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.

AP-42 Section Number: 9.10.1.2

Reference Number: 25

Title: Emissions Survey Conducted at Western Sugar Company, Scottsbluff, Nebraska

American Environmental Testing, Inc.

American Environmental Testing, Inc.

January 1995

"EMISSIONS SURVEY CONDUCTED AT WESTERN SUGAR COMPANY, LOCATED IN SCOTTSBLUFF, NEBRASKA"

AP-42 Section 9.10.1.2
Reference 25
Report Sect.
Reference

CEM Supervisor:

J. Paul Benson

EPA 5 Supervisor:

Greg E. Johnson

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Ryan B. Benson
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Test Dates:

December 14-17, 1994

Submittal Date:

January 10, 1995

Prepared for: Mr. Steve Geist

Western Sugar
2100 East Overland Drive
Scottsbluff, Nebraska 69361-1768

Prepared by: Mr. V. Brent Benson, Technical Director

American Environmental Testing, Inc.
565 South Birch Drive
Spanish Fork, Utah 84660

CERTIFICATION OF REPORT INTEGRITY

AMERICAN ENVIRONMENTAL TESTING COMPANY, INC. (AET) certifies:

1. That every effort was made to obtain accurate and representative data within the guidelines established by:

   A. The U.S. Environmental Protection Agency Code of Federal Regulations (CFR) Title 40, Chapter I, Part 60, Appendix "A", Methods 1-5 inclusive, Method 6C, Method 7E, Method 10 and Method 202.

   B. The U.S. Environmental Protection Agency "Quality Assurance Handbook for Air Pollution Measurement Systems".

2. All of sampling and analysis performed for the compliance test reported herein were carried out by myself or under my supervision.

3. The results obtained are accurate and authentic.

Greg E. Johnson
Method 5 Crew Supervisor

J. Paul Benson
CEM Crew Supervisor

I have reviewed all testing details and methods on which the results of this test are based. I find them to be accurate within the limits of the applicable methods.

V. Brent Benson
Technical Director

Table 2.1.2

(PM_{10} Emissions Summary)

Pulp Dryer North Stack

Test Run	DSCF Collected	Emissions Rates	
		Lbs/hr	gr/dscf
1	30.8168	9.3954	0.0681
2	44.6983	6.8885	0.0510
3	44.5181	6.1525	0.0472
Average =	40.0111	7.4788	0.0554

Table 2.1.3

(PM_{10} Emissions Summary)

Pulp Dryer South Stack

Test Run	DSCF Collected	Emissions Rates	
		Lbs/hr	gr/dscf
1	31.8780	6.1424	0.0444
2	44.8184	5.7570	0.0424
3	45.3842	6.1298	0.0456
Average =	40.6935	6.0097	0.0441

The average measured PM_{10} emission concentration for the Pulp Dryer's North & South Stacks combined was 13.4885 lbs/hr, which is 67.44% of the NDEQ permitted allowable ceiling level of 20.0 lbs/hr.

Table 2.2.1

(SO_2 Emissions Summary)

Pulp Dryer Scrubber

Test Run	Emissions Rates	
	ppm	lbs/hr
1	2.61	0.838
2	0.82	0.258
3	0.99	0.305
Average =	1.47	0.467

The average measured SO_2 emission concentration for the Pulp Dryer Scrubber was 0.467 lbs/hr, which is 3.34% of the NDEQ permitted allowable ceiling of 14.0 lbs/hr.

2.3 NO_x Emissions (EPA 7E)

The emissions data accumulated for NO_x emissions during the December 14-17, 1994 Pretest Emissions Testing is summarized in Table 2.3.1 for the Boiler Scrubber and Table 2.3.2 for the Pulp Dryer Scrubber.

Table 2.3.2

(NO_x Emissions Summary)

Pulp Dryer Scrubber

Test Run	Emissions Rates	
	ppm	lbs/hr
1	63.01	14.55
2	53.26	12.06
3	61.77	13.66
Average =	59.35	13.42

The average measured NO_x emission concentration for the Pulp Dryer Scrubber was 13.42 lbs/hr, which is 95.86% of the NDEQ permitted allowable ceiling level of 14.0 lbs/hr.

Figure 4.1.3

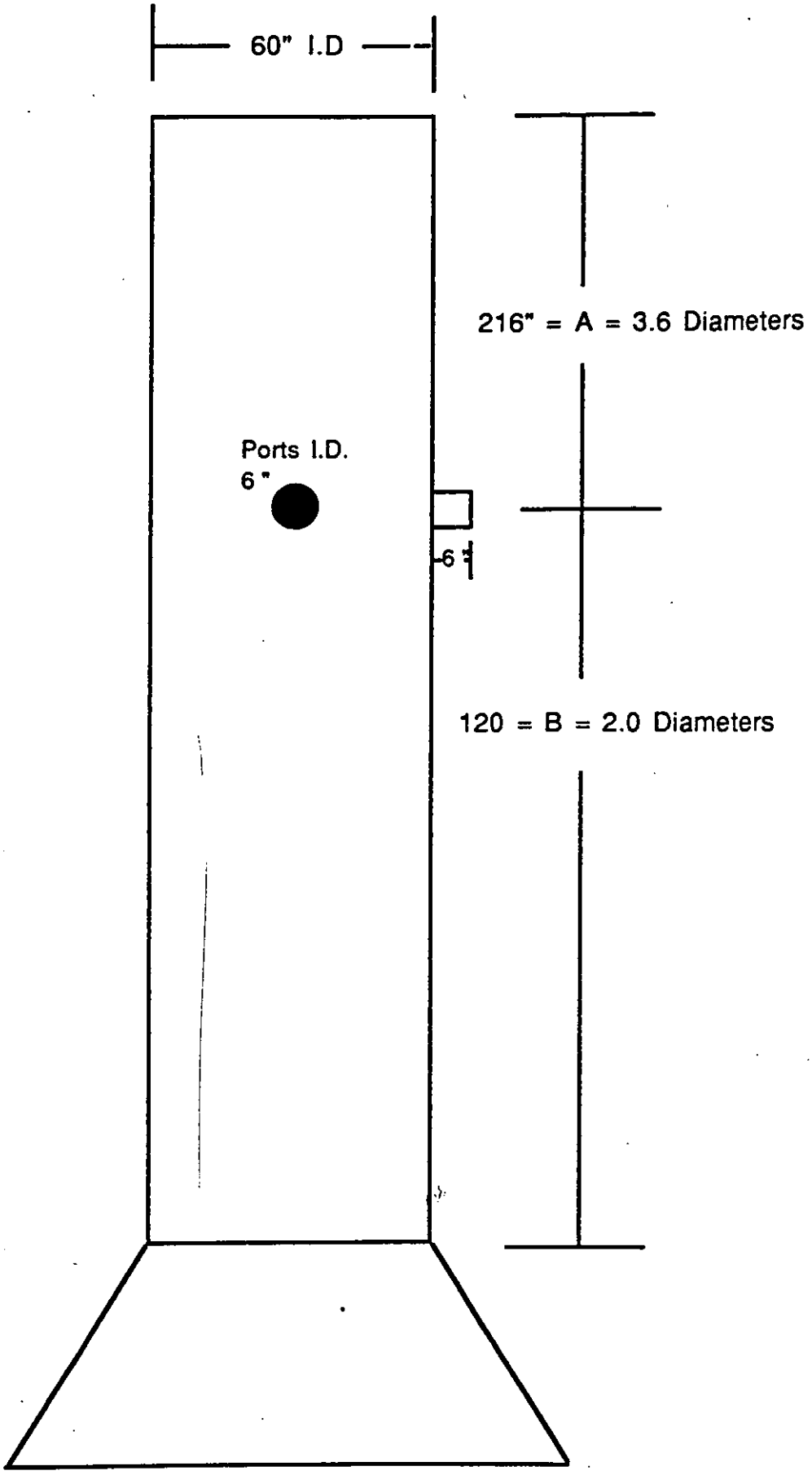

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Table 4.1.4

TRAVERSE POINT CALCULATIONS

Plant: The Western Sugar Company
Date: 12/14/94
Sampling Location: Pulp Dryer Scrubber
Inside of far wall to outside of
port (distance, X) 66.0"
Inside of near wall to outside of
port (distance, Y) 6"
Stack I.D. 60.0" = 19.634 ft squared

Traverse Point Number	Percent of Stack I.D.	Stack I.D. inches	Product of col. 2 &3 (to 1/8 in)	Distance Y	Traverse Point Location from outside of ports (sum of columns 4 & 5)
1 & 13	2.1	60	1.260	6"	7.260 = 7 1/4"
2 & 14	6.7	60	4.020	6"	10.020 = 10"
3 & 15	11.8	60	7.080	6"	13.080 = 13 1/8"
4 & 16	17.7	60	10.620	6"	16.620 = 16 5/8"
5 & 17	25	60	15.000	6"	21.000 = 21"
6 & 18	35.6	60	21.360	6"	27.360 = 27 3/8"
7 & 19	64.4	60	38.640	6"	44.640 = 44 5/8"
8 & 20	75	60	45.000	6"	51.000 = 51"
9 & 21	82.3	60	49.380	6"	55.380 = 55 3/8"
10 & 22	88.2	60	52.920	6"	58.920 = 58 7/8"
11 & 23	93.3	60	55.980	6"	61.980 = 62"
12 & 24	97.9	60	58.740	6"	64.740 = 64 3/4"

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TABLE 4.1.12
(FIELD AND LABORATORY DATA SUMMARY)

Plant : The Western Sugar Company
Source: Pulp Dryer North Stack
Type : EPA Method #5/202, 6C & 7E
Date : 12/14/94

Symbol	Description	Units	Test #1	Test #2	Test #3
Vm	Volume dry gas	Ft3	37.931	53.963	55.754
	sampled @ meter	lso	34.783	49.484	51.126
	conditions				
Pb	Barometric Pre:	"Hg abs	26.11	26.25	26.21
ΔH	Average Pres	"H2O	0.6106	1.2721	1.297
	drop across the				
	orifice meter				
Tm	Average gas	°R	520.06	512.83	531.19
	meter temp	°F	60.06	52.83	71.19
Yi	Meter Coefficient		0.917	0.917	0.917
Vw	Total H2O	ml	532.1	797.9	849.5
	collected, impingers				
	& silica gel				
CO2		%	7.2	4.6	4.7
O2		%	12.9	12.6	12.6
N2 + CO		%	79.9	82.8	82.7
Rn	Nozzle Dia.	in.	0.312	0.377	0.377
Ts	Stack Temp	°R	626.21	629.5	629.79
		°F	166.21	169.5	169.79
Sqr rt ΔP	Velocity head	"H2O	0.4717	0.4657	0.4621
	of stack gas				
Cp	Pitot Tube		0.8429	0.8429	0.8429
	Coefficient				
Ps	Static Pres	"H2O	-0.22	-0.22	-0.22
Pabs	Absolute Pres	"Hg	26.09	26.23	26.19
As	Area stack	Ft2	19.635	19.635	19.635
	Stack in inches		60	60	60
Tt	Net time	min.	72	72	72
	of test				
Mgp			136.1	147.8	136.3

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TABLE 4.1.12
(FIELD AND LABORATORY DATA SUMMARY)

Plant : The Western Sugar Company
Source: Pulp Dryer North Stack
Type : EPA Method #5/202, 6C & 7E
Date : 12/14/94

Symbol	Description	Units	Test #1	Test #2	Test #3
Vm	Volume dry gas	Ft3	37.931	53.963	55.754
	sampled @ meter	Iso	34.783	49.484	51.126
	conditions				
Pb	Barometric Pres	"Hg abs	26.11	26.25	26.21
ΔH	Average Pres	"H2O	0.6106	1.2721	1.297
	drop across the				
	orifice meter				
Tm	Average gas	°R	520.06	512.83	531.19
	meter temp	°F	60.06	52.83	71.19
Yi	Meter Coefficient		0.917	0.917	0.917
Vw	Total H2O	ml	532.1	797.9	849.5
	collected, impingers				
	& silica gel				
CO2		%	7.2	4.6	4.7
O2		%	12.9	12.6	12.6
N2 + CO		%	79.9	82.8	82.7
Rn	Nozzle Dia.	in.	0.312	0.377	0.377
Ts	Stack Temp	°R	626.21	629.5	629.79
		°F	166.21	169.5	169.79
Sqr rt ΔP	Velocity head	"H2O	0.4717	0.4657	0.4621
	of stack gas				
Cp	Pitot Tube		0.8429	0.8429	0.8429
	Coefficient				
Ps	Static Pres	"H2O	-0.22	-0.22	-0.22
Pabs	Absolute Pres	"Hg	26.09	26.23	26.19
As	Area stack	Ft2	19.635	19.635	19.635
	Stack in inches		60	60	60
Tt	Net time	min.	72	72	72
	of test				
Mgp			136.1	147.8	136.3

AMERICAN ENVIRONMENTAL TESTING, INCORPORATED
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TABLE 4.1.13
(FIELD AND LABORATORY DATA SUMMARY)

Plant : The Western Sugar Company
Source: Pulp Dryer South Stack
Type : EPA Method #5/202, 6C & 7E
Date : 12/13/94

Symbol	Description	Units	Test #1	Test #2	Test #3
Vm	Volume dry gas	Ft3	35.935	50.35	50.906
	sampled @ meter	lso	35.288	49.444	49.990
	conditions				
Pb	Barometric Pre:	"Hg abs	26.49	26.25	26.23
ΔH	Average Pres	"H2O	0.5273	1.2387	1.2473
	drop across the				
	orifice meter				
Tm	Average gas	°R	517.48	511.04	509.85
	meter temp	°F	57.48	51.04	49.85
Yi	Meter Coefficient		0.982	0.982	0.982
Vw	Total H2O	ml	528.8	750.5	789.3
	collected, impingers				
	& silica gel				
CO2		%	8.4	4.7	4.6
O2		%	12.5	12.7	12.7
N2 + CO		%	79.1	82.6	82.7
Rn	Nozzle Dia.	in.	0.302	0.376	0.376
Ts	Stack Temp	°R	632.17	632.71	631.33
		°F	172.17	172.71	171.33
Sqr rt ΔP	Velocity head	"H2O	0.4664	0.4583	0.4603
	of stack gas				
Cp	Pitot Tube		0.8414	0.8414	0.8414
	Coefficient				
Ps	Static Pres	"H2O	-0.22	-0.22	-0.22
Pabs	Absolute Pres	"Hg	26.47	26.23	26.21
As	Area stack	Ft2	19.635	19.635	19.635
	Stack in inches		60	60	60
Tt	Net time	min.	72	72	72
	of test				
Mgp			91.7	123.2	134.1

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TABLE 4.1.13
(FIELD AND LABORATORY DATA SUMMARY)

Plant : The Western Sugar Company
Source: Pulp Dryer South Stack
Type : EPA Method #5/202, 6C & 7E
Date : 12/13/94

Symbol	Description	Units	Test #1	Test #2	Test #3
Vm	Volume dry gas	Ft3	35.935	50.35	50.906
	sampled @ meter	lso	35.288	49.444	49.990
	conditions				
Pb	Barometric Pre:	"Hg abs	26.49	26.25	26.23
ΔH	Average Pres	"H2O	0.5273	1.2387	1.2473
	drop across the				
	orifice meter				
Tm	Average gas	°R	517.48	511.04	509.85
	meter temp	°F	57.48	51.04	49.85
Yi	Meter Coefficient		0.982	0.982	0.982
Vw	Total H2O	ml	528.8	750.5	789.3
	collected, impingers				
	& silica gel				
CO2		%	8.4	4.7	4.6
O2		%	12.5	12.7	12.7
N2 + CO		%	79.1	82.6	82.7
Rn	Nozzle Dia.	in.	0.302	0.376	0.376
Ts	Stack Temp	°R	632.17	632.71	631.33
		°F	172.17	172.71	171.33
Sqr rt ΔP	Velocity head	"H2O	0.4664	0.4583	0.4603
	of stack gas				
Cp	Pitot Tube		0.8414	0.8414	0.8414
	Coefficient				
Ps	Static Pres	"H2O	-0.22	-0.22	-0.22
Pabs	Absolute Pres	"Hg	26.47	26.23	26.21
As	Area stack	Ft2	19.635	19.635	19.635
	Stack in inches		60	60	60
Tt	Net time	min.	72	72	72
	of test				
Mgp			91.7	123.2	134.1

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TABLE 4.1.20
(CALCULATED COMPLIANCE CRITERIA)

Plant : The Western Sugar Company
Source: Pulp Dryer North Stack
Type : EPA Method #5/202 , 6C & 7E
Date : 12/14/94

SYMBOL	DESCRIPTION	UNITS	Test #1	Test #2	Test #3
Vm std	Volume dry gas sampled @ standard Conditions	dscfm	0.4280	0.6208	0.6183
		dscf	30.8168	44.6983	44.5181
Vw gas	Volume water vapor collected @ standard conditions	scf	25.0459	37.5572	39.986
Bws	Proportion by volume of water vapor in gas stream dimensionless		0.4483	0.4566	0.4732
Md	Dry molecular weight	lb/lb mole	29.668	29.24	29.256
Ms	Wet molecular weight	lb/lb mole	24.4367	24.1079	23.9298
Vs	Stack gas velocity	ft/sec	33.6831	33.4809	33.3799
Qs	Volumetric flow rate dry basis standard conditions	ft3/hr	9.6583 x E +5	9.4579 x E +5	9.1233 x E +5
Iso	Isokinetic variation	%	98.4543	99.9774	103.2254
Cs	Conc. Particulate matter in stack gas dry basis	lb/scf	4.4164 x E -3	3.3066 x E -3	3.0617 x E -3
Emr	Emission rate *	lbs/dscf	9.7278 x E -6	7.2833 x E -6	6.7438 x E -6
		gr/dscf	0.0681	0.051	0.0472
		lbs/hr	9.3954	6.8885	6.1525

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TABLE 4.1.21
(CALCULATED COMPLIANCE CRITERIA)

Plant : The Western Sugar Company
Source: Pulp Dryer South Stack
Type : EPA Method #5/202, 6C & 7E
Date : 12/14/94

SYMBOL	DESCRIPTION	UNITS	Test #1	Test #2	Test #3
Vm std	Volume dry gas	dscfm	0.4428	0.6225	0.6303
	sampled @ standard	dscf	31.878	44.8184	45.3842
	Conditions				
Vw gas	Volume water	scf	24.8906	35.326	37.1524
	vapor collected @				
	standard conditions				
Bws	Proportion by		0.4385	0.4408	0.4501
	volume of water				
	vapor in gas stream				
	dimensionless				
Md	Dry molecular	lb/lb mole	29.844	29.26	29.244
	weight				
Ms	Wet molecular	lb/lb mole	24.6509	24.2968	24.1827
	weight				
Vs	Stack gas	ft/sec	33.0189	32.8449	33.0414
	velocity				
Qs	Volumetric flow	ft3/hr	9.6858	9.4998	9.4101
	rate dry basis		x E +5	x E +5	x E +5
	standard conditions				
Iso	*Isokinetic*	%	108.3778	100.3349	102.569
	variation				
Cs	Conc. Particulat	lb/scf	2.8766	2.7489	2.9548
	matter in stack		x E -3	x E -3	x E -3
	gas dry basis				
Emr	Emission rate *	lbs/dscf	6.3417	6.0601	6.514
			x E -6	x E -6	x E -6
		gr/dscf	0.0444	0.0424	0.0456
		lbs/hr	6.1424	5.757	6.1298
			***RUN #1**	**RUN #2**	**RUN #3**
	NOx	ppm	63.12	53.19	61.82
		lbs/hr	14.554	12.056	13.663
	SO2	ppm	2.84	0.88	1.5
		lbs/hr	0.838	0.258	0.305

*For Pulp Dryer System (combined flow from North and South exhaust stacks)

2. Sampling Volume = > 31.8 DSCF

AET Run Number	Sample Volume (DSCF)
1	40.8572
2	39.5276
3	40.3008
Average =	40.2285

All of the compliance test quality assurance criteria was achieved for this set of tests.

Pulp North Dryer Scrubber

1. Isokinetic Sampling Rate = 100 ± 10.0%

AET Run Number	Sampling Rate
1	98.4543
2	99.9774
3	103.2254
Average =	100.5524

2. Sampling Volume = > 31.8 DSCF

AET Run Number	Sample Volume (DSCF)
1	30.8168
2	44.6983
3	44.5181
Average =	40.0111

All of the compliance test quality assurance criteria was achieved for this set of tests.

Pulp South Dryer Scrubber

1. Isokinetic Sampling Rate = 100 ± 10.0%

AET Run Number	Sampling Rate
1	108.3778
2	100.3349
3	102.5690
Average =	103.7606

2. Sampling Volume = > 31.8 DSCF

AET Run Number	Sample Volume (DSCF)
1	31.8780
2	44.8184
3	45.3842
Average =	40.6935

All of the compliance test quality assurance criteria was achieved for this set of tests.

Lime Slaker

1. Isokinetic Sampling Rate = 100 ± 10.0%

AET Run Number	Sampling Rate
1	90.4972
2	103.1651
3	101.8756
Average =	98.5126

a. Zero drift ≤ to 3.0% of the span value.

It was met for these tests.

b. Calibration drift ≤ 3.0% of the span value.

It was met for these tests.

c. Calibration bias error has to be ≤ 5.0% of the calibration gas value.

AET met this condition for the tests. These results are included in Appendix "I".

Pulp Dryer Scrubber

1. EPA Protocol 1 gas standards consisting of nitrogen oxide in nitrogen in the following ranges for the span value of 0 to 300 ppm:

   a. Zero gas (< 0.1 ppm NOx).

   AET had a zero gas of purified N_2 that was < 0.1 ppm NOx.

   b. Mid-level calibration gas with a nitrogen oxide concentration equivalent to 40 to 60 percent of the span value.

   AET's mid-level calibration gas was 159.9 ppm, which was in the acceptable range.

   c. High-level calibration gas with a nitrogen oxide concentration equivalent to 80 to 100 percent of the span value.

   AET's high-level calibration gas was 259.6 which was in the acceptable range.

The calibration gas certificates of analysis are included in Appendix "I".

2. Measurement System Performance Specifications

During the NOx tests AET's measurement system is required to meet the following criteria:

a. Zero drift ≤ to 3.0% of the span value.

It was met for these tests.

b. Calibration drift ≤ 3.0% of the span value.

It was met for these tests.

c. Calibration bias error has to be ≤ 5.0% of the calibration gas value.

AET met this condition for the tests. These results are included in Appendix "I".

The main quality assurance criteria for EPA Method 6C requires that the following items are met:

Boiler Scrubber

1. EPA Protocol 1 gas standards consisting of sulfur dioxide in nitrogen in the following ranges for the span value of 0 to 100 ppm:

a. Zero gas (< 0.1 ppm SO2).

AET had a zero gas of purified N_2 that was < 0.1 ppm SO2.

b. Mid-level calibration gas with a sulfur dioxide concentration equivalent to 40 to 60 percent of the span value.

AET's mid-level calibration gas was 54.5 ppm, which was in the acceptable range.

c. High-level calibration gas with a sulfur dioxide concentration equivalent to 80 to 100 percent of the span value.

AET's high-level calibration gas was 88.4 which was in the acceptable range.

The calibration gas certificates of analysis are included in Appendix "I".

2. Measurement System Performance Specifications

During the SO2 tests AET's measurement system is required to meet the following criteria:

a. Zero drift ≤ to 3.0% of the span value.

It was met for these tests.

b. Calibration drift ≤ 3.0% of the span value.

It was met for these tests.

c. Calibration bias error has to be ≤ 5.0% of the calibration gas value.

AET met this condition for the tests. These results are included in Appendix "I".

Pulp Dryer Scrubber

1. EPA Protocol 1 gas standards consisting of sulfur dioxide in nitrogen in the following ranges for the span value of 0 to 100 ppm:

a. Zero gas (< 0.1 ppm SO2).

AET had a zero gas of purified N_2 that was < 0.1 ppm SO2.

b. Mid-level calibration gas with a sulfur dioxide concentration equivalent to 40 to 60 percent of the span value.

AET's mid-level calibration gas was 54.5 ppm, which was in the acceptable range.

c. High-level calibration gas with a sulfur dioxide concentration equivalent to 80 to 100 percent of the span value.

AET's high-level calibration gas was 88.4 which was in the acceptable range.

The calibration gas certificates of analysis are included in Appendix "I".

2. Measurement System Performance Specifications

During the SO2 tests AET's measurement system is required to meet the following criteria:

a. Zero drift ≤ to 3.0% of the span value.

It was met for these tests.

b. Calibration drift ≤ 3.0% of the span value.

It was met for these tests.

c. Calibration bias error has to be ≤ 5.0% of the calibration gas value.

AET met this condition for the tests. These results are included in Appendix "I".

Run #1

NOx (ppm) =	63.12
NOx (ppm bias correction) =	63.01
NOx (lbs/hr)	14.554

Run #1

Zero Gas Pre (ppm) =	0.30
Zero Gas Post (ppm) =	-0.40
Cal Gas Actual (ppm) =	159.90
Cal Gas Pretest (ppm) =	160.80
Cal Gas Post test (ppm) =	159.70

Run #2

NOx (ppm) =	53.19
NOx (ppm bias correction) =	53.26
NOx (lbs/hr)	12.056

Run #2

Zero Gas Pre (ppm) =	-0.40
Zero Gas Post (ppm) =	0.10
Cal Gas Actual (ppm) =	159.90
Cal Gas Pretest (ppm) =	159.70
Cal Gas Post test (ppm) =	160.30

Run #3

NOx (ppm) =	61.82
NOx (ppm bias correction) =	61.77
NOx (lbs/hr)	13.663

Run #3

Zero Gas Pre (ppm) =	0.10
Zero Gas Post (ppm) =	0.10
Cal Gas Actual (ppm) =	159.90
Cal Gas Pretest (ppm) =	160.30
Cal Gas Post test (ppm) =	159.40

Qs South Pulp Dryer

Test	
1	9.6858E+5
2	9.4998E+5
3	9.4010E+5

Qs North Pulp Dryer

Test	
1	9.6583E+5
2	9.4579E+5
3	9.1233E+5

Pulp Dryer Volumetric Flow Rate DSCFH - Qs

Test	
1	1.9344E+6
2	1.8958E+6
3	1.8524E+6

Run #1

SO2 (ppm) =	2.84
SO2 (ppm bias correction) =	2.61
SO2 (lbs/hr)	0.838

Run #1

Zero Gas Pre (ppm) =	0.80
Zero Gas Post (ppm) =	-0.40
Cal Gas Actual (ppm) =	88.40
Cal Gas Pretest (ppm) =	89.80
Cal Gas Post test (ppm) =	89.60

Run #2

SO2 (ppm) =	0.88
SO2 (ppm bias correction) =	0.82
SO2 (lbs/hr)	0.258

Run #2

Zero Gas Pre (ppm) =	-0.40
Zero Gas Post (ppm) =	0.50
Cal Gas Actual (ppm) =	88.40
Cal Gas Pretest (ppm) =	89.80
Cal Gas Post test (ppm) =	88.90

Run #3

SO2 (ppm) =	1.50
SO2 (ppm bias correction) =	0.99
SO2 (lbs/hr)	0.305

Run #3

Zero Gas Pre (ppm) =	0.50
Zero Gas Post (ppm) =	0.50
Cal Gas Actual (ppm) =	88.40
Cal Gas Pretest (ppm) =	88.90
Cal Gas Post test (ppm) =	89.60

Qs South Pulp Dryer

Test	
1	9.6858E+5
2	9.4998E+5
3	9.4010E+5

Qs North Pulp Dryer

Test	
1	9.6583E+5
2	9.4579E+5
3	9.1233E+5

Pulp Dryer Volumetric Flow Rate DSCFH - Qs

Test	
1	1.9344E+6
2	1.8958E+6
3	1.8524E+6

AMERICAN ENVIRONMENTAL TESTING, INCORPORATED

565 So. Birch Drive 801-266-7111

Spanish Fork, Utah 84660

PARTICULATE FIELD DATA FORMAT

1	Plant	Western Sugar
2	City	Scottbluff, Nebraska
3	Location	North Pulp Dryer #1 Comp.
4	Operator	Rick Hawkins
5	Date	12-14-94
6	Stack Diameter (in)	60
7	Sample Box Number	RAC
8	Meter Box Number	RAC #2824
9	Meter ^H@	1.613
10	Meter Calibration, Y	0.917
11	Pitot Tube, Cp	0.8429
12	Probe Length (ft)	6'-B
13	Probe Liner Material	Stainless Steel
14	Probe Heater Setting (°F)	248
15	Ambient Temperature (°F)	35
16	Barometeric Press., Pb (in Hg)	26.11
17	Assumed Moisture (%)	46
18	Static Pressure, Ps (in H20)	-0.22
19	C Factor	0
20	Reference ^P (in H20)	0.19
21	Nozzle Identification Number	5/16 #0
22	Nozzle Diameter (in)	0.312
23	Thermometer Number	1-A
24	Pretest Leak Rate (CFM)	0.003
25	Leak Check Vacuum (in H20)	19.5
26	Filter Number	NP-1
27	Gas Analysis	
28	CO (%)	0
29	CO2 (%)	7.20
30	O2 (%)	12.90
31	N2 (%)	79.90
32	sq/ft	19.63

PRETEST CALCULATIONS

NOZZLE DIAMETER		PRETEST DATA		ISOKINETIC ^H	
Dn = 0.312				**^H** = 0.3194	
constant	0.0357	Cp	0.8429	**constant**	849.8000
Qm	0.75	Imp V(H20)(ml)	67.5000	**^H@**	1.0000
Pb(in HG)	26.11	Gel H20(g)	12.0000	Mds	29.6680
Pgm(in H20)	-0.22	V(H20)(ml)	127.8000	**Mm**	29.6680
Pm	26.0938	Vm(acf)	49.2300	**K**	1.6812
Cp	0.8429	^h avg	0.2000	**^P**	0.1900
Tm(°F)	60	Vwc	6.0155	**^H** = 0.3194	
Tm(°R)	520	Vmc	40.0079		
Bwm	0	**Bws** = 0.1307			
Bws	0.46				
Ts(°F)	170				
Ts(°R)	630				
Mds	29.668				
Ms	24.3007				
Pb(in HG)	26.11				
Pgs(in H20)	-0.22				
Ps	26.0938				
(^P)avg	0.19				
Dn = 0.2983					

Sample Point	Meter Temperature Outlet (°F)	Meter Temperature Inlet (°F)	Stack Temp Ts (°F)	Gas Volume Vm (ft3)	Gas Volume difference (ft3)
starting				257.4	
1	47	47	168	258.53	1.13
2	48	48	169	259.85	1.32
3	51	49	171	261.35	1.50
4	50	48	165	262.91	1.56
5	56	50	164	264.54	1.63
6	58	51	165	266.13	1.59
7	63	52	168	267.63	1.50
8	64	53	165	269.2	1.57
9	67	55	164	270.95	1.75
10	70	58	166	272.58	1.63
11	72	60	169	274.29	1.71
12	73	62	169	275.82	1.53
13	56	55	152	277.35	1.53
14	57	58	159	279.01	1.66
15	58	60	164	280.7	1.69
16	63	60	170	282.38	1.68
17	65	61	168	284.01	1.63
18	67	62	167	285.62	1.61
19	69	62	166	287.22	1.60
20	70	62	170	288.824	1.60
21	71	63	171	290.41	1.59
22	73	63	166	292.07	1.66
23	73	64	167	293.69	1.62
24	74	65	166	295.331	1.64

avg °F		60.06	166.21		
avg °R		520.06	626.21		
total =				37.9310	37.93
average =	63.12	57.00	166.21		
Sample Point	Meter Temperature Inlet (°F)	Meter Temperature Outlet (°F)	Stack Temp (°F) T	Gas Volume Vm	Gas Volume Vm

Velocity Head ^Ps (in H20)	Pressure Diff ^H (in H20)	Sqrt ^Ps	Sampling Time (min)	Clock Time (24 hrs)	Vacuum (in Hg)
				1320	
0.12	0.32	0.3464	3	1322.5	3.2
0.16	0.42	0.4000	3	1325	4.2
0.2	0.53	0.4472	3	1327.5	5
0.24	0.64	0.4899	3	1330	6.2
0.25	0.67	0.5000	3	1332.5	6.5
0.25	0.68	0.5000	3	1335	6.8
0.24	0.65	0.4899	3	1337.5	7
0.25	0.68	0.5000	3	1340	7.2
0.26	0.71	0.5099	3	1342.5	7.3
0.25	0.69	0.5000	3	1345	7
0.24	0.66	0.4899	3	1347.5	6.7
0.21	0.58	0.4583	3	1350	6.5
0.2	0.55	0.4472	3	1415	5.1
0.23	0.63	0.4796	3	1417.5	5.3
0.24	0.66	0.4899	3	1420	5.5
0.24	0.65	0.4899	3	1422.5	5.7
0.24	0.66	0.4899	3	1425	5.8
0.25	0.69	0.5000	3	1427.5	6
0.23	0.63	0.4796	3	1430	5.8
0.21	0.58	0.4583	3	1432.5	5.5
0.21	0.58	0.4583	3	1435	5.6
0.22	0.61	0.4690	3	1437.5	5.8
0.21	0.58	0.4583	3	1440	5.7
0.22	0.61	0.4690	3	1442.5	5.6

			72	72	
0.2237	0.6106	0.4717	3	1382.50	5.88
Velocity Head ^Ps	Pressure Diff ^H	Sqrt ^Ps	Sampling Time	Clock Time	Vacuum

Probe Temperature Exit (°F)	Filter Temperature (°F)	Impinger Temperature Outlet (°F)	Vs	Point to Point Isokinetics
245	245	39	24.7726	97.31
241	247	40	28.6277	98.43
250	254	40	32.0576	100.00
254	257	38	34.9500	94.60
255	256	38	35.6421	96.36
256	249	37	35.6707	93.92
251	245	37	35.0338	90.35
245	247	37	35.6707	92.34
249	248	38	36.3480	100.58
249	251	39	35.6992	95.39
252	248	39	35.0617	102.16
243	241	38	32.7972	97.55
239	240	39	31.5713	99.86
242	243	38	34.0495	101.40
245	248	39	34.9220	101.31
251	250	40	35.0895	100.92
253	247	40	35.0338	97.61
254	245	40	35.7277	94.24
250	244	39	34.2415	97.46
250	248	38	32.8232	102.51
254	248	36	32.8493	101.34
254	246	37	33.4888	103.11
257	248	38	32.7450	103.02
255	250	39	33.4888	101.77

249.75	247.71	38.46
Probe Exit Temperature (°F)	Filter Temperature (°F)	Outlet Impinger Temperature (°F)

POST TEST CALCULATION

VOLUME DRY GAS
Vm(std) = 30.8168

VOLUME H2O VAPOR
Vw(std) = 25.0459

MOISTURE CONTENT
Bws = 0.4483

Vm 37.9310
Vm(std) = 30.8168

Vic(mls) 532.1
Vw(std) = 25.0459

MOL WT DRY STACK GASES
Mds = 29.6680

STACK VELOCITY
Vs = 33.6831

Kp 85.49
Vs = 33.6831

DRY STACK FLOW RATE
Q(std) = 9.6583E+5

MOL WT WET STACK GASES
Mws = 24.4367

ISOKINETIC CALCULATION
An = 5.3093E-4
% ISO = 98.4543

PARTICULATE CONCENTRATION
Cs = 4.4164E-3

Mn 136.1
Cs = 4.4164E-3
lbs/dscf = 9.7278E-6
grains/dscf = 0.0681
lbs/hr = 9.3954

Initial Leak Check Rate

Finish	257.288	Pitot Tubes
Start	257.285	A = OK
Rate =	0.0030	B = OK
	Vac. =	19.5

Final Leak Check Rate

		Pitot Tubes
Finish	295.451	A = OK
Start	295.448	B = OK
Rate =	0.0030	
	Vac. =	18.9

American Environmental Testing Company, Inc.
565 South Birch Drive
Spanish Fork, Utah 84660
(801) 266-7111

Rack Box New One

LABORATORY DATA
EPA Method 5

Company: Western Lumber Run Number: #1 comp

Sampling Location: North Pulp Dryer Date: 12-15-94

Moisture Collected

	Initial Weight	Final Weight	Weight Gain
Impinger 1	596.7	898.8	302.1
Impinger 2	570.6	731.4	160.8
Impinger 3	460.3	507.3	47.0
Impinger 4	399.4	412.7	13.3
Impinger 5	784.2	793.1	8.9

Total Gain = 532.1

Particulate Collected

Front - Half Analysis (Nozzle, Probe, Filter and Oven Glassware)

1. Filter Final Weight 0.5490
2. Filter Tare Weight 0.5019 NP-1
3. Total Filter Weight 0.0471 47.1 mg
4. Particulate caught in nozzle, probe and glassware 0.0862
5. Total Front - Half Catch 0.1333

Back - Half Analysis (Impingers, and Connecting Glassware)

1. Particulate caught in impingers evaporated down at less than 120° F. 2.8 mg

Total Particulate Catch (Sum of Front and Back - Half Catches)

136.1 mg

American Environmental Testing Company, Inc.
565 South Birch Drive
Spanish Fork, Utah 84660
(801) 266-7111 Rack Box New One

Company: Western Sugar Date: 12-14-94

Source: North Pulp Dryer Run Number: #1 Compliance

ORSAT ANALYSIS

(Average of 3 analyses each)

Test Number	Volume Percent - Dry			
	Nitrogen	Oxygen	Carbon Dixoide	Carbon Monoxide
#1	79.9	12.9	7.2	<0.1
#2	79.9	12.9	7.2	<0.1
#3	79.9	12.9	7.2	<0.1
Average	79.9 %	12.9 %	7.2%	<0.1

AMERICAN ENVIRONMENTAL TESTING, INCORPORATED
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Spanish Fork, Utah 84660

PARTICULATE FIELD DATA FORMAT

1	Plant	Western Sugar
2	City	Scottsbluff, Nebraska
3	Location	North Pulp Dryer #2 Comp.
4	Operator	David Hunt
5	Date	12-15-94
6	Stack Diameter (in)	60
7	Sample Box Number	RAC
8	Meter Box Number	RAC #2824
9	Meter ^H@	1.613
10	Meter Calibration, Y	0.917
11	Pitot Tube, Cp	0.8429
12	Probe Length (ft)	6'-B
13	Probe Liner Material	Stainless Steel
14	Probe Heater Setting (°F)	248
15	Ambient Temperature (°F)	24
16	Barometeric Press., Pb (in Hg)	26.25
17	Assumed Moisture (%)	45
18	Static Pressure, Ps (in H20)	-0.22
19	C Factor	0
20	Reference ^P (in H20)	0.19
21	Nozzle Identification Number	3/8 #7
22	Nozzle Diameter (in)	0.377
23	Thermometer Number	1-A
24	Pretest Leak Rate (CFM)	0.006
25	Leak Check Vacuum (in H20)	20.2
26	Filter Number	NP-2
27	Gas Analysis	
28	CO (%)	0
29	CO2 (%)	4.60
30	O2 (%)	12.60
31	N2 (%)	82.80
32	sq/ft	19.63

PRETEST CALCULATIONS

NOZZLE DIAMETER		PRETEST DATA		ISOKINETIC ^H	
Dn = 0.377				^H = 0.6996	
constant	0.0357	Cp	0.8429	**constant**	849.0000
Qm	0.75	Imp V(H20)(ml)	67.5000	**^H@**	1.0000
Pb(in HG)	26.25	Gel H20(g)	12.0000	Mds	29.2400
Pgm(in H20)	-0.22	V(H20)(ml)	127.8000	**Mm**	29.2400
Pm	26.2338	Vm(acf)	49.2300	**K**	3.6822
Cp	0.8429	^h avg	0.2000	**^P**	0.1900
Tm(°F)	60	Vwc	6.0155	^H = 0.6996	
Tm(°R)	520	Vmc	40.2223		
Bwm	0	Bws = 0.1301			
Bws	0.45				
Ts(°F)	170				
Ts(°R)	630				
Mds	29.24				
Ms	24.1820				
Pb(in HG)	26.25				
Pgs(in H20)	-0.22				
Ps	26.2338				
(^P)avg	0.19				
Dn = 0.2983					

Sample Point	Meter Temperature Outlet (°F)	Meter Temperature Inlet (°F)	Stack Temp Ts (°F)	Gas Volume Vm (ft3)	Gas Volume difference (ft3)
starting				295.799	
1	34	34	168	297.954	2.15
2	36	39	165	299.934	1.98
3	36	42	163	301.891	1.96
4	37	46	164	304.168	2.28
5	38	50	166	306.412	2.24
6	38	54	168	308.708	2.30
7	39	57	169	311.044	2.34
8	40	60	170	313.351	2.31
9	42	63	168	315.677	2.33
10	43	65	171	317.964	2.29
11	44	65	172	320.246	2.28
12	45	66	172	322.457	2.21
13	47	48	171	324.666	2.21
14	48	51	170	326.933	2.27
15	49	56	172	329.224	2.29
16	50	59	171	331.567	2.34
17	50	63	170	333.912	2.35
18	51	66	171	336.194	2.28
19	52	69	172	338.548	2.35
20	53	72	170	340.765	2.22
21	54	74	171	342.977	2.21
22	56	77	173	345.264	2.29
23	58	79	170	347.475	2.21
24	60	81	171	349.762	2.29
avg °F		52.83	169.50		
avg °R		512.83	629.50		
total =				53.9630	53.96
average =	45.83	59.83	169.50		
Sample Point	Meter Temperature Inlet (°F)	Meter Temperature Outlet (°F)	Stack Temp (°F) T	Gas Volume Vm	Gas Volume Vm

Velocity Head ^Ps (in H20)	Pressure Diff ^H (in H20)	Sqrt ^Ps	Sampling Time (min)	Clock Time (24 hrs)	Vacuum (in Hg)
				930	
0.2	1.13	0.4472	3	933	6.3
0.18	1.03	0.4243	3	936	6.1
0.19	1.09	0.4359	3	939	6.9
0.22	1.27	0.4690	3	942	7.9
0.22	1.27	0.4690	3	945	8
0.23	1.33	0.4796	3	948	8.7
0.23	1.34	0.4796	3	951	8.7
0.22	1.28	0.4690	3	954	8.6
0.23	1.35	0.4796	3	957	8.9
0.23	1.35	0.4796	3	1000	8.9
0.22	1.29	0.4690	3	1003	8.7
0.21	1.23	0.4583	3	1006	8.5
0.21	1.21	0.4583	3	1100	7.1
0.22	1.28	0.4690	3	1103	8
0.22	1.28	0.4690	3	1106	8.4
0.23	1.35	0.4796	3	1109	8.7
0.23	1.36	0.4796	3	1112	8.7
0.22	1.30	0.4690	3	1115	8.5
0.23	1.36	0.4796	3	1118	8.7
0.21	1.25	0.4583	3	1121	8.2
0.21	1.25	0.4583	3	1124	8.1
0.22	1.32	0.4690	3	1127	8.4
0.21	1.27	0.4583	3	1130	8.1
0.22	1.33	0.4690	3	1133	8.4
			72	72	
0.2171	1.2721	0.4657	3	1038.00	8.15
Velocity Head ^Ps	Pressure Diff ^H	Sqrt ^Ps	Sampling Time	Clock Time	Vacuum

Probe Temperature Exit (°F)	Filter Temperature (°F)	Impinger Temperature Outlet (°F)	Vs	Point to Point Isokinetics
257	239	37	32.1126	101.71
259	241	35	30.3918	97.87
261	244	35	31.1747	93.86
258	245	35	33.5726	101.32
255	244	34	33.6263	99.74
256	239	34	34.4369	99.76
255	241	34	34.4643	101.36
251	242	34	33.7336	102.20
252	241	35	34.4369	100.36
251	242	34	34.5191	98.76
250	244	33	33.7871	100.77
250	244	34	33.0103	99.82
251	245	34	32.9841	100.50
250	246	34	33.7336	100.48
251	246	34	33.7871	101.38
251	245	34	34.5191	101.12
250	247	34	34.4917	100.92
251	246	34	33.7603	100.27
252	243	34	34.5464	101.04
252	245	35	32.9580	99.21
251	245	35	32.9841	98.91
253	241	35	33.8138	99.83
252	241	36	32.9580	98.34
253	242	36	33.7603	99.27

253.00	243.25	34.54
Probe Exit Temperature (°F)	Filter Temperature (°F)	Outlet Impinger Temperature (°F)

POST TEST CALCULATION

VOLUME DRY GAS
Vm(std) = 44.6983

VOLUME H20 VAPOR
Vw(std) = 37.5572

MOISTURE CONTENT
Bws = 0.4566

Vm 53.9630
Vm(std) = 44.6983

Vic(mls) 797.9
Vw(std) = 37.5572

MOL WT DRY STACK GASES
Mds = 29.2400

STACK VELOCITY
Vs = 33.4809

Kp 85.49
Vs = 33.4809

DRY STACK FLOW RATE
Q(std) = 9.4579E+5

MOL WT WET STACK GASES
Mws = 24.1079

ISOKINETIC CALCULATION
An = 7.7519E-4
% ISO = 99.9774

PARTICULATE CONCENTRATION
Cs = 3.3066E-3

Mn 147.8
Cs = 3.3066E-3
lbs/dscf = 7.2833E-6
grains/dscf = 0.0510
lbs/hr = 6.8885

Initial Leak Check Rate
Finish 295.728
Start 295.722
Rate = 0.0060

Pitot Tubes
A = OK
B = OK

Vac. = 20.2

Final Leak Check Rate
Finish 349.826
Start 349.822
Rate = 0.0040

Pitot Tubes
A = OK
B = OK

Vac. = 16.4

American Environmental Testing Company, Inc.
565 South Birch Drive
Spanish Fork, Utah 84660
(801) 266-7111

New Rack Box

LABORATORY DATA
EPA Method 5

Company: Western Sugar Run Number: #2 Compliance

Sampling Location: North Pulp Dryer Date: 12-15-94

Moisture Collected

	Initial Weight	Final Weight	Weight Gain
Impinger 1	600.2	868.8	268.6
Impinger 2	573.8	837.4	263.6
Impinger 3	460.9	711.1	250.2
Impinger 4	400.3	402.2	1.9
Impinger 5	793.1	806.7	13.6
		Total Gain =	797.9

Particulate Collected

Front - Half Analysis (Nozzle, Probe, Filter and Oven Glassware)

1. Filter Final Weight 0.5712
2. Filter Tare Weight 0.5053 NP.2
3. Total Filter Weight 0.0659
4. Particulate caught in nozzle, probe and glassware 0.0797
5. Total Front - Half Catch 0.1456

Back - Half Analysis (Impingers, and Connecting Glassware)

1. Particulate caught in impingers evaporated down at less than 120° F. 2.2

Total Particulate Catch (Sum of Front and Back - Half Catches)

147.8 mg

American Environmental Testing Company, Inc.
565 South Birch Drive
Spanish Fork, Utah 84660
(801) 266-7111

Company: WESTERN SUGAR Date: 12-15-94

Source: NORTH PULP DRYER Run Number: #2 Conf.

ORSAT ANALYSIS

(Average of 3 analyses each)

Test Number	Volume Percent - Dry			
	Nitrogen	Oxygen	Carbon Dixoide	Carbon Monoxide
#1	82.8	12.6	4.6	<0.1
#2	82.8	12.6	4.6	<0.1
#3	82.8	12.6	4.6	<0.1
Average	82.8	12.6	4.6	<0.1

AMERICAN ENVIRONMENTAL TESTING, INCORPORATED
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Spanish Fork, Utah 84660

POST TEST BACK HALF EVAPORATION

COMPANY: Western Sugar
SOURCE: North Platte Dryer
DATE: 12-15-94

CONTAINER #1 METHYLENE CHLORIDE			CONTAINER #2 DISTILLED WATER		
BLANK			BLANK		
Volume of Liquid	150 mls		Volume of Liquid	250 mls	
Final Weight	103.4554		Final Weight	106.1202	
Tare Weight	103.4552	X-2	Tare Weight	106.1201	X-4
Residue	0.0002		Residue	0.0001	
RUN #1			RUN #1		
Volume of Liquid	150 mls		Volume of Liquid	250 mls	
Color	Clear		Color	Yellow	
Final Weight	102.2566		Final Weight	106.5545	
Tare Weight	102.2555	B-1	Tare Weight	106.5525	A-1
Residue & Blank	0.0011		Residue & Blank	0.0020	
- Blank	0.0002		- Blank	0.0001	
Residue	0.0009	0.9 mg	Residue	0.0019	1.9 mg
RUN #2			RUN #2		
Volume of Liquid	150 mls		Volume of Liquid	250 mls	
Color	Clear		Color	Yellow	
Final Weight	102.2592		Final Weight	106.5547	
Tare Weight	102.2585	B-2	Tare Weight	106.5529	A-2
Residue & Blank	0.0007		Residue & Blank	0.0018	
- Blank	0.0002		- Blank	0.0001	
Residue	0.0005	0.5 mg	Residue	0.0017	1.7 mg
RUN #3			RUN #3		
Volume of Liquid	150 mls		Volume of Liquid	250 mls	
Color	Clear		Color	Yellow	
Final Weight	102.2579		Final Weight	106.5636	
Tare Weight	102.2571	B-3	Tare Weight	106.5611	A-3
Residue & Blank	0.0008		Residue & Blank	0.0025	
- Blank	0.0002		- Blank	0.0001	
Residue	0.0006	0.6 mg	Residue	0.0024	2.4 mg

AMERICAN ENVIRONMENTAL TESTING, INCORPORATED

565 So. Birch Drive 801-266-7111

Spanish Fork, Utah 84660

PARTICULATE FIELD DATA FORMAT

1	Plant	Western Sugar
2	City	Scottsbluff, Nebraska
3	Location	North Pulp Dryer #3 Comp.
4	Operator	David Hunt
5	Date	12-15-94
6	Stack Diameter (in)	60
7	Sample Box Number	RAC
8	Meter Box Number	RAC #2824
9	Meter ^H@	1.613
10	Meter Calibration, Y	0.917
11	Pitot Tube, Cp	0.8429
12	Probe Length (ft)	6'-8
13	Probe Liner Material	Stainless Steel
14	Probe Heater Setting (°F)	248
15	Ambient Temperature (°F)	32
16	Barometeric Press., Pb (in Hg)	26.21
17	Assumed Moisture (%)	45
18	Static Pressure, Ps (in H20)	-0.22
19	C Factor	0
20	Reference ^P (in H20)	0.19
21	Nozzle Identification Number	3/8 #7
22	Nozzle Diameter (in)	0.377
23	Thermometer Number	1-A
24	Pretest Leak Rate (CFM)	0.004
25	Leak Check Vacuum (in H20)	19.6
26	Filter Number	NP-3
27	Gas Analysis	
28	CO (%)	0
29	CO2 (%)	4.70
30	O2 (%)	12.60
31	N2 (%)	82.70
32	sq/ft	19.63

PRETEST CALCULATIONS

NOZZLE DIAMETER

Dn = 0.377

constant	0.0357
Qm	0.75
Pb(in HG)	26.21
Pgm(in H20)	-0.22
Pm	26.1938
Cp	0.8429
Tm(°F)	60
Tm(°R)	520
Bwm	0
Bws	0.45
Ts(°F)	170
Ts(°R)	630
Mds	29.256
Ms	24.1908
Pb(in HG)	26.21
Pgs(in H20)	-0.22
Ps	26.1938
(^P)avg	0.19

Dn = 0.2982

PRETEST DATA

Cp	0.8429
Imp V(H20)(ml)	67.5000
Gel H20(g)	12.0000
V(H20)(ml)	127.8000
Vm(acf)	49.2300
^h avg	0.2000
Vwc	6.0155
Vmc	40.1610

Bws = 0.1303

ISOKINETIC ^H

^H = 0.6997

constant	849.0000
^H@	1.0000
Mds	29.2560
Mm	29.2560
K	3.6829
^P	0.1900

^H = 0.6997

Sample Point	Meter Temperature Outlet (°F)	Meter Temperature Inlet (°F)	Stack Temp Ts (°F)	Gas Volume Vm (ft3)	Gas Volume difference (ft3)
starting				350.367	
1	52	53	168	352.476	2.11
2	54	58	170	354.578	2.10
3	56	62	171	356.736	2.16
4	58	66	170	359.002	2.27
5	59	70	169	361.359	2.36
6	60	74	170	363.727	2.37
7	61	78	169	366.108	2.38
8	62	81	170	368.395	2.29
9	63	84	171	370.733	2.34
10	65	86	168	373.092	2.36
11	66	87	168	375.443	2.35
12	68	89	170	377.726	2.28
13	64	65	171	380.041	2.32
14	65	68	168	382.378	2.34
15	66	72	170	384.784	2.41
16	67	77	169	387.225	2.44
17	68	81	170	389.686	2.46
18	69	84	170	392.016	2.33
19	70	87	170	394.451	2.44
20	70	88	169	396.871	2.42
21	71	89	171	399.206	2.33
22	71	89	170	401.488	2.28
23	71	90	171	403.776	2.29
24	72	91	172	406.121	2.35

avg °F		71.19	169.79		
avg °R		531.19	629.79		
total =				55.7540	55.75
average =	64.50	77.88	169.79		
Sample Point	Meter Temperature Inlet (°F)	Meter Temperature Outlet (°F)	Stack Temp (°F) T	Gas Volume Vm	Gas Volume Vm

Velocity Head ^Ps (in H20)	Pressure Diff ^H (in H20)	Sqrt ^Ps	Sampling Time (min)	Clock Time (24 hrs)	Vacuum (in Hg)
				1315	
0.19	1.12	0.4359	3	1318	7
0.19	1.12	0.4359	3	1321	7.1
0.2	1.18	0.4472	3	1324	7.5
0.21	1.25	0.4583	3	1327	8
0.23	1.38	0.4796	3	1330	8.8
0.23	1.38	0.4796	3	1333	8.8
0.23	1.39	0.4796	3	1336	9
0.21	1.27	0.4583	3	1339	8.6
0.22	1.34	0.4690	3	1342	8.9
0.22	1.35	0.4690	3	1345	9
0.22	1.35	0.4690	3	1348	9
0.2	1.23	0.4472	3	1351	8.8
0.21	1.26	0.4583	3	1420	8.2
0.21	1.27	0.4583	3	1423	8.4
0.23	1.39	0.4796	3	1426	9.1
0.23	1.40	0.4796	3	1429	9.2
0.23	1.40	0.4796	3	1432	9.9
0.21	1.29	0.4583	3	1435	9.2
0.22	1.35	0.4690	3	1438	9.5
0.22	1.36	0.4690	3	1441	9.5
0.21	1.29	0.4583	3	1444	9.3
0.2	1.23	0.4472	3	1447	9.1
0.2	1.23	0.4472	3	1450	9.1
0.21	1.29	0.4583	3	1453	9.4
			72	72	
0.2137	1.2970	0.4621	3	1385.50	8.77
Velocity Head ^Ps	Pressure Diff ^H	Sqrt ^Ps	Sampling Time	Clock Time	Vacuum

Probe Temperature Exit (°F)	Filter Temperature (°F)	Impinger Temperature Outlet (°F)	Vs	Point to Point Isokinetics
251	252	41	31.4397	101.09
252	249	41	31.4897	100.55
250	251	42	32.3334	100.40
247	250	42	33.1056	102.49
245	251	42	34.6187	101.55
247	252	42	34.6462	101.85
248	254	43	34.6187	102.07
249	253	43	33.1056	102.46
250	252	43	33.9116	102.23
251	254	44	33.8309	102.70
250	253	44	33.8309	102.25
251	255	45	32.3078	104.08
248	247	47	33.1319	104.53
249	248	47	33.0530	105.06
251	250	47	34.6462	103.28
250	249	47	34.6187	104.38
251	252	47	34.6462	105.06
248	252	48	33.1056	103.88
247	251	48	33.8847	105.87
248	250	48	33.8578	105.08
249	251	48	33.1319	103.83
251	252	48	32.3078	103.89
252	251	48	32.3334	104.19
251	250	47	33.1581	104.21

249.42	251.21	45.08
Probe Exit Temperature (°F)	Filter Temperature (°F)	Outlet Impinger Temperature (°F)

POST TEST CALCULATION

VOLUME DRY GAS
Vm(std) = 44.5181

VOLUME H2O VAPOR
Vw(std) = 39.9860

MOISTURE CONTENT
Bws = 0.4732

Vm 55.7540
Vm(std) = 44.5181

Vic(mls) 649.5
Vw(std) = 39.9860

MOL WT DRY STACK GASES
Mds = 29.2560

STACK VELOCITY
Vs = 33.3799

Kp 85.49
Vs = 33.3799

DRY STACK FLOW RATE
Q(std) = 9.1233E+5

MOL WT WET STACK GASES
Mws = 23.9298

ISOKINETIC CALCULATION
An = 7.7519E-4
% ISO = 103.2254

PARTICULATE CONCENTRATION
Cs = 3.0617E-3

Mn 136.3
Cs = 3.0617E-3
lbs/dscf = 6.7438E-6
grains/dscf = 0.0472
lbs/hr = 6.1525

Initial Leak Check Rate
Finish 350.119
Start 350.115
Rate = 0.0040
Vac. = 19.6

Pitot Tubes
A = OK
B = OK

Final Leak Check Rate
Finish 406.343
Start 406.337
Rate = 0.0060
Vac. = 15.8

Pitot Tubes
A = OK
B = OK

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(801) 266-7111

LABORATORY DATA
EPA Method 5

New Rack Box

Company: Western Sugar Run Number: #3 Compliance

Sampling Location: North Pulp Dryer Date: 12-16-94

Moisture Collected

	Initial Weight	Final Weight	Weight Gain
Impinger 1	602.2	865.5	263.3
Impinger 2	575.2	803.4	228.2
Impinger 3	463.1	795.4	332.3
Impinger 4	400.6	409.2	8.6
Impinger 5	826.4	843.5	17.1
		Total Gain =	849.5

Particulate Collected

Front - Half Analysis (Nozzle, Probe, Filter and Oven Glassware)

1. Filter Final Weight 0.5549
2. Filter Tare Weight 0.5070 NP-3
3. Total Filter Weight 0.0479
4. Particulate caught in nozzle, probe and glassware 0.0854
5. Total Front - Half Catch 0.1333

Back - Half Analysis (Impingers, and Connecting Glassware)

1. Particulate caught in impingers evaporated down at less than 120° F. 3.0 mg

Total Particulate Catch (Sum of Front and Back - Half Catches)

136.3 mg

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Company: WESTERN SUGAR Date: 12-15-94

Source: NORTH PULP DRYER Run Number: #3 Comp

ORSAT ANALYSIS

(Average of 3 analyses each)

Test Number	Volume Percent - Dry			
	Nitrogen	Oxygen	Carbon Dixoide	Carbon Monoxide
1	82.7	12.6	4.7	<0.1
2	82.7	12.6	4.7	<0.1
3	82.7	12.6	4.7	<0.1
Average	82.7	12.6	4.7	<0.1

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POST TEST EVAPORATION

COMPANY: Western Sugar
SOURCE: North Pulp Dryer
DATE: 12-15-94

ACETONE BLANK		WATER BLANK	
Volume of Liquid	250 mls	Volume of Liquid	
Final Weight	102.2558	Final Weight	
Tare Weight	102.2557	Tare Weight	
Residue	0.0001	Residue	

RUN #1		RUN #1	
Volume of Liquid	250 mls	Volume of Liquid	
Color	Brown	Color	
Final Weight	106.6384	Final Weight	
Tare Weight	106.5521	Tare Weight	
Residue & Blank	0.0863	Residue & Blank	
- Blank	0.0001	- Blank	
Residue	0.0862 (86.2 mg)	Residue	

RUN #2		RUN #2	
Volume of Liquid	250 mls	Volume of Liquid	
Color	Brown	Color	
Final Weight	106.4025	Final Weight	
Tare Weight	106.3227	Tare Weight	
Residue & Blank	0.0798	Residue & Blank	
- Blank	0.0001	- Blank	
Residue	0.0797 (79.7 mg)	Residue	

RUN #3		RUN #3	
Volume of Liquid	250 mls	Volume of Liquid	
Color	Brown	Color	
Final Weight	106.4307	Final Weight	
Tare Weight	106.3452	Tare Weight	
Residue & Blank	0.0855	Residue & Blank	
- Blank	0.0001	- Blank	
Residue	0.0854 (85.4 mg)	Residue	

AMERICAN ENVIRONMENTAL TESTING, INCORPORATED

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Spanish Fork, Utah 84660

PARTICULATE FIELD DATA FORMAT

1	Plant	Western Sugar
2	City	Scottsbluff Nebraska
3	Location	South Pulp Dryer
4	Operator	JD Schiller
5	Date	Tuesday, 13 December, 1994
6	Method and Run #	EPA 5 - #1 Compliance
7	Stack Diameter (in)	60
8	Sample Box Number	UT
9	Meter Box Number	UT 790-484
10	Meter ^H@	1.656
11	Meter Calibration, Y	0.982
12	Pitot Tube, Cp	0.8414
13	Probe Length (ft)	6'-A
14	Probe Liner Material	Stainless
15	Probe Heater Setting (°F)	248
16	Ambient Temperature (°F)	31
17	Barometeric Press., Pb (in Hg)	26.49
18	Assumed Moisture (%)	46
19	Static Pressure, Ps (in H2O)	-0.22
20	C Factor	0
21	Reference ^P (in H2O)	0.22
22	Nozzle Identification Number	5/16 #5
23	Nozzle Diameter (in)	0.302
24	Thermometer Number	1-A
25	Pretest Leak Rate (CFM)	0.0020
26	Leak Check Vacuum (in H2O)	20.5
27	Filter Number	SP-1
28	Gas Analysis	
29	CO (%)	0
30	CO2 (%)	8.40
31	O2 (%)	12.50
32	N2 (%)	79.10

PRETEST CALCULATIONS

NOZZLE DIAMETER		PRETEST DATA		ISOKINETIC ^H	
Dn =	0.302			^H =	0.3242
constant	0.0357	Cp	0.8414	**constant**	849.8000
Qm	0.75	Imp V(H2O)(ml)	67.5000	**^H@**	1.0000
Pb(in HG)	26.49	Gel H2O(g)	12.0000	Mds	29.8440
Pgm(in H2O)	-0.22	V(H2O)(ml)	127.8000	**Mm**	29.8440
Pm	26.4738	Vm(acf)	49.2300	**K**	1.4735
Cp	0.8414	^h avg	0.2000	**^P**	0.2200
Tm(°F)	60	Vwc	6.0155	^H =	0.3242
Tm(°R)	520	Vmc	43.4670		
Bwm	0	**Bws** =	0.1216		
Bws	0.46				
Ts(°F)	170				
Ts(°R)	630				
Mds	29.844				
Ms	24.3958				
Pb(in HG)	26.49				
Pgs(in H2O)	-0.22				
Ps	26.4738				
(^P)avg	0.22				
Dn =	0.2892				

Sample Point	Meter Temperature Outlet (°F)	Meter Temperature Inlet (°F)	Stack Temp Ts (°F)	Gas Volume Vm (ft3)	Gas Volume difference (ft3)
starting				667.243	
1	41	41	173	668.498	1.26
2	41	46	172	669.816	1.32
3	41	53	171	671.268	1.45
4	41	58	170	672.751	1.48
5	42	64	171	674.234	1.48
6	41	66	173	675.836	1.60
7	42	71	171	677.457	1.62
8	44	73	170	679.013	1.56
9	45	74	171	680.551	1.54
10	45	76	169	682.062	1.51
11	47	76	171	683.534	1.47
12	48	78	171	685.005	1.47
13	49	48	170	686.501	1.50
14	48	58	173	688.015	1.51
15	48	65	174	689.624	1.61
16	48	70	175	691.175	1.55
17	48	72	174	692.708	1.53
18	49	74	175	694.175	1.47
19	49	76	173	695.663	1.49
20	50	78	172	697.214	1.55
21	51	80	171	698.757	1.54
22	53	81	171	700.236	1.48
23	52	82	175	701.71	1.47
24	53	83	176	703.178	1.47

avg °F		57.48	172.17		
avg °R		517.48	632.17		
total =				35.9350	35.93
average =	46.50	68.46	172.17		
Sample Point	Meter Temperature Inlet (°F)	Meter Temperature Outlet (°F)	Stack Temp (°F) T	Gas Volume Vm	Gas Volume Vm

Velocity Head ^Ps (in H20)	Pressure Diff ^H (in H20)	Sqrt ^Ps	Sampling Time (min)	Clock Time (24 hrs)	Vacuum (in Hg)
				1320	
0.16	0.37	0.4000	3	1323	1
0.18	0.42	0.4243	3	1326	1.1
0.21	0.50	0.4583	3	1329	1.5
0.22	0.53	0.4690	3	1332	2.3
0.22	0.53	0.4690	3	1335	2.1
0.24	0.58	0.4899	3	1338	2.8
0.24	0.58	0.4899	3	1341	2.5
0.23	0.56	0.4796	3	1344	2.3
0.22	0.54	0.4690	3	1347	2.8
0.21	0.51	0.4583	3	1350	2.9
0.2	0.49	0.4472	3	1353	2.5
0.21	0.51	0.4583	3	1356	2.7
0.22	0.52	0.4690	3	1415	2.3
0.22	0.53	0.4690	3	1418	2.2
0.24	0.58	0.4899	3	1421	2.4
0.23	0.56	0.4796	3	1424	2.4
0.22	0.53	0.4690	3	1427	2.5
0.21	0.51	0.4583	3	1430	2.5
0.22	0.54	0.4690	3	1433	2.4
0.23	0.56	0.4796	3	1436	2.4
0.23	0.57	0.4796	3	1439	2.5
0.22	0.54	0.4690	3	1442	2.4
0.22	0.54	0.4690	3	1445	2.5
0.23	0.56	0.4796	3	1448	2.5

			72	72	
0.2179	0.5273	0.4664	3	1382.88	2.31
Velocity Head ^Ps	Pressure Diff ^H	Sqrt ^Ps	Sampling Time	Clock Time	Vacuum

Probe Temperature Exit (°F)	Filter Temperature (°F)	Impinger Temperature Outlet (°F)	Vs	Point to Point Isokinetics
224	261	35	28.3371	107.92
226	263	35	30.0322	106.48
228	261	35	32.4129	108.10
230	257	36	33.1493	107.49
228	261	36	33.1756	107.16
227	259	35	34.7057	110.96
226	261	35	34.6508	111.73
228	259	36	33.8943	109.23
227	257	36	33.1756	110.35
229	258	37	32.3615	110.67
228	255	38	31.6317	110.53
225	254	38	32.4129	107.62
225	261	35	33.1493	108.55
228	264	36	33.2282	109.58
232	263	35	34.7331	111.16
235	262	36	34.0286	109.25
234	259	35	33.2544	110.20
235	261	35	32.5154	107.84
236	262	36	33.2282	106.59
234	258	37	33.9481	108.41
231	262	38	33.9212	107.59
232	259	38	33.1756	105.27
234	255	38	33.2806	105.25
233	254	38	34.0554	102.49

229.79	259.42	36.21
Probe Exit Temperature (°F)	Filter Temperature (°F)	Outlet Impinger Temperature (°F)

POST TEST CALCULATION

VOLUME DRY GAS		VOLUME H2O VAPOR		MOISTURE CONTENT
Vm(std) =	31.8780	Vw(std) =	24.8906	Bws = 0.4385

Vm	35.9350	Vic(mls)	528.8
Vm(std) =	31.8780	Vw(std) =	24.8906

MOL WT DRY STACK GASES	STACK VELOCITY	DRY STACK FLOW RATE
	Vs = 33.0189	
Mds = 29.8440		Q(std) = 9.6858E+5
	Kp 85.49	
MOL WT WET STACK GASES	Vs = 33.0189	
Mws = 24.6509		

ISOKINETIC CALCULATION	PARTICULATE CONCENTRATION
	Cs = 2.8766E-3
An = 4.9744E-4	
	Mn 91.7
% ISO = 108.3778	Cs = 2.8766E-3
	lbs/dscf = 6.3417E-6
	grains/dscf = 0.0444
	grams/dscm = 0.1016
	lbs/hr = 6.1424

Initial Leak Check Rate

		Pitot Tubes
Finish	667.154	A = OK
Start	667.152	B = OK
Rate =	0.0020	
Vac. =	20.5	

Final Leak Check Rate

		Pitot Tubes
Finish	703.459	A = OK
Start	703.456	B = OK
Rate =	0.0030	
Vac. =	19.9	

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LABORATORY DATA
EPA Method 5

Company: Western Sugar Run Number: #1 comp.

Sampling Location: South Pulp Date: 12-13-94

Moisture Collected

	Initial Weight	Final Weight	Weight Gain
Impinger 1	600.3	860.8	260.5
Impinger 2	518.0	738.0	220.0
Impinger 3	506.8	540.9	34.1
Impinger ~~#~~ 4	405.9	413.6	7.7
Impinger ~~#~~ 5	836.7	843.2	6.5

Total Gain = 528.8

Particulate Collected

Front - Half Analysis (Nozzle, Probe, Filter and Oven Glassware)

1. Filter Final Weight 0.7547
2. Filter Tare Weight 0.7071 Sp-1
3. Total Filter Weight 0.0476 47.6 mg
4. Particulate caught in nozzle, probe and glassware 0.0425
5. Total Front - Half Catch 0.0901 90.1

Back - Half Analysis (Impingers, and Connecting Glassware)

1. Particulate caught in impingers evaporated down at less than 120° F. 1.6 mg

Total Particulate Catch (Sum of Front and Back - Half Catches)

91.7 mg

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(801) 266-7111

Company: Western Sugar Date: 12-13-94

Source: Pulp Dryer Bath Run Number: #1

ORSAT ANALYSIS

(Average of 3 analyses each)

Test Number	Volume Percent - Dry			
	Nitrogen	Oxygen	Carbon Dixoide	Carbon Monoxide
	79.1	12.5	8.4	<0.1
	79.1	12.5	8.4	<0.1
	79.1	12.5	8.4	<0.1
Average	79.1	12.5	8.4	<0.1

AMERICAN ENVIRONMENTAL TESTING, INCORPORATED
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Spanish Fork, Utah 84660

PARTICULATE FIELD DATA FORMAT

1	Plant	Western Sugar
2	City	Scottsbluff Nebraska
3	Location	South Pulp Dryer
4	Operator	JD Schiller
5	Date	Wednesday, 14 December, 1994
6	Method and Run #	EPA 5 - #2 Compliance
7	Stack Diameter (in)	60
8	Sample Box Number	UT
9	Meter Box Number	UT 790-484
10	Meter ^H@	1.656
11	Meter Calibration, Y	0.982
12	Pitot Tube, Cp	0.8414
13	Probe Length (ft)	6'-A
14	Probe Liner Material	Stainless
15	Probe Heater Setting (°F)	248
16	Ambient Temperature (°F)	24
17	Barometerio Press., Pb (in Hg)	26.25
18	Assumed Moisture (%)	45
19	Static Pressure, Ps (in H2O)	-0.22
20	C Factor	0
21	Reference ^P (in H2O)	0.22
22	Nozzle Identification Number	3/8 #7
23	Nozzle Diameter (in)	0.376
24	Thermometer Number	1-A
25	Pretest Leak Rate (CFM)	0.0030
26	Leak Check Vacuum (in H2O)	19
27	Filter Number	SP-2
28	Gas Analysis	
29	CO (%)	0
30	CO2 (%)	4.70
31	O2 (%)	12.70
32	N2 (%)	82.60

PRETEST CALCULATIONS

NOZZLE DIAMETER		PRETEST DATA		ISOKINETIC ^H	
Dn =	0.376			^H =	0.7912
constant	0.0357	Cp	0.8414	constant	849.8000
Qm	0.75	Imp V(H2O)(ml)	67.5000	^H@	1.0000
Pb(in HG)	26.25	Gel H2O(g)	12.0000	Mds	29.2600
Pgm(in H2O)	-0.22	V(H2O)(ml)	127.8000	Mm	29.2600
Pm	26.2338	Vm(acf)	49.2300	K	3.5962
Cp	0.8414	^h avg	0.2000	^P	0.2200
Tm(°F)	55	Vwc	6.0155	^H =	0.7912
Tm(°R)	515	Vmc	43.4916		
Bwm	0	Bws =	0.1215		
Bws	0.45				
Ts(°F)	170				
Ts(°R)	630				
Mds	29.26				
Ms	24.1930				
Pb(in HG)	26.25				
Pgs(in H2O)	-0.22				
Ps	26.2338				
(^P)avg	0.22				
Dn =	0.2893				

Sample Point	Meter Temperature Outlet (°F)	Meter Temperature Inlet (°F)	Stack Temp Ts (°F)	Gas Volume Vm (ft3)	Gas Volume difference (ft3)
starting				703.744	
1	29	28	174	705.581	1.84
2	29	36	175	707.395	1.81
3	29	47	177	709.372	1.98
4	30	54	175	711.394	2.02
5	32	59	173	713.432	2.04
6	32	62	173	715.621	2.19
7	33	66	172	717.86	2.24
8	33	69	171	720.11	2.25
9	34	70	170	722.298	2.19
10	35	72	173	724.475	2.18
11	36	72	172	726.552	2.08
12	37	71	174	728.678	2.13
13	42	43	172	730.735	2.06
14	42	53	171	732.676	1.94
15	42	60	171	734.839	2.16
16	44	66	172	736.998	2.16
17	44	69	172	739.156	2.16
18	44	71	171	741.287	2.13
19	45	74	173	743.409	2.12
20	45	75	171	745.548	2.14
21	46	77	172	747.705	2.16
22	46	78	173	749.811	2.11
23	46	79	174	751.952	2.14
24	45	79	174	754.094	2.14

avg °F		51.04	172.71		
avg °R		511.04	632.71		
total =				50.3500	50.35
average =	38.33	63.75	172.71		
Sample Point	Meter Temperature Inlet (°F)	Meter Temperature Outlet (°F)	Stack Temp (°F) T	Gas Volume Vm	Gas Volume Vm

Velocity Head ^Ps (in H20)	Pressure Diff ^H (in H20)	Sqrt ^Ps	Sampling Time (min)	Clock Time (24 hrs)	Vacuum (in Hg)
				930	
0.16	0.90	0.4000	3	933	3
0.17	0.96	0.4123	3	936	3.1
0.2	1.14	0.4472	3	939	6.2
0.21	1.21	0.4583	3	942	6.5
0.21	1.22	0.4583	3	945	7.2
0.22	1.28	0.4690	3	948	10
0.24	1.41	0.4899	3	951	10.5
0.23	1.36	0.4796	3	954	10
0.21	1.24	0.4583	3	957	8.5
0.21	1.24	0.4583	3	1000	7.2
0.2	1.18	0.4472	3	1003	6.2
0.22	1.30	0.4690	3	1006	6.1
0.21	1.22	0.4583	3	1100	4.6
0.19	1.11	0.4359	3	1103	4.2
0.22	1.30	0.4690	3	1106	6.1
0.23	1.36	0.4796	3	1109	6.2
0.22	1.31	0.4690	3	1112	6.4
0.21	1.25	0.4583	3	1115	6.5
0.21	1.25	0.4583	3	1118	6.5
0.22	1.32	0.4690	3	1121	6.7
0.22	1.32	0.4690	3	1124	6.9
0.21	1.26	0.4583	3	1127	6.8
0.22	1.32	0.4690	3	1130	7
0.21	1.26	0.4583	3	1133	7.1

			72	72	
0.2104	1.2387	0.4583	3	1033.68	6.65
Velocity Head ^Ps	Pressure Diff ^H	Sqrt ^Ps	Sampling Time	Clock Time	Vacuum

Probe Temperature Exit (°F)	Filter Temperature (°F)	Impinger Temperature Outlet (°F)	Vs	Point to Point Isokinetics
235	264	35	28.6957	103.31
237	262	32	29.6022	98.60
241	263	32	32.1586	98.63
239	265	33	32.9010	97.86
241	262	34	32.8491	98.10
238	261	35	33.6222	102.78
241	262	36	35.0894	100.32
239	259	35	34.3234	102.72
241	258	36	32.7712	104.32
239	261	37	32.8491	103.87
241	260	39	32.0321	101.40
239	259	41	33.6487	99.14
228	241	43	32.8232	99.27
232	248	36	31.1963	97.83
235	247	38	33.5690	100.96
238	253	34	34.3506	98.21
241	258	35	33.5956	100.20
245	263	35	32.7972	101.08
242	259	36	32.8491	100.60
237	255	35	33.5690	98.87
241	256	36	33.5956	99.62
240	255	36	32.8491	99.57
243	258	35	33.6487	98.94
241	264	36	32.8751	101.36

238.92	258.04	35.83
Probe Exit Temperature (°F)	Filter Temperature (°F)	Outlet Impinger Temperature (°F)

POST TEST CALCULATION

VOLUME DRY GAS
Vm(std) = 44.8184

VOLUME H2O VAPOR
Vw(std) = 35.3260

MOISTURE CONTENT
Bws = 0.4408

Vm 50.3500
Vm(std) = 44.8184

Vic(mls) 750.5
Vw(std) = 35.3260

MOL WT DRY STACK GASES
Mds = 29.2600

STACK VELOCITY
Vs = 32.8449

DRY STACK FLOW RATE
Q(std) = 9.4998E+5

Kp 85.49
Vs = 32.8449

MOL WT WET STACK GASES
Mws = 24.2968

ISOKINETIC CALCULATION
An = 7.7109E-4
% ISO = 100.3349

PARTICULATE CONCENTRATION
Cs = 2.7489E-3

Mn 123.2
Cs = 2.7489E-3
lbs/dscf = 6.0601E-6
grains/dscf = 0.0424
grams/dscm = 0.0971
lbs/hr = 5.7570

Initial Leak Check Rate
Finish 703.615
Start 703.612
Rate = 0.0030

Pitot Tubes
A = OK
B = OK

Vac. = 19

Final Leak Check Rate
Finish 754.219
Start 754.215
Rate = 0.0040

Pitot Tubes
A = OK
B = OK

Vac. = 20.5

American Environmental Testing Company, Inc.

565 South Birch Drive
Spanish Fork, Utah 84660
(801) 266-7111

LABORATORY DATA

EPA Method 5

Company: Western Sugar Run Number: #2 comp

Sampling Location: South Pulp Dryer Date: 12-14-94

Moisture Collected

	Initial Weight	Final Weight	Weight Gain
Impinger 1	596.8	871.0	274.2
Impinger 2	518.5	695.0	176.5
Impinger 3	506.8	734.2	227.4
Impinger 4	406.6	448.3	41.7
Impinger 5	842.8	873.5	30.7
		Total Gain =	750.5

Particulate Collected

Front - Half Analysis (Nozzle, Probe, Filter and Oven Glassware)

1. Filter Final Weight 0.7821
2. Filter Tare Weight 0.7143 Sp-2
3. Total Filter Weight 0.0678
4. Particulate caught in nozzle, probe and glassware 0.0531
5. Total Front - Half Catch 0.1209

Back - Half Analysis (Impingers, and Connecting Glassware)

1. Particulate caught in impingers evaporated down at less than 120° F. 2.3 mg

Total Particulate Catch (Sum of Front and Back - Half Catches)

123.2 mg

American Environmental Testing Company, Inc.
565 South Birch Drive
Spanish Fork, Utah 84660
(801) 266-7111

Company: WESTERN SUGAR Date: 12-15-94

Source: SOUTH PULP DRYER Run Number: #2 Comp

ORSAT ANALYSIS

(Average of 3 analyses each)

Test Number	Volume Percent - Dry			
	Nitrogen	Oxygen	Carbon Dixoide	Carbon Monoxide
1	82.7	12.7	4.6	20.1
2	82.7	12.7	4.6	20.1
3	82.7	12.7	4.6	20.1
Average	82.7	12.7	4.6	20.1

AMERICAN ENVIRONMENTAL TESTING, INCORPORATED
565 So. Birch Drive 801-266-7111
Spanish Fork, Utah 84660

POST TEST BACK HALF EVAPORATION

COMPANY: Western Sugar
SOURCE: South Pole Dryer
DATE: 12-15-94

CONTAINER #1
METHYLENE CHLORIDE

BLANK
Volume of Liquid 150 mls
Final Weight 103.4554
Tare Weight 103.4552 X-1
Residue 0.0002

RUN #1
Volume of Liquid 150 mls
Color Clear
Final Weight 102.9548
Tare Weight 102.9544 R-2
Residue & Blank 0.0004
- Blank 0.0002
Residue 0.0002 0.2 mg

RUN #2
Volume of Liquid 150 mls
Color Clear
Final Weight 103.4568
Tare Weight 103.4559 X-1
Residue & Blank 0.0009
- Blank 0.0002
Residue 0.0007 0.7 mg

RUN #3
Volume of Liquid 150 mls
Color Clear
Final Weight 106.5533
Tare Weight 106.5524 Q-2
Residue & Blank 0.0009
- Blank 0.0002
Residue 0.0007 0.7 mg

CONTAINER #2
DISTILLED WATER

BLANK
Volume of Liquid 250 mls
Final Weight 106.1202
Tare Weight 106.1201 X-4
Residue 0.0001

RUN #1
Volume of Liquid 250 mls
Color Yellow
Final Weight 106.1217
Tare Weight 106.1202 X-4
Residue & Blank 0.0015
- Blank 0.0001
Residue 0.0014 1.4 mg

RUN #2
Volume of Liquid 250 mls
Color Yellow
Final Weight 106.4229
Tare Weight 106.4212 R-2
Residue & Blank 0.0017
- Blank 0.0001
Residue 0.0016 1.6 mg

RUN #3
Volume of Liquid 250 mls
Color Yellow
Final Weight 105.6004
Tare Weight 105.5991 R-3
Residue & Blank 0.0013
- Blank 0.0001
Residue 0.0012 1.2 mg

AMERICAN ENVIRONMENTAL TESTING, INCORPORATED
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Spanish Fork, Utah 84660

POST TEST EVAPORATION

COMPANY: Western Sugar
SOURCE: South Pulp Dryer
DATE: 12-15-94

ACETONE BLANK		WATER BLANK	
Volume of Liquid	250 ml	Volume of Liquid	
Final Weight	102.2558	Final Weight	
Tare Weight	102.2557	Tare Weight	
Residue	0.0001	Residue	

RUN #1		RUN #1	
Volume of Liquid	250 ml	Volume of Liquid	
Color	Brown	Color	
Final Weight	102.3637	Final Weight	
Tare Weight	102.3211	Tare Weight	
Residue & Blank	0.0426	Residue & Blank	
- Blank	0.0001	- Blank	
Residue	0.0425 (42.5 mg)	Residue	

RUN #2		RUN #2	
Volume of Liquid	250 ml	Volume of Liquid	
Color	Brown	Color	
Final Weight	102.3528	Final Weight	
Tare Weight	102.2996	Tare Weight	
Residue & Blank	0.0532	Residue & Blank	
- Blank	0.0001	- Blank	
Residue	0.0531 (53.1 mg)	Residue	

RUN #3		RUN #3	
Volume of Liquid	250 ml	Volume of Liquid	
Color	Brown	Color	
Final Weight	102.2978	Final Weight	
Tare Weight	102.2477	Tare Weight	
Residue & Blank	0.0501	Residue & Blank	
- Blank	0.0001	- Blank	
Residue	0.0500 (50.0 mg)	Residue	

AMERICAN ENVIRONMENTAL TESTING, INCORPORATED

565 So. Birch Drive 801-266-7111

Spanish Fork, Utah 84660

PARTICULATE FIELD DATA FORMAT

1	Plant	Western Sugar
2	City	Scottsbluff Nebraska
3	Location	South Pulp Dryer
4	Operator	JD Schiller
5	Date	Wednesday, 14 December, 1994
6	Method and Run #	EPA 5 - #3 Compliance
7	Stack Diameter (in)	60
8	Sample Box Number	UT
9	Meter Box Number	UT 790-484
10	Meter ^H@	1.656
11	Meter Calibration, Y	0.982
12	Pitot Tube, Cp	0.8414
13	Probe Length (ft)	6'-A
14	Probe Liner Material	Stainless
15	Probe Heater Setting (°F)	248
16	Ambient Temperature (°F)	24
17	Barometeric Press., Pb (in Hg)	26.23
18	Assumed Moisture (%)	45
19	Static Pressure, Ps (in H2O)	-0.22
20	C Factor	0
21	Reference ^P (in H2O)	0.22
22	Nozzle Identification Number	3/8 #7
23	Nozzle Diameter (in)	0.376
24	Thermometer Number	1-A
25	Pretest Leak Rate (CFM)	0.0030
26	Leak Check Vacuum (in H2O)	18.7
27	Filter Number	SP-3
28	Gas Analysis	
29	CO (%)	0
30	CO2 (%)	4.60
31	O2 (%)	12.70
32	N2 (%)	82.70

PRETEST CALCULATIONS

NOZZLE DIAMETER

Dn = 0.376

constant	0.0357
Qm	0.75
Pb(in HG)	26.23
Pgm(in H20)	-0.22
Pm	26.2138
Cp	0.8414
Tm(°F)	55
Tm(°R)	515
Bwm	0
Bws	0.45
Ts(°F)	170
Ts(°R)	630
Mds	29.244
Ms	24.1842
Pb(in HG)	26.23
Pgs(in H20)	-0.22
Ps	26.2138
(^P)avg	0.22

Dn = 0.2892

PRETEST DATA

Cp	0.8414
Imp V(H20)(ml)	67.5000
Gel H20(g)	12.0000
V(H20)(ml)	127.8000
Vm(acf)	49.2300
^h avg	0.2000
Vwc	6.0155
Vmc	43.4585

Bws = 0.1216

ISOKINETIC ^H

^H = 0.7910

constant	849.8000
^H@	1.0000
Mds	29.2440
Mm	29.2440
K	3.5956
^P	0.2200

^H = 0.7910

Sample Point	Meter Temperature Outlet (°F)	Meter Temperature Inlet (°F)	Stack Temp Ts (°F)	Gas Volume Vm (ft3)	Gas Volume difference (ft3)
starting				755.016	
1	32	32	171	756.827	1.81
2	32	36	172	758.774	1.95
3	32	40	172	760.722	1.95
4	32	43	171	762.878	2.16
5	33	46	170	765.048	2.17
6	33	49	172	767.219	2.17
7	34	51	173	769.441	2.22
8	35	54	172	771.738	2.30
9	35	58	171	773.921	2.18
10	36	61	171	775.934	2.01
11	36	65	171	777.952	2.02
12	36	68	170	780.047	2.09
13	37	61	169	782.136	2.09
14	37	64	171	784.153	2.02
15	38	67	172	786.255	2.10
16	38	70	172	788.462	2.21
17	39	72	173	790.575	2.11
18	39	75	172	792.696	2.12
19	41	77	171	794.824	2.13
20	41	79	170	797.064	2.24
21	43	82	172	799.193	2.13
22	44	83	172	801.412	2.22
23	45	83	170	803.713	2.30
24	45	84	172	805.922	2.21

avg °F		49.85	171.33		
avg °R		509.85	631.33		
total =				50.9060	50.91
average =	37.21	62.50	171.33		
Sample Point	Meter Temperature Inlet (°F)	Meter Temperature Outlet (°F)	Stack Temp (°F) T	Gas Volume Vm	Gas Volume Vm

Velocity Head ^Ps (in H20)	Pressure Diff ^H (in H20)	Sqrt ^Ps	Sampling Time (min)	Clock Time (24 hrs)	Vacuum (in Hg)
				1315	
0.18	1.02	0.4243	3	1318	6
0.19	1.08	0.4359	3	1321	6.4
0.19	1.09	0.4359	3	1324	6.5
0.22	1.26	0.4690	3	1327	7.6
0.22	1.27	0.4690	3	1330	7.6
0.22	1.27	0.4690	3	1333	7.8
0.23	1.33	0.4796	3	1336	8.2
0.24	1.39	0.4899	3	1339	9.4
0.22	1.29	0.4690	3	1342	8.3
0.2	1.17	0.4472	3	1345	6.8
0.2	1.18	0.4472	3	1348	6.9
0.21	1.24	0.4583	3	1351	7.5
0.21	1.24	0.4583	3	1420	7.5
0.2	1.18	0.4472	3	1423	6.8
0.21	1.24	0.4583	3	1426	7.5
0.22	1.30	0.4690	3	1429	7.7
0.21	1.24	0.4583	3	1432	7.4
0.21	1.25	0.4583	3	1435	7.4
0.21	1.26	0.4583	3	1438	7.5
0.22	1.32	0.4690	3	1441	8.1
0.21	1.26	0.4583	3	1444	7.5
0.22	1.33	0.4690	3	1447	8.1
0.23	1.39	0.4796	3	1450	8.7
0.22	1.33	0.4690	3	1453	8

			72	72	
0.2121	1.2473	0.4603	3	1382.68	7.55
Velocity Head ^Ps	Pressure Diff ^H	Sqrt ^Ps	Sampling Time	Clock Time	Vacuum

Probe Temperature Exit (°F)	Filter Temperature (°F)	Impinger Temperature Outlet (°F)	Vs	Point to Point Isokinetics
238	256	40	30.4475	96.85
237	255	40	31.3066	101.20
235	256	4	31.3066	101.03
235	257	39	33.6609	103.69
237	259	39	33.6342	104.04
240	257	38	33.6876	104.08
241	258	39	34.4720	104.11
242	256	39	35.1855	105.05
240	252	39	33.6609	103.95
241	256	40	32.0944	100.30
239	255	40	32.0944	100.33
238	253	41	32.8609	101.41
239	255	41	32.8349	101.37
239	254	40	32.0944	100.28
241	256	39	32.9131	101.86
242	255	39	33.6876	104.33
240	252	38	32.9391	102.15
241	251	38	32.9131	102.29
239	253	40	32.8870	102.33
238	255	41	33.6342	105.06
240	255	41	32.9131	102.09
238	254	40	33.6876	103.86
241	253	39	34.3902	105.12
240	254	39	33.6876	103.28

239.21	254.88	38.04
Probe Exit Temperature (°F)	Filter Temperature (°F)	Outlet Impinger Temperature (°F)

POST TEST CALCULATION

VOLUME DRY GAS
Vm(std) = 45.3842

VOLUME H2O VAPOR
Vw(std) = 37.1524

MOISTURE CONTENT
Bws = 0.4501

Vm 50.9060
Vm(std) = 45.3842

Vic(mls) 789.3
Vw(std) = 37.1524

MOL WT DRY STACK GASES
Mds = 29.2440

STACK VELOCITY
Vs = 33.0414

DRY STACK FLOW RATE
Q(std) = 9.4101E+5

Kp 85.49
Vs = 33.0414

MOL WT WET STACK GASES
Mws = 24.1827

ISOKINETIC CALCULATION
An = 7.7109E-4
% ISO = 102.5690

PARTICULATE CONCENTRATION
Cs = 2.9548E-3

Mn 134.1
Cs = 2.9548E-3
lbs/dscf = 6.5140E-6
grains/dscf = 0.0456
grams/dscm = 0.1043
lbs/hr = 6.1298

Initial Leak Check Rate
Finish 754.864
Start 754.861
Rate = 0.0030
Vac. = 18.7

Pitot Tubes
A = OK
B = OK

Final Leak Check Rate
Finish 806.026
Start 806.024
Rate = 0.0020
Vac. = 15.8

Pitot Tubes
A = OK
B = OK

American Environmental Testing Company, Inc.
565 South Birch Drive
Spanish Fork, Utah 84660
(801) 266-7111

LABORATORY DATA
EPA Method 5

Company: Western Sugar Run Number: UT Box #3 Compliance

Sampling Location: South Pulp Dryer Date: 12-16-94

Moisture Collected

	Initial Weight	Final Weight	Weight Gain
Impinger 1	598.5	869.0	270.5
Impinger 2	525.1	720.6	195.5
Impinger 3	508.8	810.0	301.2
Impinger 4	408.2	413.2	5.0
Impinger 5	750.8	767.9	17.1
		Total Gain =	789.3

Particulate Collected

Front - Half Analysis (Nozzle, Probe, Filter and Oven Glassware)

1. Filter Final Weight 0.7952
2. Filter Tare Weight 0.7130 Sp-3
3. Total Filter Weight 0.0822
4. Particulate caught in nozzle, probe and glassware 0.0500
5. Total Front - Half Catch 0.1322

Back - Half Analysis (Impingers, and Connecting Glassware)

1. Particulate caught in impingers evaporated down at less than 120° F. 1.9 mg

Total Particulate Catch (Sum of Front and Back - Half Catches)

134.1 mg

American Environmental Testing Company, Inc.
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Company: WESTERN SUGAR Date: 12-15-94

Source: SOUTH PULP DRYER Run Number: #3 Comp

ORSAT ANALYSIS

(Average of 3 analyses each)

Test Number	Volume Percent - Dry			
	Nitrogen	Oxygen	Carbon Dixoide	Carbon Monoxide
1	82.6	12.7	4.7	<0.1
2	82.6	12.7	4.7	<0.1
3	82.6	12.7	4.7	<0.1
Average	82.6	12.7	4.7	<0.1