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

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

REPORT OF AIR EMISSIONS TESTS FOR LOUISIANA PACIFIC CORPORATION NEW WAVERLY OSB FACILITY

New Waverly, Texas
May 31, and June 1, 1995

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July 18, 1995

Subject: Louisiana Pacific Corporation
New Waverly, Texas

On May 31, and June 1, 1995, Environmental Monitoring Laboratories performed air emissions testing for Louisiana Pacific Corporation's oriented strand board (OSB) facility in New Waverly, Texas. L.P. operates a rotary OSB dryer which exhausts to a regenerative thermal oxidizer (RTO) for emissions control. Testing was performed to determine emissions of particulate matter (PM), volatile organic compounds (VOC), formaldehyde (HCOH) nitrogen oxides (NOx), and carbon monoxide (CO) from the RTO. Testing was also simultaneously performed at the RTO inlet to determine removal efficiency.

Test Results:

DRYERS RTO	PM		VOC as C		HCOH		CO		NOx	
	#/hr.	gr/dscf	#/hr.	ppm	#/hr.	ppm	#/hr.	ppm	#/hr.	ppm
RTO OUTLET	2.04	0.007	0.45	7.4	0.072	0.47	36.24	238	8.07	33
RTO INLET	25.77	0.104	90.30	1728	1.025	7.89	34.63	275	6.76	33
REMOVAL EFFICIENCY	92.08		99.50		92.98		N/A		N/A	

The testing project was coordinated by Dr. James T. Boswell of Louisiana Pacific Corporation. Danny Russell of Environmental Monitoring laboratories coordinated sample collection and analysis and report preparation. All formaldehyde samples were shipped to Oxford Laboratories in Wilmington, North Carolina, for analysis. Otherwise sample custody was limited to Mr. Russell.

Following is a report of the test.

REPORT OF AIR EMISSIONS AND INLET LOADING TESTS FOR
LOUISIANA PACIFIC CORPORATION
NEW WAVERLY OSB FACILITY
NEW WAVERLY, TEXAS
MAY 31, AND JUNE 1, 1995

CONTENTS

1.0	TEST RESULTS	page 1
2.0	SOURCE DESCRIPTION	5
3.0	TEST PROCEDURES	5
4.0	DATA REDUCTION	6
5.0	NOMENCLATURE	15
6.0	CALIBRATION	16
7.0	APPENDICES:	17

A. Field and Laboratory Data
B. Calibrations
C. Instrument Recorder Traces/Data Log
D. HCHO Analysis Report (Oxford Laboratories)

REPORT CERTIFICATION

I certify that I have examined the information submitted herein, and based upon my inquires of those responsible for obtaining the data or upon my direct acquisition of data, I believe the submitted information is true, accurate and complete.

Signed _____

Daniel G. Russell

1.0 TEST RESULTS:

The following tables present the measured flow parameters and test results for air emissions and inlet loading samples taken on May 31, and June 1, 1995, for the RTO at Louisiana Pacific Corporation 's OSB facility in New Waverly, Texas.

1.1 Dryers RTO

1.1.1 PC/CO/NOx Emissions Test

Run No.		1	2	3	AVG.
Date		5/31/95	5/31/95	5/31/95	——
Time Start		0933	1210	1349	——
Time End		1048	1312	1450	——
PARTICULATE EMISSIONS	#/hr	2.12	2.25	1.76	2.04
PARTICULATE EMISSIONS	gr/dscf	0.007	0.008	0.006	0.007
CO EMISSIONS	#/hr	51.89	29.63	27.20	36.24
CO EMISSIONS	ppm	330	200	184	238
NOx EMISSIONS	#/hr	7.88	8.80	7.52	8.07
NOx EMISSIONS	ppm	31	36	31	33
VOLUMETRIC FLOWRATE	acfm	64662	65115	65057	64945
VOLUMETRIC FLOWRATE	dscfm	36047	33959	33887	34631
VELOCITY	ft./sec.	70.3	70.8	70.8	70.7
STACK TEMPERATURE	°F	344	363	349	352
MOISTURE	%	13.8	17.5	19.0	16.8
SAMPLE RATE	% isokinetic	98	104	107	103

Dryer RTO

1.1.2 VOC, HCHO Emissions Test

Run No.		4	5	6	AVG.
Date		5/31/95	6/1/95	6/1/95	——
Time Start		1649	0855	1031	——
Time End		2114	1004	1133	——
FORMALDEHYDE EMISSIONS	#/hr	0.068	0.080	0.069	0.072
FORMALDEHYDE EMISSIONS	ppm	0.45	0.52	0.44	0.47
VOC EMISSIONS	#/hr as C	0.56	0.36	0.43	0.45
VOC EMISSIONS	ppm as C	9.2	6.0	6.9	7.4
VOLUMETRIC FLOWRATE	acfm	63213	64509	64092	63938
VOLUMETRIC FLOWRATE	dscfm	32500	32628	33029	32719
VELOCITY	ft./sec.	68.8	70.2	69.7	69.6
STACK TEMPERATURE	°F	364	365	369	366
MOISTURE	%	18.5	19.7	17.8	18.7
SAMPLE RATE	% isokinetic	103	108	100	104

1.2 RTO Inlet

1.2.1 PM/CO/NOx Loading Test

Run No.		1	2	3	AVG.
Date		5/31/95	5/31/95	5/31/95	———
Time Start		0932	1208	1347	———
Time End		1047	1310	1449	———
PARTICULATE LOADING	#/hr	22.34	25.87	29.09	25.77
PARTICULATE LOADING	gr/dscf	0.087	0.106	0.119	0.104
CO LOADING	#/hr	33.54	32.04	38.31	34.63
CO LOADING	ppm	258	259	309	275
NOx LOADING	#/hr	6.38	7.51	6.37	6.76
NOx LOADING	ppm	30	37	31	33
VOLUMETRIC FLOWRATE	acfm	44701	44510	44694	44635
VOLUMETRIC FLOWRATE	dscfm	29799	28362	28420	28860
VELOCITY	ft./sec.	79.3	79.0	79.3	79.2
STACK TEMPERATURE	°F	182	180	177	180
MOISTURE	%	15.8	19.8	20.3	18.6
SAMPLE RATE	% isokinetic	99	107	109	105

RTO Inlet

1.2.2 VOC and HCHO Loading Test

Run No.		4	5	6	AVG.
Date		5/31/95	6/1/95	6/1/95	——
Time Start		0836	1012	1147	——
Time End		0938	1114	1248	——
FORMALDEHYDE LOADING	#/hr	0.748	1.535	0.792	1.025
FORMALDEHYDE LOADING	ppm	5.84	11.90	5.92	7.89
VOC LOADING	#/hr as C	59.34	104.86	106.68	90.30
VOC LOADING	ppm as C	1157.4	2033.4	1993.1	1728.0
VOLUMETRIC FLOWRATE	acfm	43386	45469	44955	44603
VOLUMETRIC FLOWRATE	dscfm	27423	27583	28630	27879
VELOCITY	ft./sec.	77.0	80.7	79.8	79.1
STACK TEMPERATURE	°F	186	194	184	188
MOISTURE	%	19.6	22.0	19.3	20.3
SAMPLE RATE	% isokinetic	101	108	106	105

2.0 SOURCE DESCRIPTION: Louisiana Pacific Corporation operates an Oriented Strand Board (OSB) plant in New Waverly, Texas. Process description here is limited to a brief description of the emissions sources and their sampling locations. Detailed descriptions of the processes, the pollution control equipment, and records of operating rates and conditions during testing may be supplied by Louisiana Pacific Corporation.

A rotary dryer is used for drying wood flakes. The dryer exhausts to a primary cyclone, then to bank of high efficiency cyclones Exhaust from the multicyclone is directed to a manifold and then to the RTO. Inlet sampling was done upstream of the multicyclone in a vertical turned down 41.5 inch diameter duct. Two sample ports at 90° are installed at a location that is 36 inches upstream of a vertical to horizontal elbow and 138 inches downstream of a horizontal to vertical elbow. The RTO exhausts to the atmosphere by way of a vertical 53.0 inch diameter stack. Two sample ports are provided at a location that is 562 inches (2.5 diameters) downstream of the inlet duct and 562 inches (10.6 diameters) below the stack exit. Sketches of the stacks and sampling locations are provided in Appendix A.

3.0 TEST PROCEDURES: Test procedures used are those described in 40 CFR, Part 60, Appendix A and in Part 266, Appendix IX.

Particulate sampling was done as described in Method 5. An exception was the inclusion of the condenser section particulate. Reported particulate is based on three fractions: the front half, the back half organic (methylene chloride extraction), and the back half aqueous. The contribution of each fraction can be reviewed in Section 4.0.

Carbon monoxide concentrations were continuously monitored as described in Method 10. Two TECO Model 48H gas correlation filter NDIRs in various ranges were used to monitor CO at the inlet and outlet. Instrument calibration and bias checks were performed prior to and following each series of tests, and a mid range system bias check was made following each run by directing calibration to the gas sampling probe.

Nitrogen oxides were continuously monitored as described in Method 7E. Two TECO Model 10S analyzers were used. Instrument calibration was performed prior to and following each series of tests, and a mid range system bias check was made prior to and following each run by directing calibration to the gas sampling probe.

VOC concentrations were measured using Method 25A (continuous monitoring with a flame ionization detector). Two TECO Model 51 heated FIDs were used. The 0 to 100 ppm scale and the 0 to 1000 ppm scale were used for calibrations using zero air, and appropriate low, mid and high range concentrations of EPA protocol propane in nitrogen. Since calibrations are made with propane (C_3H_8), results as methane (CH_4) (or as carbon) are determined by increasing the measured concentration by a factor of three. A continuous trace of VOC as propane was recorded and manually integrated for each 60 minute test period. Instrument calibration was performed initially, and following each 60 minute test period. Any necessary adjustments were made after recording the response of the mid range calibration gas. which was introduced at the inlet to the VOC sampling probe. The gas samples were directed to the heated FID analyzers by way of heated teflon sample lines maintained at a minimum temperature of 250°F.

Instrument calibrations were made with Protocol 1 cylinder gas, an Environics Model 2020 gas diluter and EPA Conditional Method 7. (Carbon monoxide cylinder gas was certified rather than Protocol 1). All calibrations were made by introducing calibration gas at the probe inlet.

Formaldehyde was measured using the procedure described in CFR 40, Part 266, Appendix IX, Method 0011. Reagent preparation and sample analysis was performed by Oxford Laboratories of Wilmington, North Carolina.

Inlet sampling was done simultaneously with outlet sampling in order to determine removal efficiency or additional pollutant contribution. This was accomplished by operating two sampling trains simultaneously.

4.0 DATA REDUCTION

Louisiana Pacific Corporation - New Waverly, Texas
OSB RTO
PM/NOx/CO Emissions Test - May 31 through June 1, 1995

Collected Test Data:

		RUN 1	RUN 2	RUN 3	
Date	:	5/31/95	5/31/95	5/31/95	
Time start	:	0933	1210	1349	
Time end	:	1048	1312	1450	
1. As	: sq ft	15.3207	15.3207	15.3207	
2. Dn	: in.	0.250	0.250	0.250	
3. Cp	: dimensionless	0.84	0.84	0.84	
4. Theta	: minutes	60.00	60.00	60.00	
5. Y	: dimensionless	1.00	1.00	1.00	
6. Pbar	: in. Hg	29.55	29.55	29.55	
7. Pg	: in. H2O	-0.98	-0.98	-0.98	
8. Vm	: cf (dry gas)	49.637	50.279	51.917	
9. sqr(DP),avg	: in.H2O^.5	0.9850	0.9733	0.9787	
10. DH	: in. H2O	2.1563	2.1708	2.2625	
11. ts	: degrees F	344.08	362.67	349.33	352.03
12. tm	: degrees F	92.92	97.35	103.92	
13. Vlc	: ml	160.5	213.5	240	
14. CO2	: percent	2.50	2.50	3.00	
15. O2	: percent	18.00	18.00	18.00	
16. CO	: percent	0.03	0.02	0.02	
17. CO	: ppm	330.0	200.0	184.0	238.0
18. M,PM	: milligrams				
	front half	15.5	16	15.5	
	back half organic	1.9	3.4	2.3	
	back half aqueous	3.5	4.3	1.2	
19. NOx	: ppm	30.6	36.3	31.1	33

Louisiana Pacific Corporation - New Waverly, Texas
OSB RTO
PM/NOx/CO Emissions Test - May 31 through June 1, 1995

Calculations:

		RUN 1	RUN 2	RUN 3	AVG.
1. Pm	: in.Hg (DH/13.6)+Pbar	29.7086	29.7096	29.7164	
2. Ps	: in. Hg (Pg/13.6)+Pbar	29.4779	29.4779	29.4779	
3. An	: sq ft ((Dn/24)^2)(3.1416)	3.41E-04	3.41E-04	3.41E-04	
4. Vmstd	: dscf Vm Y(Pm/Pstd)(Tstd/Tm)	47.065	47.296	48.279	
5. Vwstd	: scf (.04707cf/ml)(Vlc)	7.555	10.049	11.297	
6. Bws	: dimensionless Vwstd/(Vwstd+Vmstd)	0.1383	0.1752	0.1896	0.1677
7. Md	: mol.wt. dry basis .44 CO2+.32 O2+.28(CO+N2)	29.12	29.12	29.2	
8. Ms	: mol.wt. wet basis Md(1-Bws)+18 Bws	27.58	27.17	27.08	
9. Vs	: ft/sec Kp Cp (sqrDP)sqr(Ts/(Ps Ms))	70.34	70.84	70.77	70.65
10. Q	: cfm Vs As(60 sec/min)	64662	65115	65057	64945
11. Qstw	: scfm Q(Ps/Pstd)(Tstd/Ts)	41833	41174	41816	41608
12. Qstd	: dscfm Qstw(1-Bws)	36047	33959	33887	34631
13. I	: percent [(100 Ts)(.002669 Vlc+(Vm Pm/Tm)]/(60 theta Vs Ps An)	97.81	104.34	106.73	102.96

Particulate Emissions

14. E,PM	: pounds/hr (M,PM/Vmstd)(Qstd)(60)/(453590)				
front half		1.570	1.520	1.439	1.510
back half organic		0.192	0.323	0.214	0.243
back half aqueous		0.355	0.408	0.111	0.291
Total		2.117	2.251	1.764	2.044
15. C,PM	: grains/dscf (M,PM/Vmstd)(.0154 grains/mg)				
front half		0.0051	0.0052	0.0049	0.0051
back half organic		0.0006	0.0011	0.0007	0.0008
back half aqueous		0.0011	0.0014	0.0004	0.0010
Total		0.0068	0.0077	0.0061	0.0069

CO Emissions

16. E,CO	: pounds/hr (C,CO)(7.27e-8)(Qstd)(60)	51.89	29.63	27.20	36.24

NOx Emissions

17. E,NOx	: pounds/hr C,NOx(1.19e-7)(Qstd)(60)	7.88	8.80	7.52	8.07

Louisiana Pacific Corporation - New Waverly, Texas
OSB RTO
VOC/HCHO Emissions Test - May 31 through June 1, 1995

Collected Test Data:

			RUN 4	RUN 5	RUN 6	
	Date	:	5/31/95	6/1/95	6/1/95	
	Time start	:	1649	0855	1031	
	Time end	:	2114	1004	1133	
1.	As	: sq ft	15.3207	15.3207	15.3207	
2.	Dn	: in.	0.260	0.260	0.260	
3.	Cp	: dimensionless	0.84	0.84	0.84	
4.	Theta	: minutes	60.00	60.00	60.00	
5.	Y	: dimensionless	1.00	1.00	1.00	
6.	Pbar	: in. Hg	29.55	29.52	29.52	
7.	Pg	: in. H2O	-0.98	-0.98	-0.98	
8.	Vm	: cf (dry gas)	50.956	53.295	50.962	
9.	sqr(DP),avg	: in.H2O^.5	0.9412	0.9600	0.9555	
10.	DH	: in. H2O	2.3979	2.5146	2.4813	
11.	ts	: degrees F	364.13	365.21	368.63	365.99
12.	tm	: degrees F	92.67	90.96	99.65	
13.	Vlc	: ml	234	264	220	
14.	CO2	: percent	2.00	3.50	3.50	
15.	O2	: percent	18.50	17.50	17.50	
16.	CO	: percent	0	0	0	
17.	M,HCOH	: micrograms	769	938	750	
18.	C,VOC	: ppm as CH_4	2.5	1.6	1.9	

Louisiana Pacific Corporation - New Waverly, Texas
OSB RTO
VOC/HCHO Emissions Test - May 31 through June 1, 1995

Calculations:	RUN 4	RUN 5	RUN 6	AVG.
1. Pm : in.Hg (DH/13.6)+Pbar	29.7263	29.7049	29.7024	
2. Ps : in. Hg (Pg/13.6)+Pbar	29.4779	29.4479	29.4479	
3. An : sq ft ((Dn/24)^2)(3.1416)	3.69E-04	3.69E-04	3.69E-04	
4. Vmstd : dscf Vm Y(Pm/Pstd)(Tstd/Tm)	48.366	50.707	47.730	
5. Vwstd : scf (.04707cf/ml)(Vlc)	11.014	12.426	10.355	
6. Bws : dimensionless Vwstd/(Vwstd+Vmstd)	0.1855	0.1968	0.1783	0.1869
7. Md : mol.wt. dry basis .44 CO2+.32 O2+.28(CO+N2)	29.06	29.26	29.26	
8. Ms : mol.wt. wet basis Md(1-Bws)+18 Bws	27.01	27.04	27.25	
9. Vs : ft/sec Kp Cp (sqrDP)sqr(Ts/(Ps Ms))	68.77	70.18	69.72	69.55
10. Q : cfm Vs As(60 sec/min)	63213	64509	64092	63938
11. Qstw : scfm Q(Ps/Pstd)(Tstd/Ts)	39901	40624	40195	40240
12. Qstd : dscfm Qstw(1-Bws)	32500	32628	33029	32719
13. I : percent [(100 Ts)(.002669 Vlc+(Vm Pm/Tm)]/(60 theta Vs Ps An)	103.08	107.64	100.09	103.60

Formaldehyde Emissions

14. E,HCOH : pounds/hr (M,HCOH/Vmstd)(Qstd)(60)/(453590000)	0.068	0.080	0.069	0.072
15. C,HCOH : ppm (M,HCOH/Vmstd)(.0283)	0.45	0.52	0.44	0.47

VOC Emissions

16. C'VOC : ppm as Carbon, dry ((C,VOC)*3)/(1-Bws)	9.21	5.98	6.94	7.37
17. E,VOC : pounds/hr (C'VOC)(3.116e-8)(Qstd)(60)	0.56	0.36	0.43	0.45

Louisiana Pacific Corporation - New Waverly, Texas
OSB RTO Inlet
PM/NOx/CO Emissions Test - May 31 through June 1, 1995

Collected Test Data:

			RUN 1	RUN 2	RUN 3	
	Date	:	5/31/95	5/31/95	5/31/95	
	Time start	:	0932	1208	1347	
	Time end	:	1047	1310	1449	
1.	As	: sq ft	9.3934	9.3934	9.3934	
2.	Dn	: in.	0.210	0.185	0.185	
3.	Cp	: dimensionless	0.84	0.84	0.84	
4.	Theta	: minutes	60.00	60.00	60.00	
5.	Y	: dimensionless	1.00	1.00	1.00	
6.	Pbar	: in. Hg	29.55	29.55	29.55	
7.	Pg	: in. H2O	-10	-10	-10	
8.	Vm	: cf (dry gas)	48.09	38.985	40.203	
9.	sqr(DP),avg	: in.H2O^.5	1.2237	1.2083	1.2180	
10.	DH	: in. H2O	2.1729	1.3125	1.3917	
11.	ts	: degrees F	182.29	179.75	177.42	179.82
12.	tm	: degrees F	93.69	101.17	111.71	
13.	Vlc	: ml	181.5	191	199	
14.	CO2	: percent	2.50	1.50	3.00	
15.	O2	: percent	18.00	18.50	17.50	
16.	CO	: percent	0.03	0.03	0.03	
17.	CO	: ppm	258.0	259.0	309.0	275.3
18.	M,PM	: milligrams				
		front half	251.2	246.7	279.1	
		back half organic	6.2	2.4	4.8	
		back half aqueous	0.7	1.5	0.8	
19.	NOx	: ppm	30.0	37.1	31.4	33

Louisiana Pacific Corporation - New Waverly, Texas
OSB RTO Inlet
PM/NOx/CO Emissions Test - May 31 through June 1, 1995

Calculations:		RUN 1	RUN 2	RUN 3	AVG.
1. Pm	: in.Hg (DH/13.6)+Pbar	29.7098	29.6465	29.6523	
2. Ps	: in. Hg (Pg/13.6)+Pbar	28.8147	28.8147	28.8147	
3. An	: sq ft ((Dn/24)^2)(3.1416)	2.41E-04	1.87E-04	1.87E-04	
4. Vmstd	: dscf Vm Y(Pm/Pstd)(Tstd/Tm)	45.537	36.345	36.797	
5. Vwstd	: scf (.04707cf/ml)(Vlc)	8.543	8.990	9.367	
6. Bws	: dimensionless Vwstd/(Vwstd+Vmstd)	0.1580	0.1983	0.2029	0.1864
7. Md	: mol.wt. dry basis .44 CO2+.32 O2+.28(CO+N2)	29.12	28.98	29.18	
8. Ms	: mol.wt. wet basis Md(1-Bws)+18 Bws	27.36	26.80	26.91	
9. Vs	: ft/sec Kp Cp (sqrDP)sqr(Ts/(Ps Ms))	79.31	78.97	79.30	79.20
10. Q	: cfm Vs As(60 sec/min)	44701	44510	44694	44635
11. Qstw	: scfm Q(Ps/Pstd)(Tstd/Ts)	35389	35378	35654	35474
12. Qstd	: dscfm Qstw(1-Bws)	29799	28362	28420	28860
13. I	: percent [(100 Ts)(.002669 Vlc+(Vm Pm/Tm)]/(60 theta Vs Ps An)	99.47	107.49	108.60	105.19

Particulate Emissions

14. E,PM	: pounds/hr (M,PM/Vmstd)(Qstd)(60)/(453590)				
front half		21.744	25.465	28.514	25.241
back half		0.537	0.248	0.490	0.425
back half		0.061	0.155	0.082	0.099
Total		22.342	25.868	29.086	25.765
15. C,PM	: grains/dscf (M,PM/Vmstd)(.0154 grains/mg)				
front half		0.0850	0.1045	0.1168	0.1021
back half		0.0021	0.0010	0.0020	0.0017
back half		0.0002	0.0006	0.0003	0.0004
Total		0.0873	0.1062	0.1192	0.1042

CO Emissions

16. E,CO	: pounds/hr (C,CO)(7.27e-8)(Qstd)(60)	33.54	32.04	38.31	34.63

NOx Emissions

17. E,NOx	: pounds/hr C,NOx(1.19e-7)(Qstd)(60)	6.38	7.51	6.37	6.76

Louisiana Pacific Corporation - New Waverly, Texas
OSB RTO Inlet
VOC/HCHO Emissions Test - May 31 through June 1, 1995

Collected Test Data:

		RUN 4	RUN 5	RUN 6	
	Date :	5/31/95	6/1/95	6/1/95	
	Time start :	0836	1012	1147	
	Time end :	0938	1114	1248	
1.	As : sq ft	9.3934	9.3934	9.3934	
2.	Dn : in.	0.205	0.205	0.205	
3.	Cp : dimensionless	0.84	0.84	0.84	
4.	Theta : minutes	60.00	60.00	60.00	
5.	Y : dimensionless	1.00	1.00	1.00	
6.	Pbar : in. Hg	29.55	29.55	29.55	
7.	Pg : in. H2O	-10	-10	-10	
8.	Vm : cf (dry gas)	42.906	45.933	48.207	
9.	sqr(DP),avg : in.H2O^.5	1.1753	1.2178	1.2193	
10.	DH : in. H2O	1.8271	1.9521	1.9750	
11.	ts : degrees F	186.42	194.21	184.17	188.27
12.	tm : degrees F	93.42	93.19	111.25	
13.	Vlc : ml	211	260	225	
14.	CO2 : percent	3.00	2.50	2.00	
15.	O2 : percent	17.00	18.00	19.00	
16.	CO : percent	0	0	0	
17.	M,HCOH : micrograms	8380	18300	9250	
18.	C,VOC : ppm as CH_3	310.0	529.0	536.0	

Louisiana Pacific Corporation - New Waverly, Texas
OSB RTO Inlet
VOC/HCHO Emissions Test - May 31 through June 1, 1995

Calculations:	RUN 4	RUN 5	RUN 6	AVG.
1. Pm : in.Hg (DH/13.6)+Pbar	29.6843	29.6935	29.6952	
2. Ps : in. Hg (Pg/13.6)+Pbar	28.8147	28.8147	28.8147	
3. An : sq ft ((Dn/24)^2)(3.1416)	2.29E-04	2.29E-04	2.29E-04	
4. Vmstd : dscf Vm Y(Pm/Pstd)(Tstd/Tm)	40.613	43.510	44.222	
5. Vwstd : scf (.04707cf/ml)(Vlc)	9.932	12.238	10.591	
6. Bws : dimensionless Vwstd/(Vwstd+Vmstd)	0.1965	0.2195	0.1932	0.2031
7. Md : mol.wt. dry basis .44 CO2+.32 O2+.28(CO+N2)	29.16	29.12	29.08	
8. Ms : mol.wt. wet basis Md(1-Bws)+18 Bws	26.97	26.68	26.94	
9. Vs : ft/sec Kp Cp (sqrDP)sqr(Ts/(Ps Ms))	76.98	80.67	79.76	79.14
10. Q : cfm Vs As(60 sec/min)	43386	45469	44955	44603
11. Qstw : scfm Q(Ps/Pstd)(Tstd/Ts)	34129	35341	35487	34986
12. Qstd : dscfm Qstw(1-Bws)	27423	27583	28630	27879
13. I : percent [(100 Ts)(.002669 Vlc+(Vm Pm/Tm)]/(60 theta Vs Ps An)	101.17	107.76	105.51	104.81

Formaldehyde Emissions

14. E,HCOH : pounds/hr (M,HCOH/Vmstd)(Qstd)(60)/(453590000)	0.748	1.535	0.792	1.025
15. C,HCOH : ppm (M,HCOH/Vmstd)(.0283)	5.84	11.90	5.92	7.89

VOC Emissions

16. C'VOC : ppm as Carbon, dry ((C,VOC)*3)/(1-Bws)	1157.43	2033.39	1993.10	1727.97
17. E,VOC : pounds/hr (C'VOC)(3.116e-8)(Qstd)(60)	59.34	104.86	106.68	90.30

5.0 NOMENCLATURE

SYMBOL	UNITS	DESCRIPTION
An	ft^2	Nozzle cross sectional area
As	ft^2	Stack cross sectional area
Bws	dimensionless	Wet gas fraction
CO_2	percent	Carbon dioxide content by volume
CO	percent	Carbon monoxide content by volume
Cp	dimensionless	Pitot correction factor
C,X	as labeled	Concentration of pollutant X
DGF	dimensionless	Dry gas fraction
Dn	inches	Nozzle diameter
ΔH (delta H)	in. H_2O	Pressure drop across meter orifice
ΔP (delta P)	in. H_2O	Stack gas velocity pressure
E,X	#/hr	Emission rate of pollutant X
E'X	#/MM Btu	Emission rate of pollutant X
F	dscf	Volume of flue gas per MM Btu
I	percent	Nozzle velocity/stack gas velocity
Kp	consistent	Pitot tube constant
M,X	milligrams	Sample weight of pollutant X
Md	#/# mole	Dry molecular weight of stack gas
Ms	#/# mole	Wet molecular weight of stack gas
N2	percent	Nitrogen content by volume, dry basis
O_2	percent	Oxygen content by volume, dry basis
Pbar	in. Hg	Barometric pressure
Pg	in. Hg	Stack static pressure
Pm	in. Hg	Total pressure at meter (Pbar+(DH/13.6)
Ps	in. Hg	Total stack pressure (Pbar+(Pg/13.6))
Pstd	in. Hg	Standard barometric pressure = 29.92
Q	acfm	Volumetric flow rate at stack conditions
Qstd	dscfm	Volumetric flow rate at standard conditions, dry basis
Qstdw	scfm	Volumetric flow rate at standard conditions, wet basis
θ (theta)	minutes	Sample duration
tm	°F	Meter temperature (Tm denotes °R)
ts	°F	Stack temperature (Ts denotes °R)
Tstd	°R	Standard temperature = 528°R
Vlc	ml	volume of water collected
Vm	ft^3	Volume of dry gas sampled through meter
Vmstd	dscf	Sample volume at standard conditions
Vwstd	scf	Sample volume of water vapor
Y	dimensionless	Meter coefficient
Xsair	percent	Excess air

6.0 CALIBRATIONS:

Measurement devices used by Environmental Monitoring Laboratories and subject to changes in measurement precision are initially calibrated prior to use. Those instruments for which calibration factors are subject to change or for which calibration checks are required, are calibrated following each field use or as otherwise directed and noted. Calibration procedures for specific equipment are as follows.

Dry Gas Meter:

Dry gas meters are periodically removed from the sampling consoles and cleaned and repaired (new gaskets etc. as required). Following the overhaul of a meter, the measuring precision is checked by the Bell Prover Method and adjusted when necessary to read to within 2% of 100% accuracy. This service is provided by Big Three Meter Company in Jackson, Mississippi. Overhaul service or any six month period is followed by a five point calibration described in APTD-0576 using either a wet test meter or calibrated dry gas meter (used exclusively for calibrations) as a standard reference. Following field use, a gas meter calibration is checked in one of two ways. [1] Three calibration checks at intermediate orifice settings are performed or [2] orifice meter coefficients are used.

If a meter coefficient obtained from pre-test and post-test checks differs by more than 5%, the coefficient (Y) giving the lower sample volume is used in the calculations.

Orifice:

The orifice coefficient is initially determined and is rechecked following a major gas meter repair and calibration.

Nozzles:

Nozzles are checked before each field use with a precision (.001 in.) dial caliper. Three measurements on different axes are made; an average of those three readings is used in calculations. If the tolerance among measurements exceeds 0.004 inches (highest to lowest reading) the nozzle is repaired and recalibrated or discarded.

Pitot Tubes:

Pitot tubes meeting EPA geometry standards are assigned a coefficient of 0.84. Pitot tubes are visually inspected for damage before, during and after use. Those pitot tubes not meeting the geometry standards are assigned a coefficient from the manufacturer's calibration which it retains unless damaged. All pitot tubes used by Environmental Monitoring Laboratories are manufactured by NAPP, Inc.

Temperature Measuring Instruments:

Most temperature measurements are made with a type K thermocouple and an Omega digital thermocouple thermometer which has an initial calibration traceable to NBS. Other measurements are made using bimetallic dial thermometers. The thermocouples and dial thermometers are checked following or during a test series against an ASTM mercury in glass thermometer.

Barometer:

Aneroid field barometers are checked against and adjusted to readings from a mercury barometer or readings obtained from local weather authorities.

Differential Pressure Gauges:

Velocity head (delta P) and orifice pressure differential (delta H) measurements are made using water manometers of the appropriate range unless otherwise noted in the test data. Manometers do not require calibration.

7.0 APPENDICES

A. Field and Laboratory Data

B. Calibrations

C. Instrument Recorder Traces/Data Log

D. HCOH Analysis Report (Oxford Laboratories)

7.0 APPENDICES

APPENDIX A.

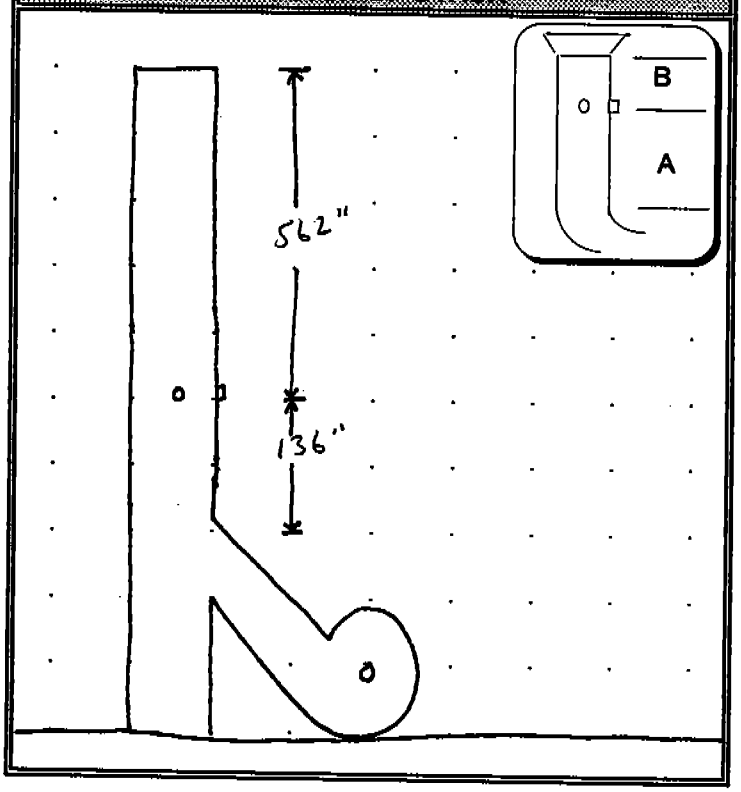
SAMPLING AND ANALYTICAL DATA

RTO OUTLET

STACK CONFIGURATION AND SAMPLE POINT LAYOUT FOR CIRCULAR STACKS

PLANT: LOUISIANA PACIFIC NEW WAVERLY, TX. **Date:** 3-3-95
SOURCE: RTO OUTLET
TEST FOR: PM SET-UP
TEST OPERATORS: BRAD INGKNIGHT

SKETCH OF STACK



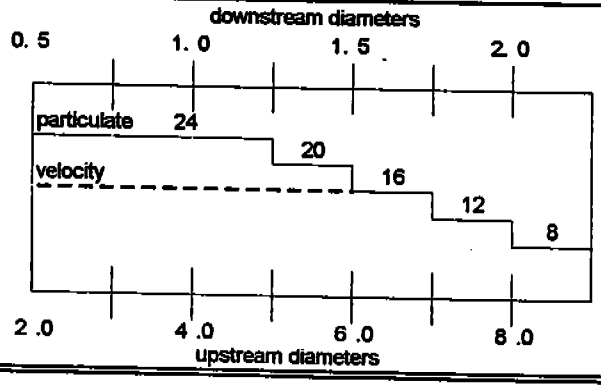
PERCENT OF DIAMETER

point no.	points on a diameter: 2	4	6	8	10	12	14	16
1	14.6	6.7	4.4	3.2	2.6	2.1	1.8	1.6
2	85.4	25.0	14.6	10.5	8.2	6.7	5.7	4.9
3		75.0	29.6	19.4	14.6	11.8	9.9	8.5
4		93.3	70.4	32.3	22.6	17.7	14.6	12.5
5			85.4	67.7	34.2	25.0	20.1	16.9
6			95.6	80.6	65.8	35.6	26.9	22.0
7				89.5	77.4	64.4	36.6	28.3
8				96.8	85.4	75.0	63.4	37.5
9					91.8	82.3	73.1	62.5
10					97.4	88.2	79.9	71.7
11						93.3	85.4	78.0
12						97.9	90.1	83.1
13							94.3	87.5
14							98.2	91.5
15								95.1
16								98.4

Point No.	Inches from wall	velocity head %
1	1.1	1.20 <5
2	3.6	1.30
3	6.3	1.30
4	9.4	1.20
5	13.3	1.20
6	18.9	.90
7	34.1	.82
8	39.8	.78
9	43.6	.78
10	46.7	.70
11	49.4	.62
12	51.9	.60

STACK DIAMETER: 53.00
Distance from ports to disturbance:
A. to upstream disturbance: 136"
B. to downstream disturbance: 562"
Upstream diameters: 2.5
Downstream diameters: 10.6
Minimum No. sample points required: 24
No. sample points selected: 12X2
Port Length: 7.75
Port Type: 4" Nipple
Port Access: CAT WALK / MOUNRAILS

MINIMUM NO. OF POINTS ON A DIAMETER



Pitot ID: _____ Pitot Cp: _____ Stack Temp: _____
Remarks:

Plant: LOUISIANA PACIFIC NEW WAVERLY TX.
Sampling Location: DRYERS RTO EXHAUST
Test For: PM / CO / NOx
Test Operators: B. McKNIGHT / L. CARRUTH

RUN No. 1
Date 5-31-95
Time start 0933 end 1048

Meter Box	RADERSON	No. Sample Pts.	12x2	Gas Analysis	Fyte
Sample Box	NO. 3	Minutes/Pt.	2.5	CO_2	2.5
Probe/Pitot	6ft s.s.	NOMOGRAPH		O_2	18.0
Pitot Cp	.84	ΔH@	1.75	CO	330 ppm TECO48
Nozzle Dia.	.250	Meter Temp.	100	Time	NOx = 30.6 ppm
Filter No.		% H_2O	21		
Amb. Temp. °F	75	C-Factor	.75	Condensate:	
Bar. Press. "Hg	29.55	Stack Temp.	400 / 325	tare 200	fin 343
Static Press. "H_2O	-.98	Ref. ΔP	.94 / .86	Silica gel:	
				tare 685.5	fin 703

Remarks:

Dn
0.250
0.250 } .250
0.250

Port Point	El. Time, Min.	DGM Reading, Ft.³	Velocity Head ΔP, in. H_2O	Orifice ΔH in. H_2O	Stack Temp. °F	Meter Temp., °F in	Meter Temp., °F Out	Oven Temp. °F	Imp. Temp. °F	Vac in. Hg
1	0000	892.851	1.40	2.80	320	77	76	248	66	2
2	230	894.6	1.40	2.80	320	83	76	249	66	2
3	500	897.0	1.40	3.00	341	90	77	251	66	2
4	730	899.7	1.10	2.40	363	95	78	252	65	2
5	1000	901.7	1.10	2.40	389	97	80	225	60	2
6	1230	904.1	0.98	2.10	332	100	81	192	60	2
7	1500	906.4	0.81	1.75	271	101	83	175	60	2
8	1730	908.1	0.80	1.70	369	102	84	145	60	2
9	2000	909.9	0.76	1.55	366	103	85	135	60	2
10	2230	911.7	0.76	1.55	332	103	86	128	60	2
11	2500	913.8	0.56	1.20	325	91	88	100	60	2
12	2730	915.2	0.50	1.15	325	93	88	100	60	2
1	3000	916.958	0.58	1.25	326	92	90	254	62	2
2	230	918.5	0.64	1.35	373	94	88	253	62	2
3	500	920.1	0.60	1.30	376	96	88	257	62	2
4	730	921.8	0.65	1.40	327	99	88	254	62	2
5	1000	923.6	0.64	1.35	344	101	89	254	62	2
6	1230	925.2	0.80	1.70	376	103	90	253	62	2
7	1500	927.2	1.20	2.60	328	106	91	247	62	2
8	1730	929.3	1.40	3.00	323	109	92	252	62	2
9	2000	931.9	1.70	3.60	352	111	93	248	62	2
10	2230	934.8	1.50	3.20	330	112	94	260	62	2
11	2500	937.2	1.40	3.00	325	112	95	258	62	2
12	2730	939.8	1.40	3.00	325	113	97	249	62	2
end	6000	942.488								

LEAK CHECK: .073 → .075 = .002 cfm @ 7" Hg

+ pitot mm 3.6
− pitot mm 3.5

49.637	.9850	2.1563	344.08		92.92	

Plant: L.P New Waverly, Tx
Sampling Location: Dryers RTO Exhaust
Test For: PM/CO/NOx
Test Operators: B.McKNIGHT / L.CARROLL

RUN No. 2
Date 5-31-95
Time start 1210 end 1312

Meter Box	Anderson	No. Sample Pts.	24 (12x2)	Gas Analysis	Fyrite		Remarks:
Sample Box	No. 4	Minutes/Pt.	2.5	CO_2	2.5		
Probe/Pitot	6ft. S.S			O_2	18.0		
Pitot Cp	.84	NOMOGRAPH		CO	200 ppm		
Nozzle Dia.	.250	ΔH@	1.75	Time	NOx = 36.3		
Filter No.		Meter Temp.	100				
		% H_2O	21 / 15	Condensate:			
Amb. Temp. °F	75°	C-Factor	.75 / .84	tare	200	fin	405
Bar. Press. "Hg	29.55	Stack Temp.	400 / ~~385~~	Silica gel:	700		708.5
Static Press. "H_2O	-.98	Ref. ΔP	.94 / ~~.86~~ .82	tare	~~685.5~~	fin	~~703~~

	Port Point	El. Time, Min.	DGM Reading, Ft.³	Velocity Head ΔP, in. H_2O	Orifice ΔH in. H_2O	Stack Temp. °F	Meter Temp., °F In	Meter Temp., °F Out	Oven Temp. °F	Imp. Temp. °F	Vac. in. Hg
1	1	0 00	942.791	1.30	2.80	380	81	79	253	61	2
2	2	2 30	944.7	1.20	2.40	385	84	79	250	61	2
3	3	5 00	946.9	1.40	3.00	391	87	80	249	61	2
4	4	7 30	949.4	1.20	2.40	337	92	81	252	61	2
5	N 5	10 00	951.6	1.20	2.40	353	95	82	249	60	2
6	6	12 30	953.9	1.00	2.25	368	98	83	256	60	2
7	7	15 00	956.1	0.80	1.80	392	100	85	251	60	2
8	8	17 30	958.2	0.75	1.70	357	100	87	256	60	2
9	9	20 00	960.1	0.73	1.65	345	101	88	257	62	2
10	10	22 30	961.9	0.68	1.55	357	102	90	258	62	2
11	11	25 00	963.8	0.55	1.25	357	103	92	251	62	2
12	12	27 30	965.3	0.54	1.25	357	104	93	252	62	2
13											
14	1	30 00	967.142	0.53	1.20	372	98	95	251	60	2
15	2	2 30	968.6	0.60	1.35	389	101	97	247	60	2
16	3	5 00	970.4	0.60	1.35	338	103	97	242	62	2
17	4	7 30	972.2	0.66	1.50	394	103	98	253	63	2
18	5	10 00	973.9	0.67	1.55	359	105	99	252	60	2
19	6	12 30	975.7	0.70	1.60	367	106	100	255	60	2
20	7	15 00	977.5	1.10	2.50	338	108	101	256	60	2
21	8	17 30	979.7	1.50	3.40	353	112	102	248	60	2
22	9	20 00	982.4	1.50	3.40	370	115	103	249	60	2
23	10	22 30	985.7	1.40	3.20	345	116	104	246	60	2
24	11	25 00	987.6	1.50	3.40	350	117	105	261	60	2
25	12	27 30	990.3	1.40	3.20	350	117	105	249	60	2
26	end	60 00	993.070								
27											
28			Leak check: .038 → .041 = .003 cfm @ 6" Hg								
29											
30			+ pitot ✓ @								
31			− pitot ✓ @								
32											
33											
34			50.279	.9733	2.1708	362.62		97.35			
35											

Plant LOUISIANA PACIFIC NEW WAVERLY, TX,
Sampling Location RTO OUTLET
Test For PM/CO/NOx
Test Operators B. McKNIGHT / L. CARRUTH

RUN No. 3
Date 5-31-95
Time start 1349 end 1450

Meter Box	ANDERSON	No. Sample Pts.	24	Gas Analysis	FURHE
Sample Box	NO. 2	Minutes/Pt.	2.5	CO_2	3.0
Probe/Pitot	6 ft S.S.	NOMOGRAPH		O_2	18
Pitot Cp	.84	ΔH@	1.75	CO	184.3
Nozzle Dia.	.250	Meter Temp.	100	Time	NOx = 31.1
Filter No.		% H_2O	15	Condensate:	
Amb. Temp. °F	88	C-Factor	.84	tare 200 fin 429	
Bar. Press. "Hg	29.55	Stack Temp.	385	Silica gel:	
Static Press. "H_2O	-.98	Ref. ΔP	.82	tare 609 fin +11	

Remarks:

Port Point	El. Time, Min.	DGM Reading, Ft.³	Velocity Head ΔP, in. H_2O	Orifice ΔH in. H_2O	Stack Temp. °F	Meter Temp., °F In	Meter Temp., °F Out	Oven Temp. °F	Imp. Temp. °F	Vac. in. Hg
1	000	993.363	1.30	3.00	341	90	93	251	66	2
2	2 30	995.9	1.50	3.40	383	93	92	249	64	2
3	5 00	998.1	1.30	3.00	378	96	92	259	65	2
4	7 30	000.8	1.30	3.00	338	101	92	253	65	2
5	10 00	003.6	1.10	2.50	357	104	93	256	65	2
6	12 30	005.7	0.98	2.20	357	105	93	254	65	2
7	15 00	007.9	0.80	1.80	391	106	94	250	65	2
8	17 30	009.7	0.75	1.70	344	106	95	252	65	2
9	20 00	012.1	0.75	1.70	351	107	97	252	65	2
10	22 30	013.6	0.70	1.60	321	108	98	253	65	2
11	25 00	015.4	0.58	1.85	325	110	100	252	65	2
12	27 30	017.4	0.55	1.25	321	110	100	253	65	2
1	30 00	019.228	0.58	1.35	351	104	101	259	60	2
2	2 30	020.9	0.58	1.35	365	107	102	259	60	2
3	5 00	022.5	0.60	1.35	393	107	103	249	60	2
4	7 30	024.3	0.60	1.35	334	108	104	253	60	2
5	10 00	025.9	0.65	1.50	338	109	105	255	60	2
6	12 30	027.8	0.75	1.70	377	110	105	247	60	2
7	15 00	029.7	1.20	2.30	363	112	106	252	60	2
8	17 30	031.8	1.40	3.20	336	114	106	254	66	2
9	20 00	034.5	1.50	3.40	337	118	107	254	60	2
10	22 30	037.3	1.40	3.20	332	120	108	256	61	2
11	25 00	039.8	1.40	3.20	325	120	108	250	61	2
12	27 30	042.4	1.50	3.40	326	120	109	247	61	2
	60 00	045.280								
		LEAK CHECK:	.012	→	.015	=	.003	cfm @	"Hg	
			+ pitot v/o	6.1						
			− pitot v/o	6.9						
		51.917	.9787	2.2625	349.33		103.92			

PARTICULATE CATCH ANALYSIS

SAMPLES: L.P. - New Waverly RTO

DATE TAKEN: 5-31-95 DATE ANALYZED: 6-10-94

DELIVERED BY: DCa RECEIVED BY: DCa

ANALYZED BY: DCa

(Attach chain of custody if additional exchanges occur)

FILTERS:

RUN NO.	1	2	3	
FILTER NO.	2788	2743	2744	
FILTER TARE, gms.	.5700	.5705	.5659	
	.5777	.5802	.5766	
	.5777	.5800	.5766	
FINAL WEIGHT, gms.	.5777	.5800	.5766	
NET GAIN, gms.	.0077	.0095	.0107	

PROBE WASH:

RUN NO.	1	2	3	
CONTAINER I.D.	LP New R1	L.P New R1	LP New R1	
VOLUME INTACT?	✓	✓	✓	
VOLUME, ml	90	140	150	
TARE WEIGHT, gms.	(3) 104.6247	(62) 113.1132	(69) 112.5838	( )
	104.6328	113.1197	112.5888	
	104.6325	113.1197	112.5886	
FINAL WEIGHT, gms	104.6325	113.1197	112.5886	
NET GAIN, gms.	.0078	.0065	.0048	
LESS BLANK, gms.				

PARTICULATE SAMPLE WEIGHT:

RUN NO.	1	2	3	
filter + probe, mg.	15.5	16.0	15.5	

BACK HALF PARTICULATE CATCH ANALYSIS

Methylene Chloride Extraction

SAMPLES: L.P. - New Waverly RTO exhaust

DATE TAKEN: 5-31-95 DATE ANALYZED: 6-10-95

DELIVERED BY: DER RECEIVED BY: DER

ANALYZED BY: DER

(Attach chain of custody if additional exchanges occur)

RUN NO.	1	2	3	
CONTAINER I.D.	LPNWR1 BAK	LPNEWR2BAK	LPNEWR3BAK	
VOLUME INTACT?	✓	✓	✓	
VOLUME, ml	350	440	445	

Organic Fraction

	(4)	(45)	(85)	( )
TARE WEIGHT, gms.	108.4536	107.2474	109.1504	
	108.4552	107.2510	109.1523	
	108.4555	107.2508	109.1527	
FINAL WEIGHT, gms.	108.4555	107.2508	109.1527	
less blank, gms.				
NET GAIN, milligrams	1.9	3.4	2.3	

Aqueous Fraction

	(56)	(65)	(71)	( )
TARE WEIGHT, gms.	105.8149	114.7804	115.8206	
	105.8184	114.7850	115.8222	
	105.8184	114.7847	115.8218	
FINAL WEIGHT, gms.	105.8184	114.7847	115.8218	
less blank, gms.				
NET GAIN, milligrams	3.5	4.3	1.2	

Plant: LOUISIANA PACIFIC NEW WAVERLY TX
Sampling Location: RTO DRYER EXHAUST
Test For: HCHO/VOC
Test Operators: B. McKNIGHT / L. CARRUTH

RUN No. 4
Date 5-31-95
Time start 1649 end 2114

Meter Box	KNOBERN	No. Sample Pts.	12X2	Gas Analysis	Fyrite
Sample Box	No. 4	Minutes/Pt.	2.5	CO_2	2.0
Probe/Pitot	6 ft HP	NOMOGRAPH		O_2	18.5
Pitot Cp	.84	ΔH@	1.75	CO	
Nozzle Dia.	.260 qtz	Meter Temp.	100	Time	
Filter No.		% H_2O	15	Condensate:	
Amb. Temp. °F	85	C-Factor	.84	tare REMARKS	fin
Bar. Press. "Hg	29.55	Stack Temp.	375	Silica gel:	
Static Press. "H_2O	-.98	Ref. ΔP	.020	tare	fin

Remarks:

impingers:	Tare	Final
1) DNPH	589	736
2) DNPH	576	634
3) MT	494	503
4) S.Gel	684	704

DRYERS WENT DOWN @ 1720

Port	Point	El. Time, Min.	DGM Reading, Ft.³	Velocity Head ΔP, in. H_2O	Orifice ΔH in. H_2O	Stack Temp. °F	Meter Temp., °F In	Meter Temp., °F Out	Oven Temp. °F	Imp. Temp. °F	Vac. in. Hg
1	1	000	045.556	1.30	3.40	404	87	85	N/A	65	2
	2	230	047.3	1.30	3.40	338	87	85		65	2
	3	500	050.0	1.20	3.20	396	93	85		63	2
	4	730	053.1	1.10	2.95	345	99	86		60	2
	5	1000	054.8	1.10	2.95	355	101	87		60	2
	6	1230	057.2	1.00	2.60	357	103	88		60	2
	7	1500	059.7	0.85	2.20	358	105	90		60	2
	8	1730	061.7	0.73	1.90	395	105	92		59	2
	9	2000	063.8	0.68	1.80	397	106	93		59	2
	10	2230	045.8	0.70	1.85	335	108	95		59	2
	11	2500	067.7	0.65	1.70	315	107	96		59	2
	12	2730	069.7	0.65	1.70	310	107	94		59	2
2	1	30/00	071.710	0.50	1.30	366	78	76		55	2
	2	230	073.1	0.54	1.40	356	82	77		58	2
	3	500	074.5	0.56	1.50	367	86	77		58	2
	4	730	076.2	0.58	1.55	411	91	78		58	2
	5	1000	078.1	0.60	1.60	408	94	77		58	2
	6	1230	079.7	0.64	1.65	364	97	81		57	2
	7	1500	081.3	0.92	2.40	355	102	83		58	2
	8	1730	083.3	1.10	2.90	402	105	85		58	2
	9	2000	085.9	1.05	2.80	325	106	87		58	2
	10	2230	088.4	1.30	3.40	385	108	89		60	2
	11	2500	091.1	1.50	4.00	359	110	91		60	2
	12	2730	093.6	1.30	3.40	376	111	91		60	2
	END	60/00	096.512								

LEAK CHECK: .076 → .086 = .010 [illegible]

+ pitot
− pitot

50.956

50.956 .9412 2.3979 364.13 92.67

Plant L.P - New Waverly, Tx
Sampling Location Dryers RTO Exhaust
Test For HCHO/VOC
Test Operators Russell / Carroll G. McKnight

RUN No. ~~5-3~~ 5
Date 6-01-95
Time start 0855 end 1004

Meter Box	Anderson	No. Sample Pts.	12x2	Gas Analysis	Fyrite
Sample Box	No.3	Minutes/Pt.	2.5	CO_2	3.5
Probe/Pitot	6' teflon	NOMOGRAPH		O_2	17.5
Pitot Cp	.84	ΔH@	1.75	CO	
Nozzle Dia.	260 Qtz	Meter Temp.		Time	
Filter No.		% H_2O		Condensate:	
Amb. Temp. °F	67	C-Factor		tare Rea fin	
Bar. Press. "Hg	29.52	Stack Temp.		Silica gel:	
Static Press. "H_2O	-.98	Ref. ΔP	.70	tare fin	

Remarks:

impingers	Tare	Final
1) DNPH	595	767
2) DNPH	586	654
3) MT	494	507
4) S. Gel	692	712

Φ .260 Qtz
Θ .260
Ø .260

Port Point	El. Time, Min.	DGM Reading, Ft.³	Velocity Head ΔP, in. H_2O	Orifice ΔH in. H_2O	Stack Temp. °F	Meter Temp., °F In	Meter Temp., °F Out	Oven Temp. °F	Imp. Temp. °F	Vac in. Hg
1	000	097.557	1.40	3.70	340	74	74	N/A	67	2
2	230	099.9	1.35	3.60	409	78	73		61	2
3	500	102.9	1.35	3.60	348	84	74		62	2
4	730	105.4	1.20	3.20	404	90	75		61	2
5	1000	108.2	1.05	2.80	351	93	77		60	2
6	1230	110.4	1.05	2.80	359	95	78		60	2
7	1500	112.6	0.78	2.10	355	97	79		62	2
8	1730	115.0	0.75	2.00	349	97	82		62	2
9	2000	116.8	0.67	1.75	391	98	83		62	2
10	2230	118.7	0.73	1.90	390	98	85		62	2
11	2500	120.8	0.57	1.50	375	99	87		62	2
12	2730	122.4	0.63	1.65	375	98	88		62	2
1	30/00	124.283	0.50	1.30	369	89	90		62	2
2	230	126.2	0.56	1.50	409	91	91		62	2
3	500	127.6	0.59	1.55	404	92	91		62	2
4	730	129.4	0.60	1.60	347	93	91		62	2
5	1000	131.3	0.64	1.70	380	95	91		62	2
6	1230	133.0	0.65	1.75	385	97	92		62	2
7	1500	134.9	1.25	3.25	379	100	92		62	2
8	1730	137.2	1.10	2.90	345	104	93		62	2
9	2000	139.7	1.30	3.40	335	106	94		62	2
10	2230	142.5	1.30	3.40	325	109	95		63	2
11	2500	144.7	1.40	3.70	320	110	96		63	2
12	2730	147.8	1.40	3.70	321	111	97		63	2
END	60/00	150.852								

LEAK CHECK: .025 → .029 = .004 Gm @ 4 Hg

+ pitot ✓ @
− pitot ✓ @

		53.295	.9600	2.5146	365.21		90.96			

Plant Louisiana Pacific - New Waverly OSB
Sampling Location Dryers ~~OSB~~ RTO
Test For HCHO / VOC
Test Operators Russell / B. McKinight / Carroll

RUN No. 6
Date 6-1-95
Time start 1031 end 1133

Meter Box	Andersen	No. Sample Pts.	12x2	Gas Analysis	Fyrite
Sample Box	No. 4	Minutes/Pt.	2.5	CO_2	3.5
Probe/Pitot	6' teflon	NOMOGRAPH		O_2	17.5
Pitot Cp	.84	ΔH@	1.75	CO	
Nozzle Dia.	.260 QTZ	Meter Temp.		Time	
Filter No.	N/A	% H_2O		Condensate:	
Amb. Temp. °F	74	C-Factor		tare	fin
Bar. Press. "Hg	29.52	Stack Temp.		Silica gel:	
Static Press. "H_2O	-.98	Ref. ΔP	0.70	tare	fin

Remarks:

impingers:	tare	fined
1) DNPH	597	747
2) DNPH	576	620
3) MT	494	502
4) S.Gel	681	699

Port Point	El. Time, Min.	DGM Reading, Ft.³	Velocity Head ΔP, in. H_2O	Orifice ΔH in. H_2O	Stack Temp. °F	Meter Temp., °F In	Meter Temp., °F Out	Oven Temp. °F	Imp. Temp. °F	Vac in. Hg
1 1	000	151.368	1.35	3.50	387	87	87	N/A	65	2
2	230	.	1.30	3.40	352	87	90		65	2
3	500	153.8	1.30	3.40	344	91	90		65	2
4	730	156.5	1.10	2.90	382	96	89		65	2
5	1000	158.9	1.00	2.60	365	98	91		65	2
6	1230	161.2	1.00	2.60	408	101	90		65	2
7	1500	163.0	0.80	2.10	391	102	91		65	2
8	1730	165.8	0.74	2.00	374	103	92		65	2
9	2000	167.7	0.74	2.00	380	103	93		65	2
10	2230	169.8	0.66	1.70	375	104	94		65	2
11	2500	171.8	0.66	1.70	360	104	95		65	2
12	2730	173.6	0.66	1.70	345	104	96		65	2
2 1	3000	175.717	0.50	1.30	390	101	97		65	2
2	230	177.2	0.55	1.45	394	102	98		65	2
3	500	179.0	0.60	1.60	348	102	99		65	2
4	730	180.9	0.63	1.70	345	103	99		65	2
5	1000	182.6	0.63	1.70	366	104	100		65	2
6	1230	184.3	0.65	1.70	364	105	100		65	2
7	1500	186.2	0.99	2.60	378	106	101		65	2
8	1730	188.5	1.10	2.90	367	110	102		65	2
9	2000	190.9	1.50	4.00	350	112	103		65	2
10	2230	193.8	1.50	4.00	367	115	104		65	2
11	2500	196.6	1.20	3.20	360	117	104		65	2
12	2730	199.2	1.40	3.80	355	116	105		65	2
END	4000	202.330								

leak check: .002 → .004 = .002 cfm @ 6" Hg
pitot +ve
pitot -ve

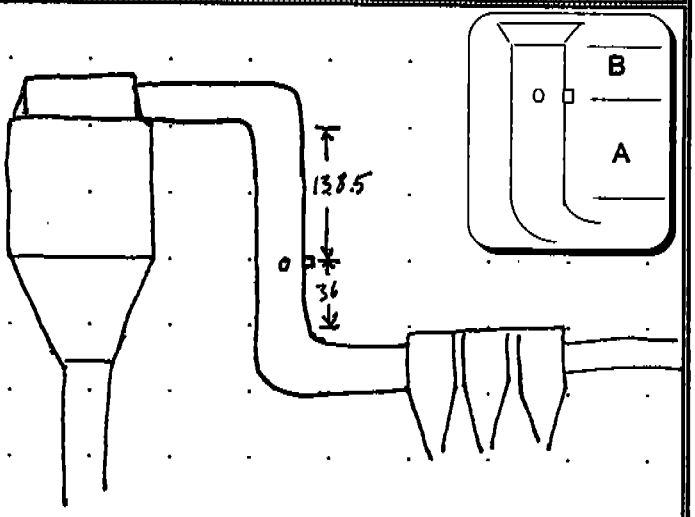
50.962	.9555	2.4813	368.63		99.65

RTO INLET

STACK CONFIGURATION AND SAMPLE POINT LAYOUT FOR CIRCULAR STACKS

PLANT: Louisiana Pacific - New Waverly **Date:**
SOURCE: DRYERS RTO INLET
TEST FOR: PM Setup
TEST OPERATORS: Russum

SKETCH OF STACK



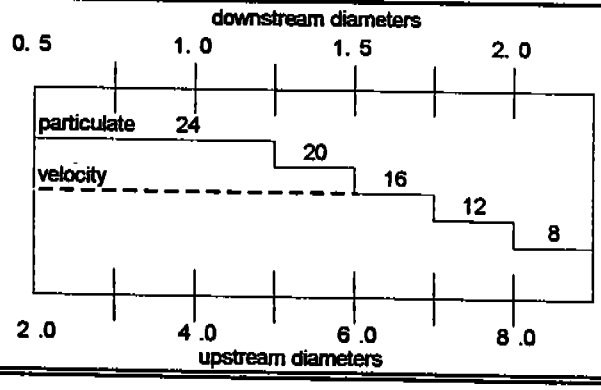
PERCENT OF DIAMETER

point no.	points on a diameter: 2	4	6	8	10	12	14	16
1	14.6	6.7	4.4	3.2	2.6	2.1	1.8	1.6
2	85.4	25.0	14.6	10.5	8.2	6.7	5.7	4.9
3		75.0	29.6	19.4	14.6	11.8	9.9	8.5
4		93.3	70.4	32.3	22.6	17.7	14.6	12.5
5			85.4	67.7	34.2	25.0	20.1	16.9
6			95.6	80.6	65.8	35.6	26.9	22.0
7				89.5	77.4	64.4	36.6	28.3
8				96.8	85.4	75.0	63.4	37.5
9					91.8	82.3	73.1	62.5
10					97.4	88.2	79.9	71.7
11						93.3	85.4	78.0
12						97.9	90.1	83.1
13							94.3	87.5
14							98.2	91.5
15								95.1
16								98.4

Point No.	Inches from wall	velocity head
1	.9	1.7 <5°
2	2.8	1.7
3	4.9	1.5
4	2.3	1.4
5	10.4	1.3
6	14.8	1.3
7	26.7	
8	31.1	1.4
9	34.2	
10	36.6	1.8
11	38.7	
12	40.6	

STACK DIAMETER:	41.5
Distance from ports to disturbance:	
A. to upstream disturbance	138.5
B. to downstream disturbance	36
Upstream diameters:	3.3
Downstream diameters:	.86
Minimum No. sample points required:	24
No. sample points selected:	12x2
Port Length:	5"
Port Type:	3" Nipple
Port Access:	MANRAILS / MANLIFT

MINIMUM NO. OF POINTS ON A DIAMETER



Pitot ID: Pitot Cp: Stack Temp: 180

Remarks:

Plant: LOUISIANA PACIFIC NEW WAVERLY, TX.
Sampling Location: RTO INLET
Test For: PM / CO / NOx
Test Operators: B. McKNIGHT / G. McKNIGHT

RUN No. 1
Date 5-31-95
Time start 0932 end 1047

Meter Box	RAC	No. Sample Pts.	24 (12x2)	Gas Analysis	
Sample Box	NO.2	Minutes/Pt.	2.5	CO_2	2.5
Probe/Pitot	5 ft. S.S.			O_2	18.0
Pitot Cp	.84	NOMOGRAPH		CO	258 ppm
Nozzle Dia.	.210	ΔH@	1.90	Time	NOx = 27.8 ppm
Filter No.	21	Meter Temp.	100		
		% H_2O	21	Condensate:	
Amb. Temp. °F	75	C-Factor	.81	tare 200	fin 359
Bar. Press. "Hg	29.55	Stack Temp.	180	Silica gel:	
Static Press. "H_2O	-10	Ref. ΔP	1.3	tare 692.5	fin 715

Remarks:
PLUGGED FILTER
stopped @ 911.462
START @ 911.664
LEAK CHECK .001 cfm @ 5" Hg

Port Point	El. Time, Min.	DGM Reading, Ft.³	Velocity Head ΔP, in. H_2O	Orifice ΔH in. H_2O	Stack Temp. °F	Meter Temp. °F In	Meter Temp. °F Out	Oven Temp. °F	Imp. Temp. °F	Vac. in. Hg
1	0000	892.544	1.60	2.30	204	75	76	252	60	2
2	230	894.5	1.70	2.40	203	81	76	250	60	2
3	500	896.6	1.50	2.15	196	80	77	251	60	2
4	730	898.7	1.40	2.00	190	86	79	252	60	2
5	1000	900.5	1.30	1.85	181	87	79	252	60	2
6	1230	902.4	1.10	1.55	176	90	80	254	60	2
7	1500	904.1	1.30	1.85	180	94	78	252	60	2
8	1730	906.0	1.60	2.30	177	97	82	256	60	2
9	2000	908.2	1.70	2.40	175	100	80	250	59	2
10	2230	909.9	1.90	2.60	175	100	81	250	59	2
11	2500	912.1	1.30	1.85	175	100	81	252	59	2
12	2730	913.9	1.80	2.60	174	100	86	250	59	2
1	3000	916.248	2.10	3.05	181	100	88	240	59	2
2	230	918.7	2.20	3.20	180	102	86	253	59	2
3	500	920.9	2.10	3.05	180	105	89	257	59	2
4	730	923.9	1.80	2.60	182	111	86	251	59	2
5	1000	925.6	1.40	2.30	184	113	91	216	59	2
6	1230	928.7	1.70	2.40	181	117	91	253	59	2
7	1500	930.0	1.30	1.85	185	117	92	255	59	2
8	1730	931.9	1.30	1.85	190	117	92	251	59	2
9	2000	933.7	1.00	1.40	201	119	92	253	58	2
10	2230	935.5	1.00	1.46	120	123	93	257	58	2
11	2500	937.1	1.10	1.60	200	123	93	252	58	2
12	2730	938.7	1.10	1.60	198	119	93	249	58	2
end	6000	940.634								
		48.090	1.2237	2.1729	182.29		93.69			

LEAK CHECK: .030 → .033 = .003 cfm @ 7" Hg

+ pitot ✓ @ 6.0
− pitot ✓ @ 7.0

Plant L.P New waverly, Tx.
Sampling Location RTO INLET
Test For PM/CO/NOx
Test Operators B. McKnight / G. McKnight

RUN No. 2
Date 5-31-95
Time start 1208 end 1310

Meter Box	RAC	No. Sample Pts.	12X2	Gas Analysis			Remarks:
Sample Box	No. 1	Minutes/Pt.	2.5	CO_2	1.5		
Probe/Pitot	5 ft S.S			O_2	18.5		
Pitot Cp	.84	NOMOGRAPH		CO	259 ppm		
Nozzle Dia.	.185	ΔH@	1.90	Time	1028.3		
Filter No.		Meter Temp.	100				
		% H_2O	21	15	Condensate:		
Amb. Temp. °F	75°	C-Factor	.81	0.9	tare 200	fin 381	
Bar. Press. "Hg	29.55	Stack Temp.	180	180	Silica gel:		
Static Press. "H_2O	-10.00	Ref. ΔP	2.35	1.95	tare 690	fin 700	

Port Point	El. Time, Min.	DGM Reading, Ft.³	Velocity Head ΔP, in. H_2O	Orifice ΔH in. H_2O	Stack Temp. °F	Meter Temp., °F In	Meter Temp., °F Out	Oven Temp. °F	Imp. Temp. °F	Vac. in. Hg
1	0:00	940.889	1.80	1.40	197	85	85	248	60	2
2	2:30	942.9	2.20	1.75	194	86	85	249	60	2
3	5:00	944.6	2.00	1.60	190	89	87	252	60	2
4	7:30	946.4	1.80	1.40	186	90	86	249	60	2
5	10:00	948.1	1.60	1.30	184	94	86	249	60	2
6	12:30	949.8	1.60	1.30	180	97	87	249	60	2
7	15:00	951.4	1.30	1.00	177	100	88	249	60	2
8	17:30	953.0	1.20	1.15	174	104	89	252	60	2
9	20:00	954.4	1.20	1.15	172	105	89	253	60	2
10	22:30	955.9	0.97	0.90	168	109	91	253	60	2
11	25:00	957.3	1.10	1.05	170	110	91	249	60	2
12	27:30	958.8	1.10	1.05	169	111	92	249	60	2
1	30:00	960.338	1.80	1.70	174	111	93	253	60	2
2	2:30	961.9	1.60	1.50	177	113	95	248	60	2
3	5:00	963.7	1.50	1.40	177	114	96	251	60	2
4	7:30	965.5	1.30	1.25	180	118	97	248	60	2
5	10:00	967.2	1.30	1.25	178	117	97	250	60	2
6	12:30	968.8	1.30	1.25	180	120	99	252	60	2
7	15:00	970.2	1.50	1.40	180	121	99	251	60	2
8	17:30	972.0	1.40	1.30	180	123	100	253	60	2
9	20:00	973.5	1.40	1.30	181	124	100	251	60	2
10	22:30	975.1	1.50	1.40	179	125	101	246	60	2
11	25:00	976.6	1.50	1.40	183	126	103	250	60	2
12	27:30	978.4	1.40	1.30	184	127	101	257	60	2
end	60:00	979.974								
		Leak check: .060 → .062			= .002 cfm @ 6 "Hg					
		+ pitot ✓ @								
		− pitot ✓ @								
		38.985	1.2083	1.3125	179.25		101.17			

Plant: L.P New Waverly, Tx.
Sampling Location: RTO Inlet
Test For: PM / CO / Nox
Test Operators: B. McKnight / G. McKnight

RUN No. 3
Date 5-31-95
Time start 1347 end 1445

Meter Box	RAC	No. Sample Pts.	24 (12x2)	Gas Analysis	
Sample Box	NO. 3	Minutes/Pt.	2.5	CO_2	3.0
Probe/Pitot	5 ft S.S			O_2	17.0
Pitot Cp	.84	NOMOGRAPH		CO	3.09
Nozzle Dia.	~~.210~~ .185	ΔH@	1.90	Time	NOx = 33.0
Filter No.		Meter Temp.	100		
		% H_2O	15	Condensate:	
Amb. Temp. °F	78°	C-Factor	0.9	tare 200 fin 384	
Bar. Press. "Hg	29.55	Stack Temp.	180	Silica gel:	
Static Press. "H_2O	-10	Ref. ΔP	1.95	tare 615 fin 630	

Remarks:

Port Point	El. Time, Min.	DGM Reading, Ft.³	Velocity Head ΔP, in. H_2O	Orifice ΔH in. H_2O	Stack Temp. °F	Meter Temp., °F In	Meter Temp., °F Out	Oven Temp. °F	Imp. Temp. °F	Vac. in. Hg
1	0 00	980.650	1.20	1.15	173	100	98	256	69	2
2	2 30	982.1	1.40	1.30	174	104	98	251	69	2
3	5 00	983.7	1.70	1.60	174	107	96	250	69	2
4	7 30	985.3	1.50	1.40	172	106	98	247	69	2
5	10 00	987.6	1.30	1.20	175	110	101	259	69	2
6	12 30	989.0	1.30	1.20	171	117	96	248	69	2
7	15 00	990.2	1.40	1.30	170	113	100	253	69	2
8	17 30	991.8	1.50	1.40	171	119	105	248	69	2
9	20 00	993.5	1.40	1.30	172	118	107	249	69	2
10	22 30	995.1	1.80	1.70	173	121	100	253	69	2
11	25 00	997.2	1.50	1.40	172	120	100	256	69	2
12	27 30	998.5	1.80	1.70	175	121	105	256	69	2
1	30 00	000.460	1.30	1.20	177	122	102	256	69	2
2	2 30	002.1	1.40	1.55	180	122	105	256	69	2
3	5 00	003.8	1.70	1.60	180	125	108	257	69	2
4	7 30	005.5	1.50	1.40	185	125	107	256	69	2
5	10 00	007.3	1.40	1.30	185	127	105	255	68	2
6	12 30	008.9	1.30	1.20	185	125	105	250	68	2
7	15 00	010.6	1.50	1.40	182	126	107	256	68	2
8	17 30	012.2	1.50	1.40	184	130	108	256	68	2
9	20 00	013.8	1.50	1.40	184	130	107	256	68	2
10	22 30	015.5	1.40	1.50	182	133	108	257	68	2
11	25 00	017.2	1.50	1.40	182	131	108	253	68	2
12	27 30	018.9	1.50	1.40	180	131	109	253	68	2
End	60 00	020.853								
		49.203	1.2180	1.3917	177.42		111.71			

Leak check: .031 → .035 = .004 cfm @ 8 "Hg

+ pitot ✓ @ 0.1
− pitot ✓ @ 0.2

PARTICULATE CATCH ANALYSIS

SAMPLES: L.P. - New Waverly RTO Outlet

DATE TAKEN: 5-31-95 DATE ANALYZED: 6-9-95

DELIVERED BY: DSR RECEIVED BY: DSR

ANALYZED BY: DSR

(Attach chain of custody if additional exchanges occur)

FILTERS:

RUN NO.	1		2	3	
FILTER NO.	2742	2741	2787	2745	
FILTER TARE, gms.	.5754	.5704	.5699	.5676	
	.6856	.6176	.7400	.7657	
	.6857	.6176	.7399	.6756	
FINAL WEIGHT, gms.	.6857	.6176	.7399	.7656	
NET GAIN, gms.	.1103	.0472	.1700	.1980	

PROBE WASH:

RUN NO.	1	2	3	
CONTAINER I.D.	L.P.N.N. R1	L.P.NN R2	LP NN R3	
VOLUME INTACT?	✓	✓	✓	
VOLUME, ml	220	230	200	
TARE WEIGHT, gms.	(E) 99.1369	(89) 106.4091	(91) 102.7993	( )
	99.2303	106.4866	102.8808	
	99.2306	106.4854	102.8804	
		106.4858		
FINAL WEIGHT, gms	99.2306	106.4858	102.8804	
NET GAIN, gms.	.0937	.0767	.0811	
LESS BLANK, gms.				

PARTICULATE SAMPLE WEIGHT:

RUN NO.	1	2	3	
filter + probe, mg.	251.2	246.7	279.1	

BACK HALF PARTICULATE CATCH ANALYSIS

Methylene Chloride Extraction

SAMPLES: L.P. New Waverly RTO Inlet

DATE TAKEN: 5-31-95 DATE ANALYZED: 6-9-95

DELIVERED BY: DER RECEIVED BY: DER

ANALYZED BY: DER

(Attach chain of custody if additional exchanges occur)

RUN NO.	1	2	3	
CONTAINER I.D.	LPNN R1 BAK	LPNN R2 BAK	LPNN R3 BAK	
VOLUME INTACT?	✓	✓	✓	
VOLUME, ml	360	400	400	

Organic Fraction

	(61)	(62)	(63)	( )
TARE WEIGHT, gms.	113.9845	113.1125	112.5352	
	113.9907	113.1152	112.5404	
	113.9907	113.1149	112.5400	
FINAL WEIGHT, gms.	113.9907	113.1149	112.5400	
less blank, gms.				
NET GAIN, milligrams	6.2	2.4	4.8	

Aqueous Fraction

	(T)	(U)	(V)	( )
TARE WEIGHT, gms.	107.3574	98.0019	101.6861	
	107.3586	98.0033	101.6867	
	107.3581	98.0034	101.6869	
FINAL WEIGHT, gms.	107.3581	98.0034	101.6869	
less blank, gms.				
NET GAIN, milligrams	0.7	1.5	0.8	

Plant L.P New Waverly, TX
Sampling Location RTO INLET
Test For HCOH / VOC
Test Operators D. McKnight / G. McKnight

RUN No. 1
Date 5-31-95
Time start 1650 end 2113

Meter Box	RAC
Sample Box	NO. 1
Probe/Pitot	4 ft. tef
Pitot Cp	.84
Nozzle Dia.	.205 qtz
Filter No.	
Amb. Temp. °F	85
Bar. Press. "Hg	29.55
Static Press. "H_2O	-10

No. Sample Pts.	24 (12x2)
Minutes/Pt.	2.5
NOMOGRAPH	
ΔH@	1.90
Meter Temp.	100
% H_2O	15
C-Factor	.90
Stack Temp.	175
Ref. ΔP	1.4

Gas Analysis

CO_2	3.0
O_2	17.0
CO	
Time	

Condensate: REMARKS
tare 200 fin
Silica gel:
tare fin

Remarks:

impingers	tare	final
1) DNPH	593	751
2) DNPH	577	611
3) MT	462	465
4) S. GEL	668	685

⊕ .205
⊖ .205 } Dn = .205
⊘ .205

Port Point	El. Time, Min.	DGM Reading, Ft.³	Velocity Head ΔP, in. H_2O	Orifice ΔH in. H_2O	Stack Temp. °F	Meter Temp., °F In	Meter Temp., °F Out	Oven Temp. °F	Imp. Temp. °F	Vac in. Hg
1	0 00	021.148	0.80	1.05	183	89	90	2N/A	60	2
2	2 30	022.8	1.50	2.00	187	90	89		60	2
3	5 00	024.7	1.50	2.00	189	92	90		60	2
4	7 30	026.5	1.60	2.10	180	97	92		60	2
5	10 00	028.8	1.30	1.70	193	100	84		60	2
6	12 30	030.2	1.20	1.60	195	103	90		60	2
7	15 00	032.1	1.40	1.85	198	106	90		60	2
8	17 30	033.7	1.50	1.95	199	109	91		60	2
9	20 00	035.7	1.50	1.95	204	113	97		60	2
10	22 30	037.7	1.60	2.10	190	115	93		60	2
11	25 00	039.5	1.60	2.05	201	117	93		59	2
12	27 30	041.6	1.90	2.50	190	115	93		58	2
1	30 00	043.890	1.50	1.95	209	80	77		58	2
2	2 30	045.7	1.70	2.20	201	81	78		58	2
3	5 00	047.5	1.60	2.10	194	82	78		58	2
4	7 30	049.3	1.30	1.70	184	82	78		58	2
5	10 00	051.7	1.30	1.70	179	89	84		58	2
6	12 30	053.0	1.10	1.45	176	93	80		58	2
7	15 00	054.6	1.20	1.60	173	96	80		58	5
8	17 30	056.3	1.30	1.70	173	103	99		58	5
9	20 00	058.0	1.50	2.00	175	107	85		58	5
10	22 30	059.6	1.30	1.70	175	111	85		58	5
11	25 00	061.1	1.10	1.45	168	109	89		58	5
12	27 30	062.5	1.10	1.45	158	112	88		58	5
end	60 00	064.054								

LEAK CHECK .055 → .057 = .002 cfm @ 6 in/Hg

+ pitot @ 6.8
− pitot @ 7.2

42.906 1.1753 1.8271 186.42 93.42

Plant L.P New Waverly, Tx.
Sampling Location RTO Inlet
Test For HCHO / VOC
Test Operators ~~B. McKnight / G. McKnight~~ Russell / Carrutt

RUN No. 5
Date 6-01-95
Time start 0854 end 1004

Meter Box	RAC
Sample Box	No. 2
Probe/Pitot	4' teflon
Pitot Cp	.87
Nozzle Dia.	.205
Filter No.	
Amb. Temp. °F	67
Bar. Press. "Hg	29.52
Static Press. "H_2O	-10

No. Sample Pts.	24 (12x2)
Minutes/Pt.	2.5
NOMOGRAPH	
ΔH@	1.90
Meter Temp.	100
% H_2O	15
C-Factor	.90
Stack Temp.	175
Ref. ΔP	1.4

Gas Analysis F pite

CO_2	2.5		
O_2	18		
CO			
Time			

Condensate:
tare 200 fin
Silica gel:
tare fin

Remarks:

impingers	Tare	fin
DNPH	575	702
DNP	604	714
MT	483	489
S. GEL	704	721

Port Point	El. Time, Min.	DGM Reading, Ft.³	Velocity Head ΔP, in. H_2O	Orifice ΔH in. H_2O	Stack Temp. °F	Meter Temp., °F In	Meter Temp., °F Out	Oven Temp. °F	Imp. Temp. °F	Vac. in. Hg
1	0 00	067.981	1.60	2.25	182	74	73	N/A	66	2
2	2 30	070.3	1.50	2.00	186	76	74		60	2
3	5 00	072.3	1.45	1.90	186	80	74		60	2
4	7 30	074.0	1.40	1.85	186	82	73		60	2
5	10 00	076.3	1.30	1.70	187	84	75		60	2
6	12 30	077.8	1.05	1.40	188	87	75		62	2
7	15 00	079.3	1.50	2.00	189	91	75		62	2
8	17 30	081.1	1.45	1.90	188	95	77		62	2
9	20 00	082.9	1.50	2.00	185	99	79		62	2
10	22 30	084.5	1.70	2.20	185	100	77		62	2
11	25 00	086.4	1.70	2.20	185	104	77		62	2
12	27 30	078.3	1.70	2.20	180	107	84		62	2
1	30 00	090.461	1.50	2.00	204	102	88		62	2
2	2 30	092.5	1.60	2.10	208	106	87		64	2
3	5 00	094.5	1.60	2.10	209	109	87		64	2
4	7 30	096.5	1.50	2.00	206	110	89		64	2
5	10 00	098.3	1.25	1.65	201	113	90		64	2
6	12 30	100.1	1.20	1.10	203	116	91		64	2
7	15 00	101.8	1.70	2.20	202	118	89		64	2
8	17 30	104.0	1.50	2.00	201	119	92		64	2
9	20 00	105.8	1.60	2.25	203	123	93		64	2
10	22 30	108.0	1.40	1.85	200	122	95		64	2
11	25 00	109.9	1.50	2.00	197	124	96		65	2
12	27 30	111.7	1.50	2.00	200	125	97		65	2
end	60 00	113.914								

LEAK CHECK: .095 → .097 = .002 cfm @ 6" Hg

+ pitot to 6.8
− pitot to 6.5

45.933 1.2178 1.9521 194.21 93.19

Plant: Louisiana Pacific - New Waverly OSB
Sampling Location: Dryer RTO Inlet
Test For: VOC / HCHO
Test Operators: B. McKnight / G. McKnight

RUN No. 6
Date 8-01-95
Time start 1030 end 1132

Meter Box	RAC	No. Sample Pts.	24 (12x2)	Gas Analysis	
Sample Box	No. 1	Minutes/Pt.	2.5	CO_2	
Probe/Pitot	5 ft S.S	NOMOGRAPH		O_2	
Pitot Cp	.84	ΔH@	1.90	CO	
Nozzle Dia.	.185	Meter Temp.	100	Time	
Filter No.		% H_2O	15	Condensate:	
Amb. Temp. °F	70	C-Factor	90	tare	fin
Bar. Press. "Hg	29.55	Stack Temp.	175	Silica gel:	
Static Press. "H_2O	-10	Ref. ΔP	1.4	tare	fin

Remarks:

impingers	tare	Final
1) DNPH	600	679
2) DNPH	576	676
3) MT	462	492
4) S. Gel	694	710

ID 185
O 185
O 185

Port Point	El. Time, Min.	DGM Reading, Ft.³	Velocity Head ΔP, in. H_2O	Orifice ΔH in. H_2O	Stack Temp. °F	Meter Temp., °F In	Meter Temp., °F Out	Oven Temp. °F	Imp. Temp. °F	Vac in. Hg
1	5 00	114.181	1.80	2.40	188	100	96	N/A	60	2
2	2 30	115.6	1.60	2.10	184	102	97		60	2
3	5 00	117.7	1.50	2.00	186	105	96		60	2
4	7 30	119.7	1.30	1.90	187	108	96		60	2
5	10 00	121.5	1.30	1.70	188	110	97		60	2
6	12 30	123.2	1.30	1.70	191	113	96		60	2
7	15 00	124.8	1.60	2.10	191	114	97		60	2
8	17 30	127.3	1.50	2.00	191	119	98		60	2
9	20 00	129.2	1.50	2.00	190	121	99		60	2
10	22 30	131.5	1.60	2.10	189	124	100		60	2
11	25 00	133.6	1.50	2.00	186	126	100		60	2
12	27 30	136.0	1.50	2.00	184	128	101		60	2
1	30 00	138.166	1.70	2.10	181	125	102		60	2
2	2 30	140.0	2.00	2.60	182	126	102		60	2
3	5 00	142.3	2.00	2.60	181	127	103		60	2
4	7 30	144.5	1.90	2.55	179	128	104		60	2
5	10 00	146.8	1.90	2.55	179	129	104		60	2
6	12 30	149.0	1.50	2.00	179	131	105		60	2
7	15 00	151.1	1.40	1.80	180	132	105		60	2
8	17 30	153.4	1.00	1.30	181	132	106		60	2
9	20 00	155.0	1.00	1.30	180	132	106		60	2
10	22 30	156.9	1.20	1.60	180	133	107		60	2
11	25 00	158.7	1.20	1.60	180	135	108		60	2
12	27 30	160.5	1.20	1.60	179	131	108		60	2
end	60 00	162.388								

leak check: .093 → .098 = .005 cfm @ 6" Hg

pitot + ✓
pitot − ✓

48.207 | 1.2193 | 1.9250 | 184.17 | 111.25

APPENDIX B.

CALIBRATION DATA

DRY GAS METER CALIBRATION

Meter ID	Andersen		
Calibration Method	DGM/DGM	**By**	DGR
Calibration Meter ID	651729	**Pbar**	30.05
Date	2/18/95		

Vac. in. Hg	DH in. H2O	Time min	Calibrating Meter Vi ft³	Vf ft³	Temp °F	Field Meter Vi ft³	Vf ft³	Temp. in init.	Temp. in final	Temp out init.	Temp out final	Y	Q	K	DH@
1	5.00	10.00	705.781	718.433	70	142.259	154.458	55	82	55	62	1.012	1.22	0.713	1.810
1	4.00	14.00	718.433	734.176	70	154.458	169.964	72	88	62	73	1.013	1.11	0.716	1.798
1	3.00	14.00	734.176	747.841	70	169.964	183.706	83	88	73	80	1.008	0.98	0.724	1.755
1	2.00	15.00	747.841	759.444	70	183.706	195.595	84	86	80	83	0.995	0.79	0.707	1.841
1	1.00	17.50	759.444	769.343	70	195.595	205.763	86	84	82	85	0.997	0.58	0.734	1.711
Averages:												**1.00**			**1.78**

Y = [Vcal)(Pbar)(Tdgm)]/[(Vdgm)(Pm)(Tcal)]

K = Q(sqrt((Pm Mm)/((Tm out)(DH))

Q = ((Vmi-Vmf)/min.)(TM,out/Tm,avg)(Y)

DH@ = 0.921/K^2

Where:

Y = Meter correction factor, dimensionless

Vcal = Volume of gas through calibrating meter, cubic feet

Vdgm = Volume of gas through field dry gas meter, cubic feet

Pbar = Barometric pressure, in. Hg

Pm = Meter pressure, (Pbar = DH/13.6)

Tdgm = Average dry gas meter temp, degrees R

Tcal = Temperature of gas at calibrating meter, degrees R

DRY GAS METER CALIBRATION

Meter ID Andersen

Calibration Method DGM/DGM **By** WBM

Calibration Meter ID 651729 **Pbar** 29.95

Date 7/14/95

Vac. in. Hg	DH in. H2O	Time min	Calibrating Meter Vi ft³	Vf ft³	Temp °F	Field Meter Vi ft³	Vf ft³	Temp. in Init.	Temp. in Final	Temp out Init.	Temp out Final	Y	Q	K	DH@
2	2.00	15.00	483.913	496.161	74	364.061	376.451	86	105	85	88	1.015	0.83	0.74	1.668
2	2.00	19.00	496.161	511.716	78	376.451	392.400	98	119	88	103	1.014	0.84	0.75	1.657
2	2.00	15.00	511.716	523.976	80	392.400	405.126	111	123	102	109	1.014	0.85	0.75	1.645
Averages:												1.01			1.66

Y = [Vcal)(Pbar)(Tdgm)]/[(Vdgm)(Pm)(Tcal)]

K = Q(sqrt((Pm Mm)/((Tm out)(DH))

Q = ((Vmi-Vmf)/min.)(TM,out/Tm,avg)(Y)

DH@ = 0.921/K^2

Where:

Y = Meter correction factor, dimensionless

Vcal = Volume of gas through calibrating meter, cubic feet

Vdgm = Volume of gas through field dry gas meter, cubic feet

Pbar = Barometric pressure, in. Hg

Pm = Meter pressure, (Pbar = DH/13.6)

Tdgm = Average dry gas meter temp, degrees R

Tcal = Temperature of gas at calibrating meter, degrees R

DRY GAS METER CALIBRATION

Meter ID	RAC		
Calibration Method	DGM/DGM	**By**	DGR
Calibration Meter ID	651729	**Pbar**	30.05
Date	2/18/95		

Vac. in. Hg	DH in. H_2O	Time min	Calibrating Meter Vi ft^3	Calibrating Meter Vf ft^3	Calibrating Meter Temp °F	Field Meter Vi ft^3	Field Meter Vf ft^3	Field Meter Temp. in init.	Field Meter Temp. in final	Field Meter Temp out init.	Field Meter Temp out final	Y	Q	K	DH@
1	5.00	12.50	772.047	787.047	59	612.402	627.716	59	98	58	69	0.990	1.2	0.694	1.911
1	4.00	19.25	787.047	807.415	59	627.716	648.935	96	111	68	77	1.004	1.08	0.691	1.929
1	3.00	13.45	807.415	819.741	62	648.935	661.985	109	114	77	82	0.998	0.94	0.692	1.921
1	2.00	18.00	819.741	832.838	62	661.985	675.978	110	108	81	84	0.992	0.75	0.676	2.015
1	1.00	21.00	832.838	844.241	62	675.978	688.173	106	111	84	87	0.995	0.57	0.716	1.795
Averages:												**1.00**			**1.91**

Y = [Vcal)(Pbar)(Tdgm)]/[(Vdgm)(Pm)(Tcal)]

K = Q(sqrt((Pm Mm)/((Tm out)(DH))

Q = ((Vmi-Vmf)/min.)(TM,out/Tm,avg)(Y)

DH@ = 0.921/K^2

Where:

Y = Meter correction factor, dimensionless

Vcal = Volume of gas through calibrating meter, cubic feet

Vdgm = Volume of gas through field dry gas meter, cubic feet

Pbar = Barometric pressure, in. Hg

Pm = Meter pressure, (Pbar = DH/13.6)

Tdgm = Average dry gas meter temp, degrees R

Tcal = Temperature of gas at calibrating meter, degrees R

DRY GAS METER CALIBRATION

Meter ID RAC

Calibration Method DGM/DGM **By** GNM

Calibration Meter ID 651729 **Pbar** 29.76

Date 7/13/95

Vac. in. Hg	DH in. H_2O	Time min	Calibrating Meter VI ft^3	Calibrating Meter VF ft^3	Calibrating Meter Temp °R	Field Meter VI ft^3	Field Meter VF ft^3	Field Meter Temp. in initial	Field Meter Temp. in final	Field Meter Temp out initial	Field Meter Temp out final	Y	Q	K	DH@
1	5.00	8.50	432.392	442.521	76	569.427	579.951	91	103	91	92	0.983	1.21	0.682	1.982
1	4.00	9.50	442.521	452.659	83	579.951	590.419	103	120	92	97	0.994	1.08	0.676	2.013
1	3.00	11.00	452.659	462.725	86	590.419	600.891	117	128	97	104	0.999	0.93	0.671	2.049
1	2.00	13.50	462.725	472.804	88	600.891	611.460	126	135	104	111	1.003	0.77	0.673	2.036
1	1.00	18.25	472.804	482.837	89	611.460	622.042	132	135	109	117	1.005	0.57	0.703	1.862
Averages:												1.00			1.99

Y = [Vcal)(Pbar)(Tdgm)]/[(Vdgm)(Pm)(Tcal)]

K = Q(sqrt((Pm Mm)/((Tm out)(DH))

Q = ((Vmi-Vmf)/min.)(TM,out/Tm,avg)(Y)

DH@ = 0.921/K^2

Where:

Y = Meter correction factor, dimensionless

Vcal = Volume of gas through calibrating meter, cubic feet

Vdgm = Volume of gas through field dry gas meter, cubic feet

Pbar = Barometric pressure, in. Hg

Pm = Meter pressure, (Pbar = DH/13.6)

Tdgm = Average dry gas meter temp, degrees R

Tcal = Temperature of gas at calibrating meter, degrees R

953.4 Propane

Scott Specialty Gases, Inc.

1290 COMBERMERE STREET, TROY, MI 48083 (810) 589-2950 FAX:(810) 589-2134

CERTIFICATE OF ANALYSIS: EPA PROTOCOL GAS

Customer
ENVIRONMENTAL MON
242 INGLESIDE DRIVE
MADISON, MS 39110

Assay Laboratory
Scott Specialty Gases, Inc
1290 Combermere
Troy, MI 48083

Purchase Order : DRV0116
Scott Project # : 576120

ANALYTICAL INFORMATION

This certification was performed according to EPA Traceability Protocol For Assay and Certification of Gaseous Calibration Standards, Procedure G1; September, 1993.

Cylinder Number : ALM049194
Cylinder Pressure + : 1900 psig
Certificate Date : 2/1/95
Previous Certificate Date : None
Expiration Date : 2/1/98

ANALYZED CYLINDER

Components	Certified Concentration	Analytical Uncertainty*
Propane	953.4 ppm	±1% NIST Directly Traceable

Balance Gas: Nitrogen

*Do not use when cylinder pressure is below 150 psig.
*Analytical accuracy is inclusive of usual known error sources which at least include precision of the measurement processes.

REFERENCE STANDARD

Type	Expiration Date	Cylinder Number	Concentration
NTRM 1668	6/7/96	ALM-032015	95.5 ppm Propane in Air.

INSTRUMENTATION

Instrument/Model/Serial #	Last Date Calibrated	Analytical Principle
Prop Beckman/400/1002059	1/19/95	Flame Ionization Detection

ANALYZER READINGS (Z=Zero Gas R=Reference Gas T=Test Gas r=Correlation Coefficient)

Components: Propane

First Triad Analysis

Date: 2/1/95 Response Units: mv

Z1=0.00	R1=14.40	T1=143.00
R2=14.40	Z2=0.00	T2=143.00
Z3=0.00	T3=143.00	R3=14.40

Avg. Conc. of Cust. Cyl. 953.4 ppm

Second Triad Analysis

Calibration Curve

Concentration=A+Bz+Cz^2+Dz^3+Ez^4

r=1.00000	NTRM 1668
Constants:	A=-0.237940000
B=6.669000000	C=0.000000000
D=0.000000000	E=0.000000000

Special Notes

Analyst

MSP/P-1

PROOF

475.3 Propane

Scott Specialty Gases, Inc.

1290 COMBERMERE STREET, TROY, MI 48083 (810) 589-2950 FAX:(810) 589-2134

CERTIFICATE OF ANALYSIS: EPA PROTOCOL GAS

Customer:
ENVIRONMENTAL MON
242 INGLESIDE DRIVE
MADISON, MS 39110

Assay Laboratory
Scott Specialty Gases, Inc
1290 Combermere
Troy, MI 48083

Purchase Order : DRV0116
Scott Project # : 576120

ANALYTICAL INFORMATION

This certification was performed according to EPA Traceability Protocol For Assay and Certification of Gaseous Calibration Standards; Procedure G1; September, 1993.

Cylinder Number : ALM016861
Cylinder Pressure + : 1900 psig

Certificate Date : 1/27/95
Previous Certificate Date : None

Expiration Date : 1/27/98

ANALYZED CYLINDER

Components	Certified Concentration	Analytical Uncertainty*
Propane	475.3 ppm	±1% NIST Directly Traceable

Balance Gas: Air

+ Do not use when cylinder pressure is below 150 psig.
* Analytical accuracy is inclusive of usual known error sources which at least include precision of the measurement processes.

REFERENCE STANDARD

Type	Expiration Date	Cylinder Number	Concentration
NTRM 1668	6/7/96	ALM-032015	95.5 ppm Propane in Air.

INSTRUMENTATION

Instrument/Model/Serial #	Last Date Calibrated	Analytical Principle
Foxboro Beckman/400/1002059	1/19/95	Flame Ionization Detection

ANALYZER READINGS (Z=Zero Gas R=Reference Gas T=Test Gas r=Correlation Coefficient)

Components: Propane

First Triad Analysis

Date: 1/27/95 Response Units: mv

Z1=0.00	R1=14.40	T1=71.30
R2=14.40	Z2=0.00	T2=71.30
Z3=0.00	T3=71.30	R3=14.40

Avg. Conc. of Cust. Cyl. 475.3 ppm

Second Triad Analysis

Calibration Curve

Concentration=A+Bx+Cx^2+Dx^3+Ex^4

r=1.00000	NTRM 1668
Constants:	A=-0.237940000
B=6.669000000	C=0.000000000
D=0.000000000	E=0.000000000

Special Notes

Analyst

MSP/P-1

90.46 Propane

Scott Specialty Gases, Inc.

1290 COMBERMERE STREET, TROY, MI 48083 (810) 589-2950 FAX:(810) 589-2134

CERTIFICATE OF ANALYSIS: EPA PROTOCOL GAS

Customer
ENVIRONMENTAL MON
242 INGLESIDE DRIVE
MADISON, MS 39110

Assay Laboratory
Scott Specialty Gases, Inc
1290 Combermere
Troy, MI 48083

Purchase Order : DRV0116
Scott Project # : 576120

ANALYTICAL INFORMATION

This certification was performed according to EPA Traceability Protocol For Assay and Certification of Gaseous Calibration Standards; Procedure G1; September, 1993.

Cylinder Number : ALM016008
Cylinder Pressure + : 1900 psig

Certificate Date : 1/27/95
Previous Certificate Date : None

Expiration Date : 1/27/98

ANALYZED CYLINDER

Components	Certified Concentration	Analytical Uncertainty*
Propane	90.46 ppm	±1% NIST Directly Traceable

Balance Gas: Air

+Do not use when cylinder pressure is below 150 psig.
*Analytical accuracy is inclusive of usual known error sources which at least include precision of the measurement processes.

REFERENCE STANDARD

Type	Expiration Date	Cylinder Number	Concentration
NTRM 1668	6/7/96	ALM-032015	95.5 ppm Propane in Air

INSTRUMENTATION

Instrument/Model/Serial #	Last Date Calibrated	Analytical Principle
Propane : Beckman/400/1002059	1/19/95	Flame Ionization Detector

ANALYZER READINGS (Z=Zero Gas R=Reference Gas T=Test Gas r=Correlation Coefficient)

Components
Propane

First Triad Analysis

Date: 1/27/95	Response Units: mv	
Z1=0.00	R1=95.50	T1=90.50
R2=95.50	Z2=0.00	T2=90.40
Z3=0.00	T3=90.50	R3=95.50
Avg. Conc. of Cust. Cyl. 90.46 ppm		

Second Triad Analysis

Calibration Curve

Concentration=A+Bx+Cx^2+Dx^3+Ex^4	
r=1.00000	NTRM 1668
Constants:	A=-0.086524000
B=1.000900000	C=0.000000000
D=0.000000000	E=0.000000000

Special Notes

Mail

Analyst

MISP/P-1

2410 NOx

Scott Specialty Gases, Inc.

500 WEAVER PARK ROAD, LONGMONT, CO 80501 (303) 442-4700, (303) 651-3094 FAX (303) 772-7673

CERTIFICATE OF ANALYSIS: EPA PROTOCOL GAS

Customer
ENVIRONMENTAL MONITORING
242 INGLESIDE DRIVE
MADISON, MS 39110

Assay Laboratory
Scott Specialty Gases, Inc.
500 Weaver Park Road
Longmont, CO 80501

Purchase Order	DRV0826
Scott Project #	0815606
CGA Fitting	660
QC Number	11039435
File Number	15606-01

ANALYTICAL INFORMATION

This certification was performed according to EPA-Traceability Protocol fo Assay and certification of Gaseous Calibration Standards; Procedure G1; September, 1993.

Cylinder Number ALM-043125 Certification Date 08/30/94 Expiration Date 08/30/96
Cylinder Pressure 2000 psig Previous Certification Dates None

ANALYZED CYLINDER

Component	Certified Concentration
[illegible]	2400 ppm
(Nitric Oxides)	2410 ppm
[illegible]	Balance

Analytical Uncertainty*
±1% NIST Directly Traceable
Reference Value Only

*Analytical uncertainty is inclusive of usual known error sources which at least include precision of the measurement processes.

REFERENCE STANDARD

Type	Expiration Date	Cylinder Number	Concentration
NTRM 2631	06/18/95	ALM-022283	2814.0ppm NO / N2
GMIS	NONE	AAL-19328	2170.0ppm NO / N2

INSTRUMENTATION

Instrument/Model/Serial #	Last Date Calibrated	Analytical Principle
Monitor Labs 8840-857	08/22/94	Chemiluminescence

ANALYZER READINGS

(Z=Zero Gas R=Reference Gas T=Test Gas r=Correlation Coefficient)

Component (Nitric Oxide)

First Triad Analysis
Date: 12/22/93 Response Units: mv
Z1 = 0.0000 R1 = 0.4316 T1 = 0.4785
R2 = 0.4316 Z2 = 0.0000 T2 = 0.4785
Z3 = 0.0000 T3 = 0.4785 R3 = 0.4316
Avg. Conc. of Cust. Cyl. = 2401.1 ppm

Second Triad Analysis
Date: 08/30/94 Response Units: mv
Z1 = 0.0000 R1 = 0.4316 T2 = 0.4786
R2 = 0.4316 Z2 = 0.0000 T2 = 0.4786
Z3 = 0.0000 T3 = 0.4786 R3 = 0.4316
Avg. Conc. of Cust. Cyl. = 2401.6 ppm

Calibration Curve
Concentration = A+Bx+Cx²+Dx³+Ex⁴
r = 0.999997 NTRM 2631
Constants: A = -11.764180
B = 5151.8800 C = -232.7234
D = 0 E = 0

Special Notes Do not use when cylinder pressure is below 150 psig.

Analyst: Diana L. Beehler

PROTOCOL

102.0 NOx

Scott Specialty Gases, Inc.

1290 COMBERMERE STREET, TROY, MI 48083 (810) 589-2950 FAX:(810) 589-2134

CERTIFICATE OF ANALYSIS: EPA PROTOCOL GAS

Customer
ENVIRONMENTAL MONITORING
242 INGLESIDE DRIVE
MADISON, MS 39110

Assay Laboratory
Scott Specialty Gases, Inc
1290 Combermere
Troy, MI 48083

Purchase Order : DRV0826
Scott Project # : 570523

ANALYTICAL INFORMATION

This certification was performed according to EPA Traceability Protocol For Assay and Certification of Gaseous Calibration Standards; Procedure G1; September, 1993.

Cylinder Number : ALM036349
Cylinder Pressure + : 1900 psig
Certificate Date : 8/30/94
Previous Certificate Date : None
Expiration Date : 8/30/96

ANALYZED CYLINDER

Components	Certified Concentration	Analytical Uncertainty*
Nitric Oxide	99.90 ppm	±1% NIST Directly Traceable
Total Oxides of Nitrogen	102.0 ppm	Reference Value Only

Balance Gas: Nitrogen

+Do not use when cylinder presssure is below 150 psig.
*Analytical accuracy is inclusive of usual known error sources which at least include precision of the measurement processes.

REFERENCE STANDARD

Type	Expiration Date	Cylinder Number	Concentration
NTRM 1684	4/1/96	ALM-024582	95.2 ppm Nitric Oxide in Nitrogen

INSTRUMENTATION

Instrument/Model/Serial #	Last Date Calibrated	Analytical Principle
NO: Horiba/OPE-235/483814	8/24/94	Chemiluminesence

ANALYZER READINGS (Z=Zero Gas R=Reference Gas T=Test Gas r=Correlation Coefficient)

Components
Nitric Oxide

First Triad Analysis

Date: 3/28/94	Response Units: mv	
Z1=0.00	R1=95.20	T1=99.80
R2=95.20	Z2=0.00	T2=99.80
Z3=0.00	T3=99.80	R3=95.20
Avg. Conc. of Cust. Cyl. 99.80 ppm		

Second Triad Analysis

Date: 8/30/94	Response Units: mv	
Z1=0.00	R1=95.20	T1=100.00
R2=95.20	Z2=0.00	T2=100.00
Z3=0.00	T3=100.00	R3=95.20
Avg. Conc. of Cust. Cyl: 100.0 ppm		

Calibration Curve

Concentration=A+Bx+Cx^2+Dx^3+Ex^4	
r=0.99999	NTRM 1684
Constants:	A=0.000000000
B=1.000000000	C=0.000000000
D=0.000000000	E=0.000000000

Special Notes

Don Eichler Jr
Analyst

PROTOCOL

MISP/P-1

12.90 NOx

Scott Specialty Gases, Inc.

1290 COMBERMERE STREET, TROY, MI 48083 (313) 589-2950 FAX: (313) 589-2134

CERTIFICATE OF ANALYSIS: EPA PROTOCOL GAS

Customer
ENVIROMENTAL MONITORING
242 INGLESIDE DRIVE
MADISON MS 39110

Assay Laboratory
Scott Specialty Gases, Inc.
1290 Combermere
Troy, MI 48083

Purchase Order 0630DR
Scott Project # 553186

ANALYTICAL INFORMATION

Certified to exceed the minimum specifications of EPA Protocol 1 Procedure # G1, Section Number 3.0.4

Cylinder Number ALM022478
Cylinder Pressure 1900 psig
Certification Date 7-19-93
Previous Certification Dates None
General Exp. Date 7-19-95
Acid Rain Exp. Date 7-19-95

ANALYZED CYLINDER

Components	Certified Concentration	Analytical Uncertainty*
Nitric Oxide	12.90 ppm	±1% NIST Directly Traceable
Total Oxides of Nitrogen	12.90 ppm	Reference Value Only

Balance Gas: Nitrogen

*Analytical uncertainty is inclusive of usual known error sources which at least includes reference standard error & precision of the measurement processes.

REFERENCE STANDARD

Type	Expiration Date	Cylinder Number	Concentration
SRM 2629A	1-4-95	FF-28502	19.40 ppm NO in N_2

INSTRUMENTATION

Instrument/Model/Serial #	Last Date Calibrated	Analytical Principle
NO: Horiba/OPE-235/560543082	5-18-93	Chemiluminescence

ANALYZER READINGS (Z=Zero Gas R=Reference Gas T=Test Gas r=Correlation Coefficient)

Components: Nitric Oxide

First Triad Analysis

Date: 7-11-93 Response Units: mv

Z1=0.00	R1=19.40	T1=12.90
R2=19.40	Z2=0.00	T2=12.90
Z3=0.00	T3=12.90	R3=19.40

Avg. Conc. of Cust. Cyl. 12.90 ppm

Second Triad Analysis

Date: 7-19-93 Response Units: mv

Z1=0.00	R1=19.40	T1=12.90
R2=19.40	Z2=0.00	T2=12.90
Z3=0.00	T3=12.90	R3=19.40

Avg. Conc. of Cust. Cyl. 12.90 ppm

Calibration Curve

Concentration=$A+Bx+Cx^2+Dx^3+Ex^4$

r=0.99999	SRM 2629A
Constants:	A=0.01381712
B=0.9992878	C=0
D=0	E=0

Concentration=$A+Bx+Cx^2+Dx^3+Ex^4$

Concentration=$A+Bx+Cx^2+Dx^3+Ex^4$

Special Notes
If this product is used for Acid Rain Rule Compliance, the *Acid Rain Expiration Date* noted above applies per 40 CFR Part 75, Appendix H. Otherwise, the *General Expiration Date* applies.

F. P. Doran
Analyst Frank P. Doran

Scott Specialty Gases, Inc.

Shipped From: 3714 LAPAS DRIVE
HOUSTON TX 77023
Phone: 713-644-4820 Fax: 713-644-0244

CERTIFICATE OF ANALYSIS

ENVIRONMENTAL MONITORING
DANNY RUSSELL
P O BOX 655

RIDGELAND MS 39158

PROJECT #: 04-43368-001
PO#: DRV0517
ITEM #: 04024315 2AL
DATE: 5/26/95

CYLINDER #: ALM055984

ANALYTICAL ACCURACY: +/- 1%
PRODUCT EXPIRATION: 5/24/96

BLEND TYPE : ACUBLEND MASTER GAS

COMPONENT	REQUESTED GAS CONC MOLES		ANALYSIS (MOLES)	
CARBON MONOXIDE	452.	PPM	453.	PPM
OXYGEN	11.	%	11.01	%
NITROGEN		BALANCE		BALANCE

2000 PSI

453

THIS PRODUCT IS TRACEABLE TO DOCUMENTATION BY BOTH THE NUMBERS IDENTIFIED ON THIS CERTIFICATE OF ANALYSIS.

ALL PRODUCTION & ANALYTICAL PROJECT & CYLINDER SERIAL

ANALYST: _____

Scott Specialty Gases, Inc.

Shipped From: 3714 LAPAS DRIVE
HOUSTON TX 77023
Phone: 713-644-4820 Fax: 713-644-0244

CERTIFICATE OF ANALYSIS

ENVIRONMENTAL MONITORING
DAN RUSSELL
P O BOX 655

RIDGELAND MS 39158

PROJECT #: 04-29381-003
PO#: DRV-0107
ITEM #: 04021453 2AL
DATE: 1/11/94

CYLINDER #: ALM007930
FILL PRESSURE: 2000 PSI
BLEND TYPE : ACUBLEND MASTER GAS

ANALYTICAL ACCURACY: +/- 1%
PRODUCT EXPIRATION: 1/11/95

COMPONENT	REQUESTED GAS CONC	MOLES	ANALYSIS (MOLES)	
CARBON MONOXIDE	4,500.	PPM	4,540.	PPM
NITROGEN		BAL		BAL

ANALYST: _____ APPROVED BY: _____

Scott Specialty Gases, Inc.

Shipped From: 3714 LAPAS DRIVE
HOUSTON TX 77023
Phone: 713-644-4820 Fax: 713-644-0244

CERTIFICATE OF ANALYSIS

ENVIRONMENTAL MONITORING
DANNY RUSSELL
P O BOX 655

RIDGELAND MS 39158

PROJECT #: 04-39907-002
PO#: DRV0116
ITEM #: 04024520 2AL
DATE: 1/27/95

CYLINDER #: AAL19761

ANALYTICAL ACCURACY: +/-1%
PRODUCT EXPIRATION: 1/27/96

BLEND TYPE : ACUBLEND MASTER GAS

COMPONENT	REQUESTED GAS CONC	MOLES	ANALYSIS (MOLES)	
CARBON DIOXIDE	12.	%	12.08	%
CARBON MONOXIDE	955.	PPM	953.	PPM
OXYGEN	3.	%	3.03	%
NITROGEN		BALANCE		BALANCE

2000 PSI

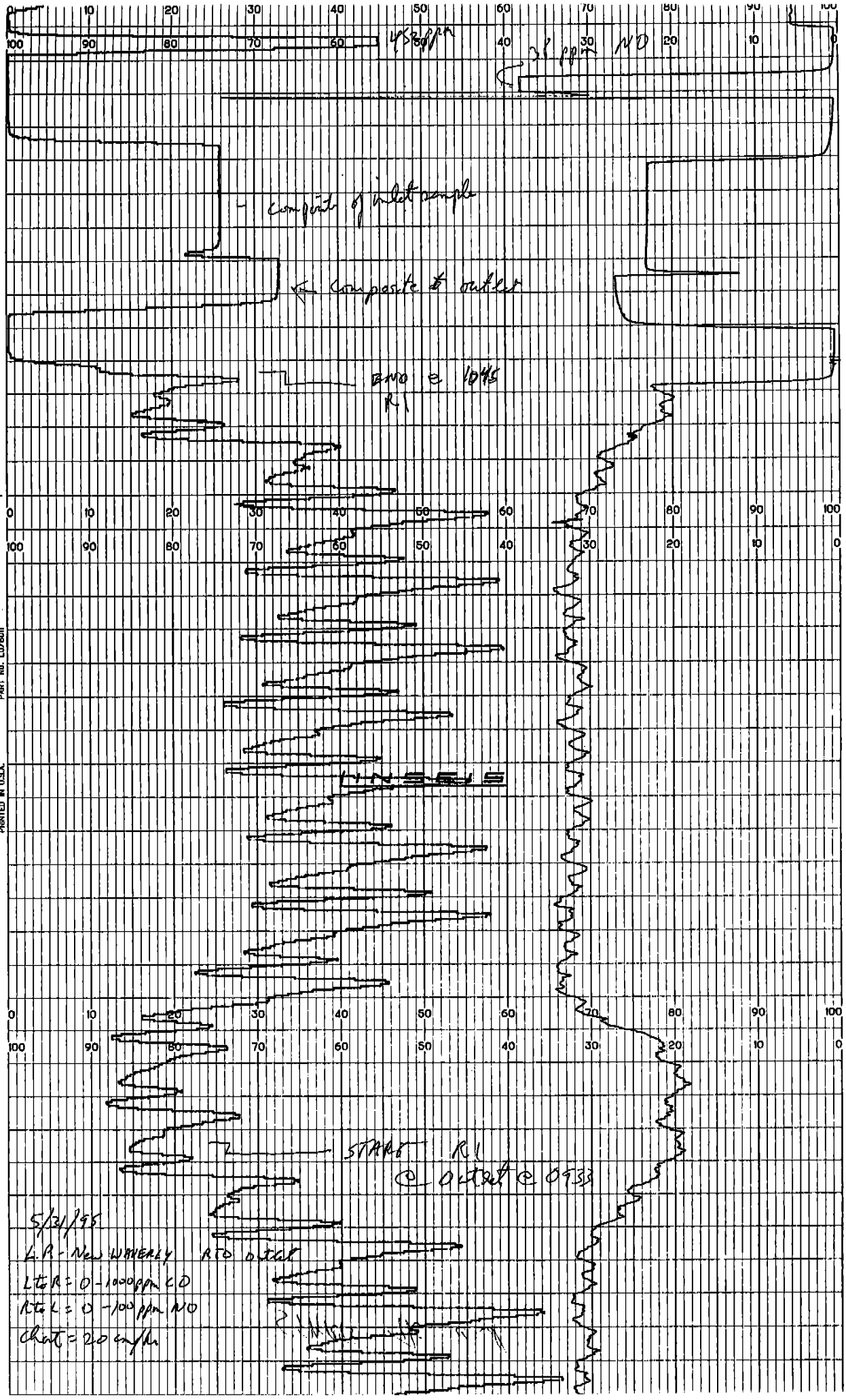
THIS PRODUCT IS TRACEABLE TO ALL PRODUCTION & ANALYTICAL DOCUMENTATION BY BOTH THE PROJECT & CYLINDER SERIAL NUMBERS IDENTIFIED ON THIS CERTIFICATE OF ANALYSIS.

ANALYST:

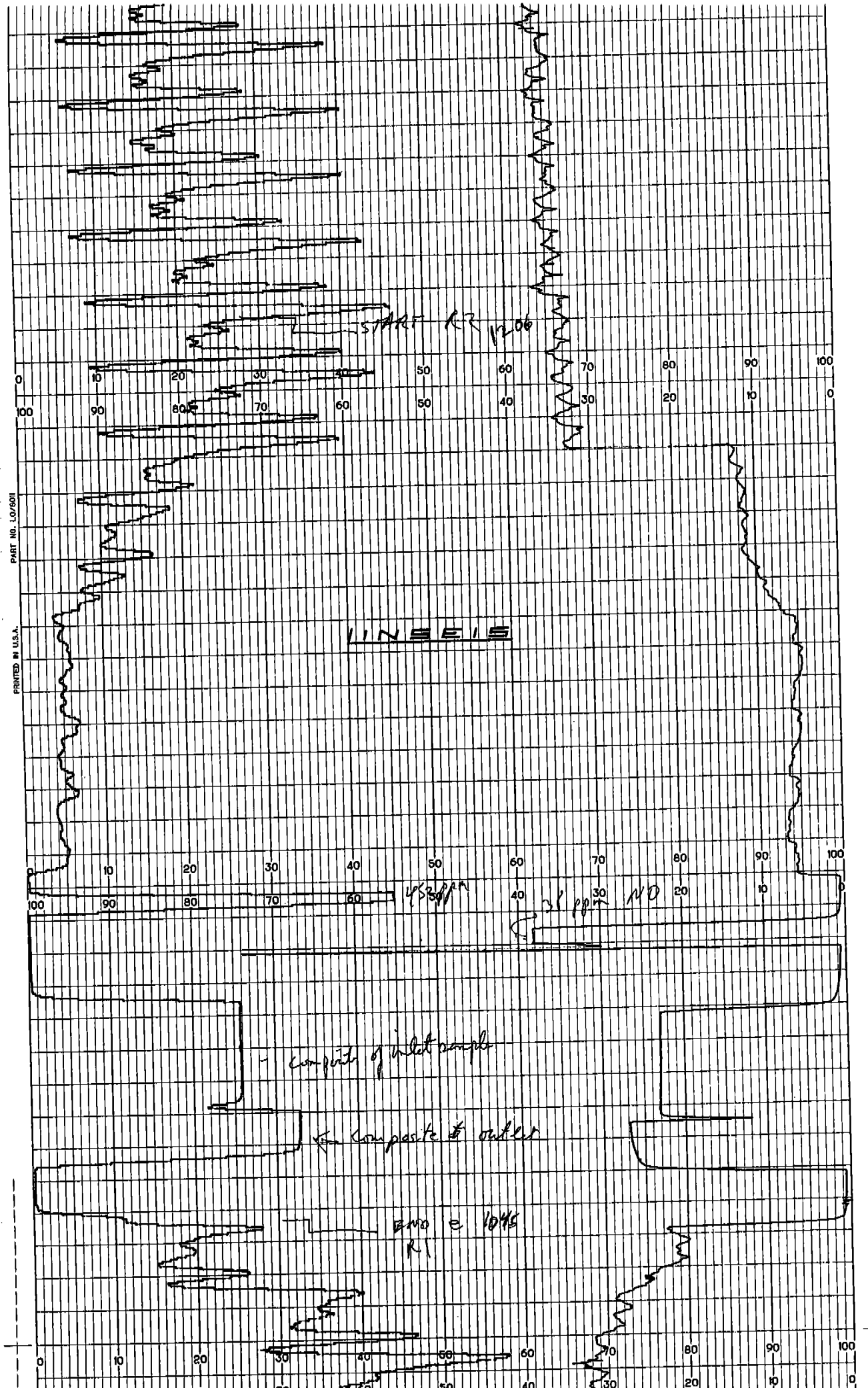
APPENDIX C.

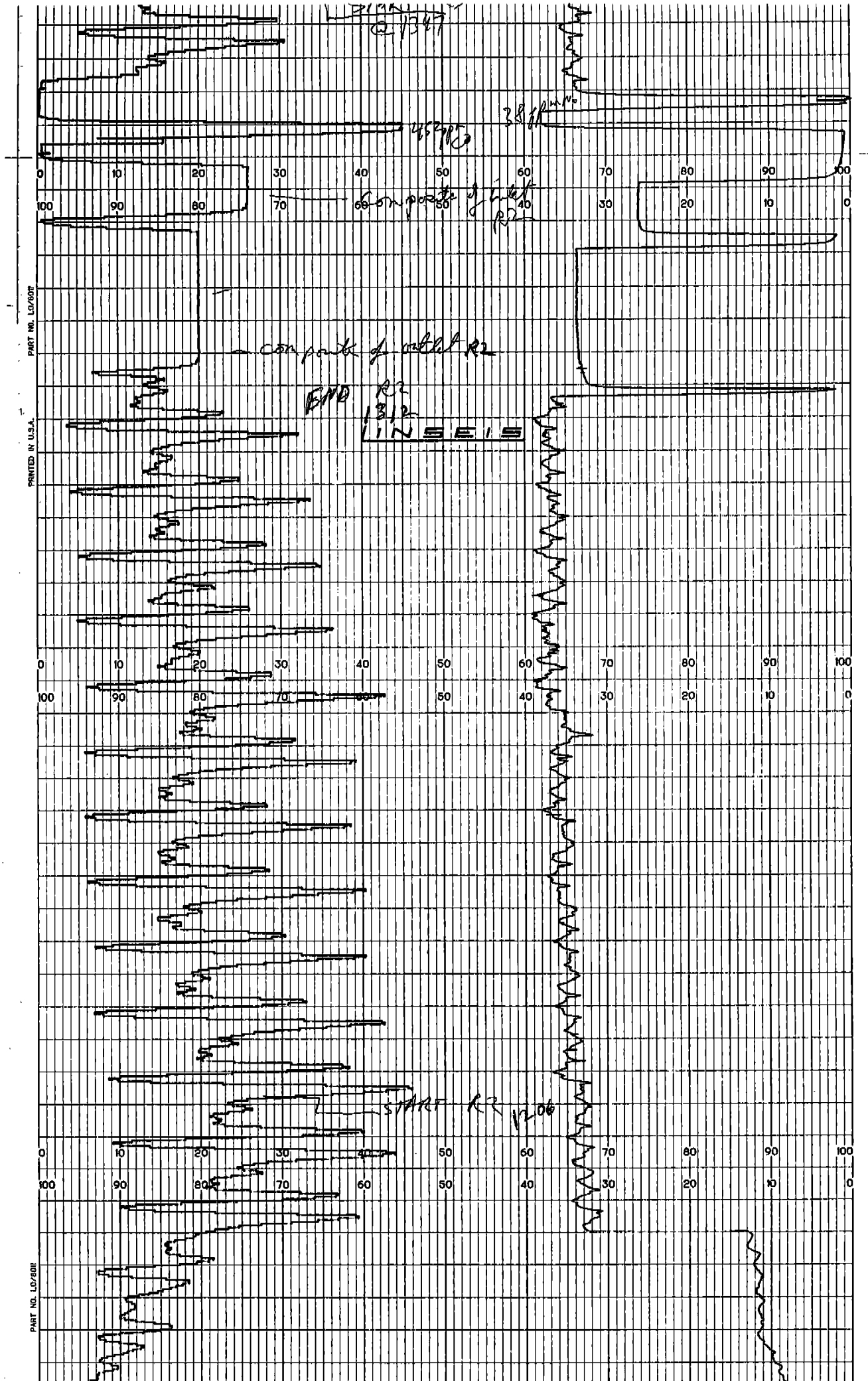
INSTRUMENT RECORDER TRACES/DATA LOG

OUTLET NOx AND CO TRACE

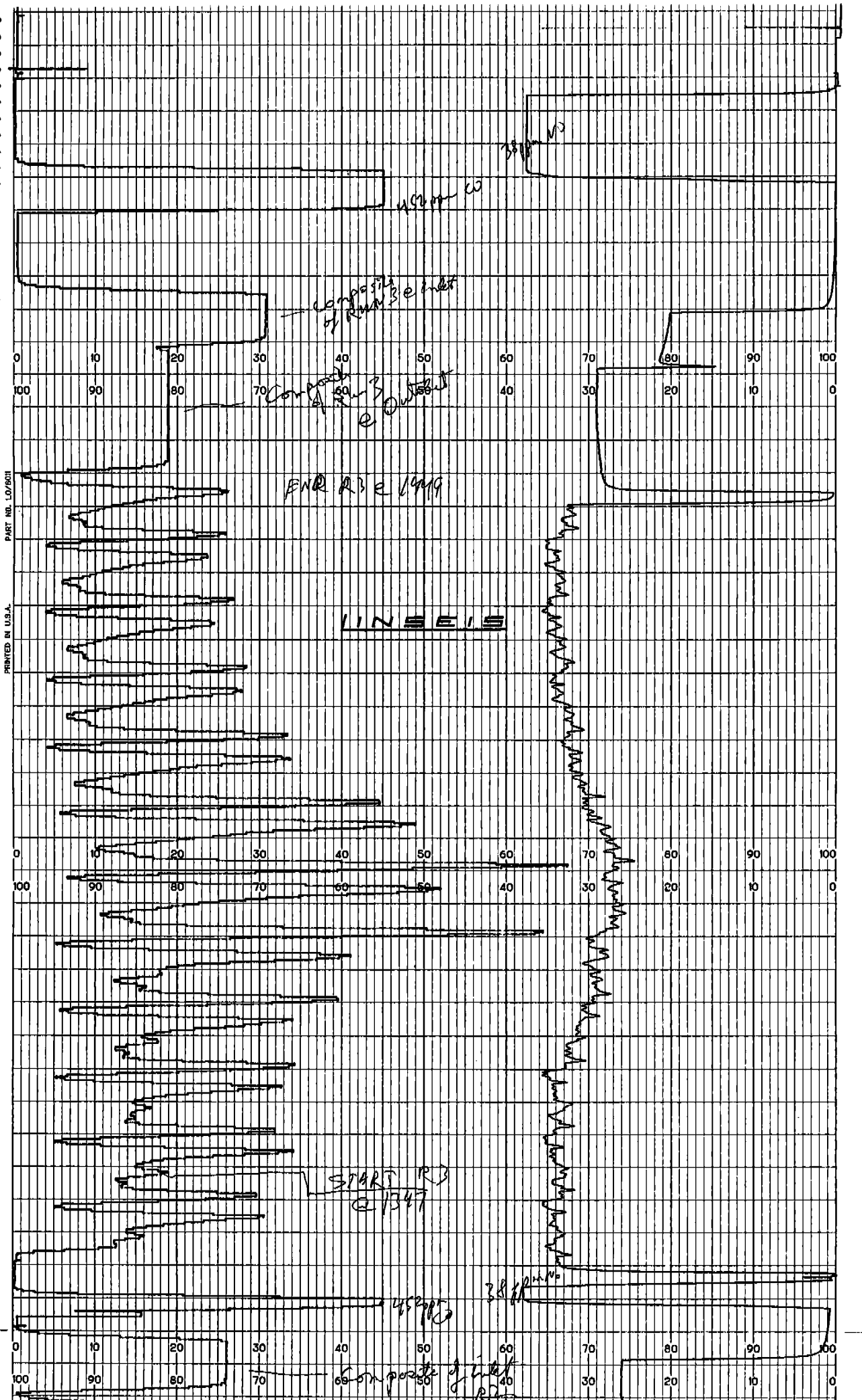


PRINTED IN U.S.A. PART NO. LO/6011


START R2 1206
LINSEIS
453 ppm
38 ppm NO
composite of inlet sample
composite of outlet
END @ 1045
R1
PART NO. LO/8011
PRINTED IN U.S.A.

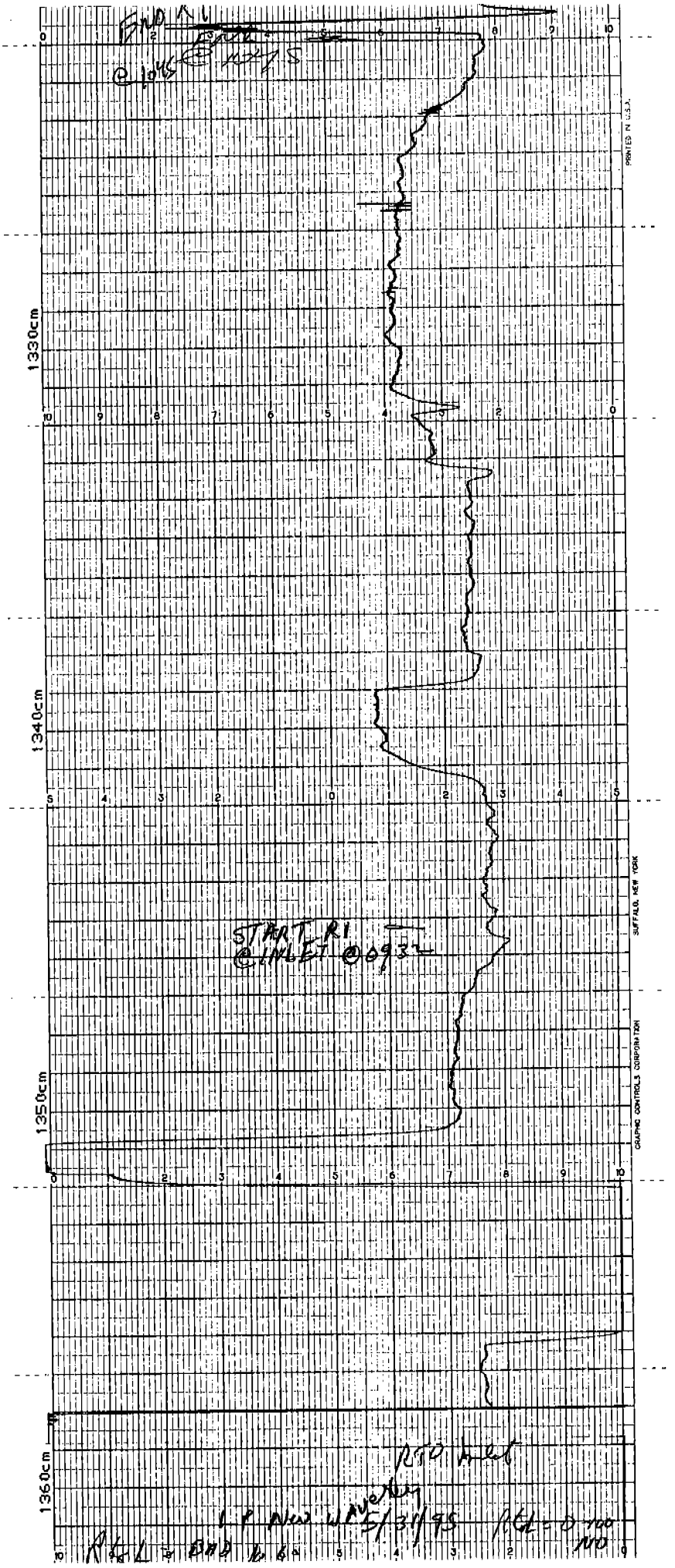


@ 1347
38 gpm No
452 ppm
composite of inlet R2
composite of outlet R2
END R2
1312
LINSEIS
START R2 1206
PART NO. LO/8011
PRINTED IN U.S.A.

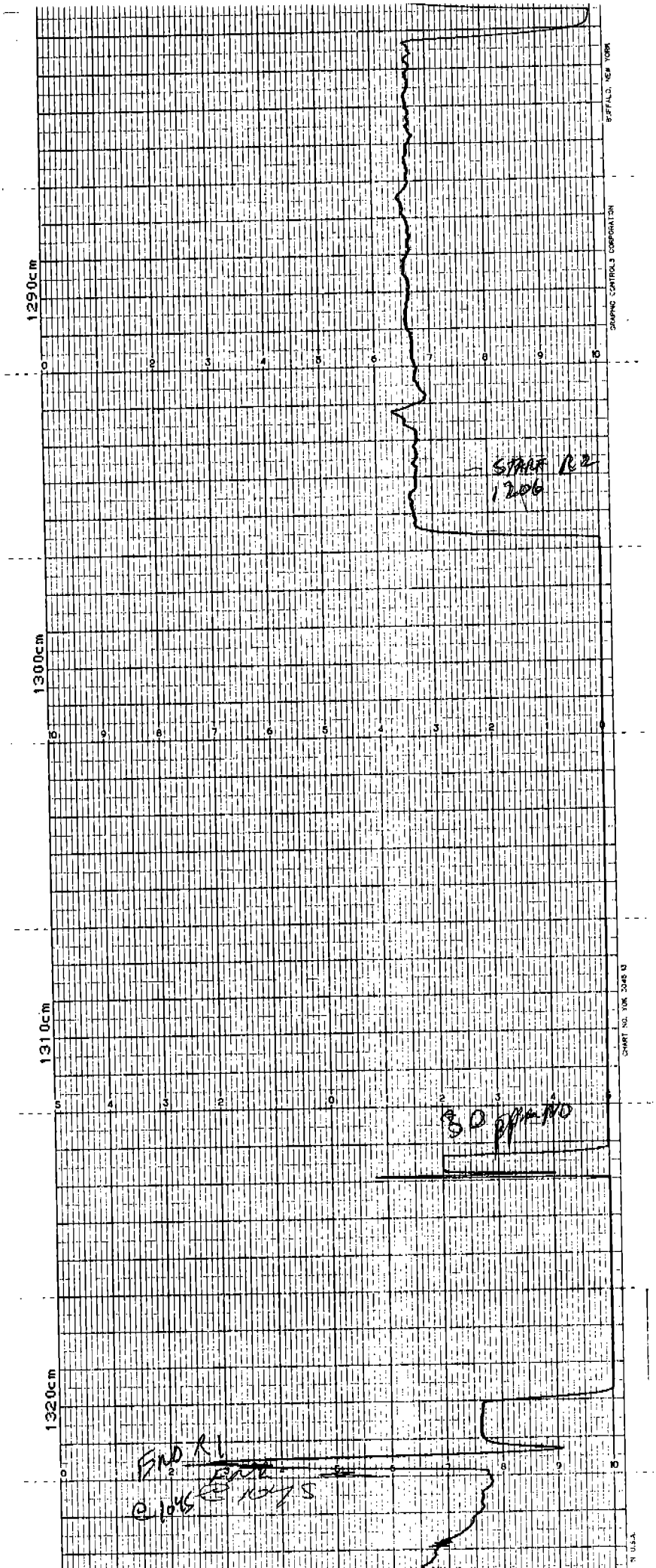


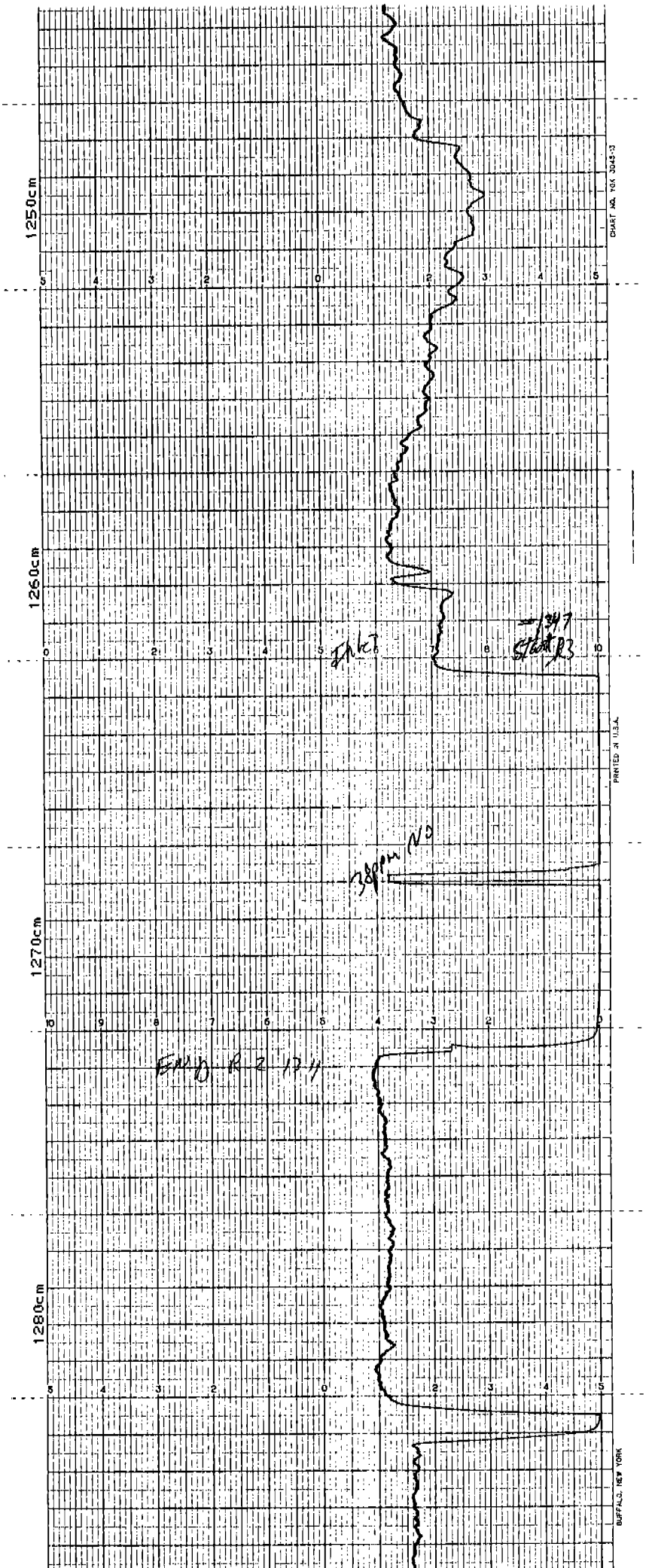
38 ppm NO
452 ppm CO
composite of Run 3 @ inlet
Composite of Run 3 @ Outlet
END R3 @ 1449
LINSEIS
START R3 @ 1347
38 ppm NO
452 ppm CO
Composite of inlet
PART NO. LO/8011
PRINTED IN U.S.A.

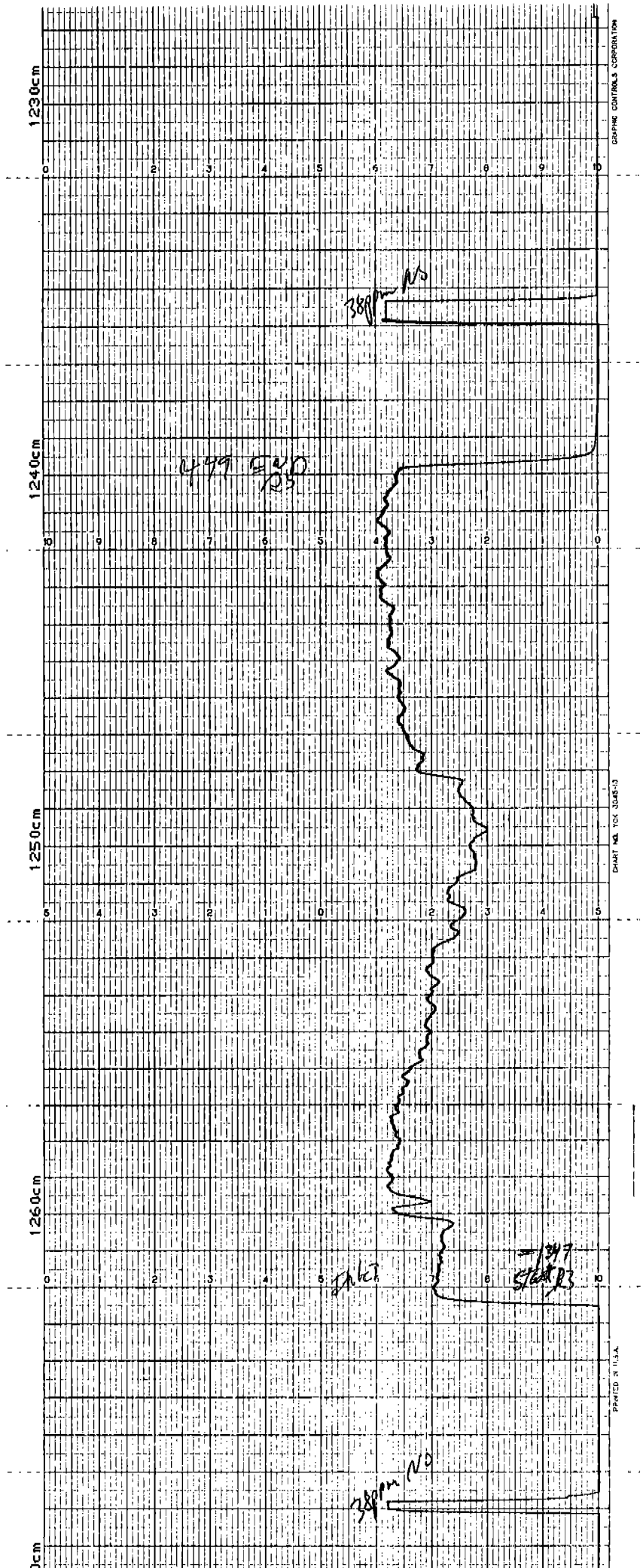
INLET NOx AND CO TRACE



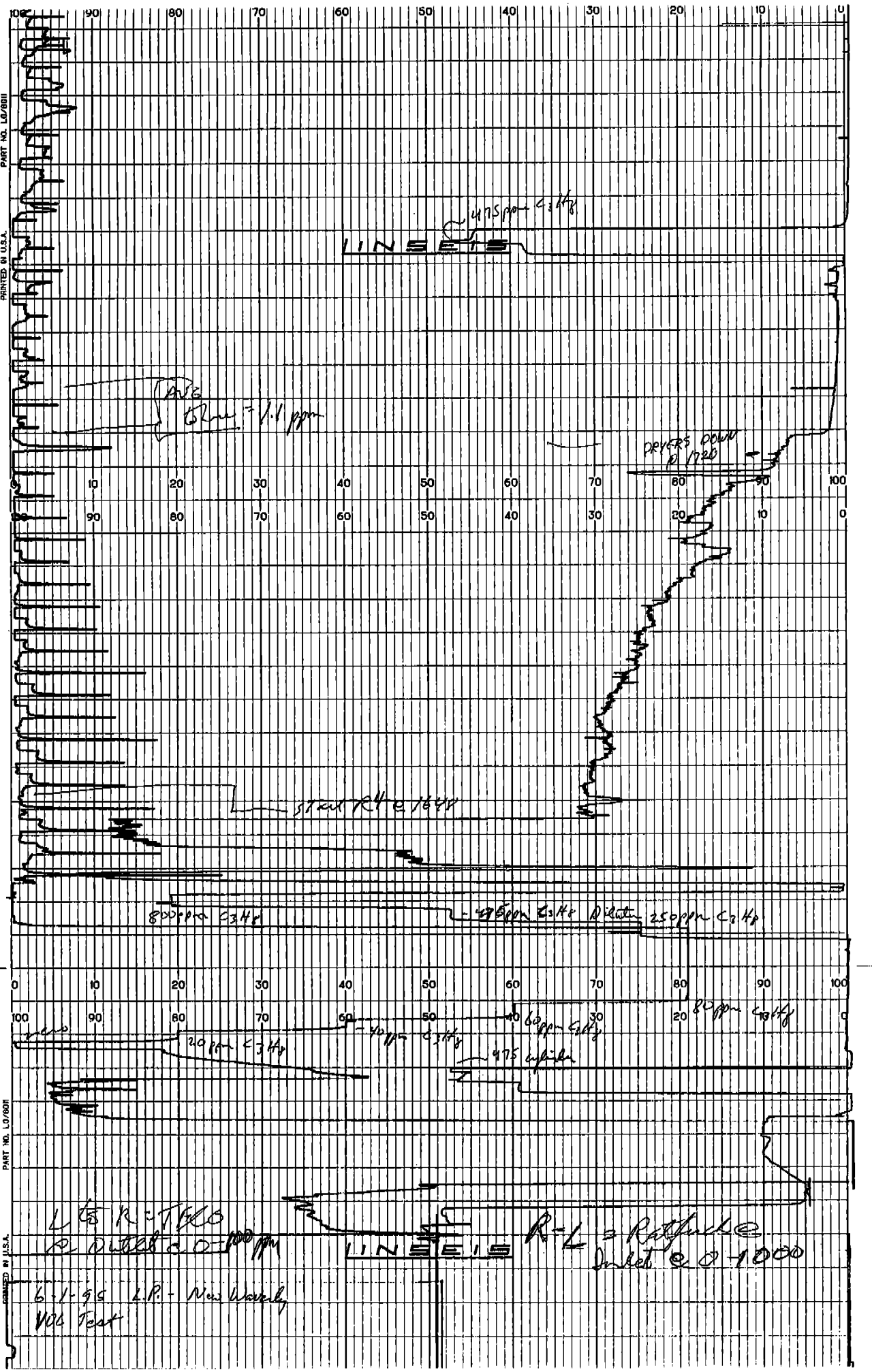
1330cm
1340cm
1350cm
1360cm
START R1
@INLET @0932
RTO Inlet
PRINTED IN U.S.A.
SUFFALO, NEW YORK
GRAPHIC CONTROLS CORPORATION


1290cm
1300cm
1310cm
1320cm
START R2
1206
30 ppm NO
END R1
@1045
BUFFALO, NEW YORK
GRAPHIC CONTROLS CORPORATION
CHART NO. YOK 3045 13
N.U.S.A.

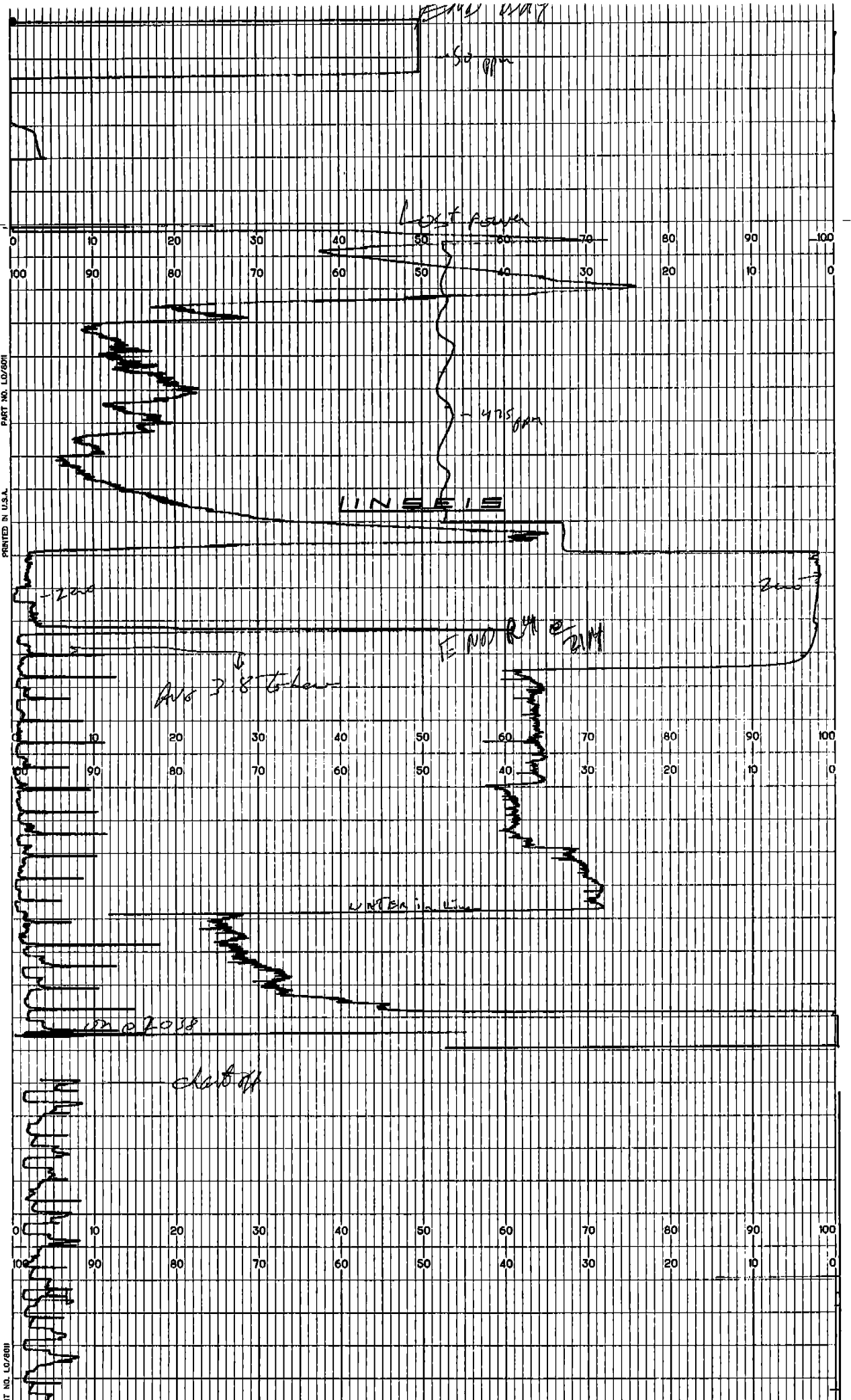

1250cm
1260cm
1270cm
1280cm
CHART NO. YGK 3045-13
PRINTED IN U.S.A.
BUFFALO, NEW YORK
38ppm NO
END R2 1341


1230cm
1240cm
1250cm
1260cm
38ppm NO
449 END
38ppm NO
GRAPHIC CONTROLS CORPORATION
CHART NO. YCK 3045-13
PRINTED IN U.S.A.

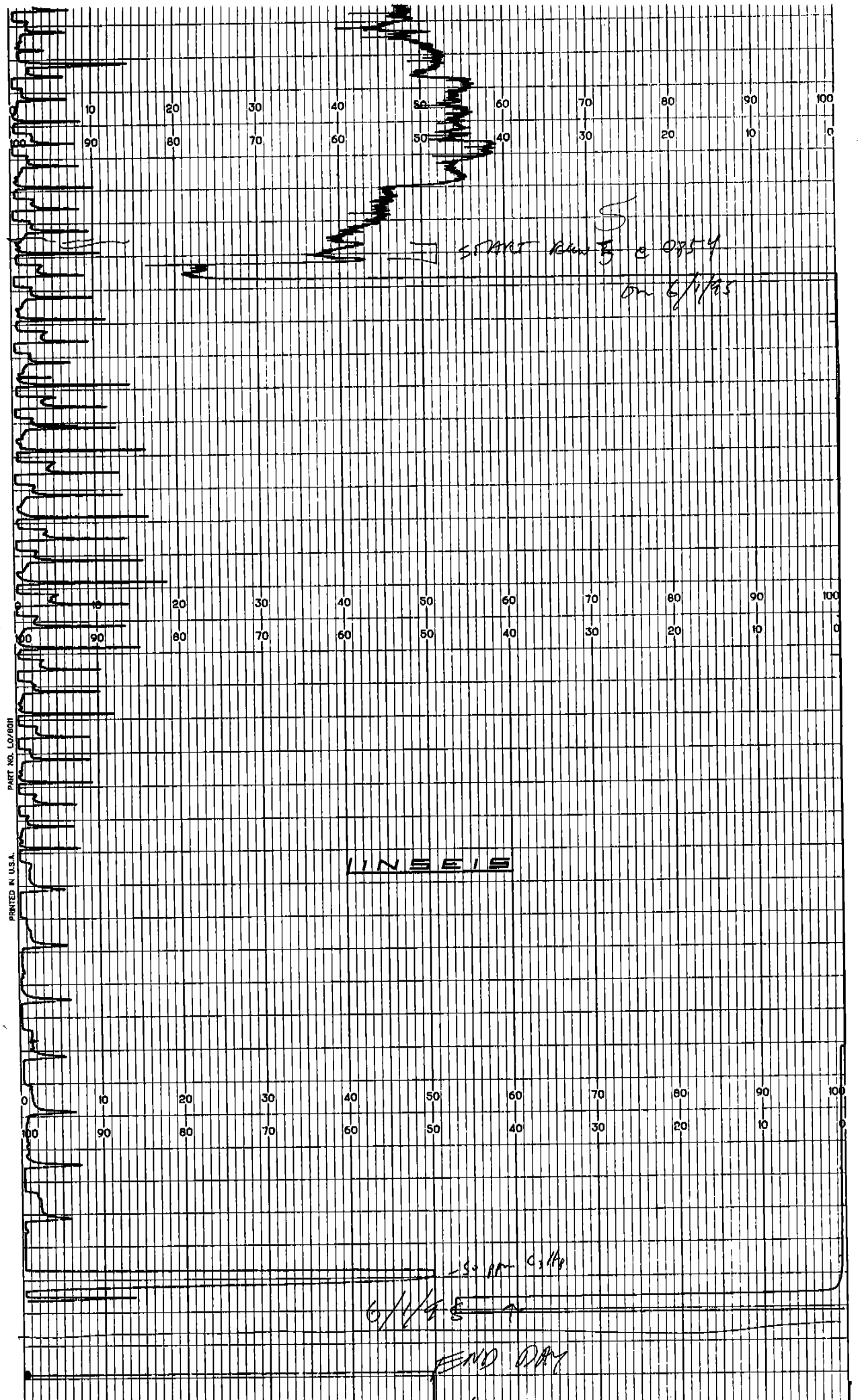
INLET AND OUTLET VOC TRACE

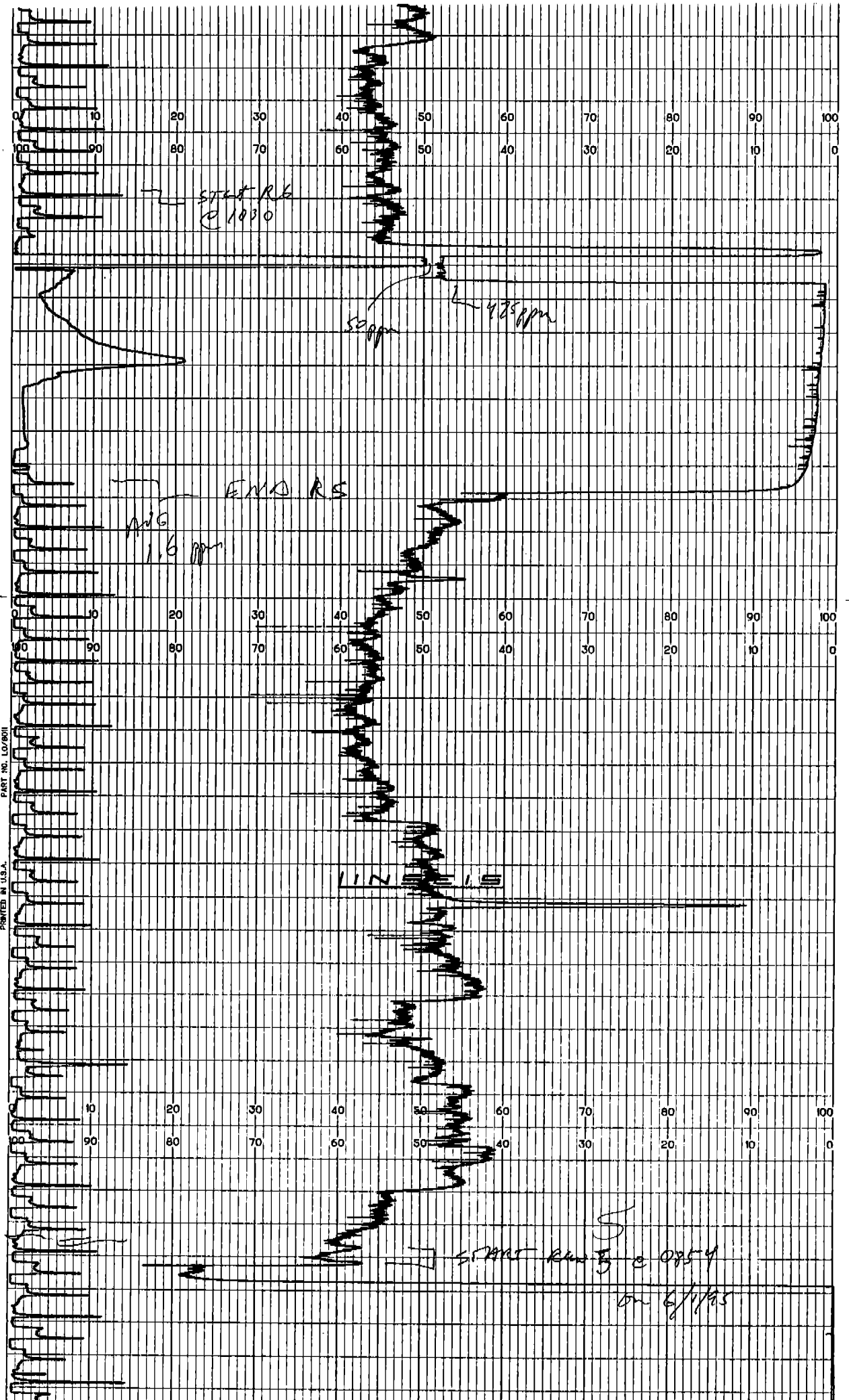


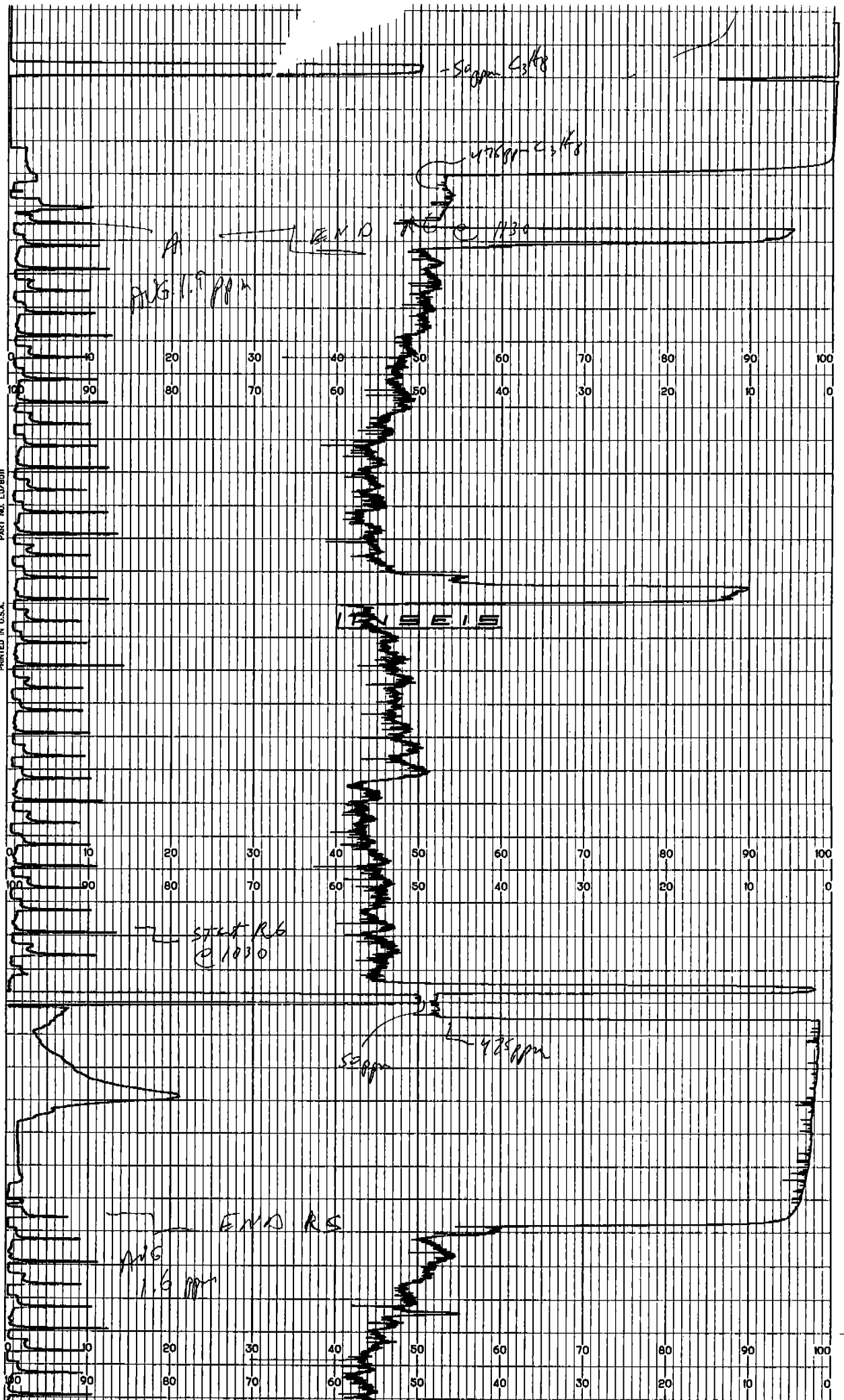
PART NO. LO/8011
PRINTED IN U.S.A.
475 ppm C3H8
LINSEIS
AVG
= 1.1 ppm
DRYERS DOWN
@ 1720
800 ppm C3H8
475 ppm C3H8 Dilution
250 ppm C3H8
80 ppm C3H8
60 ppm C3H8
40 ppm C3H8
20 ppm C3H8
475 cylinder
L to R = TECO
@ Outlet @ 0-100 ppm
LINSEIS
R-L = Rattlesnake
Inlet @ 0-1000
6-1-95 L.P. - New Waverly
VOC Test



-50 ppm
Lost power
-475 ppm
LINSEIS
-200
200
END RM @ 21M
Avg 3.8 to 6 ...
WATER in Line
on @ 2038
chart off
PART NO. LO/8011
PRINTED IN U.S.A.


START RUN 5 @ 0854
on 6/1/95
LINSEIS
-50 ppm C3H8
6/1/95
END DAY
PART NO. LO/8011
PRINTED IN U.S.A.


START R6
@ 1030
50 ppm
425 ppm
END R5
AVG
1.6 ppm
START RUN 5 @ 0854
on 6/1/95
PART NO. LO/8011
PRINTED IN U.S.A.



-50 ppm C3H8
475 ppm C3H8
END RE @ 1130
AVG 1.9 ppm
INSEIS
START RG @ 1030
50 ppm
475 ppm
END RS
AVG 1.6 ppm
PRINTED IN U.S.A.
PART NO. LO/80m

APPENDIX D.

HCHO ANALYSIS REPORT (OXFORD LABS)

OXFORD Laboratories Inc.

Analytical and Consulting Chemists
1316 South Fifth Street
Wilmington, N.C. 28401
(910) 763-9793
Fax (910) 343-9688

DATE RECEIVED 06-06-95
DATE REPORTED 06-12-95
95W7216

ENVIRONMENTAL MONITORING
242 INGLE SIDE DR.
MADISON, MS 39110

P.O. # DR0604

ATTENTION: DANNY RUSSELL

SAMPLE DESCRIPTION: 10 FORMALDEHYDE

1. LPNR1 (R4)
2. LPNR2 (R5)
3. LPNR3 (R6)
4. LPNNR1 (R4)
5. LPNNR2 (R5)
6. LPNNR3 (R6)

RESULTS

	1	2	3	4	5	6
Formaldehyde, as HCHO, Total ug	769	938	750	8380	18300	9250

OXFORD Laboratories Inc.

Analytical and Consulting Chemists
1316 South Fifth Street
Wilmington, N.C. 28401
(910) 763-9793
Fax (910) 343-9688

DATE RECEIVED 06-06-95
DATE REPORTED 06-12-95
95W7216

ENVIRONMENTAL MONITORING
242 INGLE SIDE DR.
MADISON, MS 39110

P.O. # DR0604

ATTENTION: DANNY RUSSELL

SAMPLE DESCRIPTION: 10 FORMALDEHYDE

7. LPC R1
8. LPC R2
9. LPC R3
10. BLANK

RESULTS

	7	8	9	10
Formaldehyde, as HCHO, Total ug	2480	2870	1490	37.9

Ann McMillan
ANN MCMILLAN, ANALYST

CHAIN OF CUSTODY AND REQUEST FOR ANALYSIS

ENVIRONMENTAL MONITORING LABORATORIES
POST OFFICE BOX 655
RIDGELAND, MISSISSIPPI 39158

PHONE: 601/856-3092
FAX: 601/853-2151 Attention: Danny Russell

Laboratory: Oxford Labs

Please return copy of chain of custody with analytical report

Attention: EML PO No. DR 0604

Project: Louisiana Pacific New Ulcerly, Texas and Louisiana Pacific Covington, Texas

Rush ☐ Routine ☑ Fax Results ☑

ANALYSES REQUESTED

No. of containers	SAMPLE ID	Sample matrix	REMARKS	HCOH - Method 0011				UNITS
1	LPN R1	Aqueous	DNPH	✓				
1	LPN R2	"		✓				
1	LPN R3	"		✓				
1	LPNN R1	"		✓				
1	LPNN R2	"		✓				
1	LPNN R3	"		✓				
1	LPC R1	"		✓				
1	LPC R2	"		✓				
1	LPC R3	"		✓				
1	Blank	"		✓				

Relinquished by: (print name; initial)	Date/time	Received by: (print name; initial)	Date/time
Daniel G. Russell	6/5/95		
Relinquished by: (print name; initial)	Date/time	Received by: (print name; initial)	Date/time
Relinquished by: (print name; initial)	Date/time	Received by: (print name; initial)	Date/time
COURIER	Date Shipped	Received for lab by:	Date/time
Federal Express		Mary Castelo	6/6/95 10:00

NEW WAVERLY TEXAS OSB STACK TEST OPERATIONAL SUMMARY

05/31/95

DRYER R-T-O

PM, CO, NOx

	DRYER 1	
Dry Furnish Moisture (%)	6.6 - 10.0	8.3
Inlet Temp. (°F)	715 - 1087	901
Outlet Temp. (°F)	165 - 280	223
Production (lbs/hr)	15,480	7,7 [illegible]

CONTINUOUS PRESS*

Press Temp. (°F)	428
Thickness (in)	0.438**
Density (nominal, lbs/cu ft)	41

PRODUCTION (Finished 3/8 in basis) 8,236 ft^2/hr ***
10,552 lbs/hr

*No press stack samples were collected per accepted sampling protocol - currently no control on press emissions.

**Nominal Thickness = 7/16 inch

***Annualized Production of 72,147,360 ft^2 3/8 basis (8760 hrs)

NEW WAVERLY TEXAS OSB STACK TEST OPERATIONAL SUMMARY

06/01/95

DRYER R-T-O

	DRYER 1	
Dry Furnish Moisture (%)	4.2 - 8.5	6.4
Inlet Temp. (°F)	737 - 1026	882
Outlet Temp. (°F)	164 - 205	185
Production (lbs/hr)	18,300	9.2 ODTH

CONTINUOUS PRESS*

Press Temp. (°F)	428
Thickness (in)	0.438**
Density (nominal, lbs/cu ft)	41

PRODUCTION (Finished 3/8 in basis) 9,045 ft^2/hr ***
11,589 lbs/hr

*No press stack samples were collected per accepted sampling protocol - currently no control on press emissions.

**Nominal Thickness = 7/16 inch

***Annualized Production of 79,234,200 ft^2 3/8 basis (8760 hrs)