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AP-42; REFERENCE 11

SECTION

AP-42 Section 9.13.3

Reference 11

Report Sect. _____

Reference _____

EMISSION PERFORMANCE TESTING
OF
TWO FRYER LINES

SITE: Eagle Snacks, Inc.
Visalia, California

DATE: June 1989

Prepared for:

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1.0 INTRODUCTION

At the request of Anheuser Busch, Inc., St. Louis, Missouri, Western Environmental Services (WES) conducted a compliance test at Eagle Snacks, Visalia, California. The testing consisted of collecting particulate samples at the Continuous Fryer and Kettle Fryer #6. The testing was performed on May 31 and June 1, 1989 to provide compliance test data for the Tulare County Air Pollution Control District.

The sampling program consisted of collecting particulates, carbon dioxide, oxygen, moisture, volumetric flow rate, and charge rate.

On the first day of testing, samples were collected from the continuous fryer while on the second day, samples were collected from Kettle Fryer #6.

The following sections will be presented in this report: Summary of Results, Site Description, Sampling and Analytical Procedures, Quality Assurance, and Appendices. The appendices contain the Field and Laboratory data sheets, Gas Calibration Information, and Sample Calculations.

2.0 SUMMARY OF RESULTS

2.1 Discussion of Results

Table 2.1 and Table 2.2 present the particulate sampling results.

The test data is summarized below:

Test #	Charge Rate #/Hr	Particulates Concentration Grs/SDCF	Emission Rate #/Hr

Continuous Fryer			
Test #2	12,230	0.0562	1.79
Test #3	10,700	0.0665	2.00
Test #4	12,200	0.0647	2.00
Average	11,710	0.0624	1.93
Kettle Fryer #6			
Test #1	361	0.0068	0.67
Test #2	380	0.0056	0.56
Test #3	480	0.0043	0.43
Average	407	0.0057	0.55

The first test on the continuous fryer was aborted due to the post leak test. The test results for Kettle Fryer #6 are close to the detection limit.

2.2 Quality Assurance

The particulate sampling train was leak checked prior to and after each test. The sampling equipment was calibrated according to the Quality Assurance Handbook for Air Pollution Measurement Systems.

The continuous monitoring system was leak checked and EPA Protocol #1 span gases were used for the calibrations.

The calibration and span gas certification sheets are located in the appendix of the report.

Table 2.1 Particulate Sampling and Analysis

Site: ABI- Eagle Snacks Plant- Continuous Fryer
 Date: May 31, 1989

Stack Parameters	Test 2	Test 3	Test 4	Ave
Barometric Pressure "Hg	29.85	29.85	29.85	29.85
Static Pressure "H2O	-0.05	-0.05	-0.05	-0.05
CO2 %	0.00	0.00	0.00	0.00
O2 %	20.94	20.94	20.94	20.94
N2 %	81.36	81.36	81.36	81.36
CO ppm	0.00	0.00	0.00	0.00
Stack Diameter "	30.00	30.00	30.00	30.00
Stack Temperature F	229.00	227.00	232.00	229
Stack Pressure "Hg	29.85	29.85	29.85	29.85
Test Conditions				
Sample Volume Ft3	31.554	27.855	28.051	29.153
Meter F	113.00	98.00	102.00	104.33
Nozzle Dia "	0.33	0.33	0.33	0.33
Time Min	60.00	60.00	60.00	60.00
Points	24.00	24.00	24.00	24.00
Pitot Tube Factor cp	0.83	0.83	0.83	0.83
Orifice Press "H2O	0.84	0.66	0.67	0.72
Condensate mls	600	610	600	603
Velocity Pressure "H2O	0.22	0.22	0.23	0.22
Meter Calibration	0.98	0.98	0.98	0.98
Test Calculations				
Water Vapor SDCF	28.242	28.713	28.242	28.399
Gas Sampled SDCF	28.417	25.749	25.746	26.637
Moisture %	49.85	52.72	52.31	51.63
Molecular Weight Dry	29.48	29.48	29.48	29.48
Molecular Weight Wet	23.76	23.43	23.48	23.55
Gas Velocity Ft/Sec	32.96	32.99	33.82	33.25
Flow Rate ACFM	9706	9716	9960	9794
Flow Rate DSCFM	3721	3522	3615	3619
Isokinetics %	108.5	103.9	101.2	104.5
Analytical Data				
Front Half				
Probe mg	48.5	63.6	51.0	54.4
Filter mg	28.0	22.9	25.6	25.5
Blanks mg	1.5	1.5	1.5	1.5
Subtotal mg	75.0	85.0	75.1	78.4
Back Half				
Impingers Inorg mg	1.2	2.4	0.0	1.2
Impingers Org mg	28.8	25.0	34.3	29.4
Blank mg	1.5	1.5	1.5	1.5
Subtotal mg	28.5	25.9	32.8	29.1
Total Weight Gain mg	103.5	110.9	107.9	107.4
Emission Data				
Front Half				
Grs/SDCF	0.0407	0.0509	0.0450	0.0456
Lbs/Hr	1.30	1.54	1.39	1.41
Back Half				
Grs/SDCF	0.0155	0.0155	0.0197	0.0169
Lbs/Hr	0.49	0.47	0.61	0.52
Total Emissions				
Grs/SDCF	0.0562	0.0665	0.0647	0.0624
Lbs/Hrs	1.79	2.00	2.00	1.93

Table 2.2 Particulate Sampling and Analysis

Site: ABI- Eagle Snacks Plant- Kettle #6
Date: June 1, 1989

Stack Parameters	Test 1	Test 2	Test 3	Ave
Barometric Pressure "Hg	29.85	29.85	29.85	29.85
Static Pressure "H2O	0.30	0.30	0.30	0.30
CO2 %	0.00	0.00	0.00	0.00
O2 %	20.94	20.94	20.94	20.94
N2 %	81.36	81.36	81.36	81.36
CO ppm	0.00	0.00	0.00	0.00
Stack Area Ft ²	4.89	4.89	4.89	4.89
Stack Temperature F	72.00	75.00	76.00	74
Stack Pressure "Hg	29.87	29.87	29.87	29.87
Test Conditions				
Sample Volume Ft ³	43.025	43.353	41.985	42.788
Meter F	101.00	113.00	111.00	108.33
Nozzle Dia "	0.24	0.24	0.24	0.24
Time Min	60.00	60.00	60.00	60.00
Points	24.00	24.00	24.00	24.00
Pitot Tube Factor cp	0.83	0.83	0.83	0.83
Orifice Press "H2O	1.61	1.58	1.48	1.56
Condensate mls	22	20	20	21
Velocity Pressure "H2O	0.54	0.51	0.48	0.51
Meter Calibration	0.98	0.98	0.98	0.98
Test Calculations				
Water Vapor SDCF	1.036	0.941	0.941	0.97
Gas Sampled SDCF	39.651	39.114	38.003	38.92
Moisture %	2.55	2.35	2.42	2.44
Molecular Weight Dry	29.48	29.48	29.48	29.48
Molecular Weight Wet	29.19	29.21	29.20	29.20
Gas Velocity Ft/Sec	40.73	39.68	38.53	39.65
Flow Rate ACFM	11950	11641	11306	11632
Flow Rate DSCFM	11540	11201	10850	11197
Isokinetics %	93.0	94.5	94.8	94.13
Analytical Data				
Front Half				
Probe mg	13.4	6.7	8.4	9.5
Filter mg	0.9	0.0	0.0	0.3
Blanks mg	1.5	1.5	1.5	1.5
Subtotal mg	12.8	5.2	6.9	8.3
Back Half				
Impingers Inorg mg	1.5	1.7	2.2	1.8
Impingers Org mg	4.7	9.3	3.8	5.9
Blank mg	1.5	1.5	1.5	1.5
Subtotal mg	4.7	9.5	4.5	6.2
Total Weight Gain mg	17.5	14.7	11.4	14.5
Emission Data				
Front Half				
Grs/SDCF	0.0050	0.0021	0.0028	0.0033
Lbs/Hr	0.49	0.20	0.26	0.32
Back Half				
Grs/SDCF	0.0018	0.0037	0.0018	0.0025
Lbs/Hr	0.18	0.36	0.17	0.24
Total Emissions				
Grs/SDCF	0.0068	0.0058	0.0046	0.0057
Lbs/Hrs	0.67	0.56	0.43	0.55

3.0 SITE DESCRIPTION

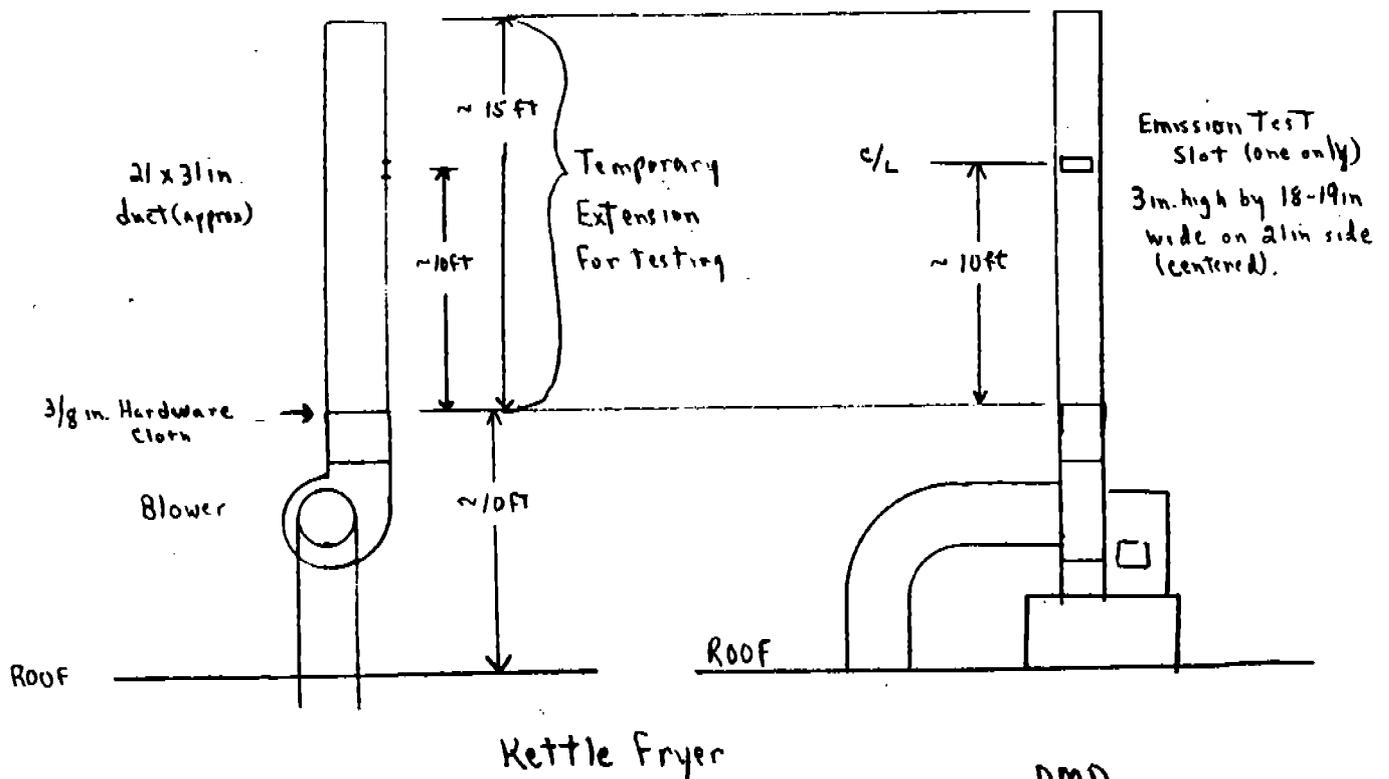
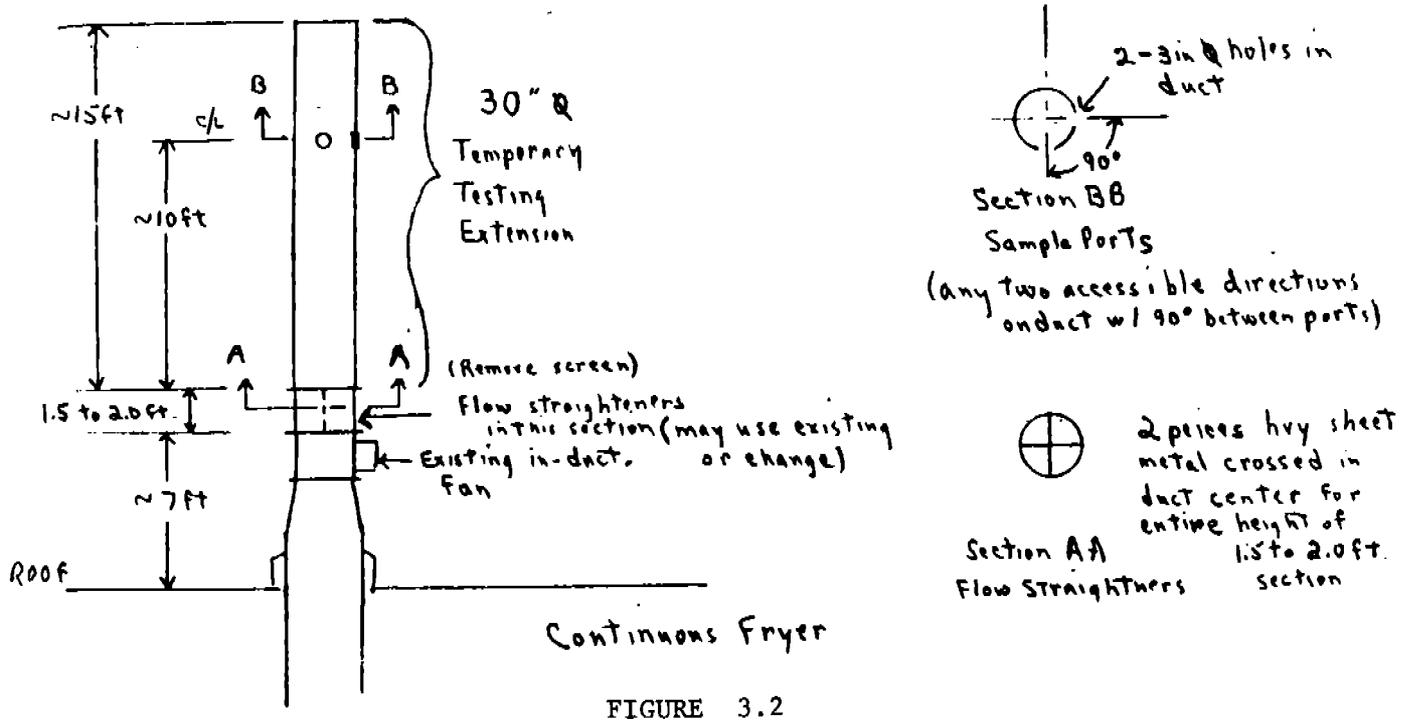
3.1 Kettle Fryer #6

Samples were collected from a 22" x 31" rectangular duct located on the roof. The sampling ports were located on the 22" side. Figure 3.1 is the site diagram while Figure 3.3 shows the sampling points.

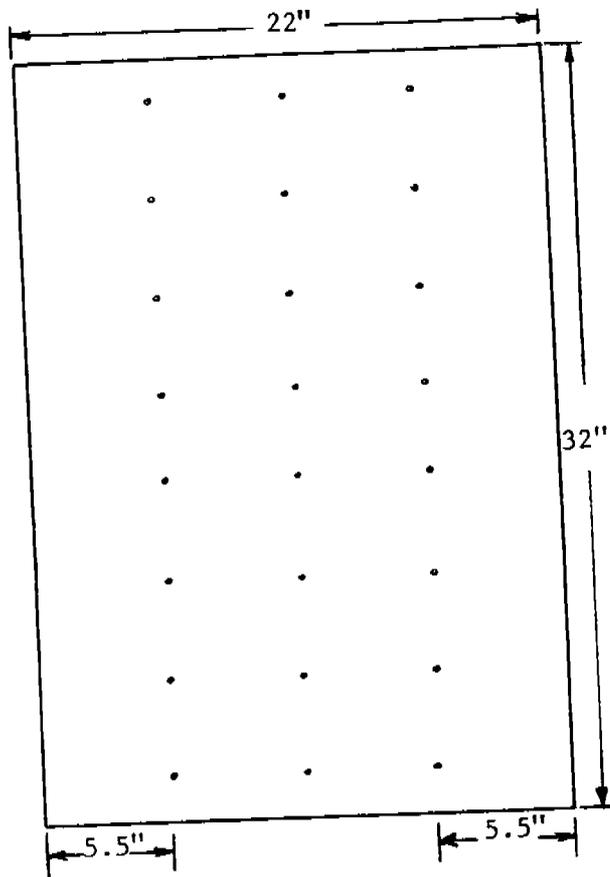
3.2 Continuous Fryer

Samples were collected from a 30 inch diameter duct located above the roof. The sampling ports are two 3 inch diameter ports located at 90 degrees of each other on the same horizontal plane. Figure 3.2 is the site diagram while Figure 3.4 depicts the traverse points.

TEMPORARY TESTING STACKS

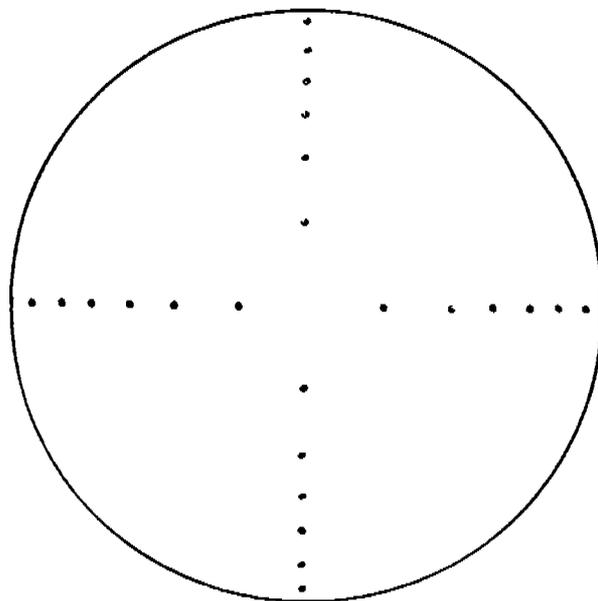


DMD
4-14-89



TRAVERSE POINT	DISTANCE
1.	2.0
2.	6.0
3.	10.0
4.	14.0
5.	18.0
6.	22.0
7.	26.0
8.	30.0

FIGURE 3.3 KETTLE FRYER #6



Traverse Point	Fraction	Stack ID	Traverse Point
1.	2.1	30"	.63
2.	6.7	30"	2.01
3.	11.8	30"	3.54
4.	17.7	30"	5.31
5.	25.0	30"	7.50
6.	35.6	30"	10.68
7.	64.4	30"	19.38
8.	75.0	30"	22.50
9.	82.3	30"	24.69
10.	88.2	30"	26.46
11.	93.3	30"	27.99
12.	97.9	30"	29.37

FIGURE 3.4 CONTINUOUS FRYER

4.0 SAMPLING AND ANALYTICAL PROCEDURES

4.1 Traverse Point Location

Traverse point locations were determined by utilizing EPA Method 1, "Sample and Velocity Traverses for Stationary Sources." Twenty four sampling points were used at the continuous fryer and kettle fryer #6.

4.2 Particulate Sampling and Analysis

Six EPA Method Five samples were collected during the testing program. Triplicate tests were performed at each location.

The sampling train consisted of a stainless steel nozzle, stainless steel probe, heated four inch filter, four glass impingers, silica gel impinger, pump, and a calibrated dry gas meter. The first and second impingers each contained 100 milliliters of distilled water. The third impinger was empty. Figure 4.1 depicts the sampling train.

After assembling the sampling train, it was leak checked and the sampling was not started until a leak rate of less than 0.02 cfm at 15 inches of mercury was achieved.

During the testing, the sampling was performed isokinetically at each traverse point. The velocity measurements were made at individual traverse points using a Type "S" pitot tube connected to an magnehlic with divisions measuring 0.05 inches of water. The stack temperature was measured by using a Type K thermocouple wire attached to a calibrated digital readout. Two and a half minute samples were collected at each point. During the particulate sampling, continuous monitoring samples for carbon dioxide and oxygen were measured and recorded.

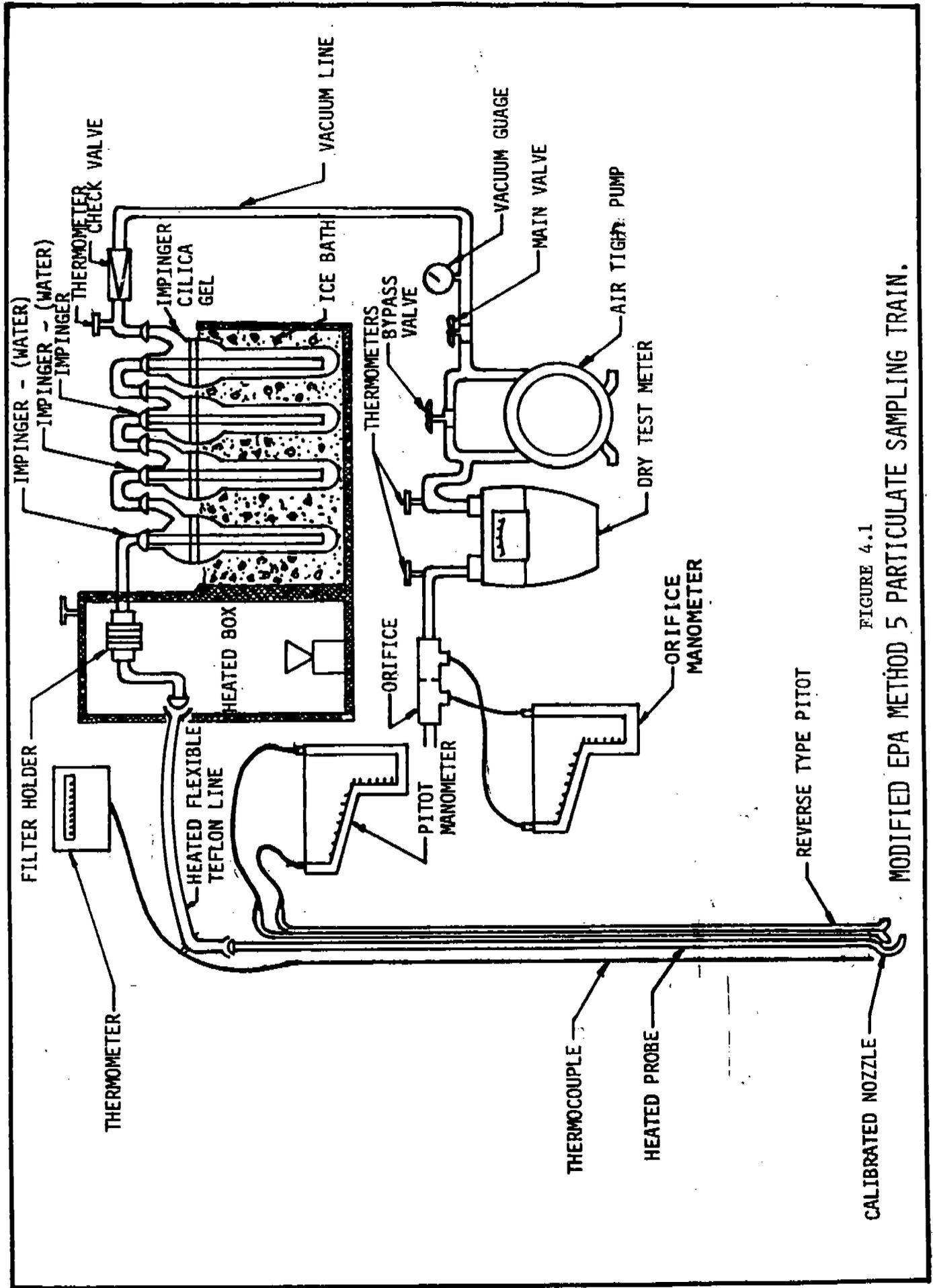


FIGURE 4.1
 MODIFIED EPA METHOD 5 PARTICULATE SAMPLING TRAIN.

Upon completion of each test, the sampling train was leak checked before disassembling the sampling system. The nozzle and the probe were removed from the train. The probe was rinsed and brushed with a nylon brush on a stainless steel handle. The probe and nozzle were rinsed with acetone. The solutions were placed into a 500 milliliter amber glass bottle. The bottle was labeled and retained for analysis.

The impinger solutions were re-measured and recovered with distilled water. The solutions were placed into 950 milliliter amber glass bottles. The bottles were labeled and retained for analysis. In addition, the impingers were rinsed with acetone, and the solutions were placed into the probe rinse bottle labeled for acetone.

The glass fiber filter was removed from the filter holder and was placed into a petri dish. The front half of the filter holder was rinsed with acetone. The back-half of the filter holder was rinsed with distilled water. The distilled water rinses were placed with the impinger solutions and the acetone rinses were placed with acetone probe rinse.

The analysis was performed by evaporating the acetone probe rinses to dryness in tared beakers. The water solutions were combined and extracted with 50 milliliters of petroleum ether. The inorganic and organic fractions were evaporated in tared beakers. The beakers and filter were placed into a desiccator and were weighed to constant weights.

The data reduction was performed by using EPA Method Five calculations.

4.3 Continuous Monitoring

Gas samples from the stack were continuously collected and analyzed by a continuous monitoring system. The gases were collected during the particulate testing.

Samples were collected by drawing gaseous samples through a stainless steel probe, water-knockout system, teflon line, 7 micron filter, and pump before entering the instrumentation. The instruments consisted of a Horiba PIR 2000 infrared carbon dioxide analyzer and a Teledyne 326A electrochemical oxygen analyzer. The data was recorded with a Monitor Labs 9350 Data Logger. The carbon dioxide was monitored with a strip chart recorder. Figure 4.2 illustrates the sampling schematic.

Before and after each test period, the instruments were zeroed and spanned with known EPA Protocol #1 span gases.

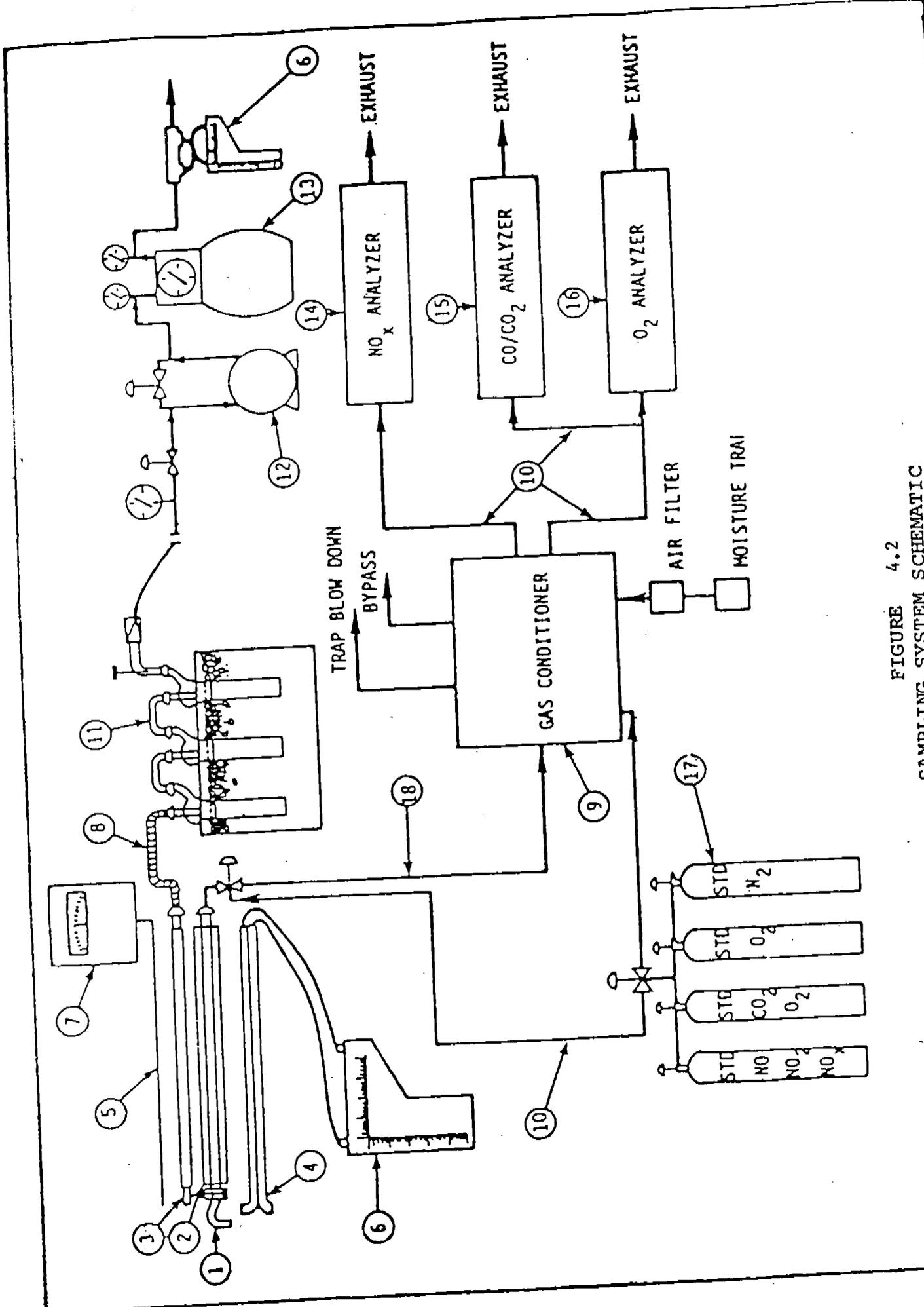


FIGURE 4.2
SAMPLING SYSTEM SCHEMATIC

FIGURE

EPA METHOD 20 SAMPLING TRAIN

1. Calibrated Nozzle
2. Heated Probe
3. Quarter-inch Inconel Tubing
4. Reverse Type-S Pitot Tube
5. Thermocouple Wire
6. Manometer
7. Digital Temperature Readout
8. Heated Teflon Flex Line
9. Gas Conditioner
10. Quarter-inch Teflon Tubing
11. Ice Bath with Three Impingers
12. Air Tight Pump
13. Dry Test Meter
14. NO_x Continuous Analyzer
15. CO/CO₂ Continuous Analyzer
16. O₂ Continuous Analyzer
17. Certified Span Gases for Calibration Purposes
18. One-half Inch Heated Teflon Line

5.0 QUALITY ASSURANCE

5.1 Instrument Calibration Gases

The instrument calibration gases were certified by an independent laboratory and copies of the certifications are included in the appendix of this report.

5.2 System Quality Assurance

The system calibration was performed before and after each test by injecting a calibration gas into the probe and determine the percent recovery at the instrument.

5.3 Test Calibration

Before and after the test period, the continuous monitors were zeroed and spanned with EPA Protocol #1 span gases.

5.4 Field Equipment Quality Assurance

The calibration of the pitot tube, dry gas meter, digital thermometers, and manometers were performed by utilizing standard EPA Methodology, "Quality Assurance Handbook for Air Pollution Measurement Systems, Volume III, Stationary Source Specific Methods (EPA-600/4-77-0278).

APPENDIX A

FIELD DATA

PLANT Eagle Snacks
 DATE 5-31-89
 SAMPLING LOCATION Cont. Eger Skoat
 SAMPLE TYPE Part
 RUN NUMBER #1
 OPERATOR Ty Hashiter
 AMBIENT TEMPERATURE 80
 BAROMETRIC PRESSURE _____
 STATIC PRESSURE (P_s) 4.015
 FILTER NUMBER (s) _____

PROBE LENGTH AND TYPE _____
 NOZZLE I.D. .375
 ASSUMED MOISTURE % 55%
 SAMPLE BOX NUMBER Green
 METER BOX NUMBER # 86 - Green
 METER ΔH_g # _____
 C FACTOR _____
 PROBE HEATER SETTING 250
 HEATER BOX SETTING 250
 REFERENCE ΔP .50 @ .05 sec

1.05 cfm at 18"

SCHEMATIC OF TRAVERSE POINT LAYOUT
 READ AND RECORD ALL DATA EVERY 2 1/2 MINUTES

Postleak ✓

Flex/Probe
 250 25C
 250 225
 250 230
 250 221
 250 175
 250 176
 250 175
 250 185
 250 200
 250 216
 250 221
 250 222

TRAVERSE POINT NUMBER	CLOCK TIME (24-hr CLOCK)	GAS METER READING (V _m) ft ³	VELOCITY HEAD (ΔP _s) in. H ₂ O	ORIFICE DIFFERENTIAL (ΔH), in. H ₂ O		STACK TEMPERATURE (T _s) °F	DRY GAS METER TEMPERATURE		PUMP VACUUM in. Hg	SAMPLE BOX TEMPERATURE °F	IMPINGER TEMPERATURE °F
				DESIRED	ACTUAL		INLET (T _{m in}) °F	OUTLET (T _{m out}) °F			
1	930	108.895	.15	.54	.54	185	80	80	1	250	64
2	932 1/2	110.000	.18	.65	.65	180	84	84	2	260	52
3	935	111.111	.14	.50	.50	185	86	84	3	260	52
4	937 1/2	112.175	.17	.58	.58	222	89	84	3	220	51
5	940	113.270	.20	.67	.67	250	92	85	4	225	51
6	942 1/2	114.425	.25	.84	.84	253	94	86	5	270	56
7	945	115.710	.30	1.3	1.3	231	97	87	10	250	57
8	947 1/2	117.300	.31	1.34	1.34	231	99	88	10	225	58
9	950	118.900	.32	1.4	1.36	233	100	88	16	260	60
10	952 1/2	120.575	.30	1.3	1.3	237	101	88	16	250	61
11	955	122.200	.33	1.4	1.3	235	101	89	14	250	66
12	957 1/2	123.820	.33	1.4	1.4	236	104	91	17	230	68
1	1000	125.443	.25	1.1	1.1	200	103	91	5	275	64
2	1005	126.500	.25	1.1	1.1	230	100	92	5	250	58
3	1008	128.100	.25	1.1	1.1	230	103	93	5	250	56
4	1011	129.600	.27	1.2	1.2	227	104	94	6	225	56
5	1013	131.170	.27	1.2	1.2	231	106	94	6	260	56
6	1016	132.700	.25	1.1	1.1	232	107	96	5	275	56
7	1018	134.225	.30	1.3	1.3	232	107	96	6	250	56
8	1021	135.800	.27	1.2	1.2	233	108	96	5	240	56
9	1023	137.360	.25	1.1	1.1	235	108	97	5	235	58
10	1026	138.900	.23	1.0	1.0	237	110	98	5	245	58
11	1028	140.300	.23	1.0	1.0	237	111	99	5	255	60
12	1031	141.750	.23	1.0	1.0	237	112	100	5	255	60
	1033	143.220	.25	1.1	1.1	237	112	100	5	255	60

COMMENTS:
 60
 34.325 1251
 1.05 225
 95.54
 60

FIELD DATA

PLANT EAGLE Stack
 DATE 5-31-89
 SAMPLING LOCATION South Flyer Stk. Out
 SAMPLE TYPE Inst.
 RUN NUMBER # 2
 OPERATOR N. Haslifier
 AMBIENT TEMPERATURE 85
 BAROMETRIC PRESSURE 30.05
 STATIC PRESSURE (P_s) 4.06
 FILTER NUMBER (F) 01015

PROBE LENGTH AND TYPE #2
 NOZZLE I.D. .375, .325
 ASSUMED MOISTURE, % 55%
 SAMPLE BOX NUMBER Green
 METER BOX NUMBER # 86 - Green
 METER ΔH_g # 11
 C FACTOR _____
 PROBE HEATER SETTING 250°
 HEATER BOX SETTING 250°
 REFERENCE ΔP # 7

SCHMATIC OF TRAVERSE POINT LAYOUT

Probe <.004 format 15" READ AND RECORD ALL DATA EVERY 2 1/2 MINUTES Probe <.001 format 19"

TRAVERSE POINT NUMBER	CLOCK TIME (24-hr CLOCK)	GAS METER READING (V _m) ft ³	VELOCITY HEAD (avg.), in. H ₂ O	ORIFICE PRESSURE DIFFERENTIAL (ΔH), in. H ₂ O		STACK TEMPERATURE (T _s), °F	DRY GAS METER TEMPERATURE		PUMP VACUUM, in. Hg	SAMPLE BOX TEMPERATURE, °F	IMPIINGER TEMPERATURE, °F	Flex
				DESIRED	ACTUAL		INLET (T _{m in}), °F	OUTLET (T _{m out}), °F				
0	1155	144.359										
1	1157	145.400	.15	.57	57	210	96	98	1	250	62	250
2	1200	146.465	.15	.56	56	225	96	98	5	247	64	250
3	1203	147.600	.17	.63	63	228	100	98	12	245	65	250
4	1205	148.750	.19	.70	70	233	104	99	11	250	68	250
5	1207	149.950	.17	.63	63	236	108	100	10	230	68	250
6	1210	151.150	.20	.74	74	237	111	101	10	255	68	250
7	1213	152.500	.26	.97	97	234	114	103	15	265	68	250
8	1215	153.900	.27	1.0	1.0	233	124	106	15	270	70	250
9	1217	155.450	.27	1.05	1.05	231	130	110	15	275	72	250
10	1220	156.850	.26	1.0	1.0	230	130	114	15	265	80	250
11	1223	158.300	.25	.96	96	231	127	117	13	270	80	250
12	1225	159.770	.25	.96	96	232	126	118	11	280	82	250
1	1230	160.800	.15	.60	60	200	120	118	5	260	81	250
2	1236	161.900	.17	.66	66	220	117	117	5	240	80	250
3	1237	163.100	.17	.66	66	221	116	116	8	245	80	250
4	1238	164.350	.18	.70	70	220	116	114	8	250	79	250
5	1240	165.700	.22	.84	84	228	118	113	10	245	112	250
6	1243	167.500	.25	.95	95	232	120	113	14	245	112	250
7	1245	168.550	.25	.95	95	232	122	114	14	250	112	250
8	1248	170.000	.26	1.0	1.0	231	124	115	13	270	104	250
9	1250	171.550	.27	1.05	1.05	232	123	116	16	250	102	250
10	1253	173.000	.26	.99	99	235	124	116	16	225	112	250
11	1255	174.450	.28	1.05	1.05	234	126	116	17	275	110	250
12	1258	175.913	.27	1.05	95	234	128	118	17	275	118	250

COMMENTS:

12 60
 31.5574, 222
 0.84 299
 113.92

DESICCATION OF SOLID SAMPLES TO CONSTANT WEIGHT

Completion Dates

1. _____ 2. _____
3. _____ 4. _____

Indicate by numbers in box under Sample column.

ABT
Tat #2

Requestor _____

JN _____

Assigned to _____

Date Assigned _____

ALL WEIGHTS IN GRAMS

TARE WEIGHT				TARE + SAMPLE WEIGHT			
1. <u>101.7382</u>	9. _____	<div style="font-size: 1.5em; font-family: cursive;">Probe</div> SAMPLE NUMBER FILTER OR CONTAINER PLUS SAMPLE FILTER OR CONTAINER TARE SAMPLE	<div style="font-size: 1.5em;">90.5</div> FILTER OR CONTAINER # <u>101.7871</u> <u>101.7386</u> <u>0.0485</u>	1. <u>101.7872</u>	9. _____		
2. <u>101.7390</u>	10. _____			2. <u>101.7871</u>	10. _____		
3. 101.7410	11. _____			3. <u>101.7870</u>	11. _____		
4. <u>101.7386</u>	12. _____			4. _____	12. _____		
5. _____	13. _____	5. _____	13. _____				
6. _____	14. _____	6. _____	14. _____				
7. _____	15. _____	7. _____	15. _____				
8. _____	16. _____	8. _____	16. _____				
1. <u>0.6281</u>	9. _____	<div style="font-size: 1.5em; font-family: cursive;">Filter</div> SAMPLE NUMBER FILTER OR CONTAINER PLUS SAMPLE FILTER OR CONTAINER TARE SAMPLE	<div style="font-size: 1.5em;">4.016</div> FILTER OR CONTAINER # <u>0.6560</u> <u>0.6280</u> <u>0.0280</u>	1. <u>0.6560</u>	9. _____		
2. <u>0.6279</u>	10. _____			2. <u>0.6559</u>	10. _____		
3. <u>0.6281</u>	11. _____			3. <u>0.6560</u>	11. _____		
4. _____	12. _____			4. _____	12. _____		
5. _____	13. _____	5. _____	13. _____				
6. _____	14. _____	6. _____	14. _____				
7. _____	15. _____	7. _____	15. _____				
8. _____	16. _____	8. _____	16. _____				
1. <u>104.3034</u>	9. _____	<div style="font-size: 1.5em; font-family: cursive;">Imp O</div> SAMPLE NUMBER FILTER OR CONTAINER PLUS SAMPLE FILTER OR CONTAINER TARE SAMPLE	<div style="font-size: 1.5em;">74.5</div> FILTER OR CONTAINER # <u>104.3325</u> <u>104.3037</u> <u>0.0288</u>	1. 104.3305	9. _____		
2. <u>104.3037</u>	10. _____			2. <u>104.3314</u>	10. _____		
3. <u>104.3041</u>	11. _____			3. <u>104.3322</u>	11. _____		
4. _____	12. _____			4. <u>104.3325</u>	12. _____		
5. _____	13. _____	5. <u>104.3327</u>	13. _____				
6. _____	14. _____	6. _____	14. _____				
7. _____	15. _____	7. _____	15. _____				
8. _____	16. _____	8. _____	16. _____				
1. <u>86.4052</u>	9. _____	<div style="font-size: 1.5em; font-family: cursive;">Imp I</div> SAMPLE NUMBER FILTER OR CONTAINER PLUS SAMPLE FILTER OR CONTAINER TARE SAMPLE	<div style="font-size: 1.5em;">83.5</div> FILTER OR CONTAINER # <u>86.4061</u> <u>86.4049</u> <u>0.0012</u>	1. <u>86.4050</u>	9. _____		
2. <u>86.4051</u>	10. _____			2. <u>86.4059</u>	10. _____		
3. <u>86.4044</u>	11. _____			3. <u>86.4064</u>	11. _____		
4. _____	12. _____			4. <u>86.4061</u>	12. _____		
5. _____	13. _____	5. _____	13. _____				
6. _____	14. _____	6. _____	14. _____				
7. _____	15. _____	7. _____	15. _____				
8. _____	16. _____	8. _____	16. _____				

Mc = 250
250
250
110
810 - 200 = 660

FIELD DATA

PLANT Eagle Slacks
 DATE 5-31-89
 SAMPLING LOCATION Cent. Fgr. Sk. Out
 SAMPLE TYPE Pact
 RUN NUMBER 15
 OPERATOR Ty. Hester
 AMBIENT TEMPERATURE 90
 BAROMETRIC PRESSURE _____
 STATIC PRESSURE, (P) 7.017
 FILTER NUMBER (S) _____

PROBE LENGTH AND TYPE #2
 NOZZLE I.D. .325
 ASSUMED MOISTURE, % 55%
 SAMPLE BOX NUMBER Green
 METER BOX NUMBER 86 Green
 METER ΔH # 11
 C FACTOR _____
 PROBE HEATER SETTING Z50
 HEATER BOX SETTING Z50
 REFERENCE ΔP # 7 CB @ 2 sec

SCHEMATIC OF TRAVERSE POINT LAYOUT

READ AND RECORD ALL DATA EVERY 2 1/2 MINUTES

Post heat < .002 cm at 10"

TRAVERSE POINT NUMBER	CLOCK TIME (24-hr CLOCK)	GAS METER READING (V _m), ft ³	VELOCITY HEAD (V _{ap}), in. H ₂ O	ORIFICE PRESSURE DIFFERENTIAL (ΔH), in. H ₂ O		STACK TEMPERATURE (T _s), °F	DRY GAS METER TEMPERATURE		PUMP VACUUM, in. Hg	SAMPLE BOX TEMPERATURE, °F	IMPINGER TEMPERATURE, °F
				DESIRED	ACTUAL		INLET (T _{m in}), °F	OUTLET (T _{m out}), °F			
0	2432	176.373									
1	244	177.475	.16	.46	.46	226	95	95	1	240	58
2	246.5	178.500	.19	.58	.58	231	98	96	1	260	58
3	249	179.600	.20	.61	.61	232	102	97	5	240	58
4	257.5	180.700	.19	.58	.58	235	102	98	7	225	64
5	254	181.850	.21	.64	.64	235	100	99	7	220	66
6	256.5	183.250	.21	.64	.64	233	99	99	5	240	66
7	259	184.300	.24	.74	.74	230	100	99	2	255	67
8	261.5	185.050	.25	.87	.87	145	101	100	2	265	68
9	264	186.950	.24	.71	.71	228	91	95	2	255	64
10	266.5	188.150	.25	.73	.73	230	97	94	4	250	62
11	269	189.300	.22	.65	.65	227	94	94	4	250	62
12	271.5	190.474	.23	.68	.68	226	95	92	3	275	60
1	274	191.500	.17	.51	.51	220	94	94	1	260	61
2	276.5	192.300	.18	.53	.53	226	97	92	1	250	62
3	279	193.550	.18	.53	.53	227	98	92	1	255	62
4	281.5	194.550	.19	.56	.56	229	100	93	1	275	64
5	284	195.625	.20	.59	.59	229	103	94	2	260	64
6	286.5	196.725	.21	.62	.62	231	103	94	2	265	64
7	289	197.975	.23	.68	.68	233	104	94	3	280	64
8	291.5	199.100	.23	.83	.83	234	106	95	5	260	66
9	294	200.400	.27	.80	.80	235	107	95	5	260	66
10	296.5	201.700	.28	.83	.83	233	107	95	5	230	68
11	299	202.950	.27	.80	.80	239	108	96	5	225	70
COMMENTS:	60	204.228	.26	.77	.77	235	108	98	5	270	71
		27.855	.22	0.66	0.66	227					

DESICCATION OF SOLID SAMPLES TO CONSTANT WEIGHT

Completion Dates

1. _____ 2. _____
3. _____ 4. _____

Indicate by numbers in box under Sample column.

AST
Test#3

Requestor _____

JN _____

Assigned to _____

Date Assigned _____

ALL WEIGHTS IN GRAMS

TARE WEIGHT			TARE + SAMPLE WEIGHT		
1. <u>96.2921</u>	9. _____	<div style="font-size: 1.5em; margin-bottom: 5px;"><u>Probe Area</u></div> SAMPLE NUMBER _____ FILTER OR CONTAINER PLUS SAMPLE <u>96.3570</u> FILTER OR CONTAINER TARE <u>96.2934</u> SAMPLE <u>0.0636</u>	<div style="font-size: 1.5em; margin-bottom: 5px;"><u>87.5</u></div> FILTER OR CONTAINER # _____	1. <u>96.3574</u>	9. _____
2. <u>96.2931</u>	10. _____		2. <u>96.3571</u>	10. _____	
3. <u>96.2943</u>	11. _____		3. <u>96.3566</u>	11. _____	
4. <u>96.2936</u>	12. _____		4. _____	12. _____	
5. <u>96.2934</u>	13. _____		5. _____	13. _____	
6. _____	14. _____		6. _____	14. _____	
7. _____	15. _____		7. _____	15. _____	
8. _____	16. _____		8. _____	16. _____	
1. <u>0.6269</u>	9. _____	<div style="font-size: 1.5em; margin-bottom: 5px;"><u>Filter</u></div> SAMPLE NUMBER _____ FILTER OR CONTAINER PLUS SAMPLE <u>0.6498</u> FILTER OR CONTAINER TARE <u>0.6269</u> SAMPLE <u>0.0229</u>	<div style="font-size: 1.5em; margin-bottom: 5px;"><u>4.014</u></div> FILTER OR CONTAINER # _____	1. <u>0.6517</u>	9. _____
2. <u>0.6268</u>	10. _____		2. <u>0.6498</u>	10. _____	
3. <u>0.6269</u>	11. _____		3. <u>0.6497</u>	11. _____	
4. _____	12. _____		4. <u>0.6500</u>	12. _____	
5. _____	13. _____		5. _____	13. _____	
6. _____	14. _____		6. _____	14. _____	
7. _____	15. _____		7. _____	15. _____	
8. _____	16. _____		8. _____	16. _____	
1. <u>97.4276</u>	9. _____	<div style="font-size: 1.5em; margin-bottom: 5px;"><u>Tap O</u></div> SAMPLE NUMBER _____ FILTER OR CONTAINER PLUS SAMPLE <u>97.4533</u> FILTER OR CONTAINER TARE <u>97.4283</u> SAMPLE <u>0.0250</u>	<div style="font-size: 1.5em; margin-bottom: 5px;"><u>81.5</u></div> FILTER OR CONTAINER # _____	1. <u>97.4529</u>	9. _____
2. <u>97.4286</u>	10. _____		2. <u>97.4534</u>	10. _____	
3. <u>97.4285</u>	11. _____		3. <u>97.4535</u>	11. _____	
4. _____	12. _____		4. _____	12. _____	
5. _____	13. _____		5. _____	13. _____	
6. _____	14. _____		6. _____	14. _____	
7. _____	15. _____		7. _____	15. _____	
8. _____	16. _____		8. _____	16. _____	
1. <u>97.9477</u>	9. _____	<div style="font-size: 1.5em; margin-bottom: 5px;"><u>In I</u></div> SAMPLE NUMBER _____ FILTER OR CONTAINER PLUS SAMPLE <u>97.9507</u> FILTER OR CONTAINER TARE <u>97.9483</u> SAMPLE <u>0.0024</u>	<div style="font-size: 1.5em; margin-bottom: 5px;"><u>93.5</u></div> FILTER OR CONTAINER # _____	1. <u>97.9505</u>	9. _____
2. <u>97.9486</u>	10. _____		2. <u>97.9510</u>	10. _____	
3. <u>97.9487</u>	11. _____		3. <u>97.9506</u>	11. _____	
4. _____	12. _____		4. _____	12. _____	
5. _____	13. _____		5. _____	13. _____	
6. _____	14. _____		6. _____	14. _____	
7. _____	15. _____		7. _____	15. _____	
8. _____	16. _____		8. _____	16. _____	

V/C = 250
250
265
765-100
665

FIELD DATA

PLANT Eagle Snacks
 DATE 5-3-89
 SAMPLING LOCATION Can. Fryer Stack
 SAMPLE TYPE PAH
 RUN NUMBER #4
 OPERATOR Hashner
 AMBIENT TEMPERATURE 85
 BAROMETRIC PRESSURE 30.03
 STATIC PRESSURE, (P_s) 4.011
 FILTER NUMBER (s)

PROBE LENGTH AND TYPE #2
 NOZZLE I.D. .025
 ASSUMED MOISTURE, % 55%
 SAMPLE BOX NUMBER Green
 METER BOX NUMBER #86 Green
 METER A# #11
 C FACTOR
 PROBE HEATER SETTING 250
 HEATER BOX SETTING 250
 REFERENCE A# 7

SCHEMATIC OF TRAVERSE POINT LAYOUT
 READ AND RECORD ALL DATA EVERY 2 1/2 MINUTES

Pre leak < .005 cfm at 16"
Post leak < .003 cfm at 13"
.06 @ 15 sec
 Polyflex

TRAVERSE POINT NUMBER	CLOCK TIME (24-hr CLOCK)	GAS METER READING (V _m) IN	VELOCITY HEAD (avg), in. H ₂ O	ORIFICE DIFFERENTIAL (Δh), in. H ₂ O		STACK TEMPERATURE (T _s), °F	DRY GAS METER TEMPERATURE		PUMP VACUUM, in. Hg	SAMPLE BOX TEMPERATURE, °F	IMPIGNER TEMPERATURE, °F
				DESIRED	ACTUAL		INLET (T _{m in}), °F	OUTLET (T _{m out}), °F			
0	524.3	205.760									
1	529	206.850	.16	.50	208	98	97	1	255	68	250
2	531	207.900	.19	.56	233	97	96	5	245	62	250
3	534	208.940	.19	.56	234	98	96	6	255	64	250
4	536.3	210.050	.20	.59	237	100	96	8	250	64	250
5	539	211.150	.21	.62	236	101	96	10	250	64	250
6	541.3	212.350	.23	.68	238	103	96	10	245	64	250
7	544	213.550	.25	.73	239	104	96	9	245	64	250
8	546.3	214.800	.26	.77	235	105	96	9	270	64	250
9	549	216.100	.28	.83	233	106	97	8	245	65	250
10	551.3	217.300	.24	.71	234	107	98	7	245	65	250
11	554	218.500	.24	.71	232	108	98	7	265	66	250
12	556.3	219.704	.23	.69	231	108	98	7	265	64	250
1	601	220.650	.17	.51	230	105	100	3	245	70	250
2	603.3	221.675	.17	.51	230	106	100	4	260	69	250
3	606	222.750	.19	.57	226	106	100	4	275	68	250
4	608.3	223.800	.18	.54	228	106	100	5	250	66	250
5	611	224.950	.21	.63	228	106	100	5	230	65	250
6	613.3	226.150	.23	.68	233	106	100	8	275	65	250
7	616	227.400	.25	.74	232	106	101	8	260	67	250
8	618.3	228.700	.28	.83	232	106	101	8	250	64	250
9	621	229.975	.27	.80	232	107	101	8	265	62	250
10	623.3	231.800	.25	.75	233	108	100	10	275	62	250
11	626	232.450	.27	.80	235	107	101	11	260	62	250
12	628.3	233.811	.27	.80	235	108	101	11	250	62	250

COMMENTS:
 12
2.8 .051
.67 232
102.

DESICCATION OF SOLID SAMPLES TO CONSTANT WEIGHT

Completion Dates

1. _____ 2. _____
3. _____ 4. _____

Indicate by numbers in box under Sample column.

ABT
Tst #4

Requestor _____

JN _____

Assigned to _____

Date Assigned _____

ALL WEIGHTS IN GRAMS

TARE WEIGHT			TARE + SAMPLE WEIGHT			
1. <u>101.1236</u>	9.		<u>Probe</u>	<u>89.5</u>	1. <u>101.1764</u>	9.
2. <u>101.1240</u>	10.	SAMPLE NUMBER		FILTER OR CONTAINER #	2. <u>101.1773</u>	10.
3. <u>101.1269</u>	11.	FILTER OR CONTAINER PLUS SAMPLE		<u>101.1777</u>	3. <u>101.1778</u>	11.
4. <u>101.1340</u>	12.	FILTER OR CONTAINER TARE		<u>101.1267</u>	4. <u>101.1781</u>	12.
5. <u>101.1378</u>	13.	SAMPLE		<u>0.0510</u>	5. _____	13.
6. <u>101.1268</u>	14.				6. _____	14.
7. <u>101.1264</u>	15.				7. _____	15.
8. <u>101.1250</u>	16.				8. _____	16.
1. <u>0.6263</u>	9.		<u>Filter</u>	<u>4.013</u>	1. <u>0.6517</u>	9.
2. <u>0.6262</u>	10.	SAMPLE NUMBER		FILTER OR CONTAINER #	2. <u>0.6517</u>	10.
3. <u>0.6262</u>	11.	FILTER OR CONTAINER PLUS SAMPLE		<u>0.6518</u>	3. <u>0.6519</u>	11.
4. _____	12.	FILTER OR CONTAINER TARE		<u>0.6262</u>	4. _____	12.
5. _____	13.	SAMPLE		<u>0.0256</u>	5. _____	13.
6. _____	14.				6. _____	14.
7. _____	15.				7. _____	15.
8. _____	16.				8. _____	16.
1. <u>98.0871</u>	9.		<u>Imp 0</u>	<u>86.5</u>	1. <u>98.1950</u>	9.
2. <u>98.0875</u>	10.	SAMPLE NUMBER		FILTER OR CONTAINER #	2. <u>98.1224</u>	10.
3. <u>98.0921</u>	11.	FILTER OR CONTAINER PLUS SAMPLE		<u>98.1218</u>	3. <u>98.1214</u>	11.
4. <u>98.0916</u>	12.	FILTER OR CONTAINER TARE		<u>98.0875</u>	4. <u>98.1215</u>	12.
5. <u>98.0879</u>	13.	SAMPLE		<u>0.0343</u>	5. _____	13.
6. _____	14.				6. _____	14.
7. _____	15.				7. _____	15.
8. _____	16.				8. _____	16.
1. <u>95.7660</u>	9.		<u>Imp I</u>	<u>85.5</u>	1. <u>95.7683</u>	9.
2. <u>95.7665</u>	10.	SAMPLE NUMBER		FILTER OR CONTAINER #	2. <u>95.7683</u>	10.
3. <u>95.7721</u>	11.	FILTER OR CONTAINER PLUS SAMPLE		<u>95.7682</u>	3. <u>95.7679</u>	11.
4. <u>95.7725</u>	12.	FILTER OR CONTAINER TARE		<u>95.7721</u>	4. _____	12.
5. <u>95.7717</u>	13.	SAMPLE		<u>0</u>	5. _____	13.
6. _____	14.				6. _____	14.
7. _____	15.				7. _____	15.
8. _____	16.				8. _____	16.

VIC # 22201
22201
12/16 816-100
716

FIELD DATA

PLANT Eagle Snack
 DATE 6-1-89
 SAMPLING LOCATION Keith #6
 SAMPLE TYPE Food
 RUN NUMBER #5
 OPERATOR M. Murik
 AMBIENT TEMPERATURE 75
 BAROMETRIC PRESSURE 28.95
 STATIC PRESSURE (P_s) 30
 FILTER NUMBER (F) 402

PROBE LENGTH AND TYPE 5' #2
 NOZZLE I.D. 2.35
 ASSUMED MOISTURE, % 5
 SAMPLE BOX NUMBER Green
 METER BOX NUMBER 86 Green
 METER AN # 11
 C FACTOR
 PROBE HEATER SETTING 250
 HEATER BOX SETTING 250
 REFERENCE AP # 9

SCHEMATIC OF TRAVERSE POINT LAYOUT

Prebreak ✓ 0.005 at cfm 15.0
 Postbreak ✓ 0.004 cfm at 19"

READ AND RECORD ALL DATA EVERY 2 1/2 MINUTES

TRAVERSE POINT NUMBER	CLOCK TIME (24-hr CLOCK)	GAS METER READING (V _m) IN	VELOCITY HEAD (V _{ap}), in. H ₂ O	ORIFICE DIFFERENTIAL (ΔH), in. H ₂ O		STACK TEMPERATURE (T _s), °F	DRY GAS METER TEMPERATURE		PUMP VACUUM, in. Hg	SAMPLE BOX TEMPERATURE, °F	IMPIGNER TEMPERATURE, °F	Flux
				DESIRED	ACTUAL		INLET (T _{m in}), °F	OUTLET (T _{m out}), °F				
1	9:01 1/2	246.800	.40	1.17	1.17	70	80	79 1/2	6	250	78	250
2	9:09	248.250	.42	1.20	1.20	82	92	84	6	225	58	250
3	9:11 1/2	249.870	.42	1.22	1.22	78	96	84	7	230	58	250
4	9:14	251.430	.50	1.50	1.50	68	99	86	10	250	60	250
5	9:16 1/2	253.220	.56	1.68	1.68	68	102	88	12	260	61	250
6	9:19	255.020	.58	1.72	1.70	77	104	89	16	250	62	250
7	9:21 1/2	256.845	.58	1.74	1.70	71	104	90	16	230	61	250
8	9:24	258.850	.54	1.64	1.64	68	105	92	15	250	62	250
9	9:26 1/2	260.480	.60	1.81	1.75	68	106	92	15	230	62	250
10	9:29	262.320	.54	1.67	1.64	67	106	94	13	225	62	250
11	9:31 1/2	264.150	.56	1.71	1.71	66	108	95	13	235	62	250
12	9:34	265.862	.56	1.68	1.68	78	108	95	12	255	62	250
13	9:36 1/2	267.540	.56	1.70	1.70	71	110	96	13	230	62	250
14	9:39	269.775	.54	1.65	1.65	68	110	96	12	225	62	250
15	9:41 1/2	271.480	.54	1.61	1.61	80	110	96	12	250	63	250
16	9:44	273.420	.54	1.64	1.64	73	111	97	12	260	63	250
17	9:46 1/2	275.150	.54	1.65	1.65	71	112	98	12	250	64	250
18	9:49	276.975	.52	1.59	1.59	70	114	100	10	240	64	250
19	9:51 1/2	278.840	.54	1.75	1.75	77	114	100	11	270	66	250
20	9:54	280.750	.56	1.70	1.70	73	115	102	11	255	65	250
21	9:56 1/2	282.640	.62	1.91	1.91	70	116	102	15	240	65	250
22	9:59	284.565	.60	1.81	1.81	83	116	102	15	235	65	250
23	10:01 1/2	286.350	.48	1.47	1.47	73	116	102	9	240	64	250
24	10:04	288.291	.50	1.54	1.54	71	115	102	10	250	64	250

COMMENTS: 60
 43.025
 1.61
 72
 101

DESICCATION OF SOLID SAMPLES TO CONSTANT WEIGHT

Completion Dates

1. _____ 2. _____
3. _____ 4. _____

Indicate by numbers in box under Sample column.

ABF
T#5

Requestor _____

JN _____

Assigned to _____

Date Assigned _____

ALL WEIGHTS IN GRAMS

TARE WEIGHT			TARE + SAMPLE WEIGHT		
1. <u>96.3188</u>	9. _____	<div style="font-size: 1.5em; margin-bottom: 5px;">Pwr</div> <div style="font-size: 1.5em; margin-bottom: 5px;">97.5</div> <div style="margin-bottom: 5px;">SAMPLE NUMBER</div> <div style="margin-bottom: 5px;">FILTER OR CONTAINER #</div> <div style="margin-bottom: 5px;">FILTER OR CONTAINER PLUS SAMPLE</div> <div style="margin-bottom: 5px;">96.3325</div> <div style="margin-bottom: 5px;">FILTER OR CONTAINER TARE</div> <div style="margin-bottom: 5px;">96.3191</div> <div style="margin-bottom: 5px;">SAMPLE</div> <div style="margin-bottom: 5px;">0.0134</div>	1. 100.1375	9. _____	
2. <u>96.3196</u>	10. _____		2. <u>96.3319</u>	10. _____	
3. <u>96.3188</u>	11. _____		3. <u>96.3327</u>	11. _____	
4. _____	12. _____		4. <u>96.3328</u>	12. _____	
5. _____	13. _____		5. _____	13. _____	
6. _____	14. _____		6. _____	14. _____	
7. _____	15. _____		7. _____	15. _____	
8. _____	16. _____		8. _____	16. _____	
1. <u>0.6297</u>	9. _____	<div style="font-size: 1.5em; margin-bottom: 5px;">Filter</div> <div style="font-size: 1.5em; margin-bottom: 5px;">4.012</div> <div style="margin-bottom: 5px;">SAMPLE NUMBER</div> <div style="margin-bottom: 5px;">FILTER OR CONTAINER #</div> <div style="margin-bottom: 5px;">FILTER OR CONTAINER PLUS SAMPLE</div> <div style="margin-bottom: 5px;">0.6306</div> <div style="margin-bottom: 5px;">FILTER OR CONTAINER TARE</div> <div style="margin-bottom: 5px;">0.6297</div> <div style="margin-bottom: 5px;">SAMPLE</div> <div style="margin-bottom: 5px;">0.0009</div>	1. <u>0.6305</u>	9. _____	
2. <u>0.6297</u>	10. _____		2. <u>0.6307</u>	10. _____	
3. <u>0.6296</u>	11. _____		3. <u>0.6307</u>	11. _____	
4. _____	12. _____		4. _____	12. _____	
5. _____	13. _____		5. _____	13. _____	
6. _____	14. _____		6. _____	14. _____	
7. _____	15. _____		7. _____	15. _____	
8. _____	16. _____		8. _____	16. _____	
1. <u>89.3176</u>	9. _____	<div style="font-size: 1.5em; margin-bottom: 5px;">Imp O</div> <div style="font-size: 1.5em; margin-bottom: 5px;">59.5</div> <div style="margin-bottom: 5px;">SAMPLE NUMBER</div> <div style="margin-bottom: 5px;">FILTER OR CONTAINER #</div> <div style="margin-bottom: 5px;">FILTER OR CONTAINER PLUS SAMPLE</div> <div style="margin-bottom: 5px;">89.3222</div> <div style="margin-bottom: 5px;">FILTER OR CONTAINER TARE</div> <div style="margin-bottom: 5px;">89.3175</div> <div style="margin-bottom: 5px;">SAMPLE</div> <div style="margin-bottom: 5px;">0.0047</div>	1. <u>89.3226</u>	9. _____	
2. <u>89.3176</u>	10. _____		2. <u>89.3221</u>	10. _____	
3. <u>89.3174</u>	11. _____		3. <u>89.3220</u>	11. _____	
4. _____	12. _____		4. _____	12. _____	
5. _____	13. _____		5. _____	13. _____	
6. _____	14. _____		6. _____	14. _____	
7. _____	15. _____		7. _____	15. _____	
8. _____	16. _____		8. _____	16. _____	
1. <u>105.0471</u>	9. _____	<div style="font-size: 1.5em; margin-bottom: 5px;">Imp I</div> <div style="font-size: 1.5em; margin-bottom: 5px;">72.5</div> <div style="margin-bottom: 5px;">SAMPLE NUMBER</div> <div style="margin-bottom: 5px;">FILTER OR CONTAINER #</div> <div style="margin-bottom: 5px;">FILTER OR CONTAINER PLUS SAMPLE</div> <div style="margin-bottom: 5px;">105.0485</div> <div style="margin-bottom: 5px;">FILTER OR CONTAINER TARE</div> <div style="margin-bottom: 5px;">105.0470</div> <div style="margin-bottom: 5px;">SAMPLE</div> <div style="margin-bottom: 5px;">0.0015</div>	1. <u>105.0488</u>	9. _____	
2. <u>105.0471</u>	10. _____		2. <u>105.0485</u>	10. _____	
3. <u>105.0467</u>	11. _____		3. <u>105.0483</u>	11. _____	
4. _____	12. _____		4. _____	12. _____	
5. _____	13. _____		5. _____	13. _____	
6. _____	14. _____		6. _____	14. _____	
7. _____	15. _____		7. _____	15. _____	
8. _____	16. _____		8. _____	16. _____	

Vlc = 25ml

FIELD DATA

PLANT Eagle Snacks
 DATE 10-1-89
 SAMPLING LOCATION Kettle #16
 SAMPLE TYPE Lent
 RUN NUMBER #6
 OPERATOR A. Huzik
 AMBIENT TEMPERATURE 83
 BAROMETRIC PRESSURE
 STATIC PRESSURE (P_s) 4.011
 FILTER NUMBER (6)

PROBE LENGTH AND TYPE 5' #2
 NOZZLE I.D. .235
 ASSUMED MOISTURE % 5
 SAMPLE BOX NUMBER GREEN
 METER BOX NUMBER 80-6666
 METER ΔH # 11
 C FACTOR
 PROBE HEATER SETTING 250
 HEATER BOX SETTING 250
 REFERENCE ΔP # 9

SCHEMATIC OF TRAVERSE POINT LAYOUT

READ AND RECORD ALL DATA EVERY 2 1/2 MINUTES Postback \checkmark 0.014 cfm at 5"

Preback \checkmark 0.017 cfm at 15"

TRAVERSE POINT NUMBER	CLOCK TIME (24-hr CLOCK)	GAS METER READING (V _m , ft ³)	VELOCITY HEAD (Avg), in. H ₂ O	ORIFICE DIFFERENTIAL (ΔH), in. H ₂ O		STACK TEMPERATURE (T _s), °F	DRY GAS METER TEMPERATURE		PUMP VACUUM, in. Hg	SAMPLE BOX TEMPERATURE, °F	IMPINGER TEMPERATURE, °F
				DESIRED	ACTUAL		INLET (T _{m in}), °F	OUTLET (T _{m out}), °F			
1	1119	292.462	.38	1.22	1.22	84	98	98	1	235	68
2	1124	295.580	.44	1.30	1.30	81	105	100	1	250	67
3	1126	297.020	.54	1.64	1.64	74	110	104	4	275	67
4	1129	299.275	.56	1.71	1.71	71	113	106	4	250	65
5	1131	301.160	.57	1.73	1.73	80	116	106	4	240	64
6	1134	302.995	.54	1.66	1.66	74	115	107	4	250	64
7	1136	304.770	.50	1.55	1.55	71	120	108	4	270	64
8	1139	306.570	.50	1.52	1.52	84	121	108	3	255	70
9	1141	308.450	.58	1.78	1.78	78	121	108	4	245	74
7	1144	310.325	.54	1.68	1.68	72	120	108	4	225	74
6	1146	312.200	.54	1.68	1.68	71	120	109	4	245	74
5	1149	314.095	.56	1.75	1.75	70	121	109	4	275	72
4	1151	315.975	.54	1.69	1.69	69	122	110	4	265	72
3	1154	317.765	.50	1.54	1.54	75	122	110	3	250	72
2	1156	319.525	.48	1.48	1.48	76	120	110	3	230	73
1	1159	321.270	.48	1.49	1.49	73	119	110	3	228	75
1	1201	322.890	.38	1.15	1.15	86	119	110	2	240	73
2	1204	324.500	.42	1.28	1.28	91	120	110	2	255	69
3	1206	326.140	.40	1.23	1.23	78	120	110	2	260	68
4	1209	327.950	.52	1.40	1.40	76	120	110	4	275	68
5	1216	329.850	.56	1.74	1.74	73	119	110	4	275	68
6	1214	331.780	.58	1.80	1.80	71	120	110	4	250	66
7	1216	333.450	.64	1.99	1.99	71	120	110	5	235	66
COMMENTS: 860	1219	335.815	.60	1.87	1.87	71	120	110	5	225	69

113

1.58

1.51

43.353

DESICCATION OF SOLID SAMPLES TO CONSTANT WEIGHT

Completion Dates

1. _____ 2. _____
3. _____ 4. _____

Indicate by numbers in box under Sample column.

Requestor _____

JN _____

Assigned to _____

Date Assigned _____

ABF
Test # C

ALL WEIGHTS IN GRAMS

TARE WEIGHT				TARE + SAMPLE WEIGHT	
1. <u>103.1623</u>	9. _____	<u>Probe</u> SAMPLE NUMBER	<u>88.5</u> FILTER OR CONTAINER #	1. <u>103.1708</u>	9. _____
2. <u>103.1628</u>	10. _____			2. <u>103.1690</u>	10. _____
3. <u>103.1618</u>	11. _____			3. <u>103.1691</u>	11. _____
4. _____	12. _____	FILTER OR CONTAINER PLUS SAMPLE	<u>103.1690</u>	4. <u>103.1688</u>	12. _____
5. _____	13. _____	FILTER OR CONTAINER TARE	<u>103.1623</u>	5. _____	13. _____
6. _____	14. _____	SAMPLE	<u>0.0067</u>	6. _____	14. _____
7. _____	15. _____			7. _____	15. _____
8. _____	16. _____			8. _____	16. _____
1. <u>0.6322</u>	9. _____	<u>Feltes</u> SAMPLE NUMBER	<u>4.011</u> FILTER OR CONTAINER #	1. <u>0.6318</u>	9. _____
2. <u>0.6323</u>	10. _____			2. <u>0.6312</u>	10. _____
3. <u>0.6324</u>	11. _____			3. <u>0.6328</u>	11. _____
4. _____	12. _____	FILTER OR CONTAINER PLUS SAMPLE	<u>0.6316</u>	4. _____	12. _____
5. _____	13. _____	FILTER OR CONTAINER TARE	<u>0.6323</u>	5. _____	13. _____
6. _____	14. _____	SAMPLE	<u>0</u>	6. _____	14. _____
7. _____	15. _____			7. _____	15. _____
8. _____	16. _____			8. _____	16. _____
1. <u>103.7278</u>	9. _____	<u>Imp F</u> SAMPLE NUMBER	<u>98.5</u> FILTER OR CONTAINER #	1. <u>103.7290</u>	9. _____
2. <u>103.7276</u>	10. _____			2. <u>103.7300</u>	10. _____
3. <u>103.7283</u>	11. _____			3. <u>103.7301</u>	11. _____
4. _____	12. _____	FILTER OR CONTAINER PLUS SAMPLE	<u>103.7296</u>	4. <u>103.7297</u>	12. _____
5. _____	13. _____	FILTER OR CONTAINER TARE	<u>103.7279</u>	5. _____	13. _____
6. _____	14. _____	SAMPLE	<u>0.0017</u>	6. _____	14. _____
7. _____	15. _____			7. _____	15. _____
8. _____	16. _____			8. _____	16. _____
1. <u>105.6699</u>	9. _____	<u>Imp O</u> SAMPLE NUMBER	<u>95.5</u> FILTER OR CONTAINER #	1. <u>105.6808</u>	9. _____
2. <u>105.6691</u>	10. _____			2. <u>105.6790</u>	10. _____
3. <u>105.6703</u>	11. _____			3. <u>105.6793</u>	11. _____
4. _____	12. _____	FILTER OR CONTAINER PLUS SAMPLE	<u>105.6791</u>	4. <u>105.6790</u>	12. _____
5. _____	13. _____	FILTER OR CONTAINER TARE	<u>105.6698</u>	5. _____	13. _____
6. _____	14. _____	SAMPLE	<u>0.0093</u>	6. _____	14. _____
7. _____	15. _____			7. _____	15. _____
8. _____	16. _____			8. _____	16. _____

Vle = 9ms

DESICCATION OF SOLID SAMPLES TO CONSTANT WEIGHT

Completion Dates

1. _____ 2. _____
3. _____ 4. _____

Indicate by numbers in box under Sample column.

A B F
#7

Requestor _____

JN _____

Assigned to _____

Date Assigned _____

ALL WEIGHTS IN GRAMS

TARE WEIGHT					TARE + SAMPLE WEIGHT		
1. <u>96.3002</u>	9. _____		<div style="font-size: 1.5em; margin-bottom: 5px;">Proba</div> <div style="font-size: 1.5em; margin-bottom: 5px;">91.5</div> <div style="margin-bottom: 5px;">SAMPLE NUMBER</div> <div style="margin-bottom: 5px;">FILTER OR CONTAINER #</div> <div style="margin-bottom: 5px;">96.3084</div> <div style="margin-bottom: 5px;">96.3000</div> <div style="margin-bottom: 5px;">SAMPLE 0.0084</div>		1. <u>96.3096</u>	9. _____	
2. <u>96.3003</u>	10. _____			2. <u>96.3001</u>	10. _____		
3. <u>96.2996</u>	11. _____	FILTER OR CONTAINER PLUS SAMPLE		3. <u>96.3087</u>	11. _____		
4. _____	12. _____	FILTER OR CONTAINER TARE		4. <u>96.3084</u>	12. _____		
5. _____	13. _____			5. _____	13. _____		
6. _____	14. _____			6. _____	14. _____		
7. _____	15. _____			7. _____	15. _____		
8. _____	16. _____			8. _____	16. _____		
1. <u>0.8457</u>	9. _____		<div style="font-size: 1.5em; margin-bottom: 5px;">Feltar</div> <div style="font-size: 1.5em; margin-bottom: 5px;">4.550</div> <div style="margin-bottom: 5px;">SAMPLE NUMBER</div> <div style="margin-bottom: 5px;">FILTER OR CONTAINER #</div> <div style="margin-bottom: 5px;">ϕ</div>		1. <u>0.8319</u>	9. _____	
2. _____	10. _____			2. <u>0.8369</u>	10. _____		
3. _____	11. _____	FILTER OR CONTAINER PLUS SAMPLE		3. <u>0.8389</u>	11. _____		
4. _____	12. _____	FILTER OR CONTAINER TARE		4. <u>0.8408</u>	12. _____		
5. _____	13. _____			5. <u>0.8405</u>	13. _____		
6. _____	14. _____			6. <u>0.8416</u>	14. _____		
7. _____	15. _____			7. _____	15. _____		
8. _____	16. _____			8. _____	16. _____		
1. 102.8957	9. _____		<div style="font-size: 1.5em; margin-bottom: 5px;">Imp I</div> <div style="font-size: 1.5em; margin-bottom: 5px;">82.5</div> <div style="margin-bottom: 5px;">SAMPLE NUMBER</div> <div style="margin-bottom: 5px;">FILTER OR CONTAINER #</div> <div style="margin-bottom: 5px;">102.8963</div> <div style="margin-bottom: 5px;">102.8939</div> <div style="margin-bottom: 5px;">SAMPLE 0.0024</div>		1. 102.8950	9. _____	
2. <u>102.8944</u>	10. _____			2. <u>102.8959</u>	10. _____		
3. <u>102.8939</u>	11. _____	FILTER OR CONTAINER PLUS SAMPLE		3. <u>102.8963</u>	11. _____		
4. 102.8935	12. _____	FILTER OR CONTAINER TARE		4. <u>102.8961</u>	12. _____		
5. <u>102.8934</u>	13. _____			5. _____	13. _____		
6. _____	14. _____			6. _____	14. _____		
7. _____	15. _____			7. _____	15. _____		
8. _____	16. _____			8. _____	16. _____		
1. <u>100.1306</u>	9. _____		<div style="font-size: 1.5em; margin-bottom: 5px;">Imp O</div> <div style="font-size: 1.5em; margin-bottom: 5px;">99.5</div> <div style="margin-bottom: 5px;">SAMPLE NUMBER</div> <div style="margin-bottom: 5px;">FILTER OR CONTAINER #</div> <div style="margin-bottom: 5px;">100.1333</div> <div style="margin-bottom: 5px;">100.1295</div> <div style="margin-bottom: 5px;">SAMPLE 0.0038</div>		1. <u>100.1336</u>	9. _____	
2. <u>100.1283</u>	10. _____			2. <u>100.1332</u>	10. _____		
3. <u>100.1297</u>	11. _____	FILTER OR CONTAINER PLUS SAMPLE		3. <u>100.1331</u>	11. _____		
4. _____	12. _____	FILTER OR CONTAINER TARE		4. _____	12. _____		
5. _____	13. _____			5. _____	13. _____		
6. _____	14. _____			6. _____	14. _____		
7. _____	15. _____			7. _____	15. _____		
8. _____	16. _____			8. _____	16. _____		

Vle 20ms

CO2 0.0885 %
CO -0.40PPM
O2 1.6375 %
0000000000
6.0
195:09:33:08

CO2 0.2007 % 81
CO 34.80PPM 81
O2 20.149 % 81
0000000000
6.0
195:09:40:01

CO2 0.2115 %
CO 47.60PPM
O2 20.135 %
0000000000
6.0
195:09:55:00

CO2 0.1905 %
CO 27.80PPM
O2 20.007 %
0000000000
6.0
195:09:35:01

CO2 0.1612 % 80
CO 34.80PPM 80
O2 20.236 % 80
0000000000
6.0
195:09:55:00

CO2 0.0885 %
CO 3.60PPM
O2 4.295 %
0000000000
6.0
195:09:32:57

CO2 0.1840 % 10
CO 42.32PPM 10
O2 20.460 % 10
0000000000
6.0
195:09:35:01

CO2 0.1905 %
CO 38.60PPM
O2 20.217 %
0000000000
6.0
195:09:50:03

CO2 0.1942 % 81
CO 45.02PPM 81
O2 20.202 % 81
0000000000
6.0
195:09:50:03

CO2 5.742 %
CO 222.20PPM
O2 11.872 %
0000000000
6.0
195:09:31:35

CO2 0.0855 %
CO -10.60PPM
O2 0.1325 %
0000000000
6.0
195:09:33:37

CO2 0.2385 %
CO 38.60PPM
O2 20.165 %
0000000000
6.0
195:09:45:02

*Continuous
Flow*

CO2 0.1948 % 81
CO 45.92PPM 81
O2 20.197 % 81
0000000000
6.0
195:09:45:02

CO2 6.145 %
CO 34.80PPM
O2 12.187 %
0000000000
6.0
195:09:30:44

CO2 0.0885 %
CO -7.80PPM
O2 0.4950 %
0000000000
6.0
195:09:33:23

CO2 0.2055 %
CO 41.60PPM
O2 20.172 %
0000000000
6.0
195:09:45:01

CO2 0.1337 % 80
CO 22.07PPM 80
O2 20.328 % 80
00000000000
6.0

195:10:10:00

CO2 0.1335 %
CO 26.20PPM
O2 20.297 %
00000000000
6.0

195:10:10:03

CO2 0.1339 % 81
CO 25.58PPM 81
O2 20.244 % 81
00000000000
6.0

195:10:10:03

CO2 0.1305 %
CO 25.00PPM
O2 20.267 %
00000000000
6.0

195:10:05:02

CO2 0.1734 % 81
CO 40.52PPM 81
O2 20.139 % 81
00000000000
6.0

195:10:05:02

CO2 0.1800 %
CO 27.60PPM
O2 20.147 %
00000000000
6.0

195:10:00:01

CO2 0.1646 % 81
CO 27.13PPM 81
O2 20.143 % 81
00000000000
6.0

195:10:00:01

CO2 0.1260 %
CO 22.33PPM
O2 20.365 %
00000000000
6.0

195:10:30:03

CO2 0.1315 % 81
CO 29.03PPM 81
O2 20.370 % 81
00000000000
6.0

195:10:30:03

CO2 0.1215 %
CO 25.58PPM
O2 20.362 %
00000000000
6.0

195:10:25:02

CO2 0.1435 % 81
CO 29.58PPM 81
O2 20.348 % 81
00000000000
6.0

195:10:25:02

CO2 0.1380 %
CO 24.00PPM
O2 20.357 %
00000000000
6.0

195:10:20:01

CO2 0.1347 % 81
CO 20.12PPM 81
O2 20.355 % 81
00000000000
6.0

195:10:20:01

CO2 0.1470 %
CO 23.80PPM
O2 20.340 %
00000000000
6.0

195:10:15:00

CO2 0.1322 % 81
CO 22.33PPM 81
O2 20.333 % 81
00000000000
6.0

195:10:50:03

CO2 0.1365 %
CO 23.80PPM
O2 20.342 %
00000000000
6.0

195:10:45:02

CO2 0.1371 % 81
CO 28.14PPM 81
O2 20.357 % 81
00000000000
6.0

195:10:45:02

CO2 0.1260 %
CO 27.40PPM
O2 20.367 %
00000000000
6.0

195:10:40:01

CO2 0.1381 % 81
CO 29.21PPM 81
O2 20.352 % 81
00000000000
6.0

195:10:40:01

CO2 0.1245 %
CO 25.20PPM
O2 20.357 %
00000000000
6.0

195:10:35:00

CO2 0.1339 % 80
CO 28.73PPM 80
O2 20.359 % 80
00000000000
6.0

195:10:35:00

CO2 0.1155 %
CO -2.40PPM
O2 20.852 %
00000000000
6.0
196:09:12:00

CO2 0.1245 %
CO -2.60PPM
O2 20.922 %
00000000000
6.0
196:09:19:00

CO2 0.1140 %
CO -2.40PPM
O2 20.962 %
00000000000
6.0
196:09:26:00

CO2 0.1095 %
CO -2.40PPM
O2 20.835 %
00000000000
6.0
196:09:11:00

CO2 0.1185 %
CO -2.60PPM
O2 20.897 %
00000000000
6.0
196:09:18:00

CO2 0.1125 %
CO -2.60PPM
O2 20.947 %
00000000000
6.0
196:09:25:00

CO2 0.1125 %
CO -2.40PPM
O2 20.835 %
00000000000
6.0
196:09:10:00

CO2 0.1350 %
CO -2.60PPM
O2 20.872 %
00000000000
6.0
196:09:17:00

CO2 0.1140 %
CO -2.60PPM
O2 20.952 %
00000000000
6.0
196:09:24:00

CO2 0.1290 %
CO -2.40PPM
O2 20.832 %
00000000000
6.0
196:09:09:00

CO2 0.1140 %
CO -2.40PPM
O2 20.892 %
00000000000
6.0
196:09:16:00

CO2 0.1260 %
CO -2.60PPM
O2 20.912 %
00000000000
6.0
196:09:23:00

CO2 0.1200 %
CO -2.40PPM
O2 20.822 %
00000000000
6.0
196:09:08:00

CO2 0.1350 %
CO -2.40PPM
O2 20.880 %
00000000000
6.0
196:09:15:00

CO2 0.1440 %
CO -2.40PPM
O2 20.910 %
00000000000
6.0
196:09:22:00

CO2 0.1080 %
CO -2.40PPM
O2 19.842 %
00000000000
6.0
196:09:07:00

CO2 0.1020 %
CO -2.60PPM
O2 20.870 %
00000000000
6.0
196:09:14:00

CO2 0.1050 %
CO -2.40PPM
O2 20.925 %
00000000000
6.0
196:09:21:00

CO2 0.1050 %
CO -2.60PPM
O2 20.877 %
00000000000
6.0
196:09:13:00

CO2 0.1020 %
CO -2.60PPM
O2 20.912 %
00000000000
6.0
196:09:20:00

Kelly #67

CO2 0.1200 %
CO -2.40PPM
O2 20.955 %
00000000000
6.0
196:09:33:00

CO2 0.1005 %
CO -2.60PPM
O2 20.965 %
00000000000
6.0
196:09:40:00

CO2 0.1125 %
CO -2.40
O2 20.982 %
00000000000
6.0
196:09:47:00

CO2 0.1305 %
CO -2.40PPM
O2 20.965 %
00000000000
6.0
196:09:32:00

CO2 0.1170 %
CO -2.60PPM
O2 20.960 %
00000000000
6.0
196:09:39:00

CO2 0.1035 %
CO -2.40PPM
O2 20.995 %
00000000000
6.0
196:09:46:00

CO2 0.1200 %
CO -2.60PPM
O2 20.950 %
00000000000
6.0
196:09:31:00

CO2 0.1185 %
CO -2.40PPM
O2 20.975 %
00000000000
6.0
196:09:38:00

CO2 0.1125 %
CO -2.60PPM
O2 20.982 %
00000000000
6.0
196:09:45:00

CO2 0.1125 %
CO -2.60PPM
O2 20.965 %
00000000000
6.0
196:09:30:00

CO2 0.1110 %
CO -2.40PPM
O2 20.962 %
00000000000
6.0
196:09:37:00

CO2 0.1050 %
CO -2.60PPM
O2 20.980 %
00000000000
6.0
196:09:44:00

CO2 0.1170 %
CO -2.40PPM
O2 20.952 %
00000000000
6.0
196:09:29:00

CO2 0.1245 %
CO -2.40PPM
O2 20.955 %
00000000000
6.0
196:09:36:00

CO2 0.0990 %
CO -2.60PPM
O2 20.985 %
00000000000
6.0
196:09:43:00

CO2 0.1005 %
CO -2.60PPM
O2 20.967 %
00000000000
6.0
196:09:28:00

CO2 0.1380 %
CO -2.40PPM
O2 20.965 %
00000000000
6.0
196:09:35:00

CO2 0.1275 %
CO -2.60PPM
O2 20.967 %
00000000000
6.0
196:09:42:00

CO2 0.1050 %
CO -2.60PPM
O2 20.957 %
00000000000
6.0
196:09:27:00

CO2 0.1095 %
CO -2.60PPM
O2 20.982 %
00000000000
6.0
196:09:34:00

CO2 0.1260 %
CO -2.60PPM
O2 20.977 %
00000000000
6.0
196:09:41:00

CO2 -0.1170 %
CO -2.40PPM
O2 20.995 %
0000000000
6.0
196:09:54:00

CO2 0.1020 %
CO -2.40PPM
O2 20.997 %
0000000000
6.0
196:09:53:00

CO2 0.1005 %
CO -2.40PPM
O2 20.995 %
0000000000
6.0
196:09:52:00

CO2 0.0975 %
CO -2.40PPM
O2 20.992 %
0000000000
6.0
196:09:51:00

CO2 0.1005 %
CO -2.40PPM
O2 20.992 %
0000000000
6.0
196:09:50:00

CO2 0.1080 %
CO -2.40PPM
O2 20.992 %
0000000000
6.0
196:09:49:00

CO2 0.1140 %
CO -2.40PPM
O2 20.990 %
0000000000
6.0
196:09:48:00

6.0
196:09:58:00

CO2 0.1095 %
CO -2.60PPM
O2 20.992 %
0000000000
6.0
196:09:57:00

CO2 0.0945 %
CO -2.60PPM
O2 20.990 %
0000000000
6.0
196:09:56:00

CO2 0.0960 %
CO -2.60PPM
O2 20.987 %
0000000000
6.0
196:09:55:00

APPENDIX B

SCOTT-MARRIN, INC.

2001 THIRD ST., UNIT 1

RIVERSIDE, CALIFORNIA 92507

REPORT OF ANALYSIS

CUSTOMER ORDER NUMBER: 3929

<hr style="border-top: 1px dashed black;"/>	
CYLINDER NUMBER <u>JJ21139</u>	CYLINDER NUMBER _____
COMPONENT	CONCENTRATION(v/v)
Oxygen	12.37 ± 0.12 mole-%
Carbon Dioxide	5.91 ± 0.06 mole-%
Nitrogen	Balance

COMPONENT	CONCENTRATION(v/v)
Replicate 4/21/89	12.36 mole-%
Analysis	12.38 mole-%
Data On	<u>12.36 mole-%</u>
O ₂ : Mean	12.37 mole-%
Expiration Date O ₂ : 10/21/89	

Cylinder Pressure: 2000 psig

<hr style="border-top: 1px dashed black;"/>	
CYLINDER NUMBER <u>JJ21139</u>	CYLINDER NUMBER _____
COMPONENT	CONCENTRATION(v/v)
Replicate 4/21/89	5.91 mole-%
Analysis	5.91 mole-%
Data On	<u>5.92 mole-%</u>
CO ₂ : Mean	5.91 mole-%
Expiration Date CO ₂ : 10/21/89	

<hr style="border-top: 1px dashed black;"/>	
CYLINDER NUMBER <u>JJ21139</u>	CYLINDER NUMBER _____
COMPONENT	CONCENTRATION(v/v)
<p>(The Oxygen analysis was performed in accordance with Section 3.0.4 of the revised) (EPA traceability protocol No. 1 dated June 9, 1987. The analysis is traceable to) (the National Bureau of Standards by direct intercomparison with GMIS, cylinder) (number FF4634 at 9.67 mole-% Oxygen in Nitrogen. The analysis was performed) (using a Varian Model 1860 gas chromatograph with thermal conductivity detection.) (The last multipoint calibration was performed 4/6/89.)</p>	

<hr style="border-top: 1px dashed black;"/>	
CYLINDER NUMBER <u>JJ21139</u>	CYLINDER NUMBER _____
COMPONENT	CONCENTRATION(v/v)
<p>(The Carbon Dioxide analysis was performed in accordance with Section 3.0.4 of the) (revised EPA traceability protocol No. 1 dated June 9, 1987. The analysis is) (traceable to the National Bureau of Standards by direct intercomparison with GMIS,) (cylinder number 3L9002 at 7.34 mole-% Carbon Dioxide in Nitrogen. The analysis) (was performed using a Varian Model 1860 gas chromatograph with thermal conductivity) (detection. The last multipoint calibration was performed 4/7/89.)</p>	

GAS METER CALIBRATION

Meter No. 87
 Barometric Pressure 29.92
 Date: January 4, 1989 Calibrated by: Ty

Orifice	Standard Meter		Temp F	Test Meter		Temp F	Time Min	V	Delta H
	Start	Finish		Start	Finish				
0.52	115.870	119.866	62	298.481	302.550	61	10	0.979	1.80
0.52	119.866	123.967	62	302.550	306.632	61	10	1.001	1.71
1.00	124.200	129.686	62	306.866	312.554	61	10	0.960	1.84
1.00	129.686	135.358	63	312.554	318.230	62	10	0.995	1.73
2.00	135.468	143.437	63	318.440	326.390	64	10	0.999	1.74
2.00	143.437	151.324	63	326.390	334.350	65	10	0.990	1.77
Average								0.987	1.77

TS # 1

Digital Thermometers Calibration

Date: 11-30-88

by: Ty Hastriter

Instrument: Thermocouple Thermometer

Calibrator Temperature Digital Thermonmeter Difference

50	47	
60		
100	97	
250	250	
300	300	
350	349	
400	399	
450	448	
500	499	
550	548	
600	597	
650		
700		
750	648	
800	697	
850	747	
900	797	
950	848	
1000	898	
	948	
	999	

APPENDIX C

Nomenclature

P_b	Barometric Pressure, in. Hg.
P_m	Average Orifice Pressure Drop, in. Hg.
T_m	Average Dry Gas Meter Temperature, °F.
V_m	Volume of Dry Gas Sampled at Meter Conditions, ft ³
$V_{m_{std}}$	Volume of Dry Gas Sampled at Standard Conditions (1), ft ³
V_w	Total H ₂ O Collected in Impingers and Silica Gel, ml
$V_{w_{std}}$	Volume of Water Vapor Collected at Standard Conditions (1), ft ³
%M	Percent Moisture in Stack Gas, by Volume
M_d	Mole Fraction Dry Stack Gas
%CO ₂	Percent CO ₂ by volume, dry
%O ₂	Percent O ₂ by volume, dry
%CO	Percent CO by volume, dry
%N ₂	Percent N ₂ by volume, dry
MW_d	Molecular Weight of Dry Stack Gas, gm/gm-mole
MW	Molecular Weight of Wet Stack Gas, gm/gm-mole
MW_c	Molecular Weight of Chemical
C_p	Pitot Tube Coefficient
P_s	Stack Gas Pressure, in. Hg., absolute
PPM	Parts per million
T_s	Stack Gas Temperature, °F
T_s	Average Stack Gas Temperature, °F
T_{std}	Standard Temperature, °F

P Velocity head, in. H₂O
 V_s Average Stack Gas Velocity, Stack Conditions, ft/sec
 A_s Stack Area, ft²
 Q_s Stack Gas Flow Rate at Standard Conditions (1), dry ft³/min
 Q_a Stack gas flow rate at stack conditions, ft³/min
 T_t Net time of test min.
 D_n Sampling nozzle diameter, in.
 %I Percent isokinetic
 M_f Particulate collected in probe, cyclone and filter, mg.
 M_t Total particulate collected mg.
 I_c Percent of particulate caught in impingers
 C_{sf} Particulate concentrations at standard conditions (1), dry, based on probe, cyclone and filter catch, GRS/SDCF
 C_{st} Particulate concentration at standard conditions (1), dry based on total catch, GRS/SDCF
 E_f Particulate emission rate, based on probe, cyclone and filter catch, lbs/hr
 E_t Particulate emission rates based on total particulate catch, lbs/hr
 P_u Unit process rate
 PE_f Particulate emission rate on a process basis, probe, cyclone and filter catch
 PE_t Particulate emission rate on a process basis, total catch
 %EA Percent excess air in stack gas

Calculations

1. Volume of water vapor at standard conditions (1)

$$V_{w_{std}} = .00267 \times \frac{460 + T_{std}}{29.92} \times V_{lc}$$

2. Volume of dry gas sampled at standard conditions (1)

$$V_{m_{std}} = 17.64 \times \frac{V_m (P_b + P_m)}{(T_m + 460)}$$

3. Percent moisture in stack gas by volume

$$\%M = \frac{100 \times V_{w_{std}}}{V_{w_{std}} + V_{m_{std}}}$$

4. Mole fraction dry stack gas

$$M_s = \frac{100 - \%M}{100}$$

5. Molecular weight of dry stack gas (gm/gm - Mole)

$$MW_d = \left[(\% CO_2 \times .44) + (\% O_2 \times .32) + (\% N_2 \times .28) + (\% CO \times .28) + \right. \\ \left. (\% \text{ Additional Gas} \times MW \text{ of Additional Gas}) \right]$$

6. Molecular weight of wet stack gas (gm/gm - Mole)

$$MW = (18 \times B_{wo}) + [(1 - B_{wo}) \times MW_d]$$

7. Stack gas velocity at stack conditions (2), (ft/sec)

$$V_s = 85.49 \times CP \times \sqrt{\Delta p} \times \sqrt{\frac{(T_s + 460)}{M_s \times P_s}}$$

8. Stack gas volumetric flow rate at stack conditions

$$Q_a = V_s \times A_s \times 60$$

9. Stack gas volumetric flow rate at standard conditions (1)

$$Q_s = Q_a \times \frac{528}{460 + T_s} \times \frac{P_s}{29.92} \times (1.00 - B_{wo})$$

10. Percent isokinetic %I = $\left[\frac{(T_s + 460) \times V_{mstd}}{P_s \times V_s \times AN \times T_t \times (1-Bwo)} \right] \times 0.0945$

11. Particulate concentrations at standard conditions (1), dry, based on probe, cyclone and filter catch

$$C_{sf} = \frac{MF \times 15.43}{V_{mstd} \times 1000}$$

12. Particulate concentration at standard conditions (1), dry, based on total catch

$$C_{st} = \frac{M_t \times 15.43}{V_{mstd} \times 1000}$$

13. Particulate emission rate, based on probe, cyclone, and filter catch

$$E_f = \frac{MF \times 60 \times Q_s}{454000 \times (V_m(std))}$$

14. Particulate emission rate, based on total catch

$$E_t = \frac{M_t \times 60 \times Q_s}{454000 \times (V_m(std))}$$

15. Particulate emission rate on a process basis, probe, cyclone, and filter catch

$$PF_f = \frac{E_f}{P_u}$$

16. Particulate emission rate on a process basis, total catch

$$PE_t = \frac{E_t}{P_u}$$

17. Particulate emission rate, part per million

$$PPM = \frac{M_t}{V_{mstd}} \times \frac{863.3}{MW(c)}$$

- (1) Standard conditions: 68°, 29.92 "Hg

- (2) $\sqrt{\Delta P_s \times (T_s + 460)}$ is determined by averaging the square root of the product of the velocity head (ΔP_s) and the absolute stack temperature ($T_s + 460$) for each individual point

APPENDIX D
PROCESS DATA

ISOKINETIC DATA SHEET*

(continued)

INSTALLATION:

DATE:

LOCATION:

RUN NO.

STACK GAS MOLECULAR WEIGHT:

$$M_s = (1 - B_{wo}) [0.44 (\%CO_2) + 0.32 (\%O_2) + 0.28 (\%N_2 + \%CO)] + 18B_{wo}$$

$$= (0.502) [0.44(0) + 0.32(20.94) + 0.28(81.36)] + 18(0.498)$$

$$= 23.76 \text{ lb/lb mole wet}$$

STACK GAS VELOCITY:

$$V_{s,avg} = 85.48 C_o (\Delta P^{0.5})_{avg} \left(\frac{T_s}{P_s M_s} \right)^{0.5}$$

$$= 85.48 (0.83) (.471) \left(\frac{689}{(29.84)(23.76)} \right)^{0.5}$$

$$= 32.94 \text{ ft/sec}$$

STACK GAS FLOW RATE:

$$Q_s = \frac{63,529 (1 - B_{wo}) (V_{s,avg}) (A_p) (P_s)}{T_s} = \frac{63,529 (0.502) (32.94) (4.91) (29.84)}{689}$$

$$= 223,388 \text{ dscf/hr} = 3723 \text{ dscf/min}$$

PERCENT ISOKINETIC:

$$I = \frac{0.0945 (T_s) (V_{m,std})}{\Theta V_s P_s A_n (1 - B_{wo})}$$

$$= \frac{0.0945 (689) (28.790)}{(60) (32.94) (29.84) (.00059) (.502)}$$

$$= 106.2 \%$$

*Standard Temperature, 68°F (528°R)

*Standard Pressure, 29.92 in. H_g

ISOKINETIC DATA SHEET*

INSTALLATION: Eagle Snacks, Inc Visalia, CA
 LOCATION: Continuous Fryer & Kettle No. 6

DATE: May 31 / June 1
 1989
 RUN NO. 2

FROM FIELD DATA SHEET

$$C_p = 0.83 \quad T_s = 689 \quad A_s = 4.91 \quad v_m = 31.554 \quad P_{\text{bar}} = 29.85 \quad (\Delta p)^{0.5}_{\text{avg}} = .471$$

$$\Theta = 60 \quad T_m = \frac{573}{13.6} \text{ dm} \quad A_n = 0.00059 \quad \gamma_m = 0.98 \quad P_{\text{stat}} = -0.05 \quad \Delta H = 0.84$$

FROM PHYSICAL SCIENCE:

$$V_{lc} = 600 \quad M_n = - \quad \%CO_2 = 0 \quad \%O_2 = 20.94 \quad \%N_2 = 81.36 \quad \%CO = 0$$

PRESSURE CALCULATIONS:

$$P_m = P_{\text{bar}} + \frac{\Delta H}{13.6} = \left(\frac{29.85}{\text{dm}} \right) + \frac{(0.84)}{13.6} = 29.91 \text{ in. H}_g$$

$$P_s = P_{\text{bar}} + \frac{P_{\text{stat}}}{13.6} = \left(\frac{29.85}{\text{dm}} \right) + \frac{(-0.05)}{13.6} = 29.84 \text{ in. H}_g$$

DRY GAS VOLUME:

$$V_{m_{\text{nd}}} = \frac{17.65 V_m \gamma_m P_m}{T_m} = \frac{17.65 (31.554) (0.98) (29.91)}{(573)} = 28.490 \text{ scf}$$

MOISTURE CONTENT:

$$V_w = 0.04707 \times V_{lc} = 0.04707 \times 600 = 28.24$$

$$B_{wo} = \frac{V_{w_{\text{nd}}}}{V_{m_{\text{nd}}} + V_{w_{\text{nd}}}} = \frac{(28.24)}{(28.49) + (28.24)} = 0.498$$

*Standard Temperature, 68°F (528°R)

*Standard Pressure, 29.92 in. H_g

June 1, 1989

Visalia Eagle Smelter

No. 6. Kettle Fryer (Potato Chips) (Batch)

Run No	Start Time	Batch Size	Run Rate (lb/min)	Run Rate (lb/hr)	Oil Temperature (Inlet)	Oil Temperature (Outlet)	ESD Batch No	H ₂ O To Smelter (1/19)	Notes
6/1	1	0801	0851 (1:05)	68	349H	310 297 256 285	6.5	10	First Run 51 mm instead of plant time
		0904	0904 (1:04)	68	349H	310 296 257 285	6.5	10	11.17 plant (batch) time = 0810h
		0909	0909 (1:09)	68	349H	310 297 257 285	6.5	10	09 20 - stop delivery Tota time
		0924	0924 (1:24)	68	349H	310 297 257 285	6.5	10	no problem (5 min)
		0932	0932 (1:32)	68	349H	310 297 257 285	6.5	10	
		0941	0941 (1:41)	68	349H	310 297 257 285	6.5	10	
6/1	2	1001	1059 (1:59)	68	361H	310 294 251 285	6.8	10	all system in Fwd 5 mm of water
		1101	1101 (1:01)	68	361H	310 295 252 284	6.8	10	main supply disconnected
		1119	1121 (1:21)	68	361H	309 293 267 283	7.5	10	1137 Fwd 6mm
		1127	1127 (1:27)	68	361H	309 293 267 283	7.5	10	7 mm chnging no potatoes
		1141	1141 (1:41)	68	361H	309 293 267 283	7.5	10	7.5
		1152	1152 (1:52)	68	361H	309 293 267 283	7.5	10	7.5
		1158	1158 (1:58)	68	361H	309 293 267 283	7.5	10	7.5
		1210	1210 (1:10)	68	361H	309 293 267 283	7.5	10	7.5
		1219	1219 (1:19)	68	361H	309 293 267 283	7.5	10	7.5
		1308	1308 (1:08)	68	361H	309 293 267 283	7.5	10	7.5
6/1	3	1308	1308 (1:08)	68	480H	310 303 272 285	7.5	10	1137 Fwd 6mm
		1312	1312 (1:12)	68	480H	310 303 272 285	7.5	10	1137 Fwd 6mm
		1315	1315 (1:15)	68	480H	309 301 271 291	7.5	10	1137 Fwd 6mm
		1324	1324 (1:24)	68	480H	309 301 271 291	7.5	10	1137 Fwd 6mm
		1327	1327 (1:27)	68	480H	309 301 271 291	7.5	10	1137 Fwd 6mm
		1335	1335 (1:35)	68	480H	310 304 268 289	7.5	10	1137 Fwd 6mm
		1343	1343 (1:43)	68	480H	310 304 268 289	7.5	10	1137 Fwd 6mm
		1351	1351 (1:51)	68	480H	309 304 268 289	7.5	10	1137 Fwd 6mm
		1402	1402 (1:02)	68	480H	309 304 268 289	7.5	10	1137 Fwd 6mm
		1408	1408 (1:08)	68	480H	309 304 268 289	7.5	10	1137 Fwd 6mm

① No flow used. Only pressure gauge on top of hand.

① Tota's time
② Plant time

Continuing Potato Chip Fryer May/June 1985

Compliance Test

Visuals

Date	Time	R	Fryer, new potatoes Trough Wt	Fryer oil making Wt	Oil Temp @ 1000 Exc. (Wt)	Oil Temp @ 1000 Exc. (Wt)	Exh. Temp down % 75	Comments
5/31	09:30	1	58,950	1866	310	359	76	Thin potato chips (Rogalun) Involved Test: Final test took too high (2190) Plants were converted to test time on May 31st.
	09:50	1	62,990	2310	308	361	75	
	10:10	1	67,080	2657	304	360	75	
	10:30	1	71,140	2687	311	360	75	
5/31	11:55	2	88,456	3967	306	358	75	Thin potato chips (Rogalun) 13,230 <u>13,230</u>
	12:15	2	92,534	4241	307	355	75	
	12:35	2	96,814	4241	309	360	75	
	12:55	2	100,712	4587	306	359	75	
(5/31)	14:41	3	22,315	5439	307	357	75	Down 60 min chipman Testing stopped 14:59 Standing again (Fryer full) 15:08 Testing started 15:59 Budget potatoes chips 10,700 <u>10,700</u>
	14:52	3	24,575	434	304	361	75	
	16:00	3	26,057	661	309	359	75	
	16:20	3	30,270	1152	307	359	75	
5/31	16:42	3	34,777	1156	308	361	75	Budget potato chips 12,200 <u>12,200</u>
	16:45	3	35,612	227	310	362	75	
	17:26	4	43,330	650	308	362	75	
	17:46	4	47,410	457	306	361	75	
	18:08	4	51,482	841	312	362	75	
	18:21	4	55,550					

② Fryer dryness

③ H 100 dryness

④ Before shown in the
Total