Georgia-Pacific

Palatka Pulp and Paper Operations
Consumer Products Division

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

January 3, 2003

Mr. Syed Arif
State of Florida
Department of Environmental Protection
2600 Blair Stone Road
Twin Towers Office Building
Tallahassee, Florida 32399

Re: DEP File No. 1070005-019-AC (PSD-FL-264A)
Georgia-Pacific Palatka Operations
No. 3 Bleach Plant

Dear Mr. Arif,

The following is in response to your request for additional information dated November 26, 2002. Please note that the items are listed in the same order as in the letter mentioned above for convenience.

1. **Request**: *Please provide the total pulp production at the facility for the years 1999, 2000 and 2001. Also, give a breakdown of where this pulp was utilized in the facility (bleached and unbleached areas). Additionally, provide a detailed accounting of this pulp when utilized in the tissue-making mill. If additional pulp was bought during those years, please include that in the accounting. The Department is expecting a complete material balance of the pulp produced in the facility and the pulp bought by the facility when compared to the material shipped from the facility.*

   Response: Please see Table 1 (see Attachment A). Note that pulp produced is back calculated from actual paper machine production. The mill also purchases both pulp and finished tissue in "parent" rolls. The purchased pulp, along with the virgin pulp, is utilized in manufacturing product at the Palatka Mill. The tissue "parent" rolls are converted into finished goods at the Mill – these rolls are only processed in the converting area of the Mill and do not add additional production to the pulp mill, bleach plant, or machine areas.

2. **Request**: *Please give a detailed accounting of how much of softwood and hardwood was utilized in the total pulp production at the facility for the years 1999, 2000 and 2001. How are the two types of woods segregated when feeding*

to the digesters? How is the pulp kept segregated and is there any blending of the pulp taking place prior to making final product.

Response: Please see Table 1. Hardwood and softwood chips are segregated into different chip silos prior to use, and are cooked separately in the digesters. The subsequent pulp is also segregated by species in different high-density pulp storage towers and is blended just prior to the paper machines as needed for the various paper grades.

3. **Request**: *During the plant trip on November 12, the No. 3 Bleach Plant was operating at 30 tph. Please indicate if the production rate was 30 ADTBP per hour.*

   Response: The production rate was 30 unbleached oven-dry standard tons per hour as measured going into the pre-bleach washer.

4. **Request**: *During the plant trip on November 12, the facility personnel talked about a chart at the No. 3 Bleach Plant presentation, which indicated reduced usage of* ClO_2 *and increased usage of oxygen and hydrogen peroxide to get the same bleach ability. If testing was done to authenticate this fact, please provide the necessary documents. Also, provide a detailed written description as well as the chart showed to the Department.*

   Response: No lab simulated testing was done to authenticate the results of the work done in reducing ClO_2 by using more hydrogen peroxide. No permanent changes to oxygen application rates were made during this time period based on trial and error results. The results presented were based on lb/ton application rates as measured by the inline instrumentation, and were obtained by trial and error experimentation.

   Charts 1 and 2 below illustrate the trial and error work that was completed, demonstrating a shift of work from ClO_2 in the first stage to hydrogen peroxide in the second stage. The last six weeks of data that were in the original presentation have been omitted due to an instrumentation failure that was identified subsequent to DEP's visit. (note, this paragraph needs to be indented to match the prior paragraph)

5. **Request**: *Please indicate if 100% of softwood pulp or 100% of hardwood pulp is processed through the bleach plant at any given time. Are there occasions when a mix of the two types of wood pulp is processed at the same time? What indicators are available in the control room to help the operators know what type and how much of either hardwood or softwood pulp is being processed.*

   Response: Softwood and hardwood are almost always processed in the bleach plant separately and are never intentionally mixed. However, the grade mix required by the machines requires the bleach plant to make frequent species changes. Therefore, it is not uncommon for more than one species to be in different stages of bleaching within the bleach plant at a given point in time. The bleach plant was designed to minimize mixing; however, there is a small amount of inadvertent mixing (typically 10~20 ADTBP) that occurs with each transition. The operators are able to approximately monitor the location of each species volumetrically in the bleach plant by tracking the origin of the pulp flow since the pulp is segregated in different pulp storage towers. This allows the distributed control system (DCS) to display the current species in each sequence of bleaching, allowing the operator to make adjustments as required.

6. **Request**: *Please explain how the ClO_2 application rate to the pulp is monitored. If data is kept on the application rate, how often is it recorded?*

   Response: Both the ClO_2 flow rate and strength are measured continuously by inline instrumentation. The pulp tonnage rate is measured by inline flow and consistency measurement instrumentation as well. This information is then converted into a lb/ton application rate. Operators record ClO_2 application information on their log sheets on an hourly basis during normal operation.

7. **Request**: *Please provide a copy of the initial and annual compliance tests done for this plant. The report should include information on the production rate of the bleach plant during the compliance tests.*

   Response: The reports are attached (Attachment B).

8. **Request**: *The Department is in receipt of daily pulp production data covering a period from January 2000 until October 2002 (34 months). The daily bleached pulp production data indicates a highest daily production rate of 1197.9 tons on June 30, 2002, and a highest monthly average of 884 tons per day in September 2002. Please explain the reasons for not achieving the permitted production rates of 1702 tons daily maximum and 1350 tons per day monthly average for the No. 3 Bleach Plant.*

   Response: The Bleach Plant, as built, is capable of producing 1440 bleached air-dry standard tons per day rather than the initial design rate of 1702 tons per day. As such, this update has been reflected in the more recent application.

Current grade mix on the paper machines does not require us to produce at the "as built", maximum rate. However, market conditions change frequently based on customer preferences and economic conditions. Therefore, the bleach plant was designed and built to meet these changing market conditions, and G-P wishes to be permitted for such operations.

9. **Request**: *Please provide detail test reports of the series of tests conducted in October 2002 to measure actual CO emissions from the plant.*

   Response: See Attachment C.

10. **Request**: *Please provide the ClO_2 application rate for the series of tests conducted in October 2002.*

    Response: See Attachment C. (See yellow page).

11. **Request**: *Please list the pertinent information (% ClO_2 applied, kappa number, temperature etc.) that a compliance inspector should gather during an inspection of a bleach plant to ensure that the source is complying with the permitted CO emission limits. How will these parameters or others provide assurance that the limit is not exceeded?*

    Response: Emissions data for carbon monoxide emissions from bleach plant scrubbers first became available to the pulp and paper industry through the National Council for Air and Stream Improvement, Inc. (NCASI). NCASI Technical Bulletin 760 (TB 760) (July 1998) provides information on carbon monoxide emissions associated with oxygen delignification and chlorine dioxide bleaching of wood pulp. In numerous sections of the document, NCASI repeatedly states that the operating parameter correlations are not strong, and in many cases are non-existent (in the case of hardwood bleaching). For example, in the Introduction to TB 760, it is stated that, "Data from mill-conducted tests for CO emissions from 14 bleach plants at kraft pulp mills have already been reported in NCASI Technical Bulletin No. 701 (NCASI 1995). These data showed tremendous variability between mills, with CO emissions ranging from 0.003 to 1.73 lb per air dry ton of bleached pulp (lb/ADTBP). The causes for this variability were, however, unclear."

    Further, later in TB 760, when comparing CO emissions between two mills (Mills B and C),NCASI specifically states that, "The magnitude of CO emissions at Mill C appear comparable to those recorded at Mill B. This is in spite of ClO_2 application rates in this mill being less than half of those at Mill B." In the concluding paragraph of this same section, NCASI states that, "The available literature suggests that the lignin content of the brownstock entering the bleach plant and the ClO_2 charge would be the two main parameters controlling CO formation. However, since the ClO_2 charge for a desired pulp brightness is determined by the lignin content or kappa number of pulp entering the bleaching sequence, the ClO_2 charge by itself would be expected to be the controlling parameter in CO formation...A general trend of increasing CO emissions with increasing percent ClO_2 applied is seen, but the correlation is not strong".

In recent conversations, NCASI staff have strongly discouraged Georgia-Pacific from using the NCASI data from TB 760 in establishing emission factors. In TB 760, NCASI has attempted to simply present data for varying operating configurations (*e.g.*, bleach plant stages/configurations, percent chlorine dioxide applied, wood species, presence/absence of oxygen delignification, etc.). While some trends appear, as they state clearly and repeatedly in TB 760, the correlations are not strong.

Given this information, and general lack of data, Georgia-Pacific feels strongly that it is not appropriate to establish parametric values to be used in demonstrating compliance. This is not only supported by testing at the Palatka Mill, but by the full array of mills that was tested by NCASI. Georgia-Pacific feels that the annual stack-testing requirement should be sufficient to demonstrate compliance with the emission limit. If additional information becomes available in the industry in the future, indicating that the correlations are stronger, it might be possible to revisit this possibility. However, at this time, the correlations are simply not developed.

For the same reasons stated above (*e.g.*, lack of correlation with operating parameters), Georgia-Pacific felt that it was necessary to incorporate a safety margin into the emission factors that were utilized in the permit application. TB 760 indicates that, for given testing scenarios and runs, the emission values can vary considerably - the standard deviations that are presented in TB 760 are often very high.

12. **Request**: *Please explain if there is a nexus between ClO_2 application rate and HAP emissions from a bleach plant. If a nexus exists, how is it being applied to keep HAP emissions to a minimum from the plant?*

    Response: In attempting to answer this question, Georgia-Pacific has reviewed various literature that is readily available in the industry, primarily through NCASI. NCASI Technical Bulletin 701 (TB 701) states that, "Volatile organic and chlorinated compounds most prominent in bleach plant emissions included Cl_2, ClO_2, methanol (CH_3OH) and chloroform ($CHCl_3$)". Of these, only ClO_2 is not a regulated hazardous air pollutant (HAP) under Section 112(d) of the Clean Air Act.

    For the most prominent of these, methanol, TB 701 states that, "Emissions of methanol from bleach plant vents are affected by various factors including (a) the type of wood pulped (hardwood vs softwood), (b) O_2 delignification preceding the bleach plant, (c) percent substitution by ClO_2, (d) amount of methanol in ClO_2 solution used in bleaching, and (e) degree of removal of methanol from pulp in brownstock washing." NCASI does not identify ClO_2 application rate as a contributing factor to methanol formation. In Technical Bulletin 666 (TB 666), NCASI discusses some of these other factors in more detail. For example, with regard to ClO_2 substitution rate, TB 666 states that, "These data show, however, that when the impact of methanol entering with the pulp and the ClO_2 liquor was eliminated, the amount of methanol generated in the bleach plant decreased with increasing levels of ClO_2 substitution. This decrease in methanol formation was gradual up to 70 percent ClO_2 substitution but was very significant at 100 percent ClO_2 substitution". The Cluster Rule targets methanol emission reductions at the brownstock washers. Therefore, we expect that the quantity of methanol entering the bleach plant with the pulp will be reduced as the Cluster Rule is fully implemented at the Palatka Mill (by April 2006).

For chloroform, TB 701 states that, "The bleaching sequence (which influences the bleaching chemicals used) and level of bleaching (final brightness) are expected to affect emissions of Cl_2, ClO_2, and $CHCl_3$...The use of hypochlorite is perhaps the single largest factor influencing the formation and emission of $CHCl_3$ from bleach plant vents". The preamble to the Cluster Rule, which is targeted at reducing HAPs in the bleach plant and other mill areas, states that, "...the technology basis for MACT control of chloroform is complete chlorine dioxide substitution and elimination of hypochlorite as a bleaching agent. These process modifications were determined to reduce chloroform emissions significantly". Again, there is confirmation of the fact that the primary contributor to the formation of chloroform, a chlorinated HAP, is the use of hypochlorite in bleaching. In order to comply with the MACT/Cluster Rule requirements for reducing HAPs, the Palatka Mill practices 100 percent chlorine dioxide substitution. Hypochlorite bleaching is not utilized. Variation in ClO_2 application rate was not identified by NCASI or EPA (as part of the MACT development process) as a significant contributing factor to the formation or reduction of chloroform. It should also be noted that the Cluster Rule establishes a very tight control level for chlorinated HAPs of 0.002 pound per ton of oven-dried pulp (lb/ODTP). Based on recent testing, measured levels at the Palatka Mill were roughly an order of magnitude lower.

13. **Request**: *Please explain how the quantity of lignin in the pulp entering the bleach plant is being monitored and what role, if any, is that playing in the ClO_2 application rate.*

Response: Kappa number has been proven to be a good relative indicator of lignin content in pulp. An inline kappa analyzer measures the kappa number of the pulp entering the bleach plant. The DCS uses this kappa measurement as one of the criteria for determining ClO_2 application rate, but final pulp brightness is the principal parameter used to control the operation of the Bleach Plant. (question – do we want to say something about the fact that final pulp brightness is something that is dictated by the customer and the specific product being manufactured.

14. **Request**: *The application pages under Section I, Page 20 proposes 3-hour average basis for monitoring pH of the gas scrubbing medium, fan amperage of the bleaching system vent gas fan and the scrubber recirculation flow. Please indicate if continuous monitoring of these parameters is required in 40 CFR 60, Subpart S. If so, EPA will have to approve this request.*

    Response: Continuous monitoring is required by 40 CFR 63.453 (c). Paragraph (n) of this same section requires that the Administrator approve the rationale for the selected operating parameter value, and monitoring frequency, and averaging time. Attachment C includes information provided to both the Department and the Administrator relative to this provision. The Northeast District worked with EPA on specific language in the draft Title V Permit Revision recently provided to us incorporating the parameter values, monitoring frequency, and averaging time (see Attachment D).

The responses to the remaining items (Nos. 15-20) in your letter dated November 26, 2002 will be provided under separate cover. We have contracted with an outside engineering firm to finalize our BACT analysis and expect to have the final response to the Department by February 1, 2003.

With the "completed responses" provided above, and those regarding the BACT analysis to be provided by February 1, we believe we will have fulfilled our obligation to submit a "complete application" no later than February 1, as required by paragraph 17 of the November 8, 2002 Consent Order and consistent with Rules 62-212.400 and 62-4.055. Please let me know promptly if the Department disagrees, so that we can consider whether we need to seek an extension to the Consent Order deadline.

If you have any further questions, please do not hesitate to call me at (386) 329-0918.

Sincerely,

Myra J. Carpenter

Myra J. Carpenter
Environmental Superintendent

Cc: W.M. Jernigan
T. Wyles
M. Aguilar
S.Matchett

C. Kirts, NED
G. Little, EPA
J. Bunyak, NPS

Attachment A

Attachment B

Georgia-Pacific

Palatka Pulp and Paper Operations
Consumer Products Division

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

November 13, 2002

VIA FAX (904) 448-4363

Mr Christopher L Kirts, P E
State of Florida
Department of Environmental Protection
7825 Baymeadows Way, Suite 200B
Jacksonville, Florida 32256-7590

RE Georgia-Pacific Corporation
Facility 1070005

Dear Mr Kirts

As you know, the Palatka mill conducted an initial performance test on the bleach plant scrubber stack in May 2001 and submitted the throughput rates and stack test results to the Department on June 11, 2001. The mill's submittal did not include other detailed information about chemical application rates, Kappa number, or the specific production mix (in terms of hardwood/softwood) being run at the time.

Enclosed is a table that contains additional information about the three test runs from that event. Also enclosed is a stack test report from the first three stack tests that were conducted during the week of October 28, 2002. Georgia-Pacific considers information about its chemical application rates, Kappa number, and other detailed production parameters to be confidential business information, pursuant to Section 403.111, F.S. This data relates to secret processes or secret methods of manufacture or production and is exempted from the public records act. G-P respectfully requests that you not copy or distribute it except to others in DEP who need to see it.

I hereby certify, based on the information and belief formed after reasonable inquiry, that the statements made and data contained in this document are true, accurate, and complete.

Feel free to call Myra Carpenter if you have any questions about this information. She can be reached at (386) 329-0918.

Sincerely,

Theodore D. Kennedy

Theodore D Kennedy
Vice President

tk

cc A. M Jernigan
S Matchett

TSI

TECHNICAL SERVICES, INC.
(904) 353-5761
2901 Danese Street
Jacksonville, Florida 32206

Source Test Report

Georgia Pacific
Palatka, FL

Bleach Plant Outlet

5/25/01

Prepared By:

Technical Services, Inc.
2901 Danese Street
Post Office Box 52329
Jacksonville, Florida 32201
(904) 353 - 5761

David Salter
David Salter

USE OF THIS REPORT AND INFORMATION INCLUDED

This Report and the information contained is the property of the individual or organization named on the face hereof and may be freely distributed in its present form.

REPORT CERTIFICATION

Technical Services, Inc. (TSI) has used its professional experience and best professional efforts in performing this compliance test. I have reviewed the results of these tests and to the best of my knowledge and belief they are true and correct.

REPORT NO. 0104A07

Harvey C. Gray, Jr.

HARVEY C. GRAY, JR.
DATE:

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I. Introduction

Compliance testing for Chlorinated Haps emissions and Carbon Monoxide emissions from the Bleach Plant Scrubber, located at the Georgia Pacific Paper facility in Palatka, FL., was performed on May 25th, 2001. Three (3) test runs, each lasting one (1) hour, were completed on this source for both tests.

Testing and analytical procedures were in accordance with EPA's Methods ten (10), twenty-six (26A), and Florida DEP requirements.

We wish to express our appreciation to Mr. Joe Taylor and the operating staff at Georgia Pacific for their valuable assistance in the successful completion of this project.

II. Summary and Discussion of Results

Results of the compliance tests are summarized in the following tables. Complete emissions data, along with supportive field and analytical data, are included in Appendices A, B, C, and G.

The Bleach Plant Scrubber was within compliance during the tests. The average emissions for Chlorinated Haps were 0.0089 lbs/hr, with an allowable emissions of 0.36 lbs/hr. The average emissions for Carbon Monoxide were 44.72 lbs/hr, with an allowable emissions of 46.0 lbs/hr.

TSI

Volumetric Flow and Emission Output - Table I

FACILITY: Georgia Pacific
LOCATION: Palatka, FL

SOURCE: Bleach Plant Outlet

Date	Run Number	Chlorinated Haps Emissions GR/SCF	LB/HR	ppm, vol.	Vol. Flow Rate ACFM	SCFMD	Adjusted Volume SCFD	Percent H20	Percent Isokinetic
5/25/01	1	0.00008	0.0098	0.13	15440.0	14275.0	35.391	4.6	96.4
5/25/01	2	0.00007	0.0083	0.11	15256.0	14178.0	36.388	5.1	99.8
5/25/01	3	0.00007	0.0084	0.11	15409.0	14413.0	36.716	5.4	99.0
Mean		0.00007	0.0089	0.12	15368.3	14288.7	36.165	5.0	98.4

Mean determined as arithmetic average of the results for each of the three runs.

REMARKS: MACT requires <10 ppm chlorinated HAPs

GEORGIA PACIFIC - PALATKA, FLORIDA BLEACH PLANT - SUMMARY OF CARBON MONOXIDE RESULTS - MAY 25 - 26, 2001

	START TIME	END TIME	STACK FLOW scfmd	CARBON MONOXIDE, ppm	CARBON MONOXIDE, lbs/hr
RUN 1	21:50	22:49	14183	670.4	41.5
RUN 2	23:02	0:01	14406	766.3	48.2
RUN 3A	0:12	2:13	14331	712.0	44.5
TEST AVERAGE			**14307**	**716.2**	**44.7**

NOTE - DURING TEST RUN NUMBER THREE THE Eop MIXER TRIPPED. THE BLEACH PLANT PRODUCTION DECREASED AND THE TEST WAS SUSPENDED. ONCE NORMAL PRODUCTION RESUMED THE TEST RESTARTED.

III. Process Description And Operation

III. Process Description and Operation

The bleaching process is an elemental chlorine-free (ECF) process. The CLO2 is produced on site.

The bleaching process consists of the staged introduction of CLO2 to the pulp slurry followed by washing of the bleached pulp. The off gases from all stages of the process are collected and passed through a wet scrubber utilizing an alkaline scrubbing solution.

IV. Sampling Point Location

T S I

Table III
Air Report - Sampling Point Locations

Facility Georgia Pacific
Location Palatka, FL
Source Name Bleach Plant Outlet

Stack Interior Diameter = 42.00 inches

Sample Point Number	Inches Inside Stack Wall
1	1.85
2	6.13
3	12.43
4	29.57
5	35.87
6	40.15

Port Length 7 inches

Distances From Nearest Disturbance

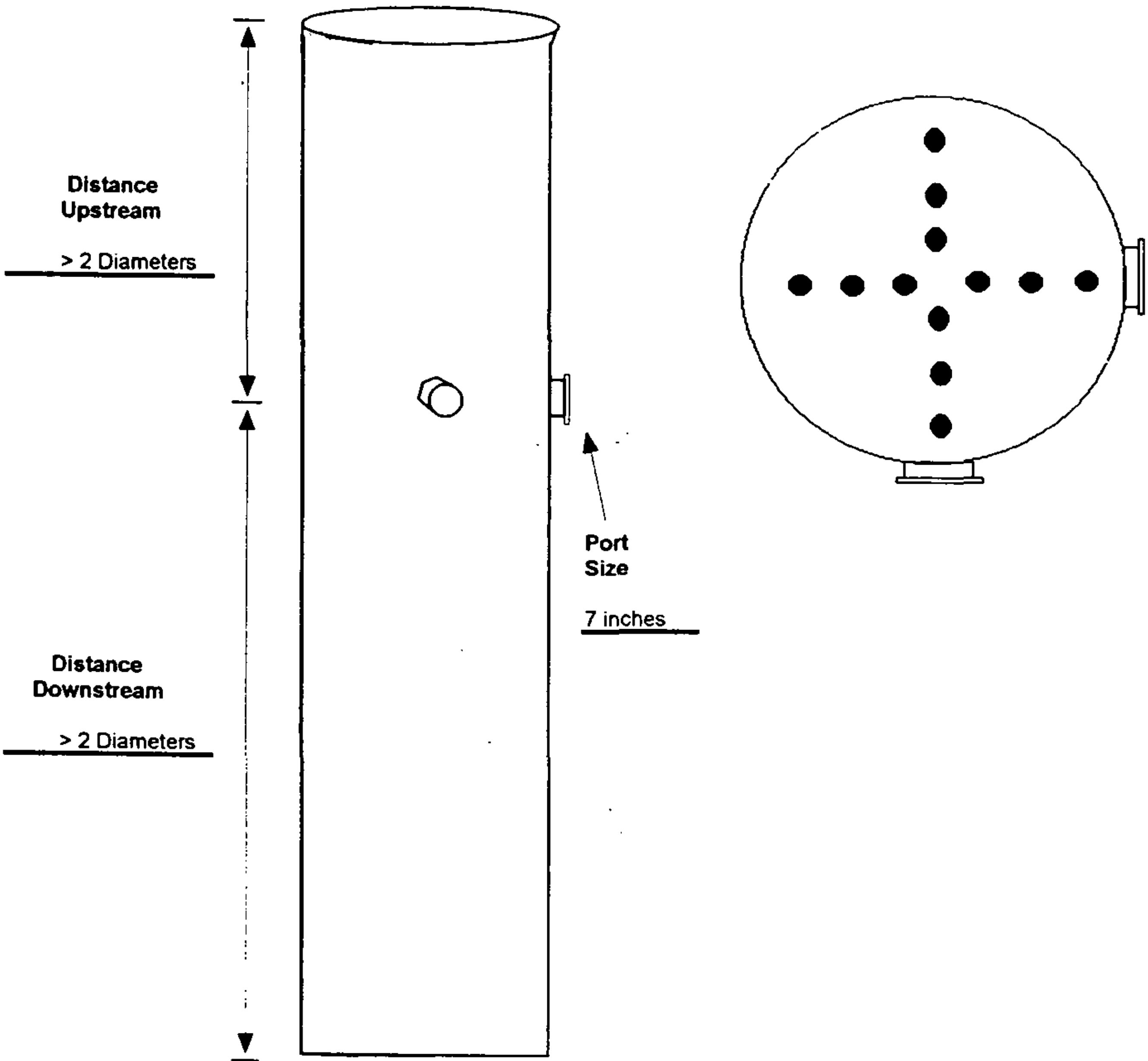
Source	Stack Distance
Downstream - - - - - - - - - - - - - - - - - - -	> 8 diameters
Upstream -	> 2 Diameters

The above mentioned Downstream and Upstream distances are approximate distances.

TSI

Air Report - Sampling Port Location Diagram

Facility	Georgia Pacific	Date	
Location	Palatka, FL		
Source	Bleach Plant Outlet		



V. Field And Analytical Procedures

METHOD 10

DETERMINATION OF CARBON MONOXIDE EMISSIONS FROM STATIONARY SOURCES

1. Principle and Applicability

1.1 Principle. An integrated or continuous gas sample is extracted from a sampling point and analyzed for carbon monoxide (CO) content using a Luft-type nondispersive infrared analyzer (NDIR) or equivalent.

1.2 Applicability. This method is applicable for the determination of carbon monoxide emissions from stationary sources only when specified by the test procedures contained in this text or otherwise specified by the Director. The test procedure will indicate whether a continuous or an integrated sample is to be used.

2. Range and Sensitivity

2.1 Range. 0 to 1,000 ppm.

2.2 Sensitivity. Minimum detectable concentration is 20 ppm for a 0 to 1,000 ppm span.

3. Interferences

Any substance having a strong absorption of infrared energy will interfere to some extent. For example, discrimination ratios for water (H_2O) and carbon dioxide (CO_2) are 3.5 percent H_2O per 7 ppm CO and 10 percent CO_2 per 10 ppm CO, respectively, for devices measuring in the 1,500 to 3,000 ppm range. For devices measuring in the 0 to 100 ppm range, interference ratios can be as high as 3.5 percent H2O per 25 ppm CO and 10 percent CO2 per 50 ppm CO. The use of silica gel and ascarite traps will alleviate the major interference problems. The measured gas volume must be corrected if these traps are used.

4. Precision and Accuracy

4.1 Precision. The precision of most NDIR analyzers is approximately ± 2 percent of span.

4.2 Accuracy. The accuracy of most NDIR analyzers is approximately ± 5 percent of span after calibration.

5. Apparatus

5.1 Continuous sample (Figure 10-1).

5.1.1 Probe. Stainless steel or sheathed Pyrex glass, equipped with a filter to remove particulate matter.

5.1.2 Air-cooler condenser or equivalent. To remove any excess moisture.

5.2 Integrated sample (Figure 10.2).

5.2.1 Probe. Stainless steel or sheathed Pyrex glass, equipped with a filter to remove particulate matter.

5.2.2 Air-cooler condenser or equivalent. To remove any excess moisture.

5.2.3 Valve. Needle valve, or equivalent, to adjust flow rate.

5.2.4 Pump. Leak-free diaphragm type, or equivalent, to transport gas.

5.2.5 Rate meter. Rotameter, or equivalent, to measure a flow range from 0 to 1.0 liter per min. (0.035 cfm).

5.2.6 Flexible bag. Tedlar, or equivalent, with a capacity of 60 to 90 liters (2 to 3 ft^3). Leak-test the bag in the laboratory before using by evacuating bag with a pump followed by a dry gas meter. When evacuation is complete, there should be no flow through the meter.

5.2.7 Pitot tube. Type S, or equivalent, attached to the probe so that the sampling rate can be regulated proportional to the stack gas velocity when velocity is varying with the time or a sample traverse is conducted.

5.3 Analysis (Figure 10-3).

5.3.1 Carbon monoxide analyzer. Nondispersive infrared spectrometer, or equivalent. This instrument should be demonstrated, preferably by the manufacturer, to meet or exceed manufacturer's specifications and those described in this method.

5.3.2 Drying tube. To contain approximately 200 g of silica gel.

5.3.3 Calibration gas. Refer to Section 6.1.

5.3.4 Filter. As recommended by NDIR manufacturer.

5.3.5 CO_2 removal tube. To contain approximately 500 g of ascarite.

5.3.6 Ice water bath. For ascarite and silica gel tubes.

5.3.7 Valve. Needle valve, or equivalent, to adust flow rate.

5.3.8 Rate meter. Rotameter or equivalent to measure gas flow rate of 0 to 1.0 liter per minute (0.035 cfm) through NDIR.

5.3.9 Recorder (optional). To provide permanent record of NDIR readings.

6. Reagents

6.1 Calibration gases. Known concentration of CO in nitrogen (N_2) for instrument span, prepurified grade of N_2 for zero, and two additional concentrations corresponding approximately to 60 percent and 30 percent span. The span concentration shall not exceed 1.5 times the applicable source performance standard. The calibration gases shall be certified by the manufacturer to be within ± 2 percent of the specified concentration.

6.2 Silica gel. Indicating type, 6 to 16 mesh, dried at 175°C (347°F) for 2 hours.

6.3 Ascarite. Commercially available.

7. Procedure

7.1 Sampling

7.1.1 Continuous sampling. Set up the equipment as shown in Figure 10-1 making sure all connections are leak free. Place the probe in the stack at a sampling point and purge the sampling line. Connect the analyzer and begin drawing sample into the analyzer. Allow 5 minutes for the system to stabilize, then record the analyzer reading as required by the test procedure. (See Sections 7.2 and 8). CO_2 content of the gas may be determined by using the Method 3 integrated sample procedure, or by weighing the ascarite CO_2 removal tube and computing CO_2 concentration from the gas volume sampled and the weight gain of the tube.

7.1.2 Integrated sampling. Evacuate the flexible bag. Set up the equipment as shown in Figure 10-2 with the bag disconnected. Place the probe in the stack and purge the sampling line. Connect the bag, making sure that all connections are leak free. Sample at a rate proportional to the stack velocity. CO_2 content of the gas may be determined by using the Method 3 integrated sample procedures, or by weighing the ascarite CO_2 removal tube and computing CO_2 concentration from the gas volume sampled and the weight gain of the tube.

7.2 CO Analysis. Assemble the apparatus as shown in Figure 10-3, calibrate the instrument, and perform other required operations as described in Section 8. Purge analyzer with N_2 prior to introduction of each sample. Direct the sample stream through the instrument for the test period, recording the readings. Check the zero and span again after the test to assure that any drift or malfunction is detected. Record the sample data on Table 10-1.

8. Calibration

Assemble the apparatus according to Figure 10-3. Generally an instrument requires a warm-up period before stability is obtained. Follow the manufacturer's instructions for specific procedure. Allow a minimum time of 1 hour for warm-up. During this time check the sample conditioning apparatus, i.e., filter, condenser, drying tube, and CO_2 removal tube, to ensure that each component is in good operating condition. Zero and calibrate the instrument according to the manufacturer's procedures using, respectively, nitrogen and the calibration gases.

TABLE 10-1. FIELD DATA

Location........................	Comments:
Test............................	
Date............................	
Operator........................	
Clock Time	Rotameter setting, liters per minute (cubic feet per minute)

9. Calculation

Calculate the concentration of carbon monoxide in the stack using Equation 10-1.

$$C_{CO_{stack}} = C_{CO_{NDIR}} (1 - F_{CO_2})$$

where:

$C_{CO_{stack}}$ = concentration of CO in stack, ppm by volume (dry basis).

$C_{CO_{DNIR}}$ = concentration of CO measured by NDIR analyzer, ppm by volume (dry basis).

F_{CO_2} = volume fraction of CO_2 in sample, i.e., percent CO_2 from Orsat analysis divided by 100.

10. Alternative Procedure

10.1 Interference Trap. The sample condition system described in Method 10A, Sections 2.1.2 and 4.2 may be used as an alternate to the silica gel and ascarite traps.

11. Bibliography

1. McElroy, Frank, The Intertech NDIR-CO Analyzer, Presented at 11th Methods Conference on Air Pollution, University of California, Berkeley, Calif., April 1, 1970.

2. Jacobs, M.B., et al., Continuous Determination of Carbon Monoxide and Hydrocarbons in Air by a Modified Infrared Analyzer, J. Air Pollution Control Association, 9(2):110-114, August 1959.

3. MSA LIRA Infrared Gas and Liquid Analyzer Instruction Book, Mine Safety Appliances Co., Technical Products Division, Pittsburgh, Pa.

4. Models 215A, 315A, and 415A Infrared Analyzers, Beckman Instruments Inc., Beckman Instructions 1635-B, Fullerton, Calif., October 1967.

5. Continuous CO Monitoring System, Model A5611, Intertech Corp., Princeton, N.J.

6. UNOR Infrared Gas Analayzers, Bendix Corp., Ronceverte, West Virginia.

ADDENDA

A. Performance Specifications for NDIR Carbon Monoxide Analyzers.

Range (minimum)	0-1000 ppm.
Output (minimum)	0-10mV.
Minimum detectable sensitivity	20 ppm.
Rise time, 90 percent (maximum)	30 seconds.
Fall time, 90 percent (maximum)	30 seconds.
Zero drift (maximum)	10% in 8 hours.
Span drift (maximum)	10% in 8 hours.
Precision (minimum)	±2% of full scale.
Noise (maximum)	±1% of full scale.
Linearity (maximum deviation)	2% of full scale.
Interference rejection ration	CO_2--1000 to 1, H_2O--500 to 1.

B. Definitions of Performance Specifications.

Range -- The minimum and maximum measurement limits.

Output -- Electrical signal which is proportional to the measurement; intended for connection to readout or data processing devices. Usually expressed as millivolts or milliamps full scale at a given impedance.

Full scale -- The maximum measuring limit for a given range.

Minimum detectable sensitivity -- The smallest amount of input concentration that can be detected as the concentration approaches zero.

Accuracy -- The degree of agreement between a measured value and the true value; usually expressed as ± percent of full scale.

Time to 90 percent response -- The time interval from a step change in the input concentration at the instrument inlet to a reading of 90 percent of the ultimate recorded concentration.

Rise Time (90 percent) -- The interval between initial response time and time to 90 percent response after a step increase in the inlet concentration.

Fall Time (90 percent) -- The interval between initial response time and time to 90 percent response after a step decrease in the inlet concentration.

Zero Drift -- The change in instrument output over a stated time period, usually 24 hours, of unadjusted continuous operation when the input concentration is zero; usually expressed as percent full scale.

Span Drift -- The change in instrument output over a stated time period, usually 24 hours of unadjusted continuous operation when the input concentration is a stated upscale value; usually expressed as percent full scale.

Precision -- The degree of agreement between repeated measurements of the same concentration, expressed as the average deviation of the single results from the mean.

Noise -- Spontaneous deviations from a mean output not caused by input concentration changes.

Linearity -- The maximum deviation between an actual instrument reading and the reading predicted by a straight line drawn between upper and lower calibration points.

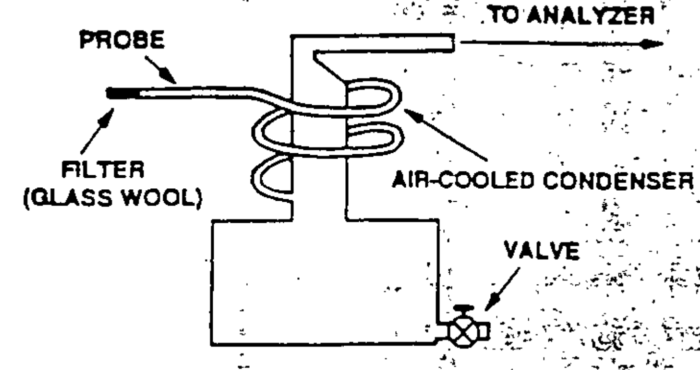


Figure 10-1. Continuous Sampling Train

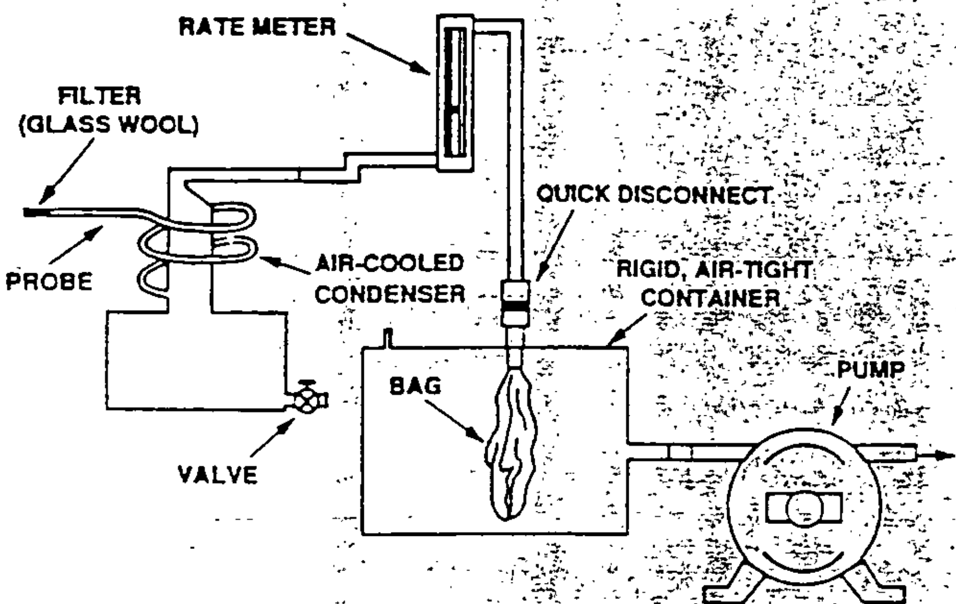


Figure 10-2. Integrated Gas--Sampling Train

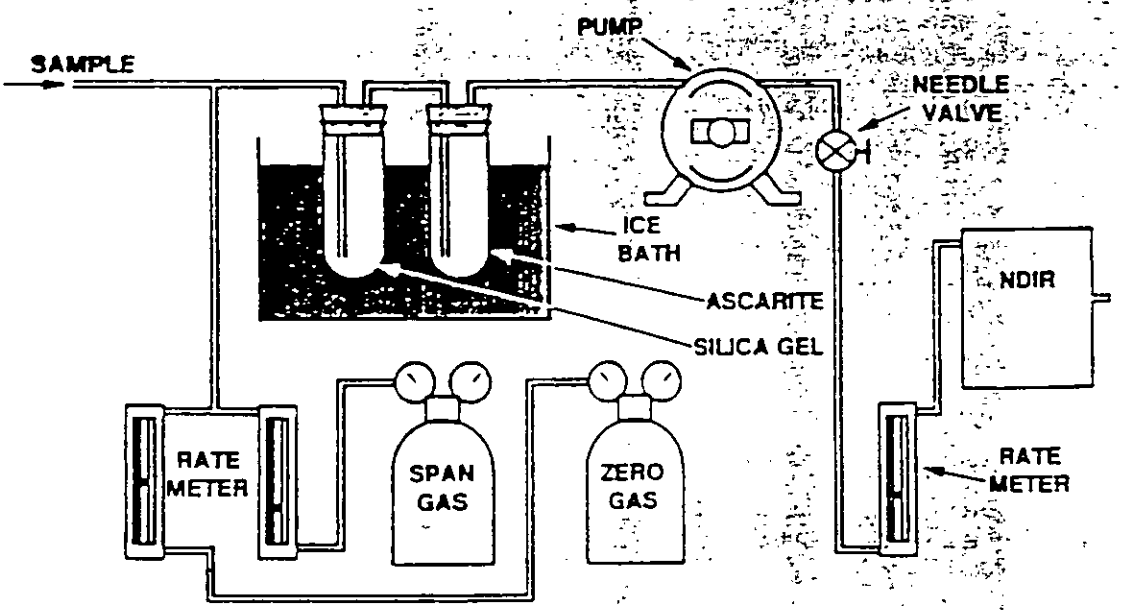


Figure 10-3. Analytical Equipment

METHOD 26A

DETERMINATION OF HYDROGEN HALIDE AND HALOGEN EMISSIONS FROM STATIONARY SOURCES - ISOKINETIC METHOD

1. Applicability, Principle, Interferences, Precision, Bias, and Stability

1.1 Applicability. This method is applicable for determining emissions of hydrogen halides (HX) [hydrogen chloride (HCL), hydrogen bromide (HBr), and hydrogen flouride (HF)] and halogens (X_2) [chlorine (Cl_2) and bromine (Br_2)] from stationary sources. This method collects the emission sample isokinetically and is therefore particulary suited for sampling at sources, such as those controlled by wet scrubbers, emitting acid particulate matter (e.g., hydrogen halides dissolved in water droplets). [**NOTE**: Mention of trade names or specific products does not constitute endorsement by the Enviromental Protection Agency.]

1.2 Principle. Gaseous and particulate pollutants are withdrawn isokinetically from the source and collected in an optional cyclone, on a filter, and in absorbing solutions. The cyclone collects any liquid droplets and is not necessary if the source emissions do not contain them; however, it is preferable to include the cyclone in the sampling train to protect the filter from any moisture present. The filter collects other particulate matter including halide salts. Acidic and alkaline absorbing solutions collect the gaseous hydrogen halides and halogens, respectively. Following sampling of emissions containing liquid droplets, any halides/halogens dissolved in the liquid in the cyclone and on the filter are vaporized to gas and corrected in the impingers by pulling conditioned ambient air throught the sampling train. The hydrogen halides are solubilized in the acidic solution and form chloride (Cl^-), bromide (Br^-), and fluoride (F^-) ions. The halogens have a very low solubility in the acidic solution and pass through to the alkaline solution where they are hydrolyzed to form a proton (H^+), the halide ion, and the hypohalous acid (HClO or HBrO). Sodium thiosulfate is added to the alkaline solution to assure reaction with the hypohalous acid to form a second halide ion such that 2 halide ions are formed for each molecule of halogen gas. The halide ions in the separate solutions are measured by ion chromatography (IC). If desired, the particulate matter recovered from the filter and the probe is analyzed following the procedures in Method 5. [**NOTE**: If the tester intendes to use this sampling arrangement to sample concurrently for particulate matter, the alternative Teflon[R] probe liner, cyclone, and filter holder should not be used. The Teflon[R] filter support must be used. The tester must also meet the probe and filter temperature requriements of both sampling trains.]

1.3 Interferences. Volatile materials, such as chlorine dioxide (ClO_2) and ammonium chloride (NH_4Cl), which produce halide ions upon dissolution during sampling are potential interferents. Interferents for the halide measurements are the halogen gases which disproportionate to a hydrogen halide and an hypohalous acid upon dissolution in water. The use of acidic rather than neutral or basic solutions for collection of the hydrogen halides greatly reduces the dissolution of any halogens passing through this solution. The simultaneous presence of both HBr and Cl_2 may cause a positive bias in the HCl result with a corresponding negative bias in the Cl_2 result as well as affecting the HBr/Br_2 split. High concentrations of nitrogen oxides (NO_x) may produce sufficient nitrate (NO_3) to interfere with measurements of very low Br levels.

1.4 Precision and Bias. The method has a possible measurable negative bias below 20 ppm HCl perhaps due to reaction with small amounts of moisture in the probe and filter. Similiar bias for the other hydrogen halides is possible.

1.5 Sample Stability. The collected Cl^- samples can be stored for up to 4 weeks for analysis for HCl and Cl_2.

1.6 Detection Limit. The in-stack detection limit for HCl is approximately 0.02 ug per liter of stack gas; the analytical detection limit for HCl is 0.1 ug/ml. Detection limits for the other analyses should be similiar.

2. Apparatus.

2.1 Sampling. The sampling train is shown in Figure 26A-1; the apparatus is similiar to the Method 5 train where noted as follows:

2.1.1 Probe Nozzle. Borosilicate or quartz glass; constructed and calibrated according to Method 5, Sections 2.1.1 and 5.1, and coupled to the probe liner using a Teflon[R] union; a stainless steel nut is recommended for this union. When the stack temperature exceeds 210°C (410°F), a one-piece glass nozzle/liner assembly must be used.

2.1.2 Probe Liner. Same as Method 5, Section 2.1.2, except metal liners shall not used. Water-cooling of the stainless steel sheath is recommended at temperatures exceeding 500°C. Teflon[R] may be used in limited applications where the minimum stack temperature exceeds 120°C (250°F) but never exceeds the temperature where Teflon[R] is estimated to become unstable (approximately 210°C).

2.1.3 Pitot Tube, Differential Pressure Gauge, Filter Heating System, Metering System, Barometer, Gas Density Determination Equipment. Same as Method 5, Sections 2.1.3, 2.1.4, 2.1.6, 2.1.8, 2.1.9, and 2.1.10.

2.1.4 Cyclone (Optional). Glass or Teflon[R]. Use of the cyclone is required only when the sample gas stream is saturated with moisture; however, the cyclone is recommended to protect the filter from any moisture droplets present.

2.1.5 Filter Holder. Borosilicate or quartz glass, or Teflon[R] filter holder, with a Teflon[R] filter support and a sealing gasket. The sealing gasket shall be constructed of Teflon[R] or equivalent materials. The holder design shall provide a positive seal against leakage at any point along the filter circumference. The holder shall be attached immediately to the outlet of the cyclone.

2.1.6 Impinger Train. The following system shall be used to determine the stack gas moisture content and to collect the hydrogen halides and halogens: five or six impingers connected in a series with leak-free ground glass fittings or any similar leak-free noncontaminating fittings. The first impinger shown in Figure 26A-1 (knockout or condensate impinger) is optional and is recommended as a water knockout trap for use under high moisture conditions. If used, this impinger should be constructed as described below for the alkaline impingers, but with a shortened stem, and should contain 50 ml of 0.1 N H_2SO_4. The following two impingers (acid impingers which each contain 100 ml of 0.1 H_2SO_4) shall be of the Greenburg-Smith design with the standard tip (Method 5, Section 2.1.7). The next two impingers (alkaline impingers which each contain 100 ml of 0.1 N NaOH) and the last impinger (containing silica gel) shall be of the modified Greenburg-Smith design (Method 5, Section 2.1.7). The condensate, acid, and alkaline impingers shall contain known quantities of the appropriate absorbing reagents. The last impinger shall contain a known weight of silica gel or equivalent desiccant. Teflon[R] impingers are an acceptable alternative.

2.1.7 Ambient Air Conditioning Tube (Optional). Tube tightly packed with approximately 150 g of fresh 8 to 20 mesh sodium hydroxide-coated silica, or equivalent, (AscariteII[R] has been found suitable) to dry and remove acid gases from the ambient air used to remove moisture from the filter and cyclone, when the cyclone is used. The inlet and outlet ends of the tube should be packed with at least 1-cm thickness of glass wool or filter material suitable to prevent escape of fines. Fit one end with flexible tubing, etc. to allow connection to probe nozzle following the test run.

2.2 Sample Recovery. The following items are needed:

2.2.1 Probe-Liner and Probe-Nozzle Brushes, Wash Bottles, Glass Sample Storage Containers, Petri Dishes, Graduated Cylinder or Balance, and Rubber Policeman. Same as Method 5, Sections 2.2.1, 2.2.2, 2.2.3, 2.2.4, 2.2.5, and 2.2.7.

2.2.2 Plastic Storage Containers. Screw-cap polypropylene containers to store silica gel. High-density polyethylene bottles with Teflon screw cap liners to store impinger reagents, 1-liter.

2.2.3 Funnels. Glass or high-density polyethylene, to aid in sample recovery.

2.3 Analysis. For analysis, the following equipment is needed:

2.3.1 Volumetric Flasks. Class A, various sizes.

2.3.2 Volumetric Pipettes. Class A, assortment, to dilute samples to calibration range of the ion chromatograph (IC).

2.3.3 Ion Chromatograph. Suppressed or nonsuppressed, with a conductivity detector and electronic integrator operating in the peak area mode. Other detectors, a strip chart recorder, and peak heights may be used.

3. Reagents

Unless otherwise indicated, all reagents must conform to the specifications of the Committee on Analytical Reagents of the American Chemical Society (ACS reagent grade). When such specifications are not available, the best available grade shall be used.

3.1 Sampling.

3.1.1 Water. Deionized, distilled water that conforms to American Society of Testing and Materials (ASTM) Specification D 1193-77, Type 3.

3.1.2 Acidic Absorbing Solution, 0.1 N Sulfuric Acid (H_2SO_4). To prepare 1 L, slowly add 2.80 ml of concentrated H_2SO_4 to about 900 ml of water while stirring, and adjust the final volume to 1 L using additional water. Shake well to mix the solution.

3.1.3 Alkaline Absorbing Solution, 0.1 N Sodium Hydroxide (NaOH). To prepare 1 L, dissolve 4.00 g of solid NaOH in about 900 ml of water and adjust the final volume to 1 L using additional water. Shake well to mix the solution.

3.1.4 Filter. Teflon mat (e.g., Pallflex[R] TX40H145) filter. When the stack gas temperature exceeds 210°C (410°F) a quartz fiber filter may be used.

3.1.5 Silica Gel, Crushed Ice, and Stopcock Grease. Same as Method 5, Sections 3.1.2, 3.1.4, and 3.1.5, respectively.

3.1.6 Sodium Thiosulfate, $(Na_2S_2O_33 \cdot 5\ H_2O)$.

3.2 Sample Recovery.

3.2.1 Water. Same as Section 3.1.1.

3.2.2 Acetone. Same as Method 5, Section 3.2.

3.3 Sample Analysis.

3.3.1 Water. Same as Section 3.1.1.

3.3.2 Reagent Blanks. A separate blank solution of each absorbing reagent should be prepared for analysis with the field samples. Dilute 200 ml of each absorbing solution (250 ml of the acidic absorbing solution, if a condensate impinger is used) to the same final volume as the field samples using the blank sample of rinse water. If a particulate determination is conducted, collect a blank sample of acetone.

3.3.3 Halide Salt Stock Standard Solutions. Prepare concentrated stock solutions from reagent grade sodium chloride (NaCl), sodium bromide (NaBr), and sodium fluoride (NaF). Each must be dried at 110°C for 2 or more hours and then cooled to room temperature in a desiccator immediately before weighing. Accurately weigh 1.6 to 1.7 g of the dried NaCl to within 0.1 mg, dissolve in water, and dilute to 1 liter. Calculate the exact Cl concentration using Equation 26A-1.

$$uCl^-/ml = g\ of\ NaCl \times 10^3 \times 35.453/58.44 \qquad \text{(Equation 26A-1)}$$

In a similar manner, accurately weigh and solubilize 1.2 to 1.3 g of dried NaBr and 2.2 to 2.3 g of NaF to make 1 liter solutions.

Use Equations 26A-2 and 26A-3 to calculate the Br^- and F^- concentrations.

$ugBr^-/ml = g \text{ of } NaBr \times 10^3 \times 79.904/102.90$ (Equation 26A-2)

$ugF^-/ml = g \text{ of } NaF \times 10^3 \times 18.998/41.99$ (Equation 26A-3)

Alternately, solutions containing a nominal certified concentration of 1000 mg/L NaCl are commercially available as convenient stock solutions from which standards can be made by appropriate volumetric dilution. Refrigerate the stock standard solutions and store no longer than 1 month.

3.3.4 Chromatographic Eluent. Same as Method 26, Section 3.2.4.

4. Procedure

Because of the complexity of this method, testers and analysts should be trained and experienced with the procedures to ensure reliable results.

4.1 Sampling.

4.1.1 Pretest Preparation. Follow the general procedure given in Method 5, Section 4.1.1, except the filter need only be desiccated and weighed if a particulate determination will be conducted.

4.1.2 Preliminary Determinations. Same as Method 5, Section 4.1.2.

4.1.3 Preparation of Sampling Train. Follow the general procedure given in Method 5, Section 4.1.3, except for the following variations:

And 50 ml of 0.1 N H_2SO_4 to the condensate impinger, if used. Place 100 ml of 0.1 N H_2SO_4 in each of the next two impingers. Finally, transfer approximately 200-300 g of preweighed silica gel from its container to the last impinger. Set up the train as in Figure 26A-1. When used, the optional cyclone is inserted between the probe liner and filter holder and located in the heated filter box.

4.1.4 Leak-Check Procedures. Follow the leak-check procedures given in Method 5, Sections 4.4.1 (Pretest Leak-Check), 4.1.4.2 (Leak-Checks During the Sample Run), and 4.1.4.3 (Post-Test Leak-Check).

4.1.5 Train Operation. Follow the general procedure given in Method 5, Section 4.1.5. Maintain a temperature around the filter and (cyclone, if used) of greater than 120°C (248°F). For each run, record the data required on a data sheet such as the one shown in Method 5, Figure 5-2. If the condensate impinger becomes too full, it may be emptied, recharged with 50 ml of 0.1 N H_2SO_4, and replaced during the sample run. The condensate emptied must be saved and included in the measurement of the volume of moisture collected and included in the sample for analysis. The additional 50 ml of absorbing reagent must also be considered in calculating the moisture. After the impinger is reinstalled in the train, conduct a leak-check as described in Method 5, Section 4.1.4.2.

4.1.6 Post-Test Moisture Removal (Optional). When the optional cyclone is included in the sampling train or when moisture is visible on the filter at the end of a sample run even in the absence of a cyclone, perform the following procedure. Upon completion of the test run, connect the ambient air conditioning tube at the probe inlet and operate the train with the filter heating system at least 120°C (248°F) at a low flow rate (e.g., ΔH = 1 in. H_2O) to vaporize any liquid and hydrogen halides in the cyclone or on the filter and pull them through the train into the impingers. After 30 minutes, turn off the flow, remove the conditioning tube, and examine the cyclone and filter for any visible moisture. If moisture is visible, repeat this step for 15 minutes and observe again. Keep repeating until the cyclone is dry. [**NOTE**: It is critical that this is repeated until the cyclone is completely dry.]

4.2 Sample Recovery. Allow the probe to cool. When the probe can be handled safely, wipe off all the external surfaces of the tip of the probe nozzle and place a cap loosely over the tip. Do not cap the probe tip tightly while the sampling train is cooling down because this will create a vacuum in the filter holder, drawing water from the impingers into the holder. Before moving the sampling train to the cleanup site, remove the probe, wipe off any silicone grease, and cap the open outlet of the impinger train, being careful not to lose any condensate that might be present. Wipe off any silicone grease and cap the filter or cyclone inlet. Remove the umbilical cord from the last impinger and cap the impinger. If a flexible line is used between the first impinger and the filter holder, disconnect it at the filter holder and let any condensed water drain into the first impinger. Wipe off any silicone grease and cap the filter holder outlet and the impinger inlet. Ground glass stoppers, plastic caps, serum caps, Teflon tape, Parafilm, or aluminum foil may be used to close these openings. Transfer the probe and filter/impinger assembly to the cleanup area. This area should be clean and protectd from the weather to minimize sample contamination or loss. Inspect the train prior to and during disassembly and note any abnormal conditions. Treat samples as follows:

4.2.1 Container No. 1 (Optional; Filter Catch for Particulate Determination). Same as Method 5, Section 4.2, Container No. 1.

4.2.2 Container No. 2 (Optional; Front-Half Rinse for Particulate Determination). Same as Method 5, Section 4.2, Container No. 2.

4.2.3 Container No. 3 (Knockout and Acid Impinger Catch for Moisture and Hydrogen Halide Determination). Disconnect the impingers. Measure the liquid in the acid and knockout impingers to ± 1 ml by using a graduated cylinder or by weighing it to ± 0.5 g by using a balance. Record the volume or weight of liquid present. This information is required to calculate the moisture content of the effluent gas. Quantitatively transfer this liquid to a leak-free sample storage container. Rinse these impingers and connecting glassware including the back portion of the filter holder (and flexible tubing, if used) with water and add these rinses to the storage container. Seal the container, shake to mix, and label. The fluid level should be marked so that if any sample is lost during transport, a correction proportional to the lost volume can be applied. Retain rinse water and acidic absorbing solution blanks and analyze with the samples.

4.2.4 Container No. 4 (Alkaline Impinger Catch for Halogen and Moisture Determination). Measure and record the liquid in the alkaline impingers as described in Section 4.2.3. Quantitatively transfer this liquid to a leak-free sample storage container. Rinse these two impingers and connecting glassware with water and add these rinses to the container. Add 25 mg of sodium thiosulfate per ppm halogen-dscm of stack gas sample. [NOTE: This amount of sodium thiosulfate includes a safety factor of approximately 5 to assure complete reaction with the hypohalous acid to form a second Cl^- ion in the alkaline solution.] Seal the container, shake to mix, and label; mark the fluid level. Retain alkaline absorbing solution blank and analyze with the samples.

4.2.5 Container No. 5 (Silica Gel for Moisture Determination). Same as Method 5, Section 4.2, Container No. 3.

4.2.6 Container Nos. 6 through 9 (Reagent Blanks). Save portions of the absorbing reagents (0.1 N H_2SO_4 and 0.1 N NaOH) equivalent to the amount used in the sampling train; dilute to the approximate volume of the corresponding samples using rinse water directly from the wash bottle being used. Add the same ratio of sodium thiosulfate solution used in container No. 4 to the 0.1 N NaOH absorbing reagent blank. Also, save a portion of the rinse water alone and a portion of the acetone equivalent to the amount used to rinse the front half of the sampling train. Place each in a separate, prelableled sample container.

4.2.7 Prior to shipment, recheck all sample containers to ensure that the caps are well-secured. Seal the lids of all containers around the circumference with Teflon tape. Ship all liquid samples upright and all particulate filters with the particulate catch facing upward.

4.3 Sample Preparation and Analysis. Note the liquid levels in the sample containers and confirm on the analysis sheet whether or not leakage occurred during transport. If a noticeable leakage has occurred, either void the sample or use methods, subject to the approval of the Administrator, to correct the final results.

4.3.1 Container Nos. 1 and 2 and Acetone Blank (Optional; Particulate Determination). Same as Method 5, Section 4.3.

4.3.2. Container No. 5. Same as Method 5, Section 4.3 for Silica gel.

4.3.3 Container Nos. 3 and 4 and Absorbing Solution and Water Blanks. Quantitatively transfer each sample to a volumetric flask or graduated cyclinder and dilute with water to a final volume within 50 ml of the largest sample.

4.3.3.1 The IC conditions will depend upon analytical column type and whether suppressed or nonsuppressed IC is used. Prior to calibration and sample analysis, establish a stable baseline. Next, inject a sample of water, and determine if any Cl^-, Br^-, or F^- appears in the chromatogram. If any of these ions are present, repeat the load/injection procedure until they are no longer present. Analysis of the acid and alkaline absorbing solution samples requires separate standard calibration curves; prepare each according to Section 5.2. Ensure adequate baseline separation of the analyses.

4.3.3.2 Between injections of the appropriate series of calibration standards, inject in duplicate the reagent blanks and the field samples. Measure the areas or heights of the Cl^-, Br^-, and F^- peaks. Use the average response to determine the concentrations of the field samples and reagent blanks using the linear calibration curve. If the values from duplicate injections are not within 5 percent of their mean, the duplicate injection shall be repaeated and all four values used to determine the average response. Dilute any sample and the blank with equal volumes of water if the concentration exceeds that of the highest standard.

4.4 Audit Sample Analysis. Audit samples must be analyzed subject to availability.

5. Calibration

Maintain a laboratory log of all calibrations.

5.1 Probe Nozzle, Pitot Tube, Dry Gas Metering System, Probe Heater, Temperature Gauges, Leak-Check of Metering System, and Barometer. Same as Method 5, Sections 5.1, 5.2, 5.3, 5.4, 5.5, 5.6, and 5.7, respectively.

5.2 Ion Chromatograph. To prepare the calibration standards, dilute given amounts (1.0 ml or greater) of the stock standard solutions to convenient volumes, using 0.1 N H_2SO_4 or 0.1 N NaOH, as appropriate. Prepare at least four calibration standards for each absorbing reagent containing the three stock solutions such that they are within the linear range of the field samples. Using one to the standards in each series, ensure adequate baseline separation for the peaks of interest. Inject the appropriate series of calibration standards, starting with the lowest concentration standard first both before and after injection of the quality control check sample, reagent blanks, and field samples. This allows compensation for any instrument drift occurring during sample analysis. Determine the peak areas, or height, of the standards and plot individual values versus halide ion concentrations in ug/ml. Draw a smooth curve through the points. Use linear regression to calculate a formula describing the resulting linear curve.

6. Quality Control

Same as Method 5, Section 4.4.

7. Quality Assurance

7.1 Applicability. When the method is used to demonstrate compliance with a regulation, a set of two audit samples shall be analyzed.

7.2 Audit Procedure. The currently available audit samples are chloride solutions. Concurrently analyze the two audit samples and a set of compliance samples in the same manner to evaluate the technique of the analyst and the standards preparation. The same analyst, analytical reagents, and analytical system shall be used both for compliance samples and the Environmental Protection Agency (EPA) audit samples.

7.3 Audit Sample Availability. Audit samples will be supplied only to enforcement agencies for compliance tests. Audit samples may be obtained by writing the Source Test Audit Coordinator (MD-77B), Quality Assurance Division, Atmospheric Research and Exposure Assessment Laboratory, U.S. Environmental Protection Laboratory, Research Triangle Park, NC 27711 or by calling the Source Test Audit Coordinator (STAC) at (919) 541-7834. The request for the audit samples should be made at least 30 days prior to the scheduled compliance sample analysis.

7.4 Audit Results. Calculate the concentrations in mg/dscm using the specified sample volume in the audit instructions. Include the results of both audit samples, their identification numbers, and the analyst's name with the results of the compliance determination samples in appropriate reports to the EPA regional office or the appropriate enforcement agency. (NOTE: Acceptability of results may be obtained immediately by reporting the audit results in mg/dscm and compliance results in total ug HCl/sample to the responsible enforcement agency.) The concentrations of the audit samples obtained by the analyst shall be agree within 10 percent of the actual concentrations. If the 10 percent specification is not met, reanalyze the compliance samples and audit samples, and include intitial and reanalysis values in the test report. Failure to meet the 10 percent specification may require retests until the audit problems are resolved.

8. Calculations

Retain at least one extra decimal figure beyond those contained in the available data in intermediate calculations, and round off only the final answer appropriately.

8.1 Nomenclature. Same as Method 5, Section 6.1. In Addition:

B_X = Mass concentration of applicable absorbing solution blank, ug halide ion (Cl^-, Br^-, F^-)/ml, not exceed 1 ug/ml which is 10 times the published analytical detection limit of 0.1 ug/ml. (It is also approximately 5 percent of the mass concentration anticipated to result from a one hour sample at 10 ppmv HCl.)

C = Concentration of hydrogen halide (HX) or halogen (X_2), dry basis, mg/dscm.

m_{HX} = Mass of HCl, HBr, or HF in sample , ug.

m_{X2} = Mass of Cl_2 or Br_2 in sample, ug.

S_{X^-} = Analysis of sample, ug halide ion (Cl^-, Br^-, F^-)/ml.

V_s = Volume of filtered and diluted sample, ml.

8.2 Average Dry Gas Meter Temperature and Average Orifice Pressure Drop. See data sheet (Figure 5-2 of Method 5).

8.3 Dry Gas Volume. Calculate $V_{m(std)}$ and adjust for leakage, if necessary, using the equation in Section 6.3 of Method 5.

8.4 Volume of Water Vapor and Moisture Content: Calculate the volume of water vapor $V_{w(std)}$ and moisture content B_{ws} from the data obtained in this method (Figure 5-2 of Method 5); use Equations 5-2 and 5-3 of Method 5.

8.5 Isokinetic Variation and Acceptable Results. Use Method 5, Sections 6.11 and 6.12.

8.6 Actone Blank Concentration, Acetone Wash Blank Residue Weight, Particulate Weight, and Particulate Concentration. For particulate determination.

8.7 Total ug HCl, HBr, or HF Per Sample.

$$m_{HX} = K\ V_s\ (S_{X-} - B_{X-}) \qquad \text{(Equation 26A-4)}$$

where:

K_{HCl} = 1.028 (ug HCl/ug-mole)/(ug Cl^-/ug-mole).

K_{HBr} = 1.013 (ug HBr/ug-mole)/(ug Br^-/ug-mole).

K_{HF} = 1.053 (ug HF/ug-mole)/(ug F^-/ug-mole).

8.8 Total ug Cl_2 or Br_2 Per Sample.

$$m_{X2} = V_s\ (S_{X-} - B_{X-}) \qquad \text{(Equation 26A-5)}$$

8.9 Concentration of Hydrogen Halide or Halogen in Flue Gas.

$$C = K\ m_{HX,X2} / V_{m(std)} \qquad \text{(Equation 26A-6)}$$

where:

$K = 10^{-3}$ mg/ug

8.10 Stack Gas Velocity and Volumetric Flow Rate. Calculate the average stack gas velocity and volumetric flow rate, if needed, in using data obtained in this method and the equations in Sections 5.2 and 5.3 of Method 2.

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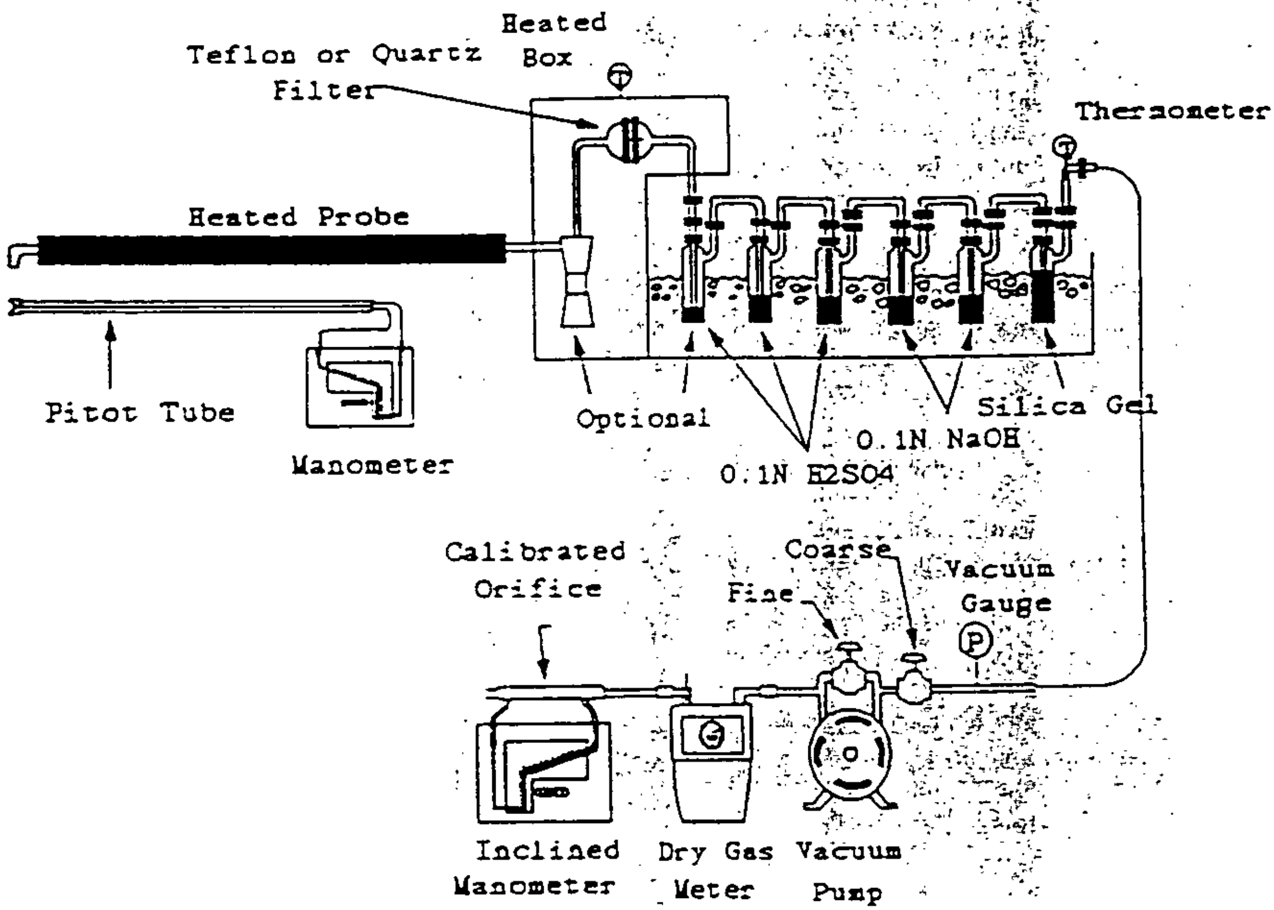

Figure 26A-1. Sampling train.

APPENDIX A

COMPLETE EMISSION DATA

Source Sampling Nomenclature Sheet

- **PB** - Barometric pressure, inches Hg.
- **PS** - Stack pressure, inches Hg.
- **AS** - Effective area of positive stack gas flow, sq. ft.
- **As** - stack area, sq. ft.
- **NPTS** - Number of traverse point where the pitot velocity head was greater than zero
- **TS** - Stack temperature, degrees fahrenheit
- **TM** - Meter temperature, degrees fahrenheit
- **ASQH** - Average square root of velocity head, inches H2O
- **DH** - Average meter orifice pressure differential, inches H2O
- **AN** - Sampling nozzle area, square feet
- **CP** - S-type pitot tube correction factor
- **VM** - Recorded meter volume sample, cubic feet (meter conditions)
- **VC** - Condensate and silica gel increase in impingers, milliliters
- **PO** - Pressure at the dry test meter orifice, $PB + \frac{H}{13.6}$
- **t** - Test time in minutes
- **STP** - Standard conditions, dry, 68 degrees fahrenheit (Tstd), 29.92 inches Hg (Pstd)
- **Y** - Average ratio of accuracy of wet test meter to dry gas meter, with a tolerance of plus or minus 0.02

- **VWV** - Conversion of condensate in milliliters to water vapor in cubic feet (STP)
- **VSTPD** - Volume sampled, cubic feet (STP)
- **VT** - Total water vapor and dry gas volume sampled, cubic feet (STP)
- **W** - Moisture fraction of stack gas
- **FDA** - Dry gas fraction
- **MD** - Molecular weight of stack gas, lbs/lb-mole (dry conditions)
- **MS** - Molecular weight of stack gas, lbs/lb-mole (stack conditions)
- **GS** - Specific gravity of stack gas, referred to air
- **EA** - Excess air
- **U** - Stack gas velocity, feet per minute
- **QS** - Stack gas flow rate, cubic feet per minute (stack conditions)
- **QD** - Stack gas flow rate, cubic feet per minute (dry conditions)
- **QSTPD** - Stack gas flow rate, cubic feet per minute (STP)
- **PISO** - Percent isokinetic volume sampled (method described in Federal Register)
- **ESTP** - Particulate concentration at standard and dry conditions, grains/scf
- **E12** - ESTP corrected to 12 % CO2, grains/scf
- **E50** - ESTP corrected to 50 % excess air, grains/scf
- **EM** - Mass emissions rate, lbs/hr
- **Eh** - Mass emissions rate, lbs mmBTUs
- **E** - ESTP corrected to % Excess Air.

Equations For Calculating Particulate Emissions

$$VWV = (0.04707) \times (VC)$$

$$VSTPD = (17.65) \times (VM) \times \left(PB + \frac{DH}{13.6}\right) \div (TM) \times (Y)$$

$$VT = (VWV) \times (VSTPD)$$

$$W = (VWV) \div (VT)$$

$$FDA = (1.0) - (W)$$

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

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

$$CS = (MS) \div (28.99)$$

$$EA = \left[(100) \times \left(\%\,O_2 - \frac{\%\,CO}{2}\right)\right] / \left[(0.266 \times \%\,N_2) - \left(O_2 - \frac{\%\,CO}{2}\right)\right]$$

$$U = (174) \times (CP) \times (ASQH) \times \sqrt{(TS \times 29.92) \div (CS \times PS)}$$

$$QS = (U) \times (AS)$$

$$QD = (QS) \times (FDA)$$

$$QSTPD = (528) \times (QD) \times (PS) \div (TS \times 29.9)$$

$$PISO = \frac{(100) \times Ts \times VSTPD \times Pstd}{Tstd \times U \times (t) \times An \times Ps \times (FDA)}$$

$$ESTP = \frac{(\text{SAMPLE WT. in mg.}) \times (0.01543)}{VSTPD}$$

$$E12 = \frac{(ESTP) \times (12)}{(CO_2\,\%)}$$

$$E50 = \frac{(ESTP) \times (100 + EA)}{150}$$

$$EM = \frac{(ESTP) \times (QSTPD)\ (60\ \text{min})}{7000}$$

$$Eh = \frac{(ESTP)}{7000} \times \text{FUEL FACTOR} \times \frac{20.9}{(20.9 - \%\,O_2)}$$

$$E_{EA} = \frac{(ESTP) \times (100 + EA)}{\text{Desired } EA}$$

Facility: Georgia Pacific **Test Date:** 5/25/01
Source: Bleach Plant Outlet **Run Number:** 1

Example Calculations:
Page 1

1. Stack Pressure, (PS)
   PS = PB + (PG/ 13.6)

Example. PB = 30.09 Therefore PS= 30.10 in. Hg.
PG = 0.07

2. Meter Pressure, (PM)
   PM = (PB) + (*H / 13.6)

Example. *H = 1.508 Therefore PM= 30.20 in. Hg.

3. Volume Water Vapor, (VWV).
   VWV = (0.04707) x (VC)

Example. VC = 37 Therefore VWV= 1.718 SCF

4. Meter Volume, corrected to Standard Conditions, (VSTD)

$$VSTPD = \frac{(17.65) \times (VM) \times (PM) \times (Y)}{TM}$$

Example. VM = 35.618 Therefore VSTPD = 35.391 SCF
PM = 30.20
TM = 553.1
Y = 1.031

5. Total Volume Of Sample, (VT).

   VT = VWV + VSTPD

Example. VWV = 1.718 Therefore VT = 37.109 SCF
VSTPD = 35.391

PB = Barometric Pressure, inches of Hg.
PG = Static Pressure of stack, inches of H2O.
*H = Average meter orifice pressure differential inches of H2O.
VC = Volume condensate liquid volume + gain in silica gel wt., grams.
PM = See eq. 2.
TM = Temperature, meter, degrees Rankine.
Y = Meter Correction Factor
VWV = See eq. 3.
VSTPD = See eq. 4.

Facility: Georgia Pacific **Test Date:** 5/25/01

Source: Bleach Plant Outlet **Run Number:** 1

Example Calculations:
Page 2

6. Fraction Water Vapor in Gas Stream, (W)

W = (VWV / VT)

Example. VWV =	1.718	Therefore W =	0.046
VT =	37.109		

7. Fraction Dry Air, (FDA).

FDA = 1.0 - W

Example. W =	0.046	Therefore FDA =	0.954

8. Molecular Weight of Stack Gas, Dry, (MD).

MD = (0.44 x %CO2) + (0.32 x %O2) + (0.28 x %N2) + (0.28 x %CO)

Example. CO2 =	0	Therefore MD =	28.84
O2 =	20.9		
N2 =	79.1		
CO =	0		

9. Molecular Weight of Stack Gas, Stack Conditions, (MS).

MS = (MD x FDA) + (18 x W)

Example. MD =	28.84	Therefore MS =	28.34
FDA =	0.954		
W =	0.046		

10. Specific Gravity of Gas, Relative to Air, (GS)

GS = MS / 28.99

Example. MS =	28.34	Therefore GS =	0.978

VWV = See eq. 3
VT = See eq. 5
W = See eq. 6
MD = See eq. 8
MS = See eq. 9

Facility: Georgia Pacific **Test Date:** 5/25/01

Source: Bleach Plant Outlet **Run Number:** 1

Example Calculations:
Page 3

11. Velocity of Stack Gas, as feet per minute, (U).

$U = 174 \times CP \times H \times \sqrt{(TS \times 29.92) / (GS \times PS)}$

Example. CP =	0.84	Therefore U =	1604.8 FPM
H =	0.4652		
TS =	548		
PS =	30.10		
GS =	0.978		

12. Stack Gas Flow Rate, Stack Conditions, cubic feet per minute, (QS).

QS = U x AS

Example. U =	1604.8	Therefore QS =	15440 ACFM
AS =	9.621		

13. Stack Gas Flow Rate, Dry (QD)

QD = QS x FDA

Example. QS =	15440	Therefore QD =	14730 CFMD
FDA =	0.954		

14. Stack Gas Flow Rate, Standard Temperature and Pressure, Dry, (QSTPD)

QSTPD = (528 x QD x PS) / (TS x 29.92)

Example QD =	14730	Therefore QSTPD =	14275 SCFMD
PS =	30.09		
TS =	548		

CP = Pitot Coefficient
H = Average of square roots of velocity heads, in H2O.
TS = Temperature of stack, deg. R.
PS = See eq. 1
GS = See eq. 10

Facility: Georgia Pacific

Test Date: 5/25/01

Source: Bleach Plant Outlet

Run Number: 1

Example Calculations:
Page 4

15. Percent Isokinetic Volume Sampled, (PISO)

$$PISO = \frac{(100) \times Ts \times VSTPD \times Pstd}{Tstd \times U \times \Theta \times An \times Ps \times FDA}$$

Example. AN =	0.000413	Therefore PISO =	96.4
Θ =	60	Pstd =	29.92
VSTPD =	35.391	Tstd =	528
Ts =	548	Ps =	30.095147
U =	1604.8	FDA =	0.954

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

ESTP = (.01543 x Mg.) / VSTPD

Example. Mg. =	0	Therefore ESTP =	0 Grs/ SCF
VSTPD =	35.391		

17. Mass Emission Rate, Lbs / Hr, (EM)

$$EM = \frac{ESTP \times QSTPD \times 60\ Min/Hr}{7000}$$

Example.

QSTPD =	14275	Therefore EM =	0 Lbs/ Hr

VSTPD = See eq. 4
AN = Area Nozzle, Sq Ft
Mg. = Weight of particulate catch in milligrams.

Technical Services, Inc.
Environmental Consultants
Analytical Chemists

2901 Danese Street
Jacksonville, Fl. 32206
(904) 353 - 5761

Facility	Georgia Pacific
Location	Palatka, FL
Stack	Bleach Plant Outlet
Run Date	5/25/01
Run Number	1
Start Time	1850
Finish Time	1952
Weather	Clear
Total Time (min.)	60.00
Barometric Pressure	30.09
Stack Diameter (in.)	42.000
Stack Area sq. ft.	9.621
Nozzle Area sq. ft.	0.0004125
Number of Points	12
Avg of SQRT of V.H.	0.4652
Meter Correction (Y)	1.031
Nozzle Diameter	0.275
Pitot Correction Factor	0.84

Impinger Condensate , Ml	32
Silica Gel Condensate, Gm	4.5
Volume Metered	35.618
Meter Temp (Deg R)	553.1
Orsat CO2 %	0.0
Orsat O2 %	20.9
Orsat CO %	0.0
Orsat N %	79.1
Condensate Volume, Ml	36.5
Delta H (inches H2O)	1.5080
Stack Pressure	30.095
Stack Temp (Deg R)	548.0

Volume Water Vapor, SCF	**1.718**
Gas Volume Sampled, STPD	**35.391**
Total Volume, STP	**37.109**
Moisture in stack gas, volume fraction	**0.046**
Dry Stack Gas, volume fraction	**0.954**
Molecular Weight of Stack Gas (Dry Basis)	**28.84**
Molecular Weight of Stack Gas (Stack conditions)	**28.34**
Specific gravity of Stack Gas Relative to Air	**0.978**
Excess Air (%)	**14864.9**
Average Stack Velocity, FPM	**1604.8**
Actual Stack Gas Flow Rate, ACFM	**15440**
Actual Stack Gas Flow Rate, (Dry) ACFMD	**14730**
Stack Gas Flow Rate, SCFMD	**14275**
Percent Isokinetic	**96.4**

Technical Services, Inc. 2901 Danese Street
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Analytical Chemists (904) 353 - 5761

Facility: Georgia Pacific
Stack: Bleach Plant Outlet
Run Date: 5/25/01
Run No: 1

Field Data Points				
Trav. Pt.	Vel. Head	Meter Orif.	Stack °F	Meter °F
1	0.23	1.60	92	91
2	0.23	1.60	91	92
3	0.22	1.53	89	93
4	0.22	1.53	90	93
5	0.22	1.53	90	93
6	0.2	1.39	90	93
7	0.22	1.53	86	93
8	0.23	1.60	85	93
9	0.22	1.53	85	93
10	0.22	1.53	85	94
11	0.21	1.46	88	95
12	0.18	1.25	85	94
13	0		0	0
14	0		0	0
15	0		0	0
16	0		0	0
17	0		0	0
18	0		0	0
19	0		0	0
20	0		0	0
21	0		0	0
22	0		0	0
23	0		0	0
24	0		0	0
25	0		0	0
26	0		0	0
27	0		0	0
28	0		0	0
29	0		0	0
30	0		0	0

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Analytical Chemists

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Facility	
Location	Palatka, FL
Stack	Bleach Plant Outlet
Run Date	5/25/01
Run Number	2
Start Time	2130
Finish Time	2234
Weather	Scattered Clouds
Total Time (min.)	60.00
Barometric Pressure	30.09
Stack Diameter (in.)	42.000
Stack Area sq. ft.	9.621
Nozzle Area sq. ft.	0.0004125
Number of Points	12
Avg of SQRT of V.H.	0.4616
Meter Correction (Y)	1.031
Nozzle Diameter	0.275
Pitot Correction Factor	0.84

Impinger Condensate, Ml	36.0
Silica Gel Condensate, Gm	5.2
Volume Metered	36.140
Meter Temp (Deg R)	545.8
Orsat CO2 %	0.0
Orsat O2 %	20.9
Orsat CO %	0.0
Orsat N %	79.1
Condensate Volume, Ml	41.2
Delta H (inches H2O)	1.4850
Stack Pressure	30.094
Stack Temp (Deg R)	542.3

==

Volume Water Vapor, SCF	**1.939**
Gas Volume Sampled, STPD	**36.388**
Total Volume, STP	**38.327**
Moisture in stack gas, volume fraction	**0.051**
Dry Stack Gas, volume fraction	**0.949**
Molecular Weight of Stack Gas (Dry Basis)	**28.84**
Molecular Weight of Stack Gas (Stack conditions)	**28.29**
Specific gravity of Stack Gas Relative to Air	**0.976**
Excess Air (%)	**14864.9**
Average Stack Velocity, FPM	**1585.7**
Actual Stack Gas Flow Rate, ACFM	**15256**
Actual Stack Gas Flow Rate, (Dry) ACFMD	**14478**
Stack Gas Flow Rate, SCFMD	**14178**
Percent Isokinetic	**99.8**

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Facility: Georgia Pacific
Stack: Bleach Plant Outlet
Run Date: 5/25/01
Run No: 2

	Field Data Points			
Trav. Pt.	Vel. Head	Meter Orif.	Stack °F	Meter °F
1	0.23	1.60	81	85
2	0.23	1.60	82	85
3	0.22	1.53	82	85
4	0.22	1.53	82	84
5	0.21	1.46	83	88
6	0.2	1.39	82	87
7	0.23	1.60	82	85
8	0.22	1.53	83	86
9	0.21	1.46	82	86
10	0.21	1.46	83	86
11	0.2	1.39	83	86
12	0.18	1.25	83	86
13	0		0	0
14	0		0	0
15	0		0	0
16	0		0	0
17	0		0	0
18	0		0	0
19	0		0	0
20	0		0	0
21	0		0	0
22	0		0	0
23	0		0	0
24	0		0	0
25	0		0	0
26	0		0	0
27	0		0	0
28	0		0	0
29	0		0	0
30	0		0	0

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Facility	Georgia Pacific		
Location	Palatka, FL		
Stack	Bleach Plant Outlet		
Run Date	5/25/01	**Impinger Condensate, Ml**	40.0
Run Number	3	**Silica Gel Condensate, Gm**	4.9
Start Time	2300	**Volume Metered**	36.222
Finish Time	2402	**Meter Temp (Deg R)**	542.2
Weather	Partly Cloudy	**Orsat CO2 %**	0.0
Total Time (min.)	60	**Orsat O2 %**	20.9
Barometric Pressure	30.09	**Orsat CO %**	0.0
Stack Diameter (in.)	42.000	**Orsat N %**	79.1
Stack Area sq. ft.	9.621	**Condensate Volume, Ml**	44.9
Nozzle Area sq. ft.	0.0004125	**Delta H (inches H2O)**	1.5250
Number of Points	12	**Stack Pressure**	30.094
Avg of SQRT of V.H.	0.4680	**Stack Temp (Deg R)**	537.1
Meter Correction (Y)	1.031		
Nozzle Diameter	0.275		
Pitot Correction Factor	0.84		

===

Volume Water Vapor, SCF	**2.113**
Gas Volume Sampled, STPD	**36.716**
Total Volume, STP	**38.829**
Moisture in stack gas, volume fraction	**0.054**
Dry Stack Gas, volume fraction	**0.946**
Molecular Weight of Stack Gas (Dry Basis)	**28.84**
Molecular Weight of Stack Gas (Stack conditions)	**28.25**
Specific gravity of Stack Gas Relative to Air	**0.974**
Excess Air (%)	**14864.9**
Average Stack Velocity, FPM	**1601.6**
Actual Stack Gas Flow Rate, ACFM	**15409**
Actual Stack Gas Flow Rate, (Dry) ACFMD	**14577**
Stack Gas Flow Rate, SCFMD	**14413**
Percent Isokinetic	**99.0**

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Facility: Georgia Pacific
Stack: Bleach Plant Outlet
Run Date: 5/25/01
Run No: 3

	Field Data Points			
Trav. Pt.	Vel. Head	Meter Orif.	Stack ' F	Meter ' F
1	0.23	1.60	80	82
2	0.22	1.53	81	83
3	0.22	1.53	80	83
4	0.22	1.53	78	82
5	0.2	1.39	78	82
6	0.2	1.39	78	82
7	0.23	1.60	76	82
8	0.23	1.60	76	82
9	0.24	1.67	75	82
10	0.22	1.53	75	82
11	0.22	1.53	74	82
12	0.2	1.39	74	82
13	0		0	0
14	0		0	0
15	0		0	0
16	0		0	0
17	0		0	0
18	0		0	0
19	0		0	0
20	0		0	0
21	0		0	0
22	0		0	0
23	0		0	0
24	0		0	0
25	0		0	0
26	0		0	0
27	0		0	0
28	0		0	0
29	0		0	0
30	0		0	0

Ambient Air Services, Inc.
Environmental Consultants

106 Ambient Air Way
Starke, Florida 32091

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

Volumetric Air-Flow Rates

Plant	GEORGIA PACIFIC		
Location	PALATKA, FL		
Stack	BLEACH PLANT		
Run Date	5/26/01		
Run Number	3	**Volume Metered**	0
Start Time	0	**Meter Temp (Deg R)**	ERR
Finish Time	0	**Orsat CO2 %**	0
Barometric Pressure	30.09	**Orsat O2 %**	21
Stack Diameter (in.)	42	**Orsat CO %**	0
Stack Area sq. ft.	9.621	**Orsat N %**	79
Number of Points	0	**Condensate Volume**	0
Avg of SQRT of V.H.	0.4641	**Delta H (inches H2O)**	ERR
Meter Correction (Y)	0	**Stack Pressure**	30.09
Pitot Correction Factor	0.84	**Stack Temp (Deg R)**	534.8

Moisture in stack gas, volume fraction	0.053
Dry Stack Gas, volume fraction	0.947
Molecular Weight of Stack Gas (Dry Basis)	28.84
Molecular Weight of Stack Gas (Stack conditions)	28.270
Specific gravity of Stack Gas Relative to Air	0.975
Excess Air (%)	
Average Stack Velocity, FPM	1584.2
Actual Stack Gas Flow Rate, ACFM	15242
Actual Stack Gas Flow Rate, (Dry) ACFMD	14434
Stack Gas Flow Rate (Standard conditions), SCFMD	14331
Stack Gas Flow Rate (Standard conditions), SCFMW	15133

APPENDIX B

FIELD DATA SHEETS

TECHNICAL SERVICES, INC.
JACKSONVILLE, FL
(904)353-5761

SOURCE SAMPLING FIELD DATA SHEET

FACILITY: Georgia Pacific Palatka, GA RUN No. 1
SOURCE: Bleach Plant outlet DATE: 5-25-01
WEATHER: Clear
TYPE TEST: M26A

BAROMETRIC PRESS 30.09
METER BOX ID 11
METER DELTA Ha 2.32
PROBE ID 5cg
PITOT CORR. FACTOR 0.84
NOZZLE DIA. 0.275 in.
PROBE TEMP. ~250
STACK ID (IN): 42
PORT LENGTH 7"

TESTERS: DA / BM
12 PTS. @ 5 MIN/PT 60 MIN
Y meter = 1.031 Filter No. =
COMMENTS:

PRE-TEST.
Ts = 558
Tm = 555
F.D.A. = 0.92

ORSAT:
CO_2 0
O_2 20.9
CO 0

Dave/GP Palatka

TIME	START	1850	START VOLUME	212.658
TIME	END	1952	END VOLUME	248.276

Factors: 6.959

Ea = 0.36 lb/hr
Chlorinated hps

LEAK CHECK: PRE.TEST 0.016 CFM@15". POST: 0.006 @ 2 "Hg

PITOT LEAK CHECK = OK AT 3"

VOL. WATER COLLECTED = 32 ML
WEIGHT MOIS. SILICA GEL = 4.5 GR

STAT.PRESS= +0.07

SCFMD = 17124

PORT & SAMPLE POINT	CLOCK TIME	GAS METER READING	STACK VELOCITY Dp	ORIFICE PRESS. DROP	STACK GAS TEMP	METER TEMP (F)	FILTER TEMP (F)	LAST IMPINGER TEMP	VACUUM INCHES Hg.
1-1	5	15.4	0.23	1.6	92	91	249	62	2
2	10	18.2	0.23	1.6	91	92	252	60	2
3	15	22.6	0.22	1.5	89	93	252	59	2
4	20	25.2	0.22	1.5	90	93	253	60	2
5	25	28.4	0.22	1.5	90	93	252	60	2
6	30	31.1	0.20	1.4	90	93	251	61	2
2-1	35	34.0	0.22	1.5	86	93	250	62	2
2	40	36.8	0.23	1.6	85	93	254	62	2
3	45	39.7	0.22	1.5	88	93	261	62	2
4	50	42.2	0.22	1.5	88	94	260	63	2
5	55	45.0	0.21	1.5	88	95	251	63	2
6	60		0.18	1.3	85	94	252	63	2

TECHNICAL SERVICES, INC.
JACKSONVILLE, FL
(904)353-5761

SOURCE SAMPLING FIELD DATA SHEET

BAROMETRIC PRESS 30.05	FACILITY: Georgia Pacific Palatka		RUN No 2
METER BOX ID 11	SOURCE: Bleach Plant outlet		DATE 5-27-0[illegible]
METER DELTA Ha 2.32	WEATHER: Scattered Clouds	PRE-TEST.	ORSAT
PROBE ID 5c9	TYPE TEST: M26A	Ts =	CO2 0
PITOT CORR. FACTOR 0.84	TESTERS: [illegible]/BM	Tm =	O2 20.9
NOZZLE DIA 0.275 in	12 PTS @ 5 MIN/PT 60 MIN	F.D.A. =	CO 0
PROBE TEMP 250	Y meter = 1.031 Filter No. =		Computer
STACK ID (IN) ~~46~~ 42		Directory and file name	
PORT LENGTH 7"			

TIME	START 2130	START VOLUME	[redacted] 248.351
TIME	END 2234	END VOLUME	284.491
		Factors:	6.959

LEAK CHECK:
PRE TEST 0.010 CFM@15". POST: 0.002 "Hg.

PITOT LEAK CHECK = OK AT 3"

VOL. WATER COLLECTED = 36 ML
WEIGHT MOIS. SILICA GEL = 5.2 GR

STAT PRESS= +0.05

PORT & SAMPLE POINT	CLOCK TIME	GAS METER READING	STACK VELOCITY Dp	ORIFICE PRESS. DROP	STACK GAS TEMP.	METER TEMP (F)	FILTER TEMP. (F)	LAST IMPINGER TEMP.	VACUUM INCHES Hg	COMMENTS:
1-1	5	52.4	0.23	1.6	81	85	249	64	3	Stopped 28 [illegible]
2	10	53.8	0.23	1.6	82	85	251	60	3	
3	15	58.2	0.22	1.5	82	85	254	60	3	
4	20	60.5	0.22	1.5	82	88	251	61	3	
5	25	63.4	0.21	1.5	83	88	252	61	3	
6	30	66.1	0.20	1.4	82	87	252	61	3	
2-1	35	68.9	0.23	1.4	82	85	242	61	3	
2	40	71.2	0.22	1.5	83	86	245	60	3	
3	45	74.2	0.21	1.5	82	86	251	61	3	
4	50	77.8	0.21	1.5	83	86	249	61	3	
5	55	79.9	0.20	1.4	83	86	242	61	3	
6	60		0.18	1.3	83	86	230	62	3	

TECHNICAL SERVICES, INC.
JACKSONVILLE, FL
(904)353-5761

SOURCE SAMPLING FIELD DATA SHEET

FACILITY: Georgia Pacific Palatka, FL — RUN No 3
SOURCE: Bleach Plant Outlet — DATE 5-25-01
WEATHER: Partly Cloudy
TYPE TEST: M26A
TESTERS: [illegible]/BM

BAROMETRIC PRESS 30.09
METER BOX ID 11
METER DELTA Ha 2.32
PROBE ID 5a
PITOT CORR FACTOR 0.84
NOZZLE DIA 0.225 in
PROBE TEMP ~250
STACK ID (IN) ~~46~~ 42
PORT LENGTH 7"

12 PTS. @ 5 MIN/PT 60 MIN F.D.A. =
Y meter = 1.031 Filter No. =

PRE-TEST:
Ts =
Tm =

ORSAT
CO2 0
O2 20.5
CO 0

Computer
Directory and file name

TIME START	2300	START VOLUME	285.953
TIME END	2402	END VOLUME	3~~2~~ ~~2~~.215

Factors: 6.959

LEAK CHECK:
PRE TEST 0.00 CFM@15" POST: 0.001 @ 3 " Hg.

PITOT LEAK CHECK = OK AT 3"

VOL. WATER COLLECTED = 40 ML
WEIGHT MOIS. SILICA GEL = 4.9 GR

STAT PRESS= +0.06

PORT & SAMPLE POINT	CLOCK TIME	GAS METER READING	STACK VELOCITY Dp	ORIFICE PRESS. DROP	STACK GAS TEMP.	METER TEMP (F)	FILTER TEMP. (F)	LAST IMPINGER TEMP.	VACUUM INCHES Hg.	COMMENTS:
1-1	5	88.7	0.23	1.6	80	82	245	62	3	
2	10	90.8	0.22	1.5	81	83	255	60	3	
3	15	94.1	0.22	1.5	82	83	256	55	3	
4	20	98.2	0.22	1.4	78	82	252	60	3	
5	25	00.0	0.20	1.4	78	82	247	59	3	
6	30	03.1	0.20	1.4	78	82	25	59	3	
2-1	35	05.6	0.23	1.6	76	82	242	60	3	
2	40	7.9	0.23	1.6	76	82	240	60	3	
3	45	10.5	0.24	1.7	75	82	241	60	3	
4	50	13.1	0.22	1.4	75	82	242	61	3	
5	55	17.2	0.22	1.4	74	82	245	60	3	
6	60		0.20	1.4	74	82	236	61	3	

Velocity Traverse

Technical Services, Inc.
Jacksonville, FL (904)353-5761

Plant: Georgia Pacific Date: 5-25-01
Source: ______ Barometric Pressure: 30.09
Stack Diameter: 46

Run No. (4) Run No. ______ Run No. ______

Start: 0030 Stop: 0035 Start: Stop: Start: Stop:
Static Press.(in.H2O) +0.05 Static Press.(in.H2O) ______ Static Press.(in.H2O) ______

Traverse Point No.	Velocity Head	Stack Temp. (Ts) Deg. F
1-1	0.24	74.5
2	0.24	75
3	0.23	75
4	0.22	75
5	0.20	75
6	0.19	75
2-1	0.23	74
2	0.23	75
3	0.22	75
4	0.22	75
5	0.19	75
6	0.18	74

Traverse Point No.	Velocity Head	Stack Temp. (Ts) Deg. F

Traverse Point No.	Velocity Head	Stack Temp. (Ts) Deg. F

APPENDIX C

LABORATORY ANALYSIS

TECHNICAL SERVICES, INC.
ENVIRONMENTAL CONSULTANTS

For Georgia Pacific (Palatka)
P O Box 919
Palatka, FL 32178-0919
Contact: Joe Taylor

Report Date: 30-May-01
Date Received: 05/26/2001 @ 10:20
Purchase Order #:

CERTIFICATE OF ANALYSIS

LAB SAMPLE DESCRIPTION	MATRIX	SAMPLE DATE	SAMPLE TIME	SAMPLED BY
01050850 BLEACH PLANT INLET AND OUTLET, OUTLET RUN 1/ COMPOSITE	IMPINGER	05/25/2001	NA	TSI- D.S. , G.H.
01050851 BLEACH PLANT INLET AND OUTLET, OUTLET RUN 2/ COMPOSITE	IMPINGER	05/25/2001	NA	TSI- D.S. , G.H.
01050852 BLEACH PLANT INLET AND OUTLET, OUTLET RUN 3/ COMPOSITE	IMPINGER	05/25/2001	NA	TSI- D.S. , G.H.
01050853 BLEACH PLANT INLET AND OUTLET, OUTLET RUN 1/ COMPOSITE	IMPINGER	05/25/2001	NA	TSI- D.S. , G.H.
01050854 BLEACH PLANT INLET AND OUTLET, OUTLET RUN 2/ COMPOSITE	IMPINGER	05/25/2001	NA	TSI- D.S. , G.H.
01050855 BLEACH PLANT INLET AND OUTLET, OUTLET RUN 3/ COMPOSITE	IMPINGER	05/25/2001	NA	TSI- D.S. , G.H.

Respectfully submitted,
Technical Services, Inc.

Walter Mock

Air and Water Pollution Sampling, Surveys, Testing and Analytical Services

Georgia Pacific (Palatka)

	Lab No.	Parameter	Result		Code	Method	Detection Limit
	01050850	Default	Not analyzed				
	01050851	Default	Not analyzed				
	01050852	Default	Not analyzed				
R-1	01050853	Chloride	0.971	ug/ml Cl-		Method 26A	0.02
	01050853	Sample Volume	196	mls			1
			190.3 µg				
R-2	01050854	Chloride	0.808	ug/ml Cl-		Method 26A	0.02
	01050854	Sample Volume	200	mls			1
			161.6 µg				
R-3	01050855	Chloride	0.838	ug/ml Cl-		Method 26A	0.02
	01050855	Sample Volume	194	mls			1
			162.6 µg				

Georgia Pacific (Palatka)

Lab No.	Parameter	Date of Analysis	Analysis Time	Analyst	Prep Date
01050850	Default			none	
01050851	Default			none	
01050852	Default			none	
01050853	Chloride	05/26/2001		WEM	
01050853	Sample Volume	05/26/2001		WEM	
01050854	Chloride	05/26/2001		WEM	
01050854	Sample Volume	05/26/2001		WEM	
01050855	Chloride	05/26/2001		WEM	
01050855	Sample Volume	05/26/2001		WEM	

APPENDIX D

SCRUBBER DATA AND PROCESS CERTIFICATION

BLEACH PLANT PRODUCTION DATA

DATE	TIME	ADTUP	FAN LOAD, %
05/25/01	1850-1952	55	85.1
	2133-2300	50	85.6
	2300-2330	55	85.9
	2330-0042	50	85.8
	0145-0230	50	85.2

ADTUP is air-dried tons of unbleached pulp across the bleach plant.
Fan load is the % of full load (amperage) of the fan used as the surrogate flow measure.
The scrubber recirculation flow ranged from 1500 gpm to 1740 gpm during the testing.
The scrubber pH was 9.5 during the testing.

DATA CERTIFICATION BY OWNER OR HIS AUTHORIZED AGENT

I, Myra Carpenter,
(print name)

certify that to my knowledge all data

submitted in this compliance test report

for the ECF Bleach Plant unit

on May 25, 2001
(date)

are true and correct.

Myra Carpenter
(signature and title)

APPENDIX E

CHAIN OF CUSTODY

01050850 -
01050855

Technical Services, Inc.

2901 Danese St., Jacksonville, FL 32206
(904) 353-5761 / fax (904) 358-2908

CHAIN of CUSTODY RECORD

CLIENT NAME & ADDRESS (REPORT TO BE SENT TO:) c/o Air Dept
Georgia Pacific
Palatka, FL

REMARKS: Bleach Plant inlet + Outlet
Method 26A

PROJ. NO.

PROJECT NAME/ ADDRESS:

SAMPLERS: (SIGNATURE) [signature] G Hawkins

TOTAL NO. of Containers

BOTTLE MAKEUP: 4 Polys

Sample Location ID	DATE	TIME	COMP	GRAB	TOTAL NO. of Containers	BOTTLE MAKEUP	PARAMETERS
Outlet R-1	5-25-01	N/A	✓		1	0.1N H_2SO_4	M 26A
2	↓	↓	↓		1		
3	↓	↓	↓		1		
R-1	↓	↓	↓		1	0.1N NaOH	
2	↓	↓	↓		1		
3	↓	↓	↓		1		

RELINQUISHED BY	DATE/TIME	RECEIVED BY	DATE/TIME
[signature]	5/26/01 1100		

RECEIVED FOR LABORATORY BY: [signature] DATE/TIME: 5/26/01 1100

J

APPENDIX F

CALIBRATION DATA

T S I

Annual Dry Gas Meter Calibration Data By TSI Reference Meter

REFERENCE METER **R-275** **TSI Reference Dry Meter Calibration Date:** **8/09/00**

Yi of reference meter: **1.012**

Date **1/4/01** **Calibrated by** **R Garza**

Barometric Pressure **30.12** **Meter Box** **11**

Orifice Manometer Setting (DH) In. H2O	Reference Dry Gas Meter Cu.ft.	Gas Volume: Reference Meter (Vw) Std.Cu. Ft.	Gas Volume: Dry Gas Meter (VD) Cu. Ft.	Temperature: Reference Meter (Tw) Deg ^F	Temperature: Dry Gas Meter	Temperature: Dry Gas Meter Temperature (Td) Deg ^F		Time (t), min	Delta H In. H2O	Yi
0.5	10.015	10.099	9.715	73.2		X	66.40	29.34	2.39	1.025
1	10.002	10.082	9.761	73.4		X	70.90	20.46	2.31	1.026
1.5	10.005	10.044	9.642	75.6		X	73.30	17.00	2.42	1.033
2	10.013	10.075	9.691	74.4		X	74.50	14.50	2.32	1.035
3	10.012	10.057	9.645	75.3		X	75.40	11.39	2.16	1.035
						Average Delta H and Y			2.32	1.031
						Yi Allowance =		1.011	To	1.051
						DH Allowance =		2.12	To	2.52

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

Vw = Gas volume passing through the Reference test meter, (cu. ft.)

Vd = Gas volume passing through the dry gas meter, (cu. ft.)

Tw = Temperature of the gas in the Reference test meter, Deg F

Td = Temperature of the gas in the dry gas meter, Deg F

DH = Pressure differential across orifice, in H2O = pretest DH + or - 0.20

Yi = Ratio of accuracy of the Reference test meter to dry gas meter for each run

Y = Average ratio of the Reference test meter to dry gas meter for all three test runs; tolerance = pretest Y + or - 0.02Y

Pb = Barometric pressure, in. Hg.

t = Time of calibration run, min.

Quality Assurance Handbook M5-2.4A

Quality Assurance Handbook M5-2.4A

T S I

Post-Test Dry Gas Meter Calibration Data Form (English Units)

Test numbers All Date 5/31/01 Meter Box No. 11 Facility GP

Barometric Pressure, Pb 30.05 Reference Meter R-275 Pretest Y Value 1.024

Orifice Manometer Setting (DH) In. H2O	Gas Volume Reference Meter (Vw) Cu. Ft.	Gas Volume Dry Gas Meter (VD) Cu. Ft.	Temperature Reference Meter (Tw) Deg ^F	Temperature Dry Gas Meter	Temperature Dry Gas Meter	Temperature Dry Gas Meter Average (Td) Deg ^F	Time (), min	Vacuum Setting In. Hg.	Yi
1.5	10.003	9.831	75	X	X	75	16.87	< 2	1.014
1.5	10.001	9.823	75	X	X	76	16.56	<2	1.016
1.5	10.000	9.820	80	X	X	81	16.92	<2	1.016
								Yi =	1.016

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

$$Yi = \frac{Vw * Pb * (Td + 460)}{Vd\ (Pb + (Delta\ H/13.6)) \times (Tw + 460)}$$

Vw = Gas volume passing through the reference test meter, (cu. ft.)
Vd = Gas volume passing through the dry gas meter, (cu. ft.)
Tw = Temperature of the gas in the reference test meter, Deg F
(Td)i = Temperature of the inlet gas of the dry gas meter, Deg F
(Td) = Temperature of the outlet gas of the dry gas meter, Deg F
Td = Average temperature of the gas in the dry gas meter, obtained by the average of (Td)i & (Td)o, Deg F
DH = Pressure differential across orifice, in H2O
Yi = Ratio of accuracy of the reference test meter to dry gas meter for each run
Y = Average ratio of the reference test meter to dry gas meter for all three test runs;
tolerance = pretest Y + or - 0.02Y
Pb = Barometric pressure, in. Hg.
= Time of calibration run, min.

Quality Assurance Handbook M5-2.4A

T
S
I

Air Report - Method Five Equipment Calibrations

THERMOCOUPLE CALIBRATIONS

Facility: Georgia Pacific | **Date:** 5/31/01

Location: Palatka, FL | **Analyst:** [signature]

Source Name: Bleach Plant Outlet Inlet

Calibration Data

Ambient Temperature 75 — **Reference: Mercury in glass** X

Thermocouple Number 5cg — **Other** ___

Barometric Pressure 29.97

Reference Point Number	Source(a) (specify)	Reference Thermometer Temperature	Thermocouple Temperature	Temperature Difference(b)
1	Ice Bath	34	33	0.20
2	Inter-mediate	75	73	0.37
3	Boiling Water	212	212	0.00
4	Hot Oil	347	345	0.25

a Type of calibration system used

b $\left[\frac{(\text{REF. TEMP.} + 460) - (\text{THERMOCOUPLE TEMP.} + 460)}{\text{ref. temp} + 460}\right] \times 100 <= 1.5\%$

GEORGIA PACIFIC

PALATKA, FLORIDA

SUMMARY OF CO CALIBRATIONS - BLEACH PLANT

5/25/01 - 5/26/01

INSTRUMENT RANGE, PPM	1200			
CALIBRATION GAS PPM	**INITIAL CALIBRATION**	**END RUN 1**	**END RUN 2**	**END RUN 3**
0.0	12.0	12.0	11.3	10.8
1015.0	1016.4	1020.0	1032.5	1031.6
594.7	575.1	N/A	N/A	N/A
301.9	293.5	N/A	N/A	N/A
CALIBRATION ERROR		((INSTRUMENT RESPONSE-CALIBRATION GAS VALUE)/INSTRUMENT RANGE)X100		
0.0	1.0	1.0	0.9	0.9
1015.0	0.1	0.4	1.5	1.4
594.7	-1.6	N/A	N/A	N/A
301.9	-0.7	N/A	N/A	N/A
CALIBRATION DRIFT		((FINAL CALIBRATION - INITIAL CALIBRATION)/INSTRUMENT RANGE)X100		
0.0	N/A	0.0	-0.1	-0.1
1015.0	N/A	0.3	1.3	1.3
594 7	N/A	N/A	N/A	N/A

ZERO BIAS CHECKS		(SAMPLE SYSTEM-DIRECT)/RANGEX100		
SAMPLE ZERO	DIRECT ZERO	BIAS		
N/A	N/A	#VALUE!	INITIAL	
N/A	N/A	#VALUE!	FINAL	ALL CAL
CALIBRATION BIAS CHECKS				GASES INJECTED
CALIBRATION GAS, PPM	N/A			TO PROBE TIP ONLY
SAMPLE	DIRECT	BIAS		
N/A	N/A	#VALUE!	INITIAL	
N/A	N/A	#VALUE!	FINAL	

PRAXAIR

Praxair Distribution, Inc.
145 Shimersville Road
Bethlehem, PA 18015
Tel. (610) 691-2474
Fax (610) 758-8384

CERTIFICATE OF ANALYSIS / EPA PROTOCOL GAS

CUSTOMER PRAXAIR SOUTHEAST **P.O NUMBER** 333045-00

REFERENCE STANDARD

COMPONENT	NIST SRM NO.	CYLINDER NO.	CONCENTRATION
CARBON MONOXIDE 503.2PPM GMIS VS	1680B	CLM-009396	490.4 PPM

ANALYZER READINGS

R=REFERENCE STANDARD ***Z=ZERO GAS*** ***C=GAS CANDIDATE***

1. **COMPONENT** CARBON MONOXIDE 503.2PPM GMI **ANALYZER MAKE-MODEL-S/N** Siemens Ultramat 5E S/N B8-900

ANALYTICAL PRINCIPLE NON-DISPERSIVE INFRARED **LAST CALIBRATION DATE** 12/31/00

FIRST ANALYSIS DATE 12/27/00 **SECOND ANALYSIS DATE** [illegible]

Z	[illegible]	**R**	503	**C**	301	**CONC.**	[illegible]	**Z**	0	**R**	504	**C**	[illegible]	**CONC.**	[illegible]
R	502	**Z**	0	**C**	302	**CONC.**	302.3	**R**	504	**Z**	0	**C**	302	**CONC.**	[illegible]
Z	0	**C**	302	**R**	503	**CONC.**	[illegible]	**Z**	0	**C**	303	**R**	504	**CONC.**	[illegible]
U/M	ppm			**MEAN TEST ASSAY**			[illegible]	**U/M**	ppm			**MEAN TEST ASSAY**			[illegible]

VALUES NOT VALID BELOW 150 PSIG
UNCERTAINTIY OF CARBON MONOXIDE ±1 PPM

THIS CYLINDER NO.	[illegible]	**CERTIFIED CONCENTRATION**	
HAS BEEN CERTIFIED ACCORDING TO SECTION	[illegible]	CARBON MONOXIDE	[illegible] PPM
OF TRACEABILITY PROTOCOL NO.	EPA-600/R97/[illegible]	AIR	BALANCE
PROCEDURE	G1		
CERTIFIED ACCURACY	± 1 % NIST TRACEABLE		
CYLINDER PRESSURE	2000 PSIG		
CERTIFICATION DATE	01/03/01		
EXPIRATION DATE	01/03/04 TERM		

ANALYZED BY JOHN PRIBISH

CERTIFIED BY KEVIN BRADY

PRAXAIR

Praxair Distribution, Inc.
145 Shimersville Road
Bethlehem, PA 18015
Tel. (610) 691-2474
Fax (610) 758-8384

CERTIFICATE OF ANALYSIS / EPA PROTOCOL GAS

CUSTOMER PRAXAIR SOUTHEAST **P.O NUMBER** 333045-00

REFERENCE STANDARD

COMPONENT	NIST SRM NO.	CYLINDER NO.	CONCENTRATION
CARBON MONOXIDE 503.2PPM GMIS VS	1680B	CLM-009396	490.4 PPM

ANALYZER READINGS

R=REFERENCE STANDARD *Z=ZERO GAS* *C=GAS CANDIDATE*

1. **COMPONENT** CARBON MONOXIDE 503.2PPM GMIS **ANALYZER MAKE-MODEL-S/N** Siemens Ultramat 5E S/N B8-900

ANALYTICAL PRINCIPLE NON-DISPERSIVE INFRARED **LAST CALIBRATION DATE** 12/31/00

FIRST ANALYSIS DATE 12/27/00 **SECOND ANALYSIS DATE** 01/03/01

Z 0	R 503	C 595	CONC. 595.6	Z 0	R 504	C 595	CONC. 594.[illegible]
R 502	Z 0	C 595	CONC. 595.6	R 504	Z 0	C 595	CONC. 594.[illegible]
Z 0	C 594	R 503	CONC. 59[illegible].6	Z 0	C 595	R 504	CONC. 594.[illegible]
U/M ppm		MEAN TEST ASSAY	595.3	U/M ppm		MEAN TEST ASSAY	594.[illegible]

VALUES NOT VALID BELOW 150 PSIG
UNCERTAINTIY OF CARBON MONOXIDE ±[illegible]PPM

THIS CYLINDER NO. SA12251	**CERTIFIED CONCENTRATION**
HAS BEEN CERTIFIED ACCORDING TO SECTION [illegible]	CARBON MONOXIDE 594 PPM
OF TRACEABILITY PROTOCOL NO. EPA-[illegible]/R97/[illegible]	AIR BALANCE
PROCEDURE [illegible]	
CERTIFIED ACCURACY [illegible] % **NIST TRACEABLE**	
CYLINDER PRESSURE 2000 **PSIG**	
CERTIFICATION DATE 01/03/01	
EXPIRATION DATE 01/03/04 **TERM**	

ANALYZED BY [illegible] *CERTIFIED BY* [illegible]

SPECTRA GASES
277 Coit St • Irvington, NJ 07111 USA Tel. (973) 372-2060 • (800) 932-0624 • Fax (973) 372-8551
Shipped From 80 Industrial Drive • Alpha, N.J. 08865

CERTIFICATE OF ANALYSIS

EPA PROTOCOL MIXTURE

PROCEDURE # : G2

CUSTOMER: Ambient Air Service
SGI ORDER # : 134478
ITEM# : 1
P.O.# : 07079802

CYLINDER # : CC88617
CYLINDER PRES: 2000 PSIG
CGA OUTLET: 350

CERTIFICATION DATE: 7/8/98
EXPIRATION DATE: 7/8/2001

CERTIFICATION HISTORY

COMPONENT	DATE OF ASSAY	MEAN CONCENTRATION	CERTIFIED CONCENTRATION	ANALYTICAL ACCURACY
Carbon Monoxide	2/24/98 7/8/98	1014 ppm 1017 ppm	1015 ppm	+/- 1%

BALANCE Nitrogen

REFERENCE STANDARDS

COMPONENT	SRM/NTRM#	CYLINDER#	CONCENTRATION
Carbon Monoxide	NTRM-81681	CC55775	994 ppm

INSTRUMENTATION

COMPONENT	MAKE/MODEL	SERIAL #	DETECTOR	CALIBRATION DATE(S)
Carbon Monoxide	Horiba VIA-510	570423011	NDIR	6/29/98

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

ANALYST: [signature]
FRED PIKULA

DATE: 7/8/98

APPENDIX G

CARBON MONOXIDE EMISSIONS

Georgia Pacific Bleach Plant - Carbon Monoxide Test

DATE / TIME	PPM	COMMENTS	ZERO CAL	1015 ppm cal	CORRECTED PPM	FLOW, acfm-dry	POUNDS OF CO PER HOUR
5/25/01 18 46	1030 0	1015 ppm cal	10 98	1026 4			
5/25/01 18 46	1026 0	1015 ppm cal	10 98	1026 4			
5/25/01 18 46	1022 0	1015 ppm cal	10 98	1026 4			
5/25/01 18 46	1026 0	1015 ppm cal	10 98	1026 4			
5/25/01 18 47	1030 0	1015 ppm cal	10 98	1026 4			
5/25/01 18 47	1024 0	1015 ppm cal	10 98	1026 4			
5/25/01 18 47	1022 0	1015 ppm cal	10 98	1026 4			
5/25/01 18 47	1016 0	wait	10 98	1026 4			
5/25/01 18 48	923 8	wait	10 98	1026 4			
5/25/01 18 48	456 9	wait	10 98	1026 4			
5/25/01 18 48	144 2	wait	10 98	1026 4			
5/25/01 18 48	24 0	wait	10 98	1026 4			
5/25/01 18 49	14 0	wait	10 98	1026 4			
5/25/01 18 49	24 0	wait	10 98	1026 4			
5/25/01 18 49	56 1	wait	10 98	1026 4			
5/25/01 18 49	44 0	wait	10 98	1026 4			
5/25/01 18 50	18 0	wait	10 98	1026 4			
5/25/01 18 50	12 0	wait	10 98	1026 4			
5/25/01 18 50	12 0	wait	10 98	1026 4			
5/25/01 18 50	10 0	0 ppm cal	10 98	1026 4			
5/25/01 18 51	10 0	0 ppm cal	10 98	1026 4			
5/25/01 18 51	10 0	0 ppm cal	10 98	1026 4			
5/25/01 18 51	12 0	wait	10 98	1026 4			
5/25/01 18 51	16 0	wait	10 98	1026 4			
5/25/01 18 52	80 1	wait	10 98	1026 4			
5/25/01 18 52	154 3	wait	10 98	1026 4			
5/25/01 18 52	214 4	wait	10 98	1026 4			
5/25/01 18 52	270 5	wait	10 98	1026 4			
5/25/01 18 53	288 5	wait	10 98	1026 4			
5/25/01 18 53	292 5	301 9 ppm cal	10 98	1026 4			
5/25/01 18 53	294 5	301 9 ppm cal	10 98	1026 4			
5/25/01 18 53	294 5	301 9 ppm cal	10 98	1026 4			
5/25/01 18 54	292 5	301 9 ppm cal	10 98	1026 4			
5/25/01 18 54	292 5	301 9 ppm cal	10 98	1026 4			
5/25/01 18 54	294 5	301 9 ppm cal	10 98	1026 4			
5/25/01 18 54	294 5	301 9 ppm cal	10 98	1026 4			
5/25/01 18 55	292 5	301 9 ppm cal	10 98	1026 4			
5/25/01 18 55	286 5	wait	10 98	1026 4			
5/25/01 18 55	298 5	wait	10 98	1026 4			
5/25/01 18 55	440 8	wait	10 98	1026 4			
5/25/01 18 56	545 0	wait	10 98	1026 4			
5/25/01 18 56	575 1	wait	10 98	1026 4			
5/25/01 18 56	579 1	wait	10 98	1026 4			
5/25/01 18 56	581 1	594 7 ppm cal	10 98	1026 4			
5/25/01 18 57	583 1	594 7 ppm cal	10 98	1026 4			
5/25/01 18 57	583 1	594 7 ppm cal	10 98	1026 4			
5/25/01 18 57	581 1	594 7 ppm cal	10 98	1026 4			
5/25/01 18 57	581 1	594 7 ppm cal	10 98	1026 4			
5/25/01 18 58	581 1	594 7 ppm cal	10 98	1026 4			
5/25/01 18 58	581 1	594.7 ppm cal	10 98	1026 4			
5/25/01 18 58	643 2	wait	10 98	1026 4			
5/25/01 18 58	939 6	wait	10 98	1026 4			
5/25/01 18 59	1070 1	wait	10 98	1026 4			
5/25/01 18 59	1118 2	wait	10 98	1026 4			
5/25/01 21 37	12 0	0 ppm cal	11 982	1021 8			
5/25/01 21 37	12 0	0 ppm cal	11 982	1021 8			
5/25/01 21 38	12 0	0 ppm cal	11 982	1021 8			
5/25/01 21 38	12 0	0 ppm cal	11 982	1021 8			
5/25/01 21 38	12 0	0 ppm cal	11 982	1021 8			
5/25/01 21 38	12 0	0 ppm cal	11 982	1021 8			
5/25/01 21 39	12 0	0 ppm cal	11 982	1021 8			

Georgia Pacific Bleach Plant - Carbon Monoxide Test

DATE / TIME	PPM	COMMENTS	ZERO CAL	1015 ppm cal	CORRECTED PPM	FLOW, scfm, dry	POUNDS OF CO PER HOUR
5/25/01 21:39	12.0	0 ppm cal	11.982	1021.8			
5/25/01 21:39	14.0	wait	11.982	1021.9			
5/25/01 21:39	212.4	wait	11.982	1021.8			
5/25/01 21:40	649.2	wait	11.982	1021.8			
5/25/01 21:40	959.9	wait	11.982	1021.8			
5/25/01 21:40	1010.0	wait	11.982	1021.8			
5/25/01 21:40	1014.0	1015 ppm cal	11.982	1021.8			
5/25/01 21:41	1018.0	1015 ppm cal	11.982	1021.8			
5/25/01 21:41	1016.0	1015 ppm cal	11.982	1021.8			
5/25/01 21:41	1012.0	1015 ppm cal	11.982	1021.8			
5/25/01 21:41	1018.0	1015 ppm cal	11.982	1021.8			
5/25/01 21:42	1020.0	1015 ppm cal	11.982	1021.8			
5/25/01 21:42	1014.0	1015 ppm cal	11.982	1021.8			
5/25/01 21:42	1018.0	1015 ppm cal	11.982	1021.8			
5/25/01 21:42	1018.0	1015 ppm cal	11.982	1021.8			
5/25/01 21:43	1014.0	1015 ppm cal	11.982	1021.8			
5/25/01 21:43	1020.0	1015 ppm cal	11.982	1021.8			
5/25/01 21:43	1016.0	1015 ppm cal	11.982	1021.8			
5/25/01 21:43	1014.0	1015 ppm cal	11.982	1021.8			
5/25/01 21:44	1018.0	1015 ppm cal	11.982	1021.8			
5/25/01 21:44	1008.0	wait	11.982	1021.8			
5/25/01 21:44	933.8	wait	11.982	1021.8			
5/25/01 21:44	729.4	wait	11.982	1021.8			
5/25/01 21:45	611.2	wait	11.982	1021.8			
5/25/01 21:45	581.1	wait	11.982	1021.8			
5/25/01 21:45	575.1	594.7 ppm cal	11.982	1018.2			
5/25/01 21:45	575.1	594.7 ppm cal	11.982	1018.2			
5/25/01 21:46	577.1	594.7 ppm cal	11.982	1018.2			
5/25/01 21:46	575.1	594.7 ppm cal	11.982	1018.2			
5/25/01 21:46	577.1	594.7 ppm cal	11.982	1018.2			
5/25/01 21:46	573.1	594.7 ppm cal	11.982	1018.2			
5/25/01 21:47	573.1	594.7 ppm cal	11.982	1018.2			
5/25/01 21:47	561.1	wait	11.982	1018.2			
5/25/01 21:47	601.1	wait	11.982	1018.2			
5/25/01 21:47	675.3	wait	11.982	1018.2			
5/25/01 21:48	701.3	wait	11.982	1018.2			
5/25/01 21:48	713.4	wait	11.982	1018.2			
5/25/01 21:48	721.4	wait	11.982	1018.2			
5/25/01 21:48	723.4	wait	11.982	1018.2			
5/25/01 21:49	717.4	wait	11.982	1018.2			
5/25/01 21:49	717.4	wait	11.982	1018.2			
5/25/01 21:49	719.4	wait	11.982	1018.2			
5/25/01 21:49	719.4	wait	11.982	1018.2			
5/25/01 21:50	715.4	run 1	11.982	1018.2	709.5	14183	43.9
5/25/01 21:50	713.4	run 1	11.982	1018.2	707.5	14183	43.8
5/25/01 21:50	711.4	run 1	11.982	1018.2	705.5	14183	43.7
5/25/01 21:50	709.4	run 1	11.982	1018.2	703.5	14183	43.5
5/25/01 21:51	705.4	run 1	11.982	1018.2	699.4	14183	43.3
5/25/01 21:51	695.3	run 1	11.982	1018.2	689.3	14183	42.7
5/25/01 21:51	695.3	run 1	11.982	1018.2	589.3	14183	42.7
5/25/01 21:51	697.3	run 1	11.982	1018.2	691.3	14183	42.8
5/25/01 21:52	687.3	run 1	11.982	1018.2	681.2	14183	42.2
5/25/01 21:52	679.3	run 1	11.982	1018.2	673.2	14183	41.7
5/25/01 21:52	683.3	run 1	11.982	1018.2	677.2	14183	41.9
5/25/01 21:52	687.3	run 1	11.982	1018.2	681.2	14183	42.2
5/25/01 21:53	687.3	run 1	11.982	1018.2	681.2	14183	42.2
5/25/01 21:53	691.3	run 1	11.982	1018.2	685.3	14183	42.4
5/25/01 21:53	691.3	run 1	11.982	1018.2	585.3	14183	42.4
5/25/01 21:53	585.3	run 1	11.982	1018.2	679.2	14183	42.[illegible]
5/25/01 21:54	587.3	run 1	11.982	1018.2	681.2	14183	42.2
5/25/01 21:54	683.3	run 1	11.982	1018.2	677.2	14183	41.9

Georgia Pacific Bleach Plant - Carbon Monoxide Test

DATE / TIME	PPM	COMMENTS	ZERO CAL	1018 ppm cal	CORRECTED PPM	FLOW, scfm dry	POUNDS OF CO PER HOUR
5/25/01 21 54	675 3	run 1	11 982	1018 2	669 1	14183	41 4
5/25/01 21 54	669 3	run 1	11 982	1018 2	563 0	14183	41 0
5/25/01 21 55	669 3	run 1	11 982	1018 2	663 0	14183	41 0
5/25/01 21 55	675 3	run 1	11 982	1018 2	669 1	14183	41 4
5/25/01 21 55	673 3	run 1	11 982	1018 2	667 1	14183	41 3
5/25/01 21 55	665 3	run 1	11 982	1018 2	659 0	14183	40 8
5/25/01 21 56	669 3	run 1	11 982	1018 2	663 0	14183	41 0
5/25/01 21 56	679 3	run 1	11 982	1018 2	673 2	14183	41 7
5/25/01 21 56	675 3	run 1	11 982	1018 2	569 1	14183	41 4
5/25/01 21 56	675 3	run 1	11 982	1018 2	669 1	14183	41 4
5/25/01 21 57	679 3	run 1	11 982	1018 2	673 2	14183	41 7
5/25/01 21 57	673 3	run 1	11 982	1018 2	567 1	14183	41 3
5/25/01 21 57	667 3	run 1	11 982	1018 2	661 0	14183	40 9
5/25/01 21 57	663 3	run 1	11 982	1018 2	657 0	14183	40 5
5/25/01 21 58	667 3	run 1	11 982	1018 2	661 0	14183	40 9
5/25/01 21 58	663 3	run 1	11 982	1018 2	657 0	14183	40 6
5/25/01 21 58	655 3	run 1	11 982	1018 2	648 9	14183	40 1
5/25/01 21 58	655 3	run 1	11 982	1018 2	648 9	14183	40 1
5/25/01 21 59	661 3	run 1	11 982	1018 2	655 0	14183	40 5
5/25/01 21 59	649 2	run 1	11 982	1018 2	642 8	14183	39 8
5/25/01 21 59	633 2	run 1	11 982	1018 2	626 7	14183	38 8
5/25/01 21 59	639 2	run 1	11 982	1018 2	632 7	14183	39 1
5/25/01 22 00	647 2	run 1	11 982	1018 2	540 8	14183	39 6
5/25/01 22 00	641 2	run 1	11 982	1018 2	634 7	14183	39 3
5/25/01 22 00	639 2	run 1	11 982	1018 2	632 7	14183	39 1
5/25/01 22 00	651 2	run 1	11 982	1018 2	644 9	14183	39 9
5/25/01 22 01	655 3	run 1	11 982	1018 2	648 9	14183	40 1
5/25/01 22 01	657 3	run 1	11 982	1018 2	650 9	14183	40 3
5/25/01 22 01	665 3	run 1	11 982	1018 2	659 0	14183	40 8
5/25/01 22 01	675 3	run 1	11 982	1018 2	669 1	14183	41 4
5/25/01 22 02	685 3	run 1	11 982	1018 2	679 2	14183	42 0
5/25/01 22 02	693 3	run 1	11 982	1018 2	587 3	14183	42 5
5/25/01 22 02	693 3	run 1	11 982	1018 2	687 3	14183	42 5
5/25/01 22 02	691.3	run 1	11 982	1018 2	685 3	14183	42 4
5/25/01 22 03	693 3	run 1	11 982	1018 2	687 3	14183	42 5
5/25/01 22 03	697 3	run 1	11 982	1018 2	691 3	14183	42 8
5/25/01 22 03	697 3	run 1	11 982	1018 2	691 3	14183	42 8
5/25/01 22 03	705 4	run 1	11.982	1018 2	699 4	14183	43 3
5/25/01 22 04	705 4	run 1	11.982	1018 2	699 4	14183	43 3
5/25/01 22 04	695 3	run 1	11 982	1018 2	689 3	14183	42 7
5/25/01 22 04	685 3	run 1	11 982	1018 2	679 2	14183	42 0
5/25/01 22 04	677 3	run 1	11 982	1018 2	671 1	14183	41 5
5/25/01 22 05	669 3	run 1	11 982	1018 2	663 0	14183	41 0
5/25/01 22 05	667 3	run 1	11.982	1018 2	661 0	14183	40 9
5/25/01 22 05	667 3	run 1	11 982	1018 2	661 0	14183	40 9
5/25/01 22 05	663 3	run 1	11 982	1018 2	657 0	14183	40 6
5/25/01 22 06	659 3	run 1	11 982	1018 2	652 9	14183	40 4
5/25/01 22.06	657 3	run 1	11 982	1018 2	650 9	14183	40 3
5/25/01 22 06	651 2	run 1	11 982	1018 2	544 9	14183	39 9
5/25/01 22 06	643 2	run 1	11 982	1018 2	636 8	14183	39 4
5/25/01 22 07	647 2	run 1	11 982	1018 2	540 8	14183	39 5
5/25/01 22 07	655 3	run 1	11 982	1018 2	648 9	14183	40 1
5/25/01 22 07	653 2	run 1	11 982	1018 2	546 9	14183	40 0
5/25/01 22 07	651 2	run 1	11 982	1018 2	644 9	14183	39 9
5/25/01 22 08	655 3	run 1	11 982	1018 2	548 9	14183	40 1
5/25/01 22 08	657 3	run 1	11 982	1018 2	550 9	14183	40 3
5/25/01 22 08	653 2	run 1	11 982	1018 2	646 9	14183	40 0
5/25/01 22 08	655 3	run 1	11 982	1018 2	648 9	14183	40 1
5/25/01 22 09	563 3	run 1	11 982	1018 2	557 0	14183	40 6
5/25/01 22 09	569 3	run 1	11 982	1018 2	563 0	14183	41 0
5/25/01 22 09	565 3	run 1	11 982	1018 2	559 0	14183	40 8

Georgia Pacific Bleach Plant - Carbon Monoxide Test

DATE / TIME	PPM	COMMENTS	ZERO CAL	1018 ppm cal	CORRECTED PPM	FLOW, scfm-dry	POUNDS OF CO PER HOUR
5/25/01 22:09	663.3	run 1	11.982	1018.2	657.0	14183	40.6
5/25/01 22:10	671.3	run 1	11.982	1018.2	665.1	14183	41.2
5/25/01 22:10	679.3	run 1	11.982	1018.2	673.2	14183	41.7
5/25/01 22:10	679.3	run 1	11.982	1018.2	673.2	14183	41.7
5/25/01 22:10	681.3	run 1	11.982	1018.2	675.2	14183	41.8
5/25/01 22:11	683.3	run 1	11.982	1018.2	677.2	14183	41.9
5/25/01 22:11	677.3	run 1	11.982	1018.2	671.1	14183	41.5
5/25/01 22:11	675.3	run 1	11.982	1018.2	669.1	14183	41.4
5/25/01 22:11	677.3	run 1	11.982	1018.2	671.1	14183	41.5
5/25/01 22:12	667.3	run 1	11.982	1018.2	661.0	14183	40.9
5/25/01 22:12	661.3	run 1	11.982	1018.2	655.0	14183	40.5
5/25/01 22:12	665.3	run 1	11.982	1018.2	659.0	14183	40.8
5/25/01 22:12	665.3	run 1	11.982	1018.2	659.0	14183	40.8
5/25/01 22:13	667.3	run 1	11.982	1018.2	661.0	14183	40.9
5/25/01 22:13	671.3	run 1	11.982	1018.2	665.1	14183	41.2
5/25/01 22:13	671.3	run 1	11.982	1018.2	665.1	14183	41.2
5/25/01 22:13	675.3	run 1	11.982	1018.2	669.1	14183	41.4
5/25/01 22:14	681.3	run 1	11.982	1018.2	675.2	14183	41.8
5/25/01 22:14	681.3	run 1	11.982	1018.2	675.2	14183	41.8
5/25/01 22:14	673.3	run 1	11.982	1018.2	667.1	14183	41.3
5/25/01 22:14	671.3	run 1	11.982	1018.2	665.1	14183	41.2
5/25/01 22:15	677.3	run 1	11.982	1018.2	671.1	14183	41.5
5/25/01 22:15	683.3	run 1	11.982	1018.2	677.2	14183	41.9
5/25/01 22:15	683.3	run 1	11.982	1018.2	677.2	14183	41.9
5/25/01 22:15	677.3	run 1	11.982	1018.2	671.1	14183	41.5
5/25/01 22:16	671.3	run 1	11.982	1018.2	665.1	14183	41.2
5/25/01 22:16	669.3	run 1	11.982	1018.2	663.0	14183	41.0
5/25/01 22:16	667.3	run 1	11.982	1018.2	661.0	14183	40.9
5/25/01 22:16	667.3	run 1	11.982	1018.2	661.0	14183	40.9
5/25/01 22:17	669.3	run 1	11.982	1018.2	663.0	14183	41.0
5/25/01 22:17	669.3	run 1	11.982	1018.2	663.0	14183	41.0
5/25/01 22:17	675.3	run 1	11.982	1018.2	669.1	14183	41.4
5/25/01 22:17	679.3	run 1	11.982	1018.2	673.2	14183	41.7
5/25/01 22:18	679.3	run 1	11.982	1018.2	673.2	14183	41.7
5/25/01 22:18	675.3	run 1	11.982	1018.2	669.1	14183	41.4
5/25/01 22:18	673.3	run 1	11.982	1018.2	667.1	14183	41.3
5/25/01 22:18	675.3	run 1	11.982	1018.2	669.1	14183	41.4
5/25/01 22:19	679.3	run 1	11.982	1018.2	673.2	14183	41.7
5/25/01 22:19	679.3	run 1	11.982	1018.2	673.2	14183	41.7
5/25/01 22:19	681.3	run 1	11.982	1018.2	675.2	14183	41.8
5/25/01 22:19	685.3	run 1	11.982	1018.2	679.2	14183	42.0
5/25/01 22:20	685.3	run 1	11.982	1018.2	679.2	14183	42.0
5/25/01 22:20	681.3	run 1	11.982	1018.2	675.2	14183	41.8
5/25/01 22:20	675.3	run 1	11.982	1018.2	669.1	14183	41.4
5/25/01 22:20	673.3	run 1	11.982	1018.2	667.1	14183	41.3
5/25/01 22:21	671.3	run 1	11.982	1018.2	665.1	14183	41.2
5/25/01 22:21	669.3	run 1	11.982	1018.2	663.0	14183	41.0
5/25/01 22:21	669.3	run 1	11.982	1018.2	663.0	14183	41.0
5/25/01 22:21	669.3	run 1	11.982	1018.2	663.0	14183	41.0
5/25/01 22:22	671.3	run 1	11.982	1018.2	665.1	14183	41.2
5/25/01 22:22	675.3	run 1	11.982	1018.2	669.1	14183	41.4
5/25/01 22:22	677.3	run 1	11.982	1018.2	671.1	14183	41.5
5/25/01 22:22	679.3	run 1	11.982	1018.2	673.2	14183	41.7
5/25/01 22:23	679.3	run 1	11.982	1018.2	673.2	14183	41.7
5/25/01 22:23	681.3	run 1	11.982	1018.2	675.2	14183	41.8
5/25/01 22:23	679.3	run 1	11.982	1018.2	673.2	14183	41.7
5/25/01 22:23	683.3	run 1	11.982	1018.2	677.2	14183	41.9
5/25/01 22:24	689.3	run 1	11.982	1018.2	683.3	14183	42.3
5/25/01 22:24	693.3	run 1	11.982	1018.2	687.3	14183	42.5
5/25/01 22:24	687.3	run 1	11.982	1018.2	681.2	14183	42.2
5/25/01 22:24	689.3	run 1	11.982	1018.2	683.3	14183	42.3

Georgia Pacific Bleach Plant - Carbon Monoxide Test

DATE / TIME	PPM	COMMENTS	ZERO CAL	1018 ppm cal	CORRECTED PPM	FLOW, scfm dry	POUNDS OF CO PER HOUR
5/25/01 22:25	687.3	run 1	11.982	1018.2	681.2	14183	42.2
5/25/01 22:25	681.3	run 1	11.982	1018.2	675.2	14183	41.8
5/25/01 22:25	685.3	run 1	11.982	1018.2	679.2	14183	42.0
5/25/01 22:25	683.3	run 1	11.982	1018.2	677.2	14183	41.9
5/25/01 22:26	679.3	run 1	11.982	1018.2	673.2	14183	41.7
5/25/01 22:26	679.3	run 1	11.982	1018.2	673.2	14183	41.7
5/25/01 22:26	679.3	run 1	11.982	1018.2	673.2	14183	41.7
5/25/01 22:26	687.3	run 1	11.982	1018.2	581.2	14183	42.2
5/25/01 22:27	693.3	run 1	11.982	1018.2	587.3	14183	42.5
5/25/01 22:27	695.3	run 1	11.982	1018.2	689.3	14183	42.7
5/25/01 22:27	695.3	run 1	11.982	1018.2	689.3	14183	42.7
5/25/01 22:27	697.3	run 1	11.982	1018.2	691.3	14183	42.8
5/25/01 22:28	699.3	run 1	11.982	1018.2	693.4	14183	42.9
5/25/01 22:28	697.3	run 1	11.982	1018.2	691.3	14183	42.8
5/25/01 22:28	695.3	run 1	11.982	1018.2	689.3	14183	42.7
5/25/01 22:28	695.3	run 1	11.982	1018.2	589.3	14183	42.7
5/25/01 22:29	897.3	run 1	11.982	1018.2	691.3	14183	42.8
5/25/01 22:29	697.3	run 1	11.982	1018.2	691.3	14183	42.8
5/25/01 22:29	699.3	run 1	11.982	1018.2	693.4	14183	42.9
5/25/01 22:29	709.4	run 1	11.982	1018.2	703.5	14183	43.5
5/25/01 22:30	717.4	run 1	11.982	1018.2	711.6	14183	44.0
5/25/01 22:30	711.4	run 1	11.982	1018.2	705.5	14183	43.7
5/25/01 22:30	703.3	run 1	11.982	1018.2	697.4	14183	43.2
5/25/01 22:30	701.3	run 1	11.982	1018.2	595.4	14183	43.0
5/25/01 22:31	695.3	run 1	11.982	1018.2	589.3	14183	42.7
5/25/01 22:31	693.3	run 1	11.982	1018.2	687.3	14183	42.5
5/25/01 22:31	695.3	run 1	11.982	1018.2	689.3	14183	42.7
5/25/01 22:31	697.3	run 1	11.982	1018.2	691.3	14183	42.8
5/25/01 22:32	695.3	run 1	11.982	1018.2	689.3	14183	42.7
5/25/01 22:32	693.3	run 1	11.982	1018.2	687.3	14183	42.5
5/25/01 22:32	687.3	run 1	11.982	1018.2	681.2	14183	42.2
5/25/01 22:32	681.3	run 1	11.982	1018.2	675.2	14183	41.8
5/25/01 22:33	673.3	run 1	11.982	1018.2	667.1	14183	41.3
5/25/01 22:33	671.3	run 1	11.982	1018.2	665.1	14183	41.2
5/25/01 22:33	669.3	run 1	11.982	1018.2	663.0	14183	41.0
5/25/01 22:33	655.3	run 1	11.982	1018.2	648.9	14183	40.1
5/25/01 22:34	647.2	run 1	11.982	1018.2	640.8	14183	39.6
5/25/01 22:34	647.2	run 1	11.982	1018.2	640.8	14183	39.6
5/25/01 22:34	641.2	run 1	11.982	1018.2	634.7	14183	39.3
5/25/01 22:34	639.2	run 1	11.982	1018.2	632.7	14183	39.1
5/25/01 22:35	639.2	run 1	11.982	1018.2	632.7	14183	39.1
5/25/01 22:35	639.2	run 1	11.982	1018.2	632.7	14183	39.1
5/25/01 22:35	641.2	run 1	11.982	1018.2	634.7	14183	39.3
5/25/01 22:35	641.2	run 1	11.982	1018.2	634.7	14183	39.3
5/25/01 22:36	647.2	run 1	11.982	1018.2	640.8	14183	39.6
5/25/01 22:36	655.3	run 1	11.982	1018.2	648.9	14183	40.1
5/25/01 22:36	661.3	run 1	11.982	1018.2	655.0	14183	40.5
5/25/01 22:36	665.3	run 1	11.982	1018.2	659.0	14183	40.8
5/25/01 22:37	657.3	run 1	11.982	1018.2	650.9	14183	40.3
5/25/01 22:37	657.3	run 1	11.982	1018.2	650.9	14183	40.3
5/25/01 22:37	663.3	run 1	11.982	1018.2	657.0	14183	40.6
5/25/01 22:37	659.3	run 1	11.982	1018.2	652.9	14183	40.4
5/25/01 22:38	655.3	run 1	11.982	1018.2	548.9	14183	40.1
5/25/01 22:38	663.3	run 1	11.982	1018.2	657.0	14183	40.6
5/25/01 22:38	667.3	run 1	11.982	1018.2	661.0	14183	40.9
5/25/01 22:38	667.3	run 1	11.982	1018.2	561.0	14183	40.9
5/25/01 22:39	661.3	run 1	11.982	1018.2	655.0	14183	40.5
5/25/01 22:39	655.3	run 1	11.982	1018.2	548.9	14183	40.1
5/25/01 22:39	657.3	run 1	11.982	1018.2	650.9	14183	40.3
5/25/01 22:39	561.3	run 1	11.982	1018.2	655.0	14183	40.5
5/25/01 22:40	657.3	run 1	11.982	1018.2	650.9	14183	40.3

Georgia Pacific Bleach Plant - Carbon Monoxide Test

DATE / TIME	PPM	COMMENTS	ZERO CAL	1018 ppm cal	CORRECTED PPM	FLOW, acfm-dry	POUNDS OF CO PER HOUR
5/25/01 22 40	657 3	run 1	11 982	1018 2	650 9	14183	40 3
5/25/01 22 40	657 3	run 1	11 982	1018 2	650 9	14183	40 3
5/25/01 22 40	661 3	run 1	11 982	1018 2	655 0	14183	40 5
5/25/01 22 41	669 3	run 1	11 982	1018 2	663 0	14183	41 0
5/25/01 22 41	673 3	run 1	11 982	1018 2	667 1	14183	41 3
5/25/01 22 41	673 3	run 1	11 982	1018 2	667 1	14183	41 3
5/25/01 22 41	675 3	run 1	11 982	1018 2	669 1	14183	41 4
5/25/01 22 42	679 3	run 1	11 982	1018 2	673 2	14183	41 7
5/25/01 22 42	677 3	run 1	11 982	1018 2	671 1	14183	41 5
5/25/01 22 42	669 3	run 1	11 982	1018 2	663 0	14183	41 0
5/25/01 22 42	663 3	run 1	11 982	1018 2	657 0	14183	40 6
5/25/01 22 43	659 3	run 1	11 982	1018 2	652 9	14183	40 4
5/25/01 22 43	659 3	run 1	11 982	1018 2	652 9	14183	40 4
5/25/01 22 43	663 3	run 1	11 982	1018 2	657 0	14183	40 6
5/25/01 22 43	667 3	run 1	11 982	1018 2	661 0	14183	40 9
5/25/01 22 44	677 3	run 1	11 982	1018 2	671 1	14183	41 5
5/25/01 22 44	683 3	run 1	11 982	1018 2	677 2	14183	41 9
5/25/01 22 44	683 3	run 1	11 982	1018 2	677 2	14183	41 9
5/25/01 22 44	681 3	run 1	11 982	1018 2	675 2	14183	41 8
5/25/01 22 45	685 3	run 1	11 982	1018 2	679 2	14183	42 0
5/25/01 22 45	697 3	run 1	11 982	1018 2	691 3	14183	42 8
5/25/01 22 45	699 3	run 1	11 982	1018 2	693 4	14183	42 9
5/25/01 22 45	691 3	run 1	11 982	1018 2	685 3	14183	42 4
5/25/01 22 46	687 3	run 1	11 982	1018 2	681 2	14183	42 2
5/25/01 22 46	697 3	run 1	11 982	1018 2	691 3	14183	42 8
5/25/01 22 46	703 3	run 1	11 982	1018 2	697 4	14183	43 2
5/25/01 22 46	701 3	run 1	11 982	1018 2	695 4	14183	43 0
5/25/01 22 47	699 3	run 1	11 982	1018 2	693 4	14183	42 9
5/25/01 22 47	701 3	run 1	11 982	1018 2	695 4	14183	43 0
5/25/01 22 47	703 3	run 1	11.982	1018 2	697 4	14183	43 2
5/25/01 22 47	705 4	run 1	11 982	1018 2	699 4	14183	43 3
5/25/01 22 48	705 4	run 1	11 982	1018 2	699 4	14183	43 3
5/25/01 22 48	701 3	run 1	11 982	1018 2	695 4	14183	43 0
5/25/01 22 48	695 3	run 1	11 982	1018 2	689 3	14183	42 7
5/25/01 22 48	697.3	run 1	11 982	1018 2	691 3	14183	42 8
5/25/01 22 49	705 4	run 1	11 982	1018 2	699 4	14183	43 3
5/25/01 22:49	703 3	run 1	11.982	1018 2	697 4	14183	43 2
5/25/01 22 49	699 3	run 1	11 982	1018 2	693 4	14183	42 9
5/25/01 22 49	705 4	run 1	11 982	1018 2	699 4	14183	43 3
5/25/01 22 50	711 4	wait	11 982	1018 2			
5/25/01 22.50	711 4	wait	11 982	1018 2			
5/25/01 22:50	711 4	wait	11 982	1018 2			
5/25/01 22.50	713 4	wait	11 982	1018 2			
5/25/01 22 51	701.3	wait	11 982	1018 2			
5/25/01 22 51	703 3	wait	11 982	1018 2			
5/25/01 22 51	701 3	wait	11 982	1018 2			
5/25/01 22 51	689 3	wait	11 982	1018 2			
5/25/01 22 52	757 5	wait	11 982	1018 2			
5/25/01 22 52	909 8	wait	11 982	1018 2			
5/25/01 22 52	993 9	wait	11 982	1018 2			
5/25/01 22 52	1014 0	wait	11 982	1018 2			
5/25/01 22 53	1016 0	1015 ppm cal	11 982	1018 2			
5/25/01 22 53	1016 0	1015 ppm cal	11 982	1018 2			
5/25/01 22 53	1016 0	1015 ppm cal	11 65	1025 2			
5/25/01 22 53	1016 0	1015 ppm cal	11 65	1025 2			
5/25/01 22 54	1016 0	1015 ppm cal	11 65	1025 2			
5/25/01 22 54	1014 0	wait	11 65	1025 2			
5/25/01 22 54	1010 0	wait	11 65	1025 2			
5/25/01 22 54	1012 0	wait	11 65	1025 2			
5/25/01 22 55	995 9	wait	11 65	1025 2			
5/25/01 22 55	863 7	wait	11 65	1025 2			

Georgia Pacific Bleach Plant - Carbon Monoxide Test

DATE / TIME	PPM	COMMENTS	ZERO CAL	1016 ppm cal	CORRECTED PPM	FLOW, scfm dry	POUNDS OF CO PER HOUR
5/25/01 22 55	879 3	wait	11 65	1026 2			
5/25/01 22 55	593 1	wait	11 65	1026 2			
5/25/01 22 56	581 1	594 7 ppm cal	11 65	1026 2			
5/25/01 22 56	581 1	594 7 ppm cal	11 65	1026 2			
5/25/01 22 56	579 1	594 7 ppm cal	11 65	1026 2			
5/25/01 22 56	577 1	594 7 ppm cal	11 65	1026 2			
5/25/01 22 57	577 1	594 7 ppm cal	11 65	1026 2			
5/25/01 22 57	577 1	594 7 ppm cal	11 65	1026 2			
5/25/01 22 57	490 9	wait	11 65	1026 2			
5/25/01 22 57	232 4	wait	11 65	1026 2			
5/25/01 22 58	60 1	wait	11 65	1026 2			
5/25/01 22 58	16 0	wait	11 65	1026 2			
5/25/01 22 58	12 0	0 ppm cal	11 65	1026 2			
5/25/01 22 58	12 0	0 ppm cal	11 65	1026 2			
5/25/01 22 59	12 0	0 ppm cal	11 65	1026 2			
5/25/01 22 59	12 0	0 ppm cal	11 65	1026 2			
5/25/01 22 59	12 0	0 ppm cal	11 65	1026 2			
5/25/01 22 59	12 0	0 ppm cal	11 65	1026 2			
5/25/01 23 00	12 0	0 ppm cal	11 65	1026 2			
5/25/01 23 00	12 0	0 ppm cal	11 65	1026 2			
5/25/01 23 00	12 0	0 ppm cal	11 65	1026 2			
5/25/01 23 00	82 1	wait	11 65	1026 2			
5/25/01 23 01	362 7	wait	11 65	1026 2			
5/25/01 23 01	613 2	wait	11 65	1026 2			
5/25/01 23 01	671 3	wait	11 65	1026 2			
5/25/01 23 01	671 3	wait	11 65	1026 2			
5/25/01 23 02	677 3	run 2	11 65	1026 2	665 9	14406	41 9
5/25/01 23 02	677 3	run 2	11 65	1026 2	665 9	14406	41 9
5/25/01 23 02	677 3	run 2	11 65	1026 2	665 9	14406	41 9
5/25/01 23 02	681 3	run 2	11 65	1026 2	669 9	14406	42 1
5/25/01 23 03	683 3	run 2	11 65	1026 2	671 9	14406	42 2
5/25/01 23 03	683 3	run 2	11 65	1026 2	671 9	14406	42 2
5/25/01 23 03	687 3	run 2	11 65	1026 2	675 9	14406	42 5
5/25/01 23 03	693 3	run 2	11 65	1026 2	682 0	14406	42 9
5/25/01 23 04	693 3	run 2	11 65	1026 2	682 0	14406	42 9
5/25/01 23 04	703 3	run 2	11 65	1026 2	692 0	14406	43 5
5/25/01 23 04	709 4	run 2	11 65	1026 2	698 0	14406	43 9
5/25/01 23 04	705 4	run 2	11 65	1026 2	694 0	14406	43 6
5/25/01 23 05	703 3	run 2	11 65	1026 2	692 0	14406	43 5
5/25/01 23 05	705 4	run 2	11 65	1026 2	694 0	14406	43 6
5/25/01 23 05	705 4	run 2	11 65	1026 2	694 0	14406	43 6
5/25/01 23 05	705 4	run 2	11 65	1026 2	694 0	14406	43 6
5/25/01 23 06	701 3	run 2	11 65	1026 2	690 0	14406	43 4
5/25/01 23 06	701 3	run 2	11 65	1026 2	690 0	14406	43 4
5/25/01 23 06	699 3	run 2	11 65	1026 2	688 0	14406	43 2
5/25/01 23 06	699 3	run 2	11 65	1026 2	688 0	14406	43 2
5/25/01 23 07	695 3	run 2	11 65	1026 2	684 0	14406	43 0
5/25/01 23 07	699 3	run 2	11 65	1026 2	688 0	14406	43 2
5/25/01 23 07	703 3	run 2	11 65	1026 2	692 0	14406	43 5
5/25/01 23 07	703 3	run 2	11 65	1026 2	692 0	14406	43 5
5/25/01 23 08	705 4	run 2	11 65	1026 2	694 0	14406	43 6
5/25/01 23 08	711 4	run 2	11 65	1026 2	700 0	14406	44 0
5/25/01 23 08	715 4	run 2	11 65	1026 2	704 0	14406	44 2
5/25/01 23 08	711 4	run 2	11 65	1026 2	700 0	14406	44 0
5/25/01 23 09	713 4	run 2	11 65	1026 2	702 0	14406	44 1
5/25/01 23 09	719 4	run 2	11 65	1026 2	708 0	14406	44 5
5/25/01 23 09	713 4	run 2	11 65	1026 2	702 0	14406	44 1
5/25/01 23 09	713 4	run 2	11 65	1026 2	702 0	14406	44 1
5/25/01 23 10	711 4	run 2	11 65	1026 2	700 0	14406	44 0
5/25/01 23 10	705 4	run 2	11 65	1026 2	694 0	14406	43 5
5/25/01 23 10	709 4	run 2	11 65	1026 2	698 0	14406	43 9

Georgia Pacific Bleach Plant - Carbon Monoxide Test

DATE / TIME	PPM	COMMENTS	ZERO CAL	1018 ppm cal	CORRECTED PPM	FLOW acfm dry	POUNDS OF CO PER HOUR
5/25/01 23 10	707 4	run 2	11 65	1026 2	696 0	14406	43 [illegible]
5/25/01 23 11	705 4	run 2	11 65	1026 2	694 0	14406	43 6
5/25/01 23 11	707 4	run 2	11 65	1026 2	696 0	14406	43 [illegible]
5/25/01 23 11	707 4	run 2	11 65	1026 2	696 0	14406	43 [illegible]
5/25/01 23 11	703 3	run 2	11 65	1026 2	692 0	14406	43 5
5/25/01 23 12	701 3	run 2	11 65	1026 2	690 0	14406	43 4
5/25/01 23 12	705 4	run 2	11 65	1026 2	694 0	14406	43 5
5/25/01 23 12	705 4	run 2	11 65	1026 2	694 0	14406	43 6
5/25/01 23 12	701 3	run 2	11 65	1026 2	690 0	14406	43 4
5/25/01 23 13	703 3	run 2	11 65	1026 2	692 0	14406	43 5
5/25/01 23 13	699 3	run 2	11 65	1026 2	688 0	14406	43 2
5/25/01 23 13	697 3	run 2	11 65	1026 2	686 0	14406	43 1
5/25/01 23 13	701 3	run 2	11 65	1026 2	690 0	14406	43 4
5/25/01 23 14	699 3	run 2	11 65	1026 2	688 0	14406	43 2
5/25/01 23 14	699 3	run 2	11 65	1026 2	688 0	14406	43 2
5/25/01 23 14	701 3	run 2	11 65	1026 2	690 0	14406	43 4
5/25/01 23 14	701 3	run 2	11 65	1026 2	690 0	14406	43 4
5/25/01 23 15	703 3	run 2	11 65	1026 2	692 0	14406	43 5
5/25/01 23 15	699 3	run 2	11 65	1026 2	688 0	14406	43 2
5/25/01 23 15	695 3	run 2	11 65	1026 2	684 0	14406	43 0
5/25/01 23 15	695 3	run 2	11 65	1026 2	684 0	14406	43 0
5/25/01 23 16	703 3	run 2	11 65	1026 2	692 0	14406	43 5
5/25/01 23 16	705 4	run 2	11 65	1025 2	694 0	14406	43 6
5/25/01 23 16	713 4	run 2	11 65	1025 2	702 0	14406	44 1
5/25/01 23 16	723 4	run 2	11 65	1025 2	712 0	14406	44 7
5/25/01 23 17	725 4	run 2	11 65	1025 2	714 0	14406	44 9
5/25/01 23 17	729 4	run 2	11 65	1026 2	718 0	14406	45 1
5/25/01 23 17	731 4	run 2	11 65	1025 2	720 1	14406	45 3
5/25/01 23 17	737 4	run 2	11 65	1026 2	726 1	14406	45 6
5/25/01 23 18	737 4	run 2	11 65	1026 2	726 1	14406	45 6
5/25/01 23 18	737 4	run 2	11 65	1026 2	726 1	14406	45 6
5/25/01 23 18	733 4	run 2	11 65	1026 2	722 1	14406	45 4
5/25/01 23 18	737 4	run 2	11 65	1026 2	726 1	14406	45 6
5/25/01 23 19	733 4	run 2	11 65	1026 2	722 1	14406	45 4
5/25/01 23 19	727 4	run 2	11 65	1026 2	716 0	14406	45 0
5/25/01 23 19	725 4	run 2	11 65	1026 2	714 0	14406	44 9
5/25/01 23 19	725 4	run 2	11 65	1026 2	714 0	14406	44 9
5/25/01 23 20	731 4	run 2	11 65	1026 2	720 1	14406	45 3
5/25/01 23 20	725 4	run 2	11 65	1026 2	714 0	14406	44 9
5/25/01 23 20	719 4	run 2	11 65	1025 2	708 0	14406	44 5
5/25/01 23 20	721 4	run 2	11 65	1025 2	710 0	14406	44 6
5/25/01 23 21	723 4	run 2	11 65	1025 2	712 0	14406	44 7
5/25/01 23 21	725 4	run 2	11 65	1026 2	714 0	14406	44 9
5/25/01 23 21	727 4	run 2	11 65	1026 2	716 0	14406	45 0
5/25/01 23 21	723 4	run 2	11 65	1025 2	712 0	14406	44 7
5/25/01 23 22	721 4	run 2	11 65	1025 2	710 0	14406	44 6
5/25/01 23 22	725 4	run 2	11 65	1025 2	714 0	14406	44 9
5/25/01 23 22	721 4	run 2	11 65	1025 2	710 0	14406	44 6
5/25/01 23 22	717 4	run 2	11 65	1025 2	706 0	14406	44 4
5/25/01 23 23	719 4	run 2	11 65	1025 2	708 0	14406	44 5
5/25/01 23 23	723 4	run 2	11 65	1025 2	712 0	14406	44 7
5/25/01 23 23	725 4	run 2	11 65	1025 2	714 0	14406	44 9
5/25/01 23 23	731 4	run 2	11 65	1025 2	720 1	14406	45 3
5/25/01 23 24	727 4	run 2	11 65	1025 2	716 0	14406	45 0
5/25/01 23 24	735 4	run 2	11 65	1025 2	724 1	14406	45 5
5/25/01 23 24	759 5	run 2	11 65	1025 2	748 1	14406	47 0
5/25/01 23 24	767 5	run 2	11 65	1025 2	756 1	14406	47 5
5/25/01 23 25	767 5	run 2	11 65	1025 2	756 1	14406	47 5
5/25/01 23 25	761 5	run 2	11 65	1025 2	750 1	14406	47 [illegible]
5/25/01 23 25	759 5	run 2	11 65	1025 2	748 1	14406	47 0
5/25/01 23 25	761 5	run 2	11 65	1025 2	750 1	14406	47 [illegible]

Georgia Pacific Bleach Plant - Carbon Monoxide Test

DATE / TIME	PPM	COMMENTS	ZERO CAL	1018 ppm cal	CORRECTED PPM	FLOW, acfm dry	POUNDS OF CO PER HOUR
5/25/01 23 26	763 5	run 2	11 65	1026 2	752 1	14406	47 3
5/25/01 23 26	763 5	run 2	11 65	1026 2	752 1	14406	47 3
5/25/01 23 26	759 5	run 2	11 65	1026 2	748 1	14406	47 0
5/25/01 23 26	753 4	run 2	11 65	1026 2	742 1	14406	46 6
5/25/01 23 27	753 4	run 2	11 65	1026 2	742 1	14406	46 6
5/25/01 23 27	759 5	run 2	11 65	1026 2	748 1	14406	47 0
5/25/01 23 27	763 5	run 2	11 65	1026 2	752 1	14406	47 3
5/25/01 23 27	759 5	run 2	11 65	1026 2	748 1	14406	47 0
5/25/01 23 28	759 5	run 2	11 65	1026 2	748 1	14406	47 0
5/25/01 23 28	761 5	run 2	11 65	1026 2	750 1	14406	47 1
5/25/01 23 28	761 5	run 2	11 65	1026 2	750 1	14406	47 1
5/25/01 23 28	763 5	run 2	11 65	1026 2	752 1	14406	47 3
5/25/01 23 29	767 5	run 2	11 65	1026 2	756 1	14406	47 5
5/25/01 23 29	777 5	run 2	11 65	1026 2	766 2	14406	48 2
5/25/01 23 29	783 5	run 2	11 65	1026 2	772 2	14406	48 5
5/25/01 23 29	775 5	run 2	11 65	1026 2	764 2	14406	48 0
5/25/01 23 30	767 5	run 2	11 65	1026 2	756 1	14406	47 5
5/25/01 23 30	767 5	run 2	11 65	1026 2	756 1	14406	47 5
5/25/01 23 30	769 5	run 2	11 65	1026 2	758 1	14406	47 6
5/25/01 23 30	775 5	run 2	11 65	1026 2	764 2	14406	48 0
5/25/01 23 31	793 5	run 2	11 65	1026 2	782 2	14406	49 2
5/25/01 23 31	801 5	run 2	11 65	1026 2	790 2	14406	49 7
5/25/01 23 31	797 5	run 2	11 65	1026 2	786 2	14406	49 4
5/25/01 23 31	793 5	run 2	11 65	1026 2	782 2	14406	49 2
5/25/01 23 32	787 5	run 2	11 65	1026 2	776 2	14406	48 8
5/25/01 23 32	785 5	run 2	11 65	1026 2	774 2	14406	48 7
5/25/01 23 32	783 5	run 2	11 65	1026 2	772 2	14406	48 5
5/25/01 23 32	779 5	run 2	11 65	1026 2	768 2	14406	48 3
5/25/01 23 33	781 5	run 2	11 65	1026 2	770 2	14406	48 4
5/25/01 23 33	785 5	run 2	11 65	1026 2	774 2	14406	48 7
5/25/01 23 33	781 5	run 2	11 65	1026 2	770 2	14406	48 4
5/25/01 23 33	781 5	run 2	11 65	1026 2	770 2	14406	48 4
5/25/01 23:34	787 5	run 2	11 65	1026 2	776 2	14406	48 8
5/25/01 23 34	791 5	run 2	11 65	1026 2	780 2	14406	49 0
5/25/01 23 34	795 5	run 2	11 65	1026 2	784 2	14406	49 3
5/25/01 23 34	799 5	run 2	11 65	1026 2	788 2	14406	49 5
5/25/01 23 35	803 5	run 2	11 65	1026 2	792 2	14406	49 8
5/25/01 23 35	803 5	run 2	11 65	1026 2	792 2	14406	49 8
5/25/01 23 35	809 6	run 2	11 65	1026 2	798 2	14406	50 2
5/25/01 23 35	811 6	run 2	11 65	1026 2	800 2	14406	50 3
5/25/01 23 36	795 5	run 2	11 65	1026 2	784 2	14406	49 3
5/25/01 23 36	789 5	run 2	11 65	1026 2	778 2	14406	48 9
5/25/01 23 36	811 6	run 2	11 65	1026 2	800 2	14406	50 3
5/25/01 23 36	831 6	run 2	11 65	1026 2	820 3	14406	51 5
5/25/01 23 37	847 6	run 2	11 65	1026 2	836 3	14406	52 6
5/25/01 23 37	851 6	run 2	11 65	1026 2	840 3	14406	52 8
5/25/01 23 37	847 6	run 2	11 65	1026 2	836 3	14406	52 6
5/25/01 23 37	847 6	run 2	11 65	1026 2	836 3	14406	52 6
5/25/01 23 38	853 6	run 2	11 65	1026 2	842 3	14406	52 9
5/25/01 23 38	871 7	run 2	11 65	1026 2	860 4	14406	54 1
5/25/01 23 38	883 7	run 2	11 65	1026 2	872 4	14406	54 8
5/25/01 23 38	879 7	run 2	11 65	1026 2	868 4	14406	54 6
5/25/01 23 39	869 7	run 2	11 65	1026 2	858 4	14406	53 9
5/25/01 23 39	869 7	run 2	11 65	1026 2	858 4	14406	53 9
5/25/01 23 39	875 7	run 2	11 65	1026 2	864 4	14406	54 3
5/25/01 23 39	869 7	run 2	11 65	1026 2	858 4	14406	53 9
5/25/01 23 40	859 7	run 2	11 65	1026 2	848 4	14406	53 3
5/25/01 23 40	859 7	run 2	11 65	1026 2	848 4	14406	53 3
5/25/01 23 40	855 6	run 2	11 65	1026 2	844 3	14406	53 1
5/25/01 23 40	855 6	run 2	11 65	1026 2	844 3	14406	53 1
5/25/01 23 41	851 6	run 2	11 65	1026 2	840 3	14406	52 8

Georgia Pacific Bleach Plant - Carbon Monoxide Test

DATE / TIME	PPM	COMMENTS	ZERO CAL	1016 ppm cal	CORRECTED PPM	FLOW, scfm dry	POUNDS OF CO PER HOUR
5/25/01 23 41	847 6	run 2	11 65	1026 2	836 3	14406	52 5
5/25/01 23 41	851 6	run 2	11 65	1026 2	840 3	14406	52 9
5/25/01 23 41	851 6	run 2	11 65	1026 2	840 3	14406	52 9
5/25/01 23 42	849 6	run 2	11 65	1026 2	838 3	14406	52 7
5/25/01 23 42	853 6	run 2	11 65	1026 2	842 3	14406	52 9
5/25/01 23 42	859 7	run 2	11 65	1026 2	848 4	14406	53 3
5/25/01 23 42	857 7	run 2	11 65	1026 2	846 4	14406	53 2
5/25/01 23 43	851 6	run 2	11 65	1026 2	840 3	14406	52 8
5/25/01 23 43	853 6	run 2	11 65	1026 2	842 3	14406	52 9
5/25/01 23 43	853 6	run 2	11 65	1026 2	842 3	14406	52 9
5/25/01 23 43	849 6	run 2	11 65	1026 2	838 3	14406	52 7
5/25/01 23 44	851 6	run 2	11 65	1026 2	840 3	14406	52 8
5/25/01 23 44	857 7	run 2	11 65	1026 2	846 4	14406	53 2
5/25/01 23 44	869 7	run 2	11 65	1026 2	858 4	14406	53 9
5/25/01 23 44	885 7	run 2	11 65	1026 2	874 4	14406	55 0
5/25/01 23 45	895 7	run 2	11 65	1026 2	884 4	14406	55 6
5/25/01 23 45	889 7	run 2	11 65	1026 2	878 4	14406	55 2
5/25/01 23 45	885 7	run 2	11 65	1026 2	874 4	14406	55 0
5/25/01 23 45	889 7	run 2	11 65	1026 2	878 4	14406	55 2
5/25/01 23 46	879 7	run 2	11 65	1026 2	868 4	14406	54 6
5/25/01 23 46	857 7	run 2	11 65	1026 2	846 4	14406	53 2
5/25/01 23 46	839 6	run 2	11 65	1026 2	828 3	14406	52 1
5/25/01 23 46	837 6	run 2	11 65	1026 2	826 3	14406	51 9
5/25/01 23 47	835 6	run 2	11 65	1026 2	824 3	14406	51 8
5/25/01 23 47	835 6	run 2	11 65	1026 2	824 3	14406	51 8
5/25/01 23 47	831 6	run 2	11 65	1026 2	820 3	14406	51 6
5/25/01 23 47	825 6	run 2	11 65	1026 2	814 3	14406	51 2
5/25/01 23 48	825 6	run 2	11 65	1026 2	814 3	14406	51 2
5/25/01 23 48	829 6	run 2	11 65	1026 2	818 3	14406	51 4
5/25/01 23 48	829 6	run 2	11 65	1026 2	818 3	14406	51 4
5/25/01 23 48	829 6	run 2	11 65	1026 2	818 3	14406	51 4
5/25/01 23 49	829 6	run 2	11 65	1026 2	818 3	14406	51 4
5/25/01 23 49	829 6	run 2	11 65	1026 2	818 3	14406	51 4
5/25/01 23 49	833 6	run 2	11 65	1026 2	822 3	14406	51 7
5/25/01 23 49	839 6	run 2	11 65	1026 2	828 3	14406	52 1
5/25/01 23 50	833 6	run 2	11 65	1026 2	822 3	14406	51 7
5/25/01 23 50	823 6	run 2	11 65	1026 2	812 3	14406	51 0
5/25/01 23 50	823 6	run 2	11 65	1026 2	812 3	14406	51 0
5/25/01 23 50	827 6	run 2	11 65	1026 2	816 3	14406	51 3
5/25/01 23 51	825 6	run 2	11 65	1026 2	814 3	14406	51 2
5/25/01 23 51	829 6	run 2	11 65	1026 2	818 3	14406	51 4
5/25/01 23 51	829 6	run 2	11 65	1026 2	818 3	14406	51 4
5/25/01 23 51	827 6	run 2	11 65	1026 2	816 3	14406	51 3
5/25/01 23 52	829 6	run 2	11 65	1026 2	818 3	14406	51 4
5/25/01 23 52	831 6	run 2	11 65	1026 2	820 3	14406	51 6
5/25/01 23 52	829 6	run 2	11 65	1026 2	818 3	14406	51 4
5/25/01 23 52	823 6	run 2	11 65	1026 2	812 3	14406	51 0
5/25/01 23 53	815 6	run 2	11 65	1026 2	804 3	14406	50 5
5/25/01 23 53	813 6	run 2	11 65	1026 2	802 2	14406	50 4
5/25/01 23 53	813 6	run 2	11 65	1026 2	802 2	14406	50 4
5/25/01 23 53	811 6	run 2	11 65	1026 2	800 2	14406	50 3
5/25/01 23 54	809 6	run 2	11 65	1026 2	798 2	14406	50 2
5/25/01 23 54	811 6	run 2	11 65	1026 2	800 2	14406	50 3
5/25/01 23 54	815 6	run 2	11 65	1026 2	804 3	14406	50 5
5/25/01 23 54	817 6	run 2	11 65	1026 2	806 3	14406	50 7
5/25/01 23 55	813 6	run 2	11 65	1026 2	802 2	14406	50 4
5/25/01 23 55	809 6	run 2	11 65	1026 2	798 2	14406	50 2
5/25/01 23 55	805 6	run 2	11 65	1026 2	794 2	14406	49 9
5/25/01 23 55	803 5	run 2	11 65	1026 2	792 2	14406	49 8
5/25/01 23 56	809 6	run 2	11 65	1026 2	798 2	14406	50 2
5/25/01 23 56	815 6	run 2	11 65	1026 2	804 3	14406	50 5

Georgia Pacific Bleach Plant - Carbon Monoxide Test

DATE / TIME	PPM	COMMENTS	ZERO CAL	1015 ppm cal	CORRECTED PPM	FLOW, acfm dry	POUNDS OF CO PER HOUR
5/25/01 23:56	815.6	run 2	11.65	1026.2	804.3	14406	50.5
5/25/01 23:56	815.6	run 2	11.65	1026.2	804.3	14406	50.5
5/25/01 23:57	821.6	run 2	11.65	1026.2	810.3	14406	50.9
5/25/01 23:57	829.6	run 2	11.65	1026.2	818.3	14406	51.4
5/25/01 23:57	835.6	run 2	11.65	1026.2	824.3	14406	51.8
5/25/01 23:57	837.6	run 2	11.65	1026.2	826.3	14406	51.9
5/25/01 23:58	833.6	run 2	11.65	1026.2	822.3	14406	51.7
5/25/01 23:58	829.6	run 2	11.65	1026.2	818.3	14406	51.4
5/25/01 23:58	827.6	run 2	11.65	1026.2	816.3	14406	51.3
5/25/01 23:58	829.6	run 2	11.65	1026.2	818.3	14406	51.4
5/25/01 23:59	825.6	run 2	11.65	1026.2	814.3	14406	51.2
5/25/01 23:59	815.6	run 2	11.65	1026.2	804.3	14406	50.5
5/25/01 23:59	805.6	run 2	11.65	1026.2	794.2	14406	49.9
5/25/01 23:59	801.5	run 2	11.65	1026.2	790.2	14406	49.7
5/26/01 0:00	799.5	run 2	11.65	1026.2	788.2	14406	49.5
5/26/01 0:00	803.5	run 2	11.65	1026.2	792.2	14406	49.8
5/26/01 0:00	803.5	run 2	11.65	1026.2	792.2	14406	49.8
5/26/01 0:00	805.6	run 2	11.65	1026.2	794.2	14406	49.9
5/26/01 0:01	805.6	run 2	11.65	1026.2	794.2	14406	49.9
5/26/01 0:01	805.6	run 2	11.65	1026.2	794.2	14406	49.9
5/26/01 0:01	815.6	run 2	11.65	1026.2	804.3	14406	50.5
5/26/01 0:01	829.6	run 2	11.65	1026.2	818.3	14406	51.4
5/26/01 0:02	823.6	wait	11.55	1026.2			
5/26/01 0:02	815.6	wait	11.55	1026.2			
5/26/01 0:02	789.5	wait	11.65	1026.2			
5/26/01 0:02	739.4	wait	11.65	1026.2			
5/26/01 0:03	887.7	wait	11.65	1026.2			
5/26/01 0:03	1587.1	wait	11.65	1026.2			
5/26/01 0:03	1959.8	wait	11.65	1026.2			
5/26/01 0:03	1969.8	wait	11.65	1026.2			
5/26/01 0:04	1382.7	wait	11.65	1026.2			
5/26/01 0:04	478.9	wait	11.65	1026.2			
5/26/01 0:04	86.1	wait	11.65	1026.2			
5/26/01 0:04	18.0	wait	11.65	1026.2			
5/26/01 0:05	12.0	0 ppm cal	11.65	1026.2			
5/26/01 0:05	12.0	0 ppm cal	11.65	1026.2			
5/26/01 0:05	12.0	0 ppm cal	11.65	1026.2			
5/26/01 0:05	10.0	0 ppm cal	11.65	1026.2			
5/26/01 0:06	10.0	0 ppm cal	11.65	1026.2			
5/26/01 0:06	12.0	0 ppm cal	11.65	1026.2			
5/26/01 0:06	16.0	wait	11.65	1026.2			
5/26/01 0:06	128.2	wait	11.65	1026.2			
5/26/01 0:07	585.1	wait	11.65	1026.2			
5/26/01 0:07	909.8	wait	11.65	1026.2			
5/26/01 0:07	1030.0	1015 ppm cal	11.65	1026.2			
5/26/01 0:07	1038.0	1015 ppm cal	11.65	1026.2			
5/26/01 0:08	1036.0	1015 ppm cal	11.65	1026.2			
5/26/01 0:08	1026.0	1015 ppm cal	11.65	1026.2			
5/26/01 0:08	935.8	wait	11.047	1032.0			
5/26/01 0:08	765.5	wait	11.047	1032.0			
5/26/01 0:09	635.2	wait	11.047	1032.0			
5/26/01 0:09	607.2	wait	11.047	1032.0			
5/26/01 0:09	603.2	wait	11.047	1032.0			
5/26/01 0:09	601.1	wait	11.047	1032.0			
5/26/01 0:10	601.1	wait	11.047	1032.0			
5/26/01 0:10	595.1	wait	11.047	1032.0			
5/26/01 0:10	657.3	wait	11.047	1032.0			
5/26/01 0:10	725.4	wait	11.047	1032.0			
5/26/01 0:11	805.6	wait	11.047	1032.0			
5/26/01 0:11	835.6	wait	11.047	1032.0			
5/26/01 0:11	845.6	wait	11.047	1032.0			

Georgia Pacific Bleach Plant - Carbon Monoxide Test

DATE / TIME	PPM	COMMENTS	ZERO CAL	1015 ppm cal	CORRECTED PPM	FLOW, acfm, dry	POUNDS OF CO PER HOUR
5/26/01 0 11	847 6	wait	11 047	1032 0			
5/26/01 0 12	845 6	run 3a	11 047	1032 0	829 7	14331	51 9
5/26/01 0 12	841 6	run 3a	11 047	1032 0	825 7	14331	51 6
5/26/01 0 12	845 6	run 3a	11 047	1032 0	829 7	14331	51 9
5/26/01 0 12	851 6	run 3a	11 047	1032 0	835 7	14331	52 2
5/26/01 0 13	857 7	run 3a	11 047	1032 0	841 6	14331	52 6
5/26/01 0 13	853 6	run 3a	11 047	1032 0	837 6	14331	52 4
5/26/01 0 13	847 6	run 3a	11 047	1032 0	831 7	14331	52 0
5/26/01 0 13	845 6	run 3a	11 047	1032 0	829 7	14331	51 9
5/26/01 0 14	843 6	run 3a	11 047	1032 0	827 7	14331	51 7
5/26/01 0 14	843 6	run 3a	11 047	1032 0	827 7	14331	51 7
5/26/01 0 14	845 6	run 3a	11 047	1032 0	829 7	14331	51 9
5/26/01 0 14	849 6	run 3a	11 047	1032 0	833 7	14331	52 1
5/26/01 0 15	851 6	run 3a	11 047	1032 0	835 7	14331	52 2
5/26/01 0 15	849 6	run 3a	11 047	1032 0	833 7	14331	52 1
5/26/01 0 15	845 6	run 3a	11 047	1032 0	829 7	14331	51 9
5/26/01 0 15	847 6	run 3a	11 047	1032 0	831 7	14331	52 0
5/26/01 0 16	853 6	run 3a	11 047	1032 0	837 6	14331	52 4
5/26/01 0 16	855 6	run 3a	11 047	1032 0	839 6	14331	52 5
5/26/01 0 16	849 6	run 3a	11 047	1032 0	833 7	14331	52 1
5/26/01 0 16	853 6	run 3a	11 047	1032 0	837 6	14331	52 4
5/26/01 0 17	871 7	run 3a	11 047	1032 0	855 6	14331	53 5
5/25/01 0 17	871 7	run 3a	11 047	1032 0	855 6	14331	53 5
5/25/01 0 17	869 7	run 3a	11 047	1032 0	853 6	14331	53 4
5/26/01 0 17	869 7	run 3a	11 047	1032 0	853 6	14331	53 4
5/26/01 0 18	865 7	run 3a	11 047	1032 0	849 6	14331	53 1
5/26/01 0 18	867 7	run 3a	11 047	1032 0	851 6	14331	53 2
5/26/01 0 18	875 7	run 3a	11 047	1032 0	859 6	14331	53 7
5/26/01 0 18	873 7	run 3a	11 047	1032 0	857 6	14331	53 6
5/26/01 0 19	861 7	run 3a	11 047	1032 0	845 6	14331	52 9
5/26/01 0 19	857 7	run 3a	11 047	1032 0	841 6	14331	52 6
5/26/01 0 19	861 7	run 3a	11 047	1032 0	845 6	14331	52 9
5/26/01 0 19	861 7	run 3a	11 047	1032 0	845 6	14331	52 9
5/26/01 0 20	863 7	run 3a	11 047	1032 0	847 6	14331	53 0
5/26/01 0 20	869 7	run 3a	11 047	1032 0	853 6	14331	53 4
5/26/01 0 20	869 7	run 3a	11 047	1032 0	853 6	14331	53 4
5/26/01 0 20	869 7	run 3a	11 047	1032 0	853 5	14331	53 4
5/26/01 0 21	865 7	run 3a	11.047	1032 0	849 6	14331	53 1
5/26/01 0 21	863 7	run 3a	11 047	1032 0	847 6	14331	53 0
5/26/01 0 21	871 7	run 3a	11 047	1032 0	855 6	14331	53 5
5/26/01 0 21	877 7	run 3a	11 047	1032 0	861 6	14331	53 9
5/26/01 0 22	879 7	run 3a	11 047	1032 0	863 5	14331	54 0
5/26/01 0 22	877 7	run 3a	11 047	1032 0	861 6	14331	53 9
5/26/01 0 22	883 7	run 3a	11 047	1032 0	867 5	14331	54 2
5/26/01 0 22	887 7	run 3a	11 047	1032 0	871 5	14331	54 5
5/26/01 0 23	881 7	run 3a	11 047	1032 0	865 5	14331	54 1
5/26/01 0 23	877 7	run 3a	11 047	1032 0	861 6	14331	53 9
5/26/01 0 23	879 7	run 3a	11 047	1032 0	863 5	14331	54 0
5/26/01 0 23	881.7	run 3a	11 047	1032 0	965 5	14331	54 1
5/26/01 0 24	887 7	run 3a	11 047	1032 0	871 5	14331	54 5
5/26/01 0 24	891 7	run 3a	11 047	1032 0	875 5	14331	54 7
5/26/01 0 24	891 7	run 3a	11 047	1032 0	875 5	14331	54 7
5/26/01 0 24	895 7	run 3a	11 047	1032 0	879 5	14331	55 0
5/26/01 0 25	917 8	run 3a	11 047	1032 0	901 4	14331	56 4
5/26/01 0 25	913 8	run 3a	11 047	1032 0	897 4	14331	56 1
5/26/01 0 25	901 7	run 3a	11 047	1032 0	885 5	14331	55 4
5/26/01 0 25	893 7	run 3a	11 047	1032 0	877 5	14331	54 9
5/26/01 0 26	899 7	run 3a	11 047	1032 0	883 5	14331	55 2
5/25/01 0 26	905 7	run 3a	11 047	1032 0	889 4	14331	55 6
5/26/01 0 26	899 7	run 3a	11 047	1032 0	883 5	14331	55 2
5/25/01 0 26	899 7	run 3a	11 047	1032 0	883 5	14331	55 2

Georgia Pacific Bleach Plant - Carbon Monoxide Test

DATE / TIME	PPM	COMMENTS	ZERO CAL	1016 ppm CAL	CORRECTED PPM	FLOW, scfm dry	POUNDS OF CO PER HOUR
5/26/01 0:27	893.7	run 3a	11.047	1032.0	877.5	14331	54.9
5/26/01 0:27	887.7	run 3a	11.047	1032.0	871.5	14331	54.5
5/26/01 0:27	891.7	run 3a	11.047	1032.0	875.5	14331	54.7
5/26/01 0:27	895.7	run 3a	11.047	1032.0	879.5	14331	55.0
5/26/01 0:28	893.7	run 3a	11.047	1032.0	877.5	14331	54.9
5/26/01 0:28	889.7	run 3a	11.047	1032.0	873.5	14331	54.6
5/26/01 0:28	887.7	run 3a	11.047	1032.0	871.5	14331	54.5
5/26/01 0:28	889.7	run 3a	11.047	1032.0	873.5	14331	54.6
5/26/01 0:29	889.7	run 3a	11.047	1032.0	873.5	14331	54.6
5/26/01 0:29	891.7	run 3a	11.047	1032.0	875.5	14331	54.7
5/26/01 0:29	887.7	run 3a	11.047	1032.0	871.5	14331	54.5
5/26/01 0:29	881.7	run 3a	11.047	1032.0	865.5	14331	54.1
5/26/01 0:30	877.7	run 3a	11.047	1032.0	861.6	14331	53.9
5/26/01 0:30	877.7	run 3a	11.047	1032.0	861.6	14331	53.9
5/26/01 0:30	885.7	run 3a	11.047	1032.0	869.5	14331	54.4
5/26/01 0:30	891.7	run 3a	11.047	1032.0	875.5	14331	54.7
5/26/01 0:31	885.7	run 3a	11.047	1032.0	869.5	14331	54.4
5/26/01 0:31	887.7	run 3a	11.047	1032.0	871.5	14331	54.5
5/26/01 0:31	887.7	run 3a	11.047	1032.0	871.5	14331	54.5
5/26/01 0:31	877.7	run 3a	11.047	1032.0	861.6	14331	53.9
5/26/01 0:32	883.7	run 3a	11.047	1032.0	867.5	14331	54.2
5/26/01 0:32	889.7	run 3a	11.047	1032.0	873.5	14331	54.6
5/26/01 0:32	883.7	run 3a	11.047	1032.0	867.5	14331	54.2
5/26/01 0:32	875.7	run 3a	11.047	1032.0	859.6	14331	53.7
5/26/01 0:33	871.7	run 3a	11.047	1032.0	855.6	14331	53.5
5/26/01 0:33	869.7	run 3a	11.047	1032.0	853.6	14331	53.4
5/26/01 0:33	867.7	run 3a	11.047	1032.0	851.6	14331	53.2
5/26/01 0:33	871.7	run 3a	11.047	1032.0	855.6	14331	53.5
5/26/01 0:34	873.7	run 3a	11.047	1032.0	857.6	14331	53.6
5/26/01 0:34	879.7	run 3a	11.047	1032.0	863.5	14331	54.0
5/26/01 0:34	883.7	run 3a	11.047	1032.0	867.5	14331	54.2
5/26/01 0:34	879.7	run 3a	11.047	1032.0	863.5	14331	54.0
5/26/01 0:35	877.7	run 3a	11.047	1032.0	861.6	14331	53.9
5/26/01 0:35	879.7	run 3a	11.047	1032.0	863.5	14331	54.0
5/26/01 0:35	879.7	run 3a	11.047	1032.0	863.5	14331	54.0
5/26/01 0:35	873.7	run 3a	11.047	1032.0	857.6	14331	53.6
5/26/01 0:36	867.7	run 3a	11.047	1032.0	851.6	14331	53.2
5/26/01 0:36	869.7	run 3a	11.047	1032.0	853.6	14331	53.4
5/26/01 0:36	869.7	run 3a	11.047	1032.0	853.6	14331	53.4
5/26/01 0:36	865.7	run 3a	11.047	1032.0	849.6	14331	53.1
5/26/01 0:37	871.7	run 3a	11.047	1032.0	855.6	14331	53.5
5/26/01 0:37	879.7	run 3a	11.047	1032.0	863.5	14331	54.0
5/26/01 0:37	885.7	run 3a	11.047	1032.0	869.5	14331	54.4
5/26/01 0:37	885.7	run 3a	11.047	1032.0	869.5	14331	54.4
5/26/01 0:38	881.7	run 3a	11.047	1032.0	865.5	14331	54.1
5/26/01 0:38	877.7	run 3a	11.047	1032.0	861.6	14331	53.9
5/26/01 0:38	879.7	run 3a	11.047	1032.0	863.5	14331	54.0
5/26/01 0:38	875.7	run 3a	11.047	1032.0	859.6	14331	53.7
5/26/01 0:39	867.7	run 3a	11.047	1032.0	851.6	14331	53.2
5/26/01 0:39	865.7	run 3a	11.047	1032.0	849.6	14331	53.1
5/26/01 0:39	867.7	run 3a	11.047	1032.0	851.6	14331	53.2
5/26/01 0:39	871.7	run 3a	11.047	1032.0	855.6	14331	53.5
5/26/01 0:40	869.7	run 3a	11.047	1032.0	853.6	14331	53.4
5/26/01 0:40	865.7	run 3a	11.047	1032.0	849.5	14331	53.1
5/26/01 0:40	871.7	run 3a	11.047	1032.0	855.6	14331	53.5
5/26/01 0:40	869.7	run 3a	11.047	1032.0	853.6	14331	53.4
5/26/01 0:41	861.7	run 3a	11.047	1032.0	845.6	14331	52.9
5/26/01 0:41	855.6	run 3a	11.047	1032.0	839.6	14331	52.5
5/26/01 0:41	855.6	run 3a	11.047	1032.0	839.6	14331	52.5
5/26/01 0:41	851.6	run 3a	11.047	1032.0	835.7	14331	52.2
5/26/01 0:42	857.7	run 3a	11.047	1032.0	841.6	14331	52.6

Georgia Pacific Bleach Plant - Carbon Monoxide Test

DATE / TIME	PPM	COMMENTS	ZERO CAL	1016 ppm cal	CORRECTED PPM	FLOW, acfm-dry	POUNDS OF CO PER HOUR
5/26/01 0 42	865 7	run 3a	11 047	1032 0	849 6	14331	53 1
5/26/01 0 42	845 6	run 3a	11 047	1032 0	829 7	14331	51 9
5/26/01 0 42	823 6	run 3a	11 047	1032 0	807 8	14331	50 5
		run 3a Average			856 9		53 6
5/26/01 0 43	813 6	plant upset/delay	11 047	1032 0			
5/26/01 0 43	823 6	plant upset/delay	11 047	1032 0			
5/26/01 0 43	831 6	plant upset/delay	11 047	1032 0			
5/26/01 0 43	823 6	plant upset/delay	11 047	1032 0			
5/26/01 0 44	817 6	plant upset/delay	11 047	1032 0			
5/26/01 0 44	815 6	plant upset/delay	11 047	1032 0			
5/26/01 0 44	813 6	plant upset/delay	11 047	1032 0			
5/26/01 0 44	807 6	plant upset/delay	11 047	1032 0			
5/26/01 0 45	811 6	plant upset/delay	11 047	1032 0			
5/26/01 0 45	825 6	plant upset/delay	11 047	1032 0			
5/26/01 0 45	833 6	plant upset/delay	11 047	1032 0			
5/26/01 0 45	829 6	plant upset/delay	11 047	1032 0			
5/26/01 0 46	825 6	plant upset/delay	11 047	1032 0			
5/26/01 0 46	823 6	plant upset/delay	11 047	1032 0			
5/26/01 0 46	813 6	plant upset/delay	11 047	1032 0			
5/26/01 0 46	799 5	plant upset/delay	11 047	1032 0			
5/26/01 0 47	793 5	plant upset/delay	11 047	1032 0			
5/26/01 0 47	791 5	plant upset/delay	11 047	1032 0			
5/26/01 0 47	789 5	plant upset/delay	11 047	1032 0			
5/26/01 0 47	781 5	plant upset/delay	11 047	1032 0			
5/26/01 0 48	777 5	plant upset/delay	11 047	1032 0			
5/26/01 0 48	781 5	plant upset/delay	11 047	1032 0			
5/26/01 0 48	783 5	plant upset/delay	11 047	1032 0			
5/26/01 0 48	777 5	plant upset/delay	11 047	1032 0			
5/26/01 0 49	781 5	plant upset/delay	11 047	1032 0			
5/26/01 0 49	787 5	plant upset/delay	11 047	1032 0			
5/26/01 0 49	783 5	plant upset/delay	11 047	1032 0			
5/26/01 0 49	777 5	plant upset/delay	11 047	1032 0			
5/26/01 0 50	781 5	plant upset/delay	11 047	1032 0			
5/26/01 0 50	785 5	plant upset/delay	11 047	1032 0			
5/26/01 0 50	785 5	plant upset/delay	11 047	1032 0			
5/26/01 0 50	785 5	plant upset/delay	11.047	1032 0			
5/26/01 0 51	785 5	plant upset/delay	11 047	1032 0			
5/26/01 0 51	791.5	plant upset/delay	11 047	1032 0			
5/26/01 0 51	803 5	plant upset/delay	11 047	1032 0			
5/26/01 0 51	813 6	plant upset/delay	11.047	1032 0			
5/26/01 0 52	817 6	plant upset/delay	11 047	1032 0			
5/26/01 0 52	819 6	plant upset/delay	11 047	1032 0			
5/26/01 0 52	827 6	plant upset/delay	11 047	1032 0			
5/26/01 0 52	833 6	plant upset/delay	11 047	1032 0			
5/26/01 0 53	829 6	plant upset/delay	11 047	1032 0			
5/26/01 0 53	819 6	plant upset/delay	11 047	1032 0			
5/26/01 0 53	807 6	plant upset/delay	11 047	1032 0			
5/26/01 0 53	791 5	plant upset/delay	11 047	1032 0			
5/26/01 0 54	773 5	plant upset/delay	11 047	1032 0			
5/26/01 0 54	759 5	plant upset/delay	11 047	1032 0			
5/26/01 0 54	741 4	plant upset/delay	11 047	1032 0			
5/26/01 0 54	723 4	plant upset/delay	11 047	1032 0			
5/26/01 0 55	711 4	plant upset/delay	11 047	1032 0			
5/26/01 0 55	709 4	plant upset/delay	11 047	1032 0			
5/26/01 0 55	701 3	plant upset/delay	11 047	1032 0			
5/26/01 0 55	585 3	plant upset/delay	11 047	1032 0			
5/26/01 0 56	583 3	plant upset/delay	11 047	1032 0			
5/26/01 0 56	589 3	plant upset/delay	11 047	1032 0			
5/26/01 0 56	593 3	plant upset/delay	11 047	1032 0			
5/26/01 0 56	593 3	plant upset/delay	11 047	1032 0			
5/26/01 0 57	589 3	plant upset/delay	11 047	1032 0			

Georgia Pacific Bleach Plant - Carbon Monoxide Test

DATE / TIME	PPM	COMMENTS	ZERO CAL	1018 ppm cal	CORRECTED PPM	FLOW, scfm-dry	POUNDS OF CO PER HOUR
5/26/01 0 57	677 3	plant upset/delay	11 047	1032 0			
5/26/01 0 57	663 3	plant upset/delay	11 047	1032 0			
5/26/01 0 57	655 3	plant upset/delay	11 047	1032 0			
5/26/01 0 58	657 3	plant upset/delay	11 047	1032 0			
5/26/01 0 58	663 3	plant upset/delay	11 047	1032 0			
5/26/01 0 58	659 3	plant upset/delay	11 047	1032 0			
5/26/01 0 58	661 3	plant upset/delay	11 047	1032 0			
5/26/01 0 59	669 3	plant upset/delay	11 047	1032 0			
5/26/01 0 59	661 3	plant upset/delay	11 047	1032 0			
5/26/01 0 59	655 3	plant upset/delay	11 047	1032 0			
5/26/01 0 59	649 2	plant upset/delay	11 047	1032 0			
5/26/01 1 00	635 2	plant upset/delay	11 047	1032 0			
5/26/01 1 00	621 2	plant upset/delay	11 047	1032 0			
5/26/01 1 00	621 2	plant upset/delay	11 047	1032 0			
5/26/01 1 00	621 2	plant upset/delay	11 047	1032 0			
5/26/01 1 01	617 2	plant upset/delay	11 047	1032 0			
5/26/01 1 01	609 2	plant upset/delay	11 047	1032 0			
5/26/01 1 01	603 2	plant upset/delay	11 047	1032 0			
5/26/01 1 01	601 1	plant upset/delay	11 047	1032 0			
5/26/01 1 02	597 1	plant upset/delay	11 047	1032 0			
5/26/01 1 02	595 1	plant upset/delay	11 047	1032 0			
5/26/01 1 02	593 1	plant upset/delay	11 047	1032 0			
5/26/01 1 02	595 1	plant upset/delay	11 047	1032 0			
5/26/01 1 03	593 1	plant upset/delay	11 047	1032 0			
5/26/01 1 03	589 1	plant upset/delay	11 047	1032 0			
5/26/01 1 03	583 1	plant upset/delay	11 047	1032 0			
5/26/01 1 03	579 1	plant upset/delay	11 047	1032 0			
5/26/01 1 04	581 1	plant upset/delay	11 047	1032 0			
5/26/01 1 04	585 1	plant upset/delay	11 047	1032 0			
5/26/01 1 04	591 1	plant upset/delay	11 047	1032 0			
5/26/01 1 04	589 1	plant upset/delay	11 047	1032 0			
5/26/01 1 05	587 1	plant upset/delay	11 047	1032 0			
5/26/01 1 05	593 1	plant upset/delay	11 047	1032 0			
5/26/01 1 05	603 2	plant upset/delay	11 047	1032 0			
5/26/01 1 05	615 2	plant upset/delay	11 047	1032 0			
5/26/01 1 06	621 2	plant upset/delay	11 047	1032 0			
5/26/01 1 06	615 2	plant upset/delay	11 047	1032 0			
5/26/01 1 06	607 2	plant upset/delay	11 047	1032 0			
5/26/01 1 06	609 2	plant upset/delay	11 047	1032 0			
5/26/01 1 07	613 2	plant upset/delay	11 047	1032 0			
5/26/01 1 07	617 2	plant upset/delay	11 047	1032 0			
5/26/01 1 07	621 2	plant upset/delay	11 047	1032 0			
5/26/01 1 07	623 2	plant upset/delay	11 047	1032 0			
5/26/01 1 08	627 2	plant upset/delay	11 047	1032 0			
5/26/01 1 08	631 2	plant upset/delay	11 047	1032 0			
5/26/01 1 08	627 2	plant upset/delay	11 047	1032 0			
5/26/01 1 08	619 2	plant upset/delay	11 047	1032 0			
5/26/01 1 09	613 2	plant upset/delay	11.047	1032 0			
5/26/01 1 09	613 2	plant upset/delay	11 047	1032 0			
5/26/01 1 09	615 2	plant upset/delay	11 047	1032 0			
5/26/01 1 09	617 2	plant upset/delay	11 047	1032 0			
5/26/01 1 10	613 2	plant upset/delay	11 047	1032 0			
5/26/01 1 10	609 2	plant upset/delay	11 047	1032 0			
5/26/01 1 10	609 2	plant upset/delay	11 047	1032 0			
5/26/01 1 10	617 2	plant upset/delay	11 047	1032 0			
5/26/01 1 11	621 2	plant upset/delay	11 047	1032 0			
5/26/01 1 11	633 2	plant upset/delay	11 047	1032 0			
5/26/01 1 11	659 3	plant upset/delay	11 047	1032 0			
5/26/01 1 11	679 3	plant upset/delay	11 047	1032 0			
5/26/01 1 12	677 3	plant upset/delay	11 047	1032 0			
5/26/01 1 12	677 3	plant upset/delay	11 047	1032 0			

Georgia Pacific Bleach Plant - Carbon Monoxide Test

DATE / TIME	PPM	COMMENTS	ZERO CAL	1016 ppm cal	CORRECTED PPM	FLOW, acfm-dry	POUNDS OF CO PER HOUR
5/26/01 1:12	685.3	plant upset/delay	11.047	1032.0			
5/26/01 1:12	697.3	plant upset/delay	11.047	1032.0			
5/26/01 1:13	697.3	plant upset/delay	11.047	1032.0			
5/26/01 1:13	693.3	plant upset/delay	11.047	1032.0			
5/26/01 1:13	687.3	plant upset/delay	11.047	1032.0			
5/26/01 1:13	683.3	plant upset/delay	11.047	1032.0			
5/26/01 1:14	679.3	plant upset/delay	11.047	1032.0			
5/26/01 1:14	681.3	plant upset/delay	11.047	1032.0			
5/26/01 1:14	679.3	plant upset/delay	11.047	1032.0			
5/26/01 1:14	675.3	plant upset/delay	11.047	1032.0			
5/26/01 1:15	683.3	plant upset/delay	11.047	1032.0			
5/26/01 1:15	685.3	plant upset/delay	11.047	1032.0			
5/26/01 1:15	685.3	plant upset/delay	11.047	1032.0			
5/26/01 1:15	685.3	plant upset/delay	11.047	1032.0			
5/26/01 1:16	681.3	plant upset/delay	11.047	1032.0			
5/26/01 1:16	677.3	plant upset/delay	11.047	1032.0			
5/26/01 1:16	673.3	plant upset/delay	11.047	1032.0			
5/26/01 1:16	675.3	plant upset/delay	11.047	1032.0			
5/26/01 1:17	679.3	plant upset/delay	11.047	1032.0			
5/26/01 1:17	679.3	plant upset/delay	11.047	1032.0			
5/26/01 1:17	679.3	plant upset/delay	11.047	1032.0			
5/26/01 1:17	671.3	plant upset/delay	11.047	1032.0			
5/26/01 1:18	669.3	plant upset/delay	11.047	1032.0			
5/26/01 1:18	669.3	plant upset/delay	11.047	1032.0			
5/26/01 1:18	669.3	plant upset/delay	11.047	1032.0			
5/26/01 1:18	671.3	plant upset/delay	11.047	1032.0			
5/26/01 1:19	667.3	plant upset/delay	11.047	1032.0			
5/26/01 1:19	665.3	plant upset/delay	11.047	1032.0			
5/26/01 1:19	665.3	plant upset/delay	11.047	1032.0			
5/26/01 1:19	671.3	plant upset/delay	11.047	1032.0			
5/26/01 1:20	673.3	plant upset/delay	11.047	1032.0			
5/26/01 1:20	671.3	plant upset/delay	11.047	1032.0			
5/26/01 1:20	673.3	plant upset/delay	11.047	1032.0			
5/26/01 1:20	679.3	plant upset/delay	11.047	1032.0			
5/26/01 1:21	679.3	plant upset/delay	11.047	1032.0			
5/26/01 1:21	675.3	plant upset/delay	11.047	1032.0			
5/26/01 1:21	671.3	plant upset/delay	11.047	1032.0			
5/26/01 1:21	673.3	plant upset/delay	11.047	1032.0			
5/26/01 1:22	677.3	plant upset/delay	11.047	1032.0			
5/26/01 1:22	681.3	plant upset/delay	11.047	1032.0			
5/26/01 1:22	683.3	plant upset/delay	11.047	1032.0			
5/26/01 1:22	697.3	plant upset/delay	11.047	1032.0			
5/26/01 1:23	707.4	plant upset/delay	11.047	1032.0			
5/26/01 1:23	711.4	plant upset/delay	11.047	1032.0			
5/26/01 1:23	705.4	plant upset/delay	11.047	1032.0			
5/26/01 1:23	705.4	plant upset/delay	11.047	1032.0			
5/26/01 1:24	709.4	plant upset/delay	11.047	1032.0			
5/26/01 1:24	711.4	plant upset/delay	11.047	1032.0			
5/26/01 1:24	709.4	plant upset/delay	11.047	1032.0			
5/26/01 1:24	707.4	plant upset/delay	11.047	1032.0			
5/26/01 1:25	705.4	plant upset/delay	11.047	1032.0			
5/26/01 1:25	701.3	plant upset/delay	11.047	1032.0			
5/26/01 1:25	697.3	plant upset/delay	11.047	1032.0			
5/26/01 1:25	683.3	plant upset/delay	11.047	1032.0			
5/26/01 1:26	671.3	plant upset/delay	11.047	1032.0			
5/26/01 1:26	675.3	plant upset/delay	11.047	1032.0			
5/26/01 1:26	679.3	plant upset/delay	11.047	1032.0			
5/26/01 1:26	669.3	plant upset/delay	11.047	1032.0			
5/26/01 1:27	665.3	plant upset/delay	11.047	1032.0			
5/26/01 1:27	663.3	plant upset/delay	11.047	1032.0			
5/26/01 1:27	661.3	plant upset/delay	11.047	1032.0			

Georgia Pacific Bleach Plant - Carbon Monoxide Test

DATE / TIME	PPM	COMMENTS	ZERO CAL	1016 ppm cal	CORRECTED PPM	FLOW, scfm dry	POUNDS OF CO PER HOUR
5/26/01 1:27	667.3	plant upset/delay	11.047	1032.0			
5/26/01 1:28	667.3	plant upset/delay	11.047	1032.0			
5/26/01 1:28	661.3	plant upset/delay	11.047	1032.0			
5/26/01 1:28	661.3	plant upset/delay	11.047	1032.0			
5/26/01 1:28	665.3	plant upset/delay	11.047	1032.0			
5/26/01 1:29	661.3	plant upset/delay	11.047	1032.0			
5/26/01 1:29	653.2	plant upset/delay	11.047	1032.0			
5/26/01 1:29	655.3	plant upset/delay	11.047	1032.0			
5/26/01 1:29	659.3	plant upset/delay	11.047	1032.0			
5/26/01 1:30	659.3	plant upset/delay	11.047	1032.0			
5/26/01 1:30	659.3	plant upset/delay	11.047	1032.0			
5/26/01 1:30	665.3	plant upset/delay	11.047	1032.0			
5/26/01 1:30	669.3	plant upset/delay	11.047	1032.0			
5/26/01 1:31	665.3	plant upset/delay	11.047	1032.0			
5/26/01 1:31	659.3	plant upset/delay	11.047	1032.0			
5/26/01 1:31	653.2	plant upset/delay	11.047	1032.0			
5/26/01 1:31	653.2	plant upset/delay	11.047	1032.0			
5/26/01 1:32	659.3	plant upset/delay	11.047	1032.0			
5/26/01 1:32	667.3	plant upset/delay	11.047	1032.0			
5/26/01 1:32	669.3	plant upset/delay	11.047	1032.0			
5/26/01 1:32	661.3	plant upset/delay	11.047	1032.0			
5/26/01 1:33	657.3	plant upset/delay	11.047	1032.0			
5/26/01 1:33	657.3	plant upset/delay	11.047	1032.0			
5/26/01 1:33	655.3	plant upset/delay	11.047	1032.0			
5/26/01 1:33	653.2	plant upset/delay	11.047	1032.0			
5/26/01 1:34	645.2	plant upset/delay	11.047	1032.0			
5/26/01 1:34	639.2	plant upset/delay	11.047	1032.0			
5/26/01 1:34	643.2	plant upset/delay	11.047	1032.0			
5/26/01 1:34	635.2	plant upset/delay	11.047	1032.0			
5/26/01 1:35	627.2	plant upset/delay	11.047	1032.0			
5/26/01 1:35	629.2	plant upset/delay	11.047	1032.0			
5/26/01 1:35	633.2	plant upset/delay	11.047	1032.0			
5/26/01 1:35	629.2	plant upset/delay	11.047	1032.0			
5/26/01 1:36	627.2	plant upset/delay	11.047	1032.0			
5/26/01 1:36	623.2	plant upset/delay	11.047	1032.0			
5/26/01 1:36	623.2	plant upset/delay	11.047	1032.0			
5/26/01 1:36	627.2	plant upset/delay	11.047	1032.0			
5/26/01 1:37	623.2	plant upset/delay	11.047	1032.0			
5/26/01 1:37	613.2	plant upset/delay	11.047	1032.0			
5/26/01 1:37	615.2	plant upset/delay	11.047	1032.0			
5/26/01 1:37	617.2	plant upset/delay	11.047	1032.0			
5/26/01 1:38	615.2	plant upset/delay	11.047	1032.0			
5/26/01 1:38	609.2	plant upset/delay	11.047	1032.0			
5/26/01 1:38	611.2	plant upset/delay	11.047	1032.0			
5/26/01 1:38	621.2	plant upset/delay	11.047	1032.0			
5/26/01 1:39	625.2	plant upset/delay	11.047	1032.0			
5/26/01 1:39	625.2	plant upset/delay	11.047	1032.0			
5/26/01 1:39	621.2	plant upset/delay	11.047	1032.0			
5/26/01 1:39	617.2	plant upset/delay	11.047	1032.0			
5/26/01 1:40	617.2	plant upset/delay	11.047	1032.0			
5/26/01 1:40	615.2	plant upset/delay	11.047	1032.0			
5/26/01 1:40	613.2	plant upset/delay	11.047	1032.0			
5/26/01 1:40	605.2	plant upset/delay	11.047	1032.0			
5/26/01 1:41	601.1	plant upset/delay	11.047	1032.0			
5/26/01 1:41	605.2	plant upset/delay	11.047	1032.0			
5/26/01 1:41	603.2	plant upset/delay	11.047	1032.0			
5/26/01 1:41	599.1	plant upset/delay	11.047	1032.0			
5/26/01 1:42	607.2	plant upset/delay	11.047	1032.0			
5/26/01 1:42	611.2	plant upset/delay	11.047	1032.0			
5/26/01 1:42	607.2	plant upset/delay	11.047	1032.0			
5/26/01 1:42	609.2	plant upset/delay	11.047	1032.0			

Georgia Pacific Bleach Plant - Carbon Monoxide Test

DATE / TIME	PPM	COMMENTS	ZERO CAL	1016 ppm cal	CORRECTED PPM	FLOW, acfm dry	POUNDS OF CO PER HOUR
5/26/01 1:43	609.2	plant upset/delay	11.047	1032.0			
5/26/01 1:43	605.2	plant upset/delay	11.047	1032.0			
5/26/01 1:43	601.1	plant upset/delay	11.047	1032.0			
5/26/01 1:43	601.1	plant upset/delay	11.047	1032.0			
5/26/01 1:44	597.1	plant upset/delay	11.047	1032.0			
5/26/01 1:44	595.1	plant upset/delay	11.047	1032.0			
5/26/01 1:44	595.1	plant upset/delay	11.047	1032.0			
5/26/01 1:44	595.1	plant upset/delay	11.047	1032.0			
5/26/01 1:45	595.1	run 3b	11.047	1032.0	580.7	14331	36.3
5/26/01 1:45	599.1	run 3b	11.047	1032.0	584.6	14331	36.6
5/26/01 1:45	603.2	run 3b	11.047	1032.0	588.6	14331	36.8
5/26/01 1:45	605.2	run 3b	11.047	1032.0	590.6	14331	36.9
5/26/01 1:46	611.2	run 3b	11.047	1032.0	596.6	14331	37.3
5/26/01 1:46	609.2	run 3b	11.047	1032.0	594.6	14331	37.2
5/26/01 1:46	595.1	run 3b	11.047	1032.0	580.7	14331	36.3
5/26/01 1:46	579.1	run 3b	11.047	1032.0	564.7	14331	35.3
5/26/01 1:47	569.1	run 3b	11.047	1032.0	554.8	14331	34.7
5/26/01 1:47	563.1	run 3b	11.047	1032.0	548.8	14331	34.3
5/26/01 1:47	565.1	run 3b	11.047	1032.0	550.8	14331	34.4
5/26/01 1:47	563.1	run 3b	11.047	1032.0	548.8	14331	34.3
5/26/01 1:48	557.1	run 3b	11.047	1032.0	542.8	14331	33.9
5/26/01 1:48	551.0	run 3b	11.047	1032.0	536.8	14331	33.6
5/26/01 1:48	557.1	run 3b	11.047	1032.0	542.8	14331	33.9
5/26/01 1:48	563.1	run 3b	11.047	1032.0	548.8	14331	34.3
5/26/01 1:49	561.1	run 3b	11.047	1032.0	546.8	14331	34.2
5/26/01 1:49	561.1	run 3b	11.047	1032.0	546.8	14331	34.2
5/26/01 1:49	565.1	run 3b	11.047	1032.0	550.8	14331	34.4
5/26/01 1:49	567.1	run 3b	11.047	1032.0	552.8	14331	34.6
5/26/01 1:50	565.1	run 3b	11.047	1032.0	550.8	14331	34.4
5/26/01 1:50	563.1	run 3b	11.047	1032.0	548.8	14331	34.3
5/26/01 1:50	561.1	run 3b	11.047	1032.0	546.8	14331	34.2
5/26/01 1:50	565.1	run 3b	11.047	1032.0	550.8	14331	34.4
5/26/01 1:51	565.1	run 3b	11.047	1032.0	550.8	14331	34.4
5/26/01 1:51	561.1	run 3b	11.047	1032.0	546.8	14331	34.2
5/26/01 1:51	565.1	run 3b	11.047	1032.0	550.8	14331	34.4
5/26/01 1:51	569.1	run 3b	11.047	1032.0	554.8	14331	34.7
5/26/01 1:52	569.1	run 3b	11.047	1032.0	554.8	14331	34.7
5/26/01 1:52	571.1	run 3b	11.047	1032.0	556.7	14331	34.8
5/26/01 1:52	575.1	run 3b	11.047	1032.0	560.7	14331	35.1
5/26/01 1:52	573.1	run 3b	11.047	1032.0	558.7	14331	34.9
5/26/01 1:53	571.1	run 3b	11.047	1032.0	556.7	14331	34.8
5/26/01 1:53	577.1	run 3b	11.047	1032.0	562.7	14331	35.2
5/26/01 1:53	581.1	run 3b	11.047	1032.0	566.7	14331	35.4
5/26/01 1:53	577.1	run 3b	11.047	1032.0	562.7	14331	35.2
5/26/01 1:54	569.1	run 3b	11.047	1032.0	554.8	14331	34.7
5/26/01 1:54	565.1	run 3b	11.047	1032.0	550.8	14331	34.4
5/26/01 1:54	563.1	run 3b	11.047	1032.0	548.8	14331	34.3
5/26/01 1:54	563.1	run 3b	11.047	1032.0	548.8	14331	34.3
5/26/01 1:55	563.1	run 3b	11.047	1032.0	548.8	14331	34.3
5/26/01 1:55	561.1	run 3b	11.047	1032.0	546.8	14331	34.2
5/26/01 1:55	559.1	run 3b	11.047	1032.0	544.8	14331	34.1
5/26/01 1:55	563.1	run 3b	11.047	1032.0	548.8	14331	34.3
5/26/01 1:56	565.1	run 3b	11.047	1032.0	550.8	14331	34.4
5/26/01 1:56	563.1	run 3b	11.047	1032.0	548.8	14331	34.3
5/26/01 1:56	563.1	run 3b	11.047	1032.0	548.8	14331	34.3
5/26/01 1:56	565.1	run 3b	11.047	1032.0	550.8	14331	34.4
5/26/01 1:57	565.1	run 3b	11.047	1032.0	550.8	14331	34.4
5/26/01 1:57	561.1	run 3b	11.047	1032.0	546.8	14331	34.2
5/26/01 1:57	559.1	run 3b	11.047	1032.0	544.8	14331	34.1
5/26/01 1:57	561.1	run 3b	11.047	1032.0	546.8	14331	34.2
5/26/01 1:58	569.1	run 3b	11.047	1032.0	554.8	14331	34.[illegible]

Georgia Pacific Bleach Plant - Carbon Monoxide Test

DATE / TIME	PPM	COMMENTS	ZERO CAL	1018 ppm cal	CORRECTED PPM	FLOW, acfm dry	POUNDS OF CO PER HOUR
5/26/01 1:58	571.1	run 3b	11.047	1032.0	556.7	14331	34.8
5/26/01 1:58	567.1	run 3b	11.047	1032.0	552.8	14331	34.6
5/26/01 1:58	571.1	run 3b	11.047	1032.0	556.7	14331	34.8
5/26/01 1:59	577.1	run 3b	11.047	1032.0	562.7	14331	35.2
5/26/01 1:59	579.1	run 3b	11.047	1032.0	564.7	14331	35.3
5/26/01 1:59	577.1	run 3b	11.047	1032.0	562.7	14331	35.2
5/26/01 1:59	581.1	run 3b	11.047	1032.0	566.7	14331	35.4
5/26/01 2:00	587.1	run 3b	11.047	1032.0	572.7	14331	35.8
5/26/01 2:00	591.1	run 3b	11.047	1032.0	576.7	14331	36.1
5/26/01 2:00	593.1	run 3b	11.047	1032.0	578.7	14331	36.2
5/26/01 2:00	595.1	run 3b	11.047	1032.0	580.7	14331	36.3
5/26/01 2:01	591.1	run 3b	11.047	1032.0	576.7	14331	36.1
5/26/01 2:01	581.1	run 3b	11.047	1032.0	566.7	14331	35.4
5/26/01 2:01	577.1	run 3b	11.047	1032.0	562.7	14331	35.2
5/26/01 2:01	577.1	run 3b	11.047	1032.0	562.7	14331	35.2
5/26/01 2:02	575.1	run 3b	11.047	1032.0	560.7	14331	35.1
5/26/01 2:02	573.1	run 3b	11.047	1032.0	558.7	14331	34.9
5/26/01 2:02	577.1	run 3b	11.047	1032.0	562.7	14331	35.2
5/26/01 2:02	575.1	run 3b	11.047	1032.0	560.7	14331	35.1
5/26/01 2:03	573.1	run 3b	11.047	1032.0	558.7	14331	34.9
5/26/01 2:03	573.1	run 3b	11.047	1032.0	558.7	14331	34.9
5/26/01 2:03	575.1	run 3b	11.047	1032.0	560.7	14331	35.1
5/26/01 2:03	573.1	run 3b	11.047	1032.0	558.7	14331	34.9
5/26/01 2:04	567.1	run 3b	11.047	1032.0	552.8	14331	34.6
5/26/01 2:04	565.1	run 3b	11.047	1032.0	550.8	14331	34.4
5/26/01 2:04	565.1	run 3b	11.047	1032.0	550.8	14331	34.4
5/26/01 2:04	567.1	run 3b	11.047	1032.0	552.8	14331	34.6
5/26/01 2:05	569.1	run 3b	11.047	1032.0	554.8	14331	34.7
5/26/01 2:05	569.1	run 3b	11.047	1032.0	554.8	14331	34.7
5/26/01 2:05	567.1	run 3b	11.047	1032.0	552.8	14331	34.6
5/26/01 2:05	565.1	run 3b	11.047	1032.0	550.8	14331	34.4
5/26/01 2:06	567.1	run 3b	11.047	1032.0	552.8	14331	34.6
5/26/01 2:06	567.1	run 3b	11.047	1032.0	552.8	14331	34.6
5/26/01 2:06	571.1	run 3b	11.047	1032.0	556.7	14331	34.8
5/26/01 2:06	567.1	run 3b	11.047	1032.0	552.8	14331	34.6
5/26/01 2:07	561.1	run 3b	11.047	1032.0	546.8	14331	34.2
5/26/01 2:07	561.1	run 3b	11.047	1032.0	546.8	14331	34.2
5/26/01 2:07	559.1	run 3b	11.047	1032.0	544.8	14331	34.1
5/26/01 2:07	559.1	run 3b	11.047	1032.0	544.8	14331	34.1
5/26/01 2:08	563.1	run 3b	11.047	1032.0	548.8	14331	34.3
5/26/01 2:08	565.1	run 3b	11.047	1032.0	550.8	14331	34.4
5/26/01 2:08	565.1	run 3b	11.047	1032.0	550.8	14331	34.4
5/26/01 2:08	567.1	run 3b	11.047	1032.0	552.8	14331	34.6
5/26/01 2:09	571.1	run 3b	11.047	1032.0	556.7	14331	34.8
5/26/01 2:09	569.1	run 3b	11.047	1032.0	554.8	14331	34.7
5/26/01 2:09	569.1	run 3b	11.047	1032.0	554.8	14331	34.7
5/26/01 2:09	569.1	run 3b	11.047	1032.0	554.8	14331	34.7
5/26/01 2:10	571.1	run 3b	11.047	1032.0	556.7	14331	34.8
5/26/01 2:10	571.1	run 3b	11.047	1032.0	556.7	14331	34.8
5/26/01 2:10	567.1	run 3b	11.047	1032.0	552.8	14331	34.6
5/26/01 2:10	563.1	run 3b	11.047	1032.0	548.8	14331	34.3
5/26/01 2:11	563.1	run 3b	11.047	1032.0	548.8	14331	34.3
5/26/01 2:11	561.1	run 3b	11.047	1032.0	546.8	14331	34.2
5/26/01 2:11	563.1	run 3b	11.047	1032.0	548.8	14331	34.3
5/26/01 2:11	565.1	run 3b	11.047	1032.0	550.8	14331	34.4
5/26/01 2:12	569.1	run 3b	11.047	1032.0	554.8	14331	34.7
5/26/01 2:12	575.1	run 3b	11.047	1032.0	560.7	14331	35.1
5/26/01 2:12	583.1	run 3b	11.047	1032.0	568.7	14331	35.6
5/26/01 2:12	585.1	run 3b	11.047	1032.0	570.7	14331	35.7
5/26/01 2:13	581.1	run 3b	11.047	1032.0	566.7	14331	35.4
5/26/01 2:13	583.1	run 3b	11.047	1032.0	568.7	14331	35.6

Georgia Pacific Bleach Plant - Carbon Monoxide Test

DATE / TIME	PPM	COMMENTS	ZERO CAL	1015 ppm cal	CORRECTED PPM	FLOW, scfm-dry	POUNDS OF CO PER HOUR
5/26/01 2 13	583 1	run 3b	11 047	1032 0	568 7	14331	35 6
5/26/01 2 13	577 1	run 3b	11 047	1032 0	562 7	14331	35 2
		run 3b Average			557 1		34 8
5/26/01 2 14	573 1	wait	11 047	1032 0			
5/26/01 2 14	571 1	wait	11 047	1032 0			
5/26/01 2 14	577 1	wait	11 047	1032 0			
5/26/01 2 14	579 1	wait	11 047	1032 0			
5/26/01 2 15	579 1	wait	11 047	1032 0			
5/26/01 2 15	575 1	wait	11 047	1032 0			
5/26/01 2 15	577 1	wait	11 047	1032 0			
5/26/01 2 15	587 1	wait	11 047	1032 0			
5/26/01 2 16	589 1	wait	11 047	1032 0			
5/26/01 2 16	585 1	wait	11 047	1032 0			
5/26/01 2 16	593 1	wait	11 047	1032 0			
5/26/01 2 16	603 2	wait	11 047	1032 0			
5/26/01 2 17	607 2	wait	11 047	1032 0			
5/26/01 2 17	607 2	wait	11 047	1032 0			
5/26/01 2 17	613 2	wait	11 047	1032 0			
5/26/01 2 17	613 2	wait	11 047	1032 0			
5/26/01 2 18	609 2	wait	11 047	1032 0			
5/26/01 2 18	613 2	wait	11 047	1032 0			
5/26/01 2 18	615 2	wait	11 047	1032 0			
5/26/01 2 18	611 2	wait	11 047	1032 0			
5/26/01 2 19	611 2	wait	11 047	1032 0			
5/26/01 2 19	615 2	wait	11 047	1032 0			
5/26/01 2 19	611 2	wait	11 047	1032 0			
5/26/01 2 19	611 2	wait	11 047	1032 0			
5/26/01 2 20	615 2	wait	11 047	1032 0			
5/26/01 2 20	611 2	wait	11 047	1032 0			
5/26/01 2 20	605 2	wait	11 047	1032 0			
5/26/01 2 20	605 2	wait	11 047	1032 0			
5/26/01 2 21	605 2	wait	11 047	1032 0			
5/26/01 2 21	599 1	wait	11 047	1032 0			
5/26/01 2 21	589 1	wait	11 047	1032 0			
5/26/01 2 21	587 1	wait	11 047	1032 0			
5/26/01 2 22	585 1	wait	11 047	1032 0			
5/26/01 2 22	573 1	wait	11 047	1032 0			
5/26/01 2 22	567 1	wait	11 047	1032 0			
5/26/01 2 22	569 1	wait	11 047	1032 0			
5/26/01 2 23	561 1	wait	11 047	1032 0			
5/26/01 2 23	557 1	wait	11 047	1032 0			
5/26/01 2 23	561 1	wait	11 047	1032 0			
5/26/01 2 23	559 1	wait	11 047	1032 0			
5/26/01 2 24	549 0	wait	11 047	1032 0			
5/26/01 2 24	450 8	wait	11 047	1032 0			
5/26/01 2 24	204 4	wait	11 047	1032 0			
5/26/01 2 24	48 1	wait	11 047	1032 0			
5/26/01 2 25	16 0	wait	11 047	1032 0			
5/26/01 2 25	10 0	0 ppm cal	11 047	1032 0			
5/26/01 2 25	12 0	0 ppm cal	11 047	1032 0			
5/26/01 2 25	12 0	0 ppm cal	11 047	1032 0			
5/26/01 2 26	10 0	0 ppm cal	11 047	1032 0			
5/26/01 2 26	10 0	0 ppm cal	11 047	1032 0			
5/26/01 2 26	128 2	wait	11 047	1032 0			
5/26/01 2 26	567 1	wait	11 047	1032 0			
5/26/01 2 27	917 8	wait	11 047	1032 0			
5/26/01 2 27	1026 0	1015 ppm cal	11 047	1032 0			
5/26/01 2 27	1032 0	1015 ppm cal	11 047	1032 0			
5/26/01 2 27	1032 0	1015 ppm cal	11 047	1032 0			
5/26/01 2 28	1036 0	1015 ppm cal	11 047	1032 0			
5/26/01 2 28	1032 0	1015 ppm cal	11 047	1032 0			

Georgia Pacific Bleach Plant - Carbon Monoxide Test

DATE / TIME	PPM	COMMENTS	ZERO CAL	1018 ppm cal	CORRECTED PPM	FLOW, scfm, dry	POUNDS OF CO PER HOUR
5/26/01 2 28	989 9	wait	11 047	1032 0			
5/26/01 2 28	813 6	wait	11 047	1032 0			
5/26/01 2 29	663 3	wait	11 047	1032 0			
5/26/01 2 29	607 2	wait	11 047	1032 0			
5/26/01 2 29	599 1	594 7 ppm cal	11 047	1032 0			
5/26/01 2 29	599 1	594 7 ppm cal	11 047	1032 0			
5/26/01 2 30	601 1	594 7 ppm cal	11 047	1032 0			
5/26/01 2 30	591 1	594 7 ppm cal	11 047	1032 0			
5/26/01 2 30	436 8	wait	11 047	1032 0			
5/26/01 2 30	176 3	wait	11 047	1032 0			
5/26/01 2 31	50 1	wait	11 047	1032 0			
5/26/01 2 31	18 0	wait	11 047	1032 0			
5/26/01 2 31	12 0	wait	11 047	1032 0			
5/26/01 2 31	12 0	wait	11 047	1032 0			
5/26/01 2 32	12 0	wait	11 047	1032 0			
5/26/01 2 32	12 0	wait	11 047	1032 0			
5/26/01 2 32	10 0	wait	11 047	1032 0			
5/26/01 2 32	12 0	wait	11 047	1032 0			
5/26/01 2 33	12 0	wait	11 047	1032 0			
5/26/01 2 33	10 0	0 ppm cal	11 047	1032 0			
5/26/01 2 33	10 0	0 ppm cal	11 047	1032 0			
5/26/01 2 33	10 0	0 ppm cal	11 047	1032 0			
5/26/01 2 34	10 0	0 ppm cal	11 047	1032 0			
5/26/01 2 34	10 0	0 ppm cal	11 047	1032 0			
5/26/01 2 34	10 0	0 ppm cal	11 047	1032 0			
5/26/01 2 34	10 0	0 ppm cal	11 047	1032 0			
5/26/01 2 35	10 0	0 ppm cal	11 047	1032 0			
5/26/01 2 35	10 0	0 ppm cal	11 047	1032 0			
5/26/01 2 35	10 0	0 ppm cal	11 047	1032 0			
5/26/01 2 35	10 0	0 ppm cal	11 047	1032 0			
5/26/01 2 36	10 0	0 ppm cal	11 047	1032 0			
5/26/01 2 36	10 0	0 ppm cal	11 047	1032 0			
5/26/01 2 36	10 0	0 ppm cal	11 047	1032 0			
5/26/01 2 36	10 0	0 ppm cal	11 047	1032.0			
5/26/01 2 37	-4 1	end test	11 047	1032 0			
		Grand Average			716 2		44 71764667
		TEST AVERAGE			716 24	14307	44 72

APPENDIX H

PROJECT PARTICIPANTS

Project Participants

DAVID SALTER	FIELD TESTING CALIBRATIONS CALCULATIONS REPORT PREPARATION
WALTER MOCK	LAB ANALYSIS
BEN MOORE	FIELD TESTING
JOE COOKSEY	CO TESTING
CRAIG COHEN	CO TESTING
GEORGE HAWKINS	FIELD TESTING
HARVEY C. GRAY	REPORT REVIEW