Background Report Reference

AP-42 Section Number: 10.6.1

Background Report Section: 4

Reference Number: 26

Title: Letter and Attachment from M. Wood and L. Kessari, USEPA, Washington, DC Calibration Drift Results for September 16, 1994 test on CO and Opacity Monitoring Systems on RTO Stack Pacific-Corp., OSB Plant, Chilco, Idaho, October 28, 1994

Louisiana-Pacific Corporation

4-26)

Route 8, Box 8263
Hayward, Wisconsin 54843
715/634-3332
FAX: 715/634-5117

October 28, 1994

Mr. Michael F. Wood, Director
Mr. Laxmi Kesari
Multi Media Enforcement & Strategic
Planning Division U.S. EPA
Aerials Rios Boulevard
1200 Pennsylvania N. W., 7th Floor
Room 7120A
Washington D.C. 20004

RE: Clean Air Enforcement Action - United States v. Louisiana Pacific Corporation
No. CV 93-0869 (W.D. La.)

Subject: Continuous Monitoring Equipment Certification: L-P Chilco OSB CO and Opacity Drift Test Results.

Gentlemen:

Enclosed please find the calibration drift (CO) test results for the carbon monoxide (CO) and opacity continuous monitoring systems installed at the RTO exhaust stack at Louisiana Pacific's OSB plant in Chilco, Idaho. These are submitted in conjunction with the September 30, 1994 (request for an extension) letter from Elizabeth Smith, Director of Environmental Affairs - Louisiana Pacific Corporation, Portland, Oregon. Attach these test results to your copy of the AmTest Air Quality, Inc. Performance Specification Test (PST) Report dated September 29, 1994.

If you have any questions or need additional information please contact me.

Sincerely,

Robert W. Schultz

Robert W. Schultz
Environmental Engineer
Hayward, WI Engineering Office

cc w/encls: Mike Razzeto - Chilco Idaho
Mike Simon/Ron Hill, Division of Environmental Quality, Boise, ID
Liz Smith, Director of Environmental Affairs, Portland, OR

w/out encls: Julie Domike U.S. EPA, Office of Civil Enforcement, Washington, D.C.
U.S. EPA, Region 10, Seattle, WA
Jim Evensen - Hayden Lake
Keith Seelig - Hayward
Bert Krages - Portland
Norm Radford Jr. - Vinson & Elkins, Dallas, TX

AMTEST
AIR QUALITY, INC.

AmTest-Air Quality, Inc.
30545 S.E. 84th St., #5
Preston, WA 98050
Office: (206) 222-7746
FAX: (206) 222-7849

October 26, 1994

Mr. Bob Schultz
Louisiana-Pacific Corporation
Route 8, Box 8263
Hayward, WI 54843

Dear Bob:

Please find enclosed the calibration drift (CD) test results which are part of the performance specification test (PST) performed for the carbon monoxide (CO) continuous emission monitoring system (CEMS) installed at the RTO exhaust stack at Louisiana Pacific's facility in Chilco, Idaho.

Performance Specification 4, Section 2.2, states that the calibration drift of the CO analyzer must not drift or deviate from the reference value by more than 5% of the span value for 6 out of 7 days. The maximum zero drift for the CO analyzer was 0.56% of span. The maximum calibration drift for the CO analyzer was 2.0% of span.

Four (4) copies of a complete data packet with a computer printout of results, example calculations and back-up CEMS data is enclosed. Copies of this information should be forwarded to the appropriate parties.

Please don't hesitate to call our office if you have any questions or require additional information.

Sincerely,
Am Test-Air Quality, Inc.

Angela Blaisdell

Angela F. Blaisdell
Sr. Technical Writer

AFB/amb
Enclosure

[amb\c:\w\r\lpcdltr]

AMTEST
AIR QUALITY, INC.

24-HOUR ZERO AND CALIBRATION DRIFT TEST
AM TEST - AIR QUALITY, INC.

FILE NAME:	R316\LPCOCD
CLIENT:	Louisiana-Pacific
LOCATION:	Chilco, Idaho
MONITOR LOCATION:	RTO Exhaust Stack
MONITOR MANUFACTURER:	Thermol Environmental Model 48
TYPE OF MONITOR:	Carbon Monoxide Analyzer
INSTRUMENT SPAN:	50 ppm CO

ZERO (LOW LEVEL) DRIFT (ppm CARBON MONOXIDE)

DATE	TIME	CAL. TANK VALUE ppm	MONITOR READING ppm	ABSOLUTE DIFFERENCE ppm	PERCENT OF SPAN
8/23/94	06:09		0.09		
8/24/94	06:09	0.00	0.14	0.14	0.28
8/25/94	06:09	0.00	0.28	0.28	0.56
8/26/94	06:09	0.00	0.05	0.05	0.10
8/27/94	06:09	0.00	-0.13	0.13	0.26
8/28/94	06:09	0.00	0.10	0.10	0.20
8/29/94	06:09	0.00	-0.10	0.10	0.20
8/30/94	06:09	0.00	-0.06	0.06	0.12

SPAN (HIGH LEVEL) DRIFT (ppm CARBON MONOXIDE)

DATE	TIME	CAL. TANK VALUE ppm	MONITOR READING ppm	ABSOLUTE DIFFERENCE ppm	PERCENT OF SPAN
8/23/94	06:09		46.15		
8/24/94	06:09	46.00	46.23	0.23	0.46
8/25/94	06:09	46.00	47.00	1.00	2.00
8/26/94	06:09	46.00	46.05	0.05	0.10
8/27/94	06:09	46.00	45.87	0.13	0.26
8/28/94	06:09	46.00	46.09	0.09	0.18
8/29/94	06:09	46.00	45.85	0.15	0.30
8/30/94	06:09	46.00	45.86	0.14	0.28

CRITERIA: Calibration should not drift from the calibration gas value by more than 5 percent of the span value for 6 out of 7 days (2.5 ppm).

24-HOUR ZERO AND CALIBRATION DRIFT
CONTINUOUS EMISSION MONITORING SYSTEM PERFORMANCE TEST

Client Louisiana-Pacific Location Chilco, ID

Monitor Manufacturer TECO Model No. 48

Type of Monitor (SO2, NOx, HC, etc.) CO

Unit of Measurement (%, ppm, wet or dry basis) ppm

Measurement Principle (NDIR, chemiluminescent, etc) NDIR

Span Value of the Instrument 50

ZERO DRIFT TEST

Day	Date	Time	Calibration Value	Monitor Value	Difference	Percent of Span Value
0	8/23	06:09	0.00	0.09	N/A	N/A
1	8/24			0.14	0.14	0.28
2	8/25			0.28	0.28	0.56
3	8/26			0.05	0.05	0.10
4	8/27			-0.13	0.13	0.26
5	8/28			0.10	0.10	0.20
6	8/29			-0.10	0.10	0.20
7	8/30	↓	↓	-0.11	0.11	0.12

CALIBRATION DRIFT TEST

Day	Date	Time	Calibration Value	Monitor Value	Difference	Percent of Span Value
0	8/23	06:09	46.00	46.15	N/A	N/A
1	8/24			46.23	0.23	0.46
2	8/25			47.00	1.00	2.00
3	8/26			46.05	0.05	0.10
4	8/27			45.87	0.13	0.26
5	8/28			46.09	0.09	0.18
6	8/29			45.85	0.15	0.30
7	8/30	↓	↓	45.86	0.14	0.28

AMTEST
AIR QUALITY, INC

EXAMPLE CALCULATION OF ZERO AND CALIBRATION DRIFT

Client: Louisiana - Pacific

Location: Chiloo, Idaho

Site Location: RTO Exhaust Stack

Analyzer Type: carbon monoxide

Percent of Span Value - Zero Drift

Day: 4 Date: 8/26/94

|Monitor Value - Calibration Value| = |Absolute Difference|

|0.05 - 0.0| = |0.05|

$$\frac{|\text{Absolute Difference}|}{\text{Span Value}} * 100\% = \text{Percent of Span Value}$$

$$\frac{|0.05|}{50} * 100\% = 0.1\ \%$$

Percent of Span Value - Calibration Drift

Day: 4 Date: 8/26/94

|Monitor Value - Calibration Value| = |Absolute Difference|

|46.05 - 46.0| = |0.05|

$$\frac{|\text{Absolute Difference}|}{\text{Span Value}} * 100\% = \text{Percent of Span Value}$$

$$\frac{|0.05|}{50} * 100\% = 0.1\ \%$$

RTO Stack NORMAL CALIBRATION REPORT
LOUISIANA PACIFIC
06:09:01 08-23-1994

SAMPLE	CAL GAS CONCENTRATION	READING	ADJUSTED READING	PERCENT DRIFT	PERCENT FULL SCALE
CO Zero	0.00	0.29	0.09	0.19	0.59
CO Span	46.00	48.35	46.15	0.30	96.70

RTO Stack NORMAL CALIBRATION REPORT
LOUISIANA PACIFIC
06:09:01 08-24-1994

SAMPLE	CAL GAS CONCENTRATION	READING	ADJUSTED READING	PERCENT DRIFT	PERCENT FULL SCALE
CO Zero	0.00	0.44	0.14	0.28	0.88
CO Span	46.00	48.60	46.23	0.47	97.19

RTO Stack NORMAL CALIBRATION REPORT
LOUISIANA PACIFIC
06:09:01 08-25-1994

SAMPLE	CAL GAS CONCENTRATION	READING	ADJUSTED READING	PERCENT DRIFT	PERCENT FULL SCALE
CO Zero	0.00	0.73	0.28	0.56	1.46
CO Span	46.00	49.65	47.00	2.01	99.29

RTO Stack NORMAL CALIBRATION REPORT
LOUISIANA PACIFIC
06:09:01 08-26-1994

SAMPLE	CAL GAS CONCENTRATION	READING	ADJUSTED READING	PERCENT DRIFT	PERCENT FULL SCALE
CO Zero	0.00	0.78	0.05	0.09	1.56
CO Span	46.00	49.69	46.05	0.09	99.39

RTO Stack NORMAL CALIBRATION REPORT
LOUISIANA PACIFIC
06:09:01 08-27-1994

SAMPLE	CAL GAS CONCENTRATION	READING	ADJUSTED READING	PERCENT DRIFT	PERCENT FULL SCALE
CO Zero	0.00	0.65	-0.13	-0.25	1.29
CO Span	46.00	49.56	45.87	-0.25	99.12

RTO Stack NORMAL CALIBRATION REPORT
LOUISIANA PACIFIC
06:09:00 08-28-1994

SAMPLE	CAL GAS CONCENTRATION	READING	ADJUSTED READING	PERCENT DRIFT	PERCENT FULL SCALE
CO Zero	0.00	0.76	0.10	0.21	1.51
CO Span	46.00	49.66	46.09	0.18	99.32

RTO Stack NORMAL CALIBRATION REPORT
LOUISIANA PACIFIC
06:09:01 08-29-1994

SAMPLE	CAL GAS CONCENTRATION	READING	ADJUSTED READING	PERCENT DRIFT	PERCENT FULL SCALE
CO Zero	0.00	0.65	-0.10	-0.21	1.29
CO Span	46.00	49.50	45.85	-0.30	99.00

RTO Stack NORMAL CALIBRATION REPORT
LOUISIANA PACIFIC
06:09:00 08-30-1994

SAMPLE	CAL GAS CONCENTRATION	READING	ADJUSTED READING	PERCENT DRIFT	PERCENT FULL SCALE
CO Zero	0.00	0.59	-0.06	-0.11	1.17
CO Span	46.00	49.35	45.86	-0.28	98.71

USI MODEL 500C ZERO & CALIBRATION DRIFT

10-25-94

PERSON CONDUCTING TEST BOB SCHULTZ
AFFILIATION LOUISIANA-PACIFIC CORP./ENG.
TEST DATES 10-8-94 THROUGH 10-15-94
MONITOR PATHLENGTH - L1 _____
ANALYZER MANUFACTURER UNITED SCIENCES, INC.
SERIAL NUMBER 0993724
LOCATION LOUISIANA-PACIFIC CORP. - CHILCO, ID - RTO STACK
EMISSION OUTLET PATHLENGTH - L2 _____
MONITORING SYSTEM OUTPUT PATHLENGTH CORRECTED: YES _____ NO XX
UPSCALE CALIBRATION VALUE: ACTUAL OPTICAL DENSITY (OPACITY) - _____ (45.94%)
PATH ADJUSTED OPTICAL DENSITY (OPACITY) - _____ (45.94%)

	PERCENT OPACITY															
	DATE	TIME		ZERO READING 1.		ZERO DRIFT	ZERO ADJ	UPSCALE CALIBRATION READING		UPSCALE DRIFT 3.	CALIBRATION DRIFT 2.	SPAN ADJ	LENS CLEANED	ALIGNMENT CHECK	ALIGNMENT ADJ	ACCUM. DIRT COMP IN % OPACITY
		BEGIN	END	INITIAL A	FINAL B	C = B - A		INITIAL D	FINAL E	F = E - D	G = F - C					
T0	10-8	0834	0900	- -	(-2.15) -3.70	- -	NO	- -	45.94	- -	- -	NO	NO	NO	NO	-3.70
T1	10-9	0834	0900	(-2.15) -3.70	(-2.03) -3.59	+0.11	NO	45.71	45.94	-0.24	-0.24	NO	NO	NO	NO	-3.59
T2	10-10	0834	0900	(-2.03) -3.59	(-1.78) -3.35	+0.24	NO	45.87	45.94	-0.07	-0.07	NO	NO	NO	NO	-3.35
T3	10-11	0834	0900	(-1.78) -3.35	(-1.21) -3.38	-0.03	NO	45.79	45.94	-0.16	-0.16	NO	NO	NO	NO	-3.38
T4	10-12	0834	0900	(-1.21) -3.38	(-1.90) -3.46	-0.08	NO	45.76	45.94	-0.18	-0.18	NO	NO	NO	NO	-3.46
T5	10-13	0834	0900	(-1.90) -3.46	(-1.83) -3.39	+0.07	NO	45.62	45.94	-0.32	-0.32	NO	NO	NO	NO	-3.39
T6	10-14	0834	0900	(-1.83) -3.39	(-1.81) -3.38	+0.01	NO	45.83	45.94	-0.11	-0.11	NO	NO	NO	NO	-3.38
T7	10-15	0834	0900	(-1.81) -3.38	(-1.90) -3.46	-0.08	NO	45.92	45.94	-0.02	-0.02	NO	NO	NO	NO	-3.46
	ARITHMETIC MEAN					+0.034					-0.157					
	CONFIDENCE INTERVAL					0.066					0.373					
	ZERO DRIFT					0.100	CALIBRATION DRIFT				0.530					

1. Accumulated dirt compensation recorded as final zero reading. Output device indication in parenthesis.
2. Zero was adjusted automatically prior to upscale check, therefore C = 0.
3. Span drift = ADJ RDG - CAL STD per Graseby-STI.

10-25-94
R. Schultz
1 of 4

CONTINUOUS EMISSION MONITORING SYSTEM (CEMS)
RELATIVE ACCURACY TEST AUDIT (RATA)

LOUISIANA-PACIFIC CORP. Location CHILCO, ID RTO STACK

Monitor Manufacturer UNITED SCIENCES, INC Model No. 500C

Type of Monitor (SO_2, NO_x, HC, etc.) OPACITY

Unit of Measurement (%, ppm, wet or dry basis) %

Emission Standard (provide units) 20%

Measurement Principle (NDIR, chemiluminescent, etc.) _____

Monitor System Type (extractive, in-situ) _____

Range of Instrument _____ Span Gas Concentration _____

RELATIVE ACCURACY TEST ZERO DRIFT

Test No.	Date	Time	~~Reference Method~~ INITIAL Value	~~CEMS~~ FINAL Value	Difference X_i	Difference X_i^2
1	10-08	0834-0900	—	-3.70	--	--
2	10-09		-3.70	-3.59	+0.11	0.0121
3	10-10		-3.54	-3.35	+0.24	0.0576
4	10-11		-3.35	-3.38	-0.03	0.0009
5	10-12		-3.38	-3.46	-0.08	0.0064
6	10-13		-3.46	-3.39	+0.07	0.0049
7	10-14		-3.39	-3.38	+0.01	0.0001
8	10-15	↓	-3.38	-3.46	-0.08	0.0064
9						
10						
11						
12						
Mean			[a]		[b] ±0.034	
Sum of the Differences						[c] 0.0884
(Sum of the Differences)^2					[d] 0.0576	

EXAMPLE CALCULATION OF
CONFIDENCE INTERVAL AND RELATIVE ACCURACY
CONTINUOUS EMISSION MONITORING SYSTEM PERFORMANCE EVALUATION

LOUISIANA-PACIFIC CORP Location CHILCO, ID RTO STACK

Date 10-08 thru 10-15-94 Monitor I.D. VSI 500C OPACITY

Confidence Interval = CI ZERO DRIFT

$t_{.975}$ = 2.447

n = 7

Xi = difference

$$\text{Confidence Interval} = \frac{t_{.975}}{n\sqrt{n-1}} * \sqrt{n * (\sum_c X_i^2) - (\sum_d X_i)^2}$$

$$= \frac{2.447}{7\sqrt{7-1}} * \sqrt{7 * (0.0884) - (0.0576)} = 0.0663$$

$$\text{Accuracy (\% basis)} = \frac{|\text{Mean of the Differences}|^b + CI}{\text{Mean of Reference Method Values}^a} * 100\%$$

$$= \frac{|\quad\quad| + \quad\quad}{\quad\quad} * 100\% = \quad\quad\%$$

✓

$$\text{Accuracy (conc. basis)} = |\text{Mean of the Differences}|^b + CI$$

$$= |0.034| + 0.066 = 0.10$$

CONTINUOUS EMISSION MONITORING SYSTEM (CEMS)
RELATIVE ACCURACY TEST AUDIT (RATA)

LOUISIANA-PACIFIC CORP Location CHILCO, 10 RTO STACK

Monitor Manufacturer USI Model No. 500C

Type of Monitor (SO_2, NO_x, HC, etc.) OPACITY

Unit of Measurement (%, ppm, wet or dry basis) %

Emission Standard (provide units) 20%

Measurement Principle (NDIR, chemiluminescent, etc.) _____

Monitor System Type (extractive, in-situ) _____

Range of Instrument _____ Span Gas Concentration _____

RELATIVE ACCURACY TEST SPAN DRIFT

Test No.	Date	Time	~~Reference Method~~ ADJ Value	CAL STD ~~CEMS~~ Value	Difference X_i	Difference X_i^2
1	10-08	0834-0900	—	45.94	—	—
2	10-09	↓	45.71	↓	-0.24	0.0576
3	10-10		45.87		-0.07	0.0049
4	10-11		45.79		-0.16	0.0256
5	10-12		45.76		-0.18	0.0324
6	10-13		45.62		-0.32	0.1024
7	10-14		45.83		-0.11	0.0121
8	10-15	↓	45.92	↓	-0.02	0.004
9						
10						
11						
12						
Mean			a		b -0.157	
Sum of the Differences						c 0.2354
(Sum of the Differences)^2					d 1.21	

EXAMPLE CALCULATION OF
CONFIDENCE INTERVAL AND RELATIVE ACCURACY
CONTINUOUS EMISSION MONITORING SYSTEM PERFORMANCE EVALUATION

LOUSIANA-PACIFIC CORP. Location CHILCO, ID RTO STACK

Date 10-08 thru 10-15-94 Monitor I.D. USI 500C OPACITY

Confidence Interval = CI SPAN DRIFT

$t_{.975}$ = 2.447

n = 7

Xi = difference

$$\text{Confidence Interval} = \frac{t_{.975}}{n\sqrt{n-1}} * \sqrt{n * (\sum X_i^2)_c - (\sum X_i)_d^2}$$

$$= \frac{2.447}{7\sqrt{7-1}} * \sqrt{7 * (0.2354) - (1.21)} = 0.373$$

$$\text{Accuracy (\% basis)} = \frac{|\text{Mean of the Differences}|_b + CI}{\text{Mean of Reference Method Values}_a} * 100\%$$

$$= \frac{|\quad\quad| + \quad\quad}{\quad\quad} * 100\% = \quad\quad \%$$

$$\text{Accuracy (conc. basis)} = |\text{Mean of the Differences}|_b + CI$$

$$= |0.157| + 0.373 = 0.530$$

RTO Stack Normal Opacity Calibration Report
LOUISIANA PACIFIC
09:00:00 10-06-1994

SAMPLE	CALIBRATION STANDARD	READING	ADJUSTED READING	PERCENT DRIFT	PERCENT TRANSMISSION
Zero	0.00	-2.15	0.00	0.00	104.35
Span	45.94	44.49	45.66	-0.28	30.81

Dirt Drift % -3.70

Stack Taper Ratio (Exit/Monitoring) 1.00

Manually CALIBRATED BEFORE THIS CALIBRATION

RTO Stack Normal Opacity Calibration Report
LOUISIANA PACIFIC
09:00:00 10-09-1994

SAMPLE	CALIBRATION STANDARD	READING	ADJUSTED READING	PERCENT DRIFT	PERCENT TRANSMISSION
Zero	0.00	-3.03	-0.00	-0.00	104.10
Span	45.94	44.80	46.71	-0.24	30.69

Dirt Drift x -3.59

Stack Taper Ratio (Exit/Monitoring) 1.00

RTO Stack Normal Opacity Calibration Report
LOUISIANA PACIFIC
09:00:00 10-10-1994

SAMPLE	CALIBRATION STANDARD	READING	ADJUSTED READING	PERCENT DRIFT	PERCENT TRANSMISSION
Zero	0.00	-1.78	-0.00	-0.00	103.59
Span	45.94	44.91	45.87	-0.07	30.35

Dirt Drift % -3.35

Stack Taper Ratio (Exit/Monitoring) 1.00

RTO Stack Normal Opacity Calibration Report
LOUISIANA PACIFIC
09:00:00 10-11-1994

SAMPLE	CALIBRATION STANDARD	READING	ADJUSTED READING	PERCENT DRIFT	PERCENT TRANSMISSION
Zero	0.00	-1.81	0.00	0.00	103.66
Span	45.94	44.80	46.79	-0.16	30.47

Dirt Drift % -3.38

Stack Taper Ratio (Exit/Monitoring) 1.00

RTO Stack Normal Opacity Calibration Report
LOUISIANA PACIFIC .
09:00:00 10-12-1994

SAMPLE	CALIBRATION STANDARD	READING	ADJUSTED READING	PERCENT DRIFT	PERCENT TRANSMISSION
Zero	0.00	-1.90	-0.00	-0.00	103.83
Span	45.94	44.74	45.76	-0.18	30.54

Dirt Drift % -3.46

Stack Taper Ratio (Exit/Monitoring) 1.00

RTG Stack Normal Opacity Calibration Report
LOUISIANA PACIFIC
09:00:00 10-13-1994

SAMPLE	CALIBRATION STANDARD	READING	ADJUSTED READING	PERCENT DRIFT	PERCENT TRANSMISSION
Zero	0.00	-1.83	0.00	0.00	103.69
Span	45.94	44.62	45.62	-0.32	30.66

Dirt Drift % -3.39

Stack Taper Ratio (Exit/Monitoring: 1.00

RTO Stack Normal Opacity Calibration Report
LOUISIANA PACIFIC
09:00:00 10-14-1994

SAMPLE	CALIBRATION STANDARD	READING	ADJUSTED READING	PERCENT DRIFT	PERCENT TRANSMISSION
Zero	0.00	-1.81	0.00	0.00	103.66
Span	45.94	44.85	45.83	-0.11	30.42

Dirt Drift % -3.38

Stack Taper Ratio (Exit/Monitoring) 1.00

RTO Stack Normal Opacity Calibration Report
LOUISIANA PACIFIC
09:00:01 10-15-1994

SAMPLE	CALIBRATION STANDARD	READING	ADJUSTED READING	PERCENT DRIFT	PERCENT TRANSMISSION
Zero	0.00	-1.90	-0.00	-0.00	103.83
Span	45.94	44.39	45.92	-0.02	30.37

Dirt Drift % -2.46

Stack Taper Ratio (Exit/Monitoring) 1.00