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RESULTS OF THE AUGUST 4-6, 2020 AIR EMISSION COMPLIANCE TESTING AT THE LOUISIANA PACIFIC SIDING PLANT IN NEWBERRY, MICHIGAN

Submitted to:

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Report Number 20-38627
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SF/sef

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ABBREVIATIONS

ACFM	actual cubic feet per minute
cc (ml)	cubic centimeter (milliliter)
DSCFM	dry standard cubic foot of dry gas per minute
DSML	dry standard milliliter
DEG-F (°F)	degrees Fahrenheit
DIA.	Diameter
FT/SEC	feet per second
g	gram
GPM	gallons per minute
GR/ACF	grains per actual cubic foot
GR/DSCF	grains per dry standard cubic foot
g/dscm	grams per dry standard meter
HP	horsepower
HRS	hours
IN.	inches
IN.HG.	inches of mercury
IN.WC.	inches of water
LB	pound
LB/DSCF	pounds per dry standard cubic foot
LB/HR	pounds per hour
LB/106BTU	pounds per million British Thermal Units heat input
LB/MMBTU	pounds per million British Thermal Units heat input
MW	megawatt
mg/dscm	milligrams per dry standard cubic meter
ug/dscm	micrograms per dry standard cubic meter
microns (um)	micrometer
MIN.	minutes
ng	nanograms
PM	particulate matter
PPH	pounds per hour
PPM	parts per million
ppmC	parts per million carbon
ppm,d	parts per million, dry
ppm,w	parts per million, wet
ppt	parts per trillion
PSI	pounds per square inch
SQ.FT.	square feet
TPD	tons per day
ug	micrograms
v/v	percent by volume
w/w	percent by weight

Standard conditions are defined as 68 °F (20 °C) and 29.92 IN. of mercury pressure

1 INTRODUCTION

On August 4-6, 2020 Interpoll Laboratories personnel conducted Air Emission compliance testing on the Dryer RTO and the East/West Press Vents at the Louisiana Pacific Corporation (LP) OSB Plant located in Newberry, Michigan. On-site testing was performed by Trent Johnson, Jim Thoma, Chris Warneke, Josh Kircher and Ed Juers. Coordination between testing activities and plant operation was provided by Nick Waddell of Louisiana Pacific Corp. The tests were witnessed by members of the State of Michigan Department of Environment, Great Lakes, and Energy.

Particulate evaluations were performed in accordance with EPA Methods 1-5, CFR Title 40, Part 60, and Appendix A (revised July 1, 2020). A preliminary determination of the gas linear velocity profile was made at each test location before the first particulate determination to allow selection of the appropriate nozzle diameter for isokinetic sample withdrawal. An Interpoll Labs sampling train, which meets or exceeds specifications in the above-cited reference was used to isokinetically extract particulate samples by means of a heated glass-lined probe. Wet catch samples were collected in the back half of the Method 5 sampling train and analyzed in accordance with EPA Method 202.

Oxygen, carbon dioxide, oxides of nitrogen, carbon monoxide and total hydrocarbon concentrations were determined in accordance with Methods 3A, 7E, 10 and 25A (Ibid). A slipstream of sample gas was withdrawn from the exhaust gas stream using a heated stainless steel probe equipped with a filter to remove interfering particulate material. The particulate-free gas was transported to the analyzers by means of a heat-traced probe and filter assembly. After passing through the filter, the gas passed through a chilled condenser-type moisture removal system. The particulate-free dry gas was then transported to the analyzers with the excess exhausted to the atmosphere through a calibrated orifice, which was used to ensure that the flow from the stack exceeds the requirements of the analyzers. For the sampling on the press vents, a 24 point traverse was used.

Total gaseous hydrocarbon concentrations were determined instrumentally using a VIG Model 20/2 heated flame ionization detector (HFID) calibrated against propane in air standards. The THC concentration was continuously monitored by extracting a slipstream of exhaust gas by means of a heated probe and filter holder. A heat-traced Teflon line was used to transport the sample gas from the filter holder outlet to the analyzer inlet.

The analog response of each analyzer was recorded with a computer datalogger. The O_2, CO_2, NOx, CO and VOC analyzers were calibrated with EPA Protocol 1 standard gases. The instrument was calibrated before and after each run.

MDI concentrations were determined in accordance with EPA Method 207. This method employs collection of MDI with 1,2-PP in toluene reagent, with analysis by HPLC.

Both Formaldehyde and Acetaldehyde were sampled using EPA Method 320 (FTIR). The on-line gas analysis was performed using a MKS MultiGas 2030 FTIR based analyzer. The MKS MultiGas 2030 FTIR has a fixed gas cell path length of 5.11 Meters and the detector was cooled by the use of liquid nitrogen. The gas was transported to the FTIR analyzer through a heat traced Teflon line originating from the manifold system described above. Three one-hour runs were conducted for each test condition. A leak-check was performed prior to and following the test on the sampling the system and was found to be acceptable. The Method 320 Data is contained in Appendix K. A dynamic spike (pre-test/post-test) was performed according to the guidelines spelled out in EPA Method 320. This was done using a compressed gas cylinder with certified quantities of acetaldehyde and sulfur hexafluoride. This data can be found in Appendix L.

NCASI 98.01 was used to measure both Phenol (Press Vents) and Acrolein (RTO) concentrations. The stack gas sample was extracted using a heated glass probe and Teflon filter holder loaded with a glass fiber filter to remove any particulate material present. The sample collection system is composed of three midget impingers in series. Each of the three impingers is loaded with approximately 10ml of high purity water. The sampling rate was set at approximately 400 cc per minute. The volume sampled was recorded using a calibrated dry gas meter (DGM). One spike and one duplicate run were performed. During the spike test, one of the two systems was spiked with representative targeted analytes to determine compound capture efficiencies. Following the conclusion of sampling (typically 60 minutes), the impinger contents were recovered and labeled. All spike recoveries fell within the method requirements of 70-130%. All duplicate test runs also met the method criteria.

The results of the test are summarized in Section 2. Detailed results are presented in Section 3. Field data and all other supporting information are presented in the appendices.

2 SUMMARY AND DISCUSSION

The results of the compliance tests are summarized in the following tables. An overview of all results is presented in the table below:

Table 1: DRYER RTO OUTLET (Without Flue Gas Re-Circulation)

PARAMETER	*LIMIT*	*MEASURED*
CO (EPA Method 10) ..... Lbs/Hr.	23.98	8.26
NOx (EPA Method 7E) ..... Lbs/Hr.	14.8	3.14
VOC (EPA Method 25a) ..... TGNM Lbs C /Hr.	5.12	3.33
Acetaldehyde (EPA Method 320) ..... Lbs/Hr.	1.17	≤ 0.23
Formaldehyde (EPA Method 320) ..... Lbs/Hr.	1.11	0.880
Acrolein (NCASI 98.01) ..... Lbs/Hr.	0.195	< 0.067
Visible Emissions (EPA Method 9) ..... %	NA	0.00

Test 9 Summary of the Results of the August 6, 2020, Method 320 (VOC/HAP's) Emission Test on the Dryer RTO Outlet (Without flue gas re-circ) at the Louisiana Pacific facility located in Newberry, Michigan

Item				Run 1		Run 2		Run 3		Average
Date of test				08-06-20		08-06-20		08-06-20		
Time runs were done (ET)		(Hrs)		1300 / 1400		1440 / 1540		1610 / 1710		
Volumetric Flow										
	Actual	(ACFM)		78,437		80,258		80,710		79,802
	Standard	(SCFM)		57,842		59,440		59,774		59,019
	Standard	(DSCFM)		46,753		48,161		47,950		47,621
Gas Temperature		(°F)		239		236		236		237
Moisture Content		(%v/v)		19 17		18 98		19 78		19 31
Gas Composition		(%v/v, dry)								
	Carbon Dioxide			3.34		3.52		3.19		3 35
	Oxygen			17.58		17.90		17.64		17.71
	Nitrogen			79.08		78.58		79.17		78.94
Acetaldehyde										
	Concentration	(ppm, d)	≤	0.65	≤	0.72	≤	0.78	≤	0.72
	Concentration	(ppm, w)	≤	0.53	≤	0.58	≤	0.63	≤	0.58
	Emission Rate	(LB /HR)	≤	**0.21**	≤	**0.24**	≤	**0.26**	≤	**0.23**
Formaldehyde										
	Concentration	(ppm, d)		3.77		3.79		4.30		3.95
	Emission Rate	(LB /HR)		**0.824**		**0.852**		**0.964**		**0.880**

Results of NCASI 98.01 Determinations

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Louisiana Pacific

Newberry, MI

Test Number 9

RTO Outlet (Without flue gas re-circ)

		Run 1		Run 2		Run 3		Average
Date of Test		08-06-20		08-06-20		08-06-20		
Time of Runs								
Start	(Hrs)	1300		1440		1610		
End	(Hrs)	1400		1540		1712		
Total	(Min)	60		60		60		
Moisture Content	(%v/v)	19.2		19.0		19.8		
Volumetric Flow Rate	(DSCFM)	46,753		48,161		47,950		
			Spike/Duplicate		**Spike/Duplicate**		**Spike/Duplicate**	
Sample Volume	(DSL)	28.57	26.26	27.99	26.29	26.44	24.49	
Acrolein	(ppm,d)	< 0.16	0.30	< 0.15	0.30	< 0.17	0.44	< **0.16**
	(ppm,d of duplicate)		< 0.17		0.17		0.19	
	(LB/HR)	< 0.065		< 0.064		< 0.072		< **0.067**
	(Spike %)		**77.77**		**76.67**		**105.46**	
	(Duplicate %)		**3.39%**		**4.92%**		**3.91%**	

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Test 10 Summary of the August 6, 2020, Oxides of Nitrogen, Carbon Monoxide and VOC's Test on the RTO Outlet Stack (Without flue gas re-circ) at the LP facility located in Newberry, Michigan.

Item		Run 1	Run 2	Run 3	Average
Date of test		08-06-20	08-06-20	08-06-20	
Time runs were done	(Hrs)	1300 / 1400	1440 / 1540	1610 / 1712	
Volumetric Flow					
Actual	(ACFM)	78,437	80,258	80,710	79,802
Standard	(SCFM)	57,842	59,440	59,774	59,019
Standard	(DSCFM)	46,753	48,161	47,950	47,621
Gas Temperature	(°F)	239	236	236	237
Moisture Content	(%v/v)	19.17	18.98	19.78	19.31
Gas Composition	(%v/v, dry)				
Carbon Dioxide		3.34	3.52	3.19	3.35
Oxygen		17.58	17.90	17.64	17.70
Nitrogen		79.08	78.58	79.17	78.94
Results:					
Oxides of Nitrogen (EPA Method 7E)					
Concentration	(ppm , d)	9.40	9.20	9.05	9.22
Emission Rate	(LB /HR)	3.15	3.17	3.11	3.14
Carbon Monoxide (EPA Method 10)					
Concentration	(ppm , d)	38.70	36.00	44.67	39.79
Emission Rate	(LB /HR)	7.89	7.56	9.34	8.26
VOC (EPA Method 25a)					
Concentration	(TGNM ppm Propane, d)	14.03	13.31	10.09	12.48
Concentration	(TGNM ppm Carbon, d)	42.10	39.94	30.26	37.44
Emission Rate (Lb x/Hr)	(TGNM LB Carbon/HR)	3.68	3.60	2.72	3.33

TGNM = Total Gaseous Non-methane

Table 2: PRESS VENTS (EAST AND WEST)

PARAMETER	LIMIT	MEASURED		
		East	West	Total
PM/PM-10 (Measured using EPA Methods 5/202) ..... *Lbs/Hr.*	24.0	1.176	0.913	**2.089**
CO (EPA Method 10) ..... *Lbs/Hr.*	4.64	< 0.23	0.61	**≤ 0.84**
NOx (EPA Method 7E) ..... *Lbs/Hr.*	1.36	< 0.37	≤ 0.44	≤ 0.81
VOC (EPA Method 25a) ..... *Lbs.C./Hr.*	73.6	3.02	2.14	5.16
Formaldehyde (EPA Method 320) ..... *Lbs/Hr.*	4.1	≤ 0.704	≤ 0.877	≤ 1.58
Phenol (NCASI 98.01) ..... *Lbs/Hr.*	2.0	< 0.31	< 0.35	**< 0.66**
MDI (OTM-14) ..... *Lbs/Hr.*	0.53	≤ 0.030	≤ 0.025	**≤ 0.055**

No difficulties were encountered in the field by Interpoll Labs or in the laboratory evaluation of the samples, which were conducted by Interpoll Labs. It should be noted that some results are presented with either a "<" sign or a "≤" sign. Those results showing the "<" indicate that all analytical fractions, or instrumental readings, were Below the Detection Level (BDL). If a "≤" sign is shown, it indicates that at least one analytical fraction or instrumental reading used to calculate final results, was below the detection level, however, there are also analytical fractions or instrumental readings which do include detectable hits, or Detection Level Limited (DLL). On the basis of these facts and a complete review of the data and results, it is our opinion that the results reported herein are accurate and closely reflect the actual values, which existed at the time the test was performed.

Test 1 Summary of the Results of the August 4, 2020, Particulate Emission Compliance Test on the East Press Vent at the Louisiana Pacific Facility located in Newberry, MI.

Item			Run 1		Run 2	Run 3	Average
Date of test			08-04-20		08-04-20	08-04-20	
Time (Start/Finish)	(Hrs)		0940 / 1144		1240 / 1443	1548 / 1803	
Volumetric Flow							
Actual	(ACFM)		112,536		113,973	110,973	112,494
Standard	(SCFM)		104,138		105,357	102,101	103,865
Dry Standard	(DSCFM)		102,491		103,778	101,031	102,433
Gas Temperature	(°F)		96		96	99	97
Moisture Content	(%v/v)		1.58		1.50	1.05	1.38
Gas Composition	(%v/v, dry)						
∞ Carbon Dioxide		<	0.03	<	0.03	0.08	0.05
Oxygen			20.63		20.43	20.38	20.48
Nitrogen			79.34		79.54	79.54	79.48
Sample Volume	(dscf)		81.59		82.46	80.10	81.39
Isokinetic Variation	(%)		100.0		99.8	99.6	99.8
Particulate Results-EPA Methods 5 & 202 (Dry Impinger Technique)							
Front Half Dry Catch Only (Filterable only)							
Sample Mass (Nozzle, PW, Filter)	(g)		0.0037		0.0034	0.0037	
Concentration - Actual	(GR/ACF)		0.00064		0.00058	0.00065	0.00062
Concentration - Actual	(MG/ACM)		1.458		1.325	1.485	1.42259
Concentration - Standard	(GR/DSCF)		0.00070		0.00064	0.00071	0.00068
Emission Rate	(LB/HR)		0.615		0.566	0.617	0.599
Total Particulate (Dry + Organic + Inorganic)							
Sample Mass	(g)		0.007		0.0067	0.0075	
Concentration - Actual	(GR/ACF)		0.00121		0.00114	0.00132	0.001221
Concentration - Standard	(GR/DSCF)		0.00132		0.00125	0.00145	0.001341
Emission Rate	(LB/HR)		1.163		1.115	1.251	1.176

Test 2 Summary of the August 4, 2020, Oxides of Nitrogen, Carbon Monoxide and VOC Emission Test on the Press Vent Stack (East) at the Louisiana Pacific Facility located in Newberry, MI.

Item		Run 1	Run 2	Run 3	Average
Date of test		08-04-20	08-04-20	08-04-20	
Time runs were done	(Hrs)	0940 / 1043	1240 / 1343	1548 / 1651	
Volumetric Flow					
Actual	(ACFM)	112,536	113,973	110,973	112,494
Standard	(SCFM)	104,138	105,357	102,101	103,865
Standard	(DSCFM)	102,491	103,778	101,031	102,433
Gas Temperature	(°F)	96	96	99	97
Moisture Content	(%v/v)	1.58	1.50	1.05	1.38
Gas Composition	(%v/v, dry)				
Carbon Dioxide	<	0.03	< 0.03	0.08	0.05
Oxygen		20.63	20.43	20.38	20.48
Nitrogen		79.34	79.54	79.54	79.48
Results					
Nox					
Concentration - ppm, dry	(ppm, d) <	0.502	< 0.502	< 0.502	< 0.502
Emission Rate	(LB/HR) <	0.369	< 0.373	< 0.363	< 0.368
CO					
Concentration - ppm, dry	(ppm, d) <	0.536	< 0.504	< 0.540	< 0.526
Emission Rate	(LB/HR) <	0.24	< 0.21	< 0.24	< 0.228
VOC					
Concentration - ppm, dry	(ppm C, d)	21.44	14.37	11.44	15.750
Emission Rate	(LB C/HR)	4.11	2.79	2.16	3.017

(<) a minimum detection limit of 2.0% of span gas was used to calculate results for NOx and CO.

Results of NCASI 98.01 Determinations

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Louisiana Pacific
Newberry, MI

Test Number 3
East Press Stack

		Run 1		Run 2		Run 3		Average
Date of Test		08-04-20		08-04-20		08-04-20		
Time of Runs								
Start	(Hrs)	0940		1240		1548		
End	(Hrs)	1043		1343		1651		
Total	(Min)	60		60		60		
Moisture Content	(%v/v)	1.6		1.5		1.0		
Volumetric Flow Rate	(DSCFM)	102,491		103,778		101,030		
			Spike/Duplicate		**Spike/Duplicate**		**Spike/Duplicate**	
Sample Volume	(DSL)	29.87	23.07	29.83	28.66	30.22	28.47	
Phenol	(ppm,d)	< 0.20	1.44	< 0.21	1.12	< 0.21	1.16	**< 0.20**
	(ppm,d of duplicate)		< 0.31		< 0.22		< 0.21	
	(LB/HR)	< 0.30		< 0.32		< 0.31		**< 0.31**
	(Spike %)		**105.65**		**102.32**		**104.72**	**104.2%**
	(Duplicate %)		**23.15%**		**3.03%**		**0.05%**	**8.74%**

Test 3 Summary of the Results of the August 4, 2020, Method 320 (Formaldehyde) Emission Test on the East Press Stack at the Louisiana Pacific facility located in Newberry, Michigan.

Item				Run 1		Run 2		Run 3		Average
Date of test				08-04-20		08-04-20		08-04-20		
Time runs were done (ET)		(Hrs)		0940 / 1043		1240 / 1343		1548 / 1651		
Volumetric Flow										
	Actual	(ACFM)		112,536		113,973		110,973		112,494
	Standard	(SCFM)		104,138		105,357		102,101		103,865
	Standard	(DSCFM)		102,491		103,778		101,031		102,433
Gas Temperature		(°F)		96		96		99		97
Moisture Content		(%v/v)		2.03		1.66		1.05		1.58
Gas Composition		(%v/v, dry)								
	Carbon Dioxide		<	0.03	<	0.03		0.08		0.05
	Oxygen			20.63		20.43		20.38		20.48
	Nitrogen			79.34		79.54		79.54		79.47
Formaldehyde		(Detection Limit ppm)		0.13		0.13		0.13		
	Concentration	(ppm, d)	≤	1.17	≤	2.02	≤	1.21	≤	1.47
	Emission Rate	(LB /HR)	≤	**0.562**	≤	**0.980**	≤	**0.570**	≤	**0.704**

Test 4 Summary of the August 5, 2020 MDI Emission Compliance Test on the Press Vent Stack (East) at the Louisiana Pacific facility in Newberry, MI.

Item			Run 1		Run 2		Run 3		Average
Date of test			08-05-20		08-05-20		08-05-20		
Time runs were done	(Hrs)		0850 / 1008		1110 / 1213		1305 / 1408		
Volumetric Flow									
Actual	(ACFM)		109,667		109,452		114,246		111,122
Standard	(DSCFM)		100,729		99,064		103,510		101,101
Gas Temperature	(°F)		81		80		81		81
Moisture Content	(%v/v)		1.23		1.24		0.84		1.11
Gas Composition	(%v/v, dry)								
Carbon Dioxide			0.03		0.03		0.03		0.03
Oxygen			20.90		20.90		20.90		20.90
Nitrogen			79.07		79.07		79.07		79.07
Isokinetic Variation	(%)		99.9		99.7		99.5		99.7
MDI Results									
Sample Volume	(DSCF)		40.06		39.31		40.99		40.12
Total Micrograms in Sample	(ug)	≤	70.36	≤	79.36	≤	120.36	≤	90.03
Concentration	(gr/dscf)	≤	0.0000271	≤	0.0000311	≤	0.0000453	≤	0.0000345
Concentration	(ppm,d)	≤	0.00596	≤	0.00685	≤	0.00996	≤	0.00759
Emission Rate	(LB/HR)	≤	0.0234	≤	0.0264	≤	0.04019	≤	0.0300
Emission Rate	(g/sec)	≤	0.002948	≤	0.003332	≤	0.005064	≤	0.003781

Test 5 Summary of the Results of the August 4, 2020, Particulate Emission Compliance Test on the West Press Stack at the LP Corporation Facility Located in Newberry, Michigan.

Item		Run 1	Run 2	Run 3	Average
Date of test		08-04-20	08-04-20	08-04-20	
Time (Start/Finish)	(Hrs)	0940 / 1145	1240 / 1243	1548 / 1800	
Volumetric Flow					
Actual	(ACFM)	102,987	102,949	105,391	103,776
Standard	(SCFM)	95,246	95,404	99,054	96,568
Dry Standard	(DSCFM)	93,844	94,032	97,568	95,148
Gas Temperature	(°F)	97	96	88	94
Moisture Content	(%v/v)	1.47	1.44	1.50	1.47
Gas Composition	(%v/v, dry)				
Carbon Dioxide		0.05	0.03	0.06	0.05
Oxygen		20.85	20.89	20.90	20.88
Nitrogen		79.10	79.08	79.04	79.07
Sample Volume	(dscf)	79.86	80.46	83.58	81.30
Isokinetic Variation	(%)	99.4	99.9	100.0	99.8
Particulate Results-EPA Methods 5 & 202 (Dry Impinger Technique)					
Front Half Dry Catch Only (Filterable only)					
Sample Mass (Nozzle, PW, Filter)	(g)	0.0033	0.0025	0.0031	
Concentration - Actual	(GR/ACF)	0.00058	0.00044	0.00053	0.00052
Concentration - Actual	(MG/ACM)	1.330	1.002	1.213	1.18155
Concentration - Standard	(GR/DSCF)	0.00064	0.00048	0.00057	0.00056
Emission Rate	(LB/HR)	0.513	0.386	0.478	0.459
Total Particulate (Dry + Organic + Inorganic)					
Sample Mass	(g)	0.0056	0.0054	0.0067	
Concentration - Actual	(GR/ACF)	0.00099	0.00095	0.00115	0.001026
Concentration - Standard	(GR/DSCF)	0.00108	0.00104	0.00124	0.001118
Emission Rate	(LB/HR)	0.870	0.835	1.034	0.913

Test 6 Summary of the Results of the August 4, 2020, Oxides of Nitrogen, Carbon Monoxide and VOC's Test on the West Press Stack at the Louisiana Pacific facility located in Newberry, MI.

Item		Run 1	Run 2	Run 3	Average
Date of test		08-04-20	08-04-20	08-04-20	
Time runs were done	(Hrs)	0940 / 0944	1240 / 1343	1548 / 1651	
Volumetric Flow					
Actual	(ACFM)	102,987	102,949	105,391	103,776
Standard	(SCFM)	95,246	95,404	99,054	96,568
Standard	(DSCFM)	93,844	94,032	97,568	95,148
Gas Temperature	(°F)	97	96	88	94
Moisture Content	(%v/v)	1 47	1.44	1.50	1.47
Gas Composition	(%v/v, dry)				
Carbon Dioxide		0.05	0.03	0.06	0.05
Oxygen		20.85	20.89	20.90	20.88
Nitrogen		79.10	79.08	79.04	79.07
Results:					
Oxides of Nitrogen (EPA Method 7E)					
Concentration	(ppm , d) <	0.50	< 0.50	0.92	≤ 0.64
Emission Rate	(LB /HR) <	0.33	< 0.33	0.65	≤ 0.44
Carbon Monoxide (EPA Method 10)					
Concentration	(ppm , d)	1.35	1.12	1.90	1.46
Emission Rate	(LB /HR)	0.55	0.46	0.81	0.61
VOC (EPA Method 25a)					
Concentration	(ppm Propane, d)	4 53	3.37	4.10	4.00
Concentration	(ppm Carbon, d)	13.59	10.10	12.31	12.00
Emission Rate (Lb x/Hr)	(LB Carbon/HR)	2.39	1.78	2.24	2.14
Emission Rate (Lb x/Hr)	(LB Propane/HR)	2 92	2 18	2.75	2.62

(<) a minimum detection limit of 2.0% of span gas was used to calculate results for NOx.

Test 7 Summary of the Results of the August 4, 2020, Method 320 (HAP's) Emission Test on the West Press Stack at the Louisiana Pacific facility located in Newberry, MI.

Item			Run 1		Run 2	Run 3		Average
Date of test			08-04-20		08-04-20	08-04-20		
Time runs were done (ET)		(Hrs)	0940 / 1044		1240 / 1343	1548 / 1651		
Volumetric Flow								
	Actual	(ACFM)	102,987		102,949	105,391		103,776
	Standard	(DSCFM)	93,844		94,034	97,568		95,149
Gas Temperature		(°F)	97		96	88		94
Moisture Content		(%v/v)	1 74		1.43	1.49		1 55
Gas Composition		(%v/v, dry)						
	Carbon Dioxide		0.05		0.03	0.06		0.05
	Oxygen		20.85		20.89	20.90		20.88
	Nitrogen		79.10		79.08	79.04		79.07
Formaldehyde								
	Concentration	(ppm, d)	2.62	≤	1.56	1.75	≤	1.98
	Emission Rate	(LB /HR)	1.148	≤	0.684	0.799	≤	0 877

Results of NCASI 98.01 Determinations

Interpoll Laboratories Report Number 20-38627
LP / Newberry
Newberry, MI

Test Number 7
West Press Stack

		Run 1		Run 2		Run 3		Average
Date of Test		08-04-20		08-04-20		08-04-20		
Time of Runs								
Start	(Hrs)	0940		1240		1548		
End	(Hrs)	1044		1343		1648		
Total	(Min)	60		60		60		
Moisture Content	(%v/v)	1 5		1.4		1.5		
Volumetric Flow Rate	(DSCFM)	93,844		94,032		97,568		
			Spike/Duplicate		**Spike/Duplicate**		**Spike/Duplicate**	
Sample Volume	(DSL)	25.39	24.41	25 39	24.41	25.75	24.79	
Phenol	(ppm,d)	< 0.27	1.35	< 0.25	1.31	< 0.24	1.40	< **0.25**
	(ppm,d of duplicate)		< 0.25		< 0 25		< 0 25	
	(LB/HR)	< 0.37		< 0.35		< 0.34		< **0.35**
	(Spike %)		**98.80**		**96.09**		**104.24**	**97.44**
	(Duplicate %)		**2.48%**		**0.32%**		**2.10%**	**1.40%**

Test 8 Summary of the August 5, 2020 MDI Emission Compliance Test on the West Press Stack at the Louisiana Pacific facility located in Newberry, MI.

Item		Run 1	Run 2	Run 3	Average
Date of test		08-05-20	08-05-20	08-05-20	
Time runs were done	(Hrs)	0850 / 1009	1110 / 1213	1305 / 1409	
Volumetric Flow					
Actual	(ACFM)	110,516	111,467	111,610	111,198
Standard	(SCFM)	101,482	100,173	100,808	100,821
Standard	(DSCFM)	100,831	98,422	99,614	99,623
Gas Temperature	(°F)	75	80	79	78
Moisture Content	(%v/v)	0.64	1.75	1.18	1.19
Gas Composition	(%v/v, dry)				
Carbon Dioxide		0.03	0.03	0.03	0.03
Oxygen		20.90	20.90	20.90	20.90
Nitrogen		79.07	79.07	79.07	79.07
Isokinetic Variation	(%)	98.9	101.1	99.8	99.9
MDI Results					
Sample Volume	(DSCF)	29.23	29.15	29.13	29.17
Total Micrograms in Sample	(ug)	≤ 55.4	≤ 52.4	≤ 60.4	≤ 56.0
Concentration	(gr/dscf)	≤ 0.0000292	≤ 0.0000277	≤ 0.0000320	≤ 0.0000296
Concentration	(ppm,d)	≤ 0.00643	≤ 0.00610	≤ 0.00703	≤ 0.00652
Emission Rate	(LB/HR)	≤ 0.02525	≤ 0.0234	≤ 0.02730	≤ 0.0253
Emission Rate	(g/sec)	≤ 0.003181	≤ 0.002946	≤ 0.003440	≤ 0.003189

3 *RESULTS*

The results of all field and laboratory evaluations are presented in this section. Gas composition and moisture is presented first followed by the computer printout of the particulate, and trace metals sampling data. Preliminary measurements including test port locations are given in the appendices.

The results have been calculated on a personal computer using programs written in using Microsoft Excel spreadsheets specifically for source testing calculations. EPA-published equations have been used as the basis of the calculation techniques in these programs. The emission rates have been calculated using the product of the concentration times flow method.

3.1 Results of Gas Composition and Moisture Determinations

Interpoll Laboratories Report Number 20-38627
Louisiana Pacific
Newberry, MI

Test Number 1
East Press Stack

Results of Gas Composition and Moisture Analyses --- Methods 3A and 4 (% v/v)

		Run 1	Run 2	Run 3
Date of Run		08-04-20	08-04-20	08-04-20
Dry basis				
Carbon Dioxide.....	(%)	0.03	0.03	0.08
Oxygen.....	(%)	20.63	20.43	20.38
Nitrogen.....	(%)	79.34	79.54	79.54
Wet basis				
Carbon Dioxide.....	(%)	0.03	0.03	0.08
Oxygen.....	(%)	20.30	20.12	20.16
Nitrogen.....	(%)	78.09	78.35	78.71
Water Vapor.....		1.58	1.50	1.05
Dry Molecular Weight.....	(g/gmole)	28.83	28.82	28.83
Wet Molecular Weight.....	(g/gmole)	28.66	28.66	28.71
Specific Gravity.....		0.990	0.990	0.992
Water Mass Flow.....	(lb/hr)	4620	4427	3002

Interpoll Laboratories Report Number 20-38627
Louisiana Pacific
Newberry, MI

Test Number 4
Press Vent Stack (East)

Results of Gas Composition and Moisture Analyses --- Methods 3A and 4 (% v/v)

		Run 1	Run 2	Run 3
Date of Run		08-05-20	08-05-20	08-05-20
Dry basis				
Carbon Dioxide.....	(%)	0.03	0.03	0.03
Oxygen.....	(%)	20.90	20.90	20.90
Nitrogen.....	(%)	79.07	79.07	79.07
Wet basis (Orsat)				
Carbon Dioxide.....	(%)	0.03	0.03	0.03
Oxygen.....	(%)	20.64	20.64	20.72
Nitrogen.....	(%)	78.10	78.09	78.40
Water Vapor.....		1.23	1.24	0.84
Dry Molecular Weight.....	(g/gmole)	28.84	28.84	28.84
Wet Molecular Weight.....	(g/gmole)	28.71	28.71	28.75
Specific Gravity.....		0.992	0.992	0.993
Water Mass Flow.....	(lb/hr)	3527	3499	2437

Interpoll Laboratories Report Number 20-38627
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Test Number 5
West Press Stack

Results of Gas Composition and Moisture Analyses --- Methods 3A and 4 (% v/v)

		Run 1	Run 2	Run 3
Date of Run		08-04-20	08-04-20	08-04-20
Dry basis				
Carbon Dioxide.....	(%)	0.05	0.03	0.06
Oxygen.....	(%)	20.85	20.89	20.90
Nitrogen.....	(%)	79.10	79.08	79.04
Wet basis				
Carbon Dioxide.....	(%)	0.05	0.03	0.06
Oxygen.....	(%)	20.54	20.59	20.59
Nitrogen.....	(%)	77.94	77.94	77.85
Water Vapor.....		1.47	1.44	1.50
Dry Molecular Weight.....	(g/gmole)	28.84	28.84	28.85
Wet Molecular Weight.....	(g/gmole)	28.68	28.68	28.68
Specific Gravity.....		0.991	0.991	0.991
Water Mass Flow.....	(lb/hr)	3933	3848	4168

Interpoll Laboratories Report Number 20-38627
LP / Newberry
Newberry, MI

Test Number 8
West Press Stack

Results of Gas Composition and Moisture Analyses --- Methods 3A and 4 (% v/v)

		Run 1	Run 2	Run 3
Date of Run		08-05-20	08-05-20	08-05-20
Dry basis				
Carbon Dioxide.....	(%)	0.03	0.03	0.03
Oxygen.....	(%)	20.90	20.90	20.90
Nitrogen.....	(%)	79.07	79.07	79.07
Wet basis (Orsat)				
Carbon Dioxide.....	(%)	0.03	0.03	0.03
Oxygen.....	(%)	20.77	20.53	20.65
Nitrogen.....	(%)	78.56	77.69	78.13
Water Vapor.....		0.64	1.75	1.18
Dry Molecular Weight.....	(g/gmole)	28.84	28.84	28.84
Wet Molecular Weight.....	(g/gmole)	28.77	28.65	28.71
Specific Gravity.....		0.994	0.990	0.992
Water Mass Flow.....	(lb/hr)	1825	4911	3347

3.2 Particulate Sampling Data

Interpoll Laboratories Report Number 20-38627
Louisiana Pacific
Newberry, MI

Test Numbe 1
East Press Stack

Results of EPA Method 5/202 Sampling Data

		Run 1	Run 2	Run 3
Date of Test		08-04-20	08-04-20	08-04-20
Time of Runs	(Hrs)	0940 / 1144	1240 / 1443	1548 / 1803
Static Pressur	(In. of WC)	-2.10	-2.10	-2.10
Cross Sectional Area	(Sq. ft)	26.27	26.27	26.27
Pitot Tube Coefficient		0.84	0.84	0.84
Avg. Sq. root of Delta p		1.219	1.234	1.200
Water in Sample Gas				
Impingers	(g)	1.5	2.1	-0.7
Desiccant	(g)	26.3	24.5	18.7
Total	(g)	27.8	26.6	18.0
Gas Meter Coefficient		0.9927	0.9927	0.9927
Barometric Pressure	(In. of Hg)	29.29	29.29	29.29
Avg. Orifice Pressure Drop	(In. of WC)	1.66	1.70	1.64
Avg. Gas Meter Temperature	(°F)	84.4	82.3	81.9
Volume Through Gas Meter				
Meter Conditions	(CF)	86.24	86.82	84.29
Standard Conditions	(DSCF)	81.59	82.46	80.10
Total Sampling Time	(Min.)	120.00	120.00	120.00
Nozzle Diameter	(In.)	0.179	0.179	0.179
Avg. Stack Gas Temperature	(°F)	96	96	99
Volumetric Flow Rate				
Actual	(ACFM)	112,536	113,973	110,973
Dry Standard	(DSCFM)	102,491	103,778	101,031
Isokinetic Variation	(%)	100.0	99.8	99.6

Interpoll Laboratories Report Number 20-38627
LP / Newberry
Newberry, MI

Test Numbe 5
West Press Stack

Results of EPA Method 5/202 Sampling Data

		Run 1	Run 2	Run 3
Date of Test		08-04-20	08-04-20	08-04-20
Time of Runs	(Hrs)	0940 / 1145	1240 / 1243	1548 / 1800
Static Pressur	(In. of WC)	-1.20	-1.20	-1.20
Cross Sectional Area	(Sq. ft)	26.27	26.27	26.27
Pitot Tube Coefficient		0.84	0.84	0.84
Avg. Sq. root of Delta p		1.115706741	1.116474664	1.151009052
Water in Sample Gas				
Impingers	(g)	9.3	0.9	3.0
Desiccant	(g)	16.0	24.0	24.0
Total	(g)	25.3	24.9	27.0
Gas Meter Coefficient		0.9959	0.9959	0.9959
Barometric Pressure	(In. of Hg)	29.29	29.29	29.29
Avg. Orifice Pressure Drop	In. of WC)	1.81	1.86	1.93
Avg. Gas Meter Temperature	(°F)	78.0	79.2	78.7
Volume Through Gas Meter				
Meter Conditions	(CF)	83.12	83.93	87.08
Standard Conditions	(DSCF)	79.86	80.46	83.58
Total Sampling Time	(Min.)	120.00	120.00	120.00
Nozzle Diameter	(In.)	0.185	0.185	0.185
Avg. Stack Gas Temperature	(°F)	97	96	88
Volumetric Flow Rate				
Actual	(ACFM)	102,987	102,949	105,391
Dry Standard	(DSCFM)	93,844	94,032	97,568
Isokinetic Variation	(%)	99.4	99.9	100.0

3.3 MDI Sampling Data

Interpoll Laboratories Report Number 20-38627
Louisiana Pacific
Newberry, MI

Test Number 4
Press Vent Stack (East)

Results of EPA OTM-14 (MDI) Sampling Data

		Run 1	Run 2	Run 3
Date of Test		08-05-20	08-05-20	08-05-20
Time of Runs	(Hrs)	0850 / 1008	1110 / 1213	1305 / 1408
Static Pressure	(In. of WC)	-2.10	-2.10	-2.10
Cross Sectional Area	(Sq. ft)	26.27	26.27	26.27
Pitot Tube Coefficient		0.84	0.84	0.84
Water in Sample Gas				
Impingers	(g)	-1.4	3.1	-3.3
Desiccant	(g)	12.0	7.4	10.6
Total	(g)	10.6	10.5	7.3
Gas Meter Coefficient		0.9927	0.9927	0.9927
Barometric Pressure	(In. of Hg)	29.27	29.27	29.27
Avg. Orifice Pressure Drop	(In. of WC)	1.64	1.57	1.67
Avg. Gas Meter Temperature	(°F)	80.8	80.2	80.5
Volume Through Gas Meter				
Meter Conditions	(CF)	42.09	41.27	43.05
Standard Conditions	(DSCF)	40.06	39.31	40.99
Total Sampling Time	(Min.)	60.00	60.00	60.00
Nozzle Diameter	(In.)	0.179	0.179	0.179
Avg. Stack Gas Temperature	(°F)	93	101	102
Volumetric Flow Rate				
Actual	(ACFM)	109,667	109,452	114,246
Dry Standard	(DSCFM)	100,729	99,064	103,510
Isokinetic Variation	(%)	99.9	99.7	99.5

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LP / Newberry
Newberry, MI

Test Number 8
West Press Stack

Results of EPA OTM-14 (MDI) Sampling Data

		Run 1	Run 2	Run 3
Date of Test		08-05-20	08-05-20	08-05-20
Time of Runs	(Hrs)	0850 / 1009	1110 / 1213	1305 / 1409
Static Pressure	(In. of WC)	-1.20	-1.20	-1.20
Cross Sectional Area	(Sq. ft)	26.27	26.27	26.27
Pitot Tube Coefficient		0.84	0.84	0.84
Water in Sample Gas				
Impingers	(g)	-1.0	6.0	3.4
Desiccant	(g)	5.0	5.0	4.0
Total	(g)	4.0	11.0	7.4
Gas Meter Coefficient		0.9959	0.9959	0.9959
Barometric Pressure	(In. of Hg)	29.26	29.26	29.26
Avg. Orifice Pressure Drop	(In. of WC)	0.92	0.92	0.91
Avg. Gas Meter Temperature	(°F)	74.5	79.6	78.8
Volume Through Gas Meter				
Meter Conditions	(CF)	30.33	30.53	30.46
Standard Conditions	(DSCF)	29.23	29.15	29.13
Total Sampling Time	(Min.)	60.00	60.00	60.00
Nozzle Diameter	(In.)	0.153	0.153	0.153
Avg. Stack Gas Temperature	(°F)	101	113	110
Volumetric Flow Rate				
Actual	(ACFM)	110,516	111,467	111,610
Dry Standard	(DSCFM)	100,831	98,422	99,614
Isokinetic Variation	(%)	98.9	101.1	99.8

3.4 Visual Emission (EPA Method 9)

AeroMet Engineering, Inc.

Solutions for a Changing Environment

AEROMET ENGINEERING INC. CERTIFIES THAT

Edward Juers III

has qualified as a CERTIFIED VISIBLE EMISSIONS READER per Title 40 Part 60 Appendix A USEPA Method 9

Issued: 06/04/2020 Expires: 12/04/2020

Certification of Visible Opacity Reading

Edward Juers III

qualified to conduct EPA Method 9 Tests for visible opacity in accordance with the methods established for such qualification in 40 CFR Part 60 Appendix A.

Jim Breese

Certification Date: June 04, 2020

Expiration Date: December 04, 2020

AeroMet Instructor: Jim Breese

EPA

Visible Emission Observation Form 1

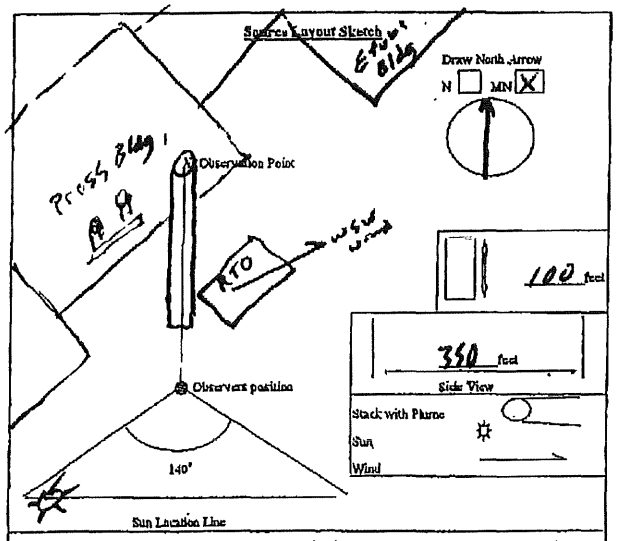
Form Number				Page 1 of 1
Continued on Form Number				

Method Used (circle one)	Method 9	203A	203B	Other
Company Name	LP Corp.			
Facility Name	Newberry			
Street Address	7299 LP mill Road			
City	Newberry	State	MI	Zip 49868

Process	Unit #	Operating Mode
Dryer RTO	E00dryer	>90%
Control Equipment	RTO	Operating Mode No Recirc

Describe Emission Point: Tall Silver Stevale

Height of Emission Point: Start 100' End Same	Height of Emission Point Relative to Observer: Start 335 End Same
Distance to Emission Point: Start 350 End Same	Direction to Emission Point (Degrees): Start 0° End Same
Vertical angle to Observation Point: Start 15 End Same	Direction to Observation Point (Degrees): Start 0° End Same
Distance and Direction to Observation point from Emission Point: Start 350 Same	End Same
Describe Emissions: Start None	End Same
Emission Color: Start NA End	Water Droplet Plume: Attached ☐ Detached ☐ None ☒
Describe Plume Background: Start Sky / clouds	End Same
Background Color: Start Gray/Blue End	Sky Conditions: Start PHy Cloudy End Same
Wind Speed: Start 5 mph End Same	Wind Direction: Start WSW End Same
Ambient Temp. Start 75F End	Wet Bulb Temp. 58° RH Percent 54%



Longitude	Latitude	Declination
46.3343417	-85.4976022	

Additional Information:

Observers Name (Print): Ed Jurus

Observers Signature: [signature] Date: 8/6/20

Organization: Intertek Labs

Certified By: Aeromet Date: 6/4/20

Observation Date	Time Zone	Start Time	End Time
8/6/20	Eastern	1440	1540

Minutes	0	15	30	45	Comments
1	0	0	0	0	
2	0	0	0	0	
3	0	0	0	0	
4	0	0	0	0	
5	0	0	0	0	
6	0	0	0	0	
7	0	0	0	0	
8	0	0	0	0	
9	0	0	0	0	
10	0	0	0	0	
11	0	0	0	0	
12	0	0	0	0	
13	0	0	0	0	
14	0	0	0	0	
15	0	0	0	0	
16	0	0	0	0	
17	0	0	0	0	
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55	0	0	0	0	
56	0	0	0	0	
57	0	0	0	0	
58	0	0	0	0	
59	0	0	0	0	
60	0	0	0	0	