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.

AP42 Section:	9.10.1.2
Background Chapter	4
Reference:	6
Title:	Particulate Emission Testing Performed for Monitor Bay Sugar Company, Bay City, Michigan, on the Pulp Dryer 3 Exhaust, Network Environmental, Inc., Grand Rapids, MI, October 12, 1992.

APPENDIX F

REPORT EXCERPTS FROM REFERENCE 6

(Monitor Bay Sugar Company, October 12, 1992)

Report of...

Particulate Emission Testing

performed for...

Monitor Sugar Company
Bay City, Michigan

on the

Pulp Dryer 3 Exhaust

October 12, 1992

022.06

Network Environmental, Inc.
Grand Rapids, MI

Network Environmental, Inc.

SUMMARY OF PARTICULATE EMISSIONS

COMPANY NAME: MONITOR SUGAR COMPANY TEST DATE: 10/12/92

COMPANY LOCATION: BAY CITY, MICHIGAN

SOURCE NAME: PULP DRYER #3 NORTH

SAMPLING STAFF: BYRD/CARGILL

SAMPLE NUMBER	1	2	3
STANDARD ANALYSIS			
E1. TOTAL WEIGHT COLLECTED, grams	0.096	0.095	0.103
E2. LBS. PARTICULATE/1000 LBS. GAS, ACTUAL(1)	0.051	0.050	0.049
E3. LBS. PARTICULATE/1000 LBS. GAS, DRY(2)	0.051	0.050	0.049
E6. GRAINS/DSCF(4)	0.037	0.034	0.034
E7. LBS./HOUR	10.64	10.21	11.00

1. 'ACTUAL' MEANS AT THE CONDITIONS FOUND AT THE SAMPLING LOCATION.
2. 'DRY' INCLUDES ONLY THE NATURAL MOISTURE THAT WOULD BE EMITTED FROM THE PROCESS. MOISTURE ADDED OR SUBTRACTED BY THE COLLECTOR IS NOT INCLUDED.
3. 'WET' INCLUDES THE MOISTURE AS MEASURED AT THE SAMPLING LOCATION.
4. 'DSCF' IS UNDER TOTALLY DRY CONDITIONS, ALL MOISTURE REMOVED.

Network Environmental, Inc.

SUMMARY OF EXHAUST GAS PARAMETERS

COMPANY NAME: MONITOR SUGAR COMPANY TEST DATE: 10/12/92

COMPANY LOCATION: BAY CITY, MICHIGAN

SOURCE NAME: PULP DRYER #3 NORTH

SAMPLING STAFF: BYRD/CARGILL

	SAMPLE NUMBER	1	2	3
G1.	STACK RADIUS, inches	33.0	33.0	33.0
G2.	AREA OF STACK, sq. ft.	23.76	23.76	23.76
G3.	BAROMETRIC PRESSURE, in. HG.	28.75	28.75	28.75
G4.	STATIC PRESSURE IN STACK, in. H2O	0.51-	0.51-	0.51-
G5.	STACK GAS TEMPERATURE, deg. F	168	165	164
G6.	AVG. SQRT VELOCITY PRESSURE OF POINTS SAMPLED	0.675	0.657	0.721
G7.	PERCENT MOISTURE AT TEST LOCATION	37.29	33.04	33.90
G8.	PERCENT MOISTURE BEFORE COLLECTOR	37.29	33.04	33.90
G9.	DRY GAS COMPOSITION: % OXYGEN	16.00	16.40	16.20
	% CARBON DIOXIDE	2.93	2.73	2.13
	% CARBON MONOXIDE	0.00	0.00	0.00
	% NITROGEN	81.07	80.87	81.67
G10.	PERCENT EXCESS AIR AT TEST LOCATION			
	DENSITY AND MOLECULAR WEIGHT OF STACK GAS:			
G11.	DRY, @ STP, lbs./cu.ft.	0.0753	0.0752	0.0749
G12.	WET, @ STP, lbs./cu.ft.	0.0645	0.0657	0.0653
G13.	WET, @ STACK CONDITIONS, lbs./cu.ft.	0.0522	0.0535	0.0533
G14.	MOLECULAR WEIGHT, DRY, @ STP, lbs./mole	29.12	29.10	29.00
G15.	AVERAGE GAS VELOCITY, feet/min.	2783	2678	2946
	STACK GAS FLOW RATE:			
G16.	STACK CONDITIONS, ACFM	66,117	63,616	69,994
G17.	STANDARD CONDITIONS, SCFM	53,512	51,804	57,097
G18.	STANDARD CONDITIONS, DRY SCFM	33,556	34,688	37,739

*STANDARD TEMPERATURE AND PRESSURE (STP) = 29.92 inches HG, 70 deg. F

Network Environmental, Inc.

SUMMARY OF PARTICULATE TRAIN PARAMETERS

COMPANY NAME: MONITOR SUGAR COMPANY TEST DATE: 10/12/92

COMPANY LOCATION: BAY CITY, MICHIGAN

SOURCE NAME: PULP DRYER #3 NORTH

SAMPLING STAFF: BYRD/CARGILL

	SAMPLE NUMBER	1	2	3
P1.	NUMBER OF POINTS SAMPLED	12	12	12
P2.	DURATION OF SAMPLE, minutes	60.00	60.00	60.00
P3.	NOZZLE DIAMETER, inches	0.309	0.309	0.309
P4.	NOZZLE AREA, sq. ft.	0.00052	0.00052	0.00052
P5.	PITOT CALIBRATION FACTOR	0.860	0.860	0.860
P6.	METER CALIBRATION FACTOR	0.982	0.982	0.982
P7.	AVERAGE FILTER TEMPERATURE, deg. F	0	0	0
P8.	AVERAGE METER TEMPERATURE, deg. F	69.5	70.9	71.5
P9.	AVERAGE METER PRESSURE, inches of water	1.570	1.835	2.193
P10.	METER VOLUME, ACTUAL READING, cu.ft.	42.13	45.09	49.35
P11.	METER VOLUME, @ STP, cu.ft.	39.93	42.65	46.67
P12.	LIQUID VOLUME OF WATER CONDENSED, mls.	501.0	444.0	505.0
P13.	VAPOR VOLUME OF WATER CONDENSED, @ STP, cu.ft.	23.75	21.05	23.94
P14.	TOTAL GAS SAMPLED, @ STP, cu.ft.	63.68	63.70	70.60
P15.	WEIGHT OF GAS SAMPLED, DRY, lbs.	3.01	3.21	3.50
P16.	WEIGHT OF GAS SAMPLED, WET, lbs.	4.11	4.19	4.61
P17.	PERCENT ISOKINETICS	90.3	93.3	93.8

CONCENTRATION CONVERSION FACTORS:

P18.	50 % EXCESS AIR, AFTER COLLECTOR			
P19.	50 % EXCESS AIR, BEFORE COLLECTOR			
P20.	MOISTURE CONDITIONS BEFORE COLLECTOR	1.00	1.00	1.00

STANDARD TEMPERATURE AND PRESSURE (STP) = 29.92 inches HG, 70 deg. F

Network Environmental, Inc.

SUMMARY OF PARTICULATE EMISSIONS

COMPANY NAME: MONITOR SUGAR COMPANY TEST DATE: 10/12/92

COMPANY LOCATION: BAY CITY, MICHIGAN

SOURCE NAME: PULP DRYER #3 SOUTH

SAMPLING STAFF: ENGELHARDT/SMITH

SAMPLE NUMBER	1	2	3
STANDARD ANALYSIS			
E1. TOTAL WEIGHT COLLECTED, grams	0.102	0.117	0.111
E2. LBS. PARTICULATE/1000 LBS. GAS, ACTUAL(1)	0.053	0.052	0.051
E3. LBS. PARTICULATE/1000 LBS. GAS, DRY(2)	0.053	0.052	0.051
E6. GRAINS/DSCF(4)	0.036	0.036	0.035
E7. LBS./HOUR	9.99	10.46	9.72

1. 'ACTUAL' MEANS AT THE CONDITIONS FOUND AT THE SAMPLING LOCATION.
2. 'DRY' INCLUDES ONLY THE NATURAL MOISTURE THAT WOULD BE EMITTED FROM THE PROCESS. MOISTURE ADDED OR SUBTRACTED BY THE COLLECTOR IS NOT INCLUDED.
3. 'WET' INCLUDES THE MOISTURE AS MEASURED AT THE SAMPLING LOCATION.
4. 'DSCF' IS UNDER TOTALLY DRY CONDITIONS, ALL MOISTURE REMOVED.

Network Environmental, Inc.

SUMMARY OF EXHAUST GAS PARAMETERS

COMPANY NAME: MONITOR SUGAR COMPANY TEST DATE: 10/12/92

COMPANY LOCATION: BAY CITY, MICHIGAN

SOURCE NAME: PULP DRYER #3 SOUTH

SAMPLING STAFF: ENGELHARDT/SMITH

	SAMPLE NUMBER	1	2	3
G1.	STACK RADIUS, inches	33.0	33.0	33.0
G2.	AREA OF STACK, sq. ft.	23.76	23.76	23.76
G3.	BAROMETRIC PRESSURE, in. HG.	28.75	28.75	28.75
G4.	STATIC PRESSURE IN STACK, in. H2O	0.28-	0.28-	0.28-
G5.	STACK GAS TEMPERATURE, deg. F	176	174	174
G6.	AVG. SQRT VELOCITY PRESSURE OF POINTS SAMPLED	0.637	0.672	0.649
G7.	PERCENT MOISTURE AT TEST LOCATION	33.19	33.72	34.79
G8.	PERCENT MOISTURE BEFORE COLLECTOR	33.19	33.72	34.79
G9.	DRY GAS COMPOSITION: % OXYGEN	16.80	17.60	17.33
	% CARBON DIOXIDE	1.80	1.27	1.20
	% CARBON MONOXIDE	0.00	0.00	0.00
	% NITROGEN	81.40	81.13	81.47
G10.	PERCENT EXCESS AIR AT TEST LOCATION			
	DENSITY AND MOLECULAR WEIGHT OF STACK GAS:			
G11.	DRY, @ STP, lbs./cu.ft.	0.0749	0.0747	0.0747
G12.	WET, @ STP, lbs./cu.ft.	0.0655	0.0652	0.0649
G13.	WET, @ STACK CONDITIONS, lbs./cu.ft.	0.0524	0.0524	0.0521
G14.	MOLECULAR WEIGHT, DRY, @ STP, lbs./mole	28.97	28.92	28.89
G15.	AVERAGE GAS VELOCITY, feet/min.	2530	2670	2588
	STACK GAS FLOW RATE:			
G16.	STACK CONDITIONS, ACFM	60,105	63,439	61,475
G17.	STANDARD CONDITIONS, SCFM	48,120	50,943	49,359
G18.	STANDARD CONDITIONS, DRY SCFM	32,147	33,763	32,189

STANDARD TEMPERATURE AND PRESSURE (STP) = 29.92 inches HG, 70 deg. F

Network Environmental, Inc.

SUMMARY OF PARTICULATE TRAIN PARAMETERS

COMPANY NAME: MONITOR SUGAR COMPANY TEST DATE: 10/12/92

COMPANY LOCATION: BAY CITY, MICHIGAN

SOURCE NAME: PULP DRYER #3 SOUTH

SAMPLING STAFF: ENGELHARDT/SMITH

	SAMPLE NUMBER	1	2	3
P1.	NUMBER OF POINTS SAMPLED	12	12	12
P2.	DURATION OF SAMPLE, minutes	60.00	60.00	60.00
P3.	NOZZLE DIAMETER, inches	0.322	0.322	0.322
P4.	NOZZLE AREA, sq. ft.	0.00057	0.00057	0.00057
P5.	PITOT CALIBRATION FACTOR	0.830	0.830	0.830
P6.	METER CALIBRATION FACTOR	0.998	0.998	0.998
P7.	AVERAGE FILTER TEMPERATURE, deg. F	0	0	0
P8.	AVERAGE METER TEMPERATURE, deg. F	69.8	71.0	72.5
P9.	AVERAGE METER PRESSURE, inches of water	1.903	2.583	2.408
P10.	METER VOLUME, ACTUAL READING, cu.ft.	44.95	51.94	50.44
P11.	METER VOLUME, @ STP, cu.ft.	43.31	50.03	48.43
P12.	LIQUID VOLUME OF WATER CONDENSED, mls.	454.0	537.0	545.0
P13.	VAPOR VOLUME OF WATER CONDENSED, @ STP, cu.ft.	21.52	25.45	25.83
P14.	TOTAL GAS SAMPLED, @ STP, cu.ft.	64.83	75.48	74.26
P15.	WEIGHT OF GAS SAMPLED, DRY, lbs.	3.24	3.74	3.62
P16.	WEIGHT OF GAS SAMPLED, WET, lbs.	4.24	4.92	4.82
P17.	PERCENT ISOKINETICS	94.3	103.7	105.3

CONCENTRATION CONVERSION FACTORS:

P18.	50 % EXCESS AIR, AFTER COLLECTOR			
P19.	50 % EXCESS AIR, BEFORE COLLECTOR			
P20.	MOISTURE CONDITIONS BEFORE COLLECTOR	1.00	1.00	1.00

STANDARD TEMPERATURE AND PRESSURE (STP) = 29.92 inches HG, 70 deg. F

DISCUSSION OF RESULTS

The resulting combined exhaust particulate emission concentrations for the three samples were 0.052 Lbs/1000 Lbs for sample one, 0.051 Lbs/1000 Lbs for sample two, and 0.050 Lbs/1000 Lbs for sample three. The average exhaust particulate concentration was 0.051 Lbs/1000 Lbs.

The combined particulate mass emission rates were 20.63 Lbs/Hr for sample one, 20.67 Lbs/Hr for sample two, and 20.72 Lbs/Hr for sample three. The average mass emission rate was 20.68 Lbs/Hr.

SOURCE DESCRIPTION

The source tested was the number three beet pulp dryer. The rotary dryer is fired by natural gas and dries the pulp with direct contact. The pulp is fed into the dryer at the beginning of the rotary section. The pulp is passed through the rotary dryer where most of the moisture is removed. The particulate laden exhaust is then passed through a multiclone collector and then a scrubber for particulate removal before it is exhausted to the atmosphere through the twin exhaust stacks. Each exhaust stack is equipped with a scrubber.

Process operating information for the day of the sampling can be found in Appendix C.

SAMPLING AND ANALYTICAL PROTOCOL

The sampling locations were on the twin 66 inch I.D. exhaust stacks at a distance that meets the eight duct diameter downstream two duct diameter upstream requirement of U.S. EPA Reference Method 1.

Particulate

The particulate sampling and analysis were performed in accordance with MDNR Reference Method 5B, and the methods referenced therein. Three (3) samples, each sixty (60) minutes in duration, were collected simultaneously from the north and south exhausts. All the quality control and quality assurance requirements specified in the methods were incorporated in the sampling and analysis. No alterations were incorporated in the testing or analysis. Figure 1 shows a schematic of the particulate sampling train.

3 TACKS TEST #1 11:05A.M - 12:10P.M.
TEST #2 12:35-P.M - 1:40P.M.
TEST #3 2:00PM - 3:30

MONITOR SUGAR COMPANY

Operating Log
Pulp Driers Station

2913290

Day Ending: 10-12-92
Campaing Day: 19

Time	Inlet Temp. #1	Inlet Temp. #2	Inlet Temp. #3	Outlet Temp. #1	Outlet Temp. #2	Outlet Temp. #3	Moist. Plain #1	Moist. Plain #2	Moist. Plain #3	Moist. Pellets	Collectors Press. Drop #1	Collectors Press. Drop #2	Collectors Press. Drop #3	Collectors Press. Drop #4	Belt Scale Wet Pulp Ton/Hr.	Feed Conv. R.P.M. #1	Feed Conv. R.P.M. #2	Feed Conv. R.P.M. #3	Loading Scrolls % #1	Loading Scrolls % #2	Loading Scrolls % #3
7	780	950	820	168	145	125	10.1	10.1	10.1	9.9	4	4	4	4	68	235	220	100	60	41	50
8	[illegible]	970	820	168	145	125	10.6	12.6	12.4	10.2	4	4	4	4	70	235	220	100	58	41	52
9	740	940	810	168	145	125	15.0	12.6	11.0	10.1	4	4	4	4	67	210	195	100	58	40	52
10	820	940	830	168	145	125	14.1	13.5	14.3	10.3	4	4	4	4	78	235	210	100	58	41	52
11	700	940	830	168	145	125	10.6	12.6	11.8	10.3	4	4	4	4	79	235	210	100	60	41	50
12	660	930	820	168	145	125	11.0	12.8	11.0	10.1	4	4	4	4	67	235	210	100	60	41	50
1	680	920	840	168	145	125	11.0	10.6	10.8	10.1	4	4	4	4	63	235	210	100	60	41	50
2	620	920	880	168	145	125	9.2	12.6	11.8	9.9	4	4	4	4	69	235	210	100	58	41	58
3	600	900	800	170	145	125	9.6	11.3	11.3	10.6	4	4	3.5	3.75	63	235	210	100	56	40	56
4	680	900	820	170	145	125	11.1	12.8	13.1	10.0	4	4	3.5	3.75	65	235	210	100	58	42	50
5	700	900	840	170	145	125	10.2	12.8	11.6	10.2	4	4	3.5	3.75	79	235	210	100	58	42	52
6	700	880	840	170	145	125	9.3	13.7	12.8	9.8	4	4	3.5	3.75	79	235	210	100	60	42	52
7	700	900	840	170	145	125	10.2	11.1	9.6	10.3	4	4	3.5	3.75	64	235	210	100	58	40	52
8	700	900	740	170	145	125	8.7	9.8	7.2	10.6	4	4	3.5	3.75	50	235	210	100	58	42	54
9	700	900	760	170	145	125	9.6	10.0	10.2	9.8	4	4	3.5	3.75	51	235	210	100	58	42	48
10	680	920	820	170	145	125	7.0	9.6	9.8	10.5	4	4	3.5	[illegible]	65	235	210	80	58	42	52
11	720	920	860	170	145	125	8.5	11.0	10.5	9.2	4	4	3.5	3.75	64	235	210	98	58	42	50
12	620	920	880	165	145	125	11.1	9.6	8.9	8.9	4	4	3.5	3.75	60	235	210	98	56	40	52
1	/	900	880	/	145	125	/	8.2	9.5	9.2	/	4	3.5	[illegible]	51	/	210	98	/	40	52
2	620	930	860	165	145	125	8.0	11.0	9.5	9.5	4	4	3.5	[illegible]	40	240	170	80	50	40	58
3	600	980	920	165	145	125	10.5	11.6	10.2	9.5	4	4	3.5	3.75	62	240	210	98	48	40	58
4	/	340	340	165	145	125	8.0	11.7	10.3	9.2	4	4	3.5	[illegible]	72	240	180	98	48	40	54
5	/	1000	800	/	145	125	/	10.5	12.1	9.5	/	4	3.5	[illegible]	46	/	200	80	/	42	56
6	860	1000	880	165	145	125	13.0	12.8	13.0	[illegible]	4	4	3.5	[illegible]	49	240	200	98	60	42	50

FAC-042
(11-88)

Filename: BEET6.WQ1
Date: 07-Dec-94
Facility: Monitor Sugar Company
Location: Bay City, Michigan
Source: Pulp dryer 3
Natural gas-fired rotary drum beet pulp dryer controlled with a multiclone and wet scrubber in series (two parallel stacks following controls)
Test date: Oct. 12, 1992

Test ID	Parameter	Units	Values reported			
			Run 1	Run 2	Run 3	Run 4
1	Stack temperature	Deg F	168	165	164	
NORTH STACK	Pressure	in. HG	28.75	28.75	28.75	
	Moisture	%	37.29	33.04	33.9	
	Oxygen	%	16	16.4	16.2	
	Volumetric flow, actual	acfm	66117	63616	69994	
	Volumetric flow, standard*	dscfm	33623	34710	37760	
	Isokinetic variation	%	90.3	93.3	93.8	
Circle: Production or feed rate Capacity:		TPH	77.15	64.54	67.00	
	Pollutant concentrations:					
	Filterable PM	G/dscf	0.037	0.034	0.034	
	CO2	% vol	2.93	2.73	2.13	
	Pollutant mass flux rates:					
	Filterable PM	lb/hr	10.66	10.12	11.00	
	CO2	lb/hr	6750	6493	5511	
	Emission factors (ENGLISH UNITS):					AVERAGE
	Filterable PM	lb/ton	0.138	0.157	0.164	0.153
	CO2	lb/ton	87.5	101	82.3	90.1
	Emission factors (METRIC UNITS):					AVERAGE
	Filterable PM	kg/Mg	0.0691	0.0784	0.0821	0.0765
	CO2	kg/Mg	43.7	50.3	41.1	45.1

*DSCFM BASED ON A STANDARD TEMPERATURE OF 70 DEGREES FAHRENHEIT

Test ID	Parameter	Units	Values reported			
			Run 1	Run 2	Run 3	Run 4
2	Stack temperature	Deg F	176	174	174	
SOUTH STACK	Pressure	in. HG	28.75	28.75	28.75	
	Moisture	%	33.19	33.72	34.79	
	Oxygen	%	16.8	17.6	17.33	
	Volumetric flow, actual	acfm	60105	63439	61475	
	Volumetric flow, standard*	dscfm	32155	33775	32201	
	Isokinetic variation	%	94.3	103.7	105.3	
Circle: Production or feed rate Capacity:		TPH	77.15	64.54	67.00	
	Pollutant concentrations:					
	Filterable PM	G/dscf	0.036	0.036	0.035	
	CO2	% vol	1.8	1.27	1.2	
	Pollutant mass flux rates:					
	Filterable PM	lb/hr	9.92	10.42	9.66	
	CO2	lb/hr	3966	2939	2648	
	Emission factors (ENGLISH UNITS):					AVERAGE
	Filterable PM	lb/ton	0.129	0.161	0.144	0.145
	CO2	lb/ton	51.4	46	39.5	45.5
	Emission factors (METRIC UNITS):					AVERAGE
	Filterable PM	kg/Mg	0.0643	0.0807	0.0721	0.0724
	CO2	kg/Mg	25.7	22.8	19.8	22.7

*DSCFM BASED ON A STANDARD TEMPERATURE OF 70 DEGREES FAHRENHEIT

TOTAL EMISSION FACTORS FOR BOTH STACKS	Emission factors (ENGLISH UNITS):					AVERAGE
	Filterable PM	lb/ton	0.267	0.318	0.308	0.298
	CO2	lb/ton	139	146	122	136
	Emission factors (METRIC UNITS):					AVERAGE
	Filterable PM	kg/Mg	0.133	0.159	0.154	0.149
	CO2	kg/Mg	69.4	73.1	60.9	67.8

Network Environmental, Inc.

EMISSION SOURCE SUMMARY

STANDARD ANALYSIS

COMPANY NAME: MONITOR SUGAR COMPANY TEST DATE: 10/12/92

COMPANY LOCATION: BAY CITY, MICHIGAN

SOURCE NAME: PULP DRYER #3 SOUTH

SAMPLING STAFF: ENGELHARDT/SMITH

STACK RADIUS, inches		33.0
AREA OF STACK, sq. ft.		23.76
STATIC PRESSURE IN STACK, in. H2O		0.28-
STACK GAS TEMPERATURE, deg. F		174
PERCENT MOISTURE AT TEST LOCATION		33.90
DRY GAS COMPOSITION:	% OXYGEN	17.24
	% CARBON DIOXIDE	1.42
	% CARBON MONOXIDE	0.00
	% NITROGEN	81.33
DENSITY, WET, @ STP, lbs./cu.ft.		0.0652
MOLECULAR WEIGHT, DRY, @ STP, lbs./mole		28.93
AVERAGE GAS VELOCITY, feet/min.		2596
STACK GAS FLOW RATE:	ACFM	61673
	SCFM	49474
	SCFM, DRY	32700

EMISSIONS:

LBS. PARTICULATE/1000 LBS. GAS, ACTUAL(1)	0.0520
LBS. PARTICULATE/1000 LBS. GAS, DRY(2)	0.0520
GRAINS/DSCF(4)	0.0359
LBS./HOUR	10.06

1. 'ACTUAL' MEANS AT THE CONDITIONS FOUND AT THE SAMPLING LOCATION.
2. 'DRY' INCLUDES ONLY THE NATURAL MOISTURE THAT WOULD BE EMITTED FROM THE PROCESS. MOISTURE ADDED OR SUBTRACTED BY THE COLLECTOR IS NOT INCLUDED.
3. 'WET' INCLUDES THE MOISTURE AS MEASURED AT THE SAMPLING LOCATION.
4. 'DSCF' IS UNDER TOTALLY DRY CONDITIONS, ALL MOISTURE REMOVED.

Network Environmental, Inc.

EMISSION SOURCE SUMMARY

STANDARD ANALYSIS

COMPANY NAME: MONITOR SUGAR COMPANY TEST DATE: 10/12/92

COMPANY LOCATION: BAY CITY, MICHIGAN

SOURCE NAME: PULP DRYER #3 NORTH

SAMPLING STAFF: BYRD/CARGILL

STACK RADIUS, inches		33.0
AREA OF STACK, sq. ft.		23.76
STATIC PRESSURE IN STACK, in. H2O		0.51-
STACK GAS TEMPERATURE, deg. F		166
PERCENT MOISTURE AT TEST LOCATION		34.75
DRY GAS COMPOSITION:	% OXYGEN	16.20
	% CARBON DIOXIDE	2.60
	% CARBON MONOXIDE	0.00
	% NITROGEN	81.20
DENSITY, WET, @ STP, lbs./cu.ft.		0.0652
MOLECULAR WEIGHT, DRY, @ STP, lbs./mole		29.07
AVERAGE GAS VELOCITY, feet/min.		2802
STACK GAS FLOW RATE:	ACFM	66576
	SCFM	54138
	SCFM, DRY	35328

EMISSIONS:	
LBS. PARTICULATE/1000 LBS. GAS, ACTUAL(1)	0.0502
LBS. PARTICULATE/1000 LBS. GAS, DRY(2)	0.0502
GRAINS/DSCF(4)	0.0351
LBS./HOUR	10.62

1. 'ACTUAL' MEANS AT THE CONDITIONS FOUND AT THE SAMPLING LOCATION.
2. 'DRY' INCLUDES ONLY THE NATURAL MOISTURE THAT WOULD BE EMITTED FROM THE PROCESS. MOISTURE ADDED OR SUBTRACTED BY THE COLLECTOR IS NOT INCLUDED.
3. 'WET' INCLUDES THE MOISTURE AS MEASURED AT THE SAMPLING LOCATION.
4. 'DSCF' IS UNDER TOTALLY DRY CONDITIONS, ALL MOISTURE REMOVED.

NETWORK ENVIRONMENTAL, INC.

Date: 10/12/92
Client:

Plant: Moreton Sugar Co
Source: Dryer #3 North
Staff: Byrd / Cargill

Sample #: 1
Nozzle #: .3093
Rate Meter #:
Control Box #: 3065
Condenser Box #: 1
#1 = .86

Filter Set #: 7
Primary Filter #: DH-378
Secondary Filter #: BH-378
Type Train: 5B
Mls. H_2O Cond.: 491
3.27/3.24

Barometric Press: 28.75
Initial Gas Read: 008.84
Clock Meter Start: 11:03
Time Meter Start: 0
Time Meter Stop: 1

Port	Point	Vel Press "H_2O	P Venturi "H_2O	Gas Meter Reading	Pump Vac. "Hg	Meter Temp °F In	Meter Temp °F Out	Stack Temp °F	Box Temp °F	1 Gas Bag #
2	1	.39	1.27	012.01	0	66	67	168		Dryer # 5
					4	68	67	171		
	2	.28	.915	014.81	6	70	67	172		Notes
	3	.18	.588	017.13	5.5	70	66	169		Initial Leak Check
	4	.76	2.48	021.52	9	71	67	174		0.006 ft³/min @15" Hg
	5	.81	2.64	026.16	8	72	67	172		
	6	.74	2.41	030.652	7	72	67	170		
3	1	.36	1.16	033.75	6	71	67	169		Final Leak Check
	2	.23	.745	036.82	5.5	72	67	165		
	3	.31	1.00	039.23	6	73	67	165		0.000 ft³/min @10" Hg
	4	.32	1.03	042.20	6	74	68	164		
	5	.71	2.30	046.58	8	74	68	165		
	6	.71	2.30	050.972	7	75	69	165		

42.13

NETWORK ENVIRONMENTAL, INC.

Date: 10/12/92
Client:

Plant: Monitor Sugar Co.
Source: Dryer #3 North
Staff: Byrd / Cargill

Sample #: 2
Nozzle #: .3093
Rate Meter #:
Control Box #: 3065
Condenser Box #: 1
#1 = .86

Filter Set #: 5
Primary Filter #: DH-377
Secondary Filter #: BH-377
Type Train: 5B
Mls. H_2O Cond.: 430
3.99

Barometric Press: 28.75
Initial Gas Read: 051.205
Clock Meter Start: 12:34
Time Meter Start: 0
Time Meter Stop: 1

Port	Point	Vel Press "H_2O	P Venturi "H_2O	Gas Meter Reading	Pump Vac. "Hg	Meter Temp °F In	Meter Temp °F Out	Stack Temp °F	Box Temp °F	2 Gas Bag #
2	1	.34	1.35	054.58	0 / 4	69 / 68	68 / 68	163 / 164		Dryer # 2
	2	.19	.758	057.18	4.5	70	68	164		Notes
	3	.18	.718	059.68	5	71	68	165		Initial Leak Check 0.000 ft³/min @15" Hg
	4	.65	2.59	063.99	7.5	73	68	163		
	5	.81	3.23	069.10	7	73	68	163		
	6	.74	2.95	073.995	6	75	69	164		
2	1	.39	1.55	077.57	5	72	69	166		
	2	.24	.957	080.50	3.5	73	68	165		
	3	.30	1.19	083.645	4	73	69	165		Final Leak Check 0.000 ft³/min 10" Hg
	4	.30	1.19	086.85	4	75	69	165		
	5	.70	2.79	091.52	6	77	69	165		
	6	.69	2.75	096.292	6	78	70	166		

45.08 cf

NETWORK ENVIRONMENTAL, INC.

Date: 10/12/92
Client:

Plant: Monitor Sugar Co
Source: Dryer #3 Vent
Staff: Boyd / Cayatt

Sample #: 3
Nozzle #: .3093
Rate Meter #:
Control Box #: 3065
Condenser Box #: 1
#1 = .86

Filter Set #: 1
Primary Filter #: DH-375
Secondary Filter #: BH-375
Type Train: 5B
Mls. H_2O Cond.: 492

Barometric Press: 28.75
Initial Gas Read: 096.86
Clock Meter Start: 13:58
Time Meter Start: 0
Time Meter Stop: 1

Port	Point	Vel Press "H_2O	P Venturi "H_2O	Gas Meter Reading	Pump Vac. "Hg	Meter Temp °F In	Meter Temp °F Out	Stack Temp °F	Box Temp °F	3 Gas Bag #
2	1	.44	1.75	100.65	0	70	70	163		Dryer # 3
					4	70	70	166		
	2	.28	1.11	103.72	4.5	72	70	165		Notes
	3	.17	.67	106.17	4	74	70	164		Initial Leak check
	4	.80	3.19	111.13	9	75	70	165		0.050 ft³/min
	5	.83	3.31	116.32	9	75	70	165		@15" Hg
	6	.78	3.11	121.352	8	76	70	163		
1	1	.42	1.67	125.08	5.5	72	70	164		Final Leak check
	2	.43	1.71	128.88	5	72	69	164		ft³/min
	3	.29	1.15	132.08	4	73	69	164		
	4	.43	1.71	135.80	4.5	75	69	161		
	5	.86	3.43	140.94	6	74	69	161		
	6	.88	3.51	146.205	6	73	69	160		

49.345 g

NETWORK ENVIRONMENTAL INCORPORATED

Date: 10/12/92

Client: Monitor Sugar

Project #:

Plant Monitor Sugar - Bay City, MI

Source Dryer #3 - South

Staff Engelhaedt / Smith

Sample # 1

Nozzle # 0.322

Rate Meter # —

Control Box # 3072

Condenser Box # 2

Filter Set # 19

Primary Filter # DH-386

Secondary Filter # BH-386

Type Train MDNR-5B

Mls. H_2O Cond. 444

Barometric Press 28.75

Initial Gas Read 152.288

Clock Meter Start 11:03

Time Meter Start 0

Time Meter Stop 1

Yd = 0.9976 Pitot #7 = 0.83

Port	Point	Vel Press "H_2O	P Venturi "H_2O	Gas Meter Reading	Pump Vac. "Hg	Meter Temp °F In	Meter Temp °F Out	Stack Temp °F	Box Temp °F	Gas Bag # 1
2	1	0.48	2.18	156.28	2.5	68	68	179		Dryer # 10
	2	0.50	2.27	160.38	3.5	69	67	177		Notes
	3	0.12	0.55	162.64	2.0	71	67	177		Initial Leak Test
	4	0.35	1.60	166.01	4.0	71	67	177		0.000 ft³/min
	5	0.47	2.15	169.96	4.0	72	67	176		@ 15" Hg
	6	0.50	2.28	174.155	5.0	72	68	178		Final Leak Test
1	1	0.43	1.96	177.94	3.5	71	68	177		0.000 ft³/min
	2	0.55	2.51	182.31	4.5	72	68	178		@ 8" Hg
	3	0.38	1.75	185.99	3.5	73	68	174		
	4	0.30	1.39	189.28	3.0	74	69	171		
	5	0.41	1.89	193.07	3.5	74	69	173		
	6	0.50	2.31	197.235	4.5	74	69	171		END TEST AT 12:05
										17

326 %

NETWORK ENVIRONMENTAL INCORPORATED

Date: 10/12/92

Client: Monitor Sugar

Project #:

Plant Monitor Sugar - Bay City, MI.

Source Dryer #3 South

Staff Engelhaedt/Smith

Sample # 2

Filter Set # 17

Barometric Press 28.75

Nozzle # 0.322

Primary Filter # DH - 353

Initial Gas Read 197.656

Rate Meter # —

Secondary Filter # BH - 383

Clock Meter Start 12:34

Control Box # 3072

Type Train MDNR-5B

Time Meter Start 0

Condenser Box # 2

Mls. H_2O Cond. 526

Time Meter Stop 1

Y d = 0.9976 Pitot #7 = 0.83

Port	Point	Vel Press "H_2O	P Venturi "H_2O	Gas Meter Reading	Pump Vac. "Hg	Meter Temp °F In	Meter Temp °F Out	Stack Temp °F	Box Temp °F	Gas Bag #2
1	1	0.38	2.10	201.59	2.5	70	70	173		Dryer # 11
	2	0.55	3.02	206.32	4.0	70	69	177		Notes
	3	0.41	2.25	210.54	3.5	72	69	178		Initial Leak Test
	4	0.27	1.49	213.97	3.0	73	69	176		0.010 ft³/min
	5	0.69	3.85	218.10	4.5	73	69	168		@ 18 "Hg
	6	0.51	2.85	223.850	4.0	74	69	168		Final Leak Test
2	1	0.56	3.08	228.58	4.0	72	69	177		0.005 ft³/min
	2	0.52	2.86	233.22	6.0	72	69	176		@ 10 "Hg
	3	0.13	0.72	235.70	4.5	72	69	174		
	4	0.40	2.21	239.65	8.0	73	70	174		
	5	0.63	3.50	244.73	8.5	74	70	172		
	6	0.55	3.07	249.598	8.0	77	70	172		END TEST AT 13:36
										15

NETWORK ENVIRONMENTAL INCORPORATED

Date: 10/12/92

Client: Monitor Sugar

Project #:

Plant: Monitor Sugar - Bay City, MI

Source: Dryer #3 South

Staff: Engelhardt/Smith

Sample #: 8

Nozzle #: 0.322

Rate Meter #: —

Control Box #: 3072

Condenser Box #: 2

Filter Set #: 15

Primary Filter #: DH-382

Secondary Filter #: BH-382

Type Train: MDNR-5B

Mls. H_2O Cond.: 534

Barometric Press: 28.75

Initial Gas Read: 249.968

Clock Meter Start: 13:58

Time Meter Start: 0

Time Meter Stop: 1

Y/d = 0.9976 Pitot #7 = 0.83

Port	Point	Vel Press "H_2O	P Venturi "H_2O	Gas Meter Reading	Pump Vac. "Hg	Meter Temp °F In	Meter Temp °F Out	Stack Temp °F	Box Temp °F	Gas Bag # 3
2	1	0.51	2.79	254.53	3.0	72	72	181		Dryer # 12
	2	0.56	3.08	259.33	4.0	72	72	178		Notes
	3	0.12	0.66	261.73	2.0	74	71	178		Initial Leak Test
	4	0.41	2.27	265.78	4.5	75	71	176		0.000 cft³/min
	5	0.50	2.78	270.36	5.0	76	71	173		@ 16 "Hg
	6	0.49	2.72	274.935	4.5	76	71	174		Final Leak Test
1	1	0.41	2.28	279.08	4.5	73	71	173		0.000 cft³/min
	2	0.55	3.05	283.79	6.0	73	71	174		@ 7 "Hg
	3	0.42	2.33	288.04	6.0	74	71	175		
	4	0.24	1.34	291.34	4.5	74	71	169		
	5	0.49	2.75	295.78	6.0	74	71	167		
	6	0.51	2.85	300.412	6.5	73	70	168		END TEST AT: 15:01