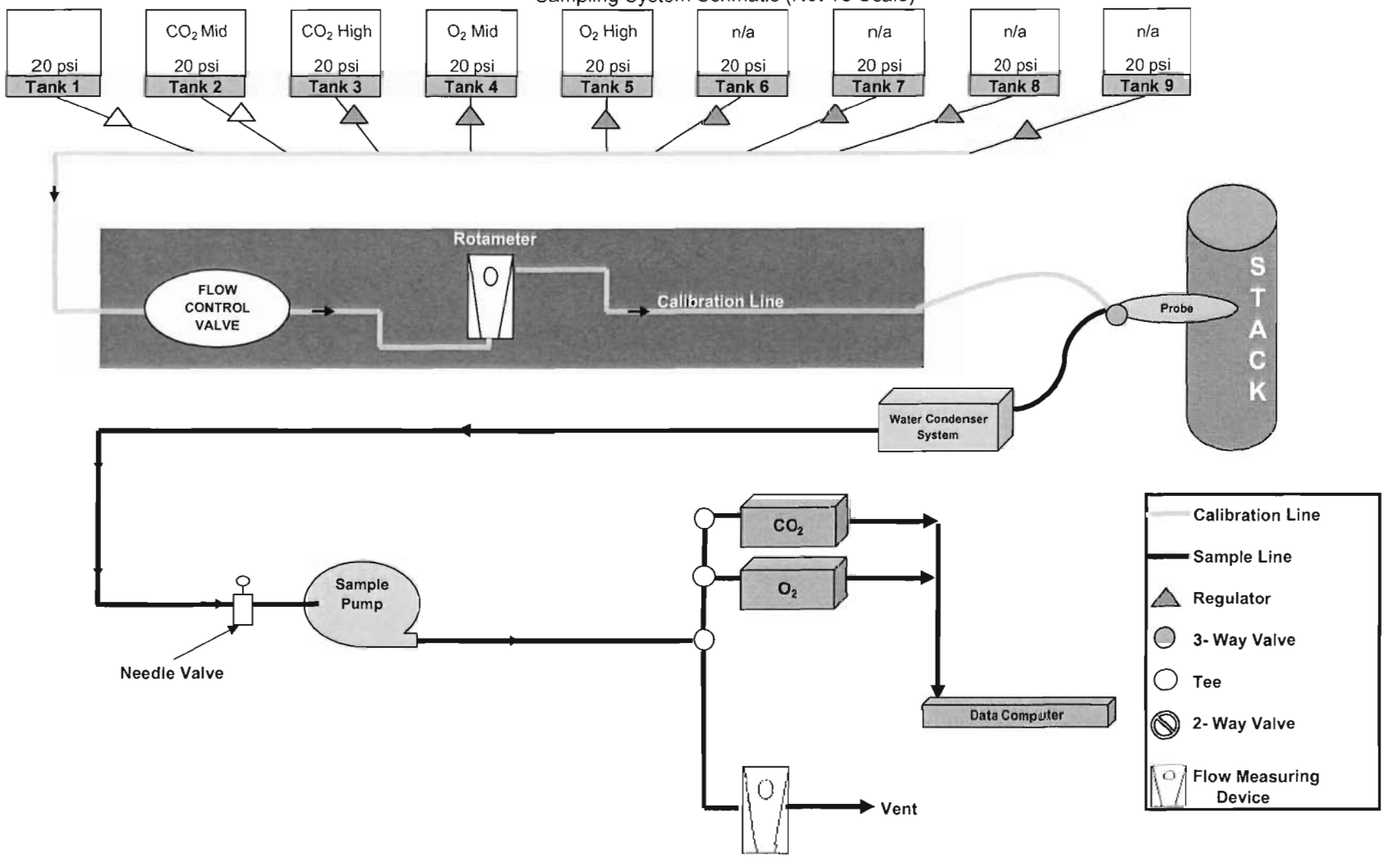
pump. The amount of gas sampled was measured with a calibrated dry gas meter. The amount of moisture collected during the test was gravimetrically determined and the amount of gas drawn, corrected to dry standard conditions, was determined. One moisture run was conducted for each test condition.

4.2 Sample System

A fully extractive sample system conveyed the stack gas to the analytical instruments. The sample system consisted of the following components: a probe, calibration tee, moisture removal system, particulate filter, sample line, a sample pump and a sample manifold to distribute the sample gas to the analytical instruments. The system was designed so that all calibration gases were injected at the probe and passed through the same system as the sample gas. A schematic of the sampling system is shown in Figure 4-2-1.

Figure 4-2-1

Sampling System Schmatic (Not To Scale)



5.0 TEST COMMENTS

-The traverse points listed in the protocol were incorrect. This error was corrected onsite and the correct traverse points are listed in the report.

-All calibration gases were injected at the probe. Therefore, no separate bias checks were performed.

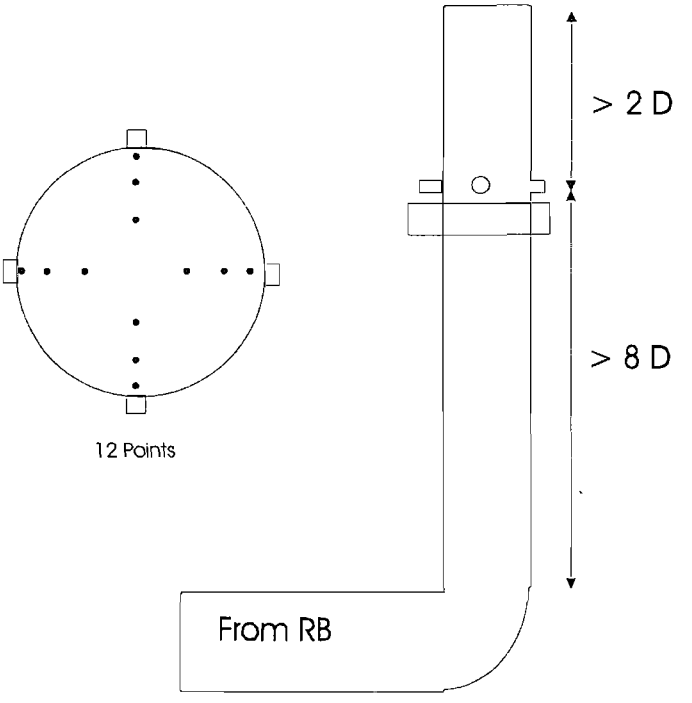
6.0 SAMPLING POINT LOCATION

Figure 6-1

Georgia-Pacific Consumer Operations, LLC
Palatka, Florida
Number 4 Recovery Boiler (EU-018)

		Sampling Points (inches)	
Diameters Upstream:	> 2		
Diameters Downstream	> 8	1	6.3"
Stack diameter	144"	2	21.0"
Drawing Date	7/24/06	3	42.6"

Drawing Not to Scale



Note: Four equal distance, ninety-degree ports. 4 ports with 3 points per port, 12 total points. All distances are approximate.

LIST OF APPENDICES

APPENDIX A	FLOW, OXYGEN AND FUEL ANALYSIS/RATE DATA
APPENDIX B	TEST PROTOCOL
APPENDIX C	LABORATORY ACCREDITATION
APPENDIX D	PROCESS DATA

APPENDIX A

FLOW, OXYGEN AND FUEL ANALYSIS/RATE DATA

-Example Calculations – O_2, CO_2, Flow, Moisture, BLS Factor
-Emission Run Summaries
-Field Data Sheets
-O_2, CO_2 Calibration Data
-O_2, CO_2 Data Recorder Printout
-Fuel Analysis Data
-Meter Box Pre Test Calibration
-Meter Box Post Test Calibration
-Pitot Tube Calibration
-Thermocouple Calibration

EXAMPLE CALCULATIONS FOR GASEOUS EMISSIONS

Calculations for Run 1 of the O_2 Test

Correction of O_2 Concentrations for Instrument Drift - High Load

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

The EPA equation presented in Section 12 of EPA Method 7E is:

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

Where:

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

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

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

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

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

Using the average for Run 1 of the O_2 test:

C_{avg} = 5.03

From the Pre test / post test calibration

Pre test + Post Test / 2

C_o =	0.14	0.22	2.00	0.18	percent
C_m =	11.11	10.95	2.00	11.03	percent
C_{ma} =	11.10	percent			

	Cavg	Co	Cma	Cm	Co
C_{gas} =	5.03	0.18	11.10	11.03	0.18

C_{gas} = 5.0

EXAMPLE CALCULATIONS FOR GASEOUS EMISSIONS

Calculations for Run 1 of the CO_2 Test - High Load

Correction of CO_2 Concentrations for Instrument Drift

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

The EPA equation presented in Section 12 of EPA Method 7E is:

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

Where:

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

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

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

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

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

Using the average for Run 1 of the CO_2 test:

C_{avg} = 14.19

From the Pre test / post test calibration

Pre test + Post Test / 2

C_o =	0.07	0.21	2.00	0.14	percent
C_m =	10.56	10.53	2.00	10.55	percent
C_{ma} =	10.80	percent			

	Cavg	Co	Cma	Cm	Co
C_{gas} =	14.19	0.14	10.80	10.55	0.14

C_{gas} = 14.6

Ambient Air Services, Inc.
Environmental Consultants
106 Ambient Airway Starke, Florida 32091 (904) 964-8440

Method 1,2,4 Flow and Moisture Template Rev4, 12-15-05

Example Calculations, Flow - Run 1-1-1

Facility	Georgia-Pacific Corporation	**Source**	**No. 4 Recovery Boiler**
Location	Palatka, Florida	**Date**	**April 7, 2008**

1. **Stack Pressure (P_s)**

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

Example.	P_{bar}	=	29.93	**P_s**	=	**29.89**	**in. Hg.**
	P_g	=	-0.53				

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

$$1 - B_{ws}$$

Example.	B_{ws}	=	0.267	**B_{wd}**	=	**0.733**

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

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

Example.	CO2	=	14.6	**M_d**	=	**30.54**
	O2	=	5.0			
	N2	=	80.4			
	CO	=	0			

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

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

Example.	M_d	=	30.54	**M_s**	=	**27.19**
	B_{wd}	=	0.733			
	B_{ws}	=	0.267			

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Method 1,2,4 Flow and Moisture Template Rev4, 12-15-05

Example Calculations, Flow - Run 1-1-1

Facility	*Georgia-Pacific Corporation*	**Source**	**No. 4 Recovery Boiler**
Location	**Palatka, Florida**	**Date**	**April 7, 2008**

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

$$= M_S / 28.99$$

Example.	M_s	=	27.19	**G_s**	=	**0.938**	

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

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

Example.	C_p	=	0.84	**v_s**	=	**3636.1**	**FPM**
	Δp_{avg}	=	0.8222				
	$T_{s(abs)}$	=	856.3				
	P_s	=	29.89				
	M_s	=	27.19				
	K_p	=	85.49				

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

$$= A \times v_s$$

Example.	v_s	=	3636.1	**Q_s**	=	**411235**	**ACFM**
	A	=	113.097				

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

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

Example.	Q_s	=	411235	**Q_d**	=	**301530**	**ACFMD**
	B_{wd}	=	0.733				

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Example Calculations, Flow - Run 1-1-1

Facility	Georgia-Pacific Corporation	**Source**	No. 4 Recovery Boiler
Location	Palatka, Florida	**Date**	April 7, 2008

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

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

Example	Q_d	=	301530	$Q_{d(std)}$	=	**185738**	**SCFMD**
	P_s	=	29.89				
	$T_{s(abs)}$	=	856.3				
	P_{std}	=	29.92				
	T_{std}	=	528				

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

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

	$Q_{d(std)}$	=	185738	$Q_{s(std)}$	=	**253315**	**SCFMW**
	B_{wd}	=	0.733				

Constants

T_{std}	=	528 °R	K_p	=	85.49 Velocity equation constant
P_{std}	=	29.92 inches Hg			

Variables

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

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Method 1,2,4 Flow and Moisture Template Rev4, 12-15-05

Example Calculations, Moisture - Run 1

Facility	**Georgia-Pacific Corporation**	**Source**	**No. 4 Recovery Boiler**
Location	**Palatka, Florida**	**Date**	**April 7, 2008**

1. **Meter Pressure (Pm)**

$$Pm = P_{bar} + (\Delta H_a / 13.6)$$

Example.	P_{bar}	=	29.93	P_m	=	**30.08**	**in. Hg.**
	ΔH_{avg}	=	2.0000				

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

$$V_{lc} \times 0.04706$$

Example.	V_{lc}	=	185.7	$V_{w(std)}$	=	**8.741**	**SCF**

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

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

Example.	V_m	=	23.950	$V_{m(std)}$	=	**24.025**	**SCF**
	P_{bar}	=	29.93				
	T_m	=	533.7				
	Y	=	1.009				
	K_1	=	17.64				
	ΔH_{avg}	=	2.0000				

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

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

Example.	$V_{m(std)}$	=	24.025	V_t	=	**32.766**	**SCF**
	$V_{w(std)}$	=	8.741				

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

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

Example.	$V_{m(std)}$	=	24.025	B_{ws}	=	**0.267**	
	$V_{w(std)}$	=	8.741				

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Example Calculations, Moisture - Run 1

Facility	Georgia-Pacific Corporation	**Source**	No. 4 Recovery Boiler
Location	Palatka, Florida	**Date**	April 7, 2008

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

$$= 1 - B_{ws}$$

Example. B_{ws} = 0.267 B_{wd} = **0.733**

Constants

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

Variables

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

EXAMPLE CALCULATIONS FOR FUEL FACTOR

Calculations for Run 1 of the BLS Fuel Factor Test

Calculation of Fuel Factor

The equation presented in the protocol to calculate the fuel factor is as follows:

$$F_d = Q \times (20.9 - O_2) / (H \times 20.9)$$

Where:

F_d = Calculated Oxygen Based Fuel Factor, SCF/mmBtu

Q = Measured Stack Gas Flow Rate, SCFHD

O_2 = Measured Oxygen Concentration, Percent

H = Calculated Boiler Heat Input Rate, mmBtu/Hr

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

Using the average for Run 1 of the BLS test at the high load condition:

SCFMD = 186723

Q = SCFMD x 60

Q = 11203380 SCFHD

O2 = 5.0 percent

H = F x B / 1000000

Where:

F = BLS Feed Rate , lbs BLS/Hr

B = Measured Heating Value, BTU/Lb on wet basis

$$H = \frac{F \times B}{1000000}$$

F = 209563 (Production Records)

B = 4244 (Lab Report)

H = 889.4 mmBtu/Hr

$$F_d = \frac{Q}{H} \times \frac{(20.9 - O_2)}{20.9}$$

$$F_d = \frac{11203380}{889.4} \times \frac{15.9}{20.9}$$

F_d = 9583 SCF/mmBtu

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Volumetric Flow Calculations Worksheet

Data Request Entry Area	Flow Run 1-1-1
Facility	Georgia-Pacific Corporation
Location	Palatka, Florida
Source	No. 4 Recovery Boiler
Date	04/07/08
Run Number	1-1-1
Start Time	9:15
Finish Time	9:23
Weather	Cloudy
Total Time (minutes) (Θ)	8.0
Number of Points (n)	12
Barometric Pressure (inches Hg) (P_{bar})	29.93
Static Pressure (inches H_2O) (P_g)	-0.53
Stack Diameter (inches) (D)	144.00
Pitot Factor (C_p)	0.84
Moisture Fraction (B_{ws})	0.267
Carbon Dioxide (%)	14.6
Oxygen (%)	5.0
Carbon Monoxide (%)	0.0
Nitrogen (%)	80.4

Field Data Points - Flow Run 1-1-1

Port	Trav. Pt.	Velocity Head (inches H_2O)		Stack Temperature (°F)		Square Root of Velocity Head
1	1	0.76		402		0.8718
	2	0.71		402		0.8426
	3	0.62		398		0.7874
2	1	0.72		398		0.8485
	2	0.74		399		0.8602
	3	0.60		396		0.7746
3	1	0.71		394		0.8426
	2	0.72		396		0.8485
	3	0.58		397		0.7616
4	1	0.68		387		0.8246
	2	0.72		393		0.8485
	3	0.57		394		0.7550

Flow Summary Run 1-1-1

Facility	Georgia-Pacific Corporation	Source	No. 4 Recovery Boiler
Location	Palatka, Florida	Run Date	4/7/2008
Start Time	9:15	Weather	Cloudy
Finish Time	9:23	Total Time (min.)	8
(P_{bar}) Barometric Pressure (in Hg)	29.93	Carbon Dioxide (%)	14.6
(D) Diameter (inches)	144.00	Oxygen (%)	5.0
(A) Stack Area (ft^2)	113.097	Carbon Monoxide (%)	0.0
(n) Number of Points	12	Nitrogen (%)	80.4
(Δp_{avg}) Avg of SQRT of V.H.	0.8222	(P_s)Stack Pressure (inches Hg)	29.89
(C_p) Pitot Correction Factor	0.84	($T_{s(abs)}$) Stack Temp (°R)	856.3

(B_{ws}) Moisture in stack gas, volume fraction	0.267
(B_{wd}) Dry Stack Gas, volume fraction	0.733
(M_d) Molecular Weight of Stack Gas (Dry Basis)	30.54
(M_s) Molecular Weight of Stack Gas (Stack conditions)	27.19
(G_s) Specific gravity of Stack Gas Relative to Air	0.938
(v_s) Average Stack Velocity, FPM	3636.1
(Q_s) Actual Stack Gas Flow Rate, ACFM	411235
(Q_d) Actual Stack Gas Flow Rate, ACFMD	301530
($Q_{d(std)}$) Stack Gas Flow Rate, SCFMD	185738
($Q_{s(std)}$) Stack Gas Flow Rate Wet, SCFMW	253315

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Volumetric Flow Calculations Worksheet

Data Request Entry Area	Flow Run 1-1-2
Facility	Georgia-Pacific Corporation
Location	Palatka, Florida
Source	No. 4 Recovery Boiler
Date	04/07/08
Run Number	1-1-2
Start Time	9:30
Finish Time	9:38
Weather	Cloudy
Total Time (minutes) (Θ)	8.0
Number of Points (n)	12
Barometric Pressure (inches Hg) (P_{bar})	29.93
Static Pressure (inches H_2O) (P_g)	-0.57
Stack Diameter (inches) (D)	144.00
Pitot Factor (C_p)	0.84
Moisture Fraction (B_{ws})	0.267
Carbon Dioxide (%)	14.6
Oxygen (%)	5.0
Carbon Monoxide (%)	0.0
Nitrogen (%)	80.4

Field Data Points - Flow Run 1-1-2

Port	Trav. Pt.	Velocity Head (inches H_2O)		Stack Temperature (°F)		Square Root of Velocity Head
1	1	0.75		401		0.8660
	2	0.76		402		0.8718
	3	0.63		401		0.7937
2	1	0.68		398		0.8246
	2	0.72		398		0.8485
	3	0.64		398		0.8000
3	1	0.74		399		0.8602
	2	0.71		398		0.8426
	3	0.65		398		0.8062
4	1	0.70		396		0.8367
	2	0.72		398		0.8485
	3	0.58		397		0.7616

Flow Summary Run 1-1-2

Facility	Georgia-Pacific Corporation	Source	No. 4 Recovery Boiler
Location	Palatka, Florida	Run Date	4/7/2008
Start Time	9:30	Weather	Cloudy
Finish Time	9:38	Total Time (min.)	8

(P_{bar}) Barometric Pressure (in Hg)	29.93	Carbon Dioxide (%)	14.6
(D) Diameter (inches)	144.00	Oxygen (%)	5.0
(A) Stack Area (ft^2)	113.097	Carbon Monoxide (%)	0.0
(n) Number of Points	12	Nitrogen (%)	80.4
(Δp_{avg}) Avg of SQRT of V.H.	0.8300	(P_s)Stack Pressure (inches Hg)	29.89
(C_p) Pitot Correction Factor	0.84	($T_{s(abs)}$) Stack Temp (°R)	858.7

(B_{ws}) Moisture in stack gas, volume fraction	0.267
(B_{wd}) Dry Stack Gas, volume fraction	0.733
(M_d) Molecular Weight of Stack Gas (Dry Basis)	30.54
(M_s) Molecular Weight of Stack Gas (Stack conditions)	27.19
(G_s) Specific gravity of Stack Gas Relative to Air	0.938
(v_s) Average Stack Velocity, FPM	3676.1
(Q_s) Actual Stack Gas Flow Rate, ACFM	415761
(Q_d) Actual Stack Gas Flow Rate, ACFMD	304848
($Q_{d(std)}$) Stack Gas Flow Rate, SCFMD	187253
($Q_{s(std)}$) Stack Gas Flow Rate Wet, SCFMW	255381

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Volumetric Flow Calculations Worksheet

Data Request Entry Area	Flow Run 1-1-3
Facility	Georgia-Pacific Corporation
Location	Palatka, Florida
Source	No. 4 Recovery Boiler
Date	04/07/08
Run Number	1-1-3
Start Time	9:45
Finish Time	9:53
Weather	Cloudy
Total Time (minutes) (Θ)	8.0
Number of Points (n)	12
Barometric Pressure (inches Hg) (P_{bar})	29.93
Static Pressure (inches H_2O) (P_g)	-0.73
Stack Diameter (inches) (D)	144.00
Pitot Factor (C_p)	0.84
Moisture Fraction (B_{ws})	0.267
Carbon Dioxide (%)	14.6
Oxygen (%)	5.0
Carbon Monoxide (%)	0.0
Nitrogen (%)	80.4

Field Data Points - Flow Run 1-1-3

Port	Trav. Pt.	Velocity Head (inches H_2O)		Stack Temperature (°F)		Square Root of Velocity Head
1	1	0.73		402		0.8544
	2	0.62		402		0.7874
	3	0.65		400		0.8062
2	1	0.73		398		0.8544
	2	0.72		399		0.8485
	3	0.65		398		0.8062
3	1	0.72		399		0.8485
	2	0.74		399		0.8602
	3	0.65		397		0.8062
4	1	0.73		399		0.8544
	2	0.74		399		0.8602
	3	0.60		398		0.7746

Flow Summary Run 1-1-3

Facility	Georgia-Pacific Corporation	Source	No. 4 Recovery Boiler
Location	Palatka, Florida	Run Date	4/7/2008
Start Time	9:45	Weather	Cloudy
Finish Time	9:53	Total Time (min.)	8
(P_{bar}) Barometric Pressure (in Hg)	29.93	Carbon Dioxide (%)	14.6
(D) Diameter (inches)	144.00	Oxygen (%)	5.0
(A) Stack Area (ft^2)	113.097	Carbon Monoxide (%)	0.0
(n) Number of Points	12	Nitrogen (%)	80.4
(Δp_{avg}) Avg of SQRT of V.H.	0.8301	(P_s) Stack Pressure (inches Hg)	29.88
(C_p) Pitot Correction Factor	0.84	($T_{s(abs)}$) Stack Temp (°R)	859.2
(B_{ws}) Moisture in stack gas, volume fraction			0.267
(B_{wd}) Dry Stack Gas, volume fraction			0.733
(M_d) Molecular Weight of Stack Gas (Dry Basis)			30.54
(M_s) Molecular Weight of Stack Gas (Stack conditions)			27.19
(G_s) Specific gravity of Stack Gas Relative to Air			0.938
(v_s) Average Stack Velocity, FPM			3678.2
(Q_s) Actual Stack Gas Flow Rate, ACFM			416000
(Q_d) Actual Stack Gas Flow Rate, ACFMD			305024
($Q_{d(std)}$) Stack Gas Flow Rate, SCFMD			187179
($Q_{s(std)}$) Stack Gas Flow Rate Wet, SCFMW			255279

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Volumetric Flow Calculations Worksheet

Data Request Entry Area	Flow Run 1-2-1
Facility	Georgia-Pacific Corporation
Location	Palatka, Florida
Source	No. 4 Recovery Boiler
Date	04/07/08
Run Number	1-2-1
Start Time	10:15
Finish Time	10:23
Weather	Cloudy
Total Time (minutes) (Θ)	8.0
Number of Points (n)	12
Barometric Pressure (Inches Hg) (P_{bar})	29.93
Static Pressure (inches H_2O) (P_g)	-0.82
Stack Diameter (inches) (D)	144.00
Pitot Factor (C_p)	0.84
Moisture Fraction (B_{ws})	0.267
Carbon Dioxide (%)	14.7
Oxygen (%)	5.0
Carbon Monoxide (%)	0.0
Nitrogen (%)	80.3

Field Data Points - Flow Run 1-2-1

Port	Trav. Pt.	Velocity Head (inches H_2O)		Stack Temperature (°F)		Square Root of Velocity Head
1	1	0.73		399		0.8544
	2	0.72		399		0.8485
	3	0.61		398		0.7810
2	1	0.64		395		0.8000
	2	0.66		397		0.8124
	3	0.56		398		0.7483
3	1	0.66		395		0.8124
	2	0.70		392		0.8367
	3	0.61		394		0.7810
4	1	0.68		390		0.8246
	2	0.69		397		0.8307
	3	0.60		398		0.7746

Flow Summary Run 1-2-1

Facility	Georgia-Pacific Corporation	Source	No. 4 Recovery Boiler
Location	Palatka, Florida	Run Date	4/7/2008
Start Time	10:15	Weather	Cloudy
Finish Time	10:23	Total Time (min.)	8
(P_{bar}) Barometric Pressure (in Hg)	29.93	Carbon Dioxide (%)	14.7
(D) Diameter (inches)	144.00	Oxygen (%)	5.0
(A) Stack Area (ft^2)	113.097	Carbon Monoxide (%)	0.0
(n) Number of Points	12	Nitrogen (%)	80.3
(Δp_{avg}) Avg of SQRT of V.H.	0.8087	(P_s)Stack Pressure (inches Hg)	29.87
(C_p) Pitot Correction Factor	0.84	($T_{s(abs)}$) Stack Temp (°R)	856.0
(B_{ws}) Moisture in stack gas, volume fraction			0.267
(B_{wd}) Dry Stack Gas, volume fraction			0.733
(M_d) Molecular Weight of Stack Gas (Dry Basis)			30.55
(M_s) Molecular Weight of Stack Gas (Stack conditions)			27.20
(G_s) Specific gravity of Stack Gas Relative to Air			0.938
(v_s) Average Stack Velocity, FPM			3576.5
(Q_s) Actual Stack Gas Flow Rate, ACFM			404488
(Q_d) Actual Stack Gas Flow Rate, ACFMD			296583
($Q_{d(std)}$) Stack Gas Flow Rate, SCFMD			182632
($Q_{s(std)}$) Stack Gas Flow Rate Wet, SCFMW			249078

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Volumetric Flow Calculations Worksheet

Data Request Entry Area	Flow Run 1-2-2
Facility	Georgia-Pacific Corporation
Location	Palatka, Florida
Source	No. 4 Recovery Boiler
Date	04/07/08
Run Number	1-2-2
Start Time	10:30
Finish Time	10:38
Weather	Cloudy
Total Time (minutes) (Θ)	8.0
Number of Points (n)	12
Barometric Pressure (inches Hg) (P_{bar})	29.93
Static Pressure (inches H_2O) (P_g)	-0.87
Stack Diameter (inches) (D)	144.00
Pitot Factor (C_p)	0.84
Moisture Fraction (B_{ws})	0.267
Carbon Dioxide (%)	14.7
Oxygen (%)	5.0
Carbon Monoxide (%)	0.0
Nitrogen (%)	80.3

Field Data Points - Flow Run 1-2-2

Port	Trav. Pt.	Velocity Head (inches H_2O)		Stack Temperature (°F)		Square Root of Velocity Head
1	1	0.72		399		0.8485
	2	0.71		399		0.8426
	3	0.60		399		0.7746
2	1	0.67		400		0.8185
	2	0.68		400		0.8246
	3	0.58		399		0.7616
3	1	0.68		396		0.8246
	2	0.70		397		0.8367
	3	0.53		397		0.7280
4	1	0.68		400		0.8248
	2	0.68		400		0.8246
	3	0.60		397		0.7748

Flow Summary Run 1-2-2

Facility	Georgia-Pacific Corporation	Source	No. 4 Recovery Boiler
Location	Palatka, Florida	Run Date	4/7/2008
Start Time	10:30	Weather	Cloudy
Finish Time	10:38	Total Time (min.)	8

(P_{bar}) Barometric Pressure (in Hg)	29.93	Carbon Dioxide (%)	14.7
(D) Diameter (inches)	144.00	Oxygen (%)	5.0
(A) Stack Area (ft^2)	113.097	Carbon Monoxide (%)	0.0
(n) Number of Points	12	Nitrogen (%)	80.3
(Δp_{avg}) Avg of SQRT of V.H.	0.8070	(P_s)Stack Pressure (inches Hg)	29.87
(C_p) Pitot Correction Factor	0.84	($T_{s(abs)}$) Stack Temp (°R)	858.6

(B_{ws}) Moisture in stack gas, volume fraction	0.267
(B_{wd}) Dry Stack Gas, volume fraction	0.733
(M_d) Molecular Weight of Stack Gas (Dry Basis)	30.55
(M_s) Molecular Weight of Stack Gas (Stack conditions)	27.20
(G_s) Specific gravity of Stack Gas Relative to Air	0.938
(v_s) Average Stack Velocity, FPM	3574.3
(Q_a) Actual Stack Gas Flow Rate, ACFM	404244
(Q_d) Actual Stack Gas Flow Rate, ACFMD	296404
($Q_{d(std)}$) Stack Gas Flow Rate, SCFMD	181950
($Q_{s(std)}$) Stack Gas Flow Rate Wet, SCFMW	248148

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Method 1,2,4 Flow and Moisture Template Rev4, 12-15-05

Volumetric Flow Calculations Worksheet

Data Request Entry Area	Flow Run 1-2-3
Facility	Georgia-Pacific Corporation
Location	Palatka, Florida
Source	No. 4 Recovery Boiler
Date	04/07/08
Run Number	1-2-3
Start Time	10:57
Finish Time	11:05
Weather	Cloudy
Total Time (minutes) (Θ)	8.0
Number of Points (n)	12
Barometric Pressure (inches Hg) (P_{bar})	29.93
Static Pressure (inches H_2O) (P_g)	-0.80
Stack Diameter (inches) (D)	144.00
Pitot Factor (C_p)	0.84
Moisture Fraction (B_{ws})	0.267
Carbon Dioxide (%)	14.7
Oxygen (%)	5.0
Carbon Monoxide (%)	0.0
Nitrogen (%)	80.3

Field Data Points - Flow Run 1-2-3

Port	Trav. Pt.	Velocity Head (*inches* H_2O)		Stack *Temperature* (°F)		Square Root of Velocity Head
1	1	0.70		394		0.8367
	2	0.71		398		0.8426
	3	0.58		392		0.7616
2	1	0.66		385		0.8124
	2	0.64		391		0.8000
	3	0.64		395		0.8000
3	1	0.68		390		0.8246
	2	0.67		394		0.8185
	3	0.65		396		0.8062
4	1	0.67		391		0.8185
	2	0.66		395		0.8124
	3	0.57		396		0.7550

Flow Summary Run 1-2-3

Facility	Georgia-Pacific Corporation	Source	No. 4 Recovery Boiler
Location	Palatka, Florida	Run Date	4/7/2008
Start Time	10:57	Weather	Cloudy
Finish Time	11:05	Total Time (min.)	8
(P_{bar}) Barometric Pressure (in Hg)	29.93	Carbon Dioxide (%)	14.7
(D) Diameter (inches)	144.00	Oxygen (%)	5.0
(A) Stack Area (ft^2)	113.097	Carbon Monoxide (%)	0.0
(n) Number of Points	12	Nitrogen (%)	80.3
(Δp_{avg}) Avg of SQRT of V.H.	0.8074	(P_s)Stack Pressure (inches Hg)	29.87
(C_p) Pitot Correction Factor	0.84	($T_{s(abs)}$) Stack Temp (°R)	853.1

(B_{ws}) Moisture in stack gas, volume fraction	0.267
(B_{wd}) Dry Stack Gas, volume fraction	0.733
(M_d) Molecular Weight of Stack Gas (Dry Basis)	30.55
(M_s) Molecular Weight of Stack Gas (Stack conditions)	27.20
(G_s) Specific gravity of Stack Gas Relative to Air	0.938
(v_s) Average Stack Velocity, FPM	3564.4
(Q_s) Actual Stack Gas Flow Rate, ACFM	403119
(Q_d) Actual Stack Gas Flow Rate, ACFMD	295579
($Q_{d(std)}$) Stack Gas Flow Rate, SCFMD	182645
($Q_{s(std)}$) Stack Gas Flow Rate Wet, SCFMW	249096

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Method 1,2,4 Flow and Moisture Template Rev4 12-15-05

Volumetric Flow Calculations Worksheet

Data Request Entry Area	Flow Run 1-3-1
Facility	Georgia-Pacific Corporation
Location	Palatka, Florida
Source	No. 4 Recovery Boiler
Date	04/07/08
Run Number	1-3-1
Start Time	13:05
Finish Time	13:13
Weather	Cloudy
Total Time (minutes) (Θ)	8.0
Number of Points (n)	12
Barometric Pressure (inches Hg) (P_{bar})	29.93
Static Pressure (inches H_2O) (P_g)	-0.81
Stack Diameter (inches) (D)	144.00
Pitot Factor (C_p)	0.84
Moisture Fraction (B_{ws})	0.267
Carbon Dioxide (%)	14.7
Oxygen (%)	4.9
Carbon Monoxide (%)	0.0
Nitrogen (%)	80.4

Field Data Points - Flow Run 1-3-1

Port	Trav. Pt.	Velocity Head (inches H_2O)		Stack Temperature (°F)		Square Root of Velocity Head
1	1	0.74		400		0.8602
	2	0.73		401		0.8544
	3	0.60		402		0.7746
2	1	0.70		397		0.8367
	2	0.71		398		0.8426
	3	0.64		400		0.8000
3	1	0.73		393		0.8544
	2	0.74		397		0.8602
	3	0.64		397		0.8000
4	1	0.69		392		0.8307
	2	0.68		396		0.8246
	3	0.58		398		0.7616

Flow Summary Run 1-3-1

Facility	Georgia-Pacific Corporation	Source	No. 4 Recovery Boiler
Location	Palatka, Florida	Run Date	4/7/2008
Start Time	13:05	Weather	Cloudy
Finish Time	13:13	Total Time (min.)	8
(P_{bar}) Barometric Pressure (In Hg)	29.93	Carbon Dioxide (%)	14.7
(D) Diameter (inches)	144.00	Oxygen (%)	4.9
(A) Stack Area (ft^2)	113.097	Carbon Monoxide (%)	0.0
(n) Number of Points	12	Nitrogen (%)	80.4
(Δp_{avg}) Avg of SQRT of V.H.	0.8250	(P_s) Stack Pressure (inches Hg)	29.87
(C_p) Pitot Correction Factor	0.84	($T_{s(abs)}$) Stack Temp (°R)	857.6

(B_{ws}) Moisture in stack gas, volume fraction	0.267
(B_{wd}) Dry Stack Gas, volume fraction	0.733
(M_d) Molecular Weight of Stack Gas (Dry Basis)	30.55
(M_s) Molecular Weight of Stack Gas (Stack conditions)	27.20
(G_s) Specific gravity of Stack Gas Relative to Air	0.938
(v_s) Average Stack Velocity, FPM	3652.0
(Q_s) Actual Stack Gas Flow Rate, ACFM	413029
(Q_d) Actual Stack Gas Flow Rate, ACFMD	302845
($Q_{d(std)}$) Stack Gas Flow Rate, SCFMD	186148
($Q_{s(std)}$) Stack Gas Flow Rate Wet, SCFMW	253874

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Method 1,2,4 Flow and Moisture Template Rev4, 12-15-05

Volumetric Flow Calculations Worksheet

Data Request Entry Area	Flow Run 1-3-2
Facility	Georgia-Pacific Corporation
Location	Palatka, Florida
Source	No. 4 Recovery Boiler
Date	04/07/08
Run Number	1-3-2
Start Time	13:20
Finish Time	13:28
Weather	Cloudy
Total Time (minutes) (Θ)	8.0
Number of Points (n)	12
Barometric Pressure (inches Hg) (P_{bar})	29.93
Static Pressure (Inches H_2O) (P_g)	-0.86
Stack Diameter (Inches) (D)	144.00
Pitot Factor (C_p)	0.84
Moisture Fraction (B_{ws})	0.267
Carbon Dioxide (%)	14.7
Oxygen (%)	4.9
Carbon Monoxide (%)	0.0
Nitrogen (%)	80.4

Field Data Points - Flow Run 1-3-2

Port	Trav. Pt.	Velocity Head (Inches H_2O)		Stack Temperature (°F)		Square Root of Velocity Head
1	1	0.68		393		0.8246
	2	0.67		397		0.8185
	3	0.57		398		0.7550
2	1	0.73		390		0.8544
	2	0.74		394		0.8602
	3	0.62		395		0.7874
3	1	0.70		400		0.8367
	2	0.74		401		0.8602
	3	0.61		399		0.7810
4	1	0.67		397		0.8185
	2	0.65		397		0.8062
	3	0.62		398		0.7874

Flow Summary Run 1-3-2

Facility	Georgia-Pacific Corporation	Source	No. 4 Recovery Boiler
Location	Palatka, Florida	Run Date	4/7/2008
Start Time	13:20	Weather	Cloudy
Finish Time	13:28	Total Time (min.)	8

(P_{bar}) Barometric Pressure (in Hg)	29.93	Carbon Dioxide (%)	14.7
(D) Diameter (inches)	144.00	Oxygen (%)	4.9
(A) Stack Area (ft^2)	113.097	Carbon Monoxide (%)	0.0
(n) Number of Points	12	Nitrogen (%)	80.4
(Δp_{avg}) Avg of SQRT of V.H.	0.8159	(P_s)Stack Pressure (inches Hg)	29.87
(C_p) Pitot Correction Factor	0.84	($T_{s(abs)}$) Stack Temp (°R)	856.6

(B_{ws}) Moisture in stack gas, volume fraction	0.267
(B_{wd}) Dry Stack Gas, volume fraction	0.733
(M_d) Molecular Weight of Stack Gas (Dry Basis)	30.55
(M_s) Molecular Weight of Stack Gas (Stack conditions)	27.20
(G_s) Specific gravity of Stack Gas Relative to Air	0.938
(v_s) Average Stack Velocity, FPM	3609.6
(Q_s) Actual Stack Gas Flow Rate, ACFM	408237
(Q_d) Actual Stack Gas Flow Rate, ACFMD	299332
($Q_{d(std)}$) Stack Gas Flow Rate, SCFMD	184181
($Q_{s(std)}$) Stack Gas Flow Rate Wet, SCFMW	251191

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Volumetric Flow Calculations Worksheet

Data Request Entry Area	Flow Run 1-3-3
Facility	Georgia-Pacific Corporation
Location	Palatka, Florida
Source	No. 4 Recovery Boiler
Date	04/07/08
Run Number	1-3-3
Start Time	13:40
Finish Time	13:48
Weather	Cloudy
Total Time (minutes) (Θ)	8.0
Number of Points (n)	12
Barometric Pressure (inches Hg) (P_{bar})	29.93
Static Pressure (inches H_2O) (P_g)	-0.85
Stack Diameter (inches) (D)	144.00
Pitot Factor (C_p)	0.84
Moisture Fraction (B_{ws})	0.267
Carbon Dioxide (%)	14.7
Oxygen (%)	4.9
Carbon Monoxide (%)	0.0
Nitrogen (%)	80.4

Field Data Points - Flow Run 1-3-3

Port	Trav. Pt.	Velocity Head (inches H_2O)		Stack Temperature (°F)		Square Root of Velocity Head
1	1	0.70		394		0.8367
	2	0.69		396		0.8307
	3	0.62		397		0.7874
2	1	0.69		392		0.8307
	2	0.73		395		0.8544
	3	0.59		395		0.7681
3	1	0.71		400		0.8426
	2	0.72		401		0.8485
	3	0.60		398		0.7746
4	1	0.71		395		0.8426
	2	0.71		397		0.8426
	3	0.65		398		0.8062

Flow Summary Run 1-3-3

Facility	Georgia-Pacific Corporation	Source	No. 4 Recovery Boiler
Location	Palatka, Florida	Run Date	4/7/2008
Start Time	13:40	Weather	Cloudy
Finish Time	13:48	Total Time (min.)	8
(P_{bar}) Barometric Pressure (in Hg)	29.93	Carbon Dioxide (%)	14.7
(D) Diameter (inches)	144.00	Oxygen (%)	4.9
(A) Stack Area (ft^2)	113.097	Carbon Monoxide (%)	0.0
(n) Number of Points	12	Nitrogen (%)	80.4
(Δp_{avg}) Avg of SQRT of V.H.	0.8221	(P_s)Stack Pressure (inches Hg)	29.87
(C_p) Pitot Correction Factor	0.84	($T_{s(abs)}$) Stack Temp (°R)	856.5

(B_{ws}) Moisture in stack gas, volume fraction	0.267
(B_{wd}) Dry Stack Gas, volume fraction	0.733
(M_d) Molecular Weight of Stack Gas (Dry Basis)	30.55
(M_s) Molecular Weight of Stack Gas (Stack conditions)	27.20
(G_s) Specific gravity of Stack Gas Relative to Air	0.938
(v_s) Average Stack Velocity, FPM	3637.0
(Q_s) Actual Stack Gas Flow Rate, ACFM	411333
(Q_d) Actual Stack Gas Flow Rate, ACFMD	301602
($Q_{d(std)}$) Stack Gas Flow Rate, SCFMD	185600
($Q_{s(std)}$) Stack Gas Flow Rate Wet, SCFMW	253126

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Method 1,2,4 Flow and Moisture Template Rev4, 12-15-05

Moisture Calculations Worksheet

Data Request Entry Area	Moisture Run 1
Facility	Georgia-Pacific Corporation
Location	Palatka, Florida
Source	No. 4 Recovery Boiler
Date	04/07/08
Run Number	1
Start Time	13:00
Finish Time	13:30
Weather	Cloudy
Total Time (minutes) (Θ)	30.0
Meter (ΔH_a)	1.760
Barometric Pressure (inches Hg) (P_{bar})	29.93
Stack Diameter (inches) (D)	144.00
Final Meter Reading (ft^3)	907.422
Initial Meter Reading (ft^3)	883.472
Condensate (grams or ml)	176
Silica Gel Weight (grams)	9.7
Meter Y Factor (Y)	1.009

Field Data Points - Moisture Run 1

Port	Traverse Point	Meter Orifice Setting (inches H_2O)	Meter Inlet Temperature (°F)	Meter Outlet Temperature (°F)
1	1	2.0	73	68
	2	2.0	73	72
	3	2.0	74	72
	4	2.0	74	72
	5	2.0	74	72
	6	2.0	74	72

Moisture Summary Run 1

Facility	Georgia-Pacific Corporation	Run Date	4/7/2008
Location	*Palatka, Florida*	Start Time	13:00
Stack	No. 4 Recovery Boiler	Finish Time	13:30
Weather	Cloudy	(V_m) Volume Metered (ft^3)	23.950
(Θ) Total Time (minutes)	30	(T_m) Meter Temp (°R)	533.7
(P_{bar}) Barometric Pressure (in Hg)	29.93	Impinger Condensate	176.0
(D) Diameter (inches)	144.00	Silica Gel Condensate	9.7
(A) Stack Area (ft^2)	113.097	(V_{lc}) Condensate Volume (ml)	185.7
(Y) Meter Correction	1.009	(ΔH_{avg}) Delta H (inches H_2O)	2.0000
($V_{w(std)}$) Volume Water Vapor, SCF			8.741
($V_{m(std)}$) Gas Volume Sampled, STPD			24.025
Total Volume, STP			32.766
(B_{ws}) Moisture in stack gas, volume fraction			0.267
(B_{wd}) Dry Stack Gas, volume fraction			0.733

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Method 1,2,4 Flow and Moisture Template Rev4, 12-15-05

Volumetric Flow Calculations Worksheet

Data Request Entry Area	Flow Run 2-1-1
Facility	Georgia-Pacific Corporation
Location	Palatka, Florida
Source	No. 4 Recovery Boiler
Date	04/07/08
Run Number	2-1-1
Start Time	14:49
Finish Time	14:57
Weather	Cloudy
Total Time (minutes) (Θ)	8.0
Number of Points (n)	12
Barometric Pressure (inches Hg) (P_{bar})	29.91
Static Pressure (inches H_2O) (P_g)	-0.65
Stack Diameter (inches) (D)	144.00
Pitot Factor (C_p)	0.84
Moisture Fraction (B_{ws})	0.277
Carbon Dioxide (%)	14.0
Oxygen (%)	5.7
Carbon Monoxide (%)	0.0
Nitrogen (%)	80.3

Field Data Points - Flow Run 2-1-1

Port	Trav. Pt.	Velocity Head (inches H_2O)		Stack Temperature (°F)		Square Root of Velocity Head
1	1	0.50		399		0.7071
	2	0.51		399		0.7141
	3	0.41		398		0.6403
2	1	0.48		393		0.6928
	2	0.50		397		0.7071
	3	0.47		397		0.6856
3	1	0.50		391		0.7071
	2	0.51		397		0.7141
	3	0.44		396		0.6633
4	1	0.46		396		0.6782
	2	0.46		397		0.6782
	3	0.39		393		0.6245

Flow Summary Run 2-1-1

Facility	Georgia-Pacific Corporation	Source	No. 4 Recovery Boiler
Location	Palatka, Florida	Run Date	4/7/2008
Start Time	14:49	Weather	Cloudy
Finish Time	14:57	Total Time (min.)	8
(P_{bar}) Barometric Pressure (in Hg)	29.91	Carbon Dioxide (%)	14.0
(D) Diameter (inches)	144.00	Oxygen (%)	5.7
(A) Stack Area (ft^2)	113.097	Carbon Monoxide (%)	0.0
(n) Number of Points	12	Nitrogen (%)	80.3
(Δp_{avg}) Avg of SQRT of V.H.	0.6844	(P_s)Stack Pressure (inches Hg)	29.86
(C_p) Pitot Correction Factor	0.84	($T_{s(abs)}$) Stack Temp (°R)	856.1
(B_{ws}) Moisture in stack gas, volume fraction			0.277
(B_{wd}) Dry Stack Gas, volume fraction			0.723
(M_d) Molecular Weight of Stack Gas (Dry Basis)			30.47
(M_s) Molecular Weight of Stack Gas (Stack conditions)			27.02
(G_s) Specific gravity of Stack Gas Relative to Air			0.932
(v_s) Average Stack Velocity, FPM			3037.6
(Q_s) Actual Stack Gas Flow Rate, ACFM			343550
(Q_d) Actual Stack Gas Flow Rate, ACFMD			248413
($Q_{s(std)}$) Stack Gas Flow Rate, SCFMD			152916
($Q_{s(std)}$) Stack Gas Flow Rate Wet, SCFMW			211479

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Method 1,2,4 Flow and Moisture Template Rev4, 12-15-05

Volumetric Flow Calculations Worksheet

Data Request Entry Area	Flow Run 2-1-2
Facility	Georgia-Pacific Corporation
Location	Palatka, Florida
Source	No. 4 Recovery Boiler
Date	04/07/08
Run Number	2-1-2
Start Time	15:10
Finish Time	15:18
Weather	Cloudy
Total Time (minutes) (Θ)	8.0
Number of Points (n)	12
Barometric Pressure (inches Hg) (P_{bar})	29.91
Static Pressure (inches H_2O) (P_g)	-0.65
Stack Diameter (inches) (D)	144.00
Pitot Factor (C_p)	0.84
Moisture Fraction (B_{ws})	0.277
Carbon Dioxide (%)	14.0
Oxygen (%)	5.7
Carbon Monoxide (%)	0.0
Nitrogen (%)	80.3

Field Data Points - Flow Run 2-1-2

Port	Trav. Pt.	Velocity Head (inches H_2O)		Stack Temperature (°F)		Square Root of Velocity Head
1	1	0.52		392		0.7211
	2	0.51		394		0.7141
	3	0.43		393		0.6557
2	1	0.54		389		0.7348
	2	0.53		393		0.7280
	3	0.39		392		0.6245
3	1	0.48		391		0.6928
	2	0.49		393		0.7000
	3	0.37		392		0.6083
4	1	0.45		287		0.6708
	2	0.48		392		0.6928
	3	0.41		390		0.6403

Flow Summary Run 2-1-2

Facility	Georgia-Pacific Corporation	Source	No. 4 Recovery Boiler
Location	Palatka, Florida	Run Date	4/7/2008
Start Time	15:10	Weather	Cloudy
Finish Time	15:18	Total Time (min.)	8
(P_{bar}) Barometric Pressure (In Hg)	29.91	Carbon Dioxide (%)	14.0
(D) Diameter (inches)	144.00	Oxygen (%)	5.7
(A) Stack Area (ft^2)	113.097	Carbon Monoxide (%)	0.0
(n) Number of Points	12	Nitrogen (%)	80.3
(Δp_{avg}) Avg of SQRT of V.H.	0.6820	(P_s)Stack Pressure (inches Hg)	29.86
(C_p) Pitot Correction Factor	0.84	($T_{s(abs)}$) Stack Temp (°R)	843.2

(B_{ws}) Moisture in stack gas, volume fraction	0.277
(B_{wd}) Dry Stack Gas, volume fraction	0.723
(M_d) Molecular Weight of Stack Gas (Dry Basis)	30.47
(M_s) Molecular Weight of Stack Gas (Stack conditions)	27.02
(G_s) Specific gravity of Stack Gas Relative to Air	0.932
(v_s) Average Stack Velocity, FPM	3003.9
(Q_a) Actual Stack Gas Flow Rate, ACFM	339736
(Q_d) Actual Stack Gas Flow Rate, ACFMD	245655
($Q_{d(std)}$) Stack Gas Flow Rate, SCFMD	153535
($Q_{w(std)}$) Stack Gas Flow Rate Wet, SCFMW	212335

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Volumetric Flow Calculations Worksheet

Data Request Entry Area	Flow Run 2-1-3
Facility	Georgia-Pacific Corporation
Location	Palatka, Florida
Source	No. 4 Recovery Boiler
Date	04/07/08
Run Number	2-1-3
Start Time	15:26
Finish Time	15:34
Weather	Cloudy
Total Time (minutes) (Θ)	8.0
Number of Points (n)	12
Barometric Pressure (inches Hg) (P_{bar})	29.91
Static Pressure (inches H_2O) (P_g)	-0.76
Stack Diameter (inches) (D)	144.00
Pitot Factor (C_p)	0.84
Moisture Fraction (B_{ws})	0.277
Carbon Dioxide (%)	14.0
Oxygen (%)	5.7
Carbon Monoxide (%)	0.0
Nitrogen (%)	80.3

Field Data Points - Flow Run 2-1-3

Port	Trav. Pt.	Velocity Head (inches H_2O)		Stack Temperature (°F)		Square Root of Velocity Head
1	1	0.52		396		0.7211
	2	0.53		395		0.7280
	3	0.42		391		0.6481
2	1	0.56		389		0.7483
	2	0.56		394		0.7483
	3	0.41		393		0.6403
3	1	0.53		393		0.7280
	2	0.52		394		0.7211
	3	0.43		393		0.6557
4	1	0.50		391		0.7071
	2	0.53		394		0.7280
	3	0.46		393		0.6782

Flow Summary Run 2-1-3

Facility	Georgia-Pacific Corporation	Source	No. 4 Recovery Boiler
Location	Palatka, Florida	Run Date	4/7/2008
Start Time	15:26	Weather	Cloudy
Finish Time	15:34	Total Time (min.)	8
(P_{bar}) Barometric Pressure (in Hg)	29.91	Carbon Dioxide (%)	14.0
(D) Diameter (inches)	144.00	Oxygen (%)	5.7
(A) Stack Area (ft^2)	113.097	Carbon Monoxide (%)	0.0
(n) Number of Points	12	Nitrogen (%)	80.3
(Δp_{avg}) Avg of SQRT of V.H.	0.7044	(P_s) Stack Pressure (inches Hg)	29.85
(C_p) Pitot Correction Factor	0.84	($T_{s(tbs)}$) Stack Temp (°R)	853.0
(B_{ws}) Moisture in stack gas, volume fraction			0.277
(B_{wd}) Dry Stack Gas, volume fraction			0.723
(M_d) Molecular Weight of Stack Gas (Dry Basis)			30.47
(M_s) Molecular Weight of Stack Gas (Stack conditions)			27.02
(G_s) Specific gravity of Stack Gas Relative to Air			0.932
(v_s) Average Stack Velocity, FPM			3121.1
(Q_s) Actual Stack Gas Flow Rate, ACFM			352991
(Q_d) Actual Stack Gas Flow Rate, ACFMD			255240
($Q_{d(std)}$) Stack Gas Flow Rate, SCFMD			157643
($Q_{s(std)}$) Stack Gas Flow Rate Wet, SCFMW			218017

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Method 1,2,4 Flow and Moisture Template Rev4, 12-15-05

Volumetric Flow Calculations Worksheet

Data Request Entry Area	Flow Run 2-2-1
Facility	Georgia-Pacific Corporation
Location	Palatka, Florida
Source	No. 4 Recovery Boiler
Date	04/07/08
Run Number	2-2-1
Start Time	15:57
Finish Time	16:05
Weather	Cloudy
Total Time (minutes) (Θ)	8.0
Number of Points (n)	12
Barometric Pressure (inches Hg) (P_{bar})	29.93
Static Pressure (inches H_2O) (P_g)	-0.55
Stack Diameter (inches) (D)	144.00
Pitot Fector (C_p)	0.84
Moisture Fraction (B_{ws})	0.277
Carbon Dioxide (%)	14.0
Oxygen (%)	5.6
Carbon Monoxide (%)	0.0
Nitrogen (%)	80.4

Field Data Points - Flow Run 2-2-1

Port	Trav. Pt.	Velocity Head (inches H_2O)		Stack Temperature (°F)		Square Root of Velocity Head
1	1	0.53		392		0.7280
	2	0.56		392		0.7483
	3	0.42		389		0.6481
2	1	0.52		388		0.7211
	2	0.53		391		0.7280
	3	0.39		388		0.6245
3	1	0.53		386		0.7280
	2	0.57		390		0.7550
	3	0.37		376		0.6083
4	1	0.47		387		0.6856
	2	0.49		389		0.7000
	3	0.45		387		0.6708

Flow Summary Run 2-2-1

Facility	Georgia-Pacific Corporation	Source	No. 4 Recovery Boiler
Location	Palatka, Florida	Run Date	4/7/2008
Start Time	15:57	Weather	Cloudy
Finish Time	16:05	Total Time (min.)	8
(P_{bar}) Barometric Pressure (in Hg)	29.93	Carbon Dioxide (%)	14.0
(D) Diameter (inches)	144.00	Oxygen (%)	5.6
(A) Stack Area (ft^2)	113.097	Carbon Monoxide (%)	0.0
(n) Number of Points	12	Nitrogen (%)	80.4
(Δp_{avg}) Avg of SQRT of V.H.	0.6955	(P_s)Stack Pressure (inches Hg)	29.89
(C_p) Pitot Correction Factor	0.84	($T_{s(abs)}$) Stack Temp (°R)	847.9

(B_{ws}) Moisture in stack gas, volume fraction	0.277
(B_{wd}) Dry Stack Gas, volume fraction	0.723
(M_d) Molecular Weight of Stack Gas (Dry Basis)	30.46
(M_s) Molecular Weight of Stack Gas (Stack conditions)	27.01
(G_s) Specific gravity of Stack Gas Relative to Air	0.932
(v_s) Average Stack Velocity, FPM	3070.9
(Q_s) Actual Stack Gas Flow Rate, ACFM	347308
(Q_d) Actual Stack Gas Flow Rate, ACFMD	251130
($Q_{d(std)}$) Stack Gas Flow Rate, SCFMD	156220
($Q_{s(std)}$) Stack Gas Flow Rate Wet, SCFMW	216049

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Method 1,2,4 Flow and Moisture Template Rev4, 12-15-05

Volumetric Flow Calculations Worksheet

Data Request Entry Area	Flow Run 2-2-2
Facility	Georgia-Pacific Corporation
Location	Palatka, Florida
Source	No. 4 Recovery Boiler
Date	04/07/08
Run Number	2-2-2
Start Time	16:15
Finish Time	16:23
Weather	Cloudy
Total Time (minutes) (Θ)	8.0
Number of Points (n)	12
Barometric Pressure (inches Hg) (P_{bar})	29.93
Static Pressure (inches H_2O) (P_g)	-0.53
Stack Diameter (inches) (D)	144.00
Pitot Factor (C_p)	0.84
Moisture Fraction (B_{ws})	0.277
Carbon Dioxide (%)	14.0
Oxygen (%)	5.6
Carbon Monoxide (%)	0.0
Nitrogen (%)	80.4

Field Data Points - Flow Run 2-2-2

Port	Trav. Pt.	Velocity Head (inches H_2O)		Stack Temperature (°F)		Square Root of Velocity Head
1	1	0.52		389		0.7211
	2	0.55		389		0.7416
	3	0.47		388		0.6856
2	1	0.51		387		0.7141
	2	0.50		389		0.7071
	3	0.45		385		0.6708
3	1	0.54		386		0.7348
	2	0.56		388		0.7483
	3	0.46		388		0.6782
4	1	0.53		383		0.7280
	2	0.55		388		0.7416
	3	0.47		388		0.6856

Flow Summary Run 2-2-2

Facility	Georgia-Pacific Corporation	Source	No. 4 Recovery Boiler
Location	Palatka, Florida	Run Date	4/7/2008
Start Time	16:15	Weather	Cloudy
Finish Time	16:23	Total Time (min.)	8
(P_{bar}) Barometric Pressure (in Hg)	29.93	Carbon Dioxide (%)	14.0
(D) Diameter (inches)	144.00	Oxygen (%)	5.6
(A) Stack Area (ft^2)	113.097	Carbon Monoxide (%)	0.0
(n) Number of Points	12	Nitrogen (%)	80.4
(Δp_{avg}) Avg of SQRT of V.H.	0.7131	(P_s)Stack Pressure (inches Hg)	29.89
(C_p) Pitot Correction Factor	0.84	($T_{s(abs)}$) Stack Temp (°R)	847.3

(B_{ws}) Moisture in stack gas, volume fraction	0.277
(B_{wd}) Dry Stack Gas, volume fraction	0.723
(M_d) Molecular Weight of Stack Gas (Dry Basis)	30.46
(M_s) Molecular Weight of Stack Gas (Stack conditions)	27.01
(G_s) Specific gravity of Stack Gas Relative to Air	0.932
(v_s) Average Stack Velocity, FPM	3147.5
(Q_a) Actual Stack Gas Flow Rate, ACFM	355969
(Q_d) Actual Stack Gas Flow Rate, ACFMD	257393
($Q_{d(std)}$) Stack Gas Flow Rate, SCFMD	180234
($Q_{s(std)}$) Stack Gas Flow Rate Wet, SCFMW	221601

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Method 1,2,4 Flow and Moisture Template Rev4: 12-15-05

Volumetric Flow Calculations Worksheet

Data Request Entry Area	Flow Run 2-2-3
Facility	Georgia-Pacific Corporation
Location	Palatka, Florida
Source	No. 4 Recovery Boiler
Date	04/07/08
Run Number	2-2-3
Start Time	16:32
Finish Time	16:40
Weather	Cloudy
Total Time (minutes) (Θ)	8.0
Number of Points (n)	12
Barometric Pressure (inches Hg) (P_{bar})	29.93
Static Pressure (inches H_2O) (P_g)	-0.54
Stack Diameter (inches) (D)	144.00
Pitot Factor (C_p)	0.84
Moisture Fraction (B_{ws})	0.277
Carbon Dioxide (%)	14.0
Oxygen (%)	5.6
Carbon Monoxide (%)	0.0
Nitrogen (%)	80.4

Field Data Points - Flow Run 2-2-3

Port	Trav. Pt.	Velocity Head (inches H_2O)		Stack Temperature (°F)		Square Root of Velocity Head
1	1	0.52		389		0.7211
	2	0.54		389		0.7348
	3	0.47		388		0.6856
2	1	0.48		380		0.6928
	2	0.50		387		0.7071
	3	0.41		387		0.6403
3	1	0.49		382		0.7000
	2	0.52		388		0.7211
	3	0.46		387		0.6782
4	1	0.51		382		0.7141
	2	0.52		387		0.7211
	3	0.46		386		0.6782

Flow Summary Run 2-2-3

Facility	Georgia-Pacific Corporation	Source	No. 4 Recovery Boiler
Location	Palatka, Florida	Run Date	4/7/2008
Start Time	16:32	Weather	Cloudy
Finish Time	16:40	Total Time (min.)	8
(P_{bar}) Barometric Pressure (in Hg)	29.93	Carbon Dioxide (%)	14.0
(D) Diameter (inches)	*144.00*	*Oxygen (%)*	*5.6*
(A) Stack Area (ft^2)	113.097	Carbon Monoxide (%)	0.0
(n) Number of Points	12	Nitrogen (%)	80.4
(Δp_{avg}) Avg of SQRT of V.H.	0.6995	(P_s)Stack Pressure (inches Hg)	29.89
(C_p) Pitot Correction Factor	0.84	($T_{s(abs)}$) Stack Temp (°R)	846.0
(B_{ws}) Moisture in stack gas, volume fraction			0.277
(B_{wd}) Dry Stack Gas, volume fraction			0.723
(M_d) Molecular Weight of Stack Gas (Dry Basis)			30.46
(M_s) Molecular Weight of Stack Gas (Stack conditions)			27.01
(G_s) Specific gravity of Stack Gas Relative to Air			0.932
(v_s) Average Stack Velocity, FPM			3085.3
(Q_s) Actual Stack Gas Flow Rate, ACFM			348943
(Q_d) Actual Stack Gas Flow Rate, ACFMD			252313
($Q_{s(std)}$) Stack Gas Flow Rate, SCFMD			157315
($Q_{s(std)}$) Stack Gas Flow Rate Wet, SCFMW			217564

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Method 1,2,4 Flow and Moisture Template Rev4 12-15-05

Volumetric Flow Calculations Worksheet

Data Request Entry Area	Flow Run 2-3-1
Facility	Georgia-Pacific Corporation
Location	Palatka, Florida
Source	No. 4 Recovery Boiler
Date	04/07/08
Run Number	2-3-1
Start Time	16:03
Finish Time	16:11
Weather	Cloudy
Total Time (minutes) (Θ)	8.0
Number of Points (n)	12
Barometric Pressure (inches Hg) (P_{bar})	29.91
Static Pressure (inches H_2O) (P_g)	-0.59
Stack Diameter (inches) (D)	144.00
Pitot Factor (C_p)	0.84
Moisture Fraction (B_{ws})	0.277
Carbon Dioxide (%)	14.0
Oxygen (%)	5.5
Carbon Monoxide (%)	0.0
Nitrogen (%)	80.5

Field Data Points - Flow Run 2-3-1

Port	Trav. Pt.	Velocity Head (inches H_2O)		Stack Temperature (°F)		Square Root of Velocity Head
1	1	0.52		384		0.7211
	2	0.53		387		0.7280
	3	0.45		387		0.6708
2	1	0.50		385		0.7071
	2	0.49		385		0.7000
	3	0.42		388		0.6481
3	1	0.52		382		0.7211
	2	0.53		384		0.7280
	3	0.46		387		0.6782
4	1	0.44		381		0.6633
	2	0.48		383		0.6928
	3	0.42		385		0.6481

Flow Summary Run 2-3-1

Facility	Georgia-Pacific Corporation	Source	No. 4 Recovery Boiler
Location	Palatka, Florida	Run Date	4/7/2008
Start Time	16:03	Weather	Cloudy
Finish Time	16:11	Total Time (min.)	8
(P_{bar}) Barometric Pressure (in Hg)	29.91	Carbon Dioxide (%)	14.0
(D) Diameter (inches)	144.00	Oxygen (%)	5.5
(A) Stack Area (ft^2)	113.097	Carbon Monoxide (%)	0.0
(n) Number of Points	12	Nitrogen (%)	80.5
(Δp_{avg}) Avg of SQRT of V.H.	0.6922	(P_s)Stack Pressure (inches Hg)	29.87
(C_p) Pitot Correction Factor	0.84	($T_{s(abs)}$) Stack Temp (°R)	844.8

(B_{ws}) Moisture in stack gas, volume fraction	0.277
(B_{wd}) Dry Stack Gas, volume fraction	0.723
(M_d) Molecular Weight of Stack Gas (Dry Basis)	30.46
(M_s) Molecular Weight of Stack Gas (Stack conditions)	27.01
(G_s) Specific gravity of Stack Gas Relative to Air	0.932
(v_s) Average Stack Velocity, FPM	3052.3
(Q_s) Actual Stack Gas Flow Rate, ACFM	345207
(Q_d) Actual Stack Gas Flow Rate, ACFMD	249611
($Q_{s(std)}$) Stack Gas Flow Rate, SCFMD	155722
($Q_{s(std)}$) Stack Gas Flow Rate Wet, SCFMW	215361

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Method 1,2,4 Flow and Moisture Template Rev4 12-15-05

Volumetric Flow Calculations Worksheet

Data Request Entry Area	Flow Run 2-3-2
Facility	Georgia-Pacific Corporation
Location	Palatka, Florida
Source	No. 4 Recovery Boiler
Date	04/07/08
Run Number	2-3-2
Start Time	16:20
Finish Time	16:28
Weather	Cloudy
Total Time (minutes) (Θ)	8.0
Number of Points (n)	12
Barometric Pressure (Inches Hg) (P_{bar})	29.91
Static Pressure (inches H_2O) (P_g)	-0.56
Stack Diameter (inches) (D)	144.00
Pitot Factor (C_p)	0.84
Moisture Fraction (B_{ws})	0.277
Carbon Dioxide (%)	14.0
Oxygen (%)	5.5
Carbon Monoxide (%)	0.0
Nitrogen (%)	80.5

Field Data Points - Flow Run 2-3-2

Port	Trav. Pt.	Velocity Head (inches H_2O)		Stack Temperature (°F)		Square Root of Velocity Head
1	1	0.54		387		0.7348
	2	0.53		385		0.7280
	3	0.43		385		0.6557
2	1	0.52		383		0.7211
	2	0.50		385		0.7071
	3	0.43		386		0.6557
3	1	0.49		382		0.7000
	2	0.49		384		0.7000
	3	0.43		387		0.6557
4	1	0.47		384		0.6856
	2	0.52		387		0.7211
	3	0.45		383		0.6708

Flow Summary Run 2-3-2

Facility	Georgia-Pacific Corporation	Source	No. 4 Recovery Boiler
Location	Palatka, Florida	Run Date	4/7/2008
Start Time	16:20	Weather	Cloudy
Finish Time	16:28	Total Time (min.)	8
(P_{bar}) Barometric Pressure (in Hg)	29.91	Carbon Dioxide (%)	14.0
(D) Diameter (inches)	144.00	Oxygen (%)	5.5
(A) Stack Area (ft^2)	113.097	Carbon Monoxide (%)	0.0
(n) Number of Points	12	Nitrogen (%)	80.5
(Δp_{avg}) Avg of SQRT of V.H.	0.6947	(P_s)Stack Pressure (inches Hg)	29.87
(C_p) Pitot Correction Factor	0.84	($T_{s(abs)}$) Stack Temp (°R)	844.8

(B_{ws}) Moisture in stack gas, volume fraction	0.277
(B_{wd}) Dry Stack Gas, volume fraction	0.723
(M_d) Molecular Weight of Stack Gas (Dry Basis)	30.46
(M_s) Molecular Weight of Stack Gas (Stack conditions)	27.01
(G_s) Specific gravity of Stack Gas Relative to Air	0.932
(v_s) Average Stack Velocity, FPM	3062.9
(Q_s) Actual Stack Gas Flow Rate, ACFM	346404
(Q_d) Actual Stack Gas Flow Rate, ACFMD	250476
($Q_{d(std)}$) Stack Gas Flow Rate, SCFMD	156274
($Q_{s(std)}$) Stack Gas Flow Rate Wet, SCFMW	216123

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Method 1, 2, 4 Flow and Moisture Template Rev4, 12-15-05

Volumetric Flow Calculations Worksheet

Data Request Entry Area	Flow Run 2-3-3
Facility	Georgia-Pacific Corporation
Location	Palatka, Florida
Source	No. 4 Recovery Boiler
Date	04/07/08
Run Number	2-3-3
Start Time	16:38
Finish Time	16:46
Weather	Cloudy
Total Time (minutes) (Θ)	8.0
Number of Points (n)	12
Barometric Pressure (inches Hg) (P_{bar})	29.91
Static Pressure (inches H_2O) (P_g)	-0.56
Stack Diameter (inches) (D)	144.00
Pitot Factor (C_p)	0.84
Moisture Fraction (B_{ws})	0.277
Carbon Dioxide (%)	14.0
Oxygen (%)	5.5
Carbon Monoxide (%)	0.0
Nitrogen (%)	80.5

Field Data Points - Flow Run 2-3-3

Port	Trav. Pt.	Velocity Head (inches H_2O)		Stack Temperature (°F)		Square Root of Velocity Head
1	1	0.55		386		0.7416
	2	0.53		386		0.7280
	3	0.46		383		0.6782
2	1	0.54		382		0.7348
	2	0.52		385		0.7211
	3	0.43		384		0.6557
3	1	0.48		383		0.6928
	2	0.50		386		0.7071
	3	0.44		386		0.6633
4	1	0.45		386		0.6708
	2	0.49		387		0.7000
	3	0.41		384		0.6403

Flow Summary Run 2-3-3

Facility	Georgia-Pacific Corporation	Source	No. 4 Recovery Boiler
Location	Palatka, Florida	Run Date	4/7/2008
Start Time	16:38	Weather	Cloudy
Finish Time	16:46	Total Time (min.)	8
(P_{bar}) Barometric Pressure (in Hg)	29.91	Carbon Dioxide (%)	14.0
(D) Diameter (inches)	144.00	Oxygen (%)	5.5
(A) Stack Area (ft^2)	113.097	Carbon Monoxide (%)	0.0
(n) Number of Points	12	Nitrogen (%)	80.5
(Δp_{avg}) Avg of SQRT of V.H.	0.6945	(P_s) Stack Pressure (inches Hg)	29.87
(C_p) Pitot Correction Factor	0.84	($T_{s(abs)}$) Stack Temp (°R)	844.8
(B_{ws}) Moisture in stack gas, volume fraction			0.277
(B_{wd}) Dry Stack Gas, volume fraction			0.723
(M_d) Molecular Weight of Stack Gas (Dry Basis)			30.46
(M_s) Molecular Weight of Stack Gas (Stack conditions)			27.01
(G_s) Specific gravity of Stack Gas Relative to Air			0.932
(v_s) Average Stack Velocity, FPM			3062.2
(Q_s) Actual Stack Gas Flow Rate, ACFM			346327
(Q_d) Actual Stack Gas Flow Rate, ACFMD			250421
($Q_{s(std)}$) Stack Gas Flow Rate, SCFMD			156239
($Q_{s(std)}$) Stack Gas Flow Rate Wet, SCFMW			216075

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Method 1,2,4 Flow and Moisture Template Rev4, 12-15-05

Moisture Calculations Worksheet

Data Request Entry Area	Moisture Run 2
Facility	Georgia-Pacific Corporation
Location	Palatka, Florida
Source	No. 4 Recovery Boiler
Date	04/07/08
Run Number	2
Start Time	15:10
Finish Time	15:40
Weather	Cloudy
Total Time (minutes) (Θ)	30.0
Meter (ΔH_a)	1.760
Barometric Pressure (inches Hg) (P_{bar})	29.91
Stack Diameter (inches) (D)	144.00
Final Meter Reading (ft^3)	930.460
Initial Meter Reading (ft^3)	907.725
Condensate (grams or ml)	176
Silica Gel Weight (grams)	8.8
Meter Y Factor (Y)	1.009

Field Data Points - Moisture Run 2

Port	Traverse Point	Meter Orifice Setting (inches H_2O)	Meter Inlet Temperature (°F)	Meter Outlet Temperature (°F)
1	1	2.0	74	74
	2	2.0	74	74
	3	2.0	74	73
	4	2.0	76	73
	5	2.0	77	73
	6	2.0	78	73

Moisture Summary Run 2

Facility	Georgia-Pacific Corporation	Run Date	4/7/2008
Location	Palatka, Florida	Start Time	15:10
Stack	No. 4 Recovery Boiler	Finish Time	15:40
Weather	Cloudy	(V_m) Volume Metered (ft^3)	22.735
(Θ) Total Time (minutes)	30	(T_m) Meter Temp (°R)	535.5
(P_{bar}) Barometric Pressure (in Hg)	29.91	Impinger Condensate	176.0
(D) Diameter (inches)	144.00	Silica Gel Condensate	8.8
(A) Stack Area (ft^2)	113.097	(V_{lc}) Condensate Volume (ml)	184.8
(Y) Meter Correction	1.009	(ΔH_{avg}) Delta H (inches H_2O)	2.0000

($V_{w(std)}$) Volume Water Vapor, SCF	8.699
($V_{m(std)}$) Gas Volume Sampled, STPD	22.713
Total Volume, STP	31.411
(B_{ws}) Moisture in stack gas, volume fraction	0.277
(B_{wd}) Dry Stack Gas, volume fraction	0.723

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Volumetric Flow Calculations Worksheet

Data Request Entry Area	Flow Run 3-1-1
Facility	Georgia-Pacific Corporation
Location	Palatka, Florida
Source	No. 4 Recovery Boiler
Date	04/11/08
Run Number	3-1-1
Start Time	13:10
Finish Time	13:22
Weather	Scattered
Total Time (minutes) (Θ)	12.0
Number of Points (n)	12
Barometric Pressure (inches Hg) (P_{bar})	30.01
Static Pressure (inches H_2O) (P_g)	-0.81
Stack Diameter (Inches) (D)	144.00
Pitot Factor (C_p)	0.84
Moisture Frection (B_{ws})	0.252
Carbon Dioxide (%)	13.7
Oxygen (%)	5.9
Carbon Monoxide (%)	0.0
Nitrogen (%)	80.4

Field Data Points - Flow Run 3-1-1

Port	Trav. Pt.	Velocity Head (Inches H_2O)		Stack Temperature (°F)		Square Root of Velocity Head
1	1	0.53		384		0.7280
	2	0.54		384		0.7348
	3	0.55		384		0.7416
2	1	0.56		383		0.7483
	2	0.55		383		0.7416
	3	0.48		383		0.6928
3	1	0.52		381		0.7211
	2	0.52		381		0.7211
	3	0.50		381		0.7071
4	1	0.54		381		0.7348
	2	0.50		381		0.7071
	3	0.47		381		0.6856

Flow Summary Run 3-1-1

Facility	Georgia-Pacific Corporation	Source	No. 4 Recovery Boiler
Location	Palatka, Florida	Run Date	4/11/2008
Start Time	13:10	Weather	Scattered
Finish Time	13:22	Total Time (min.)	12
(P_{bar}) Barometric Pressure (in Hg)	30.01	Carbon Dioxide (%)	13.7
(D) Diameter (inches)	144.00	Oxygen (%)	5.9
(A) Stack Area (ft^2)	113.097	Carbon Monoxide (%)	0.0
(n) Number of Points	12	Nitrogen (%)	80.4
(Δp_{avg}) Avg of SQRT of V.H.	0.7220	(P_s)Stack Pressure (Inches Hg)	29.95
(C_p) Pitot Correction Factor	0.84	($T_{s(abs)}$) Stack Temp (°R)	842.3

(B_{ws}) Moisture in stack gas, volume frection	0.252
(B_{wd}) Dry Stack Gas, volume fraction	0.748
(M_d) Molecular Weight of Stack Gas (Dry Basis)	30.43
(M_s) Molecular Weight of Stack Gas (Stack conditions)	27.29
(G_s) Specific gravity of Stack Gas Relative to Air	0.942
(v_s) Average Stack Velocity, FPM	3157.7
(Q_a) Actual Stack Gas Flow Rate, ACFM	357126
(Q_d) Actual Stack Gas Flow Rate, ACFMD	267082
($Q_{d(std)}$) Stack Gas Flow Rate, SCFMD	167602
($Q_{s(std)}$) Stack Gas Flow Rate Wst, SCFMW	224108

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Volumetric Flow Calculations Worksheet

Data Request Entry Area	Flow Run 3-1-2
Facility	Georgia-Pacific Corporation
Location	Palatka, Florida
Source	No. 4 Recovery Boiler
Date	04/11/08
Run Number	3-1-2
Start Time	13:35
Finish Time	13:41
Weather	Scattered
Total Time (minutes) (Θ)	6.0
Number of Points (n)	12
Barometric Pressure (inches Hg) (P_{bar})	30.01
Static Pressure (inches H_2O) (P_g)	-0.76
Stack Diameter (inches) (D)	144.00
Pitot Factor (C_p)	0.84
Moisture Fraction (B_{ws})	0.252
Carbon Dioxide (%)	13.7
Oxygen (%)	5.9
Carbon Monoxide (%)	0.0
Nitrogen (%)	80.4

Field Data Points - Flow Run 3-1-2

Port	Trav. Pt.	Velocity Head (inches H_2O)		Stack Temperature (°F)		Square Root of Velocity Haad
1	1	0.52		380		0.7211
	2	0.49		380		0.7000
	3	0.45		380		0.6708
2	1	0.44		380		0.6633
	2	0.43		380		0.6557
	3	0.40		380		0.6325
3	1	0.52		379		0.7211
	2	0.52		379		0.7211
	3	0.48		379		0.6928
4	1	0.47		371		0.6856
	2	0.51		371		0.7141
	3	0.48		371		0.6928

Flow Summary Run 3-1-2

Facility	Georgia-Pacific Corporation	Source	No. 4 Recovery Boiler
Location	Palatka, Florida	Run Date	4/11/2008
Start Time	13:35	Weather	Scattered
Finish Time	13:41	Total Time (min.)	6
(P_{bar}) Barometric Pressure (In Hg)	30.01	Carbon Dioxide (%)	13.7
(D) Diameter (inches)	144.00	Oxygen (%)	5.9
(A) Stack Area (ft^2)	113.097	Carbon Monoxide (%)	0.0
(n) Number of Points	12	Nitrogen (%)	80.4
(Δp_{avg}) Avg of SQRT of V.H.	0.6893	(P_s)Stack Pressure (inches Hg)	29.95
(C_p) Pitot Correction Factor	0.84	($T_{s(abs)}$) Stack Temp (°R)	837.5

(B_{ws}) Moisture in stack gas, volume fraction	0.252
(B_{wd}) Dry Stack Gas, volume fraction	0.748
(M_d) Molecular Weight of Stack Gas (Dry Basis)	30.43
(M_s) Molecular Weight of Stack Gas (Stack conditions)	27.29
(G_s) Specific gravity of Stack Gas Relative to Air	0.942
(v_s) Average Stack Velocity, FPM	3005.7
(Q_s) Actual Stack Gas Flow Rate, ACFM	339941
(Q_d) Actual Stack Gas Flow Rate, ACFMD	254229
($Q_{d(std)}$) Stack Gas Flow Rate, SCFMD	160461
($Q_{s(std)}$) Stack Gas Flow Rate Wet, SCFMW	214559

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Method 1,2,4 Flow and Moisture Template Rev4: 12-15-05

Volumetric Flow Calculations Worksheet

Data Request Entry Area	Flow Run 3-1-3
Facility	Georgia-Pacific Corporation
Location	Palatka, Florida
Source	No. 4 Recovery Boiler
Date	04/11/08
Run Number	3-1-3
Start Time	13:55
Finish Time	14:03
Weather	Scattered
Total Time (minutes) (Θ)	8.0
Number of Points (n)	12
Barometric Pressure (inches Hg) (P_{bar})	30.01
Static Pressure (inches H_2O) (P_g)	-0.77
Stack Diameter (inches) (D)	144.00
Pitot Factor (C_p)	0.84
Moisture Fraction (B_{ws})	0.252
Carbon Dioxide (%)	13.7
Oxygen (%)	5.9
Carbon Monoxide (%)	0.0
Nitrogen (%)	80.4

Field Data Points - Flow Run 3-1-3

Port	Trav. Pt.	Velocity Head (inches H_2O)		Stack Temperature (°F)		Square Root of Velocity Head
1	1	0.51		380		0.7141
	2	0.48		380		0.6928
	3	0.42		380		0.6481
2	1	0.44		376		0.6633
	2	0.45		376		0.6708
	3	0.40		376		0.6325
3	1	0.53		375		0.7280
	2	0.51		375		0.7141
	3	0.48		375		0.6928
4	1	0.51		373		0.7141
	2	0.47		373		0.6856
	3	0.41		373		0.6403

Flow Summary Run 3-1-3

Facility	Georgia-Pacific Corporation	Source	No. 4 Recovery Boiler
Location	Palatka, Florida	Run Date	4/11/2008
Start Time	13:55	Weather	Scattered
Finish Time	14:03	Total Time (min.)	8
(P_{bar}) Barometric Pressure (in Hg)	30.01	Carbon Dioxide (%)	13.7
(D) Diameter (inches)	144.00	Oxygen (%)	5.9
(A) Stack Area (ft^2)	113.097	Carbon Monoxide (%)	0.0
(n) Number of Points	12	Nitrogen (%)	80.4
(Δp_{avg}) Avg of SQRT of V.H.	0.6831	(P_s) Stack Pressure (inches Hg)	29.95
(C_p) Pitot Correction Factor	0.84	($T_{s(abs)}$) Stack Temp (°R)	836.0
(B_{ws}) Moisture in stack gas, volume fraction			0.252
(B_{wd}) Dry Stack Gas, volume fraction			0.748
(M_d) Molecular Weight of Stack Gas (Dry Basis)			30.43
(M_s) Molecular Weight of Stack Gas (Stack conditions)			27.29
(G_s) Specific gravity of Stack Gas Relative to Air			0.942
(v_s) Average Stack Velocity, FPM			2976.1
(Q_s) Actual Stack Gas Flow Rate, ACFM			336586
(Q_d) Actual Stack Gas Flow Rate, ACFMD			251720
($Q_{d(std)}$) Stack Gas Flow Rate, SCFMD			159158
($Q_{s(std)}$) Stack Gas Flow Rate Wet, SCFMW			212818

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Method 1,2,4 Flow and Moisture Template Rev4: 12-15-05

Volumetric Flow Calculations Worksheet

Data Request Entry Area	Flow Run 3-2-1
Facility	Georgia-Pacific Corporation
Location	Palatka, Florida
Source	No. 4 Recovery Boiler
Date	04/11/08
Run Number	3-2-1
Start Time	14:20
Finish Time	14:28
Weather	Scattered
Total Time (minutes) (Θ)	8.0
Number of Points (n)	12
Barometric Pressure (inches Hg) (P_{bar})	29.95
Static Pressure (inches H_2O) (P_g)	-0.79
Stack Diameter (inches) (D)	144.00
Pitot Factor (C_p)	0.84
Moisture Fraction (B_{ws})	0.252
Carbon Dioxide (%)	14.0
Oxygen (%)	5.1
Carbon Monoxide (%)	0.0
Nitrogen (%)	80.9

Field Data Points - Flow Run 3-2-1

Port	Trav. Pt.	Velocity Head (inches H_2O)		Stack Temperature (°F)		Square Root of Velocity Head
1	1	0.54		377		0.7348
	2	0.46		377		0.6782
	3	0.40		377		0.6325
2	1	0.50		377		0.7071
	2	0.45		377		0.6708
	3	0.41		377		0.6403
3	1	0.52		374		0.7211
	2	0.50		374		0.7071
	3	0.38		374		0.6164
4	1	0.42		374		0.6481
	2	0.44		374		0.6633
	3	0.43		374		0.6557

Flow Summary Run 3-2-1

Facility	Georgia-Pacific Corporation	Source	No. 4 Recovery Boiler
Location	Palatka, Florida	Run Date	4/11/2008
Start Time	14:20	Weather	Scattered
Finish Time	14:28	Total Time (min.)	8
(P_{bar}) Barometric Pressure (In Hg)	29.95	Carbon Dioxide (%)	14.0
(D) Diameter (Inches)	144.00	Oxygen (%)	5.1
(A) Stack Area (ft^2)	113.097	Carbon Monoxide (%)	0.0
(n) Number of Points	12	Nitrogen (%)	80.9
(Δp_{avg}) Avg of SQRT of V.H.	0.6730	(P_s)Stack Pressure (inches Hg)	29.89
(C_p) Pitot Correction Factor	0.84	($T_{s(tbe)}$) Stack Temp (°R)	835.5
(B_{ws}) Moisture in stack gas, volume fraction			0.252
(B_{wd}) Dry Stack Gas, volume fraction			0.748
(M_d) Molecular Weight of Stack Gas (Dry Basis)			30.44
(M_s) Molecular Weight of Stack Gas (Stack conditions)			27.31
(G_s) Specific gravity of Stack Gas Relative to Air			0.942
(v_s) Average Stack Velocity, FPM			2933.6
(Q_s) Actual Stack Gas Flow Rate, ACFM			331783
(Q_d) Actual Stack Gas Flow Rate, ACFMD			248128
($Q_{d(std)}$) Stack Gas Flow Rate, SCFMD			156659
($Q_{s(std)}$) Stack Gas Flow Rate Wet, SCFMW			209476

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Method 1,2,4 Flow and Moisture Template Rev4, 12-15-05

Volumetric Flow Calculations Worksheet

Data Request Entry Area	Flow Run 3-2-2
Facility	Georgia-Pacific Corporation
Location	Palatka, Florida
Source	No. 4 Recovery Boiler
Date	04/11/08
Run Number	3-2-2
Start Time	14:46
Finish Time	14:53
Weather	Scattered
Total Time (minutes) (Θ)	7.0
Number of Points (n)	12
Barometric Pressure (inches Hg) (P_{bar})	29.95
Static Pressure (Inches H_2O) (P_g)	-0.78
Stack Diameter (Inches) (D)	144.00
Pitot Factor (C_p)	0.84
Moisture Fraction (B_{ws})	0.252
Carbon Dioxide (%)	14.0
Oxygen (%)	5.1
Carbon Monoxide (%)	0.0
Nitrogen (%)	80.9

Field Data Points - Flow Run 3-2-2

Port	Trav. Pt.	Velocity Head (Inches H_2O)		Stack Temperature (°F)		Square Root of Velocity Head
1	1	0.51		375		0.7141
	2	0.49		375		0.7000
	3	0.44		375		0.6633
2	1	0.46		373		0.6782
	2	0.47		373		0.6856
	3	0.40		373		0.6325
3	1	0.47		372		0.6856
	2	0.41		372		0.6403
	3	0.40		372		0.6325
4	1	0.46		372		0.6782
	2	0.52		372		0.7211
	3	0.43		372		0.6557

Flow Summary Run 3-2-2

Facility	Georgia-Pacific Corporation	Source	No. 4 Recovery Boiler
Location	Palatka, Florida	Run Date	4/11/2008
Start Time	14:46	Weather	Scattered
Finish Time	14:53	Total Time (min.)	7

(P_{bar}) Barometric Pressure (In Hg)	29.95	Carbon Dioxide (%)	14.0
(D) Diameter (inches)	144.00	Oxygen (%)	5.1
(A) Stack Area (ft^2)	113.097	Carbon Monoxide (%)	0.0
(n) Number of Points	12	Nitrogen (%)	80.9
(Δp_{avg}) Avg of SQRT of V.H.	0.6739	(P_s)Stack Pressure (inches Hg)	29.89
(C_p) Pitot Correction Factor	0.84	($T_{s(abs)}$) Stack Temp (°R)	833.0

(B_{ws}) Moisture in stack gas, volume fraction	0.252
(B_{wd}) Dry Stack Gas, volume fraction	0.748
(M_d) Molecular Weight of Stack Gas (Dry Basis)	30.44
(M_s) Molecular Weight of Stack Gas (Stack conditions)	27.31
(G_s) Specific gravity of Stack Gas Relative to Air	0.942
(v_s) Average Stack Velocity, FPM	2933.4
(Q_s) Actual Stack Gas Flow Rate, ACFM	331757
(Q_d) Actual Stack Gas Flow Rate, ACFMD	248109
($Q_{d(std)}$) Stack Gas Flow Rate, SCFMD	157121
($Q_{s(std)}$) Stack Gas Flow Rate Wet, SCFMW	210093

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Method 1,2,4 Flow and Moisture Template Rev4, 12-15-05

Volumetric Flow Calculations Worksheet

Data Request Entry Area	Flow Run 3-2-3
Facility	Georgia-Pacific Corporation
Location	Palatka, Florida
Source	No. 4 Recovery Boiler
Date	04/11/08
Run Number	3-2-3
Start Time	15:10
Finish Time	15:19
Weather	Scattered
Total Time (minutes) (Θ)	9.0
Number of Points (n)	12
Barometric Pressure (Inches Hg) (P_{bar})	29.95
Static Pressure (inches H_2O) (P_g)	-0.78
Stack Diameter (inches) (D)	144.00
Pitot Factor (C_p)	0.84
Moisture Fraction (B_{ws})	0.252
Carbon Dioxide (%)	14.0
Oxygen (%)	5.1
Carbon Monoxide (%)	0.0
Nitrogen (%)	80.9

Field Data Points - Flow Run 3-2-3

Port	Trav. Pt.	Velocity Head (inches H_2O)		Stack Temperature (°F)		Square Root of Velocity Head
1	1	0.51		375		0.7141
	2	0.52		375		0.7211
	3	0.53		375		0.7280
2	1	0.42		371		0.6481
	2	0.46		371		0.6782
	3	0.47		371		0.6856
3	1	0.51		371		0.7141
	2	0.50		371		0.7071
	3	0.42		371		0.6481
4	1	0.45		372		0.6708
	2	0.52		372		0.7211
	3	0.45		372		0.6708

Flow Summary Run 3-2-3

Facility	Georgia-Pacific Corporation	Source	No. 4 Recovery Boiler
Location	Palatka, Florida	Run Date	4/11/2008
Start Time	15:10	Weather	Scattered
Finish Time	15:19	Total Time (min.)	9
(P_{bar}) Barometric Pressure (in Hg)	29.95	Carbon Dioxide (%)	14.0
(D) Diameter (inches)	144.00	Oxygen (%)	5.1
(A) Stack Area (ft^2)	113.097	Carbon Monoxide (%)	0.0
(n) Number of Points	12	Nitrogen (%)	80.9
(Δp_{avg}) Avg of SQRT of V.H.	0.6923	(P_s)Stack Pressure (inches Hg)	29.89
(C_p) Pitot Correction Factor	0.84	($T_{s(abs)}$) Stack Temp (°R)	832.3

(B_{ws}) Moisture in stack gas, volume fraction	0.252
(B_{wd}) Dry Stack Gas, volume fraction	0.748
(M_d) Molecular Weight of Stack Gas (Dry Basis)	30.44
(M_s) Molecular Weight of Stack Gas (Stack conditions)	27.31
(G_s) Specific gravity of Stack Gas Relative to Air	0.942
(v_s) Average Stack Velocity, FPM	3011.8
(Q_s) Actual Stack Gas Flow Rate, ACFM	340631
(Q_d) Actual Stack Gas Flow Rate, ACFMD	254746
($Q_{d(std)}$) Stack Gas Flow Rate, SCFMD	161469
($Q_{s(std)}$) Stack Gas Flow Rate Wet, SCFMW	215907

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Method 1,2,4 Flow and Moisture Template Rev4, 12-15-05

Volumetric Flow Calculations Worksheet

Data Request Entry Area	Flow Run 3-3-1
Facility	Georgia-Pacific Corporation
Location	Palatka, Florida
Source	No. 4 Recovery Boiler
Date	04/11/08
Run Number	3-3-1
Start Time	15:35
Finish Time	15:45
Weather	Scattered
Total Time (minutes) (Θ)	10.0
Number of Points (n)	12
Barometric Pressure (inches Hg) (P_{bar})	29.95
Static Pressure (inches H_2O) (P_g)	-0.77
Stack Diameter (inches) (D)	144.00
Pitot Factor (C_p)	0.84
Moisture Fraction (B_{ws})	0.252
Carbon Dioxide (%)	14.1
Oxygen (%)	5.4
Carbon Monoxide (%)	0.0
Nitrogen (%)	80.5

Field Data Points - Flow Run 3-3-1

Port	Trav. Pt.	Velocity Head (inches H_2O)		Stack Temperature (°F)		Square Root of Velocity Head
1	1	0.50		375		0.7071
	2	0.52		375		0.7211
	3	0.50		375		0.7071
2	1	0.51		368		0.7141
	2	0.51		368		0.7141
	3	0.44		368		0.6633
3	1	0.50		373		0.7071
	2	0.43		373		0.6557
	3	0.40		373		0.6325
4	1	0.52		373		0.7211
	2	0.48		373		0.6928
	3	0.41		373		0.6403

Flow Summary Run 3-3-1

Facility	Georgia-Pacific Corporation	Source	No. 4 Recovery Boiler
Location	Palatka, Florida	Run Date	4/11/2008
Start Time	15:35	Weather	Scattered
Finish Time	15:45	Total Time (min.)	10
(P_{bar}) Barometric Pressure (In Hg)	29.95	Carbon Dioxide (%)	14.1
(D) Diameter (inches)	144.00	Oxygen (%)	5.4
(A) Stack Area (ft^2)	113.097	Carbon Monoxide (%)	0.0
(n) Number of Points	12	Nitrogen (%)	80.5
(Δp_{avg}) Avg of SQRT of V.H.	0.6897	(P_s)Stack Pressure (inches Hg)	29.89
(C_p) Pitot Correction Factor	0.84	($T_{s(abs)}$) Stack Temp (°R)	832.3

(B_{ws}) Moisture in stack gas, volume fraction	0.252
(B_{wd}) Dry Stack Gas, volume fraction	0.748
(M_d) Molecular Weight of Stack Gas (Dry Basis)	30.47
(M_s) Molecular Weight of Stack Gas (Stack conditions)	27.33
(G_s) Specific gravity of Stack Gas Relative to Air	0.943
(v_s) Average Stack Velocity, FPM	2999.5
(Q_a) Actual Stack Gas Flow Rate, ACFM	339237
(Q_d) Actual Stack Gas Flow Rate, ACFMD	253703
($Q_{d(std)}$) Stack Gas Flow Rate, SCFMD	160812
($Q_{s(std)}$) Stack Gas Flow Rate Wet, SCFMW	215029

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Method 1,2,4 Flow and Moisture Template Rev4, 12-15-05

Volumetric Flow Calculations Worksheet

Data Request Entry Area	Flow Run 3-3-2
Facility	Georgia-Pacific Corporation
Location	Palatka, Florida
Source	No. 4 Recovery Boiler
Date	04/11/08
Run Number	3-3-2
Start Time	15:55
Finish Time	16:05
Weather	Scattered
Total Time (minutes) (Θ)	10.0
Number of Points (n)	12
Barometric Pressure (inches Hg) (P_{bar})	29.95
Static Pressure (Inches H_2O) (P_g)	-0.76
Stack Diameter (inches) (D)	144.00
Pitot Factor (C_p)	0.84
Moisture Fraction (B_{ws})	0.252
Carbon Dioxide (%)	14.1
Oxygen (%)	5.4
Carbon Monoxide (%)	0.0
Nitrogen (%)	80.5

Field Data Points - Flow Run 3-3-2

Port	Trav. Pt.	Velocity Head (Inches H_2O)		Stack Temperature (°F)		Square Root of Velocity Head
1	1	0.47		374		0.6856
	2	0.46		374		0.6782
	3	0.43		374		0.6557
2	1	0.45		372		0.6708
	2	0.45		372		0.6708
	3	0.42		372		0.6481
3	1	0.48		367		0.6928
	2	0.48		367		0.6928
	3	0.41		367		0.6403
4	1	0.49		370		0.7000
	2	0.50		370		0.7071
	3	0.42		370		0.6481

Flow Summary Run 3-3-2

Facility	Georgia-Pacific Corporation	Source	No. 4 Recovery Boiler
Location	Palatka, Florida	Run Date	4/11/2008
Start Time	15:55	Weather	Scattered
Finish Time	16:05	Total Time (min.)	10
(P_{bar}) Barometric Pressure (in Hg)	29.95	Carbon Dioxide (%)	14.1
(D) Diameter (inches)	144.00	Oxygen (%)	5.4
(A) Stack Area (ft^2)	113.097	Carbon Monoxide (%)	0.0
(n) Number of Points	12	Nitrogen (%)	80.5
(Δp_{avg}) Avg of SQRT of V.H.	0.6742	(P_s)Stack Pressure (inches Hg)	29.89
(C_p) Pitot Correction Factor	0.84	($T_{s(abs)}$) Stack Temp (°R)	830.8

(B_{ws}) Moisture in stack gas, volume fraction	0.252
(B_{wd}) Dry Stack Gas, volume fraction	0.748
(M_d) Molecular Weight of Stack Gas (Dry Basis)	30.47
(M_s) Molecular Weight of Stack Gas (Stack conditions)	27.33
(G_s) Specific gravity of Stack Gas Relative to Air	0.943
(v_s) Average Stack Velocity, FPM	2929.4
(Q_s) Actual Stack Gas Flow Rate, ACFM	331307
(Q_d) Actual Stack Gas Flow Rate, ACFMD	247772
($Q_{d(std)}$) Stack Gas Flow Rate, SCFMD	157340
($Q_{s(std)}$) Stack Gas Flow Rate Wet, SCFMW	210386

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Method 1,2,4 Flow and Moisture Template Rev4: 12-15-05

Volumetric Flow Calculations Worksheet

Data Request Entry Area	Flow Run 3-3-3
Facility	Georgia-Pacific Corporation
Location	Palatka, Florida
Source	No. 4 Recovery Boiler
Date	04/11/08
Run Number	3-3-3
Start Time	16:15
Finish Time	16:25
Weather	Scattered
Total Time (minutes) (Θ)	10.0
Number of Points (n)	12
Barometric Pressure (inches Hg) (P_{bar})	29.95
Static Pressure (inches H_2O) (P_g)	-0.77
Stack Diameter (inches) (D)	144.00
Pitot Factor (C_p)	0.84
Moisture Fraction (B_{ws})	0.252
Carbon Dioxide (%)	14.1
Oxygen (%)	5.4
Carbon Monoxide (%)	0.0
Nitrogen (%)	80.5

Field Data Points - Flow Run 3-3-3

Port	Trav. Pt.	Velocity Head (inches H_2O)		Stack Temperature (°F)		Square Root of Velocity Head
1	1	0.50		374		0.7071
	2	0.51		374		0.7141
	3	0.49		374		0.7000
2	1	0.44		371		0.6633
	2	0.47		371		0.6856
	3	0.43		371		0.6557
3	1	0.46		372		0.6782
	2	0.45		372		0.6708
	3	0.44		372		0.6633
4	1	0.48		371		0.6928
	2	0.54		371		0.7348
	3	0.46		371		0.6782

Flow Summary Run 3-3-3

Facility	Georgia-Pacific Corporation	Source	No. 4 Recovery Boiler
Location	Palatka, Florida	Run Date	4/11/2008
Start Time	16:15	Weather	Scattered
Finish Time	16:25	Total Time (min.)	10
(P_{bar}) Barometric Pressure (in Hg)	29.95	Carbon Dioxide (%)	14.1
(D) Diameter (inches)	144.00	Oxygen (%)	5.4
(A) Stack Area (ft^2)	113.097	Carbon Monoxide (%)	0.0
(n) Number of Points	12	Nitrogen (%)	80.5
(Δp_{avg}) Avg of SQRT of V.H.	0.6870	(P_s)Stack Pressure (inches Hg)	29.89
(C_p) Pitot Correction Factor	0.84	($T_{s(abs)}$) Stack Temp (°R)	832.0

(B_{ws}) Moisture in stack gas, volume fraction	0.252
(B_{wd}) Dry Stack Gas, volume fraction	0.748
(M_d) Molecular Weight of Stack Gas (Dry Basis)	30.47
(M_s) Molecular Weight of Stack Gas (Stack conditions)	27.33
(G_s) Specific gravity of Stack Gas Relative to Air	0.943
(v_s) Average Stack Velocity, FPM	2887.4
(Q_a) Actual Stack Gas Flow Rate, ACFM	337862
(Q_d) Actual Stack Gas Flow Rate, ACFMD	252674
($Q_{d(std)}$) Stack Gas Flow Rate, SCFMD	160208
($Q_{s(std)}$) Stack Gas Flow Rate Wet, SCFMW	214221

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Method 1,2,4 Flow and Moisture Template Rev4, 12-15-05

Moisture Calculations Worksheet

Data Request Entry Area	Moisture Run 3
Facility	Georgia-Pacific Corporation
Location	Palatka, Florida
Source	No. 4 Recovery Boiler
Date	04/11/08
Run Number	3
Start Time	13:29
Finish Time	13:59
Weather	Clear
Total Time (minutes) (Θ)	30.0
Meter (ΔH_a)	1.760
Barometric Pressure (inches Hg) (R_{bar})	30.01
Stack Diameter (inches) (D)	144.00
Final Meter Reading (ft^3)	954.900
Initial Meter Reading (ft^3)	930.459
Condensate (grams or ml)	170
Silica Gel Weight (grams)	5.2
Meter Y Factor (Y)	1.009

Field Data Points - Moisture Run 3

Port	Traverse Point	Meter Orifice Setting (inches H_2O)	Meter Inlet Temperature (°F)	Meter Outlet Temperature (°F)
1	1	2.0	69	73
	2	2.0	73	73
	3	2.0	77	72
	4	2.0	78	72
	5	2.0	80	72
	6	2.0	81	72

Moisture Summary Run 3

Facility	Georgia-Pacific Corporation	Run Date	4/11/2008
Location	Palatka, Florida	Start Time	13:29
Stack	No. 4 Recovery Boiler	Finish Time	13:59
Weather	Clear	(V_m) Volume Metered (ft^3)	24.441
(Θ) Total Time (minutes)	30	(T_m) Meter Temp (°R)	536.3
(P_{bar}) Barometric Pressure (in Hg)	30.01	Impinger Condensate	170.0
(D) Diameter (Inches)	144.00	Silica Gel Condensate	5.2
(A) Stack Area (ft^2)	113.097	(V_{lc}) Condensate Volume (ml)	175.2
(Y) Meter Correction	1.009	(ΔH_{avg}) Delta H (inches H_2O)	2.0000
($V_{w(std)}$) Volume Water Vapor, SCF			8.247
($V_{m(std)}$) Gas Volume Sampled, STPD			24.460
Total Volume, STP			32.707
(B_{ws}) Moisture in stack gas, volume fraction			0.252
(B_{wd}) Dry Stack Gas, volume fraction			0.748

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Velocity Traverse

High Load
R-1

Plant: Georgia-Pacific Palatka Date: 4/7/08

Source: NO.4 Recovery Boiler Magnehelic ID: NA

Stack Diameter: 144 Pitot ID Yellow-1 Thermocouple ID Blue L

Run 1			Run 2			Run 3		
Static Pressure		-0.53	Static Pressure		-.57	Static Pressure		-0.73
Start	915		Start	930		Start	945	
Stop	923		Stop	938		Stop	953	
Barometer (in. Hg)		29.93	Barometer (in. Hg)		29.93	Barometer (in. Hg)		29.93
Traverse Point No.	Velocity Head	Stack Temp Deg F	Traverse Point No.	Velocity Head	Stack Temp Deg F	Traverse Point No.	Velocity Head	Stack Temp Deg F
1-1	0.76	402	1-1	0.75	401	1-1	0.73	402
2	0.71	402	2	0.76	402	2	0.62	402
3	0.62	398	3	0.63	401	3	0.65	400
2-1	0.72	398	2-1	0.68	398	2-1	0.73	398
2	0.74	399	2	0.72	398	2	0.72	399
3	0.60	396	3	0.64	398	3	0.65	398
3-1	0.71	394	3-1	0.74	399	3-1	0.72	399
2	0.72	396	2	0.71	398	2	0.74	399
3	0.58	397	3	0.65	398	3	0.65	397
4-1 4-1	0.68	387	4-1	0.70	396	4-1	0.73	399
2 2	0.72	393	2	0.72	398	2	0.74	399
3 3	0.57	394	3	0.58	397	3	0.60	398
Analyzer:	CO_2	14.6	CO/			CO/		
	O_2	5.0	O_2			O_2		
			BDP			BDP		

BDP

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High Load-
R-2

Velocity Traverse

Plant: Georgia - Pacific Palatka Date: 4/7/08

Source: #4 Recovery Boiler Magnehelic ID: NA

Stack Diameter: 144 Pitot ID Yellow -1 Thermocouple ID Blue - L

Run 1			Run 2			Run 3		
Static Pressure		-0.82	Static Pressure		-0.87	Static Pressure		-0.80
Start	1015		Start	1030		Start	1057	
Stop	1023		Stop	1038		Stop	1105	
Barometer (in. Hg)		29.93	Barometer (in. Hg)		29.93	Barometer (in. Hg)		29.93
Traverse Point No.	Velocity Head	Stack Temp Deg F	Traverse Point No.	Velocity Head	Stack Temp Deg F	Traverse Point No.	Velocity Head	Stack Temp Deg F
1-1	0.73	399	1-1	0.72	399	1-1	~~0.60~~ 0.70	394
2	0.72	399	2	0.71	399	2	0.71	398
3	0.61	398	3	0.60	399	3	0.58	392
2-1	0.64	395	2-1	0.67	400	2-1	0.66	385
2	0.66	397	2	0.68	400	2	0.64	391
3	0.56	398	3	0.58	399	3	0.64	395
3-1	0.66	395	3-1	0.68	396	3-1	0.68	390
2	0.70	392	2	0.70	397	2	0.67	394
3	0.61	394	3	0.53	397	3	0.65	396
4-1	0.68	390	4-1	0.68	400	4-1	0.67	391
2	0.69	397	2	0.68	400	2	0.66	395
3	0.60	398	3	0.60	397	3	0.57	396
Analyzer:	CO_2:	14.7						
	O_2:	5.0						

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Velocity Traverse

High Load
R-3

Plant: Georgia - Pacific Palatka Date: 4/7/08

Source: No.4 Recovery Boiler Magnehelic ID: NA

Stack Diameter: 144 Pitot ID Yellow-1 Thermocouple ID Blue-L

Run 1			Run 2			Run 3		
Static Pressure		-0.81	Static Pressure		-0.86	Static Pressure		-0.85
Start	1305		Start	1320		Start	1340	
Stop	1313		Stop	1328		Stop	1348	
Barometer (in. Hg)		29.93	Barometer (in. Hg)		29.93	Barometer (in. Hg)		29.93
Traverse Point No.	Velocity Head	Stack Temp Deg F	Traverse Point No.	Velocity Head	Stack Temp Deg F	Traverse Point No.	Velocity Head	Stack Temp Deg F
1-1	0.74	400	1-1	0.68	393	1-1	0.70	394
2	0.73	401	2	0.67	397	2	0.69	396
3	0.60	402	3	0.57	398	3	0.62	397
2-1	0.70	397	2-1	0.73	390	2-1	0.69	392
2	0.71	398	2	0.74	394	2	0.73	395
3	0.64	400	3	0.62	395	3	0.59	395
3-1	0.73	393	3-1	0.70	400	3-1	0.71	400
2	0.74	397	2	0.74	401	2	0.72	401
3	0.64	397	3	0.61	399	3	0.60	398
4-1	0.69	392	4-1	0.67	397	4-1	0.71	395
2	0.68	396	2	0.65	397	2	0.71	397
3	0.58	398	3	0.62	398	3	0.65	398
Analyzer:	CO_2	14.7						
	O_2	4.9						

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Facility	Georgia - Pacific Palatka	Run No.	1- High
Source	NO. 4 Recovery Boiler	Date	4/7/08
Weather	Cloudy	Test(s)	M4
Testers	DP, JE	Barometric Pressure	29.93

Equipment Identification	Pitot	-	Probe	-	Heater Box	-	Meter Box	#8	Cold box		#3
Thermocouple Identification	Stack	-	Impinger	Wht-K	Heater Box	-	Meter In		Meter Out		
Sampling	Total min (Θ)		30	Total Points (n)		6			Min/Pt	5	
Profile	Stack Diameter (in) (D)		-	Downstream Dia.		-			Upstream Dia.		-
Nozzle Diameter (avg) (D_n)	-	Nozzle Diameter Calibration Checks		1	-	2	-		3	-	
	Pre T_s	-	Pre T_m	-	Pre Dry Stack Gas (B_{wd})		-	Meter (ΔHa)	1.760	Meter (Y)	1.009
	$a = (D_n^2 X B_{wd})^2$		$b = (1.6+B_{wd})T_s$		$c = T_m X \Delta H_a$		$F = 1570(aXc)/b$		Isokinetic Rate Factor		
Isokinetic Factor Calculation	-		-		-		-		-		

Start Time	1300	Final Meter Reading (ft3)	907.422	Orsat/Fyrite/ Analyzer	O_2 (%)	NA	Comments:
Finish Time	1330	Initial Meter Reading (ft3)	883.372		CO_2 (%)	NA	

Pre Test Leak Check	Post Test Leak Check	Static Pressure	Pitot Leak Check	Volume H_2O Collected	
0.006 cfm@ 15/20 "Hg	0.004 cfm@ 9 "H_g	- "H_2O	- at 3"	Silica Gel Weight	9.7 (Weighed in gr

Port and Sample Point	Clock Time (min)	Gas Meter Reading (cfm)	Stack Velocity (in H_2O)	Orifice Pressure Drop (in H_2O)	Vacuum (in H_g)	Stack Gas Temp (°F)	Filter Temp (°F)	Last Impinger Temp (°F)	Meter Temp (°F)	Meter Temp (°F)	Field - TRS scale
1-1	0	883.372	NA	2.0	6	NA	NA	64	73	68	
2	5	887.4	↓	2.0	6	↓	↓	48	73	72	
3	10	891.4		2.0	6			54	74	72	
4	15	895.4		2.0	6			55	74	72	
5	20	899.5		2.0	6			57	87 74	72	
6	25	903.5		2.0	6			59	74	72	
	30	907.422	↓			↓	↓				

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Mid Load

R-1

Velocity Traverse

Plant: Georgia - Pacific Palatka Date: 4/7/08

Source: No.4 Recovery Boiler Magnehelic ID: NA

Stack Diameter: 144 Pitot ID Yellow-1 Thermocouple ID BlueL

Run 1			Run 2			Run 3		
Static Pressure		-0.65	Static Pressure		-0.65	Static Pressure		-0.76
Start	1449		Start	1510		Start	1526	
Stop	1457		Stop	1518		Stop	1534	
Barometer (in. Hg)		29.91	Barometer (in. Hg)		29.91	Barometer (in. Hg)		29.91
Traverse Point No.	Velocity Head	Stack Temp Deg F	Traverse Point No.	Velocity Head	Stack Temp Deg F	Traverse Point No.	Velocity Head	Stack Temp Deg F
1-1	0.50	399	1-1	0.52	392	1-1	0.52	396
2	0.51	399	2	0.51	394	2	0.53	395
3	0.41	398	3	0.43	393	3	0.42	391
2-1	0.48	393	2-1	0.54	389	2-1	0.56	389
2	0.50	397	2	0.53	393	2	0.56	394
3	0.47	397	3	0.39	392	3	0.41	393
3-1	0.50	391	3-1	0.48	391	3-1	0.53	393
2	0.51	397	2	0.49	393	2	0.52	394
3	0.44	396	3	0.37	392	3	0.43	393
4-1	0.46	396	4-1	0.45	387	4-1	0.50	391
2	0.46	397	2	0.48	392	2	0.53	394
3	0.39	393	3	0.41	390	3	0.46	393
800 Ash								
Analyzer	CO_2	14.0						
	O_2	5.7						

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Velocity Traverse

Mid Load
R-2

Plant: Georgia - Pacific Corporation Date: 4/7/08

Source: No.4 Recovery Boiler Magnehelic ID: NA

Stack Diameter: 144" Pitot ID Yellow-1 Thermocouple ID Blue-L

Run 1			Run 2			Run 3		
Static Pressure		-0.55	Static Pressure		-0.53	Static Pressure		-0.54
Start	1557		Start	1615		Start	1632	
Stop	1605		Stop	1623		Stop	1640	
Barometer (in. Hg)		29.93	Barometer (in. Hg)		29.93	Barometer (in. Hg)		29.93
Traverse Point No.	Velocity Head	Stack Temp Deg F	Traverse Point No.	Velocity Head	Stack Temp Deg F	Traverse Point No.	Velocity Head	Stack Temp Deg F
1-1	0.53	392	1-1	0.52	389	1-1	0.52	389
2	0.56	392	2	0.55	389	2	0.54	389
3	0.42	389	3	0.47	388	3	0.47	388
2-1	0.52	388	2-1	0.51	387	2-1	0.48	380
2	0.53	391	2	0.50	389	2	0.50	387
3	0.39	388	3	0.45	385	3	0.41	387
3-1	0.53	386	3-1	0.54	386	3-1	0.49	382
2	0.57	390	2	0.56	388	2	0.52	388
3	0.37	376	3	0.46	388	3	0.46	387
4-1	0.47	387	4-1	0.53	383	4-1	0.51	382
2	0.49	389	2	0.55	388	2	0.52	387
3	0.45	387	3	0.47	388	3	0.46	386
Analyzer	CO_2	14.0						
	O_2	5.6						

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Velocity Traverse

Mid Load
R-3

Plant: Georgia - Pacific Corporation Date: 4/7/08

Source: NO. 4 Recovery Boiler Magnehelic ID: NA

Stack Diameter: 144 Pitot ID Yellow-1 Thermocouple ID Blue-L

Run 1			Run 2			Run 3		
Static Pressure		-0.59	Static Pressure		-0.56	Static Pressure		-0.56
Start	1603 BP 1703		Start	1620 BP 1720		Start	1638 BP 1738	
Stop	1611	1711	Stop	1628	1728	Stop	1646	1746
Barometer (in. Hg)		29.91	Barometer (in. Hg)		29.91	Barometer (in. Hg)		29.91
Traverse Point No.	Velocity Head	Stack Temp Deg F	Traverse Point No.	Velocity Head	Stack Temp Deg F	Traverse Point No.	Velocity Head	Stack Temp Deg F
1-1	0.52	384	1-1	0.54	387	1-1	0.55	386
2	0.53	387	2	0.53	385	2	0.53	386
3	0.45	387	3	0.43	385	3	0.46	383
2-1	0.50	385	2-1	0.52	383	2-1	0.54	382
2	0.49	385	2	0.50	385	2	0.52	385
3	0.42	388	3	0.43	386	3	0.43	384
3-1	0.52	382	3-1	0.49	382	3-1	0.48	383
2	0.53	384	2	0.49	384	2	0.50	386
3	0.46	387	3	0.43	387	3	0.44	386
4-1	0.44	381	4-1	0.47	384	4-1	0.45	386
2	0.48	383	2	0.52	387	2	0.49	387
3	0.42	385	3	0.45	383	3	0.41	384
Analyzer	CO_2	14.0						
	O_2	5.5						

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Facility	Georgia - Pacific Palatka			Run No.	2-Mid		
Source	NO.4 Recovery Boiler			Date	4/7/08		
Weather	Cloudy			Test(s)	M4		
Testers	DP, JE			Barometric Pressure	29.91		

Equipment Identification	Pitot	-	Probe	-	Heater Box	-	Meter Box	8	Cold box	#3
Thermocouple Identification	Stack	-	Impinger	Wht-K	Heater Box	-	Meter In		Meter Out	

Sampling	Total min (Θ)	30	Total Points (n)	6	Min/Pt	5	
Profile	Stack Diameter (in) (D)	144	Downstream Dia.	-	Upstream Dia.		-

Nozzle Diameter (avg) (D_n)	-	Nozzle Diameter Calibration Checks		1	-	2	-	3	-
Isokinetic Factor Calculation	Pre T_s	-	Pre T_m	-	Pre Dry Stack Gas (B_{wd})	-	Meter (ΔHa)	1.760	Meter (Y)	1.009
	$a = (D_n^2 X B_{wd})^2$		$b = (1.6+B_{wd})T_s$		$c = T_m X \Delta H_a$		$F = 1570(aXc)/b$		Isokinetic Rate Factor	
	-		-		-		-		-	

Start Time	1510	Final Meter Reading (ft3)	930.460	Orsat/Fyrite/ Analyzer	O_2 (%)	NA	Comments:
Finish Time	1540	Initial Meter Reading (ft3)	907.725		CO_2 (%)	NA	

Pre Test Leak Check	Post Test Leak Check	Static Pressure	Pitot Leak Check	Volume H_2O Collected	176	ml	
0.018 cfm@15"Hg	cfm@ "H_g	NA "H_2O	NA at 3"	Silicia Gel Weight	8.8 (weighed in	gr	

Port and Sample Point	Clock Time (min)	Gas Meter Reading (cfm)	Stack Velocity (in H_2O)	Orifice Pressure Drop (in H_2O)	Vacuum (in H_g)	Stack Gas Temp (°F)	Filter Temp (°F)	Last Impinger Temp (°F)	Meter Temp (°F)	Meter Temp (°F)	Field - TRB scale)
1-1	0	907.725	NA	2.0	7	NA	NA	66	74	74	
2	5	910.9	↓	↓	7	↓	↓	58	74	74	
3	10	914.9	↓	↓	7	↓	↓	60	74	73	
4	15	918.8	↓	↓	7	↓	↓	61	76	73	
5	20	922.7	↓	↓	7	↓	↓	61	77	73	
6	25	926.6	↓	↓	7	↓	↓	61	78	73	
	30	930.460	↓	↓		↓	↓				

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Low load
R-1
1310-1410

Velocity Traverse

Plant: GP Palatka Date: 4/11/08

Source: Recovery Boiler Magnehelic ID: NA

Stack Diameter: 144 Pitot ID Yellow-1 Thermocouple ID Blue L

Run 1			Run 2			Run 3		
Static Pressure		-0.81	Static Pressure		-0.76	Static Pressure		-0.77
Start	1310		Start	1335		Start	1355	
Stop	1322		Stop	1341		Stop	1403	
Barometer (in. Hg)		30.01	Barometer (in. Hg)		30.01	Barometer (in. Hg)		30.01
Traverse Point No.	Velocity Head	Stack Temp Deg F	Traverse Point No.	Velocity Head	Stack Temp Deg F	Traverse Point No.	Velocity Head	Stack Temp Deg F
1-1	0.53	384	4-1	0.52	380	3-1	0.51	380
2	0.54	384	2	0.49	380	2	0.48	
3	0.55	384	3	0.45	380	3	0.42	
2-1	0.56	383	3-1	0.44	380	4-1	0.44	376
2	0.55	383	2	0.43	380	2	0.45	
3	0.48	383	3	0.4	380	3	0.4	
3-1	0.52	381	2-1	0.52	379	1-1	0.53	375
2	0.52	381	2	0.52	379	2	0.51	
3	0.5	381	3	0.48	379	3	0.48	
4-1	0.54	381	4-1	0.47	371	2-1	0.51	375
2	0.5	381	2	0.51	371	2	0.47	
3	0.47	381	3	0.48	371	3	0.41	
Analyzer:	CO_2	13.7						
	O_2	5.9						

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Low Load
R-2
1420 - 1520

Velocity Traverse

Plant: GP Palatka Date: 4/11/08

Source: #4 Recovery Boiler Magnehelic ID: NA

Stack Diameter: 144 Pitot ID Yellow-1 Thermocouple ID Blue-L

Run 1			Run 2			Run 3		
Static Pressure		-0.79	Static Pressure		-0.78	Static Pressure		-0.78
Start	1420		Start	1446		Start	1510	
Stop	1428		Stop	1453		Stop	1519	
Barometer (in. Hg)		29.95 ~~30.01~~	Barometer (in. Hg)		29.95 ~~30.01~~	Barometer (in. Hg)		29.95 ~~30.01~~
Traverse Point No.	Velocity Head	Stack Temp Deg F	Traverse Point No.	Velocity Head	Stack Temp Deg F	Traverse Point No.	Velocity Head	Stack Temp Deg F
1 - 1	0.54	377	1 - 1	0.51	375	1 - 1	0.51	375
2	0.46		2	0.49		2	0.52	
3	0.4		3	0.44		3	0.53	
2 - 1	0.5	377	2 - 1	0.46	373	2 - 1	0.42	371
2	0.45		2	0.47		2	0.46	
3	0.41		3	0.4		3	0.47	
3 - 1	0.52	374	3 - 1	0.47	372	3 - 1	0.51	371
2	0.5		2	0.41		2	0.5	
3	0.38		3	0.4		3	0.42	
4 - 1	0.48	374	4 - 1	0.46	372	4 - 1	0.45	372
2	0.44		2	0.52		2	0.52	
3	0.43		3	0.43		3	0.45	
Analyzer:	CO_2	14.0						
	O_2	5.1						

revised 10/26/07

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Low Load
R-3

Velocity Traverse

Plant: GP Palatka Date: 4/11/08

Source: #4 Recovery Boiler Magnehelic ID: NA

Stack Diameter: 144 Pitot ID Yellow-1 Thermocouple ID Blue L

Run 1			Run 2			Run 3		
Static Pressure		-0.77	Static Pressure		-0.76	Static Pressure		-0.77
Start	1535		Start	1555		Start	1615	
Stop	1545		Stop	1605		Stop	1625	
Barometer (in. Hg)		29.95	Barometer (in. Hg)		29.95	Barometer (in. Hg)		29.95
Traverse Point No.	Velocity Head	Stack Temp Deg F	Traverse Point No.	Velocity Head	Stack Temp Deg F	Traverse Point No.	Velocity Head	Stack Temp Deg F
1	0.5	375	1	0.47	374	1	0.5	374
2	0.52	375	2	0.46	374	2	0.51	
3	0.5	375	3	0.43	374	3	0.49	
1	0.51	368	1	0.45	372	1	0.44	371
2	0.51	368	2	0.45	372	2	0.47	
3	0.44	368	3	0.42	372	3	0.43	
1	0.50	373	1	0.48	367	1	0.46	372
2	0.43	373	2	0.48	367	2	0.45	
3	0.4	373	3	0.41	367	3	0.44	
1	0.52	373	1	0.49	370	1	0.48	371
2	0.48	373	2	0.5	370	2	0.54	
3	0.41	373	3	0.42	370	3	0.46	
Analyzer:								
CO_2	14.1							
O_2	5.4							

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SOURCE SAMPLING FIELD DATA SHEET

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

Facility	SP Palatka	Run No.	3-Low
Source	#4 Recovery Boiler	Date	4/11/08
Weather	Partial	Test(s)	M-4
Testers	RW, RY	Barometric Pressure	30.01

Equipment Identification	Pitot	-	Probe	-	Heater Box	-	Meter Box	#8	Cold box		#3
Thermocouple Identification	Stack	-	Impinger	wet-K	Heater Box	-	Meter In		Meter Out		
Sampling	Total min (Θ)		30	Total Points (n)		-		Min/Pt		-	
Profile	Stack Diameter (in) (D)		144	Downstream Dia.		-		Upstream Dia.		-	
Nozzle Diameter (avg) (D_n)	-	Nozzle Diameter Calibration Checks		1	-	2	-	3	-		
	Pre T_s	-	Pre T_m	-	Pre Dry Stack Gas (B_{wd})	-	Meter (ΔHa)	1.760	Meter (Y)	1.009	
	$a = (D_n^2 X B_{wd})^2$		$b = (1.6+B_{wd})T_s$		$c = T_m X \Delta H_a$		$F = 1570(aXc)/b$		Isokinetic Rate Factor		
Isokinetic Factor Calculation	-		-		-		-305		N/A		

Start Time	1329	Final Meter Reading (ft3)	954.900	Orsat/Fyrite/ Analyzer	O_2 (%)	3.4%	Comments:
Finish Time	1359	Initial Meter Reading (ft3)	930.459		CO_2 (%)	11.9%	

Pre Test Leak Check		Post Test Leak Check		Static Pressure	Pitot Leak Check	Volume H_2O Collected	170 ml
2.0	cfm@15"Hg	0.000 cfm@ 7	"H_g	N/A "H_2O	- at 3"	Silicia Gel Weight	5.2 (Weighed gr

Port and Sample Point	Clock Time (min)	Gas Meter Reading (cfm)	Stack Velocity (in H_2O)	Orifice Pressure Drop (in H_2O)	Vacuum (in H_g)	Stack Gas Temp (°F)	Filter Temp (°F)	Last Impinger Temp (°F)	Meter Temp (°F)	Meter Temp (°F)	in Field - TR8 scale)
	0	930.459	N/A	2.0	4	N/A	N/A	68	69	73	
	5	934.4		2.0	4			59	73	73	
	10	939.0		2.0	4			61	77	72	
	15	943.0		2.0	4			61	78	72	
	20	946.9		2.0	4			61	80	72	
	25	951.2						61	81	72	
	30	954.900	-	-	-	-	-	-	-	-	

AASI

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

Georgia-Pacific Corporation - No. 4 Recovery Boiler - Gas Calibration Data - April 7, 2008

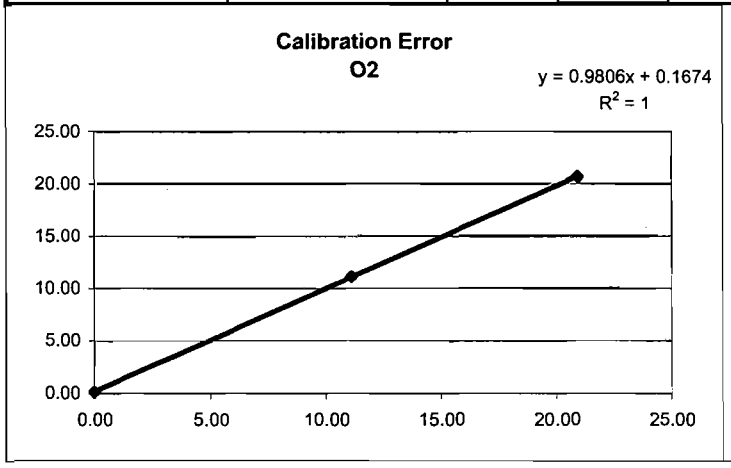
Sampling and Calibration Flow Rate (LPM)	3

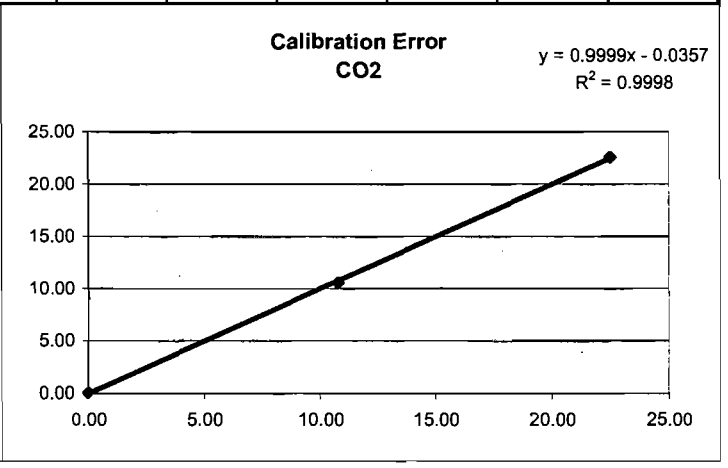
Carbon Dioxide

Instrument Information	Manuf.	Servomex		Model	1440			Serial #	01415C/2820		
CALIBRATION GAS VALUE	INITIAL CALIBRATION	CALIBRATION ERROR, % SPAN	POST RUN 1 - High Load	POST RUN 2 - High Load	POST RUN 3 - High Load	POST RUN 1 - Mid Load	POST RUN 2 - Mid Load	POST RUN 3 - Mid Load			
0.00	0.07	0.31	0.21	0.20	0.21	0.14	0.21	0.19			
10.80	10.56	-1.07	10.53	10.56	10.60	10.60	10.53	10.62			
22.49	22.55	0.27	NA	NA	NA	NA	NA	NA			
RANGE	22.49										
Co	N/A		0.14	0.21	0.21	0.18	0.18	0.20			
Cm			10.55	10.55	10.58	10.60	10.57	10.58			
Cma			10.80	10.80	10.80	10.80	10.80	10.80			
Cdo			0.62	0.58	0.62	0.31	0.62	0.53			
Cdma			-0.13	0.00	0.18	0.18	-0.13	0.27			

Oxygen

Instrument Information	Manuf.	Servomex		Model	1440			Serial #	01420C/2811		
CALIBRATION GAS VALUE	INITIAL CALIBRATION	CALIBRATION ERROR, % SPAN	POST RUN 1 - High Load	POST RUN 2 - High Load	POST RUN 3 - High Load	POST RUN 1 - Mid Load	POST RUN 2 - Mid Load	POST RUN 3 - Mid Load			
0.00	0.14	0.67	0.22	0.22	0.19	0.29	0.24	0.12			
11.10	11.11	0.05	10.95	10.97	10.97	10.93	11.22	11.13			
20.92	20.65	-1.29	NA	NA	NA	NA	NA	NA			
RANGE	20.92										
Co	N/A		0.18	0.22	0.21	0.24	0.27	0.18			
Cm			11.03	10.96	10.97	10.95	11.08	11.18			
Cma			11.10	11.10	11.10	11.10	11.10	11.10			
Cdo			0.38	0.38	0.24	0.72	0.48	-0.10			
Cdma			-0.76	-0.67	-0.67	-0.86	0.53	0.10			





AASI

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

Georgia-Pacific Corporation - No. 4 Recovery Boiler - Gas Calibration Data - April 11, 2008

Sampling and Calibration Flow Rate (LPM)	3

Carbon Dioxide

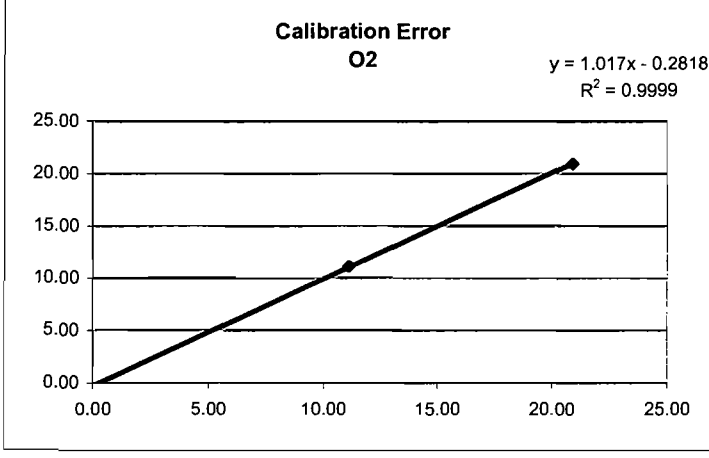
Instrument Information	Manuf.	Servomex	Model	1440	Serial #	01415C/2820

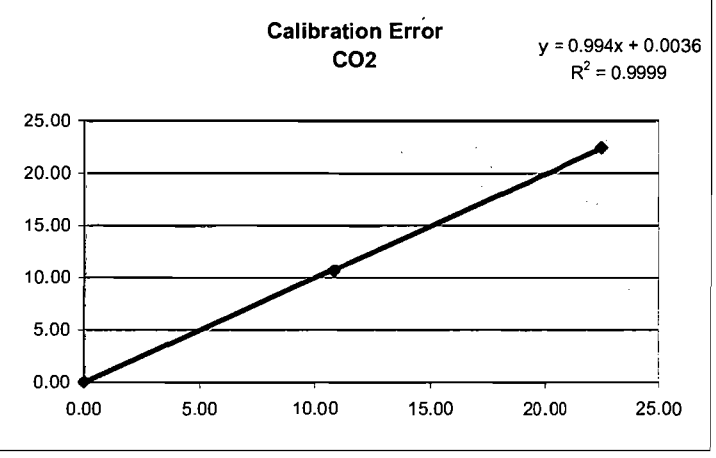
CALIBRATION GAS VALUE	INITIAL CALIBRATION	CALIBRATION ERROR, % SPAN	POST RUN 1 - Low Load	POST RUN 2 - Low Load	POST RUN 3 - Low Load						
0.00	0.06	0.27	-0.23	-0.25	-0.23						
10.80	10.63	-0.76	10.97	10.58	10.58						
22.49	22.41	-0.36	NA	NA	NA						
RANGE	22.49										
Co	N/A		-0.09	-0.24	-0.24						
Cm			10.80	10.78	10.58						
Cma			10.80	10.80	10.80						
Cdo			-1.29	-1.38	-1.29						
Cdma			1.51	-0.22	-0.22						

Oxygen

Instrument Information	Manuf.	Servomex	Model	1440	Serial #	01420C/2811

CALIBRATION GAS VALUE	INITIAL CALIBRATION	CALIBRATION ERROR, % SPAN	POST RUN 1 - Low Load	POST RUN 2 - Low Load	POST RUN 3 - Low Load						
0.00	-0.33	-1.58	0.02	0.28	0.03						
11.10	11.11	0.05	11.49	11.51	11.49						
20.92	20.94	0.10	NA	NA	NA						
RANGE	20.92										
Co	N/A		-0.16	0.15	0.16						
Cm			11.30	11.50	11.50						
Cma			11.10	11.10	11.10						
Cdo			1.67	2.92	1.72						
Cdma			1.82	1.91	1.82						





Georgia-Pacific Corporation - Palatka, Florida - Gaseous Emissions Test Summary - April 7, 2008

No. 4 Recovery Boiler

	Uncorrected			BIAS CHECK RESULTS, AVERAGE RESPONSE, Percent						Corrected	
TimeStamp (EDT)	CO2, %	O2, %	COMMENTS	Co, CO2	Cm, CO2	Cma, CO2	Co, O2	Cm, O2	Cma, O2	CORR % CO2	CORR % O2
4/7/2008 8:25	0.11	20.65									
4/7/2008 8:26	0.13	20.65	20.92 O2								
4/7/2008 8:27	0.11	20.65	20.92 O2								
		20.65	**20.92 O2 Average**								
4/7/2008 8:28	0.10	5.05									
4/7/2008 8:29	0.09	-0.01									
4/7/2008 8:30	0.07	-0.03									
4/7/2008 8:31	18.49	0.73									
4/7/2008 8:32	22.54	0.57	22.49 CO2								
4/7/2008 8:33	22.56	0.57	22.49 CO2								
	22.55		**22.49 CO2 Average**								
4/7/2008 8:34	13.20	0.28									
4/7/2008 8:35	10.57	0.14	10.8 CO2, 0 O2								
4/7/2008 8:36	10.55	0.14	10.8 CO2, 0 O2								
	10.56	**0.14**	**10.8 CO2, 0 O2 Average**								
4/7/2008 8:37	1.63	9.76									
4/7/2008 8:38	0.07	11.11	0 CO2, 11.1 O2								
4/7/2008 8:39	0.07	11.11	0 CO2, 11.1 O2								
	0.07	**11.11**	**0 CO2, 11.1 O2 Average**								
4/7/2008 8:40	0.11	20.01									
4/7/2008 8:41	0.13	20.53									
4/7/2008 8:42	0.14	20.52									
4/7/2008 8:43	0.11	20.70									
4/7/2008 8:44	0.11	20.71									
4/7/2008 8:45	0.11	20.71									
4/7/2008 8:46	0.11	20.71									
4/7/2008 8:47	0.10	20.71									
4/7/2008 8:48	0.10	20.71									
4/7/2008 8:49	0.10	20.70									
4/7/2008 8:50	0.10	20.70									
4/7/2008 8:51	0.41	20.04									
4/7/2008 8:52	1.78	16.65									
4/7/2008 8:53	0.10	10.89									
4/7/2008 8:54	0.09	10.86									
4/7/2008 8:55	2.84	9.53									
4/7/2008 8:56	13.92	5.03									
4/7/2008 8:57	14.23	4.87									
4/7/2008 8:58	14.25	4.89									
4/7/2008 8:59	14.22	4.94									
4/7/2008 9:00	14.20	4.94	Run 1 - High Load	0.14	10.55	10.80	0.18	11.03	11.10	14.6	4.9
4/7/2008 9:01	14.28	4.89	Run 1 - High Load	0.14	10.55	10.80	0.18	11.03	11.10	14.7	4.8
4/7/2008 9:02	14.20	4.94	Run 1 - High Load	0.14	10.55	10.80	0.18	11.03	11.10	14.6	4.9
4/7/2008 9:03	14.20	4.95	Run 1 - High Load	0.14	10.55	10.80	0.18	11.03	11.10	14.6	4.9
4/7/2008 9:04	14.03	5.09	Run 1 - High Load	0.14	10.55	10.80	0.18	11.03	11.10	14.4	5.0
4/7/2008 9:05	14.28	4.85	Run 1 - High Load	0.14	10.55	10.80	0.18	11.03	11.10	14.7	4.8
4/7/2008 9:06	14.29	4.81	Run 1 - High Load	0.14	10.55	10.80	0.18	11.03	11.10	14.7	4.7
4/7/2008 9:07	14.22	4.87	Run 1 - High Load	0.14	10.55	10.80	0.18	11.03	11.10	14.6	4.8
4/7/2008 9:08	14.01	5.06	Run 1 - High Load	0.14	10.55	10.80	0.18	11.03	11.10	14.4	5.0
4/7/2008 9:09	14.13	4.97	Run 1 - High Load	0.14	10.55	10.80	0.18	11.03	11.10	14.5	4.9
4/7/2008 9:10	14.19	4.92	Run 1 - High Load	0.14	10.55	10.80	0.18	11.03	11.10	14.6	4.9
4/7/2008 9:11	14.23	4.89	Run 1 - High Load	0.14	10.55	10.80	0.18	11.03	11.10	14.6	4.8

Georgia-Pacific Corporation - Palatka, Florida - Gaseous Emissions Test Summary - April 7, 2008

No. 4 Recovery Boiler

	Uncorrected			BIAS CHECK RESULTS, AVERAGE RESPONSE, Percent						Corrected	
TimeStamp (EDT)	CO2, %	O2, %	COMMENTS	Co, CO2	Cm, CO2	Cma, CO2	Co, O2	Cm, O2	Cma, O2	CORR % CO2	CORR % O2
4/7/2008 9:12	14.22	4.91	Run 1 - High Load	0.14	10.55	10.80	0.18	11.03	11.10	14.6	4.8
4/7/2008 9:13	14.25	4.89	Run 1 - High Load	0.14	10.55	10.80	0.18	11.03	11.10	14.6	4.8
4/7/2008 9:14	14.26	4.86	Run 1 - High Load	0.14	10.55	10.80	0.18	11.03	11.10	14.7	4.8
4/7/2008 9:15	14.26	4.89	Run 1 - High Load	0.14	10.55	10.80	0.18	11.03	11.10	14.7	4.8
4/7/2008 9:16	14.22	4.91	Run 1 - High Load	0.14	10.55	10.80	0.18	11.03	11.10	14.6	4.8
4/7/2008 9:17	14.18	4.96	Run 1 - High Load	0.14	10.55	10.80	0.18	11.03	11.10	14.6	4.9
4/7/2008 9:18	14.29	4.86	Run 1 - High Load	0.14	10.55	10.80	0.18	11.03	11.10	14.7	4.8
4/7/2008 9:19	14.28	4.89	Run 1 - High Load	0.14	10.55	10.80	0.18	11.03	11.10	14.7	4.8
4/7/2008 9:20	14.32	4.85	Run 1 - High Load	0.14	10.55	10.80	0.18	11.03	11.10	14.7	4.8
4/7/2008 9:21	14.22	4.96	Run 1 - High Load	0.14	10.55	10.80	0.18	11.03	11.10	14.6	4.9
4/7/2008 9:22	14.26	4.91	Run 1 - High Load	0.14	10.55	10.80	0.18	11.03	11.10	14.7	4.8
4/7/2008 9:23	14.32	4.86	Run 1 - High Load	0.14	10.55	10.80	0.18	11.03	11.10	14.7	4.8
4/7/2008 9:24	14.36	4.84	Run 1 - High Load	0.14	10.55	10.80	0.18	11.03	11.10	14.8	4.8
4/7/2008 9:25	14.32	4.87	Run 1 - High Load	0.14	10.55	10.80	0.18	11.03	11.10	14.7	4.8
4/7/2008 9:26	14.33	4.86	Run 1 - High Load	0.14	10.55	10.80	0.18	11.03	11.10	14.7	4.8
4/7/2008 9:27	14.29	4.92	Run 1 - High Load	0.14	10.55	10.80	0.18	11.03	11.10	14.7	4.9
4/7/2008 9:28	14.22	5.00	Run 1 - High Load	0.14	10.55	10.80	0.18	11.03	11.10	14.6	4.9
4/7/2008 9:29	14.18	5.03	Run 1 - High Load	0.14	10.55	10.80	0.18	11.03	11.10	14.6	5.0
4/7/2008 9:30	14.19	5.00	Run 1 - High Load	0.14	10.55	10.80	0.18	11.03	11.10	14.6	4.9
4/7/2008 9:31	14.30	4.91	Run 1 - High Load	0.14	10.55	10.80	0.18	11.03	11.10	14.7	4.8
4/7/2008 9:32	14.32	4.90	Run 1 - High Load	0.14	10.55	10.80	0.18	11.03	11.10	14.7	4.8
4/7/2008 9:33	14.32	4.92	Run 1 - High Load	0.14	10.55	10.80	0.18	11.03	11.10	14.7	4.9
4/7/2008 9:34	14.29	4.92	Run 1 - High Load	0.14	10.55	10.80	0.18	11.03	11.10	14.7	4.9
4/7/2008 9:35	14.52	4.72	Run 1 - High Load	0.14	10.55	10.80	0.18	11.03	11.10	14.9	4.6
4/7/2008 9:36	14.46	4.77	Run 1 - High Load	0.14	10.55	10.80	0.18	11.03	11.10	14.9	4.7
4/7/2008 9:37	14.38	4.86	Run 1 - High Load	0.14	10.55	10.80	0.18	11.03	11.10	14.8	4.8
4/7/2008 9:38	14.36	4.90	Run 1 - High Load	0.14	10.55	10.80	0.18	11.03	11.10	14.8	4.8
4/7/2008 9:39	14.32	4.91	Run 1 - High Load	0.14	10.55	10.80	0.18	11.03	11.10	14.7	4.8
4/7/2008 9:40	14.45	4.82	Run 1 - High Load	0.14	10.55	10.80	0.18	11.03	11.10	14.8	4.7
4/7/2008 9:41	14.38	4.90	Run 1 - High Load	0.14	10.55	10.80	0.18	11.03	11.10	14.8	4.8
4/7/2008 9:42	14.32	4.96	Run 1 - High Load	0.14	10.55	10.80	0.18	11.03	11.10	14.7	4.9
4/7/2008 9:43	14.42	4.87	Run 1 - High Load	0.14	10.55	10.80	0.18	11.03	11.10	14.8	4.8
4/7/2008 9:44	14.42	4.89	Run 1 - High Load	0.14	10.55	10.80	0.18	11.03	11.10	14.8	4.8
4/7/2008 9:45	14.28	5.03	Run 1 - High Load	0.14	10.55	10.80	0.18	11.03	11.10	14.7	5.0
4/7/2008 9:46	14.26	5.05	Run 1 - High Load	0.14	10.55	10.80	0.18	11.03	11.10	14.7	5.0
4/7/2008 9:47	14.25	5.06	Run 1 - High Load	0.14	10.55	10.80	0.18	11.03	11.10	14.6	5.0
4/7/2008 9:48	14.11	5.18	Run 1 - High Load	0.14	10.55	10.80	0.18	11.03	11.10	14.5	5.1
4/7/2008 9:49	14.02	5.29	Run 1 - High Load	0.14	10.55	10.80	0.18	11.03	11.10	14.4	5.2
4/7/2008 9:50	13.99	5.30	Run 1 - High Load	0.14	10.55	10.80	0.18	11.03	11.10	14.4	5.2
4/7/2008 9:51	13.86	5.47	Run 1 - High Load	0.14	10.55	10.80	0.18	11.03	11.10	14.2	5.4
4/7/2008 9:52	13.86	5.46	Run 1 - High Load	0.14	10.55	10.80	0.18	11.03	11.10	14.2	5.4
4/7/2008 9:53	13.76	5.57	Run 1 - High Load	0.14	10.55	10.80	0.18	11.03	11.10	14.1	5.5
4/7/2008 9:54	13.71	5.63	Run 1 - High Load	0.14	10.55	10.80	0.18	11.03	11.10	14.1	5.6
4/7/2008 9:55	13.75	5.62	Run 1 - High Load	0.14	10.55	10.80	0.18	11.03	11.10	14.1	5.6
4/7/2008 9:56	13.76	5.62	Run 1 - High Load	0.14	10.55	10.80	0.18	11.03	11.10	14.1	5.6
4/7/2008 9:57	13.72	5.67	Run 1 - High Load	0.14	10.55	10.80	0.18	11.03	11.10	14.1	5.6
4/7/2008 9:58	13.76	5.65	Run 1 - High Load	0.14	10.55	10.80	0.18	11.03	11.10	14.1	5.6
4/7/2008 9:59	13.82	5.62	Run 1 - High Load	0.14	10.55	10.80	0.18	11.03	11.10	14.2	5.6
	14.19	**5.03**	**Run 1 - High Load Average**							**14.6**	**5.0**
4/7/2008 10:00	13.58	5.73									
4/7/2008 10:01	6.28	6.46									

Georgia-Pacific Corporation - Palatka, Florida - Gaseous Emissions Test Summary - April 7, 2008

No. 4 Recovery Boiler

	Uncorrected			BIAS CHECK RESULTS, AVERAGE RESPONSE, Percent						Corrected	
TimeStamp (EDT)	CO2, %	O2, %	COMMENTS	Co, CO2	Cm, CO2	Cma, CO2	Co, O2	Cm, O2	Cma, O2	CORR % CO2	CORR % O2
4/7/2008 10:02	10.45	0.25									
4/7/2008 10:03	10.53	0.22	10.8 CO2, 0 O2								
4/7/2008 10:04	10.53	0.22	10.8 CO2, 0 O2								
	10.53	**0.22**	**10.8 CO2, 0 O2 Average**								
4/7/2008 10:05	10.27	0.58									
4/7/2008 10:06	0.81	10.51									
4/7/2008 10:07	0.23	10.95	0 CO2, 11.1 O2								
4/7/2008 10:08	0.18	10.95	0 CO2, 11.1 O2								
	0.21	**10.95**	**0 CO2, 11.1 O2 Average**								
4/7/2008 10:09	11.15	6.86									
4/7/2008 10:10	13.94	5.10	Run 2 - High Load	0.21	10.55	10.80	0.22	10.96	11.10	14.3	5.0
4/7/2008 10:11	13.75	5.41	Run 2 - High Load	0.21	10.55	10.80	0.22	10.96	11.10	14.1	5.4
4/7/2008 10:12	13.92	5.35	Run 2 - High Load	0.21	10.55	10.80	0.22	10.96	11.10	14.3	5.3
4/7/2008 10:13	13.88	5.42	Run 2 - High Load	0.21	10.55	10.80	0.22	10.96	11.10	14.3	5.4
4/7/2008 10:14	14.02	5.32	Run 2 - High Load	0.21	10.55	10.80	0.22	10.96	11.10	14.4	5.3
4/7/2008 10:15	14.05	5.30	Run 2 - High Load	0.21	10.55	10.80	0.22	10.96	11.10	14.5	5.3
4/7/2008 10:16	14.12	5.24	Run 2 - High Load	0.21	10.55	10.80	0.22	10.96	11.10	14.5	5.2
4/7/2008 10:17	14.19	5.20	Run 2 - High Load	0.21	10.55	10.80	0.22	10.96	11.10	14.6	5.1
4/7/2008 10:18	14.25	5.15	Run 2 - High Load	0.21	10.55	10.80	0.22	10.96	11.10	14.7	5.1
4/7/2008 10:19	14.28	5.14	Run 2 - High Load	0.21	10.55	10.80	0.22	10.96	11.10	14.7	5.1
4/7/2008 10:20	14.26	5.14	Run 2 - High Load	0.21	10.55	10.80	0.22	10.96	11.10	14.7	5.1
4/7/2008 10:21	14.19	5.23	Run 2 - High Load	0.21	10.55	10.80	0.22	10.96	11.10	14.6	5.2
4/7/2008 10:22	14.22	5.19	Run 2 - High Load	0.21	10.55	10.80	0.22	10.96	11.10	14.6	5.1
4/7/2008 10:23	14.36	5.08	Run 2 - High Load	0.21	10.55	10.80	0.22	10.96	11.10	14.8	5.0
4/7/2008 10:24	14.32	5.13	Run 2 - High Load	0.21	10.55	10.80	0.22	10.96	11.10	14.7	5.1
4/7/2008 10:25	14.25	5.18	Run 2 - High Load	0.21	10.55	10.80	0.22	10.96	11.10	14.7	5.1
4/7/2008 10:26	14.20	5.20	Run 2 - High Load	0.21	10.55	10.80	0.22	10.96	11.10	14.6	5.1
4/7/2008 10:27	14.36	5.04	Run 2 - High Load	0.21	10.55	10.80	0.22	10.96	11.10	14.8	5.0
4/7/2008 10:28	14.38	5.04	Run 2 - High Load	0.21	10.55	10.80	0.22	10.96	11.10	14.8	5.0
4/7/2008 10:29	14.29	5.11	Run 2 - High Load	0.21	10.55	10.80	0.22	10.96	11.10	14.7	5.1
4/7/2008 10:30	14.19	5.20	Run 2 - High Load	0.21	10.55	10.80	0.22	10.96	11.10	14.6	5.1
4/7/2008 10:31	14.25	5.14	Run 2 - High Load	0.21	10.55	10.80	0.22	10.96	11.10	14.7	5.1
4/7/2008 10:32	14.29	5.10	Run 2 - High Load	0.21	10.55	10.80	0.22	10.96	11.10	14.7	5.0
4/7/2008 10:33	14.33	5.06	Run 2 - High Load	0.21	10.55	10.80	0.22	10.96	11.10	14.8	5.0
4/7/2008 10:34	14.28	5.14	Run 2 - High Load	0.21	10.55	10.80	0.22	10.96	11.10	14.7	5.1
4/7/2008 10:35	14.28	5.11	Run 2 - High Load	0.21	10.55	10.80	0.22	10.96	11.10	14.7	5.1
4/7/2008 10:36	14.42	4.97	Run 2 - High Load	0.21	10.55	10.80	0.22	10.96	11.10	14.8	4.9
4/7/2008 10:37	14.40	5.00	Run 2 - High Load	0.21	10.55	10.80	0.22	10.96	11.10	14.8	4.9
4/7/2008 10:38	14.32	5.06	Run 2 - High Load	0.21	10.55	10.80	0.22	10.96	11.10	14.7	5.0
4/7/2008 10:39	14.23	5.15	Run 2 - High Load	0.21	10.55	10.80	0.22	10.96	11.10	14.6	5.1
4/7/2008 10:40	14.30	5.10	Run 2 - High Load	0.21	10.55	10.80	0.22	10.96	11.10	14.7	5.0
4/7/2008 10:41	14.33	5.09	Run 2 - High Load	0.21	10.55	10.80	0.22	10.96	11.10	14.8	5.0
4/7/2008 10:42	14.33	5.10	Run 2 - High Load	0.21	10.55	10.80	0.22	10.96	11.10	14.8	5.0
4/7/2008 10:43	14.43	5.03	Run 2 - High Load	0.21	10.55	10.80	0.22	10.96	11.10	14.9	5.0
4/7/2008 10:44	14.47	4.94	Run 2 - High Load	0.21	10.55	10.80	0.22	10.96	11.10	14.9	4.9
4/7/2008 10:45	14.53	4.91	Run 2 - High Load	0.21	10.55	10.80	0.22	10.96	11.10	15.0	4.8
4/7/2008 10:46	14.52	4.92	Run 2 - High Load	0.21	10.55	10.80	0.22	10.96	11.10	14.9	4.9
4/7/2008 10:47	14.35	5.08	Run 2 - High Load	0.21	10.55	10.80	0.22	10.96	11.10	14.8	5.0
4/7/2008 10:48	14.33	5.10	Run 2 - High Load	0.21	10.55	10.80	0.22	10.96	11.10	14.8	5.0
4/7/2008 10:49	14.42	5.01	Run 2 - High Load	0.21	10.55	10.80	0.22	10.96	11.10	14.8	5.0
4/7/2008 10:50	14.47	4.96	Run 2 - High Load	0.21	10.55	10.80	0.22	10.96	11.10	14.9	4.9

Georgia-Pacific Corporation - Palatka, Florida - Gaseous Emissions Test Summary - April 7, 2008												
No. 4 Recovery Boiler												
	Uncorrected			BIAS CHECK RESULTS, AVERAGE RESPONSE, Percent						Corrected	
TimeStamp (EDT)	CO2, %	O2, %	COMMENTS	Co, CO2	Cm, CO2	Cma, CO2	Co, O2	Cm, O2	Cma, O2	CORR % CO2	CORR % O2
4/7/2008 10:51	14.42	5.04	Run 2 - High Load	0.21	10.55	10.80	0.22	10.96	11.10	14.8	5.0
4/7/2008 10:52	14.28	5.13	Run 2 - High Load	0.21	10.55	10.80	0.22	10.96	11.10	14.7	5.1
4/7/2008 10:53	14.46	5.00	Run 2 - High Load	0.21	10.55	10.80	0.22	10.96	11.10	14.9	4.9
4/7/2008 10:54	14.47	4.95	Run 2 - High Load	0.21	10.55	10.80	0.22	10.96	11.10	14.9	4.9
4/7/2008 10:55	14.43	5.00	Run 2 - High Load	0.21	10.55	10.80	0.22	10.96	11.10	14.9	4.9
4/7/2008 10:56	14.28	5.14	Run 2 - High Load	0.21	10.55	10.80	0.22	10.96	11.10	14.7	5.1
4/7/2008 10:57	14.29	5.11	Run 2 - High Load	0.21	10.55	10.80	0.22	10.96	11.10	14.7	5.1
4/7/2008 10:58	14.30	5.08	Run 2 - High Load	0.21	10.55	10.80	0.22	10.96	11.10	14.7	5.0
4/7/2008 10:59	14.40	4.99	Run 2 - High Load	0.21	10.55	10.80	0.22	10.96	11.10	14.8	4.9
4/7/2008 11:00	14.42	4.96	Run 2 - High Load	0.21	10.55	10.80	0.22	10.96	11.10	14.8	4.9
4/7/2008 11:01	14.43	4.94	Run 2 - High Load	0.21	10.55	10.80	0.22	10.96	11.10	14.9	4.9
4/7/2008 11:02	14.50	4.87	Run 2 - High Load	0.21	10.55	10.80	0.22	10.96	11.10	14.9	4.8
4/7/2008 11:03	14.55	4.82	Run 2 - High Load	0.21	10.55	10.80	0.22	10.96	11.10	15.0	4.8
4/7/2008 11:04	14.49	4.86	Run 2 - High Load	0.21	10.55	10.80	0.22	10.96	11.10	14.9	4.8
4/7/2008 11:05	14.43	4.92	Run 2 - High Load	0.21	10.55	10.80	0.22	10.96	11.10	14.9	4.9
4/7/2008 11:06	14.35	5.03	Run 2 - High Load	0.21	10.55	10.80	0.22	10.96	11.10	14.8	5.0
4/7/2008 11:07	14.22	5.14	Run 2 - High Load	0.21	10.55	10.80	0.22	10.96	11.10	14.6	5.1
4/7/2008 11:08	14.26	5.08	Run 2 - High Load	0.21	10.55	10.80	0.22	10.96	11.10	14.7	5.0
4/7/2008 11:09	14.28	5.06	Run 2 - High Load	0.21	10.55	10.80	0.22	10.96	11.10	14.7	5.0
	14.30	**5.09**	**Run 2 - High Load Average**							**14.7**	**5.0**
4/7/2008 11:10	7.71	5.10									
4/7/2008 11:11	10.55	0.22	10.8 CO2, 0 O2								
4/7/2008 11:12	10.57	0.22	10.8 CO2, 0 O2								
	10.56	**0.22**	**10.8 CO2, 0 O2 Average**								
4/7/2008 11:13	5.87	5.34									
4/7/2008 11:14	0.33	10.92									
4/7/2008 11:15	0.23	10.96	0 CO2, 11.1 O2								
4/7/2008 11:16	0.17	10.97	0 CO2, 11.1 O2								
	0.20	**10.97**	**0 CO2, 11.1 O2 Average**								
4/7/2008 11:17	11.24	5.96									
4/7/2008 11:18	13.96	5.06									
4/7/2008 11:19	14.15	5.01									
4/7/2008 11:20	14.29	4.91									
4/7/2008 11:21	14.46	4.77									
4/7/2008 11:22	14.50	4.82									
4/7/2008 11:23	14.47	4.86									
4/7/2008 11:24	14.39	4.94									
4/7/2008 11:25	14.49	4.82									
4/7/2008 11:26	14.39	4.91									
4/7/2008 11:27	14.28	5.03									
4/7/2008 11:28	14.23	5.08									
4/7/2008 11:29	14.30	5.01									
4/7/2008 11:30	14.30	5.01									
4/7/2008 11:31	14.32	4.99									
4/7/2008 11:32	14.38	4.94									
4/7/2008 11:33	14.49	4.85									
4/7/2008 11:34	14.49	4.85									
4/7/2008 11:35	14.56	4.77									
4/7/2008 11:36	14.50	4.85									
4/7/2008 11:37	14.49	4.84									
4/7/2008 11:38	14.49	4.85									

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	Uncorrected			BIAS CHECK RESULTS, AVERAGE RESPONSE, Percent						Corrected	
TimeStamp (EDT)	CO2, %	O2, %	COMMENTS	Co, CO2	Cm, CO2	Cma, CO2	Co, O2	Cm, O2	Cma, O2	CORR % CO2	CORR % O2
4/7/2008 11:39	14.43	4.90									
4/7/2008 11:40	14.49	4.84									
4/7/2008 11:41	14.56	4.80									
4/7/2008 11:42	14.49	4.87									
4/7/2008 11:43	14.49	4.85									
4/7/2008 11:44	14.55	4.78									
4/7/2008 11:45	14.59	4.76									
4/7/2008 11:46	14.63	4.72									
4/7/2008 11:47	14.53	4.81									
4/7/2008 11:48	14.55	4.81									
4/7/2008 11:49	14.55	4.80									
4/7/2008 11:50	14.53	4.81									
4/7/2008 11:51	14.52	4.81									
4/7/2008 11:52	14.50	4.82									
4/7/2008 11:53	14.57	4.77									
4/7/2008 11:54	14.66	4.68									
4/7/2008 11:55	14.67	4.66									
4/7/2008 11:56	14.57	4.76									
4/7/2008 11:57	14.66	4.66									
4/7/2008 11:58	14.72	4.61									
4/7/2008 11:59	14.66	4.67									
4/7/2008 12:00	14.59	4.75									
4/7/2008 12:01	14.53	4.78									
4/7/2008 12:02	14.55	4.76									
4/7/2008 12:03	14.59	4.70									
4/7/2008 12:04	14.66	4.62									
4/7/2008 12:05	14.80	4.49									
4/7/2008 12:06	14.79	4.52									
4/7/2008 12:07	14.77	4.49									
4/7/2008 12:08	14.66	4.59									
4/7/2008 12:09	14.67	4.56									
4/7/2008 12:10	14.83	4.43									
4/7/2008 12:11	14.89	4.39									
4/7/2008 12:12	14.77	4.49									
4/7/2008 12:13	14.62	4.65									
4/7/2008 12:14	14.69	4.58									
4/7/2008 12:15	14.67	4.61									
4/7/2008 12:16	14.69	4.61									
4/7/2008 12:17	14.69	4.58									
4/7/2008 12:18	14.72	4.56									
4/7/2008 12:19	14.80	4.53									
4/7/2008 12:20	14.82	4.52									
4/7/2008 12:21	14.76	4.56									
4/7/2008 12:22	14.72	4.58									
4/7/2008 12:23	14.83	4.48									
4/7/2008 12:24	15.00	4.32									
4/7/2008 12:25	14.84	4.48									
4/7/2008 12:26	14.63	4.67									
4/7/2008 12:27	14.30	4.99									
4/7/2008 12:28	14.25	5.04									
4/7/2008 12:29	14.28	5.03									

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	Uncorrected			BIAS CHECK RESULTS, AVERAGE RESPONSE, Percent						Corrected	
TimeStamp (EDT)	CO2, %	O2, %	COMMENTS	Co, CO2	Cm, CO2	Cma, CO2	Co, O2	Cm, O2	Cma, O2	CORR % CO2	CORR % O2
4/7/2008 12:30	14.29	5.00									
4/7/2008 12:31	14.22	5.09									
4/7/2008 12:32	14.05	5.24									
4/7/2008 12:33	14.16	5.11									
4/7/2008 12:34	14.18	5.10									
4/7/2008 12:35	14.22	5.08									
4/7/2008 12:36	14.25	5.04									
4/7/2008 12:37	14.35	4.94									
4/7/2008 12:38	14.39	4.90									
4/7/2008 12:39	14.28	5.03									
4/7/2008 12:40	14.25	5.06									
4/7/2008 12:41	14.19	5.13									
4/7/2008 12:42	14.19	5.10									
4/7/2008 12:43	14.29	5.01									
4/7/2008 12:44	14.36	4.95									
4/7/2008 12:45	14.39	4.91									
4/7/2008 12:46	14.45	4.86									
4/7/2008 12:47	14.43	4.89									
4/7/2008 12:48	14.46	4.86									
4/7/2008 12:49	14.46	4.86									
4/7/2008 12:50	14.47	4.84									
4/7/2008 12:51	14.46	4.86									
4/7/2008 12:52	14.47	4.85									
4/7/2008 12:53	14.49	4.84									
4/7/2008 12:54	14.52	4.81									
4/7/2008 12:55	14.52	4.80									
4/7/2008 12:56	14.55	4.77									
4/7/2008 12:57	14.59	4.72									
4/7/2008 12:58	14.60	4.72									
4/7/2008 12:59	14.57	4.76									
4/7/2008 13:00	14.60	4.72	Run 3 - High Load	0.21	10.58	10.80	0.21	10.97	11.10	15.0	4.7
4/7/2008 13:01	14.52	4.80	Run 3 - High Load	0.21	10.58	10.80	0.21	10.97	11.10	14.9	4.7
4/7/2008 13:02	14.46	4.85	Run 3 - High Load	0.21	10.58	10.80	0.21	10.97	11.10	14.8	4.8
4/7/2008 13:03	14.40	4.91	Run 3 - High Load	0.21	10.58	10.80	0.21	10.97	11.10	14.8	4.8
4/7/2008 13:04	14.39	4.92	Run 3 - High Load	0.21	10.58	10.80	0.21	10.97	11.10	14.8	4.9
4/7/2008 13:05	14.40	4.89	Run 3 - High Load	0.21	10.58	10.80	0.21	10.97	11.10	14.8	4.8
4/7/2008 13:06	14.45	4.85	Run 3 - High Load	0.21	10.58	10.80	0.21	10.97	11.10	14.8	4.8
4/7/2008 13:07	14.42	4.87	Run 3 - High Load	0.21	10.58	10.80	0.21	10.97	11.10	14.8	4.8
4/7/2008 13:08	14.52	4.78	Run 3 - High Load	0.21	10.58	10.80	0.21	10.97	11.10	14.9	4.7
4/7/2008 13:09	14.57	4.73	Run 3 - High Load	0.21	10.58	10.80	0.21	10.97	11.10	15.0	4.7
4/7/2008 13:10	14.55	4.76	Run 3 - High Load	0.21	10.58	10.80	0.21	10.97	11.10	14.9	4.7
4/7/2008 13:11	14.43	4.87	Run 3 - High Load	0.21	10.58	10.80	0.21	10.97	11.10	14.8	4.8
4/7/2008 13:12	14.47	4.84	Run 3 - High Load	0.21	10.58	10.80	0.21	10.97	11.10	14.9	4.8
4/7/2008 13:13	14.56	4.76	Run 3 - High Load	0.21	10.58	10.80	0.21	10.97	11.10	14.9	4.7
4/7/2008 13:14	14.49	4.80	Run 3 - High Load	0.21	10.58	10.80	0.21	10.97	11.10	14.9	4.7
4/7/2008 13:15	14.60	4.72	Run 3 - High Load	0.21	10.58	10.80	0.21	10.97	11.10	15.0	4.7
4/7/2008 13:16	14.69	4.65	Run 3 - High Load	0.21	10.58	10.80	0.21	10.97	11.10	15.1	4.6
4/7/2008 13:17	14.63	4.68	Run 3 - High Load	0.21	10.58	10.80	0.21	10.97	11.10	15.0	4.6
4/7/2008 13:18	14.56	4.72	Run 3 - High Load	0.21	10.58	10.80	0.21	10.97	11.10	14.9	4.7
4/7/2008 13:19	14.53	4.77	Run 3 - High Load	0.21	10.58	10.80	0.21	10.97	11.10	14.9	4.7
4/7/2008 13:20	14.60	4.68	Run 3 - High Load	0.21	10.58	10.80	0.21	10.97	11.10	15.0	4.6

Georgia-Pacific Corporation - Palatka, Florida - Gaseous Emissions Test Summary - April 7, 2008												
No. 4 Recovery Boiler												
	Uncorrected			BIAS CHECK RESULTS, AVERAGE RESPONSE, Percent						Corrected	
TimeStamp (EDT)	CO2, %	O2, %	COMMENTS	Co, CO2	Cm, CO2	Cma, CO2	Co, O2	Cm, O2	Cma, O2	CORR % CO2	CORR % O2
4/7/2008 13:21	14.55	4.73	Run 3 - High Load	0.21	10.58	10.80	0.21	10.97	11.10	14.9	4.7
4/7/2008 13:22	14.50	4.77	Run 3 - High Load	0.21	10.58	10.80	0.21	10.97	11.10	14.9	4.7
4/7/2008 13:23	14.36	4.90	Run 3 - High Load	0.21	10.58	10.80	0.21	10.97	11.10	14.7	4.8
4/7/2008 13:24	14.38	4.90	Run 3 - High Load	0.21	10.58	10.80	0.21	10.97	11.10	14.8	4.8
4/7/2008 13:25	14.32	4.94	Run 3 - High Load	0.21	10.58	10.80	0.21	10.97	11.10	14.7	4.9
4/7/2008 13:26	14.22	5.03	Run 3 - High Load	0.21	10.58	10.80	0.21	10.97	11.10	14.6	5.0
4/7/2008 13:27	14.13	5.11	Run 3 - High Load	0.21	10.58	10.80	0.21	10.97	11.10	14.5	5.1
4/7/2008 13:28	14.13	5.11	Run 3 - High Load	0.21	10.58	10.80	0.21	10.97	11.10	14.5	5.1
4/7/2008 13:29	14.13	5.11	Run 3 - High Load	0.21	10.58	10.80	0.21	10.97	11.10	14.5	5.1
4/7/2008 13:30	14.12	5.11	Run 3 - High Load	0.21	10.58	10.80	0.21	10.97	11.10	14.5	5.1
4/7/2008 13:31	14.11	5.11	Run 3 - High Load	0.21	10.58	10.80	0.21	10.97	11.10	14.5	5.1
4/7/2008 13:32	14.15	5.09	Run 3 - High Load	0.21	10.58	10.80	0.21	10.97	11.10	14.5	5.0
4/7/2008 13:33	14.16	5.08	Run 3 - High Load	0.21	10.58	10.80	0.21	10.97	11.10	14.5	5.0
4/7/2008 13:34	14.11	5.13	Run 3 - High Load	0.21	10.58	10.80	0.21	10.97	11.10	14.5	5.1
4/7/2008 13:35	14.11	5.14	Run 3 - High Load	0.21	10.58	10.80	0.21	10.97	11.10	14.5	5.1
4/7/2008 13:36	14.18	5.08	Run 3 - High Load	0.21	10.58	10.80	0.21	10.97	11.10	14.5	5.0
4/7/2008 13:37	14.12	5.13	Run 3 - High Load	0.21	10.58	10.80	0.21	10.97	11.10	14.5	5.1
4/7/2008 13:38	14.09	5.14	Run 3 - High Load	0.21	10.58	10.80	0.21	10.97	11.10	14.5	5.1
4/7/2008 13:39	14.16	5.10	Run 3 - High Load	0.21	10.58	10.80	0.21	10.97	11.10	14.5	5.0
4/7/2008 13:40	14.19	5.06	Run 3 - High Load	0.21	10.58	10.80	0.21	10.97	11.10	14.6	5.0
4/7/2008 13:41	14.22	5.04	Run 3 - High Load	0.21	10.58	10.80	0.21	10.97	11.10	14.6	5.0
4/7/2008 13:42	14.22	5.05	Run 3 - High Load	0.21	10.58	10.80	0.21	10.97	11.10	14.6	5.0
4/7/2008 13:43	14.18	5.10	Run 3 - High Load	0.21	10.58	10.80	0.21	10.97	11.10	14.5	5.0
4/7/2008 13:44	14.33	4.96	Run 3 - High Load	0.21	10.58	10.80	0.21	10.97	11.10	14.7	4.9
4/7/2008 13:45	14.42	4.92	Run 3 - High Load	0.21	10.58	10.80	0.21	10.97	11.10	14.8	4.9
4/7/2008 13:46	14.42	4.95	Run 3 - High Load	0.21	10.58	10.80	0.21	10.97	11.10	14.8	4.9
4/7/2008 13:47	14.32	5.04	Run 3 - High Load	0.21	10.58	10.80	0.21	10.97	11.10	14.7	5.0
4/7/2008 13:48	14.43	4.92	Run 3 - High Load	0.21	10.58	10.80	0.21	10.97	11.10	14.8	4.9
4/7/2008 13:49	14.46	4.89	Run 3 - High Load	0.21	10.58	10.80	0.21	10.97	11.10	14.8	4.8
4/7/2008 13:50	14.35	5.00	Run 3 - High Load	0.21	10.58	10.80	0.21	10.97	11.10	14.7	4.9
4/7/2008 13:51	14.18	5.14	Run 3 - High Load	0.21	10.58	10.80	0.21	10.97	11.10	14.5	5.1
4/7/2008 13:52	14.26	5.05	Run 3 - High Load	0.21	10.58	10.80	0.21	10.97	11.10	14.6	5.0
4/7/2008 13:53	14.45	4.90	Run 3 - High Load	0.21	10.58	10.80	0.21	10.97	11.10	14.8	4.8
4/7/2008 13:54	14.55	4.84	Run 3 - High Load	0.21	10.58	10.80	0.21	10.97	11.10	14.9	4.8
4/7/2008 13:55	14.47	4.95	Run 3 - High Load	0.21	10.58	10.80	0.21	10.97	11.10	14.9	4.9
4/7/2008 13:56	14.36	5.05	Run 3 - High Load	0.21	10.58	10.80	0.21	10.97	11.10	14.7	5.0
4/7/2008 13:57	14.43	4.95	Run 3 - High Load	0.21	10.58	10.80	0.21	10.97	11.10	14.8	4.9
4/7/2008 13:58	14.47	4.91	Run 3 - High Load	0.21	10.58	10.80	0.21	10.97	11.10	14.9	4.8
4/7/2008 13:59	14.29	5.09	Run 3 - High Load	0.21	10.58	10.80	0.21	10.97	11.10	14.7	5.0
	14.36	**4.94**	**Run 3 - High Load Average**							**14.7**	**4.9**
4/7/2008 14:00	13.44	5.52									
4/7/2008 14:01	8.13	2.68									
4/7/2008 14:02	10.60	0.19	10.8 CO2, 0 O2								
4/7/2008 14:03	10.60	0.19	10.8 CO2, 0 O2								
	10.60	**0.19**	**10.8 CO2, 0 O2 Average**								
4/7/2008 14:04	3.76	7.66									
4/7/2008 14:05	0.34	10.96									

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	Uncorrected			BIAS CHECK RESULTS, AVERAGE RESPONSE, Percent						Corrected	
TimeStamp (EDT)	CO2, %	O2, %	COMMENTS	Co, CO2	Cm, CO2	Cma, CO2	Co, O2	Cm, O2	Cma, O2	CORR % CO2	CORR % O2
4/11/2008 11:00	22.43	-0.27									
4/11/2008 11:01	22.41	-0.26	22.49 CO2								
	22.41		**22.49 CO2 Average**								
4/11/2008 11:02	18.24	4.25									
4/11/2008 11:03	0.43	11.00									
4/11/2008 11:04	0.37	11.04									
4/11/2008 11:05	0.35	11.05									
4/11/2008 11:06	0.34	11.05									
4/11/2008 11:07	0.34	11.05									
4/11/2008 11:08	0.38	14.48									
4/11/2008 11:09	0.48	20.94									
4/11/2008 11:10	0.55	20.94									
4/11/2008 11:11	0.61	20.94									
4/11/2008 11:12	0.65	20.94									
4/11/2008 11:13	0.70	20.94	20.9 O2								
		20.94	**20.92 O2 Average**								
4/11/2008 11:14	0.72	20.94									
4/11/2008 11:15	0.75	20.94									
4/11/2008 11:16	6.47	13.11									
4/11/2008 11:17	10.35	0.20									
4/11/2008 11:18	10.97	0.34									
4/11/2008 11:19	0.39	0.25									
4/11/2008 11:20	22.37	0.58									
4/11/2008 11:21	22.60	0.43									
4/11/2008 11:22	22.59	0.42									
4/11/2008 11:23	22.63	0.39									
4/11/2008 11:24	22.71	0.31									
4/11/2008 11:25	22.73	0.29									
4/11/2008 11:26	21.95	-0.23									
4/11/2008 11:27	19.63	-0.33									
4/11/2008 11:28	10.63	-0.33	10.8 CO2/ 0 O2								
	10.63	**-0.33**	**10.8 CO2/ 0 O2 Average**								
4/11/2008 11:29	10.63	-0.33									
4/11/2008 11:30	13.89	0.45									
4/11/2008 11:31	4.20	11.11	11.1 O2								
		11.11	**11.1 O2 Average**								
4/11/2008 11:32	0.06	11.05	0 CO2								
	0.06		**0 CO2 Average**								
4/11/2008 11:33	0.91	0.10									
4/11/2008 11:34	9.72	-0.18									
4/11/2008 11:35	9.69	-0.07									
4/11/2008 11:36	10.50	1.31									
4/11/2008 11:37	10.90	-0.10									
4/11/2008 11:38	13.33	4.47									
4/11/2008 11:39	15.33	4.50									
4/11/2008 11:40	15.42	4.41									
4/11/2008 11:41	15.48	4.34									
4/11/2008 11:42	15.46	4.37									
4/11/2008 11:43	15.52	4.28									
4/11/2008 11:44	15.46	4.32									
4/11/2008 11:45	15.40	4.38									

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	Uncorrected			BIAS CHECK RESULTS, AVERAGE RESPONSE, Percent						Corrected	
TimeStamp (EDT)	CO2, %	O2, %	COMMENTS	Co, CO2	Cm, CO2	Cma, CO2	Co, O2	Cm, O2	Cma, O2	CORR % CO2	CORR % O2
4/11/2008 11:46	13.09	2.00									
4/11/2008 11:47	11.35	0.00									
4/11/2008 11:48	10.48	0.91									
4/11/2008 11:49	0.25	11.27									
4/11/2008 11:50	10.65	6.28									
4/11/2008 11:51	15.42	4.37									
4/11/2008 11:52	15.33	4.47									
4/11/2008 11:53	15.31	4.50									
4/11/2008 11:54	15.27	4.56									
4/11/2008 11:55	15.27	4.50									
4/11/2008 11:56	15.27	4.47									
4/11/2008 11:57	15.14	4.56									
4/11/2008 11:58	14.95	4.73									
4/11/2008 11:59	15.01	4.67									
4/11/2008 12:00	15.08	4.61									
4/11/2008 12:01	15.12	4.56									
4/11/2008 12:02	15.06	4.64									
4/11/2008 12:03	15.12	4.53									
4/11/2008 12:04	15.14	4.49									
4/11/2008 12:05	15.06	4.56									
4/11/2008 12:06	14.91	4.73									
4/11/2008 12:07	14.97	4.66									
4/11/2008 12:08	15.04	4.55									
4/11/2008 12:09	15.12	4.49									
4/11/2008 12:10	15.06	4.58									
4/11/2008 12:11	15.01	4.64									
4/11/2008 12:12	15.16	4.47									
4/11/2008 12:13	15.16	4.46									
4/11/2008 12:14	15.08	4.56									
4/11/2008 12:15	14.99	4.66									
4/11/2008 12:16	15.10	4.52									
4/11/2008 12:17	15.12	4.49									
4/11/2008 12:18	15.16	4.47									
4/11/2008 12:19	15.10	4.56									
4/11/2008 12:20	15.14	4.52									
4/11/2008 12:21	15.20	4.46									
4/11/2008 12:22	15.16	4.47									
4/11/2008 12:23	15.18	4.49									
4/11/2008 12:24	15.06	4.63									
4/11/2008 12:25	15.08	4.53									
4/11/2008 12:26	15.01	4.56									
4/11/2008 12:27	15.04	4.55									
4/11/2008 12:28	15.01	4.58									
4/11/2008 12:29	15.08	4.50									
4/11/2008 12:30	15.10	4.44									
4/11/2008 12:31	15.08	4.46									
4/11/2008 12:32	14.97	4.61									
4/11/2008 12:33	15.04	4.53									
4/11/2008 12:34	15.08	4.47									
4/11/2008 12:35	15.08	4.46									
4/11/2008 12:36	15.06	4.49									

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No. 4 Recovery Boiler												
	Uncorrected			BIAS CHECK RESULTS, AVERAGE RESPONSE, Percent						Corrected	
TimeStamp (EDT)	CO2, %	O2, %	COMMENTS	Co, CO2	Cm, CO2	Cma, CO2	Co, O2	Cm, O2	Cma, O2	CORR % CO2	CORR % O2
4/11/2008 12:37	15.06	4.49									
4/11/2008 12:38	15.10	4.41									
4/11/2008 12:39	15.10	4.43									
4/11/2008 12:40	14.95	4.63									
4/11/2008 12:41	14.76	4.87									
4/11/2008 12:42	14.82	4.78									
4/11/2008 12:43	14.91	4.67									
4/11/2008 12:44	14.91	4.70									
4/11/2008 12:45	14.72	4.90									
4/11/2008 12:46	14.70	4.93									
4/11/2008 12:47	14.65	5.00									
4/11/2008 12:48	14.55	5.14									
4/11/2008 12:49	14.29	5.41									
4/11/2008 12:50	14.19	5.50									
4/11/2008 12:51	14.08	5.57									
4/11/2008 12:52	14.04	5.66									
4/11/2008 12:53	13.91	5.84									
4/11/2008 12:54	13.79	5.97									
4/11/2008 12:55	13.85	5.90									
4/11/2008 12:56	13.79	5.96									
4/11/2008 12:57	13.66	6.08									
4/11/2008 12:58	13.51	6.25									
4/11/2008 12:59	13.62	6.17									
4/11/2008 13:00	13.62	6.17									
4/11/2008 13:01	13.53	6.28									
4/11/2008 13:02	13.34	6.49									
4/11/2008 13:03	13.26	6.57									
4/11/2008 13:04	13.15	6.66									
4/11/2008 13:05	13.04	6.73									
4/11/2008 13:06	13.00	6.78									
4/11/2008 13:07	13.19	6.58									
4/11/2008 13:08	13.34	6.41									
4/11/2008 13:09	13.32	6.43									
4/11/2008 13:10	13.21	6.54	Run 1 - Low Load	-0.09	10.80	10.80	-0.16	11.30	11.10	13.2	6.5
4/11/2008 13:11	13.17	6.60	Run 1 - Low Load	-0.09	10.80	10.80	-0.16	11.30	11.10	13.2	6.5
4/11/2008 13:12	13.21	6.55	Run 1 - Low Load	-0.09	10.80	10.80	-0.16	11.30	11.10	13.2	6.5
4/11/2008 13:13	13.26	6.51	Run 1 - Low Load	-0.09	10.80	10.80	-0.16	11.30	11.10	13.2	6.5
4/11/2008 13:14	13.24	6.51	Run 1 - Low Load	-0.09	10.80	10.80	-0.16	11.30	11.10	13.2	6.5
4/11/2008 13:15	13.13	6.61	Run 1 - Low Load	-0.09	10.80	10.80	-0.16	11.30	11.10	13.1	6.6
4/11/2008 13:16	13.15	6.58	Run 1 - Low Load	-0.09	10.80	10.80	-0.16	11.30	11.10	13.1	6.5
4/11/2008 13:17	13.09	6.63	Run 1 - Low Load	-0.09	10.80	10.80	-0.16	11.30	11.10	13.1	6.6
4/11/2008 13:18	13.11	6.61	Run 1 - Low Load	-0.09	10.80	10.80	-0.16	11.30	11.10	13.1	6.6
4/11/2008 13:19	13.00	6.72	Run 1 - Low Load	-0.09	10.80	10.80	-0.16	11.30	11.10	13.0	6.7
4/11/2008 13:20	13.07	6.66	Run 1 - Low Load	-0.09	10.80	10.80	-0.16	11.30	11.10	13.0	6.6
4/11/2008 13:21	13.15	6.58	Run 1 - Low Load	-0.09	10.80	10.80	-0.16	11.30	11.10	13.1	6.5
4/11/2008 13:22	13.11	6.63	Run 1 - Low Load	-0.09	10.80	10.80	-0.16	11.30	11.10	13.1	6.6
4/11/2008 13:23	13.07	6.66	Run 1 - Low Load	-0.09	10.80	10.80	-0.16	11.30	11.10	13.0	6.6
4/11/2008 13:24	13.02	6.72	Run 1 - Low Load	-0.09	10.80	10.80	-0.16	11.30	11.10	13.0	6.7
4/11/2008 13:25	13.24	6.52	Run 1 - Low Load	-0.09	10.80	10.80	-0.16	11.30	11.10	13.2	6.5
4/11/2008 13:26	13.26	6.49	Run 1 - Low Load	-0.09	10.80	10.80	-0.16	11.30	11.10	13.2	6.4
4/11/2008 13:27	13.13	6.60	Run 1 - Low Load	-0.09	10.80	10.80	-0.16	11.30	11.10	13.1	6.5

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	Uncorrected			BIAS CHECK RESULTS, AVERAGE RESPONSE, Percent						Corrected	
TimeStamp (EDT)	CO2, %	O2, %	COMMENTS	Co, CO2	Cm, CO2	Cma, CO2	Co, O2	Cm, O2	Cma, O2	CORR % CO2	CORR % O2
4/11/2008 13:28	13.09	6.63	Run 1 - Low Load	-0.09	10.80	10.80	-0.16	11.30	11.10	13.1	6.6
4/11/2008 13:29	13.26	6.44	Run 1 - Low Load	-0.09	10.80	10.80	-0.16	11.30	11.10	13.2	6.4
4/11/2008 13:30	13.24	6.46	Run 1 - Low Load	-0.09	10.80	10.80	-0.16	11.30	11.10	13.2	6.4
4/11/2008 13:31	13.21	6.49	Run 1 - Low Load	-0.09	10.80	10.80	-0.16	11.30	11.10	13.2	6.4
4/11/2008 13:32	13.21	6.48	Run 1 - Low Load	-0.09	10.80	10.80	-0.16	11.30	11.10	13.2	6.4
4/11/2008 13:33	13.62	5.99	Run 1 - Low Load	-0.09	10.80	10.80	-0.16	11.30	11.10	13.6	6.0
4/11/2008 13:34	13.85	5.76	Run 1 - Low Load	-0.09	10.80	10.80	-0.16	11.30	11.10	13.8	5.7
4/11/2008 13:35	13.83	5.79	Run 1 - Low Load	-0.09	10.80	10.80	-0.16	11.30	11.10	13.8	5.8
4/11/2008 13:36	13.76	5.85	Run 1 - Low Load	-0.09	10.80	10.80	-0.16	11.30	11.10	13.7	5.8
4/11/2008 13:37	13.87	5.73	Run 1 - Low Load	-0.09	10.80	10.80	-0.16	11.30	11.10	13.8	5.7
4/11/2008 13:38	14.02	5.57	Run 1 - Low Load	-0.09	10.80	10.80	-0.16	11.30	11.10	14.0	5.5
4/11/2008 13:39	14.08	5.47	Run 1 - Low Load	-0.09	10.80	10.80	-0.16	11.30	11.10	14.1	5.5
4/11/2008 13:40	14.00	5.58	Run 1 - Low Load	-0.09	10.80	10.80	-0.16	11.30	11.10	14.0	5.6
4/11/2008 13:41	14.00	5.58	Run 1 - Low Load	-0.09	10.80	10.80	-0.16	11.30	11.10	14.0	5.6
4/11/2008 13:42	14.06	5.49	Run 1 - Low Load	-0.09	10.80	10.80	-0.16	11.30	11.10	14.0	5.5
4/11/2008 13:43	14.08	5.46	Run 1 - Low Load	-0.09	10.80	10.80	-0.16	11.30	11.10	14.1	5.4
4/11/2008 13:44	14.08	5.52	Run 1 - Low Load	-0.09	10.80	10.80	-0.16	11.30	11.10	14.1	5.5
4/11/2008 13:45	14.00	5.61	Run 1 - Low Load	-0.09	10.80	10.80	-0.16	11.30	11.10	14.0	5.6
4/11/2008 13:46	14.10	5.47	Run 1 - Low Load	-0.09	10.80	10.80	-0.16	11.30	11.10	14.1	5.5
4/11/2008 13:47	14.21	5.35	Run 1 - Low Load	-0.09	10.80	10.80	-0.16	11.30	11.10	14.2	5.3
4/11/2008 13:48	14.12	5.44	Run 1 - Low Load	-0.09	10.80	10.80	-0.16	11.30	11.10	14.1	5.4
4/11/2008 13:49	14.06	5.52	Run 1 - Low Load	-0.09	10.80	10.80	-0.16	11.30	11.10	14.0	5.5
4/11/2008 13:50	14.10	5.46	Run 1 - Low Load	-0.09	10.80	10.80	-0.16	11.30	11.10	14.1	5.4
4/11/2008 13:51	14.12	5.41	Run 1 - Low Load	-0.09	10.80	10.80	-0.16	11.30	11.10	14.1	5.4
4/11/2008 13:52	14.17	5.38	Run 1 - Low Load	-0.09	10.80	10.80	-0.16	11.30	11.10	14.1	5.4
4/11/2008 13:53	14.17	5.40	Run 1 - Low Load	-0.09	10.80	10.80	-0.16	11.30	11.10	14.1	5.4
4/11/2008 13:54	14.02	5.60	Run 1 - Low Load	-0.09	10.80	10.80	-0.16	11.30	11.10	14.0	5.6
4/11/2008 13:55	14.06	5.57	Run 1 - Low Load	-0.09	10.80	10.80	-0.16	11.30	11.10	14.0	5.5
4/11/2008 13:56	14.06	5.52	Run 1 - Low Load	-0.09	10.80	10.80	-0.16	11.30	11.10	14.0	5.5
4/11/2008 13:57	14.08	5.49	Run 1 - Low Load	-0.09	10.80	10.80	-0.16	11.30	11.10	14.1	5.5
4/11/2008 13:58	14.02	5.53	Run 1 - Low Load	-0.09	10.80	10.80	-0.16	11.30	11.10	14.0	5.5
4/11/2008 13:59	13.98	5.55	Run 1 - Low Load	-0.09	10.80	10.80	-0.16	11.30	11.10	14.0	5.5
4/11/2008 14:00	14.04	5.49	Run 1 - Low Load	-0.09	10.80	10.80	-0.16	11.30	11.10	14.0	5.5
4/11/2008 14:01	14.12	5.41	Run 1 - Low Load	-0.09	10.80	10.80	-0.16	11.30	11.10	14.1	5.4
4/11/2008 14:02	14.15	5.41	Run 1 - Low Load	-0.09	10.80	10.80	-0.16	11.30	11.10	14.1	5.4
4/11/2008 14:03	14.19	5.35	Run 1 - Low Load	-0.09	10.80	10.80	-0.16	11.30	11.10	14.2	5.3
4/11/2008 14:04	14.29	5.25	Run 1 - Low Load	-0.09	10.80	10.80	-0.16	11.30	11.10	14.3	5.2
4/11/2008 14:05	14.21	5.34	Run 1 - Low Load	-0.09	10.80	10.80	-0.16	11.30	11.10	14.2	5.3
4/11/2008 14:06	14.23	5.34	Run 1 - Low Load	-0.09	10.80	10.80	-0.16	11.30	11.10	14.2	5.3
4/11/2008 14:07	14.19	5.35	Run 1 - Low Load	-0.09	10.80	10.80	-0.16	11.30	11.10	14.2	5.3
4/11/2008 14:08	14.15	5.43	Run 1 - Low Load	-0.09	10.80	10.80	-0.16	11.30	11.10	14.1	5.4
4/11/2008 14:09	14.12	5.46	Run 1 - Low Load	-0.09	10.80	10.80	-0.16	11.30	11.10	14.1	5.4
4/11/2008 14:10	14.17	5.40	Run 1 - Low Load	-0.09	10.80	10.80	-0.16	11.30	11.10	14.1	5.4
4/11/2008 14:11	14.19	5.40	Run 1 - Low Load	-0.09	10.80	10.80	-0.16	11.30	11.10	14.2	5.4
4/11/2008 14:12	14.21	5.37	Run 1 - Low Load	-0.09	10.80	10.80	-0.16	11.30	11.10	14.2	5.4
4/11/2008 14:13	14.02	5.60	Run 1 - Low Load	-0.09	10.80	10.80	-0.16	11.30	11.10	14.0	5.6
4/11/2008 14:14	13.74	5.79	Run 1 - Low Load	-0.09	10.80	10.80	-0.16	11.30	11.10	13.7	5.8
4/11/2008 14:15	13.83	5.67	Run 1 - Low Load	-0.09	10.80	10.80	-0.16	11.30	11.10	13.8	5.6
	13.74	**5.88**	**Run 1 - Low Load Average**							**13.7**	**5.9**
4/11/2008 14:16	13.85	5.64									
4/11/2008 14:17	13.72	5.78									

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	Uncorrected			BIAS CHECK RESULTS, AVERAGE RESPONSE, Percent						Corrected	
TimeStamp (EDT)	CO2, %	O2, %	COMMENTS	Co, CO2	Cm, CO2	Cma, CO2	Co, O2	Cm, O2	Cma, O2	CORR % CO2	CORR % O2
4/11/2008 14:18	5.93	9.07									
4/11/2008 14:19	-0.21	11.45									
4/11/2008 14:20	-0.23	11.49	11.1 O2/ 0 CO2								
	-0.23	**11.49**	**11.1 O2/ 0 CO2 Average**								
4/11/2008 14:21	-0.21	11.49									
4/11/2008 14:22	9.42	1.41									
4/11/2008 14:23	10.97	0.02	10.8 CO2/ 0 O2								
	10.97	**0.02**	**10.8 CO2/ 0 O2 Average**								
4/11/2008 14:24	10.84	0.08									
4/11/2008 14:25	13.10	5.41	Run 2 - Low Load	-0.24	10.78	10.80	0.15	11.50	11.10	13.1	5.1
4/11/2008 14:26	12.64	5.41	Run 2 - Low Load	-0.24	10.78	10.80	0.15	11.50	11.10	12.6	5.1
4/11/2008 14:27	14.51	4.96	Run 2 - Low Load	-0.24	10.78	10.80	0.15	11.50	11.10	14.5	4.7
4/11/2008 14:28	14.36	5.08	Run 2 - Low Load	-0.24	10.78	10.80	0.15	11.50	11.10	14.3	4.8
4/11/2008 14:29	14.32	5.11	Run 2 - Low Load	-0.24	10.78	10.80	0.15	11.50	11.10	14.3	4.9
4/11/2008 14:30	14.21	5.25	Run 2 - Low Load	-0.24	10.78	10.80	0.15	11.50	11.10	14.2	5.0
4/11/2008 14:31	14.12	5.35	Run 2 - Low Load	-0.24	10.78	10.80	0.15	11.50	11.10	14.1	5.1
4/11/2008 14:32	14.27	5.20	Run 2 - Low Load	-0.24	10.78	10.80	0.15	11.50	11.10	14.2	4.9
4/11/2008 14:33	14.23	5.25	Run 2 - Low Load	-0.24	10.78	10.80	0.15	11.50	11.10	14.2	5.0
4/11/2008 14:34	14.36	5.11	Run 2 - Low Load	-0.24	10.78	10.80	0.15	11.50	11.10	14.3	4.9
4/11/2008 14:35	14.29	5.17	Run 2 - Low Load	-0.24	10.78	10.80	0.15	11.50	11.10	14.2	4.9
4/11/2008 14:36	14.27	5.17	Run 2 - Low Load	-0.24	10.78	10.80	0.15	11.50	11.10	14.2	4.9
4/11/2008 14:37	14.27	5.17	Run 2 - Low Load	-0.24	10.78	10.80	0.15	11.50	11.10	14.2	4.9
4/11/2008 14:38	14.27	5.17	Run 2 - Low Load	-0.24	10.78	10.80	0.15	11.50	11.10	14.2	4.9
4/11/2008 14:39	14.19	5.28	Run 2 - Low Load	-0.24	10.78	10.80	0.15	11.50	11.10	14.1	5.0
4/11/2008 14:40	14.29	5.16	Run 2 - Low Load	-0.24	10.78	10.80	0.15	11.50	11.10	14.2	4.9
4/11/2008 14:41	14.21	5.22	Run 2 - Low Load	-0.24	10.78	10.80	0.15	11.50	11.10	14.2	5.0
4/11/2008 14:42	14.21	5.22	Run 2 - Low Load	-0.24	10.78	10.80	0.15	11.50	11.10	14.2	5.0
4/11/2008 14:43	14.17	5.29	Run 2 - Low Load	-0.24	10.78	10.80	0.15	11.50	11.10	14.1	5.0
4/11/2008 14:44	14.15	5.31	Run 2 - Low Load	-0.24	10.78	10.80	0.15	11.50	11.10	14.1	5.0
4/11/2008 14:45	14.25	5.22	Run 2 - Low Load	-0.24	10.78	10.80	0.15	11.50	11.10	14.2	5.0
4/11/2008 14:46	14.36	5.11	Run 2 - Low Load	-0.24	10.78	10.80	0.15	11.50	11.10	14.3	4.9
4/11/2008 14:47	14.38	5.08	Run 2 - Low Load	-0.24	10.78	10.80	0.15	11.50	11.10	14.3	4.8
4/11/2008 14:48	14.46	4.99	Run 2 - Low Load	-0.24	10.78	10.80	0.15	11.50	11.10	14.4	4.7
4/11/2008 14:49	14.55	4.87	Run 2 - Low Load	-0.24	10.78	10.80	0.15	11.50	11.10	14.5	4.6
4/11/2008 14:50	14.53	4.87	Run 2 - Low Load	-0.24	10.78	10.80	0.15	11.50	11.10	14.5	4.6
4/11/2008 14:51	14.32	5.13	Run 2 - Low Load	-0.24	10.78	10.80	0.15	11.50	11.10	14.3	4.9
4/11/2008 14:52	14.08	5.38	Run 2 - Low Load	-0.24	10.78	10.80	0.15	11.50	11.10	14.0	5.1
4/11/2008 14:53	14.08	5.40	Run 2 - Low Load	-0.24	10.78	10.80	0.15	11.50	11.10	14.0	5.1
4/11/2008 14:54	14.08	5.40	Run 2 - Low Load	-0.24	10.78	10.80	0.15	11.50	11.10	14.0	5.1
4/11/2008 14:55	14.02	5.50	Run 2 - Low Load	-0.24	10.78	10.80	0.15	11.50	11.10	14.0	5.2
4/11/2008 14:56	13.89	5.64	Run 2 - Low Load	-0.24	10.78	10.80	0.15	11.50	11.10	13.8	5.4
4/11/2008 14:57	13.91	5.58	Run 2 - Low Load	-0.24	10.78	10.80	0.15	11.50	11.10	13.9	5.3
4/11/2008 14:58	13.98	5.52	Run 2 - Low Load	-0.24	10.78	10.80	0.15	11.50	11.10	13.9	5.3
4/11/2008 14:59	13.98	5.53	Run 2 - Low Load	-0.24	10.78	10.80	0.15	11.50	11.10	13.9	5.3
4/11/2008 15:00	13.96	5.55	Run 2 - Low Load	-0.24	10.78	10.80	0.15	11.50	11.10	13.9	5.3
4/11/2008 15:01	13.89	5.60	Run 2 - Low Load	-0.24	10.78	10.80	0.15	11.50	11.10	13.8	5.3
4/11/2008 15:02	14.00	5.47	Run 2 - Low Load	-0.24	10.78	10.80	0.15	11.50	11.10	14.0	5.2
4/11/2008 15:03	14.02	5.44	Run 2 - Low Load	-0.24	10.78	10.80	0.15	11.50	11.10	14.0	5.2
4/11/2008 15:04	14.06	5.41	Run 2 - Low Load	-0.24	10.78	10.80	0.15	11.50	11.10	14.0	5.1
4/11/2008 15:05	13.93	5.57	Run 2 - Low Load	-0.24	10.78	10.80	0.15	11.50	11.10	13.9	5.3
4/11/2008 15:06	13.85	5.63	Run 2 - Low Load	-0.24	10.78	10.80	0.15	11.50	11.10	13.8	5.4

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	Uncorrected			BIAS CHECK RESULTS, AVERAGE RESPONSE, Percent						Corrected	
TimeStamp (EDT)	CO2, %	O2, %	COMMENTS	Co, CO2	Cm, CO2	Cma, CO2	Co, O2	Cm, O2	Cma, O2	CORR % CO2	CORR % O2
4/11/2008 15:07	13.91	5.58	Run 2 - Low Load	-0.24	10.78	10.80	0.15	11.50	11.10	13.9	5.3
4/11/2008 15:08	13.89	5.63	Run 2 - Low Load	-0.24	10.78	10.80	0.15	11.50	11.10	13.8	5.4
4/11/2008 15:09	13.85	5.72	Run 2 - Low Load	-0.24	10.78	10.80	0.15	11.50	11.10	13.8	5.4
4/11/2008 15:10	13.87	5.66	Run 2 - Low Load	-0.24	10.78	10.80	0.15	11.50	11.10	13.8	5.4
4/11/2008 15:11	13.91	5.63	Run 2 - Low Load	-0.24	10.78	10.80	0.15	11.50	11.10	13.9	5.4
4/11/2008 15:12	13.96	5.57	Run 2 - Low Load	-0.24	10.78	10.80	0.15	11.50	11.10	13.9	5.3
4/11/2008 15:13	14.08	5.44	Run 2 - Low Load	-0.24	10.78	10.80	0.15	11.50	11.10	14.0	5.2
4/11/2008 15:14	14.36	5.28	Run 2 - Low Load	-0.24	10.78	10.80	0.15	11.50	11.10	14.3	5.0
4/11/2008 15:15	14.27	5.37	Run 2 - Low Load	-0.24	10.78	10.80	0.15	11.50	11.10	14.2	5.1
4/11/2008 15:16	14.08	5.53	Run 2 - Low Load	-0.24	10.78	10.80	0.15	11.50	11.10	14.0	5.3
4/11/2008 15:17	13.81	5.79	Run 2 - Low Load	-0.24	10.78	10.80	0.15	11.50	11.10	13.8	5.5
4/11/2008 15:18	13.68	5.84	Run 2 - Low Load	-0.24	10.78	10.80	0.15	11.50	11.10	13.6	5.6
4/11/2008 15:19	13.83	5.69	Run 2 - Low Load	-0.24	10.78	10.80	0.15	11.50	11.10	13.8	5.4
4/11/2008 15:20	13.87	5.69	Run 2 - Low Load	-0.24	10.78	10.80	0.15	11.50	11.10	13.8	5.4
4/11/2008 15:21	13.81	5.75	Run 2 - Low Load	-0.24	10.78	10.80	0.15	11.50	11.10	13.8	5.5
4/11/2008 15:22	13.83	5.72	Run 2 - Low Load	-0.24	10.78	10.80	0.15	11.50	11.10	13.8	5.4
4/11/2008 15:23	13.83	5.70	Run 2 - Low Load	-0.24	10.78	10.80	0.15	11.50	11.10	13.8	5.4
4/11/2008 15:24	13.83	5.70	Run 2 - Low Load	-0.24	10.78	10.80	0.15	11.50	11.10	13.8	5.4
4/11/2008 15:25	13.74	5.78	Run 2 - Low Load	-0.24	10.78	10.80	0.15	11.50	11.10	13.7	5.5
	14.06	**5.40**	**Run 2 - Low Load - Average**							**14.0**	**5.1**
4/11/2008 15:26	11.90	2.06									
4/11/2008 15:27	12.16	2.17									
4/11/2008 15:28	10.58	0.28	10.8 CO2/ 0 O2								
	10.58	**0.28**	**10.8 CO2/ 0 O2 Average**								
4/11/2008 15:29	1.88	10.11									
4/11/2008 15:30	-0.23	11.49									
4/11/2008 15:31	-0.25	11.51	11.1 O2/ 0 CO2								
	-0.25	**11.51**	**11.1 O2/ 0 CO2 Average**								
4/11/2008 15:32	3.11	10.08									
4/11/2008 15:33	13.79	5.69									
4/11/2008 15:34	13.79	5.76									
4/11/2008 15:35	13.79	5.75	Run 3 - Low Load	-0.24	10.58	10.80	0.16	11.50	11.10	14.0	5.5
4/11/2008 15:36	13.89	5.64	Run 3 - Low Load	-0.24	10.58	10.80	0.16	11.50	11.10	14.1	5.4
4/11/2008 15:37	13.76	5.78	Run 3 - Low Load	-0.24	10.58	10.80	0.16	11.50	11.10	14.0	5.5
4/11/2008 15:38	13.72	5.82	Run 3 - Low Load	-0.24	10.58	10.80	0.16	11.50	11.10	13.9	5.5
4/11/2008 15:39	13.72	5.82	Run 3 - Low Load	-0.24	10.58	10.80	0.16	11.50	11.10	13.9	5.5
4/11/2008 15:40	13.74	5.76	Run 3 - Low Load	-0.24	10.58	10.80	0.16	11.50	11.10	14.0	5.5
4/11/2008 15:41	13.79	5.75	Run 3 - Low Load	-0.24	10.58	10.80	0.16	11.50	11.10	14.0	5.5
4/11/2008 15:42	13.74	5.78	Run 3 - Low Load	-0.24	10.58	10.80	0.16	11.50	11.10	14.0	5.5
4/11/2008 15:43	13.72	5.81	Run 3 - Low Load	-0.24	10.58	10.80	0.16	11.50	11.10	13.9	5.5
4/11/2008 15:44	13.74	5.76	Run 3 - Low Load	-0.24	10.58	10.80	0.16	11.50	11.10	14.0	5.5
4/11/2008 15:45	13.76	5.73	Run 3 - Low Load	-0.24	10.58	10.80	0.16	11.50	11.10	14.0	5.5
4/11/2008 15:46	13.70	5.82	Run 3 - Low Load	-0.24	10.58	10.80	0.16	11.50	11.10	13.9	5.5
4/11/2008 15:47	13.60	5.91	Run 3 - Low Load	-0.24	10.58	10.80	0.16	11.50	11.10	13.8	5.6
4/11/2008 15:48	13.57	5.94	Run 3 - Low Load	-0.24	10.58	10.80	0.16	11.50	11.10	13.8	5.7
4/11/2008 15:49	13.60	5.94	Run 3 - Low Load	-0.24	10.58	10.80	0.16	11.50	11.10	13.8	5.7
4/11/2008 15:50	13.74	5.81	Run 3 - Low Load	-0.24	10.58	10.80	0.16	11.50	11.10	14.0	5.5
4/11/2008 15:51	13.72	5.81	Run 3 - Low Load	-0.24	10.58	10.80	0.16	11.50	11.10	13.9	5.5
4/11/2008 15:52	13.91	5.61	Run 3 - Low Load	-0.24	10.58	10.80	0.16	11.50	11.10	14.1	5.3
4/11/2008 15:53	13.85	5.67	Run 3 - Low Load	-0.24	10.58	10.80	0.16	11.50	11.10	14.1	5.4
4/11/2008 15:54	13.76	5.75	Run 3 - Low Load	-0.24	10.58	10.80	0.16	11.50	11.10	14.0	5.5

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	Uncorrected			BIAS CHECK RESULTS, AVERAGE RESPONSE, Percent						Corrected	
TimeStamp (EDT)	CO2, %	O2, %	COMMENTS	Co, CO2	Cm, CO2	Cma, CO2	Co, O2	Cm, O2	Cma, O2	CORR % CO2	CORR % O2
4/11/2008 15:55	13.68	5.87	Run 3 - Low Load	-0.24	10.58	10.80	0.16	11.50	11.10	13.9	5.6
4/11/2008 15:56	13.72	5.82	Run 3 - Low Load	-0.24	10.58	10.80	0.16	11.50	11.10	13.9	5.5
4/11/2008 15:57	13.81	5.73	Run 3 - Low Load	-0.24	10.58	10.80	0.16	11.50	11.10	14.0	5.5
4/11/2008 15:58	13.83	5.70	Run 3 - Low Load	-0.24	10.58	10.80	0.16	11.50	11.10	14.0	5.4
4/11/2008 15:59	13.74	5.81	Run 3 - Low Load	-0.24	10.58	10.80	0.16	11.50	11.10	14.0	5.5
4/11/2008 16:00	13.66	5.88	Run 3 - Low Load	-0.24	10.58	10.80	0.16	11.50	11.10	13.9	5.6
4/11/2008 16:01	13.70	5.84	Run 3 - Low Load	-0.24	10.58	10.80	0.16	11.50	11.10	13.9	5.6
4/11/2008 16:02	13.62	5.94	Run 3 - Low Load	-0.24	10.58	10.80	0.16	11.50	11.10	13.8	5.7
4/11/2008 16:03	13.64	5.94	Run 3 - Low Load	-0.24	10.58	10.80	0.16	11.50	11.10	13.9	5.7
4/11/2008 16:04	13.72	5.85	Run 3 - Low Load	-0.24	10.58	10.80	0.16	11.50	11.10	13.9	5.6
4/11/2008 16:05	14.02	5.53	Run 3 - Low Load	-0.24	10.58	10.80	0.16	11.50	11.10	14.2	5.3
4/11/2008 16:06	14.04	5.52	Run 3 - Low Load	-0.24	10.58	10.80	0.16	11.50	11.10	14.3	5.2
4/11/2008 16:07	14.02	5.50	Run 3 - Low Load	-0.24	10.58	10.80	0.16	11.50	11.10	14.2	5.2
4/11/2008 16:08	13.93	5.61	Run 3 - Low Load	-0.24	10.58	10.80	0.16	11.50	11.10	14.1	5.3
4/11/2008 16:09	14.02	5.47	Run 3 - Low Load	-0.24	10.58	10.80	0.16	11.50	11.10	14.2	5.2
4/11/2008 16:10	14.17	5.29	Run 3 - Low Load	-0.24	10.58	10.80	0.16	11.50	11.10	14.4	5.0
4/11/2008 16:11	14.10	5.38	Run 3 - Low Load	-0.24	10.58	10.80	0.16	11.50	11.10	14.3	5.1
4/11/2008 16:12	14.06	5.46	Run 3 - Low Load	-0.24	10.58	10.80	0.16	11.50	11.10	14.3	5.2
4/11/2008 16:13	14.08	5.46	Run 3 - Low Load	-0.24	10.58	10.80	0.16	11.50	11.10	14.3	5.2
4/11/2008 16:14	14.23	5.32	Run 3 - Low Load	-0.24	10.58	10.80	0.16	11.50	11.10	14.4	5.1
4/11/2008 16:15	14.21	5.38	Run 3 - Low Load	-0.24	10.58	10.80	0.16	11.50	11.10	14.4	5.1
4/11/2008 16:16	14.08	5.55	Run 3 - Low Load	-0.24	10.58	10.80	0.16	11.50	11.10	14.3	5.3
4/11/2008 16:17	13.98	5.66	Run 3 - Low Load	-0.24	10.58	10.80	0.16	11.50	11.10	14.2	5.4
4/11/2008 16:18	14.00	5.61	Run 3 - Low Load	-0.24	10.58	10.80	0.16	11.50	11.10	14.2	5.3
4/11/2008 16:19	14.04	5.57	Run 3 - Low Load	-0.24	10.58	10.80	0.16	11.50	11.10	14.3	5.3
4/11/2008 16:20	13.96	5.61	Run 3 - Low Load	-0.24	10.58	10.80	0.16	11.50	11.10	14.2	5.3
4/11/2008 16:21	13.93	5.60	Run 3 - Low Load	-0.24	10.58	10.80	0.16	11.50	11.10	14.1	5.3
4/11/2008 16:22	14.06	5.46	Run 3 - Low Load	-0.24	10.58	10.80	0.16	11.50	11.10	14.3	5.2
4/11/2008 16:23	13.91	5.61	Run 3 - Low Load	-0.24	10.58	10.80	0.16	11.50	11.10	14.1	5.3
4/11/2008 16:24	14.00	5.57	Run 3 - Low Load	-0.24	10.58	10.80	0.16	11.50	11.10	14.2	5.3
4/11/2008 16:25	14.00	5.55	Run 3 - Low Load	-0.24	10.58	10.80	0.16	11.50	11.10	14.2	5.3
4/11/2008 16:26	13.98	5.57	Run 3 - Low Load	-0.24	10.58	10.80	0.16	11.50	11.10	14.2	5.3
4/11/2008 16:27	14.06	5.47	Run 3 - Low Load	-0.24	10.58	10.80	0.16	11.50	11.10	14.3	5.2
4/11/2008 16:28	14.06	5.46	Run 3 - Low Load	-0.24	10.58	10.80	0.16	11.50	11.10	14.3	5.2
4/11/2008 16:29	14.12	5.35	Run 3 - Low Load	-0.24	10.58	10.80	0.16	11.50	11.10	14.3	5.1
4/11/2008 16:30	14.25	5.23	Run 3 - Low Load	-0.24	10.58	10.80	0.16	11.50	11.10	14.5	5.0
4/11/2008 16:31	14.21	5.28	Run 3 - Low Load	-0.24	10.58	10.80	0.16	11.50	11.10	14.4	5.0
4/11/2008 16:32	14.02	5.52	Run 3 - Low Load	-0.24	10.58	10.80	0.16	11.50	11.10	14.2	5.2
4/11/2008 16:33	13.96	5.58	Run 3 - Low Load	-0.24	10.58	10.80	0.16	11.50	11.10	14.2	5.3
4/11/2008 16:34	14.27	5.34	Run 3 - Low Load	-0.24	10.58	10.80	0.16	11.50	11.10	14.5	5.1
4/11/2008 16:35	14.59	5.10	Run 3 - Low Load	-0.24	10.58	10.80	0.16	11.50	11.10	14.8	4.8
	13.91	**5.63**	**Run 3 - Low Load - Average**							**14.1**	**5.4**
4/11/2008 16:36	10.16	2.17									
4/11/2008 16:37	10.58	0.03	10.8 CO2/ 0 O2								
	10.58	**0.03**	**10.8 CO2/ 0 O2 Average**								

9143 Philips Highway, Suite 200 Jacksonville, FL 32256 (904) 739-2277 (904) 739-2011 fax

Columbia Analytical Services INC.
An Employee - Owned Company

April 29, 2008 Service Request No: J0801660

Ron Reynolds
Georgia Pacific Corporation
County Road 216
Palatka, FL 32177

RE: BLS Fuel Factor

Dear Ron:

Enclosed are the results of the sample(s) submitted to our laboratory on April 8, 2008. For your reference, these analyses have been assigned our service request number **J0801660**.

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

Please call if you have any questions. My extension is 4408. You may also contact me via email at TKissinger@caslab.com.

Respectfully submitted,

Columbia Analytical Services, Inc.

Tom Kissinger
Project Chemist

Laboratory Manager: Greg Jordan
Quality Assurance Officer: Kathy Brungard

CAS Jacksonville is NELAC-accredited by the State of Florida, #E82502 valid through 6/30/08. Other state accreditations include: Arkansas, #88-0600 valid through 1/12/06; Georgia, #958 valid through 6/30/08; Louisiana, #02086 valid through 6/30/08; Texas, #T104704197-06-TX valid through 5/31/08; North Carolina, #527 valid through 12/31/07; South Carolina, #96021001 valid through 6/30/08.

1

Client: Georgia Pacific Corporation
Project: BLS Fuel Factor

Service Request: J0801660

SAMPLE CROSS-REFERENCE

SAMPLE #	CLIENT SAMPLE ID	DATE	TIME
J0801660-001	1A	04/07/08	00:00
J0801660-002	1B	04/07/08	00:00
J0801660-003	1C	04/07/08	00:00
J0801660-004	2A	04/07/08	00:00
J0801660-005	2B	04/07/08	00:00
J0801660-006	2C	04/07/08	00:00

Columbia Analytical Services, inc.
An Employee-Owned Company

Columbia Analytical Services
9143 Philips Highway, Suite 200
Jacksonville, FL 32256
Tel 904-739-2277
Fax 904-739-2011

Appendix A

Subcontracted Analytical Results

Columbia Analytical Services, INC

April 29, 2008

Client: Columbia Analytical Services, Inc.
8540 Baycenter Rd.
Jacksonville, FL 32256

Attn: Tom Kissinger

Project: J0801660, BLS Fuel Factor *Date Received:* April 9, 2008

Certificate of Analysis

Sample ID:	Sample Date & Time	DA Lab #:	Moisture D3173-03 %	Ash D3174-03		Heating Value D5865-04	
				As Received %	Moist. Free %	As Received %	Moist. Free %
1A (J0801660-001)	4/7/08 0:00	DA 11076	32.1	17.7	26.1	4,244	6,251
1B (J0801660-002)	4/7/08 0:00	DA 11077	33.0	15.8	23.6	4,079	6,087
1C (J0801660-003)	4/7/08 0:00	DA 11078	33.4	22.5	33.8	4,233	6,359
2A (J0801660-004)	4/7/08 0:00	DA 11079	33.2	23.3	34.9	4,052	6,065
2B (J0801660-005)	4/7/08 0:00	DA 11080	32.2	27.3	40.2	4,260	6,279
2C (J0801660-006)	4/7/08 0:00	DA 11081	33.1	24.8	37.0	4,163	6,218

Sample ID:	DA Lab #:	Density 25C D891	Carbon	Hydrogen D5373	Nitrogen	Oxygen D5373 Mod	Sulfur D4239
		As Received g/cm^3	As Received %	As Received %	As Received %	As Received %	As Received %
1A (J0801660-001)	DA 11076	1.230	25.44	5.60	<0.05	36.12	2.32
1B (J0801660-002)	DA 11077	1.234	24.85	5.93	<0.05	36.62	2.05
1C (J0801660-003)	DA 11078	1.224	24.62	5.81	0.14	34.91	1.87
2A (J0801660-004)	DA 11079	1.214	24.95	6.01	<0.05	35.83	1.90
2B (J0801660-005)	DA 11080	1.226	24.77	5.88	<0.05	36.66	2.04
2C (J0801660-006)	DA 11081	1.231	24.91	5.86	0.07	35.57	2.07

Notes:

RV Poulsen RVP

Ralph V. Poulsen, Laboratory Manager

3860 S. Palo Verde Rd.
Suite 302
Tucson, AZ 85714
520.623.3381

Columbia Analytical Services, Inc.
Cooler Receipt and Preservation Form

Client: GP Palatka Service Request # J0801660

Project: BLS F-Factor

Cooler received on 4/8/08 and opened on 4/8/08 by SO

COURIER: CAS UPS FEDEX DHL CLIENT Tracking #

1	Were custody seals on outside of cooler?	Yes	No	N/A
2	Were seals intact, signed and dated?	Yes	No	N/A
3	Were custody papers properly filled out?	Yes	No	N/A
4	Temperature of cooler(s) upon receipt (Should be 4 +/- 2 degrees C)	0.2		
5	Correct Temperature?	Yes	No	N/A
6	Were Ice or Ice Packs present	Yes	No	N/A
7	Did all bottles arrive in good condition (unbroken, etc....)?	Yes	No	N/A
8	Were all bottle labels complete (sample ID, preservation, etc....)?	Yes	No	N/A
9	Did all bottle labels and tags agree with custody papers?	Yes	No	N/A
10	Were the correct bottles used for the tests indicated?	Yes	No	N/A
11	Were all of the preserved bottles received with the appropriate preservative?	Yes	No	N/A

HNO3 pH<2 H2SO4 pH<2 ZnAc2/NaOH pH>9 NaOH pH>12 HCl pH<2

Preservative additions noted below

12	Were all samples received within analysis holding times?	Yes	No	N/A
13	Were VOA vials checked for absence of air bubbles? If present, note below	Yes	No	N/A
14	Where did the bottles originate?	CAS	Client	

SO 4/8/08

Sample ID	Reagent	Manuf. Lot # or CAS Chem ID	ml added	Inititials

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

Client approval to run samples if discrepancies noted: Date

SR # : J 0301660 Date: 4/8/08 Initials: SW

Note that pH is checked and meets the required pH criterion listed in the column heading unless otherwise noted on cooler receipt form.

	Bottle Code																												
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
	40mL	40mL	40mL	40mL	125mL	125mL	125mL	125mL	250mL	250mL	250mL	250mL	250mL	250mL	250mL	500mL	500mL	500mL	1L	1L	1L	1L	1L	2oz	4oz	8oz	16oz	5g	100mL	Misc.
Container	G	G	G	G	P	P	P	P	P	P	P	P	P	G	G	P	P	P	P	P	G	G	G	G	G	G	G	ENC	P	Misc.
Pres.		HCl	Sodium Thiosulfate	H2SO4		HCl	H2SO4	HNO3		H2SO4	HNO3	ZnAcetate NaOH	NaOH		HNO3		H2SO4	HNO3		HNO3		HCl	H2SO4						Sodium Thiosulfate	
Req. pH	N/A	<2	N/A	<2	N/A	<2	<2	<2	N/A	<2	<2	>9	>12	N/A	<2	N/A	<2	<2	N/A	<2	N/A	<2	<2	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Sample #	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
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-040																														

Columbia Analytical Services, Inc.
An Employee - Owned Company
www.caslab.com

CHAIN OF CUSTODY/LABORATORY ANALYSIS REQUEST FORM

8540 Baycenter Rd. • Jacksonville, FL 32256 • (904) 739-2277 • 800-695-7222 x06 • FAX (904) 739-2011

PAGE 1 OF 1

SR # J8801660

CAS Contact T. Kissinger

Project Name: BLS F-FACTOR	Project Number: P.O. 625111
Project Manager: RON REYNOLDS	Email Address: ron.reynolds@gapac.com
Company/Address: Georgia-Pacific P.O. BOX 919 PALATKA, FL 32178	
Phone #: 386-329-0967	FAX#:
Sampler's Signature:	Sampler's Printed Name:

ANALYSIS REQUESTED (Include Method Number a

PRESERVATIVE: 0 0 0 0 0 0

[redacted]

1. HCL
2. HNO_3
3. H_2SO_4
4. NaOH
5. Zn. Acetate
6. MeOH
7. $NaHSO_4$
8. Other _____

CLIENT SAMPLE ID	LAB ID	SAMPLING DATE	SAMPLING TIME	MATRIX	NUMBER OF CONTAINERS	BTU content	Density	Total solids	Ash %	Total Sulfur	Nitrogen	REMARKS/ ALTERNATE DESCRIPTION
1A		4-7			1	X	X	X	X	X	X	
1B		↓			1	↓	↓	↓	↓	↓	↓	
1C					1	↓	↓	↓	↓	↓	↓	
2A					1	X	X	X	X	X	X	
2B					1	↓	↓	↓	↓	↓	↓	
2C		↓			1	↓	↓	↓	↓	↓	↓	

SPECIAL INSTRUCTIONS/COMMENTS

Black liquor samples

See QAPP ☐

TURNAROUND REQUIREMENTS

____ RUSH (SURCHARGES APPLY)

✓ STANDARD

REQUESTED FAX DATE

REQUESTED REPORT DATE

REPORT REQUIREMENTS

____ I. Results Only

____ II. Results + QC Summaries (LCS, DUP, MS/MSD as required)

✓ III. Results + QC and Calibration Summaries

____ IV. Data Validation Report with Raw Data

____ V. Speicalized Forms / Custom Report

Edata ____ Yes ____ No

INVOICE INFORMATION

PO# 625111

BILL TO:

SAMPLE RECEIPT: CONDITION/COOLER TEMP: _____ CUSTODY SEALS: Y N

RELINQUISHED BY	RECEIVED BY	RELINQUISHED BY	RECEIVED BY	RELINQUISHED BY	RECEIVED BY
Signature: Ron Reynolds	Signature: Aimee L Ostrom	Signature	Signature	Signature	Signature
Printed Name: RON REYNOLDS	Printed Name: Aimee OSTROM	Printed Name	Printed Name	Printed Name	Printed Name
Firm: GP	Firm: CAS	Firm	Firm	Firm	Firm
Date/Time: 4/8/08 0900	Date/Time: 4/8/08 1040	Date/Time	Date/Time	Date/Time	Date/Time

Distribution: White - Return to Originator; Yellow - Lab Copy; Pink - Retained by Client

JSCOC-08/28/06

Columbia Analytical Services™

May 5, 2008

Client: Columbia Analytical Services, Inc.
8540 Baycenter Rd.
Jacksonville, FL 32256

Attn: Tom Kissinger

Project: J0801840, BLS Fuel Factor *Date Received:* *April 18, 2008*

Certificate of Analysis

Sample ID:	Sample Date & Time	DA Lab #:	Moisture D3173 %	Ash D3174		Heating Value D5865	
				As Received %	Moist. Free %	As Received %	Moist. Free %
3A (J0801840-001)	4/11/08 11:15	DA 11252	34.0	18.7	28.3	4,102	6,219
3B (J0801840-002)	4/11/08 14:20	DA 11253	34.0	23.9	36.3	3,816	5,782
3C (J0801840-003)	4/11/08 15:40	DA 11254	35.9	25.2	39.3	3,978	6,210

Sample ID:	DA Lab #:	Density 25C D891	Carbon	Hydrogen D5373	Nitrogen	Oxygen D5373 Mod	Sulfur D4239
		As Received g/cm^3	As Received %	As Received %	As Received %	As Received %	As Received %
3A (J0801840-001)	DA 11252	1.228	24.34	5.62	<0.05	37.70	1.85
3B (J0801840-002)	DA 11253	1.219	24.50	5.09	<0.05	37.27	2.22
3C (J0801840-003)	DA 11254	1.197	23.76	5.43	<0.05	35.59	1.76

Notes:

R V Poulsen RVP

Ralph V. Poulsen, Laboratory Manager

3860 S. Palo Verde Rd.
Suite 302
Tucson, AZ 85714
520.623.3381

Rpt-11252 CAS J0801840 Kissinger Fuels.xls, 5/5/2008

Columbia Analytical Services, INC

May 5, 2008

Client: Columbia Analytical Services, Inc.
8540 Baycenter Rd.
Jacksonville, FL 32256

Attn: Tom Kissinger

Project: J0801840, BLS Fuel Factor *Date Received:* April 18, 2008

Certificate of Analysis

Sample ID:	*Sample Date & Time*	*DA Lab #:*		*Sulfur* *D4239* As Received %	*Heating Value* *D5865* As Received %		
TO-1 (J0801840-004)	4/11/08 9:00	DA 11255		0.14	16,788		
TO-2 (J0801840-005)	4/12/08 7:30	DA 11256		0.16	15,490		
TO-3 (J0801840-006)	4/13/08 7:45	DA 11257		0.28	11,147		
TO-4 (J0801840-007)	4/14/08 10:30	DA 11258		0.08	16,551		
TO-5 (J0801840-008)	4/16/08 14:00	DA 11259		0.15	17,032		

Notes:
BTU value for sample TO-3 is low due to confirmed higher water and ash content as compared to other oil samples.

RV Poulsen RVP

Ralph V. Poulsen, Lab Manager

3860 S. Palo Verde Rd.
Suite 302
Tucson, AZ 85714
520.623.3381

Rpt-11255 CAS J0801840 Kissinger Fuels.xls, 5/5/2008

APEX INSTRUMENTS METHOD 5 PRE-TEST CONSOLE CALIBRATION
USING CALIBRATED CRITICAL ORIFICES
5-POINT ENGLISH UNITS

Meter Console Information	
Console Model	AASI
Console Serial Number	8
DGM Model Number	S 275
DGM Serial Number	6843195

Calibration Conditions			
Date	Time	26-Aug-05	1500
Barometric Pressure		29.74	in Hg
Theoretical Critical Vacuum[1]		14.0	in Hg
Calibration Technician		J Barnett	

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

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

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

Calibration Data

Run Time	Metering Console					Critical Orifice				
Elapsed	DGM Orifice ΔH	Volume Initial	Volume Final	Outlet Temp Initial	Outlet Temp Final	Serial Number	Coefficient	Amb Temp Initial	Amb Temp Final	Actual Vacuum
(Θ)	(P_m)	(V_{mi})	(V_{mf})	(t_{mi})	(t_{mf})		K'	(t_{amb})	(t_{amb})	
min	in H_2O	cubic feet	cubic feet	°F	°F		see above2	°F	°F	in Hg
14	0.6	231.203	237.329	85	85	12	0.3303	86	86	23
12	1.1	237.329	244.590	86	87	17	0.4587	87	88	21
11	1.3	244.590	251.849	87	89	19	0.5047	88	88	21
14	2.4	251.849	264.311	89	92	25	0.6807	88	88	19
13	4.1	264.311	279.089	92	93	32	0.8776	88	87	17

Results

Standardized Data				Dry Gas Meter				
				Calibration Factor		Flowrate	ΔH @	
Dry Gas Meter		Critical Orifice		Value	Variation	Std & Corr	0.75 SCFM	Variation
($V_{m(std)}$)	($Q_{m(std)}$)	($Vcr_{(std)}$)	($Q_{cr(std)}$)	(Y)	(ΔY)	($Q_{m(std)(corr)}$)	(ΔH@)	(ΔΔH@)
cubic feet	cfm	cubic feet	cfm			cfm	in H2O	
5.908	0.422	5.885	0.420	0.996	-0.013	0.420	1.784	0.024
6.992	0.583	6.996	0.583	1.001	-0.008	0.583	1.759	-0.001
6.974	0.634	7.053	0.641	1.011	0.003	0.641	1.716	-0.044
11.951	0.854	12.107	0.865	1.013	0.004	0.865	1.743	-0.017
14.180	1.091	14.501	1.115	1.023	0.014	1.115	1.798	0.038
				1.009	Y Average		1.760	ΔH@ Average

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

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

Technician Sign: _____ Date: 8-26-05 Q A Signature: _____ Date: 8/26/05

APEX INSTRUMENTS METHOD 5 POST-TEST CONSOLE CALIBRATION
USING CALIBRATED CRITICAL ORIFICES
3-POINT ENGLISH UNITS

Meter Console Information	
Console Number	8
Pre-test "Y" value	1.009
DGM Model Number	S 275
DGM Serial Number	6843195

Calibration Conditions			
Date	Time	22-Apr-08	1600
Barometric Pressure		29.80	in Hg
Theoretical Critical Vacuum[1]		14.1	in Hg
Calibration Technician		Jory	

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

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

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

Calibration Data

Run Time	Metering Console					Critical Orifice				
Elapsed	DGM Orifice ΔH	Volume Initial	Volume Final	Outlet Temp Initial	Outlet Temp Final	Serial Number	Coefficient	Amb Temp Initial	Amb Temp Final	Actual Vacuum
(Θ)	(P_m)	(V_{mi})	(V_{mf})	(t_{mi})	(t_{mf})		K'	(t_{amb})	(t_{amb})	
min	in H_2O	cubic feet	cubic feet	°F	°F		see above2	°F	°F	in Hg
13	2.0	990.700	1001.125	89	87	63	0.6213	81	82	16
11	2.0	1001.125	1009.975	87	87	63	0.6213	82	83	16
13	2.0	1009.975	1020.496	87	87	63	0.6213	83	83	16

Results

Standardized Data				Dry Gas Meter				
				Calibration Factor		Flowrate	ΔH @	
Dry Gas Meter		Critical Orifice		Value	Variation	Std & Corr	0.75 SCFM	Variation
($V_{m(std)}$)	($Q_{m(std)}$)	($Vcr_{(std)}$)	($Q_{cr(std)}$)	(Y)	(ΔY)	($Q_{m(std)(corr)}$)	(ΔH@)	(ΔΔH@)
cubic feet	cfm	cubic feet	cfm			cfm	In H2O	
10.063	0.774	10.343	0.796	1.028	0.006	0.796	1.725	-0.005
8.558	0.778	8.744	0.795	1.022	0.000	0.795	1.732	0.002
10.174	0.783	10.329	0.795	1.015	-0.006	0.795	1.733	0.003
				1.022	Y Average		1.730	ΔH@ Average

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

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

Technician Sign: _____ Date: 4-22-08 Q A Signature: _____ Date: 4/24/08

AAS Inc. AMBIENT AIR SERVICES INCORPORATED
ENVIRONMENTAL CONSULTANTS

PITOT TUBE CALIBRATION MEASUREMENTS

DATE CALIBRATED 4-22-08 PITOT TUBE Yellow 1

Technician name: Jon

Pitot tube assembly level ? ✓ Yes ____ No

Pitot tube openings damaged? ____ Yes (explain below) ✓ NO

a1 = 2° degrees (< 10 deg) a2 = 2° degrees (< 10 deg)

b2 = 0 degrees (<5 deg) b1 = ~~3~~ 3° degrees (<5 deg)

Y = 0 degrees 0 = 1° degrees A = 0.83 inches = (Pa + Pb)

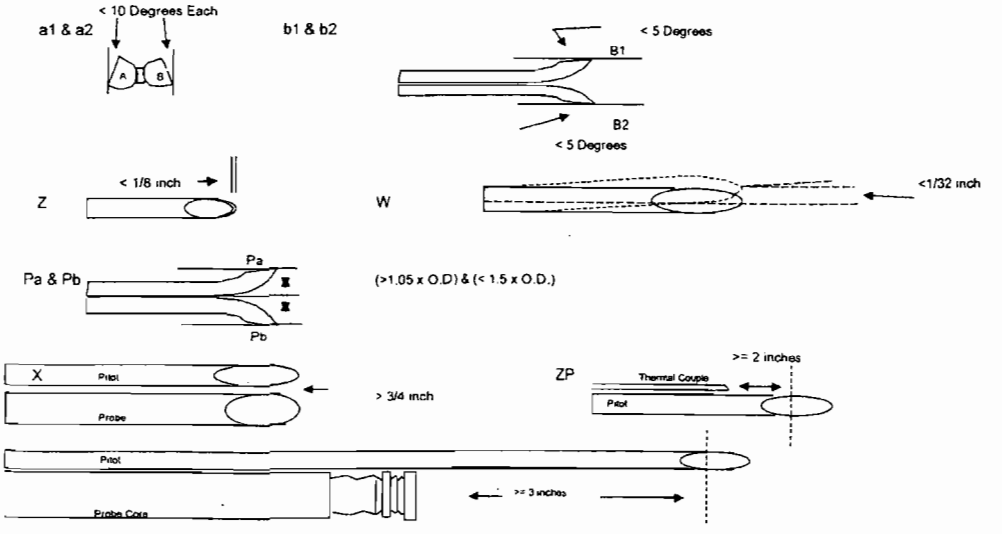
Pa = .41 Pb = .42 Dt = .375

z = A sin Y = 0 inches ; / < 1/8 inches

w = A sin 0 = 0.014 inches ; / < 1/32 inches

Calibration required ? ____ Yes ✓ No Technician signature

Quality Assurance Review by: 4/24/08 QA date



AMBIENT AIR SERVICES, INC.
106 Ambient Airway
Starke, Flroida 32091

GP Pal

THERMOCOUPLE CALIBRATION FORM

Date 4.22.08 Time 1600
Ambient Temperature SFD Source SFD Therm
Barometric Pressure 29.80 Source Hg B-
Technician's Name Jory

Standard Thermometer Type MS in Glass
Manufacturer BCR
Serial Number 208244
Pyrometer Manufacturer Omega Model 201K
Serial Number AASP 8 Meter Box 8

TEMPERATURE SOURCE (A)		Ice water			Ambient water			Boiling water					
REFERENCE THERMOMETER	Actual Reading	32°			77			212°					
	Corrected Temperature												
CALIBRATED THERMOCOUPLE		Indicated Temp.	Difference (B)	Percent Diff. (C)	Indicated Temp.	Difference	Percent Diff.	Indicated Temp.	Difference	Percent Diff.	Indicated Temp.	Difference	Percent Diff.
Serial Number	Location												
Blu L	Stack	32			77			215	+3	0.4%			
	Filter												
	Impinger												
M8	Meter In	32			78	+1		214	+2				
M8a	Meter Out	33	+1		77			213	+1				

COMMENTS:

Technician Signature
Quality Assurance Signature Date 4/24/08

Calibration Tolerances Stack = 1.5% of value, Filter Box = ±5.4°F, Impinger = ±2°F, Meter = ±5.4°F (40 CFR Pt, App. A Method 5, and QA Handbook Section 3.4, Method 5, page 13, Rev. O)

(A) Type of calibration system used (B) Reference - Indicated = Difference

$$(C)\left[\frac{(\text{ref. temp. oF} + 460) - (\text{indicatedtemp. oF} + 460)}{(\text{referencetemp. oF} + 460)}\right] \text{x100}$$

99010 AASI 68A

APPENDIX B

TEST PROTOCOL

Ambient Air Services, Inc.

106 Ambient Airway • Starke, FL 32091 • (904) 964-8440 • FAX (904) 964-6675

Georgia-Pacific Consumer Operations, LLC.
Palatka, Florida

Permit Number: 1070005-038-AC, PSD-FL-380
Emission Unit 018 - Number 4 Recovery Boiler

SITE-SPECIFIC TEST PLAN

March 6, 2008

1.0 INTRODUCTION

It is the intention of Georgia-Pacific (GP) located in Palatka, Florida to conduct testing on the Number 4 Recovery Boiler as specified in section 3 condition D.7.a-d of the construction permit The purpose of the testing is to develop a site specific fuel factor for Black Liquor Solids (BLS). The fuel factor will be used in place of a flow monitor on the CEMS (Permit Section 3 condition D.7.). The testing will be scheduled following approval of this test plan (Permit Section 3 condition D.7.b). The Permit is included as Attachment A of this test plan for reference.

The contacts for the test plan and testing are:

Mr. Ron Reynolds
Georgia- Pacific
215 County Road 216
Palatka, FL 32178
Phone: (386) 329-0967
Email:ron.reynolds@gapac.com

Mr. Joseph L. Cooksey
Ambient Air Services, Inc.
106 Ambient Airway
Starke, FL 32091
Phone: (904) 964-8440
Email: joecooksey@ambientairservices.com

The proposed sampling and methodology described in this protocol are based on pre test knowledge and assumptions. Schedules may change, the order of testing may change, and if necessary, the test methodology and equipment may change. The changes will be based on the actual conditions encountered while on site. Conditions such as weather, process changes, equipment problems or other unforeseen issues will necessitate changes in the test plan. When practical, deviations to the protocol will be discussed with the on site regulatory representative. Deviations from this protocol will be listed in the test report.

2.0 Facility Information

2.1 Emission Unit Description

No. 4 Recovery Boiler: This unit fires black liquor solids (BLS) as the primary fuel to facilitate the recovery of the cooking liquor. Residual fuel oil is fired as a startup and supplemental fuel. The maximum steam production rate is 789,000 lb/hour (24-hour average) for steam conditions of 850° F to 900° F at 1250 psi. Particulate matter emissions are controlled by an electrostatic precipitator (ESP) with automatic voltage control, 2-chambers, and 6 electric fields per chamber. Total reduced sulfur emissions are reduced by the low-odor design. NO_x emissions are controlled by good combustion design and operating practices. SO_2, TRS, and opacity are continuously monitored and recorded. At permitted capacity, the exhaust gas flow rate is 294,000 dscfm at 8% oxygen with an exit temperature of 400° F. Exhaust gasses exit a stack that is 12 feet in diameter and 230 feet tall.

2.2 Operating Conditions

During this testing the Number 4 Recovery Boiler will be operated over a range of loads representing the normal and most likely operating conditions. The loads will be based on the permitted BLS feed rate of 210,000 pounds of BLS per hour. The testing will be conducted during periods where the boiler is fired only using BLS. Three boiler loads will be tested; 75%, 85%, and 95% (+/-5%)of permitted BLS feed rate. The boiler load conditions will be documented using process records normally kept by GP. Should a boiler upset condition be encountered during the test program then the run will be redone as it will be important in the establishment of the fuel factor for the boiler to be operated at steady load conditions.

3.0. SPECIFIC TESTING PROPOSED

3.1 Proposed Test Methods

The fuel factor for black liquor solids (BLS) will be determined by using the following methods:

Summary of Tests to be Conducted

Georgia-Pacific Corporation
Palatka, Florida

Source	Parameters	EPA Reference Methods	Duration of tests
Number 4 Recovery Boiler	Flow, oxygen, and fuel analysis/rate	40 CFR, Part 60, Appendix A, Methods 1, 2, 3A, and 4. Fuel analysis for Btu content.	3 test runs, each run 1 hour, 3 test conditions.

The site specific BLS fuel factor will be determined using the measured air flow in the stack, the measured oxygen concentration in the stack, the BLS feed rate into the boiler and the Btu content per pound of BLS as determined by fuel analysis.

The boiler will be evaluated under 3 load conditions, (+/-5%); condition 1: 75%, condition 2: 85% and condition 3: 95% of the permitted firing rate (210,000 lb/hour of BLS). The fuel factor determined will be an average of the fuel factors determined for each condition. The following formula will be used to calculate the fuel factor (Fd):

$$F_d = \text{flow (SCFHD)} \quad X \quad \frac{1}{\text{mmBtu/hr}} \quad X \quad \frac{(20.9 - 0_2 \text{ concentration})}{20.9}$$

Where:

Flow (SCFHD) = Average flow determined using methods 1, 2,3a, and 4 in standard cubic feet per hour dry.

mmBTU/hr = Pounds of BLS per hour X Btu per pound ÷1,000,000.
Pounds of BLS per hour will be determined based on the measured boiler feed rate. This will be provided to AASI from Georgia-Pacific.
The Btu per pound will be determined by fuel analysis of the BLS. This is done on a routine basis by GP.

O_2 concentration (%) will be determined using instrumental analysis reported on a volume basis (method 3A).

3.2 Reporting

Following the completion of this test project a report will be prepared and submitted by AASI to GP. The report will include, at a minimum, a summary of the test conducted, any deviations from this test plan, the data collected, the proposed site specific F-factor for BLS, and an evaluation of the f-factor predicted flow rates vs. the actual measured flow rates.

4.0 SAMPLING AND ANALYTICAL PROCEDURES

The following are short descriptions of the reference methods that will be used.

4.1 Sample and Velocity Traverse

USEPA Method 1, as published in 40 CFR, Part 60, Appendix A, will be used as the reference method to determine the location of the traverse points for velocity measurements.

4.2 Velocity and Volumetric Flow Rate

USEPA Method 2, as published in 40 CFR, Part 60, Appendix A, will be used as the reference method to determine average gas velocity. A type "S" pitot tube and oil manometer will be used for velocity determination. Gas temperature will be measured with a type K thermocouple. Calibration checks will be performed on the pitot tube to verify the face opening alignments, external tubing diameter, and base-to-opening plane distances. A base-line coefficient of 0.84 will be assigned to the pitot tube.

Three (3) flow traverses will be conducted per run, three runs per boiler load condition and three separate boiler conditions.

4.3 Oxygen and Carbon Dioxide

USEPA Method 3A, as published in 40 CFR, Part 60, Appendix A, will be used as the reference method for determining oxygen and carbon dioxide levels in the effluent gas stream. A Servomex Model 1440 will be used.

4.4 Moisture Content

USEPA Method 4, as published in 40 CFR, Part 60, Appendix A, will be used as the reference method to determine the moisture content of the gas stream by extracting the gas sample at a known and regulated rate through a glass condenser train. The condenser train consists of four glass impingers connected in series with leak free U-tube connectors. The gas sample will be extracted through the impinger train (maintained at below 68° F in an ice bath) with a vacuum

pump. The amount of gas sampled will be measured with a calibrated dry gas meter. The amount of moisture collected during the test will be gravimetrically determined, and the amount of gas drawn, corrected to dry standard conditions, will be determined. One (1) moisture run will be conducted for each load condition.

4.5 Sample System

The sample system for oxygen and carbon dioxide will consist of the following components: A fully extractive sample system to convey the stack gas to the analytical instruments. The sample system will consist of the following components: a probe, calibration tee, moisture removal system, particulate filter, sample line, a sample pump and a sample manifold to distribute the sample gas to the analytical instruments. The system is designed so that all calibration gases are injected at the probe and pass through the same system as the sample gas. A schematic of the sampling system is shown in Figure 1.

5.0 SAMPLING LOCATION

See Figure 2.

6.0 PROCESS DATA

GP will be responsible for collecting process data during the test including BLS consumption, boiler loads, fuel analysis and general operating data.

7.0 QUALITY ASSURANCE

7.1 QA Objectives

The objectives of AASI QA program are to produce data that are complete, representative, and of known precision and accuracy.

7.2 Completeness

Completeness is the percentage of the required field and laboratory measurements and all necessary documentation that was achieved. It is our policy to promote a systematic, detailed and documented approach to completeness.

7.3 Precision and Accuracy

Precision and Accuracy are measures of data quality. These measures are included in the reference test methods and procedures in the form of equipment, reagent, and performance specifications, e.g., calibration accuracy, precision of triplicate analyses, percent recoveries, and trace abilities to primary standards. AASI has a stated company policy that all staff members are to be dedicated to

highest standards of precision and accuracy. Team Leaders and the Project Manager are considered to be precision and accuracy inspectors for the projects they oversee.

7.4 Out of Control and/or Unacceptable Data

All of the test methods addressed in contain some form of allowable data limits, whether it will be in the form of calibration limits or perhaps repeatability limits on a liquid titration. In all cases where these limits are not met, the technician shall document these facts and contact his supervisor for further guidance.

AASI policy is to have the supervisor and technician jointly identify the problem and see a successful alternative to the procedure to enable future results to be within specified tolerances. If for some reason, such as sample exhaustion, satisfactory results cannot be achieved, the results of the sample run in question will be declared void with proper notations in the project file and/or report as appropriate. For the situation where two of three runs are considered valid, the administrator can be petitioned to consider those two runs as adequate to satisfy the needs dictated by the test. In the event the test team has the foresight to anticipate trouble with one or more runs and collects more than the minimum of three runs, then any set of three or more successful replicate runs may be reported, with the notation however that problems were encountered with data excluded.

In the event that less than two successful runs are realized from an acceptable data perspective; the entire test will be repeated with proper precautions to avoid another set of unacceptable results. Note however that all data, whether acceptable or not, should be retained in project files.

7.5 Representativeness

Representativeness is defined by the "when", "how", and "how many" of measurements taken. These conditions are usually specified within the regulation, e.g., source operating at maximum capacity using high sulfur content fuel, Method 6C for SO_2 at a single point at the centroid of the stack, three 20-minute runs, etc. If not specified in the regulations, all interested parties must agree upon the desired "representative" conditions before any measurement are taken. Special care will be taken to ensure a detailed record of test specifics or other special data testing and processing matrices.

7.6 Organization

Ambient Air Services, Inc. has a designated QA Manager and is responsible to the President of the company. The QA Manager's responsibilities include:

a. Adherence to SOP plan, including stipulated calibration scheduled therein.
b. Organization and conduct of internal training programs.
c. Reviews of reports or other work product prior to release.

7.7 Procedures

Specified procedural steps can be found in the Ambient Air Services, Inc. Quality Manual, which complies with the rules and guidance of the Louisiana Environmental Laboratory Accreditation Program. LELAP Certification Number 04064, LELAP Agency Interest Number 100329. All of AASI's Team Leaders and Project Managers possess a copy of this manual.

7.8 Sample Identification and Custody

The Team Leader/Project Manager will be responsible for the custody control of the samples taken. A custody control form will be filled out and utilized for the samples until the samples can be legally disposed of.

8.0 SAFETY

The AASI Team Leader/Project Manager will be responsible for the safety conduct of all AASI personnel. It is the responsibility of Georgia-Pacific to inform and train AASI personnel in their specific safety requirements for their plant.

9.0 DETAILED TEST SCHEDULE

Day 1:	Arrive on site, set-up, test 1 boiler load condition.
Day 2:	Test 2 boiler load conditions, breakdown equipment.

Schedules may change, the order of testing may change, and if necessary, the test methodology and equipment may change. The changes will be based on the actual conditions encountered while on site. Conditions such as weather, process changes, equipment problems or other unforeseen issues will necessitate changes in the test plan.

GP will notify FDEP of the scheduled test dates after approval of this test plan.

Figure 1

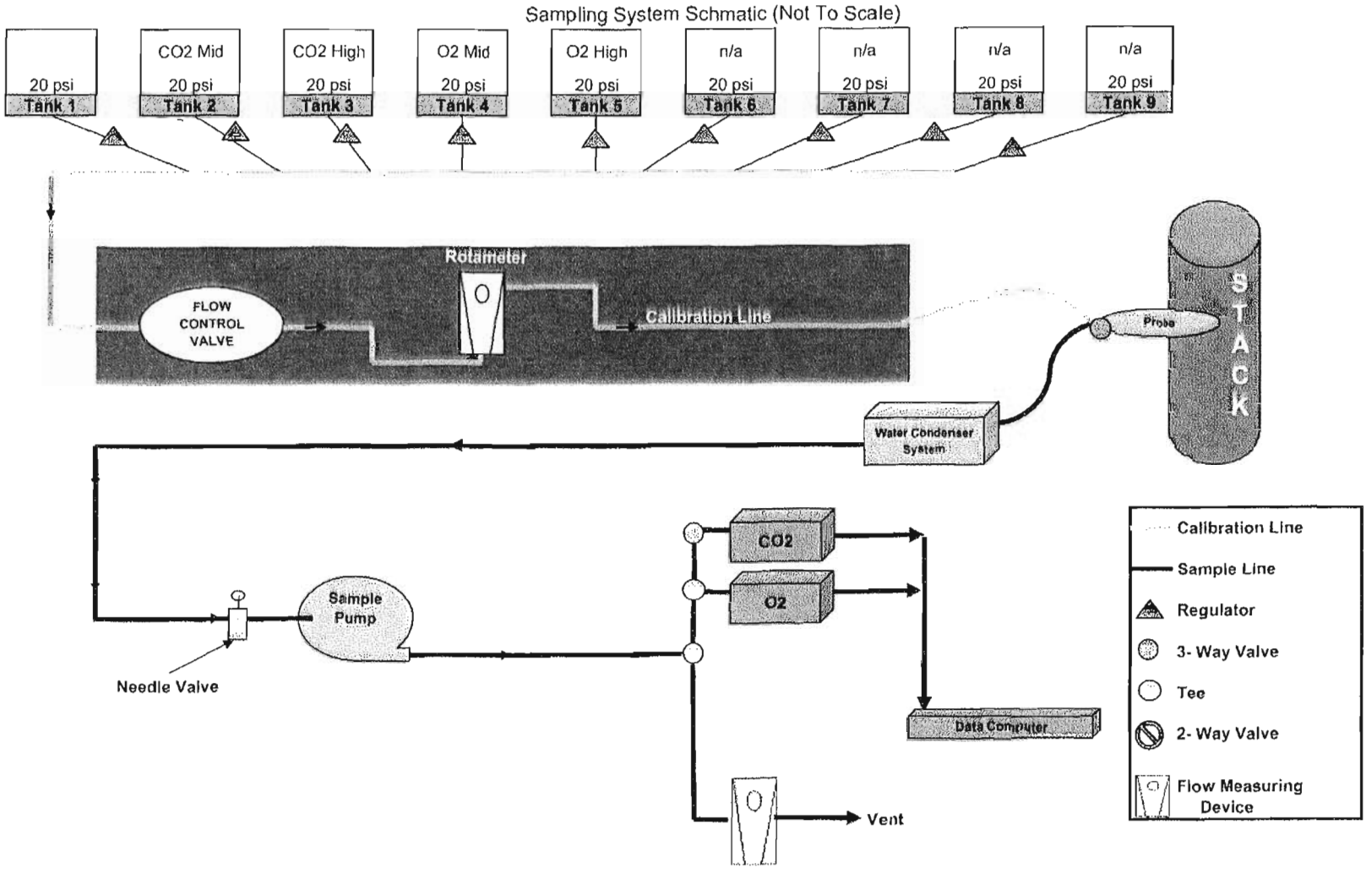
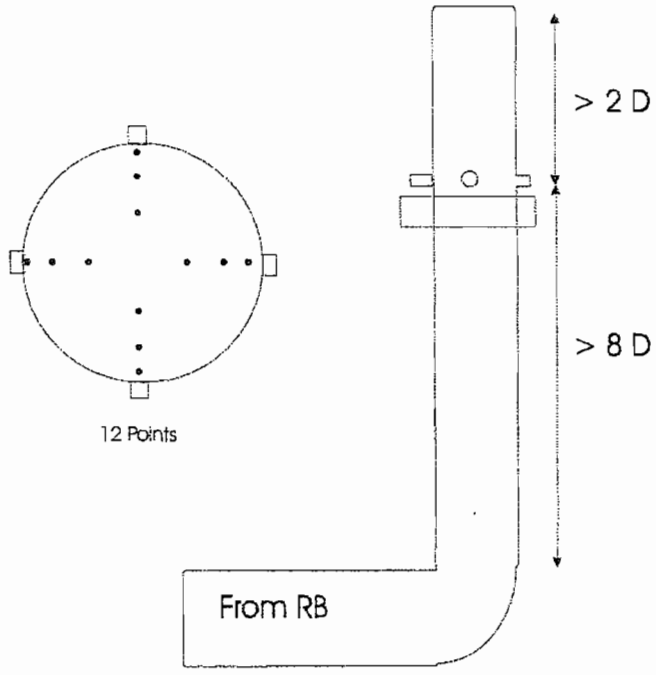

Sampling System Schmatic (Not To Scale)
20 psi
Tank 1
CO2 Mid
20 psi
Tank 2
CO2 High
20 psi
Tank 3
O2 Mid
20 psi
Tank 4
O2 High
20 psi
Tank 5
n/a
20 psi
Tank 6
n/a
20 psi
Tank 7
n/a
20 psi
Tank 8
n/a
20 psi
Tank 9
Rotameter
FLOW CONTROL VALVE
Calibration Line
Probe
STACK
Water Condenser System
CO2
O2
Sample Pump
Needle Valve
Data Computer
Vent
Calibration Line
Sample Line
Regulator
3- Way Valve
Tee
2- Way Valve
Flow Measuring Device

Figure 2

Georgia-Pacific Consumer Operations, LLC
Palatka, Florida
Number 4 Recovery Boiler (EU-018)

		Sampling Points (inches)	
Diameters Upstream:	> 2		
Diameters Downstream	> 8	1	7.0"
Stack diameter	144"	2	23.1"
Drawing Date	7/24/06	3	46.8"

Drawing Not to Scale



Note: Four equal distance, ninety-degree ports.. 4 ports with 3 points per port, 12 total points. All distances are approximate.

Attachment A - Permit Number: 1070005-038-AC, PSD-FL-380

PERMITTEE

Georgia-Pacific Consumer Operations LLC
Post Office Box 919
Palatka, Florida 32178-0919

Authorized Representative:
Mr. Keith Wahoske, Vice President

Air Permit No. 1070005-038-AC
PSD No. PSD-FL-380
Georgia-Pacific Palatka Mill
PSD Modification
SIC Nos. 2611 and 2621
Permit Expires: November 1, 2009

FACILITY AND LOCATION

Georgia-Pacific Consumer Operations LLC operates the Palatka Mill, which is a Kraft process pulp and paper mill located North of County Road 216 and West of U.S. Highway 17 in Palatka, Putnam County, Florida. The map coordinates are: UTM Zone 17; 434.0 km East; and, 3283.4 km North. This permit requires permanent shutdown of the No. 4 Power Boiler and authorizes modifications to the No. 5 Power Boiler, No. 4 Lime Kiln, No. 4 Recovery Boiler, and No. 4 multiple effect evaporator set.

STATEMENT OF BASIS

This air pollution construction permit is issued under the provisions of Chapter 403 of the Florida Statutes (F.S.), and Chapters 62-4, 62-204, 62-210, 62-212, 62-296, and 62-297 of the Florida Administrative Code (F.A.C.) and Title 40, Parts 60 and 63 of the Code of Federal Regulations (CFR). The permittee is authorized to install the proposed equipment in accordance with the conditions of this permit and as described in the application, approved drawings, plans, and other documents on file with the Department of Environmental Protection (Department).

CONTENTS

Section 1. General Information
Section 2. Administrative Requirements
Section 3. Emissions Units Specific Conditions
Section 4. Appendices

Joseph Kahn, Director
Division of Air Resource Management

Effective Date

FACILITY DESCRIPTION

Georgia-Pacific operates an existing paper and pulp mill in Palatka, Florida using the Kraft sulfate process. In the Kraft process, the digesting liquor (white liquor) is a solution of sodium hydroxide and sodium sulfide that is mixed with wood chips and cooked under pressure. The spent liquor, known as weak black liquor, is concentrated and sodium sulfate is added to make up for chemical losses. The black liquor solids (BLS) are burned in the recovery furnace to produce a smelt of sodium carbonate and sodium sulfide. The smelt is dissolved in water to form green liquor to which quicklime (calcium oxide) is added to convert the sodium carbonate back to sodium hydroxide, which reconstitutes the cooking liquor. The spent lime cake (calcium carbonate) is recalcined in a rotary lime kiln to produce quicklime, which is used to convert the green liquor to cooking liquor. Other steam and energy needs are met by the power boilers, which burn a variety of fuels including fuel oil and natural gas.

REGULATORY CLASSIFICATION

- The facility is a major source of hazardous air pollutants (HAP).
- The facility operates no units subject to the acid rain provisions of the Clean Air Act.
- The facility is a Title V major source of air pollution.
- The facility is a major stationary source subject to the Prevention of Significant Deterioration (PSD) of Air Quality.

PROJECT DESCRIPTION

This permit authorizes the following major modifications: permanent shutdown of the No. 4 Power Boiler; conversion of the No. 5 Power Boiler to natural gas; replacement of the hot-end section and cooler tubes for the No. 4 Lime Kiln; extensive tube replacement and modification of the combustion air system (including the addition of a fourth level of overfire air) for the No. 4 Recovery Boiler; and the addition of a crystallizer with associated storage/flash tank and modifications to the two concentrators associated with the No. 4 multiple effect evaporator set. This permit affects the following emissions units.

ID	Emission Unit Description
014	No. 4 Power Boiler
015	No. 5 Power Boiler
016	No. 4 Combination Boiler
017	No. 4 Lime Kiln
018	No. 4 Recovery Boiler
037	Noncondensable Gas System including the No. 4 Multiple Effect Evaporator (MEE) Set

The permittee conducted a PSD netting analysis based on contemporaneous emissions increases and decreases to avoid PSD preconstruction review for sulfur dioxide (SO_2), sulfuric acid mist (SAM), and total reduced sulfur (TRS). The project is subject to PSD preconstruction review for carbon monoxide (CO), nitrogen oxides (NO_X), particulate matter (PM), and volatile organic compounds (VOC). For this permit, the Department determined the Best Available Control Technology (BACT) for the following units: the No. 5 Power Boiler (CO and VOC); the No. 4 Lime Kiln (CO, NO_X, PM, and VOC); and the No. 4 Recovery Boiler (CO, NO_X, PM, and VOC). The No. 4 Combination Boiler is currently under PSD preconstruction review in Project No. 1070005-045-AC for CO, NO_X, PM, and VOC. Throughout this permit, particulate matter emissions are referred to as PM emissions, which serve as a surrogate for regulating $PM_{2.5}$ and PM_{10} emissions.

RELEVANT DOCUMENTS

The following relevant documents are not a part of this permit, but helped form the basis for this permitting action: the permit application and additional information received to make it complete; the draft permit package including the Department's Technical Evaluation and Preliminary Determination; publication and comments; the Department's Final Determination; previous air construction permits; and the current Title V air operation permit.

SECTION 2. ADMINISTRATIVE REQUIREMENTS

1. Permitting Authority: The Permitting Authority for this project is the Bureau of Air Regulation in the Division of Air Resource Management of the Department. The mailing address is 2600 Blair Stone Road, MS #5505, Tallahassee, Florida 32399-2400. The phone number is 850/488-0114.
2. Compliance Authority: All documents related to compliance activities such as reports, tests, and notifications shall be submitted to the Air Resource Section of the Department's Northeast District Office. The mailing address is 7825 Baymeadows Way, Suite 200B, Jacksonville, Florida, 32256. The phone number is 904/807-3300.
3. Appendices: The following Appendices are attached as part of this permit:
   a. Appendix A. Citation Formats
   b. Appendix B. General Conditions
   c. Appendix C. Common Conditions
   d. Appendix D. Standard Testing Requirements
   e. Appendix E. Standard Continuous Monitoring Requirements
   f. Appendix F. Final BACT Determinations and Emissions Summary
   g. Appendix G. On-Specification Used Oil Requirements
4. Applicable Regulations, Forms and Application Procedures: Unless otherwise specified in this permit, the construction and operation of the subject emissions units shall be in accordance with the capacities and specifications stated in the application. The facility is subject to all applicable provisions of: Chapter 403, F.S.; and Chapters 62-4, 62-204, 62-210, 62-212, 62-213, 62-296, and 62-297, F.A.C. Issuance of this permit does not relieve the permittee from compliance with any applicable federal, state, or local permitting or regulations.
5. New or Additional Conditions: For good cause shown and after notice and an administrative hearing, if requested, the Department may require the permittee to conform to new or additional conditions. The Department shall allow the permittee a reasonable time to conform to the new or additional conditions, and on application of the permittee, the Department may grant additional time. [Rule 62-4.080, F.A.C.]
6. Modifications: No emissions unit shall be constructed or modified without obtaining an air construction permit from the Department. Such permit shall be obtained prior to beginning construction or modification. [Rules 62-210.300(1) and 62-212.300(1)(a), F.A.C.]
7. Source Obligation:
   (a) Authorization to construct shall expire if construction is not commenced within 18 months after receipt of the permit, if construction is discontinued for a period of 18 months or more, or if construction is not completed within a reasonable time. This provision does not apply to the time period between construction of the approved phases of a phased construction project except that each phase must commence construction within 18 months of the commencement date established by the Department in the permit.
   (b) At such time that a particular source or modification becomes a major stationary source or major modification (as these terms were defined at the time the source obtained the enforceable limitation) solely by virtue of a relaxation in any enforceable limitation which was established after August 7, 1980, on the capacity of the source or modification otherwise to emit a pollutant, such as a restriction on hours of operation, then the requirements of subsections 62-212.400(4) through (12), F.A.C., shall apply to the source or modification as though construction had not yet commenced on the source or modification.

(c) At such time that a particular source or modification becomes a major stationary source or major modification (as these terms were defined at the time the source obtained the enforceable limitation) solely by exceeding its projected actual emissions, then the requirements of subsections 62-212.400(4) through (12), F.A.C., shall apply to the source or modification as though construction had not yet commenced on the source or modification.

[Rule 62-212.400(12), F.A.C.]

8. Title V Permit: This permit authorizes specific modifications and/or new construction on the affected emissions units as well as initial operation to determine compliance with conditions of this permit. A Title V operation permit is required for regular operation of the permitted emissions unit. The permittee shall apply for a Title V operation permit at least 90 days prior to expiration of this permit, but no later than 180 days after completing the required work and commencing operation. To apply for a Title V operation permit, the applicant shall submit the appropriate application form, compliance test results, and such additional information as the Department may by law require. The application shall be submitted to the Air Resource Section of the Department's Northeast District Office. [Rules 62-4.030, 62-4.050, 62-4.220, and Chapter 62-213, F.A.C.]

9. Previous Air Construction Permits: This permit supplements all previous permits issued for the affected emissions units. The conditions of this permit satisfy the applicable requirements for the emissions increases related to the project. These conditions supersede corresponding similar conditions specified in previous air construction permits. However, if not specifically regulated by this permit, other standards and permit requirements from previous air construction permits remain valid. The affected emissions units remain subject to all applicable standards and regulations as regulated by the Title V air operation permit. [Rules 62-212.300 and 62-212.400 (BACT), F.A.C.]

A. No. 4 Power Boiler and No. 4 Combination Boiler

This subsection of the permit addresses the following emissions units.

ID	Emission Unit Description
014	No. 4 Power Boiler
016	No. 4 Combination Boiler

{Permitting Note: In accordance with Rule 62-212.400 (PSD), F.A.C., the permittee conducted a PSD netting analysis that used contemporaneous emissions decreases from the permanent shutdown of the No. 4 Power Boiler to avoid PSD preconstruction review for SO_2, SAM, and TRS.}

PERFORMANCE RESTRICTIONS

1. Shutdown: The No. 4 Power Boiler is currently not in operation. As part of this project, the permittee shall permanently shutdown the No. 4 Power Boiler. Within 90 days of issuance of this permit, the permittee shall provide written notice of the permanent shutdown of this unit. [Rules 62-4.070(3) and 62-212.400(12), F.A.C.]

2. PSD Review: The permittee plans to modify the No. 4 Combination Boiler. Although a review is being conducted under Project No. 1070005-045-AC, emissions increases from this unit were included in the PSD netting analysis. That project is also subject to PSD preconstruction review for CO, NO_X, PM, and VOC emissions. [Rule 62-212.400 (PSD), F.A.C.]

3. Oil Firing – No. 4 Combination Boiler: The maximum sulfur content of oil is 2.35% by weight. No more than 5,100,000 gallons of oil shall be fired during any consecutive 12 months. The permittee shall keep records on a monthly basis to ensure compliance with the oil firing restriction. *{Permitting Note: This limits oil firing to an annual capacity factor of approximately 21% of the total maximum heat input rate to the unit.}*

B. No. 5 Power Boiler

This subsection of the permit addresses the following emissions unit.

ID	Emission Unit Description
015	**No. 5 Power Boiler**: This unit fires natural gas to produce steam and power for use at the mill. The permitted capacity is 568.9 MMBtu per hour of heat input to produce approximately 445,200 lb/hour of steam. CO, NO_X and VOC emissions are controlled by the burner design and efficient combustion of natural gas, which also minimizes PM/PM_{10}, SAM and SO_2 emissions. At permitted capacity, the exhaust gas flow rate is 135,400 dscfm at 10% oxygen with an exit temperature of 500° F. Exhaust gases exit a stack that is 9.0 feet in diameter and 156.5 feet tall.

{Permitting Note: In accordance with Rule 62-212.400 (PSD), F.A.C., the above emission unit is subject to BACT determinations for CO and VOC emissions, which are presented in Appendix E of this permit.}

EXISTING APPLICABLE REQUIREMENTS

1. State Rule for Kraft Pulp Mills: The No. 5 Power Boiler is subject to the applicable requirements of Rule 62-296.404, F.A.C. for Kraft Pulp Mills.
2. State Rule for Large Boilers: The No. 5 Power Boiler is subject to the applicable requirements of Rule 62-296.405, F.A.C. for Fossil Fuel Steam Generators with More than 250 MMBtu per hour of Heat Input.
3. NESHAP Subpart S for Kraft Pulp Mills: The No. 5 Power Boiler is subject to the applicable MACT requirements in NESHAP Subpart S in 40 CFR 63.
4. NESHAP Subpart DDDDD for Industrial Boilers: The No. 5 Power Boiler is subject to the applicable requirements for existing units specified in NESHAP Subpart DDDDD of 40 CFR 63 for Industrial, Commercial, and Institutional Boilers and Process Heaters.
5. PCP Exemption: This current permitting action does not affect the previous authorization of Permit No. 1070005-024-AC issued on July 2, 2004 for destroying DNCGs issued as a Pollution Control Project (PCP) pursuant to Rule 62-212.400(2)(a)2.b, F.A.C. That permit specified the strategy for complying with the applicable requirements of the MACT standards in NESHAP Subpart S in 40 CFR 63. That permit authorizes the No. 5 Power Boiler to destroy dilute non-condensable gases (DNCGs) from the high-volume, low-concentration (HVLC) system, which include emissions from brown stock washers, pressure knotters, the bleach plant pre-washer, the oxygen delignification system, and softwood/hardwood high density storage tanks. The DNCGs are introduced with the primary fuel, directed into the flame zone, or added with the combustion air. Optionally, the DNCGs may also be directed to the No. 4 Combination Boiler, which shares common permit conditions with the No. 5 Power Boiler. Permit No. 1070005-024-AC limits SO_2 emissions to 82.6 lb/hour and 236.3 tons per year from the destruction of DNCGs in any combination of the No. 4 Combination Boiler and the No. 5 Power Boiler. [Permit No. 1070005-024-AC; Rule 62-212.400 (PSD), F.A.C.]

MODIFICATIONS AND CAPACITIES

6. Natural Gas Conversion: The permittee shall convert the No. 5 Power Boiler to a natural gas-fired boiler. The permittee shall remove the oil burners and install natural gas burners that will achieve the emissions standards and capacities specified in this permit. If necessary to achieve the NO_X standard, the permittee is authorized to install a flue gas recirculation system consisting of the necessary fans, ductwork, and dampers. The conversion to natural gas shall be completed by April 1, 2008. Once converted to natural gas, the existing electrostatic precipitator may be removed from the No. 5 Power Boiler. It may be used as additional fields for controlling PM emissions from the No. 4 Combination Boiler. [Application No. 1070005-038-AC; Rule 62-212.400 (PSD), F.A.C.]

7. Authorized Fuels: The No. 5 Power Boiler shall be converted to fire pipeline natural gas as the sole fuel. After completing the project, the firing of oil is prohibited. As a control device, the No. 5 Power Boiler is authorized to destroy dilute non-condensable gases (DNCGs) from the high-volume, low-concentration (HVLC) system *{Permitting Note: The No. 5 Power Boiler currently fires oil with a maximum sulfur content of 2.35% by weight. After conversion to natural gas, potential annual SO_2 emissions will be less than 2 tons per year and potential SAM and TRS emissions will be negligible.}* [Application No. 1070005-038-AC; Rule 62-212.400 (PSD), F.A.C.]

8. Permitted Capacity: After converting to natural gas, the permitted capacity of the No. 5 Power Boiler shall be 568.9 MMBtu of heat input per hour based on a 24-hour average. At this heat input rate, the unit will produce approximately 445,200 lb/hour of steam based on a 24-hour average. Hours of operation are not restricted (8760 hours/year). [Application No. 1070005-038-AC; Rules 62-210.200 (PTE) and 62-212.400 (PSD), F.A.C.]

EMISSIONS AND PERFORMANCE STANDARDS

9. CO Standard: As determined by EPA Method 10, CO emissions shall not exceed 0.185 lb per MMBtu of heat input and 105.2 lb/hour based on the average of three test runs. The CO standard serves as a surrogate standard for minimizing VOC emissions as a result of the efficient combustion of natural gas. *{Permitting Note: VOC emissions are expected to be less than 14 tons per year from firing natural gas.}* [Rule 62-212.400 (BACT), F.A.C.]

10. NO_X Standard: As determined by EPA Method 7E, NO_X emissions shall not exceed 0.125 lb/MMBtu of heat input and 71.1 lb/hour based on the average of three test runs. [Rules 62-4.070(3) and 62-212.400(12), F.A.C.]

COMPLIANCE MONITORING AND TESTING

11. Standard Testing Requirements: All required emissions tests shall be conducted in accordance with the requirements specified in Appendix D (Standard Testing Requirements) of this permit. [Rules 62-204.800 and 62-297.100, F.A.C.; and 40 CFR 60, Appendix A]

12. Test Notification: The permittee shall notify the Compliance Authority in writing at least 15 days prior to any required tests. [Rule 62-297.310(7)(a)9, F.A.C.]

13. Test Methods: When required, tests shall be performed in accordance with the following methods.

Method	Description of Method and Comments
1-4	Traverse Points, Velocity and Flow Rate, Gas Analysis, and Moisture Content
7E	Determination of Nitrogen Oxide Emissions from Stationary Sources
10	Determination of Carbon Monoxide Emissions from Stationary Sources {Note: The method shall be based on a continuous sampling train.}
19	Determination of Sulfur Dioxide Removal Efficiency and Particulate Matter, Sulfur Dioxide, and Nitrogen Oxides Emission Rates (Optional F-factor method may be used to determine flow rate and gas analysis to calculate mass emissions in lieu of Methods 1-4.)

Tests shall also be conducted in accordance with the requirements specified in Appendix D (Standard Testing Requirements) of this permit. The above methods are described in 40 CFR 60, Appendix A, and adopted by reference in Rule 62-204.800, F.A.C. [Rules 62-204.800 and 62-297.100, F.A.C.; 40 CFR 60, Appendix A]

14. Initial Stack Tests: In accordance with the specified test methods, the No. 5 Power Boiler shall be tested to demonstrate compliance with the emissions standards for CO and NO_X. Initial stack tests for these pollutants shall be conducted within 60 days after achieving permitted capacity, but not later than 180 days after initial startup on natural gas. All initial tests shall be conducted with the emissions unit operating at 90% to 100% of the permitted capacity; otherwise, this permit shall be modified to reflect the true maximum capacity as constructed. The Department may require the permittee to repeat some or all of the initial stack tests after major replacement or major repair of emissions-related equipment. [Rules 62-4.070(3), 62-212.400(PSD) and 62-297.310(7), F.A.C.]

15. Annual Stack Tests: During each federal fiscal year (October 1st to September 30th), the No. 5 Power Boiler shall be tested to demonstrate compliance with the emission standards for CO and NO_X. Testing of emissions shall be conducted with the emissions unit operating at 90% to 100% of the permitted capacity. If it is impractical to test within this range, the emissions unit may be tested at less than 90% of the maximum permitted capacity. In this case, subsequent emissions unit operation is limited to 110% of the tested rate until a new test is conducted. Once the unit is so limited, operation at higher capacities is allowed for no more than 15 consecutive days for the purpose of additional compliance testing to regain the authority to operate at the permitted capacity. *{Permitting Note: Additional tests may be required by other applicable requirements.}* [Rules 62-4.070(3), 62-212.400(PSD) and 62-297.310(7), F.A.C.]

16. Fuel Monitoring: The permittee shall install equipment to continuously monitor the flow rates of natural gas and DNCGs to the No. 5 Power Boiler. This may consist of fuel flow meters with integrators to monitor each flow rate. [Rules 62-4.070(3) and 62-212.400(12), F.A.C.]

RECORDS AND REPORTS

17. Test Reports: For each required test, the permittee shall file a report with the Compliance Authority on the results of each required test in accordance with the requirements of Rule 62-297.310(8), F.A.C.

18. Monitoring of Capacity: The permittee shall monitor and record the operating rate of the No. 5 Power Boiler on a daily average basis considering the number of hours of operation during each day. This shall be achieved through monitoring daily rates of consumption and heat content of natural gas. The information shall be documented and recorded for each day of operation. Records shall be made available to the Compliance Authority upon request. [Rule 62-4.070(3), F.A.C.]

C. No. 4 Lime Kiln

This subsection of the permit addresses the following emissions unit.

ID	Emission Unit Description
017	**No. 4 Lime Kiln**: This unit recalcines the spent lime cake (calcium carbonate) to produce the quicklime (calcium oxide), which is used to convert the green liquor to cooking liquor. The kiln fires residual fuel oil and has a maximum processing rate of 41.5 tons of material per hour based on a 24-hour average. Particulate matter emissions are controlled by a cyclonic dust collector followed by a wet venturi scrubber. TRS emissions, scrubber pressure drop, and scrubber flow rate are continuously monitored and recorded. At permitted capacity, the exhaust gas flow rate is 54,200 dscfm at 10% oxygen with an exit temperature of 164° F. Exhaust gases exit a stack that is 4.4 feet in diameter and 131 feet tall.

{Permitting Note: In accordance with Rule 62-212.400 (PSD), F.A.C., the above emission unit is subject to BACT determinations for CO and VOC emissions, which are presented in Appendix E of this permit.}

EXISTING APPLICABLE REQUIREMENTS

1. State Rule for Kraft Pulp Mills: The No. 4 Lime Kiln remains subject to the applicable requirements of Rule 62-296.404, F.A.C. for Kraft Pulp Mills.
2. NESHAP Subpart MM for Kraft Pulp Mills: The No. 4 Lime Kiln remains subject to the applicable MACT requirements in NESHAP Subpart S in 40 CFR 63.
3. PSD Permit: Unless otherwise specified by condition in this permit, the No. 4 Lime Kiln remains subject to the applicable requirements of Permit No. PSD-FL-171.

MODIFICATIONS AND CAPACITIES

4. Kiln Modification: For the No. 4 Lime Kiln, the permittee is authorized to replace approximately 62 feet of the hot-end kiln shell and all 10 coolers located in this section. The new coolers will be mounted with an improved bracket design to prevent stress cracks underneath the coolers. [Rule 62-210.300(1), F.A.C.]
5. Permitted Capacity: The maximum processing rate of the No. 4 Lime Kiln is 41.5 tons of lime mud solids per hour based on a 24-hour average. This corresponds to a maximum production rate of 19.4 tons per hour of quicklime. There is no restriction on the hours of operation (8760 hours/year). At permitted capacity, the maximum flue gas flow rate is 54,200 dscfm @ 10% oxygen. The lime kiln typically operates at flue gas oxygen contents in the range of 4% to 6% by volume. [Application No. 1070005-038-AC; Rule 62-210.200 (PTE), F.A.C.]
6. Authorized Fuels: The No. 4 Lime Kiln is authorized to fire residual fuel oil with a maximum fuel sulfur content of 2.35% by weight as the primary fuel. On-specification used oil meeting the requirements in Appendix G of this permit may be blended with the residual oil and fired at a rate of no more than 10% of the fuel consumed. Natural gas is authorized as a startup and alternate fuel. The maximum heat input rate is 140 MMBtu per hour when firing a maximum of 933 gallons per hour of residual oil with a heating value of 150,000 Btu per gallon. No more than 8,173,000 gallons of oil shall be fired during any consecutive 12 months. [Application No. 1070005-038-AC; Rule 62-210.200 (PTE), F.A.C.]

EMISSIONS AND PERFORMANCE STANDARDS

7. CO Standard: As determined by EPA Method 10, CO emissions shall not exceed 69.0 ppmvd at 10% O_2 and 16.3 lb/hour based on the average of three test runs. [Rule 62-212.400 (BACT), F.A.C.]

8. NO_X Standard: As determined by EPA Method 7E, NO_X emissions shall not exceed 140.0 ppmvd at 10% O_2 and 54.2 lb/hour based on the average of three test runs. [Rule 62-212.400 (BACT), F.A.C.]

9. PM Standard: As determined by EPA Method 5, PM emissions from the No. 4 Lime Kiln shall not exceed 0.55 lb per ton of lime mud solids processed and 22.9 lb/hour based on the average of three test runs. *{Permitting Note: The venturi scrubber causes a wet plume, which interferes with the determination of opacity. The scrubber monitoring provisions will be used to ensure proper operation of the venturi scrubber.}* [Rule 62-212.400 (BACT), F.A.C.]

10. SO_2 Standard: As determined by EPA Method 8, SO_2 emissions shall not exceed 16.9 ppmvd at 10% O_2 and 9.1 lb/hour based on the average of three test runs. [Rule 62-212.400(12), F.A.C.]

11. TRS Standard: As determined by the existing CEMS, TRS emissions shall not exceed 25.1 tons per year based on a 12-month rolling CEMS total. [Rule 62-212.400(12), F.A.C.]

12. VOC Standard: As determined by EPA Method 25A, VOC emissions from the lime kiln shall not exceed 70.0 ppmvd at 10% O_2 and 9.4 lb/hour (total hydrocarbons determined as methane) based on the average of three test runs. [Rule 62-212.400 (BACT), F.A.C.]

COMPLIANCE MONITORING AND TESTING

13. Standard Testing Requirements: All required emissions tests shall be conducted in accordance with the requirements specified in Appendix D (Standard Testing Requirements) of this permit. [Rules 62-204.800 and 62-297.100, F.A.C.; and 40 CFR 60, Appendix A]

14. Test Notification: The permittee shall notify the Compliance Authority in writing at least 15 days prior to any required tests. [Rule 62-297.310(7)(a)9, F.A.C.]

15. Test Methods: When required, tests shall be performed in accordance with the following methods.

Method	Description of Method and Comments
1-4	Traverse Points, Velocity and Flow Rate, Gas Analysis, and Moisture Content
5	Determination of Particulate Matter from Stationary Sources
7E	Determination of Nitrogen Oxide Emissions from Stationary Sources
10	Determination of Carbon Monoxide Emissions from Stationary Sources {Note: The method shall be based on a continuous sampling train.}
19	Determination of Sulfur Dioxide Removal Efficiency and Particulate Matter, Sulfur Dioxide, and Nitrogen Oxides Emission Rates (Optional F-factor method may be used to determine flow rate and gas analysis to calculate mass emissions in lieu of Methods 1-4.)
25A	Method for Determining Gaseous Organic Concentrations (Flame Ionization)

Tests shall also be conducted in accordance with the requirements specified in Appendix D (Standard Testing Requirements) of this permit. The above methods are described in 40 CFR 60, Appendix A, and adopted by reference in Rule 62-204.800, F.A.C. [Rules 62-204.800 and 62-297.100, F.A.C.; 40 CFR 60, Appendix A]

16. Initial Compliance Tests: The No. 4 Lime Kiln shall be tested to demonstrate initial compliance with the emissions standards specified for CO, NO_X, PM, SO_2, and VOC. The initial tests shall be conducted within 60 days after completing the kiln modification and achieving permitted capacity, but not later than 180 days after initial operation of the unit. [Rules 62-297.310(7)(a)1 and 62-212.400 (BACT), F.A.C.]

17. Annual Compliance Tests: During each federal fiscal year (October 1st to September 30th), the No. 4 Lime Kiln shall be tested to demonstrate compliance with the emissions standards for CO, NO_X, PM, SO_2, and VOC. If consecutive annual tests for CO or VOC emissions show compliance at 50% of the standard or less, the test frequency for that pollutant is reduced to testing prior to renewal of the operation permit. Annual testing shall resume for any subsequent failure to demonstrate compliance at renewal. [Rules 62-297.310(7)(a)4 and 62-212.400 (BACT), F.A.C.]

18. Tests Prior to Renewal: Within the 12-month period prior to expiration of the operation permit, the No. 4 Lime Kiln shall be tested to demonstrate compliance with the emission standards for CO, NO_X, PM, SO_2, and VOC. [Rules 62-297.310(7)(a)3 and 62-212.400 (BACT), F.A.C.]

19. Scrubber Monitoring: The permittee shall install, operate, and maintain equipment to continuously monitor and record the venturi scrubber pressure drop and flow rate. In accordance with the monitoring requirements specified in NESHAP Subpart MM, minimum operating levels shall be determined for these parameters; however, the operating levels shall be selected to ensure compliance with the BACT standard specified in this permit. If monitors show operation below the minimum operating levels, the permittee shall take appropriate corrective actions to regain proper operation of the control system. [Rules 62-4.070(3) and 62-212.400 (BACT), F.A.C.]

RECORDS AND REPORTS

20. Scrubber Records: The permittee shall continuously monitor and record the venturi scrubber pressure drop and flow rate in accordance with the monitoring requirements specified in NESHAP Subpart MM. The permittee shall document and record corrective actions taken to regain proper operation of the control system if operation falls below the minimum operating levels. [Rules 62-4.070(3) and 62-212.400 (BACT), F.A.C.]

21. Kiln Process Rate: The permittee shall monitor and record the total lime mud solids input to the No. 4 Lime Kiln on an hourly basis and record the daily average in tons per hour. [Rule 62-4.070(3), F.A.C.]

22. Fuel Records: On a monthly basis, the permittee shall document the amount of oil fired during each calendar month and the 12-month rolling total. [Rule 62-4.070(3), F.A.C.]

23. Test Reports: The permittee shall prepare and submit reports for all required tests in accordance with the requirements specified in Appendix D (Standard Testing Requirements) of this permit. For each test run, the report shall also indicate the lime kiln processing rate, the fuel firing rate, the venturi scrubber pressure differential, and the venturi scrubber flow rate. [Rule 62-297.310(8), F.A.C.]

D. No. 4 Recovery Boiler

This subsection of the permit addresses the following emissions unit.

ID	Emission Unit Description
018	**No. 4 Recovery Boiler**: This unit fires black liquor solids (BLS) as the primary fuel to facilitate the recovery of the cooking liquor. Residual fuel oil is fired as a startup and supplemental fuel. The maximum steam production rate is 789,000 lb/hour (24-hour average) for steam conditions of 850° F to 900° F at 1250 psi. Particulate matter emissions are controlled by an electrostatic precipitator (ESP) with automatic voltage control, 2-chambers, and 6 electric fields per chamber. Total reduced sulfur emissions are reduced by the low-odor design. NO_X emissions are controlled by a four-level overfire air system. CO and VOC emissions are controlled by good combustion design and operating practices. CO, NO_X, SO_2, TRS, and opacity are continuously monitored and recorded. At permitted capacity, the exhaust gas flow rate is 294,000 dscfm at 8% oxygen with an exit temperature of 400° F. Exhaust gases exit a stack that is 12 feet in diameter and 230 feet tall.

{Permitting Note: In accordance with Rule 62-212.400 (PSD), F.A.C., the above emission unit is subject to BACT determinations for CO, NO_X, PM, and VOC emissions, which are presented in Appendix E of this permit.}

EXISTING APPLICABLE REGULATIONS

1. State Rule for Kraft Pulp Mills: The No. 4 Recovery Boiler is subject to the applicable requirements for existing units in Rule 62-296.404, F.A.C. These standards are specified in the Title V air operation permit.
2. NESHAP Subpart MM: The No. 4 Recovery Boiler is subject to the applicable requirements specified in NESHAP Subpart MM of 40 CFR 63 for recovery combustion sources at Kraft pulp mills. These standards are specified in the Title V air operation permit.
3. PSD Permits: Unless otherwise specified by condition in this permit, the No. 4 Recovery Boiler remains subject to the applicable requirements of Permit Nos. PSD-FL-171 and PSD-FL-226.

MODIFICATIONS AND CAPACITIES

4. No. 4 Recovery Boiler Modifications: The permittee is authorized to perform the following modifications to the No. 4 Recovery Boiler in accordance with the following preliminary schedule: modify the combustion air system; add a fourth level of overfire air (quaternary air); and replace tubes in the superheater, economizer, and walls of the recovery boiler. These changes will not increase the existing permitted capacity of the recovery boiler or the pulp mill. The preliminary schedule is to begin construction in May of 2007. [Application No. 1010005-038-AC; Rules 62-212.300 and 62-212.400 (PSD), F.A.C.]
5. Capacities, Fuels and Restrictions: The No. 4 Recovery Boiler fires BLS as the primary fuel for the recovery process as well as the following fuels: natural gas as a startup and supplemental fuel; residual fuel oil with a maximum sulfur content of 2.35% by weight; and limited amounts of on-specification used oil meeting the requirements in Appendix G of this permit. The permitted capacity is 210,000 lb/hour of BLS based on a 24-hour average. The maximum consumption of oil (residual oil and on-specification used oil) shall not exceed 7,860,640 gallons during any consecutive 12-months. On-specification used oil shall be blended with residual oil and shall not exceed 10% of the oil consumed. Hours of operation are not restricted (8760 hours/year). *{Permitting Note: The maximum heat input from firing BLS is 1345 MMBtu/hour based on the permitted capacity and an average heating value of 6410 Btu/lb of BLS. The oil firing restriction maintains an annual capacity factor of less than 10% for fossil fuel firing.}* [Application No. 1070005-038-AC; Rules 62-210.200 (PTE) and 62-212.400 (PSD), F.A.C.]

6. Fuel Monitoring: The permittee shall install equipment to continuously monitor the flow rates of all fuels for the No. 4 Recovery Boiler. This may consist of fuel flow meters with integrators to monitor each flow rate. [Rules 62-4.070(3) and 62-212.400 (PSD), F.A.C.]

7. CEMS: To demonstrate compliance with the emissions standards for the No. 4 Recovery Boiler, the permittee shall properly install, calibrate, operate and maintain continuous emissions monitoring systems (CEMS) to measure and record CO and NO_X emissions in the terms of the applicable standard. The systems shall include continuous monitors to determine the flue gas oxygen content and exhaust flow rate. Each CEMS shall be installed such that representative measurements of emissions or process parameters from the facility are obtained. The permittee shall locate the CEMS by following the procedures contained in the applicable performance specification of 40 CFR Part 60, Appendix B. Within 240 calendar days of completing construction of the fourth level of overfire air, the permittee shall install and certify the required CEMS in accordance with the applicable performance specifications identified in Appendix F (Standard Continuous Monitoring Requirements) of this permit. *{Permitting Note: This unit has existing continuous monitors for determining opacity, SO_2 and TRS emissions.}*

   As an alternative to a continuous flow monitor, the permittee may develop a site specific F-factor for BLS in accordance with the following procedure:

   a. Submit a test protocol for approval to the Bureau of Air Regulation for developing a site specific F-factor for BLS.

   b. Upon written approval from the Bureau of Air Regulation, conduct the testing program in accordance with the protocol.

   c. Develop a site-specific F-factor for BLS based on the testing program and operational data.

   d. Submit a report on the testing program to the Bureau of Air Regulation summarizing: the tests conducted, explanations of any deviations from the test protocol, the data collected, the proposed site-specific F-factor for BLS, and an evaluation of the estimated flow rates compared to the actual measured flow rates.

   e. Submit a request for approval to the Bureau of Air Regulation to use the proposed site-specific F-factor for BLS.

   f. Upon written approval by the Bureau of Air Regulation, the permittee may begin using the site-specific F-factor for BLS to determine the exhaust flow rate. If the Bureau of Air Regulation does not approve the site-specific F-factor for BLS, the permittee shall install a continuous flow monitor.

   [Rules 62-4.070(3) and 62-212.400 (PSD), F.A.C.]

EMISSIONS AND PERFORMANCE STANDARDS

8. CO Standards:

   a. After completing installation of the four-level overfire air system, CO emissions shall not exceed 800.0 ppmvd @ 8% O_2 and 1025.4 lb/hour as determined by EPA Method 10 stack testing. *{Permitting Note: Once compliance with this standard is demonstrated and the CO CEMS is certified, this standard becomes obsolete.}*

   b. Once the CO CEMS is certified, compliance shall be determined by data collected from the required CEMS. For the initial 180 calendar days after certifying the CEMS, CO emissions shall not exceed 800.0 ppmvd @ 8% O_2 and 1025.4 lb/hour based on a 30-day rolling CEMS average, excluding periods of startup and shutdown. Thereafter, CO emissions shall not exceed 400.0 ppmvd @ 8% O_2 and 512.7 lb/hour based on a 30-day rolling CEMS average, excluding periods of startup and shutdown. [Rule 62-

212.400 (BACT), F.A.C.]

9. NOx Standards:

   a. After completing installation of the four-level overfire air system, NO_X emissions shall not exceed 80.0 ppmvd @ 8% O_2 and 168.5 lb/hour as determined by EPA Method 10 stack testing. *{Permitting Note: Once compliance with this standard is demonstrated and the NO_X CEMS is certified, this standard becomes obsolete.}*

   b. As determined by data collected from the required CEMS, NO_X emissions shall not exceed 80.0 ppmvd @ 8% O_2 and 168.5 lb/hour based on a 30-day rolling CEMS average, excluding periods of startup and shutdown. [Rule 62-212.400 (BACT), F.A.C.]

10. Opacity Standard: Once the ESP in placed in service during startup of the recovery boiler, visible emissions shall not exceed 20% opacity based on a 6-minute average as determined by the existing COMS and EPA Method 9. [Rule 62-212.400 (BACT), F.A.C.]

11. PM Standard: As determined by EPA Method 5 or 29, PM emissions shall not exceed 0.030 grains per dscf @ 8% O_2 and 75.6 lb/hour based on the average of three test runs. [Rule 62-212.400 (BACT), F.A.C.]

12. SO_2 Standard: As determined by data collected from the existing CEMS, SO_2 emissions shall not exceed 153.9 tons per year based on a 12-month rolling CEMS total. [Rule 62-212.400(12), F.A.C.]

13. TRS Standard: As determined by data collected from the existing CEMS, TRS emissions shall not exceed 34.2 tons per year based on a 12-month rolling CEMS total. [Rule 62-212.400(12), F.A.C.]

14. VOC Standard: As determined by EPA Method 25A, VOC emissions shall not exceed 0.20 lb/ton of BLS and 21.0 lb/hour (THC determined as methane) based on the average of three test runs. [Rule 62-212.400 (BACT), F.A.C.]

15. ESP Operation: The permittee shall operate and maintain the ESP to minimize PM emissions. The permittee may conduct additional stack tests with fields removed from service to determine compliance with the PM and opacity standards for these periods. During such tests, the permittee shall continuously monitor and record the parameters necessary to determine the secondary power input to the ESP. If these tests demonstrate compliance, the permittee is authorized to operate the ESP under the operating conditions of the tests when conducting repairs or maintenance on the ESP. [Rules 62-4.070(3) and 62-212.400 (BACT), F.A.C.]

COMPLIANCE MONITORING AND TESTING

16. Compliance by CEMS: Compliance with the opacity, SO_2, and TRS standards shall be demonstrated with data collected from the existing COMS and CEMS. Compliance with the CO and NO_X standards shall be demonstrated with data collected from the CEMS required by this permit. The permittee shall comply with the conditions of Appendix F (Standard Continuous Monitoring Requirements) of this permit as the compliance method for the corresponding emissions standards. [Rules 62-4.070(3) and 62-212.400 (BACT), F.A.C.]

17. Standard Testing Requirements: All required emissions tests shall be conducted in accordance with the requirements specified in Appendix D (Standard Testing Requirements) of this permit. [Rules 62-204.800 and 62-297.100, F.A.C.; 40 CFR 60, Appendix A]

18. Test Notification: The permittee shall notify the Compliance Authority in writing at least 15 days prior to any required tests. [Rule 62-297.310(7)(a)9, F.A.C.]

19. Test Methods: When required, tests shall be performed in accordance with the following methods.

EPA Method	Description of Method and Comments
1 - 4	Methods for Determining Traverse Points, Velocity, Flow Rate, Gas Analysis, and Moisture Content These methods shall be performed as necessary to support other methods.
5	Method for Determining Particulate Matter Emissions
7E	Method for Determining NOx Emissions (Instrumental)
9	Method for Determining Opacity Observations
10	Method for Determining Carbon Monoxide Emissions (Instrumental) The method shall be based on a continuous sampling train.
19	Methods for Determining NO_X, PM, and SO_2 Mass Emission Rates
25A	Method for Determining Gaseous Organic Concentrations (Flame Ionization)
29	Method for Determining Metals Emissions from Stationary Sources

The above methods are specified in Appendix A of 40 CFR 60 and are adopted by reference in Rule 62-204.800, F.A.C. No other methods may be used unless prior written approval is received from the Department. [Rules 62-4.070(3), 62-204.800(8) and 62-212.400 (BACT), F.A.C.; 40 CFR 60, Appendix A]

20. Compliance Tests: In accordance with the following requirements, the permittee shall have stack tests conducted to demonstrate compliance with the emissions standards specified in this permit for CO, NO_X, PM and VOC.

    a. *Initial Tests*: Initial compliance tests shall be conducted within 60 calendar days of installing the fourth level of overfire air and achieving permitted capacity, but no later than 180 calendar days after initial startup. For the initial CO and NO_X tests prior to certification of the CEMS, the permittee shall demonstrate compliance with at least three hours of data, but no more than nine hours of data. [Rules 62-212.400 (BACT) and 62-297.310(7), F.A.C.]

    b. *Subsequent Tests*: During each federal fiscal year (October 1st to September 30th), compliance tests shall be conducted to determine PM emissions. Because VOC emissions are expected to be low and the CO CEMS will ensure efficient combustion, subsequent tests shall be conducted prior to renewal of the operation permit or when the Department requests a special test pursuant to Rule 62-297.310(7)(b), F.A.C.

    c. *Test Fuel*: Compliance tests shall be conducted when firing BLS at permitted capacity. [Rules 62-4.070(3), 62-212.400 (BACT) and 62-297.310, F.A.C.]

    d. *Operational Data for Tests*: For each test run, the permittee shall monitor and record the following information: fuel feed rate; the secondary power input to the ESP; the flue gas oxygen content (%); CO, NO_X, SO_2 and TRS CEMS data; and opacity COMS data. [Rules 62-297.310 and 62-4.070(3), F.A.C.]

RECORDS AND REPORTS

21. Stack Test Reports: The owner or operator of an emissions unit for which a compliance test is required shall file a report with the Compliance Authority on the results of each such test. The required test report shall be filed with the Compliance Authority as soon as practical but no later than 45 days after the last sampling run of each test is completed. The test report shall provide sufficient detail on the emissions unit tested and the test procedures used to allow the Compliance Authority to determine if the test was properly conducted and the test results properly computed. As a minimum, the test report, other than for an EPA or DEP Method 9 test, shall provide the information specified in Rule 62-297.310(8), F.A.C. The stack test

shall also report all operational data collected during each test run. [Rule 62-297.310(8), F.A.C.]

22. Semiannual Monitoring Reports: The permittee shall submit a written report to the Compliance Authority summarizing the following for each calendar quarter: CO, NO_X, SO_2, and TRS emissions; opacity; CEMS monitor availability; gallons of oil fired; and total hours of operation. The reports shall identify any exceedance of an emissions or performance limitation. The reports are due within 30 days following the second and fourth calendar quarters. [Rule 62-4.070(3), F.A.C.]

E. No. 4 Multiple Effect Evaporator Set

This subsection of the permit addresses the following emissions unit.

ID	Emission Unit Description
037	Thermal Oxidizer handling the Noncondensable Gas System from the No. 4 Multiple Effect Evaporator (MEE) Set

EXISTING APPLICABLE REGULATIONS

1. State Rule for Kraft Pulp Mills: This emissions unit is subject to the applicable requirements for existing units in Rule 62-296.404, F.A.C. These standards are specified in the Title V air operation permit.
2. NSPS Subpart BB: This emissions unit is subject to the applicable requirements specified in NESHAP Subpart BB of 40 CFR 63 for recovery combustion sources at Kraft pulp mills. These standards are specified in the Title V air operation permit.

MODIFICATIONS AND CAPACITIES

3. No. 4 MEE Set: The permittee is authorized to install a new crystallizer and associated storage/flash tank as a modification to the existing multiple effect evaporator (MEE) set with two associated concentrators (EU-032). The purpose is to increase the temperature and flash-off moisture from the black liquor, which will increase the solids content of the BLS from 65% to approximately 75%. The BLS fired in the existing No. 4 Recovery Boiler will contain less moisture. Emissions from the crystallizer and associated storage/flash tank shall be directed back to the MEE set and collected as part of the existing noncondensable gas (NCG) collection system. The preliminary schedule is to begin construction in May of 2007 and startup the new equipment by May of 2008. [Application No. 1010005-038-AC; Rules 62-212.300 and 62-212.400 (PSD), F.A.C.]

APPENDIX C

LABORATORY ACCREDITATION

-LELAP Certificate
-Laboratory Scope of Accreditation

STATE OF LOUISIANA
DEPARTMENT OF ENVIRONMENTAL QUALITY

Is hereby granting a Louisiana Environmental Laboratory Accreditation to:

Ambient Air Services, Inc.
106 Ambient Air Way
Starke, FL 32091

Agency Interest No. 100329

According to the Louisiana Administrative Code, Title 33, Part I, Subpart 3, LABORATORY ACCREDITATION, the State of Louisiana formally recognizes that this laboratory is technically competent to perform the environmental analyses listed on the scope of accreditation detailed in the attachment.

The laboratory agrees to perform all analyses listed on this scope of accreditation according to the Part I, Subpart 3 requirements and acknowledges that continued accreditation is dependent on successful *ongoing compliance* with the applicable requirements of Part I. Please contact the Department of Environmental Quality, Louisiana Environmental Laboratory Accreditation Program (LELAP) to verify the laboratory's scope of accreditation and accreditation status. Accreditation by the State of Louisiana is not an endorsement or a guarantee of validity of the data generated by the laboratory, and does not constitute an endorsement of the suitability of the listed methods for any specific application.

To be accredited initially and maintain accreditation, the laboratory agrees to participate in two single-blind, single-concentration PT studies, where available, per year for each field of testing for which it seeks accreditation or maintains accreditation as required in LAC 33:I.4711.

Melvin C. Mitchell Sr., Accreditation Officer
Louisiana Environmental Laboratory Accreditation Program

Certificate Number: 04064
Expiration Date: June 30, 2008
Issued On: July 1, 2007

Louisiana Environmental Laboratory
LELAP
Accreditation Program

Laboratory Scope of Accreditation

Organization

04064 **(904) 964-8440**

Ambient Air Services Inc.
106 Ambient Air Way
Starke, FL 32091

Louisiana Stack Testing Program Certification

Method Code	Method Ref	Analyte	Status	Date Effective	Type	AA
1217	Method 1 40 CFR 60 App. A	Traverse Points	Accredited	8/4/2003	STATE	LA
1218	Method 10 40 CFR 60 App. A	Carbon monoxide (CO)	Accredited	8/4/2003	STATE	LA
1245	Method 17 40 CFR 60 App. A	Particulates	Accredited	8/4/2003	STATE	LA
1247	Method 19 40 CFR 60 App. A	Nitrogen Oxides (NOx)	Accredited	8/4/2003	STATE	LA
1247	Method 19 40 CFR 60 App. A	Particulates SO2 NOx sulfur removal efficiency	Accredited	8/4/2003	STATE	LA
1247	Method 19 40 CFR 60 App. A	Sulfur dioxide	Accredited	8/4/2003	STATE	LA
1250	Method 20 40 CFR 60 App. A	Nitrogen Oxides (NOx)	Accredited	8/4/2003	STATE	LA
1250	Method 20 40 CFR 60 App. A	Oxygen	Accredited	8/4/2003	STATE	LA
1250	Method 20 40 CFR 60 App. A	Sulfur dioxide	Accredited	8/4/2003	STATE	LA
1251	Method 201A 40 CFR 51 App. M	Particulates <10 um	Accredited	8/4/2003	STATE	LA
1262	Method 22 40 CFR 60 App. A	Visible emissions from coke oven batteries	Accredited	8/4/2003	STATE	LA
1279	Method 3 40 CFR 60 App. A	Carbon dioxide oxygen dry molecular weight	Accredited	8/4/2003	STATE	LA
1296	Method 3A 40 CFR 60 App. A	Carbon dioxide	Accredited	8/4/2003	STATE	LA
1295	Method 3A 40 CFR 60 App. A	Oxygen	Accredited	8/4/2003	STATE	LA
1302	Method 4 40 CFR 60 App. A	Moisture content	Accredited	8/4/2003	STATE	LA
1303	Method 5 40 CFR 60 App. A	Particulates	Accredited	8/4/2003	STATE	LA
1304	Method 5A 40 CFR 60 App. A	Particulates from asphalt processing	Accredited	8/4/2003	STATE	LA
1305	Method 5B 40 CFR 60 App. A	Particulates	Accredited	8/4/2003	STATE	LA
1306	Method 5D 40 CFR 60 App. A	Particulates from fabric filters	Accredited	8/4/2003	STATE	LA
1312	Method 6 40 CFR 60 App. A	Sulfur dioxide	Accredited	8/4/2003	STATE	LA
1315	Method 6C 40 CFR 60 App. A	Sulfur dioxide	Accredited	8/4/2003	STATE	LA
1321	Method 7E 40 CFR 60 App. A	Nitrogen Oxides (NOx)	Accredited	8/4/2003	STATE	LA
1322	Method 8 40 CFR 60 App. A	Sulfur dioxide	Accredited	8/4/2003	STATE	LA
1322	Method 8 40 CFR 60 App. A	Sulfuric Acid Mist	Accredited	8/4/2003	STATE	LA
1323	Method 9 40 CFR 60 App. A	Opacity	Accredited	8/4/2003	STATE	LA
1761	Method 101A 40 CFR 61 App. B (Sample Only)	Mercury	Accredited	8/4/2003	STATE	LA
1793	Method 12 40 CFR 60 App. A (Sample Only)	Lead	Accredited	8/4/2003	STATE	LA

Issue Date: July 1, 2007
Expiration Date: June 30, 2008

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Louisiana Environmental Laboratory
LELAP
Accreditation Program

Laboratory Scope of Accreditation

Organization

04064 **(904) 964-8440**

Ambient Air Services Inc.
106 Ambient Air Way
Starke, FL 32091

Louisiana Stack Testing Program Certification

Method Code	Method Ref	Analyte	Status	Date Effective	Type	AA
1795	Method 13A 40 CFR 60 App. A (Sample Only)	Fluoride	Accredited	8/4/2003	STATE	LA
1797	Method 13B 40 CFR 60 App. A (Sample Only)	Fluoride	Accredited	8/4/2003	STATE	LA
1805	Method 16 40 CFR 60 App. A (Sample Only)	Dimethyl Disulfide	Accredited	8/4/2003	STATE	LA
1805	Method 16 40 CFR 60 App. A (Sample Only)	Dimethyl Sulfide	Accredited	8/4/2003	STATE	LA
1805	Method 16 40 CFR 60 App. A (Sample Only)	Hydrogen sulfide	Accredited	8/4/2003	STATE	LA
1805	Method 16 40 CFR 60 App. A (Sample Only)	Methyl Mercaptan	Accredited	8/4/2003	STATE	LA
1819	Method 2 40 CFR 60 App. A (Sample Only)	Stack gas velocity volume flow rate	Accredited	8/4/2003	STATE	LA
1851	Method 25A 40 CFR 60 App. A (Sample Only)	Gaseous Organic Emissions	Accredited	8/4/2003	STATE	LA
1861	Method 29 40 CFR 60 App. A (Sample Only)	Antimony	Accredited	8/4/2003	STATE	LA
1861	Method 29 40 CFR 60 App. A (Sample Only)	Arsenic	Accredited	8/4/2003	STATE	LA
1861	Method 29 40 CFR 60 App. A (Sample Only)	Barium	Accredited	8/4/2003	STATE	LA
1861	Method 29 40 CFR 60 App. A (Sample Only)	Beryllium	Accredited	8/4/2003	STATE	LA
1861	Method 29 40 CFR 60 App. A (Sample Only)	Cadmium	Accredited	8/4/2003	STATE	LA
1861	Method 29 40 CFR 60 App. A (Sample Only)	Chromium	Accredited	8/4/2003	STATE	LA
1861	Method 29 40 CFR 60 App. A (Sample Only)	Cobalt	Accredited	8/4/2003	STATE	LA
1861	Method 29 40 CFR 60 App. A (Sample Only)	Copper	Accredited	8/4/2003	STATE	LA
1861	Method 29 40 CFR 60 App. A (Sample Only)	Lead	Accredited	8/4/2003	STATE	LA
1861	Method 29 40 CFR 60 App. A (Sample Only)	Manganese	Accredited	8/4/2003	STATE	LA
1861	Method 29 40 CFR 60 App. A (Sample Only)	Mercury	Accredited	8/4/2003	STATE	LA
1861	Method 29 40 CFR 60 App. A (Sample Only)	Nickel	Accredited	8/4/2003	STATE	LA
1861	Method 29 40 CFR 60 App. A (Sample Only)	Phosphorus total	Accredited	8/4/2003	STATE	LA
1861	Method 29 40 CFR 60 App. A (Sample Only)	Selenium	Accredited	8/4/2003	STATE	LA
1861	Method 29 40 CFR 60 App. A (Sample Only)	Silver	Accredited	8/4/2003	STATE	LA
1861	Method 29 40 CFR 60 App. A (Sample Only)	Thallium	Accredited	8/4/2003	STATE	LA
1861	Method 29 40 CFR 60 App. A (Sample Only)	Zinc	Accredited	8/4/2003	STATE	LA
1889	Method 308 40 CFR 63 App. A (Sample Only)	Methanol	Accredited	8/4/2003	STATE	LA
2032	Method 5C 40 CFR 60 APP. A	Particulate Emissions.	Accredited	8/4/2003	STATE	LA

Issue Date: July 1, 2007
Expiration Date: June 30, 2008

Print Date 6/20/2007 11:13:48 AM

APPENDIX C

PROCESS DATA

GEORGIA-PACIFIC PALATKA OPERATIONS

#4 RECOVERY BOILER STACK TEST - BLS F-FACTOR

BLACK LIQUOR SOLIDS FIRING RATES

TEST 1 - HIGH LOAD CONDITION

PI Tag	68prodctl:prctlr.meas	68prodctl:prctlr.meas	68prodctl:prctlr.meas	
	RUN 1	RUN 2	RUN 3	High-Load Average
	BLS	BLS	BLS	BLS
	MMLB/DAY	MMLB/DAY	MMLB/DAY	MMLB/DAY
start time	4/7/08 9:00	4/7/08 10:10	4/7/08 13:00	TEST 1
end time	4/7/08 10:00	4/7/08 11:10	4/7/08 14:00	
AVG BLS	5.03	5.00	4.99	5.01
Lbs/Hr	209563	208244	207830	208546

TEST 2 - MID LOAD CONDITION

PI Tag	68prodctl:prctlr.meas	68prodctl:prctlr.meas	68prodctl:prctlr.meas	
	RUN 1	RUN 2	RUN 3	MID-Load Average
	BLS	BLS	BLS	BLS
	MMLB/DAY	MMLB/DAY	MMLB/DAY	MMLB/DAY
start time	4/7/08 14:40	4/7/08 15:50	4/7/08 17:00	TEST 2
end time	4/7/08 15:40	4/7/08 16:50	4/7/08 18:00	
AVG BLS	4.37	4.37	4.40	4.38
Lbs/Hr	182285	182045	183142	182491

TEST 3 - LOW LOAD CONDITION

PI Tag	68prodctl:prctlr.meas	68prodctl:prctlr.meas	68prodctl:prctlr.meas	
	RUN 1	RUN 2	RUN 3	MID-Load Average
	BLS	BLS	BLS	BLS
	MMLB/DAY	MMLB/DAY	MMLB/DAY	MMLB/DAY
start time	4/11/08 13:10	4/11/08 14:25	4/11/08 15:35	TEST 3
end time	4/11/08 14:10	4/11/08 15:25	4/11/08 16:35	
AVG BLS	4.00	4.01	4.02	4.01
Lbs/Hr	166800	167031	167432	167088