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: 1.8

Reference Number: 31

Title: Source Test Report for Particulate Emissions Twin Impingement Wet Scrubbers Boiler Number 1: Sugar Cane Growers Cooperative of Florida

November 1991

SOURCE TEST REPORT
for
PARTICULATE EMISSIONS

TWIN IMPINGEMENT WET SCRUBBERS
BOILER NUMBER 1

NOVEMBER 14, 1991

Prepared for:

SUGAR CANE GROWERS
COOPERATIVE OF FLORIDA
AIRPORT ROAD
BELLE GLADE, FLORIDA 33430-0666

Prepared by:

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236-91-01

TABLE OF CONTENTS

SECTION		PAGE
1.0	INTRODUCTION	1
2.0	SUMMARY AND DISCUSSION OF RESULTS	2
3.0	PROCESS DESCRIPTION AND OPERATION	4
4.0	SAMPLING POINT LOCATION	5
5.0	FIELD AND ANALYTICAL PROCEDURES	7
5.1	PARTICULATE MATTER SAMPLING AND ANALYSIS--EPA METHOD 5	7

APPENDICES

APPENDIX A--COMPLETE EMISSION DATA

APPENDIX B--FIELD DATA SHEETS

APPENDIX C--LABORATORY DATA

APPENDIX D--PRODUCTION RATE CERTIFICATION

APPENDIX E--QUALITY ASSURANCE

APPENDIX F--PROJECT PARTICIPANTS

LIST OF TABLES

TABLE		PAGE
1	*EMISSION SUMMARY*	3

LIST OF FIGURES

FIGURE		PAGE
1	*SAMPLING POINT LOCATION*	6
2	*EPA METHOD 5 SAMPLING TRAIN*	8

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REPORT CERTIFICATION

To the best of my knowledge, all applicable field and analytical procedures comply with Florida Department of Environmental Regulation requirements and all test data and plant operating data are true and correct.

Dagmar Neck

Dagmar Neck

12/20/91

Date

1.0 INTRODUCTION

On November 14, 1991, Air Consulting and Engineering, Inc. (ACE), conducted particulate emission testing on the Wet Scrubber Outlet of Boiler 1 at Sugar Cane Growers Cooperative of Florida (Sugar Cane Growers) located in Belle Glade, Florida.

Testing was performed to demonstrate compliance with the current Florida Department of Environmental Regulation (FDER) operating permit.

United States Environmental Protection Agency (EPA) Method 5 was utilized for the emission testing.

Mr. Ken Tucker of the FDER observed a portion of the testing.

Mr. Blas Marin of Sugar Cane Growers coordinated testing and provided production data.

2.0 SUMMARY AND DISCUSSION OF RESULTS

Boiler Number 1 demonstrated compliance with the permit conditions.

Table 1 is a summary of the emission results and flue gas parameters.

Particulate emissions averaged 31.85 pounds per hour (lbs/Hr) and 0.157 pounds per million BTU (lbs/MMBTU) which is within the allowable emissions of 46.61 lbs/Hr and 0.230 lbs/MMBTU.

Complete emission summaries, field data sheets and laboratory data are presented in Appendices A, B, and C, respectively.

Production rate summaries are provided in Appendix D. This data was obtained from control room recordings of steam flow, temperature, and pressure as well as feed water temperature and pressure. Residue integrator and oil meter readings were recorded at the beginning and end of each particulate run.

Table 1 Emission Summary
Boiler Number 1
Sugar Cane Growers Cooperative of Florida
Belle Glade, Florida
November 14, 1991

Run Number	Flow Rate SCFMD	Stack Temp. °F	Stack Moisture %	Particulate Emissions lbs/Hr	Particulate Emissions lbs/MMBTU	Allowable Emissions lbs/Hr	Allowable Emissions lbs/MMBTU
1	71488	138	18.1	30.67	0.153	46.06	0.230
2	72996	140	17.9	32.25	0.158	46.81	0.230
3	71447	140	18.6	32.64	0.160	46.95	0.230
AVERAGE	71977	139	18.2	31.85	0.157	46.61	0.230

3.0 PROCESS DESCRIPTION AND OPERATION

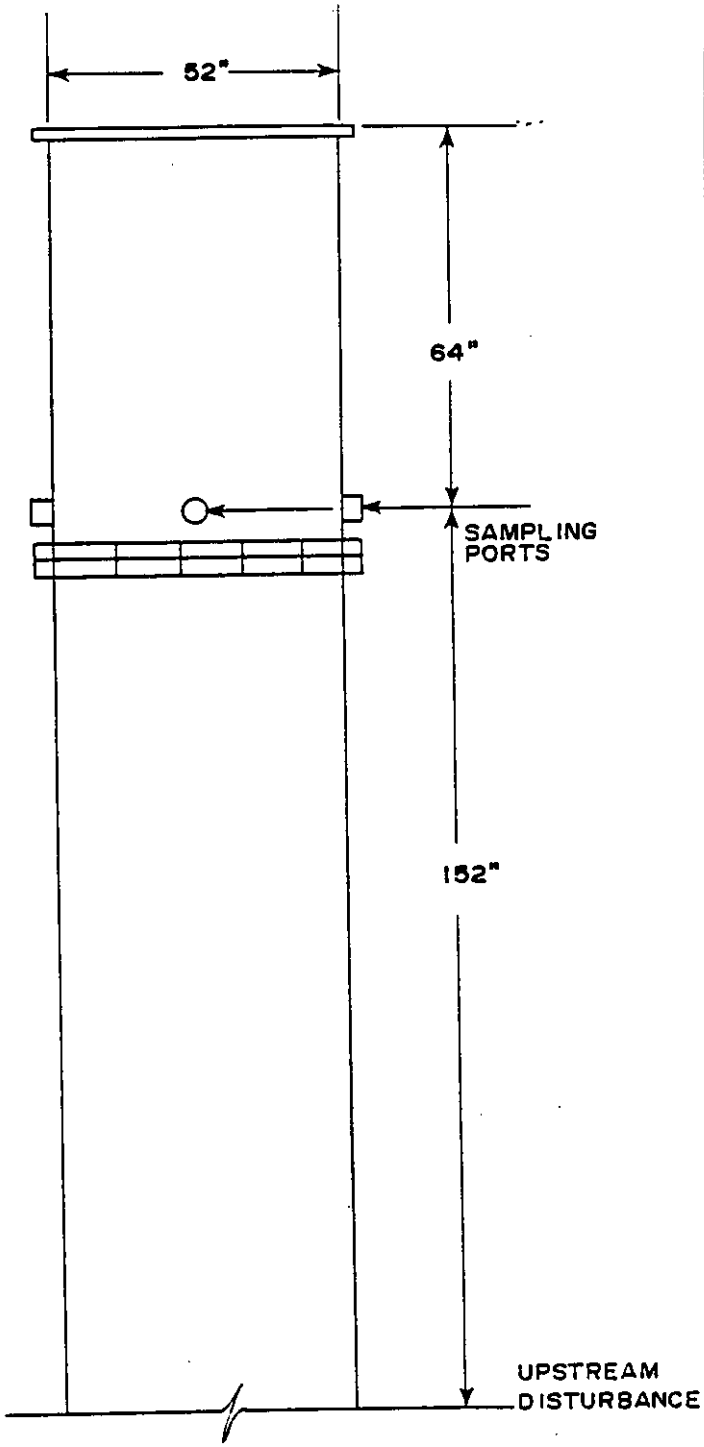
The Number 1 Boiler at Sugar Cane Growers is a spreader stoker design used primarily for residue fuel firing. Supplemental oil firing was also utilized for the emission test. The boiler averaged 119,273 lbs/Hr steam production over the three run test period.

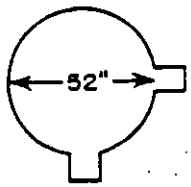
Oil meters, steam integrators, and other production monitoring devices were rigorously calibrated prior to the production season.

4.0 SAMPLING POINT LOCATION

The sampling point location (Figure 1) consists of dual scrubber outlet stacks, each 52" in diameter. Each stack has two sample ports 90 degrees apart. The ports on the south stack are located 166 from an upstream disturbance and 52" from the outlet while the north stack ports are 154" from an upstream disturbance and 53" from the outlet.

Twenty-four test points were sampled on each stack for each test run. The traverse were located as shown below. The stack configuration is such that there was no reason to evaluate the presence of cyclonic flow.





TRAVERSE POINT NUMBER	INCHES INSIDE STACK WALL
1	1.1
2	3.5
3	6.1
4	9.2
5	13.0
6	18.5
7	33.5
8	39.0
9	42.8
10	45.9
11	48.5
12	50.9

NOTE: NOT TO SCALE
BOTH STACKS ARE IDENTICAL.

FIGURE 1.
SAMPLING POINT LOCATION
BOILER NO. 1
SUGARCANE GROWERS COOP. OF FLORIDA

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5.0 FIELD AND ANALYTICAL PROCEDURES

5.1 Particulate Matter Sampling and Analysis--EPA Method 5 (Glass Probe)

Particulate matter samples were collected by the particulate matter emission measurement method specified by the United States Environmental Protection Agency. A schematic diagram of the sampling train used is shown in Figure 2. All particulate matter captured from the nozzle to, and including, the filter was included in the calculation of the emission rate of particulate matter.

PREPARATION OF EQUIPMENT

1. FILTERS - Gelman type "A" filters were placed in a drying oven for two hours at 105 degrees C, removed and placed in a standard desiccator containing indicating silica gel, allowed to cool for two hours, and weighed to the nearest 0.1 mg. The filters were then re-desiccated for a minimum of six hours and weighed to a constant weight (less than 0.5 mg change from previous weighing). The average of the two constant weights was used as the tare weight.

2. NOZZLE, FILTER HOLDER, AND SAMPLING PROBE - The nozzle, filter holder, and sampling probe were washed vigorously with soapy water and brushes, rinsed with distilled water and acetone, and dried prior to the test program. All openings on the sampling equipment were sealed while in transit to the test site.

3. IMPINGERS - The Greenburg-Smith impingers were cleaned with a warm soapy water solution and brushes, rinsed with distilled water and acetone, and dried. The impingers were sealed tightly during transit.

TEST PROCEDURE

Prior to performing the actual particulate matter sample runs, certain stack and stack gas parameters were measured. These preliminary measurements

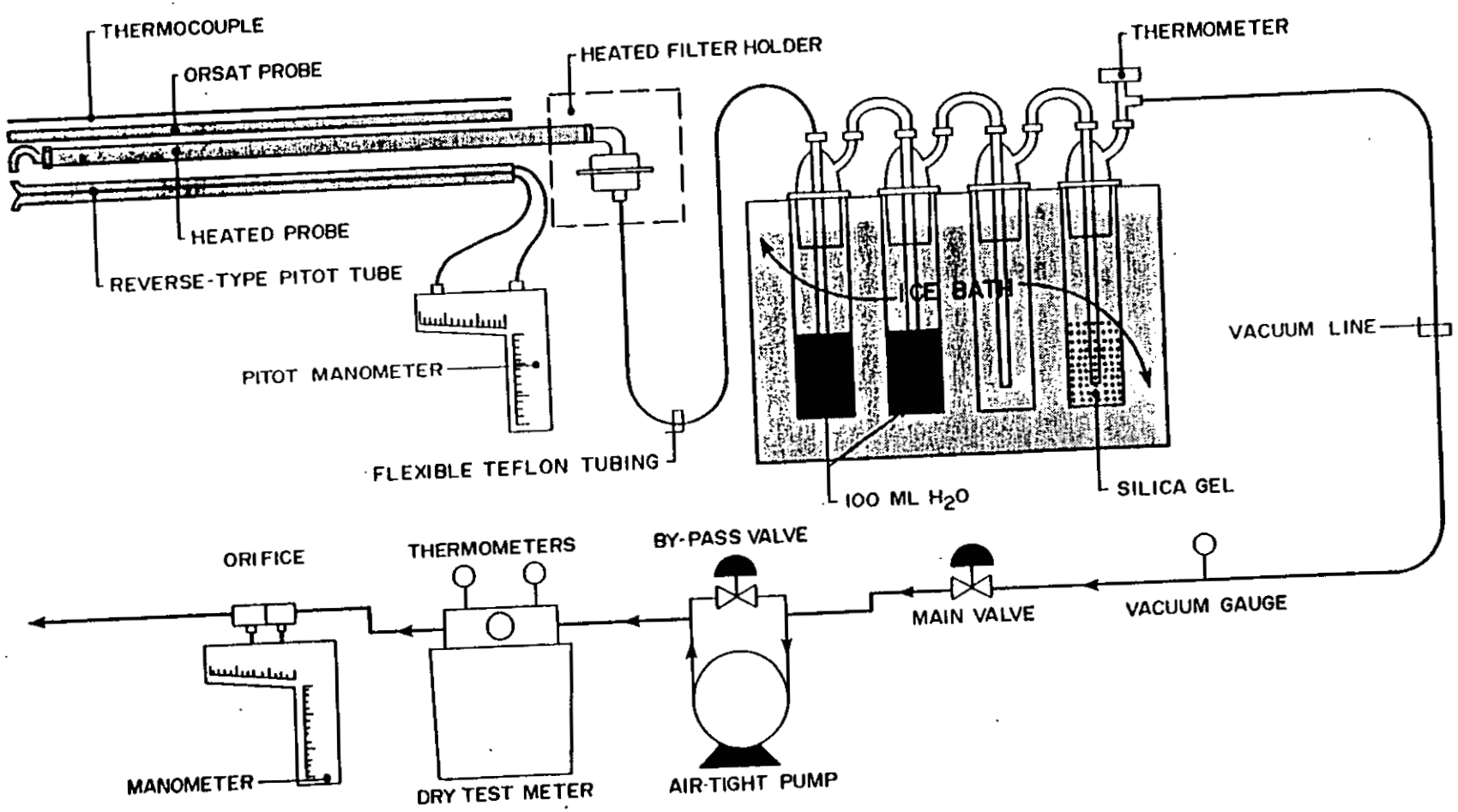

FIGURE I.
EPA METHOD 5 SAMPLING TRAIN

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included the average gas temperature, the stack gas velocity head, the stack gas moisture content, and the stack dimensions at the point where the tests were being performed. The stack gas temperature was determined by using a bi-metallic thermocouple and calibrated pyrometer. Velocity head measurements were made with calibrated type "S" pitot tube and an inclined manometer. Velocity head measurements of 0.05 inches H_2O or less were measured utilizing a micromanometer.

The sampling traverse points were selected so that a representative sample could be extracted from the gas stream. The traverse points were located in the center of equal areas, the number of which were dependent upon the distance upstream and downstream from flow disturbances.

Each particulate matter test run consisted of sampling for a specific amount of time at each traverse point. The type "S" pitot tube was connected to the sampling probe so that an instantaneous velocity head measurement could be made at each traverse point while making the test run. The stack gas temperature was also measured at each traverse point. Nomographs were used to calculate the isokinetic sampling rate at each traverse point during each test run.

The gases sampled passed through the following components: a stainless steel nozzle and glass probe; a glass fiber filter; two impingers each with 100 ml

of distilled deionized water; one impinger dry; one impinger with 200 grams of silica gel; a flexible sample line; an air-tight pump; a dry test meter; and a calibrated orifice. The second impinger had a standard tip, while the first, third, and fourth impingers had modified tips with a 0.5 inch I.D. opening.

Sample recovery was accomplished by the following procedures:

1. The pre-tared filter was removed from its holder and placed in Container 1 and sealed. (This is usually performed in the lab.)
2. All sample-exposed surfaces prior to the filter were washed with acetone and placed in Container 2, sealed and the liquid level marked.
3. The volume of water from the first three impingers was measured for the purpose of calculating the moisture in the stack gas and then discarded.
4. The used silica gel from the fourth impinger was transferred to the original tared container and sealed.

LABORATORY ANALYSIS

The three sample containers from each sample run were analyzed according to the following procedures:

1. The filter was dried at 105 degrees C for three hours, desiccated for a minimum of one hour, and weighed to the nearest 0.1 mg. A minimum of two such weighings six hours apart was made to determine constant weight.
2. The acetone from Container 2 was transferred to a tared beaker and evaporated to dryness at ambient temperature and pressure, desiccated for 24 hours, and weighed to the nearest 0.1 mg. A minimum of two such weighings six hours apart were made to determine constant weight.
3. The used silica gel in its tared container was weighed to the nearest 0.1 gram.

The total sample weight included the weight of material collected on the filter plus the weight of material collected in the nozzle, sampling probe, and front half of the filter holder.

DATA

The field data sheets, calculation sheets, and nomenclature definitions are included in the appendices of this report.

APPENDIX A
COMPLETE EMISSION DATA

1.

AIR CONSULTING and ENGINEERING
COMPLETE EMISSION DATA

PLANT: SUGAR CANE GROWERS COOPERATIVE
SOURCE: NUMBER 1 BOILER
DATE: 11-14-91

RUN NO.:	1	IMPINGER ml	305
BEGIN TIME:	824	SILICA GEL gms.	11.3
END TIME:	1004	PERCENT O2	11.50
TOTAL RUN TIME:	96.00 min.	PERCENT CO2	7.50
BAROMETRIC PRESSURE:	30.32 "Hg	"F" FACTOR	0
STACK PRESSURE:	30.32 "Hg.		
NOZZLE DIAMETER:	.235 inches	PARTICULATE	
METER CORR. FACTOR:	1.004	---	
FINAL METER:	1004.508 cubic ft.	FILTER mg.	202.8
INITIAL METER:	937.435 cubic ft.	WASH mg.	17.1
STACK AREA:	29.500 sq. ft.		

STACK 1 DATA INPUTS

PORT-POINT	VELOCITY HEAD	SQUARE RT. VEL. HEAD	ORIF. DIFF.	STACK TEMP.	METER TEMP.
1-1	1.100	1.049	2.500	136	63
1-2	1.150	1.072	2.650	135	64
1-3	1.150	1.072	2.650	137	64
1-4	1.350	1.162	3.100	138	64
1-5	1.100	1.049	2.500	138	64
1-6	1.000	1.000	2.300	138	65
1-7	.940	0.970	2.150	138	66
1-8	1.000	1.000	2.300	138	66
1-9	1.050	1.025	2.400	138	67
1-10	1.000	1.000	2.300	138	68
1-11	.900	0.949	2.100	138	68
1-12	.850	0.922	1.950	138	68
2-1	.920	0.959	2.100	137	70
2-2	.920	0.959	2.100	137	70
2-3	1.000	1.000	2.300	138	70
2-4	1.200	1.095	2.750	138	71
2-5	1.100	1.049	2.500	138	71
2-6	1.000	1.000	2.300	138	72
2-7	.850	0.922	1.950	139	72
2-8	.790	0.889	1.800	139	73
2-9	.750	0.866	1.700	139	73
2-10	.750	0.866	1.700	139	73
2-11	.700	0.837	1.600	139	74
2-12	.700	0.837	1.400	139	74
AVERAGES	0.970	0.981	2.213	138	69

EMISSION RESULTS

NOZZLE AREA(FT2)	:0.0003016	---		
AVG. VELOCITY HEAD	:---	0.82 "H2O	VOL. FLOW ACFM :	97558
AVG. STACK TEMP.:	---	138 F	VOL. FLOW SCFMD :	71488
AVG. METER TEMP.:	---	74 F		
AVG. ORIFICE DIFFERENTIAL:	---	1.91 "H2O	PARTICULATE DATA :	
METER STANDARD CUBIC FEET:	---	67.797	---	
% H2O VAPOR:	:---	18.1	POUNDS PER HOUR:	30.671
GAS MOL. WT. DRY:	---	29.66	POUNDS PER SCF :	0.0000072
GAS MOL. WT. WET:	---	27.55	GRAINS/SCF:	0.050
% EXCESS AIR:	---	116.35	GRAINS/SCF @ 8% O2	0.069
AVG. STACK VEL.(FPS)	---	55.12	GRAINS/SCF @50% EA	0.072
MMBTU INPUT:	---	200.44	POUNDS PER MMBTU:	0.153
PERCENT ISOKINETIC :	---	96.62		

STACK 2 DATA INPUTS

PORT-POINT	VELOCITY HEAD	SQUARE RT. VEL. HEAD	ORIFICE DIFF.	STACK TEMP.	METER TEMP.
1-1	.710	0.843	1.600	137	75
1-2	.710	0.843	1.600	137	75
1-3	.790	0.889	1.800	138	75
1-4	.860	0.927	2.000	137	76
1-5	.900	0.949	2.050	136	77
1-6	.730	0.854	1.650	138	77
1-7	.760	0.872	1.750	138	77
1-8	.840	0.917	1.900	138	78
1-9	.650	0.806	1.500	138	78
1-10	.530	0.728	1.200	138	79
1-11	.500	0.707	1.150	138	79
1-12	.470	0.686	1.050	138	79
2-1	.620	0.787	1.400	138	80
2-2	.620	0.787	1.400	137	80
2-3	.620	0.787	1.400	138	80
2-4	.850	0.922	1.950	138	80
2-5	.900	0.949	2.050	138	81
2-6	.780	0.883	1.800	138	81
2-7	.780	0.883	1.800	138	81
2-8	.880	0.938	2.000	138	82
2-9	.700	0.837	1.600	138	82
2-10	.580	0.762	1.300	139	82
2-11	.530	0.728	1.200	138	82
2-12	.510	0.714	1.200	138	82
AVERAGES	0.701	0.833	1.598	138	79

AIR CONSULTING and ENGINEERING
COMPLETE EMISSION DATA

PLANT: SUGAR CANE GROWERS COOPERATIVE
SOURCE: NUMBER 1 BOILER
DATE: 11-14-91

RUN NO.:	2	IMPINGER ml	305
BEGIN TIME:	1047	SILICA GEL gms.	12.1
END TIME:	1227	PERCENT O2	12.00
TOTAL RUN TIME:	96.00 min.	PERCENT CO2	8.00
BAROMETRIC PRESSURE:	30.32 "Hg	"F" FACTOR	0
STACK PRESSURE:	30.32 "Hg.		
NOZZLE DIAMETER:	.235 inches	PARTICULATE	
METER CORR. FACTOR:	1.004	---	
FINAL METER:	74.002 cubic ft.	FILTER mg.	209.5
INITIAL METER:	4.805 cubic ft.	WASH mg.	21.3
STACK AREA:	29.500 sq. ft.		

STACK 1 DATA INPUTS

PORT-POINT	VELOCITY HEAD	SQUARE RT. VEL. HEAD	ORIF. DIFF.	STACK TEMP.	METER TEMP.
1-1	1.200	1.095	2.750	140	79
1-2	1.250	1.118	2.900	140	79
1-3	1.250	1.118	2.900	141	78
1-4	1.400	1.183	3.200	139	78
1-5	1.200	1.095	2.750	140	78
1-6	1.350	1.162	2.900	141	78
1-7	1.100	1.049	2.500	140	78
1-8	.970	0.985	2.200	142	78
1-9	1.000	1.000	2.300	141	79
1-10	1.100	1.049	2.500	140	79
1-11	1.050	1.025	2.400	141	79
1-12	.950	0.975	2.150	142	79
2-1	.920	0.959	2.100	141	79
2-2	.920	0.959	2.100	140	80
2-3	1.000	1.000	2.300	138	80
2-4	1.200	1.095	2.750	141	80
2-5	1.300	1.140	3.000	138	80
2-6	1.100	1.049	2.500	142	80
2-7	.900	0.949	2.100	138	80
2-8	.770	0.877	1.800	143	80
2-9	.770	0.877	1.800	140	81
2-10	.730	0.854	1.700	143	81
2-11	.710	0.843	1.700	140	81
2-12	.680	0.825	1.600	142	81
AVERAGES	1.034	1.012	2.371	141	79

EMISSION RESULTS

NOZZLE AREA(FT2)	:0.0003016			
AVG. VELOCITY HEAD	:--------	0.86 "H2O	VOL. FLOW ACFM :	99698
AVG. STACK TEMP.:	---------	140 F	VOL. FLOW SCFMD :	72996
AVG. METER TEMP.:	---------	81 F		
AVG. ORIFICE DIFFERENTIAL:	---	2.01 "H2O	PARTICULATE DATA :	
METER STANDARD CUBIC FEET:	---	69.104	---	
% H2O VAPOR:	:--------	17.9	POUNDS PER HOUR:	32.249
GAS MOL. WT. DRY:	---------	29.76	POUNDS PER SCF :	0.0000074
GAS MOL. WT. WET:	---------	27.66	GRAINS/SCF:	0.052
% EXCESS AIR:	---------	131.58	GRAINS/SCF @ 8% O2	0.075
AVG. STACK VEL.(FPS)	---------	56.33	GRAINS/SCF @50% EA	0.080
MMBTU INPUT:	---------	203.84	POUNDS PER MMBTU:	0.158
PERCENT ISOKINETIC :	---------	96.44		

STACK 2 DATA INPUTS

PORT-POINT	VELOCITY HEAD	SQUARE RT. VEL. HEAD	ORIFICE DIFF.	STACK TEMP.	METER TEMP.
1-1	.700	0.837	1.600	141	81
1-2	.740	0.860	1.700	139	81
1-3	.800	0.894	1.850	138	81
1-4	.900	0.949	2.050	143	81
1-5	.950	0.975	2.200	140	81
1-6	.780	0.883	1.800	139	81
1-7	.760	0.872	1.750	139	81
1-8	.780	0.883	1.800	141	82
1-9	.620	0.787	1.450	140	82
1-10	.570	0.755	1.300	140	82
1-11	.530	0.728	1.200	139	82
1-12	.530	0.728	1.200	140	82
2-1	.620	0.787	1.450	140	82
2-2	.620	0.787	1.450	140	82
2-3	.660	0.812	1.500	137	82
2-4	.830	0.911	1.900	139	82
2-5	.830	0.911	1.900	139	82
2-6	.800	0.894	1.850	137	82
2-7	.880	0.938	2.000	141	82
2-8	.880	0.938	2.000	141	82
2-9	.720	0.849	1.660	140	82
2-10	.600	0.775	1.380	140	82
2-11	.580	0.762	1.300	139	82
2-12	.500	0.707	1.150	141	82
AVERAGES	0.716	0.843	1.643	140	82

AIR CONSULTING and ENGINEERING
COMPLETE EMISSION DATA

PLANT: SUGAR CANE GROWERS COOPERATIVE
SOURCE: NUMBER 1 BOILER
DATE: 11-14-91

RUN NO.:	3	IMPINGER ml	315
BEGIN TIME:	1329	SILICA GEL gms.	13.4
END TIME:	1509	PERCENT O2	12.50
TOTAL RUN TIME:	96.00 min.	PERCENT CO2	7.50
BAROMETRIC PRESSURE:	30.32 "Hg	"F" FACTOR	0
STACK PRESSURE:	30.32 "Hg.		
NOZZLE DIAMETER:	.235 inches	PARTICULATE	
METER CORR. FACTOR:	1.004		
FINAL METER:	142.322 cubic ft.	FILTER mg.	214.8
INITIAL METER:	74.321 cubic ft.	WASH mg.	20.3
STACK AREA:	29.500 sq. ft.		

STACK 1 DATA INPUTS

PORT-POINT	VELOCITY HEAD	SQUARE RT. VEL. HEAD	ORIF. DIFF.	STACK TEMP.	METER TEMP.
1-1	1.150	1.072	2.640	140	76
1-2	1.200	1.095	2.750	140	76
1-3	1.150	1.072	2.650	139	76
1-4	1.300	1.140	3.000	139	76
1-5	1.200	1.095	2.750	142	76
1-6	1.200	1.095	2.750	140	76
1-7	1.100	1.049	2.500	141	76
1-8	.970	0.985	2.200	143	76
1-9	1.000	1.000	2.300	141	76
1-10	.970	0.985	2.200	141	77
1-11	.950	0.975	2.200	142	77
1-12	.870	0.933	2.000	142	77
2-1	.870	0.933	2.000	140	78
2-2	.920	0.959	2.100	140	78
2-3	1.000	1.000	2.300	137	78
2-4	1.150	1.072	2.600	137	79
2-5	1.250	1.118	2.900	141	79
2-6	1.100	1.049	2.500	141	79
2-7	.780	0.883	1.800	142	79
2-8	.720	0.849	1.650	139	79
2-9	.700	0.837	1.600	139	79
2-10	.700	0.837	1.600	140	80
2-11	.700	0.837	1.600	140	80
2-12	.630	0.794	1.460	139	80
AVERAGES	0.982	0.986	2.252	140	78

Avg
O_2 = 12.5
Temp = 139
Flow = 71,97

EMISSION RESULTS

NOZZLE AREA(FT2)	:0.0003016		
AVG. VELOCITY HEAD	:-------- 0.83 "H2O	VOL. FLOW ACFM :	98417
AVG. STACK TEMP.:	--------- 140 F	VOL. FLOW SCFMD :	71447
AVG. METER TEMP.:	--------- 79 F		
AVG. ORIFICE DIFFERENTIAL:---	1.95 "H2O	PARTICULATE DATA :	
METER STANDARD CUBIC FEET:---	68.068		
% H2O VAPOR:	:-------- 18.6	POUNDS PER HOUR:	32.542
GAS MOL. WT. DRY:	--------- 29.70	POUNDS PER SCF :	0.0000076
GAS MOL. WT. WET:	--------- 27.52	GRAINS/SCF:	0.053
% EXCESS AIR:	--------- 145.01	GRAINS/SCF @ 8% O2	0.082
AVG. STACK VEL.(FPS)	--------- 55.60	GRAINS/SCF @50% EA	0.087
MMBTU INPUT:	--------- 104.19	POUNDS PER MMBTU:	0.160
PERCENT ISOKINETIC	--------- 97.[illegible]		

STACK 2 DATA INPUTS

PORT-POINT	VELOCITY HEAD	SQUARE RT. VEL. HEAD	ORIFICE DIFF.	STACK TEMP.	METER TEMP.
1-1	.720	0.849	1.650	138	80
1-2	.700	0.837	1.600	139	80
1-3	.770	0.877	1.800	141	80
1-4	.920	0.959	2.100	141	80
1-5	.940	0.970	2.150	139	80
1-6	.760	0.872	1.800	139	81
1-7	.820	0.906	1.900	140	81
1-8	.850	0.922	1.950	141	81
1-9	.730	0.854	1.700	140	81
1-10	.570	0.755	1.300	138	81
1-11	.520	0.721	1.200	140	81
1-12	.520	0.721	1.200	139	81
2-1	.600	0.775	1.400	139	81
2-2	.600	0.775	1.400	140	81
2-3	.600	0.775	1.400	141	81
2-4	.780	0.883	1.800	138	81
2-5	.870	0.933	2.000	140	81
2-6	.740	0.860	1.700	140	81
2-7	.870	0.933	2.000	140	81
2-8	.870	0.933	2.000	138	81
2-9	.700	0.837	1.600	141	81
2-10	.600	0.775	1.400	136	81
2-11	.560	0.748	1.300	138	81
2-12	.500	0.707	1.150	137	81
AVERAGES	0.713	0.841	1.646	139	81

APPENDIX B

FIELD DATA SHEETS

STACK SAMPLING FIELD DATA SHEET

ACE AIR CONSULTING & ENGINEERING, INC.
2106 N. W. 67th PLACE · Suites 9 & 10
GAINESVILLE, FLORIDA 32606

TEST ID _____
PAGE ____ OF ____

PLANT: Sugar Cane Growers' Co-op
SOURCE: _____
PLANT LOCATION: Belle Glade, Florida
TYPE OF SAMPLING TRAIN: EPA-5
TYPE OF SAMPLES: PM
DATE: 11-14-91 RUN NO.: 1
TIME START: 0824 TIME END: 1004
SAMPLE TIME: 48.2 (min/pt) = 96 Total min
ASSUMED MOISTURE: 18 % FDA: .82
NOMOGRAPH C_f: 2.3 PITOT CORR.: .84
P_b: 30.32 "Hg P_s: 30.32 "Hg
WEATHER: CLEAR TEMP.: ____ °F
METER BOX NO.: 1 H: 2.15 Y: 1.004
NOZZLE CAL.: .235 .235 .235 = .235
STACK DIMENSIONS: 52.4 x 2
STACK AREA: 29.5 ft.² EFFECTIVE: ____ ft.²
STACK HEIGHT: ____ ft.
STACK DIAMETER: UPSTRM. ____ DNSTRM. ____
PORT SIZE: ____ in. NIPPLE LENGTH: ____ in.
U CORD LENGTH: 12.5 + 7.5
REMARKS: DAVID BROWN – STERLING JORDAN
KEN TUCKER – FDER
JEFF KOERNER –

3265 FPM
96298 ACFM
70920 SCFM
.6265
.4182
210.3
42.71 lb/hr
.147
68.477 SCF
FDA = .82
38.87
200.44
33.972

MAT'L PROCESSING RATE: _____
GAS METER READINGS: FINAL 1004.508 ft.³
INITIAL 937.435 ft.³
NET: _____ ft.³
FILTER NO.: 3457 IMP. VOL. GAIN: 305 ml.
SIL GEL NO.: 120 WT. GAIN: 11.3 ml.
TOTAL CONDENSATE: 316.8 ml.

ORSAT

	1	2	3	4	AVG.
% CO_2			GT	7.5	8.0
% O_2				11.5	12.0
% CO					
% N_2					

F_O = _____ F_O RANGE = _____
ORSAT ANALYZER: _____

LEAK CHECKS

PRE 0.00 cfm 20 "Hg POST .003 cfm 20 "Hg
METER BOX/PUMP: _____ GAS SAMPLE SYST.: _____
ORSAT BAG: _____
PITOT TUBE NO.: 88 PRE-TEST: OK
POST-TEST(+): 3.5 / 0 H_2O/Sec
POST-TEST(−): 3.8 / 0 H_2O/Sec
PYROMETER NO.: ATKINS 2
BOX OPERATOR: NECK PROBE HOLDER: GERARD

PORT AND TRAVERSE POINT NUMBER	DISTANCE FROM INSIDE STACK WALL /COMMENTS	CLOCK TIME	GAS METER READING (FT.³)	STACK VELOCITY HEAD	METER ORIFICE PRESS. DIFF. ("H_2O) CALC.	ACTUAL	STACK GAS TEMP. (°F)	SAMPLE BOX TEMP. (°F)	LAST IMPINGER TEMP. F	DRY GAS METER TEMP. (°F)	VACUUM ON SAMPLE TRAIN ("Hg)
S-1-1		0826	937.06	1.1	2.5	2.5	136	270	41	63	11
2		0828	940.65	1.15	2.65	2.65	135	272	38	64	11.5
3		0830	942.27	1.15	2.65	2.65	137	272	39	64	12
4		0832	944.04	1.35	3.1	3.1	138	269	40	64	14.5
5		0834	945.65	1.1	2.5	2.5	138	268	41	64	12
6		0836	947.20	1.00	2.3	2.3	138	269	41	65	11.5

AIR CONSULTING & ENGINEERING, INC.

TEST ID _____

PAGE ____ OF ____

PORT AND TRAVERSE POINT NUMBER	DISTANCE FROM INSIDE STACK WALL /COMMENTS	CLOCK TIME	GAS METER READING (ft^3)	STACK VELOCITY HEAD	METER ORIFICE PRESS. DIFF. ("H_2O) CALC.	ACTUAL	STACK GAS TEMP. (°F)	SAMPLE BOX TEMP. (°F)	LAST IMPINGER TEMP. (°F)	DRY GAS METER TEMP. (°F)	VACUUM ON SAMPLE TRAIN ("Hg)
N-1-8		0931	988.02	.84	1.9	1.9	138	274	43	78	14.5
9		0933	985.31	.65	1.5	1.5	138	274	43	78	13
10		0935	986.–	.53	1.2	1.2	138	273	42	79	13
11		0937	987.75	.50	1.15	1.15	138	273	42	79	11.5
12		0939	988.84	.47	1.05	1.05	138	274	42	79	10.5
N-2-1		0942	990.04	.62	1.4	1.4	138	271	43	80	12
2		0944	991.23	.62	1.4	1.4	137	270	42	80	12
3		0946	992.43	.62	1.4	1.4	138	268	42	80	12
4		0948	993.74	.85	1.95	1.95	138	265	42	80	16
5		0950	995.14	.90	2.05	2.05	138	266	42	81	17
6		0952	996.51	.78	1.8	1.8	138	262	43	81	16
7		0954	997.90	.78	1.8	1.8	138	256	43	81	16
8		0956	999.40	.88	2.0	2.0	138	254	43	82	19.5
9		0958	1000.9–	.70	1.6	1.6	138	258	44	82	
10		1000	1002.2–	.58	1.3	1.3	139	258	44	82	15
11		1002	1003.37	.53	1.2	1.2	138	256	44	82	13.5
12		1004	1004.508	.51	1.2	1.2	138	257	44	82	13

$\sqrt{\Delta P} = .966$

AIR CONSULTING & ENGINEERING, INC.

TEST ID _____

PAGE ____ OF ____

PORT AND TRAVERSE POINT NUMBER	DISTANCE FROM INSIDE STACK WALL /COMMENTS	CLOCK TIME	GAS METER READING (ft.³)	STACK VELOCITY HEAD	METER ORIFICE PRESS. DIFF. ("H₂O) CALC.	METER ORIFICE PRESS. DIFF. ("H₂O) ACTUAL	STACK GAS TEMP (°F)	SAMPLE BOX TEMP (°F)	LAST IMPINGER TEMP (°F)	DRY GAS METER TEMP (°F)	VACUUM ON SAMPLE TRAIN ("Hg)
S-1-7		0838	948.70	.94	2.15	2.15	138	268	41	66	11
8		0840	950.22	1.0	2.3	2.3	138	268	41	66	12
9		0842	951.75	1.05	2.4	2.4	138	267	41	67	12.5
10		0844	953.3	1.0	2.3	2.3	138	264	41	68	12.5
11		0846	954.80	.90	2.1	2.1	138	262	42	68	12
12		0848	956.20	.85	1.95	1.95	138	262	42	68	11
S-2-1		0852	957.—	.92	2.1	2.1	137	264	43	70	11.5
2		0854	959.05	.92	2.1	2.1	137	266	41	70	11.5
3		0856	960.60	1.0	2.3	2.3	138	268	41	70	13.5
4		0858	962.28	1.2	2.75	2.75	138	266	42	71	17.5
5		0800	963.95	1.1	2.5	2.5	138	267	42	71	16
6		0902	965.49	1.0	2.3	2.3	138	267	42	72	15
7		0904	966.90	.85	1.95	1.95	139	264	42	72	12.5
8		0906	968.28	.79	1.8	1.8	139	260	42	73	12
9		0908	969.57	.75	1.7	1.7	139	259	42	73	11.5
10		0910	970.87	.75	1.7	1.7	139	259	42	73	11.5
11		0912	972.17	.70	1.6	1.6	139	261	42	74	11.5
12		0914	973.42	.60	1.4	1.4	139	261	42	74	10.5
N-1-1		0917	974.64	.71	1.6	1.6	137	271	41	75	11
2		0919	975.90	.71	1.6	1.6	137	271	41	75	11.5
3		0921	977.20	.79	1.8	1.8	138	274	42	75	13
4		0923	978.6	.86	2	2	137	274	42	76	14
5		0925	980.05	.90	2.05	2.05	136	274	42	77	15
6		0927	981.36	.73	1.65	1.65	138	272	42	77	13.5
7		0929	982.68	.76	1.75	1.75	138	274	42	77	13.5

STACK SAMPLING FIELD DATA SHEET

ACE AIR CONSULTING & ENGINEERING, INC.
2106 N. W. 67th PLACE · Suites 9 & 10
GAINESVILLE, FLORIDA 32606

TEST ID _____
PAGE ____ OF ____

PLANT: SUGAR CANE GROWER'S COOP
SOURCE: NUMBER 1 BOILER
PLANT LOCATION: Belle Glade, Florida
TYPE OF SAMPLING TRAIN: EPA-5
TYPE OF SAMPLES: PM
DATE: 11-14-91 RUN NO.: 2
TIME START: 1047 TIME END: 1227
SAMPLE TIME: 48.2 (min/pt) = 96 Total min
ASSUMED MOISTURE ____ % FDA ____
NOMOGRAPH C_p ____ PITOT CORR. ____
P_b: 30.32 "Hg P_s: 30.32 "Hg
WEATHER: CLEAR TEMP ____ °F
METER BOX NO.: 1 H: 2.15 Y: 1.004
NOZZLE CAL. ____ ____ : .235
STACK DIMENSIONS: 52" φ x 2
STACK AREA: 29.5 ft.² EFFECTIVE ____ ft.²
STACK HEIGHT ____ ft.
STACK DIAMETER: UPSTRM. ____ DNSTRM. ____
PORT SIZE ____ in. NIPPLE LENGTH ____ in.
U CORD LENGTH ____
REMARKS: ____

69.64 SCF
FDA - .82
3363 FPM
99199 ACFM
72935 SCFMD
203.64 97.4 150
.6325
.4175
215.0 34.685

MAT'L PROCESSING RATE ____
GAS METER READINGS: FINAL 74002 ft.³
INITIAL 4805 ft.³
NET ____ ft.³
FILTER NO.: 3459 IMP. VOL. GAIN: 305 ml.
SIL GEL NO.: 22 WT. GAIN: 12.1 ml.
TOTAL CONDENSATE: 317.1 ml.

ORSAT

	1	2	3	4	AVG.
% CO_2					8
% O_2					12
% CO					
% N_2					

F_O = ____ F_O RANGE = ____
ORSAT ANALYZER ____

LEAK CHECKS

PRE: 0.005 cfm 20 "Hg POST: .018 cfm 20 "Hg
METER BOX/PUMP ____ GAS SAMPLE SYST. ____
ORSAT BAG ____
PITOT TUBE NO.: 88 PRE-TEST: OK
POST-TEST(+): 3.7 / 0 H_2O/Sec
POST-TEST(−): 3.2 / 0 H_2O/Sec
PYROMETER NO.: ATKINS 2
BOX OPERATOR: NICK PROBE HOLDER: GERARD

PORT AND TRAVERSE POINT NUMBER	DISTANCE FROM INSIDE STACK WALL /COMMENTS	CLOCK TIME	GAS METER READING (FT.³)	STACK VELOCITY HEAD	METER ORIFICE PRESS. DIFF. ("H_2O) CALC.	ACTUAL	STACK GAS TEMP. (°F)	SAMPLE BOX TEMP. (°F)	LAST IMPINGER TEMP. F	DRY GAS METER TEMP. (°F)	VACUUM ON SAMPLE TRAIN ("Hg)
S-1-1		1049	6.47	1.2	2.75	2.75	140	265	48	79	12
2		1051	8.20	1.25	2.9	2.9	140	266	46	79	13
3		1053	9.95	1.25	2.9	2.9	141	267	45	78	13
4		1055	11.65	1.4	3.2	3.2	139	269	47	78	13
5		1057	13.26	1.2	2.75	2.75	140	261	47	78	13
6		1059	15.00	1.35	2.9	2.9	141	264	49	78	14

CO_2 ?
O_2 12

AIR CONSULTING & ENGINEERING, INC.

TEST ID _____

PAGE ____ OF ____

PORT AND TRAVERSE POINT NUMBER	DISTANCE FROM INSIDE STACK WALL /COMMENTS	CLOCK TIME	GAS METER READING (ft.³)	STACK VELOCITY HEAD	METER ORIFICE PRESS. DIFF. ("H₂O) CALC.	ACTUAL	STACK GAS TEMP. (°F)	SAMPLE BOX TEMP. (°F)	LAST IMPINGER TEMP. (°F)	DRY GAS METER TEMP. (°F)	VACUUM ON SAMPLE TRAIN ("Hg)
S-1-7		1101	16.66	1.1	2.5	2.5	140	263	44	78	13.5
-8		1103	18.22	.97	2.2	2.2	142	261	50	78	12
9		1105	19.8	1.0	2.3	2.3	141	261	51	79	12.5
10		1107	21.35	1.1	2.5	2.5	140	261	51	79	12.5
11		1109	22.90	1.05	2.4	2.4	141	261	51	79	13
12		1111	24.51	.95	2.15	2.15	142	267	51	79	12.5
S-2-1		1114	25.94	.98	2.1	2.1	141	268	52	79	11.5
2		1116	27.43	.92	2.1	2.1	140	265	50	80	11.5
3		1118	28.9	1.0	2.3	2.3	138	266	50	80	13
4		1120	30.5	1.2	2.75	2.75	141	267	50	80	16
5		1122	32.3	1.3	3.0	3.0	138	266	50	80	18
6		1124	33.95	1.1	2.5	2.5	142	265	51	80	16.5
7		1126	35.48	.9	2.1	2.1	138	261	51	80	16
8		1128	36.90	.77	1.8	1.8	143	259	51	80	12
9		1130	38.25	.77	1.8	1.8	140	263	52	81	12
10		1132	39.60	.73	1.7	1.7	143	263	51	81	11.5
11		1134	40.92	.71	1.7	1.7	140	260	51	81	10.5
12		1136	42.22	.68	1.6	1.6	142	257	51	81	11
N-1-1		1139	43.50	.70	1.6	1.6	141	262	53	81	10.5
2		1141	44.80	.74	1.7	1.7	139	274	51	81	11.5
3		1143	46.16	.80	1.85	1.85	138	276	50	81	13
4		1145	47.60	.90	2.05	2.05	143	279	50	81	14
5		1147	49.05	.95	2.2	2.2	140	274	50	81	15
6		1149	50.6	.78	1.8	1.8	139	274	50	81	15
7		1151	51.—	.76	1.75	1.75	139	274	50	81	15

AIR CONSULTING & ENGINEERING, INC.

TEST ID _____

PAGE ____ OF ____

PORT AND TRAVERSE POINT NUMBER	DISTANCE FROM INSIDE STACK WALL /COMMENTS	CLOCK TIME	GAS METER READING (ft.^{3})	STACK VELOCITY HEAD	METER ORIFICE PRESS. DIFF. ("H_2O) CALC.	ACTUAL	STACK GAS TEMP. (°F)	SAMPLE BOX TEMP. (°F)	LAST IMPINGER TEMP. (°F)	DRY GAS METER TEMP. (°F)	VACUUM ON SAMPLE TRAIN ("Hg)
N-1-8		1153	53.30	.78	1.8	1.8	141	269	52	82	14
9		1155	54.70	.62	1.45	1.45	140	274	52	82	14
10		1157	55.90	.57	1.3	1.3	140	271	52	82	13
11		1159	57.06	.53	1.2	1.2	139	272	52	82	11
12		1201	58.26	.53	1.2	1.2	140	269	52	82	11.5
N-2-1		1205	59.33	.62	1.45	1.45	140	265	52	82	12
2		1207	60.50	.62	1.45	1.45	140	261	52	82	12
3		1209	61.75	.66	1.5	1.5	137	258	52	82	13
4		1211	63.17	.83	1.9	1.9	139	256	52	82	16
5		1213	64.63	.83	1.9	1.9	139	253	52	82	16
6		1215	66.01	.80	1.85	1.85	137	256	53	82	16
7		1217	67.5	.88	2	2	141	255	53	82	16.5
8		1219	68.86	.88	2	2	141	254	53	82	16.5
9		1221	70.25	.72	1.66	1.66	140	251	53	82	16.5
10		1223	71.58	.60	1.38	1.38	140	255	53	82	16.5
11		1225	72.80	.58	1.3	1.3	139	254	53	82	13.5
12		1227	74.002	.50	1.15	1.15	141	254	53	82	13

STACK SAMPLING FIELD DATA SHEET

ACE AIR CONSULTING & ENGINEERING, INC.
2106 N. W. 67th PLACE · Suites 9 & 10
GAINESVILLE, FLORIDA · 32606

TEST ID _____
PAGE ____ OF ____

PLANT Sugar Cane Growers' Co-op
SOURCE No. 1 Boiler
PLANT LOCATION Belle Glade, Fla.
TYPE OF SAMPLING TRAIN EPA-5
TYPE OF SAMPLES PM
DATE 11-14-91 RUN NO. 3
TIME START 1329 TIME END 1509
SAMPLE TIME 48.2 (min/pt) = 96 Total min
ASSUMED MOISTURE 18 % FDA .82
NOMOGRAPH C_f 2.3 PITOT CORR. .84
P_b 30.32 "Hg P_s 30.32 "Hg
WEATHER Clear TEMP ____ °F
METER BOX NO. 1 H 2.15 Y 1.0054
NOZZLE CAL. _____ = .235
STACK DIMENSIONS 52" ϕ x 2
STACK AREA 29.5 ft.² EFFECTIVE ____ ft.²
STACK HEIGHT ____ ft.
STACK DIAMETER: UPSTRM. ____ DNSTRM. ____
PORT SIZE ____ in. NIPPLE LENGTH ____ in.
U CORD LENGTH _____
REMARKS: _____

.6430
.4232
219.8
35.0
34.725
204.19

MAT'L PROCESSING RATE _____
GAS METER READINGS: FINAL 142.322 ft.³
INITIAL 74.321 ft.³
NET _____ ft.³
FILTER NO. 3543 IMP. VOL. GAIN 315 ml.
SIL GEL NO. 106 WT. GAIN 13.4 ml.
TOTAL CONDENSATE 328.4 ml.

ORSAT

	1	2	3	4	AVG.
% CO_2					12.5
% O_2					7.5
% CO					
% N_2					

F_O = _____ F_O RANGE = _____
ORSAT ANALYZER _____

LEAK CHECKS

PRE 0.00 cfm 20 "Hg POST 0.006 cfm 19 "Hg
METER BOX/PUMP _____ GAS SAMPLE SYST. _____
ORSAT BAG _____
PITOT TUBE NO. 88 PRE-TEST OK
POST-TEST(+) 4.2 / 0 H_2O/Sec
POST-TEST(−) 4.4 / 0 H_2O/Sec
PYROMETER NO. ATKINS 2
BOX OPERATOR ~~Alex~~ PROBE HOLDER [illegible]

PORT AND TRAVERSE POINT NUMBER	DISTANCE FROM INSIDE STACK WALL /COMMENTS	CLOCK TIME	GAS METER READING (FT.³)	STACK VELOCITY HEAD	METER ORIFICE PRESS. DIFF. ("H_2O) CALC.	ACTUAL	STACK GAS TEMP. (°F)	SAMPLE BOX TEMP. (°F)	LAST IMPINGER TEMP. F	DRY GAS METER TEMP. (°F)	VACUUM ON SAMPLE TRAIN ("Hg)
S-1-1		1330	75.95	1.15	2.64	2.64	140	256	51	76	12
2		1333	77.61	1.2	2.75	2.75	140	254	46	76	13
3		1338	79.27	1.15	2.65	2.65	139	254	46	76	13
4		1339	81.00	1.3	3.0	3.0	139	254	48	76	15
5		1341	82.70	1.2	2.75	2.75	142	253	51	76	15
6		1348	84.40	1.2	2.75	2.75	140	253	51	76	15

115 14 02
8.5 6

AIR CONSULTING & ENGINEERING, INC.

TEST ID _____

PAGE ____ OF ____

PORT AND TRAVERSE POINT NUMBER	DISTANCE FROM INSIDE STACK WALL /COMMENTS	CLOCK TIME	GAS METER READING (ft.³)	STACK VELOCITY HEAD	METER ORIFICE PRESS. DIFF. ("H₂O) CALC.	ACTUAL	STACK GAS TEMP. (°F)	SAMPLE BOX TEMP. (°F)	LAST IMPINGER TEMP. (°F)	DRY GAS METER TEMP. (°F)	VACUUM ON SAMPLE TRAIN ("Hg)
S-1-7		1345	86.0	1.1	2.5	2.5	141	253	52	76	14
8		1347	87.54	.97	2.2	2.2	143	257	52	76	15
9		1349	89.13	1.0	2.3	2.3	141	260	53	76	14
10		1351	90.61	.97	2.2	2.2	141	265	53	77	13
11		1353	92.15	.95	2.2	2.2	142	265	53	77	13
12		1355	93.—	.87	2.0	2.0	142	263	53	77	12
S-2-1		1358	95.00	.87	2	2	140	262	55	78	12
2		1400	96.41	.92	2.1	2.1	140	260	53	78	12.5
3		1402	98.00	1.0	2.3	2.3	137	258	53	78	14
4		1404	99.58	1.15	2.6	2.6	137	260	53	79	16.5
5		1406	101.30	1.25	2.9	2.9	141	257	53	79	19
6		1408	102.96	1.1	2.5	2.5	141	257	55	79	18
7		1410	104.46	.78	1.8	1.8	142	255	55	79	12.5
8		1412	105.70	.72	1.65	1.65	139	254	55	79	12
9		1414	107.00	.70	1.6	1.6	139	254	55	79	12
10		1416	107.30	.70	1.6	1.6	140	255	55	80	12
11		1418	109.56	.70	1.6	1.6	140	257	55	80	12
12		1420	110.80	.63	1.45	1.45	139	256	55	80	11
N-1-1		1423	112.10	.72	1.65	1.65	138	259	55	80	12
2		1425	113.37	.70	1.6	1.6	139	267	54	80	12
3		1427	114.65	.77	1.8	1.8	141	271	54	80	13.5
4		1429	115.87	.92	2.1	2.1	141	269	54	80	16
5		1430	117.35	.94	2.15	2.15	139	270	54	80	16.5
6		1432	118.85	.76	1.8	1.8	139	270	54	81	16.5
7		1434	120.3	.82	1.9	1.9	140	271	58	81	16.5

AGE AIR CONSULTING & ENGINEERING, INC.

TEST ID _____

PAGE ____ OF ____

PORT AND TRAVERSE POINT NUMBER	DISTANCE FROM INSIDE STACK WALL /COMMENTS	CLOCK TIME	GAS METER READING (ft^3)	STACK VELOCITY HEAD	METER ORIFICE PRESS. DIFF. ("H_2O) CALC.	METER ORIFICE PRESS. DIFF. ("H_2O) ACTUAL	STACK GAS TEMP. (°F)	SAMPLE BOX TEMP. (°F)	LAST IMPINGER TEMP. (°F)	DRY GAS METER TEMP. (°F)	VACUUM ON SAMPLE TRAIN ("Hg)
N-1-8		1436	121.72	.85	1.96	1.95	141	270	55	81	16.5
9		1438	123.07	.73	1.7	1.7	140	268	55	81	15
10		1440	124.35	.57	1.3	1.3	138	268	55	81	13.5
11		1442	125.55	.52	1.2	1.2	140	262	55	81	12.5
12		1444	126.—	.52	1.2	1.2	139	260	55	81	12.5
N-2-1		1447	127.91	.60	1.4	1.4	139	249	54	81	12.5
2		1449	129.1	.60	1.4	1.4	140	240	54	81	12.5
3		1451	130.30	.60	1.4	1.4	141	226	55	81	12.5
4		1453	131.65	.78	1.8	1.8	138	225	55	81	15
5		1455	133.05	.87	2.0	2.0	140	263	55	81	17.5
6		1457	134.40	.74	1.7	1.7	140	267	56	81	15.5
7		1459	135.75	.87	2.0	2.0	140	263	56	81	20
8		1501	137.24	.87	2.0	2.0	138	264	56	81	20
9		1503	138.—	.70	1.6	1.6	141	263	56	81	15
10		1505	139.93	.60	1.4	1.4	136	265	56	81	16
11		1507	141.17	.56	1.3	1.3	138	267	57	81	14.5
12		1509	142.322	.50	1.15	1.15	137	268	57	81	13.5

APPENDIX C

LABORATORY ANALYSIS

AIR CONSULTING & ENGINEERING, inc.

PARTICULATE LAB DATA

SOURCE SUGAR GROWER'S CO-OP UNIT #1

PROBE RINSE	RUN 1	RUN 2	RUN 3	BLANK	
CONTAINER NUMBER	S-1	S-6	S-8	S-21	
TOTAL VOLUME (ml)	240	180	195	265	LIQUID LEVEL ✓
1st GROSS WEIGHT (g)	106.6251	103.1581	104.7731	104.8230	DATE & TIME: 11-18-91 07:30
2nd GROSS WEIGHT (g)	106.6251	103.1581	104.7730	104.8231	DATE & TIME: 11-19-91 03:45
AVERAGE GROSS WEIGHT (g)	106.6251	103.1581	104.7730	104.8230	
TARE WEIGHT (g)	106.6080	103.1368	104.7527	104.8229	
SUB NET WEIGHT (g)	0.0171	0.0213	0.0203	0.0001	214.8
ACETONE BLANK (g)	—	—	—	—	
TOTAL NET WEIGHT (mg)	17.1	21.3	20.3	.1	

NOTE: In no case should a blank residue >0.01 mg/g or 0.001% of the weight of acetone used be subtracted from the sample weight.

FILTER	RUN 1	RUN 2	RUN 3	BLANK	
FILTER NUMBER	3457	3459	3543	3464	
1st GROSS WEIGHT (g)	0.6210	0.6270	0.6381	0.4250	DATE & TIME: 11-18-91 19:15
2nd GROSS WEIGHT (g)	0.6210	0.6271	0.6379	0.4250	DATE & TIME: 11-19-91 09:30
AVERAGE GROSS WEIGHT (g)	0.6210	0.6270	0.6380	0.4250	
TARE WEIGHT (g)	0.4182	0.4175	0.4232	0.4253	
SUB NET WEIGHT (g)	0.2028	0.2095	0.2148	-.0003	
TOTAL NET WEIGHT (mg)	202.8	209.5	214.8	-.3	

TARE BALANCE CHECK

SEE LAB BOOK

1st GROSS WEIGHT BALANCE CHECK

0 ✓ 10.0g ✓

0.5 g ✓ 100.0g ✓

%RH 65 DATE 11-18-91

Signature Christy L. Peck

2nd GROSS WEIGHT BALANCE CHECK

0 ✓ 10.0g ✓

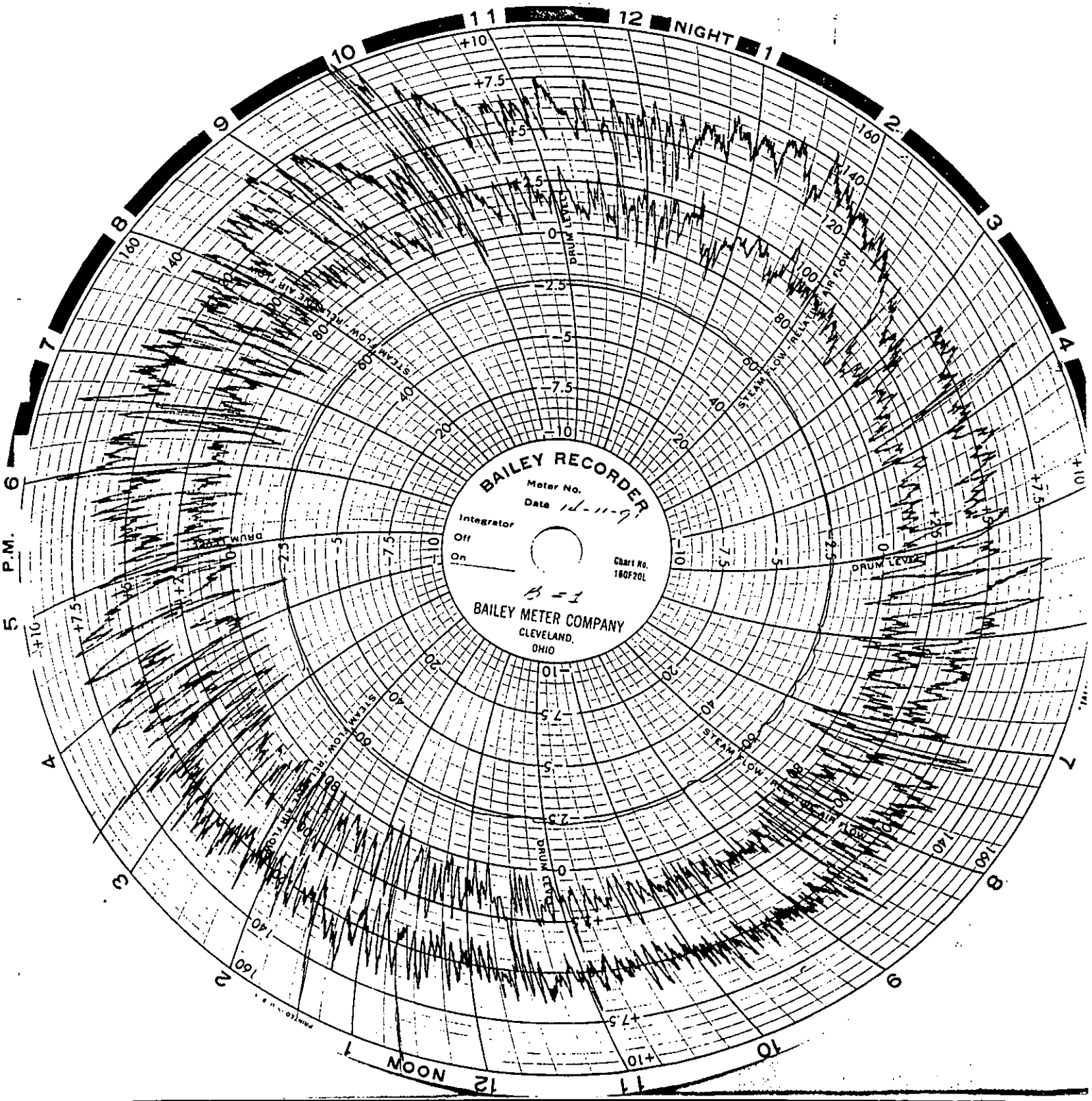
0.5g ✓ 100.0g ✓

%RH 66 DATE 11-19-91

Signature Christy L. Peck

APPENDIX D

PRODUCTION RATE CERTIFICATION


BAILEY RECORDER
Meter No.
Date 12-11-91
Integrator
Off
On
Chart No.
160F20L
B-1
BAILEY METER COMPANY
CLEVELAND,
OHIO
DRUM LEVEL
STEAM FLOW - RELATIVE AIR FLOW
NIGHT
NOON
P.M.

[illegible] 9644.
9727

PARTICULATE EMISSION TESTS, ON STACK NO. 1

[illegible] 821 27,

FUEL Residue + Oil CO_2 < 7 DATE 11-14-91

FEED WATER PRES.	FEED WATER TEMP.	TIME	STEAM PRES.	STEAM FLOW M LBS./HR.	STEAM TEMP. F°	OIL PRES.	OIL TEMP.	DRAFT IN INCHES OF WATER FURNACE	BOILER OUTLET	AIR HEATER OUTLET	DUST COL. OUTLET	D/P S	D/P C	D/P N
600	260	8:21	430	120,000	580	40	207	.20	2.00	3.30	8	7		7
600	260	8:31	430	120,000	580	40	207	.20	2.00	3.30	8			
600	260	8:41	430	120,000	580	40	203	.15	2.00	3.30	8			
600	260	8:51	420	120,000	580	40	194	.20	2.00	3.30	8	7		7
600	260	9:01	420	120,000	580	40	200	.20	2.00	3.30	8			
600	260	9:11	420	120,000	580	40	205	.20	2.00	3.30	8	6		6
600	260	9:21	420	120,000	575	40	202	.15	2.00	3.30	8			
600	260	9:31	420	125,000	575	40	195	.20	2.00	3.30	8	7		7
600	260	9:41	420	120,000	560	40	203	.20	2.00	3.30	8			
600	260	9:51	420	120,000	575	40	205	.14	2.00	3.30	8			
600	260	10:01	420	120,000	570	40	198	.13	2.00	3.30	8	7		7
		100	MIN					FINISH	10:01					

BELLE GLADE, FLORIDA

OIL 17-3 / 37 .73 INT 8 - 3 / 140

PARTICULATE EMISSION TESTS, ON STACK NO. 1

FUEL RESIDUE + oil CO_2 < 6 DATE 11-14-91

FEED WATER PRES.	FEED WATER TEMP.	TIME	STEAM PRES.	STEAM FLOW M LBS./HR.	STEAM TEMP. F°	OIL PRES.	OIL TEMP.	DRAFT IN INCHES OF WATER FURNACE	BOILER OUTLET	AIR HEATER OUTLET	DUST COL. OUTLET	D/P S	D/P C	D/P N
600	260	10:41	430	120,000	575	40	191	.14	2.00	3.30	8	7		7
600	260	10:51	430	120,000	575	40	192	.12	2.00	3.30	8			
600	260	11.01	420	120,000	580	40	206	.14	2.00	3.30	8			
600	260	11:11	420	120,000	575	40	205	.13	2.00	3.30	8	6		6
600	260	11:21	420	120 000	575	40	191	.13	2.00	3.30	8			
600	260	11:31	430	120 000	575	40	198	.14	2.00	3.30	8			
600	260	11:41	430	120 000	580	40	205	.14	2.00	3.30	8	7		7
600	260	11:51	430	120 000	575	40	199	.20	2.10	3.10	8			
600	260	12:01	430	120 000	585	40	194	.20	2.00	3.30	8			
600	260	12:11	430	120 000	580	40	191	.20	2.00	3.30	8	6		6
600	260	12:21	430	120 000	575	40	206	.20	2.00	3.30	8			
600	260	12:33	430	120 000	575	40	200	.20	2.00	3.30	8	7		7
		1:12	MIN											
								FINISH	12:33					

OIL 909736

PARTICULATE EMISSION TESTS, ON STACK NO. 1

FUEL Residual oil

DATE

FEED WATER PRES.	FEED WATER TEMP.	TIME	STEAM PRES.	STEAM FLOW M LBS./HR.	STEAM TEMP. F°	OIL PRES.	OIL TEMP.	DRAFT IN INCHES OF WATER: FURNACE	BOILER OUTLET	AIR HEATER OUTLET	DUST COL. OUTLET	D/P S	D/P C	D/P N
600	260	1:21	430	120000	580	40	201	.20	2.10	3.30	8	7		7
600	260	1:31	430	120000	580	40	192	.20	2.00	3.30	8			
600	260	1:41	430	120000	575	40	192	.15	2.00	3.30	8			
600	260	1:51	430	120000	580	40	199	.20	2.00	3.30	8	6		6
600	260	2:01	425	120000	580	40	204	.20	2.00	3.30	8			
600	260	2:11	430	120000	575	40	196	.20	2.00	3.30	8			
600	260	2:21	430	120000	580	40	194	.20	2.00	3.30	8	7		7
600	260	2:31	430	120000	590	40	192	.20	2.00	3.30	8			
600	260	2:41	430	120000	590	40	200	.20	2.10	3.30	8			
600	260	2:51	425	120000	575	40	204	.20	2.10	3.30	8	6		6
600	260	3:01	430	120000	590	40	196	.20	2.00	3.30	8			
600	260	3:13	430	120000	580	40	196	.20	2.00	3.30	8	7		7
		1:12	MIN											
								FINISH	3.13					

AIR CONSULTING & ENGINEERING, INC.
Complete Emission Data

PLANT:	SUGAR CANE GROWERS COOPERATIVE	DATE:	11-14-91
LOCATION:	BELLE GLADE, FLORIDA	RUN NUMBER	1
SOURCE:	NUMBER 1 BOILER, SCRUBBER OUTLET	TIME:	0821-1011

TIME INTERVAL	110	MINUTES
OIL:		
FINAL OIL	97270	
BEGIN OIL	96940	
FACTOR	1	
STEAM:		
FINAL STEAM	821273	
BEGIN STEAM	821138	
FACTOR	1600	
TEMPERATURE	580	DEGREES F
PRESSURE	423	PSIG
	438	PSIA
FEEDWATER:		
TEMPERATURE	260	DEGREES F
PRESSURE	600	PSIG
	615	PSIA
HEAT INPUT:		
STEAM	1291.9	BTU/LB
FEEDWATER	228.6	BTU/LB
NET STEAM	1063.3	BTU/LB
STEAM RATE	117818	LB/HR
BOILER EFFICIENCY	62.5	%
TOTAL FUEL HEAT INPUT	200.44	MMBTUH
STEAM CALIBRATION FACTOR	1.00	
OIL	180.00	GPH
OIL	150000	BTU/GAL
TOTAL HEAT INPUT (OIL)	27.00	MMBTUH
TOTAL HEAT INPUT (NON-OIL)	173.44	MMBTUH
ALLOWABLES:		
ALLOWABLE EMISSION (OIL)	.10	LB/MMBTU
ALLOWABLE EMISSION (NON-OIL)	.25	LB/MMBTU
TOTAL ALLOWABLE EMISSION	46.06	LB/HR
TOTAL ACTUAL EMISSION	30.67	LB/HR
TOTAL ALLOWABLE EMISSION	0.230	LB/MMBTU
TOTAL ACTUAL EMISSION	0.153	LB/MMBTU

BOILER OPERATION PARAMETERS

PLANT Sugar Cane Growers' Coop BOILER NUMBER 1

DATE 11-14-91 RUN NUMBER 1 OIL METER FACTOR 10

STEAM INTEGRATOR FACTOR 1600 SCRUBBER(S) PRESS.DROP 7 ,

SCRUBBER(S) GPM ,

OPERATOR SIGNATURE [signature] SCRUBBER(S)H2O LEVEL ,

PH(if applicable) ,

INITIAL INTEGRATOR 821138 FINAL INTEGRATOR 821273

TIME	OIL	STEAM			FEEDWATER	
	METER READING	LBS.FLOW	TEMP.	PRESSURE	TEMP.	PRESSURE
0821	9694	120 000	580	430	260	600
0841		120 000	580	430	260	600
0856		120 000	580	420	260	600
0911		120 000	580	420	260	600
0931		125 000	575	420	260	600
0951		120.000	575	420	260	600
10:11	9727					

AIR CONSULTING & ENGINEERING, INC.
Complete Emission Data

PLANT:	SUGAR CANE GROWERS COOPERATIVE	DATE:	11-14-91
LOCATION:	BELLE GLADE, FLORIDA	RUN NUMBER	2
SOURCE:	NUMBER 1 BOILER, SCRUBBER OUTLET	TIME:	1041-1233

TIME INTERVAL	112	MINUTES
OIL:		
FINAL OIL	97720	
BEGIN OIL	97380	
FACTOR	1	
STEAM:		
FINAL STEAM	821453	
BEGIN STEAM	821313	
FACTOR	1600	
TEMPERATURE	576	DEGREES F
PRESSURE	427	PSIG
	442	PSIA
FEEDWATER:		
TEMPERATURE	260	DEGREES F
PRESSURE	600	PSIG
	615	PSIA
HEAT INPUT:		
STEAM	1289.2	BTU/LB
FEEDWATER	228.6	BTU/LB
NET STEAM	1060.6	BTU/LB
STEAM RATE	120000	LB/HR
BOILER EFFICIENCY	62.5	%
TOTAL FUEL HEAT INPUT	203.64	MMBTUH
STEAM CALIBRATION FACTOR	1.00	
OIL	182.14	GPH
OIL	150000	BTU/GAL
TOTAL HEAT INPUT (OIL)	27.32	MMBTUH
TOTAL HEAT INPUT (NON-OIL)	176.31	MMBTUH
ALLOWABLES:		
ALLOWABLE EMISSION (OIL)	.10	LB/MMBTU
ALLOWABLE EMISSION (NON-OIL)	.25	LB/MMBTU
TOTAL ALLOWABLE EMISSION	46.81	LB/HR
TOTAL ACTUAL EMISSION	32.24	LB/HR
TOTAL ALLOWABLE EMISSION	0.230	LB/MMBTU
TOTAL ACTUAL EMISSION	0.158	LB/MMBTU

BOILER OPERATION PARAMETERS

PLANT Sugar Cane Grower's Co-op BOILER NUMBER 1

DATE 11-14-91 RUN NUMBER 2 OIL METER FACTOR ~~[illegible]~~ 16

STEAM INTEGRATOR FACTOR 1600 SCRUBBER(S) PRESS.DROP ____, ____

SCRUBBER(S) GPM _____, _____

OPERATOR SIGNATURE _____ SCRUBBER(S)H2O LEVEL _____, _____

Ph(if applicable) _____, _____

INITIAL INTEGRATOR 821313 FINAL INTEGRATOR 821453

TIME	OIL	STEAM			FEEDWATER	
	METER READING	LBS.FLOW	TEMP.	PRESSURE	TEMP.	PRESSURE
1041	9738	120,000	575	430	260	600
10:56		120,000	570	430	260	600
11:11		120,000	575	420	260	600
11:31		120,000	575	420	260	600
11:41		120,000	580	430	260	600
12:01		120,000	575	430	260	600
12:21		120,000	580	430	260	600
1233	9772					
			576	427		

AIR CONSULTING & ENGINEERING, INC.
Complete Emission Data

PLANT:	SUGAR CANE GROWERS COOPERATIVE	DATE:	11-14-91
LOCATION:	BELLE GLADE, FLORIDA	RUN NUMBER	3
SOURCE:	NUMBER 1 BOILER, SCRUBBER OUTLET	TIME:	1321-1513

TIME INTERVAL	112 MINUTES
OIL:	
FINAL OIL	98200
BEGIN OIL	97860
FACTOR	1
STEAM:	
FINAL STEAM	821652
BEGIN STEAM	821512
FACTOR	1600
TEMPERATURE	580 DEGREES F
PRESSURE	430 PSIG
	445 PSIA
FEEDWATER:	
TEMPERATURE	260 DEGREES F
PRESSURE	600 PSIG
	615 PSIA
HEAT INPUT:	
STEAM	1292.1 BTU/LB
FEEDWATER	228.6 BTU/LB
NET STEAM	1063.5 BTU/LB
STEAM RATE	120000 LB/HR
BOILER EFFICIENCY	62.5 %
TOTAL FUEL HEAT INPUT	204.19 MMBTUH
STEAM CALIBRATION FACTOR	1.00
OIL	182.14 GPH
OIL	150000 BTU/GAL
TOTAL HEAT INPUT (OIL)	27.32 MMBTUH
TOTAL HEAT INPUT (NON-OIL)	176.87 MMBTUH
ALLOWABLES:	
ALLOWABLE EMISSION (OIL)	.10 LB/MMBTU
ALLOWABLE EMISSION (NON-OIL)	.25 LB/MMBTU
TOTAL ALLOWABLE EMISSION	46.95 LB/HR
TOTAL ACTUAL EMISSION	32.64 LB/HR
TOTAL ALLOWABLE EMISSION	0.230 LB/MMBTU
TOTAL ACTUAL EMISSION	0.160 LB/MMBTU

Avg

181.43 gph

27.21
175.54
202.75

BOILER OPERATION PARAMETERS

PLANT Sugar Cane Growers Co-op BOILER NUMBER 1

DATE 11-14-91 RUN NUMBER 3 OIL METER FACTOR 10

STEAM INTEGRATOR FACTOR 1600 SCRUBBER(S) PRESS.DROP ____,___

SCRUBBER(S) GPM _____,_____

OPERATOR SIGNATURE _____ SCRUBBER(S)H2O LEVEL _____,____

Ph(if applicable)_____,_____

INITIAL INTEGRATOR 821512 FINAL INTEGRATOR 821652

TIME	OIL	STEAM			FEEDWATER	
	METER READING	LBS.FLOW	TEMP.	PRESSURE	TEMP.	PRESSURE
1321	9786	[illegible]	560	430	360	600
1401		100000	560	430	360	600
2101		100000	525	425	360	600
2321		100000	570	430	360	600
[illegible]		100000	550	430	360	600
[illegible]		[illegible]	550	430	360	600
1513	9820					

APPENDIX E

QUALITY ASSURANCE AND CHAIN OF CUSTODY

STANDARD METER CALIBRATION
Meter Number 691751

Air Consulting and Engineering, Inc. (ACE) uses a dry gas meter for the calibration standard. This meter has been calibrated against a wet test meter in triplicate. This data was used to generate a standard meter calibration curve (see next page). Field meter calibrations are corrected to this curve using the following formula:

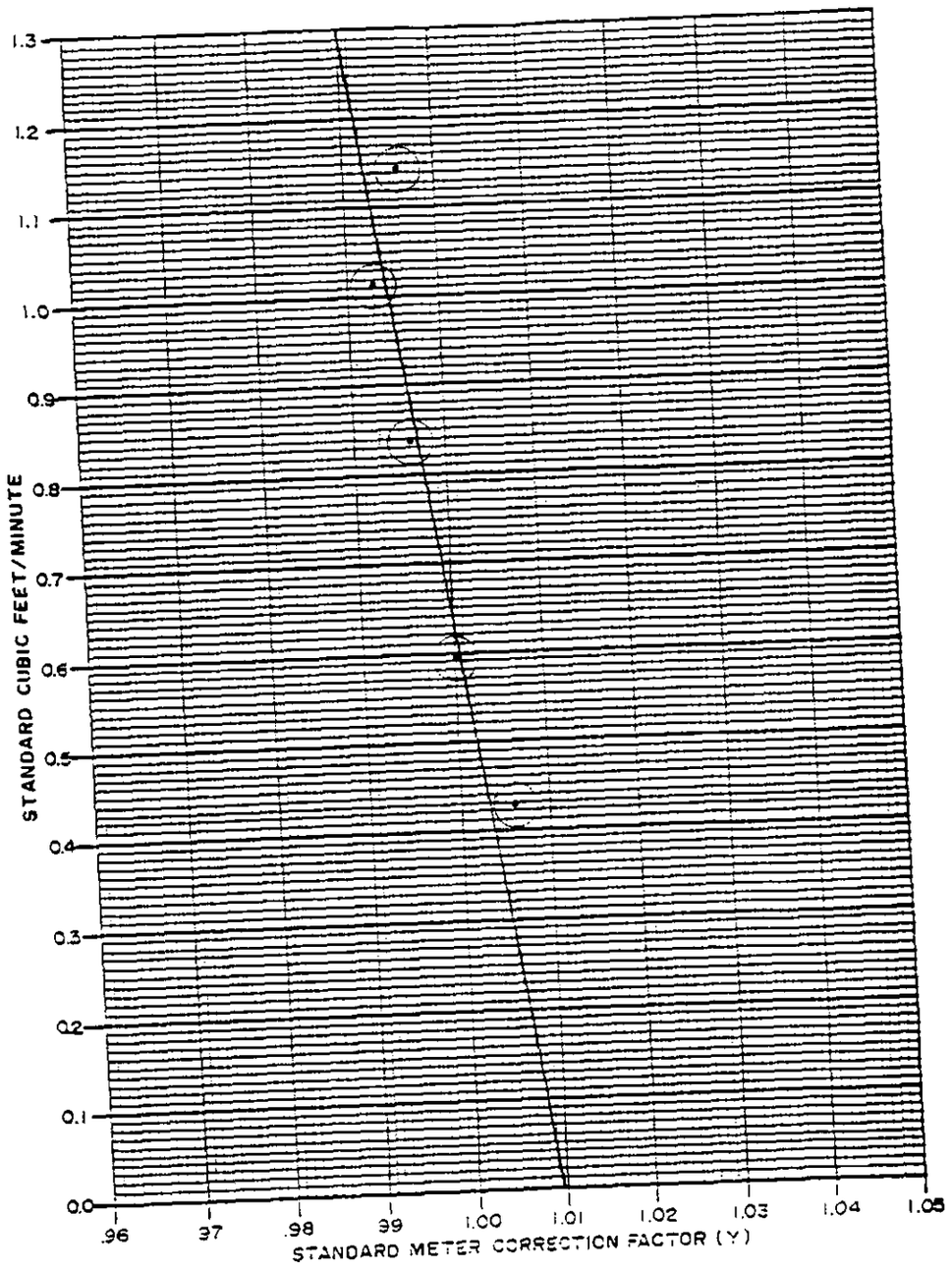
$$Y_a \times Y_s = Y$$

Y_a = actual ratio of field meter to standard meter

Y_s = ratio of standard meter to wet test meter at a given flow rate (from Calibration Curve)

Y = corrected ratio of field meter

The dry standard meter was calibrated on June 11, 1991, and is checked and/or recalibrated at least annually.



STANDARD METER CALIBRATION CURVE

JUNE 11, 1991

AIR CONSULTING and ENGINEERING

AIR CONSULTING & ENGINEERING — STANDARD METER CALIBRATION

DATE 6-11-91

LEAK CHECK 0.000 CFM at 12 in. Hg.

METER SERIAL NUMBER 691751

BAROMETRIC PRESSURE 30.14 in. Hg.

STD GAS METER TEMPERATURE 74 °F/ ASTM GLASS THERMOMETER TEMPERATURE 73 °F

WET ΔH	STD ΔH	GAS VOLUME, WET TEST METER			GAS VOLUME, STD GAS METER			TEMP. WET TEST METER (°F)	TEMP. OF STD. METER (°F)	TIME (Minutes)
		INITIAL	FINAL	ACTUAL ft³	INITIAL	FINAL	ACTUAL ft³			
-.2	-.64	0.0	5.608	5.608	852.005	857.616	5.611	74	76	13
-.2	-.64	5.608	11.211	5.603	857.616	863.196	5.580	74	75	13
-.2	-.64	11.211	16.806	5.595	863.196	868.765	5.569	74	74	13
-.4	-1.02	0.0	6.029	6.029	871.007	877.049	6.042	74	73	10
-.4	-1.02	6.029	11.441	5.412	877.049	882.455	5.406	74	73	9
-.4	-1.02	11.441	16.834	5.393	882.455	887.858	5.403	74	73	9
-.5	-1.6	0.0	6.721	6.721	888.354	895.128	6.774	73	73	8
-.5	-1.6	6.721	11.750	5.029	895.128	900.193	5.065	73	73	6
-.5	-1.6	11.750	16.770	5.020	900.193	905.257	5.064	73	73	6
-.6	-2.2	0.0	5.071	5.071	905.727	910.862	5.135	73	73	5
-.6	-2.2	5.071	10.132	5.061	910.862	915.992	5.130	73	73	5
-.6	-2.2	10.132	15.192	5.060	915.992	921.117	5.125	73	73	5
-.7	-2.7	0.0	5.773	5.773	921.694	927.543	5.849	74	74	5
-.7	-2.7	5.773	11.512	5.739	927.543	933.343	5.800	74	74	5
-.7	-2.7	11.512	17.230	5.718	933.343	939.128	5.758	74	74	5

CALIBRATED BY: H. F. Hebel

	Y	SCFM	Y	SCFM	Y	SCFM	Y	SCFM	Y	SCFM
Run 1	1.005	0.430	0.998	0.601	0.996	0.838	0.993	1.012	0.994	1.150
Run 2	1.008	0.429	1.002	0.599	0.997	0.836	0.992	1.010	0.996	1.143
Run 3	1.006	0.429	0.999	0.597	0.995	0.835	0.993	1.010	1.000	1.139
Average	1.006	0.429	1.000	0.599	0.996	0.836	0.993	1.011	0.996	1.144

air consulting and engineering

AIR CONSULTING & ENGINEERING — ANNUAL METER CALIBRATION

DATE 6-14-91

LEAK CHECK 0.000 CFM at 14 In. Hg.

METER BOX NUMBER #1

BAROMETRIC PRESSURE 30.10 In. Hg.

DRY GAS METER TEMPERATURE 87 °F/ASTM GLASS THERMOMETER TEMPERATURE 88 °F

ΔHS	AVERAGE ΔHD	GAS VOLUME, STANDARD METER			GAS VOLUME, DRY GAS METER			TEMP. STD. METER	TEMP. OF DRY METER	TIME (Minutes)	TIMER
		INITIAL	FINAL	ACTUAL ft^3	INITIAL	FINAL	ACTUAL ft^3				
-.06	.5	977.651	983.301	5.650	884.756	890.239	5.483	87	88	15	15
-.12	1.0	971.708	977.548	5.840	878.739	884.547	5.808	86	87	11	11
-.16	1.5	985.835	993.630	7.795	892.764	900.523	7.759	88	89	12	12
-.23	2.0	993.630	1000.397	6.767	900.523	907.262	6.739	88	89	9	9
-.33	3.0	1000.397	1006.790	6.393	907.262	913.626	6.364	89	90	7	7
-.47	4.0	1007.008	1012.339	5.331	913.950	919.144	5.194	89	91	5	5

	DELTA H	Ya	SCFM	Ys	Y
	2.026	1.031	0.366	1.000	1.031
	2.036	1.005	0.516	0.998	1.003
	2.048	1.003	0.630	0.996	0.999
	2.038	1.001	0.729	0.994	0.995
	2.076	0.999	0.884	0.991	0.990
	2.027	1.020	1.032	0.988	1.008
MEAN:	2.042	1.010		0.995	1.004

CALIBRATED BY: Greg R. Brown

AIR CONSULTING & ENGINEERING, inc. — POST TEST CALIBRATION

DATE 11-28-91 METER BOX NUMBER 1 LEAK CHECK 0.000 CFM at 20 in. Hg.

CLIENT Sugar Cane Growers Co-op SOURCE All THERMOCOUPLE NUMBER ATK 2 PYROMETER NUMBER 88

FLIGHT SERVICE Pb 30.18 in. Hg. ACE BAROMETER Pb 30.30 in. Hg.

ASTM GLASS THERMOMETER 150 °F / THERMOCOUPLE 150 °F ASTM GLASS THERMOMETER 75 °F / METER TEMP 76 °F

ΔHS	AVERAGE ΔHD	GAS VOLUME, STANDARD METER			GAS VOLUME, DRY GAS METER			TEMP. STANDARD METER	TEMP. OF DRY METER	TIME (Minutes)	MAX. VACUUM In. Hg.
		INITIAL	FINAL	ACTUAL ft^3	INITIAL	FINAL	ACTUAL ft^3				
.82	1.2	396.050	410.553	14.503	589.332	604.342	15.010	75 76 75.5	75 79 77	27	23
1.1	1.8	411.948	447.738	35.79	605.777	642.838	37.061	77 79 78	79 91 85	56	15
1.2	2.0	448.113	484.770	36.657	643.230	681.586	38.356	79 79 79	91 93 92	52	18.5

CALIBRATED BY: S L [illegible]

RUN NUMBER	SCFM	STANDARD M.C.F.	DELTA Ha	M.C.F.
1	0.53	1.005	2.338	0.971
2	0.63	1.005	2.464	0.979
3	0.69	1.005	2.230	0.979
AVERAGES	0.62	1.005	2.344	0.976

air consulting and engineering

AIR CONSULTING & ENGINEERING, INC. PYROMETER CALIBRATION

DATE 10-1-90

PYROMETER NUMBER Atkins #2

SOURCE (SPECIFY)	GLASS THERMOMETER WITH NBS MERCURY (°F)	PYROMETER (°F)	DEGREE DIFFERENCE	PERCENT DIFFERENCE
ICE BATH	42	41	1	0.2
AMBIENT	88	88	0	0.0
HOT OVEN	345	344	1	0.2

FDER - MAXIMUM 5° DIFFERENCE

EPA $\left[\frac{(\text{REF. TEMP. °F} + 460°) - (\text{PYROMETER TEMP. °F} + 460°)}{\text{REF. TEMP. °F} + 460°}\right] 100 \leq 1.5\%$

CALIBRATED BY: Sid Carter

AIR CONSULTING & ENGINEERING, INC.

PITOT TUBE CALIBRATION

DATE CALIBRATED 10-4-91

PITOT TUBE 88

IS PITOT TUBE ASSEMBLY LEVEL YES

ARE PITOT TUBE OPENINGS DAMAGED no

α_1 = 2 °(<10°), α_2 = 0 °(<10°), β_1 = 0 °(<5°), β_2 = 1 °(<5°)

γ = 2 ° θ = 1 ° A = 1.035 in. = (Pa + Pb)

z = A sin γ = 0.036 in.; <0.32/<1/8 in.

w = A sin θ = 0.018 in.; <0.08/<1/32 in.

P_a 0.512 in. P_b 0.512 in. D_t .375

WAS CALIBRATION REQUIRED no

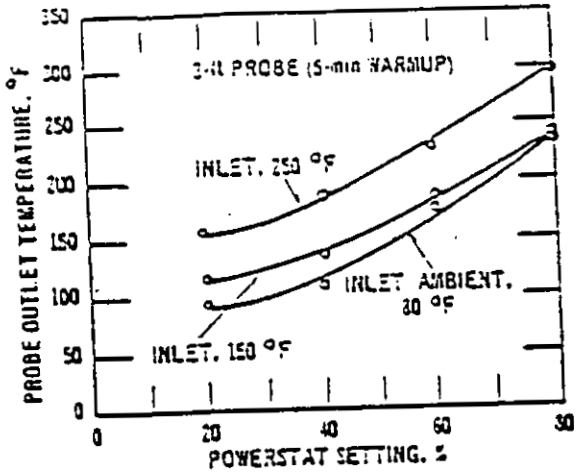
THERMOCOUPLE CALIBRATION

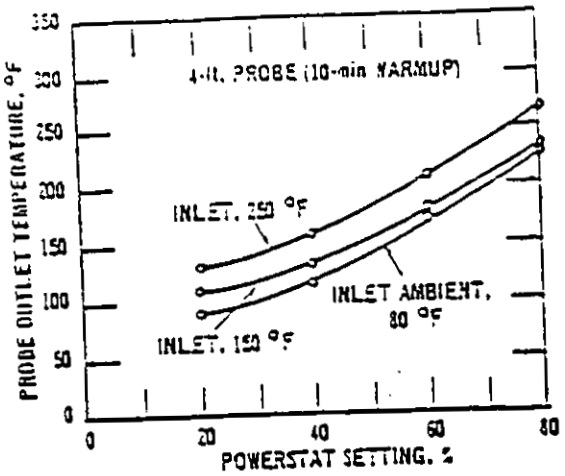
SOURCE (SPECIFY)	ASTM GLASS THERMOMETER WITH MERCURY (°F)	PYROMETER (°F)	DEGREE DIFFERENCE	PERCENT DIFFERENCE
ICE BATH	44	45	1	0.19
AMBIENT	77	78	1	0.19
HOT OVEN	345	346	1	0.19

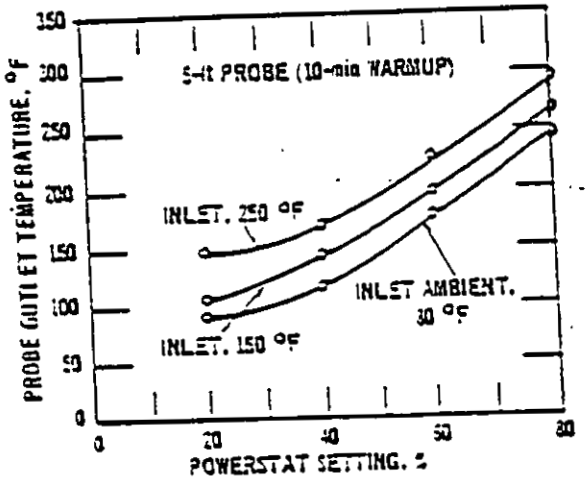
FDER - MAXIMUM 5° DIFFERENCE

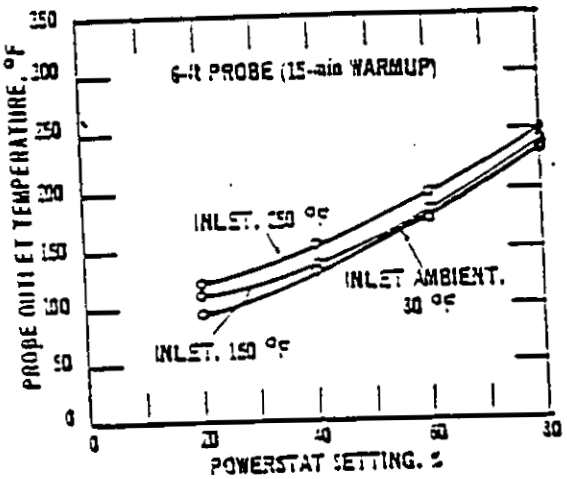
CALIBRATED BY: _____

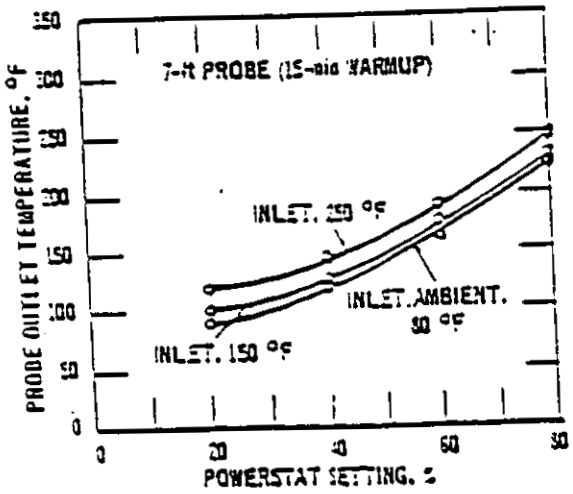
EPA $\left[\frac{(\text{REF. TEMP °F} + 460°) - (\text{PYROMETER TEMP °F} + 460°)}{\text{REF. TEMP °F} + 460°}\right] 100 \leq 1.5\%$











NOTE: Flow rate held constant at 0.75; 50% change in flow rate has little effect on probe temperature.

Probe temperatures.

AIR CONSULTING AND ENGINEERING, Inc.

SAMPLE RECOVERY AND CHAIN OF CUSTODY

PLANT NAME SCGC
TEST DATE 11/14/91
SOURCE NAME #1 BOILER
SAMPLE RECOVERED BY SLN
TYPE OF SAMPLE PM
PARTICULATE ANALYSES BY CLN

SAMPLE RECOVERY

RUN NO.	CONTAINER NO.	LIQUID LEVEL MARKED	COLOR	COMMENTS
1	5-1	✓	MED	
1	3457	–	BLK	
2	5-6	✓	"	
2	3459	–	"	
3	5-8	✓	"	
3	3543	–	"	
ACETONE / WATER BLANK (CIRCLE)	5-27	✓	CLEAR	
FILTER BLANK	3464	–	WH	

SILICA GEL

RUN NO.	CONTAINER NO.	FINAL WT. (g)	INIT. WT. (g)	NET WT. (g)	COLOR
1	120	211.3	200.0	11.3	PINK
2	22	212.1	200.0	12.1	"
3	106	213.4	200.0	13.4	"
			200.0		
			200.0		
			200.0		
			200.0		
			200.0		

APPENDIX F

PROJECT PARTICIPANTS

PROJECT PARTICIPANTS

AIR CONSULTING AND ENGINEERING, INC.

Stephen L. Neck, P.E.
Project Manager
Field Testing

Gerard Gauthreaux
Field Participant

Christy Neck
Laboratory Analysis

Dagmar Neck
Report Preparation

Candace V. Taylor
Document Production

SUGAR CANE GROWERS

Jose Alvarez
Test Coordinator

Blas Marin
Test Coordinator

FDER

Ken Tucker
Test Observer

Sterling Jordan
Test Observer

PALM BEACH COUNTY

Jeffrey K. Koerner
Test Observer

David Brown
Test Observer