Note: This material is related to a section in *AP42, 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 file number, the AP42 chapter and then the section. The file name "rel01_c01s02.pdf" would mean the file relates to AP42 chapter 1 section 2. The document may be out of date and related to a previous version of the section. The document has been saved for archival and historical purposes. The primary source should always be checked. If current related information is available, it will be posted on the AP42 webpage with the current version of the section.

9.5.3 Meat Rendering Plants

Total Hydrocarbon emissions of the blood drier stack

TRC Environmental Corporation for IBP, Inc. (Dakota City, NE)

September 1997

1996 (post section publication) source test data.

April 1, 1998

Mr. Dave Meirhenry
Air Quality Compliance Section
Nebraska Department of Environmental Quality
P. O. Box 98922
Lincoln, NE 68509-8922

RE: IBP, inc., Dakota City, Nebraska
Blood Drying System VOC Test Report

Dear Mr. Meirhenry:

This letter replaces my original letter dated February 13, 1998, for the blood drying system VOC test report for the above referenced facility. Please find enclosed a copy of that report. The testing was conducted on September 9, 1997, by TRC Environmental Corporation. Volatile organic carbon testing was completed per the Nebraska Compliance Sampling Methods and was approved through protocol submittals. As shown in the detailed testing report on page 3, the average VOC (Total Hydrocarbons as Methane) emission rate from the natural gas fired blood dryers is 0.132 lbs/hr as methane.

If you have any questions concerning the testing results or procedures used, please contact me at 402-241-3647 or you may contact Mr. Scott Miller, TRC Project Manager, at 630-810-1122.

Sincerely,

Rechelle Kruse

Rechelle Kruse
Air Pollution Control Engineer

Enclosure

c: Tom Trosper (without test report)
Angel Gogel (with test report)
Dallas Safriet (with test report)

RK98-465/DC-Stack Test

TRC Environmental Corporation

98207-E04-02

FINAL REPORT

TOTAL HYDROCARBON EMISSIONS OF THE BLOOD DRIER STACK

Prepared for

IBP, Inc.
Dakota City, Nebraska

Prepared by

TRC ENVIRONMENTAL CORPORATION
1307 Butterfield Road, Suite 420
Downers Grove, IL 60515
TELEPHONE (630) 810-1122
FACSIMILE (630) 810-1122

TRC Project No. 22214-0000-00004

DISCLAIMER

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LIST OF ACRONYMS AND ABBREVIATIONS

acfm	actual cubic feet per minute
afmp	actual feet per minute
CEM	continuous emission monitor
CEMS	continuous emission monitoring system
cf	cubic feet
CO_2	carbon dioxide
dscf	dry standard cubic feet
EPA	Environmental Protection Agency
• F	degrees Fahrenheit
ft	feet
in H_2O	inches of water
in Hg	inches of mercury
lb/hr	pounds per hour
O_2	oxygen
ppm (v)	parts per million volume
QA/QC	Quality Assurance/Quality Control
scfm	standard cubic feet per minute
THC	total hydrocarbons
TRC	TRC Environmental Corporation
VOC	volatile organic compound

PROGRAM SUMMARY

The IBP, Inc. facility located in Dakota City, Nebraska has a Blood Drier in their rendering operations. TRC Environmental Corporation (TRC) was contracted by IBP, Inc. to conduct VOC emissions emission rates testing on the Blood Drier. Testing was performed only after the Nebraska Environmental Protection Agency (NEPA) reviewed and approved the test protocol. The major objectives of the test program were to collect representative flue gas samples and determine the emission rates of volatile organic compounds (VOC's) at the Blood Drier.

TRC accomplished this objective through the use of acceptable protocols performed by trained and experienced staff. IBP, Inc. personnel were responsible for maintaining the proper operations during the emission test series. The emission test program was conducted on September 9,1997. The emission tests included sampling for total non-methane hydrocarbons (THC), volumetric flow rate, and moisture content of the Blood Drier flue gas following USEPA Methods 1 (sampling location selection), 2 (flow rate), 3 (CO_2 and O_2 for Molecular Weight), 4 (moisture), and 25A (Total Hydrocarbons and Methane).

SECTION I

INTRODUCTION

1.1 Project Scope

The IBP, Inc. facility operates a natural gas Blood Drier at its Dakota City, Nebraska facility. TRC Environmental tested the West Blood Drier exhaust gas before it tied in with the East Blood Drier, and any control devices.

TRC was contracted by IBP, Inc. to conduct total non-methane hydrocarbon emission testing. The major objective of the test program was to collect representative flue gas samples and determine emission rates of VOC's for the Blood Drier. Three 1-hour tests were conducted on the exhaust gas. Flow rates, CO_2 and Q for molecular weight, and moisture was performed simultaneously with the THC testing.

1.2 Sampling Locations

Sampling for THC was conducted on the Blood Drier exhaust. The inside stack dimensions were measured to be 22" x 18"; therefore, the stack area equals 396.0 square inches. Stack gas velocity, moisture, and volumetric flow rates were measured simultaneously with the THC sampling. The required number of sample points and the sample point locations for the velocity traverse were calculated according to 40 CFR Part 60, Appendix A, Method 1.

SECTION 2

SUMMARY OF RESULTS

On September 9, 1997, testing was conducted to determine emission rates of the Blood Drier at the IBP, Inc. plant in Dakota City, Nebraska. All testing was completed without incident in strict accordance with the approved source test protocol. Tests were not witnessed by a representative of the Nebraska EPA Air Pollution Control Division.

Table 2-1 summarizes the data collected on September 9, 1997 at the IBP, Inc. plant located in Dakota City, Nebraska.

Raw field data sheets are located in Appendix A, this includes CEM's data sheets, CEM's one minute averages, strip chart trending data, volumetric flow rate data sheets, and moisture data sheets.

Process data recorded by IBP, Inc. is located in Appendix B.

Equipment calibration data sheets are located in Appendix C.

Example calculations can be found in Appendix D.

All test procedures were conducted as stated in Section 3. No anomalous data is reported.

Table 2-1 Summary of Emission Test Data for the Emission rates of the Blood Drier

BLOOD DRIER EMISSION RATE RESULTS			
	TEST #1	**TEST #2**	**TEST #3**
Total Hydrocarbons Lbs/Hr as Methane	.150	.113	.134

AVG = .132 lbs/hr as methane

SECTION 3

FIELD SAMPLING PROCEDURES

3.1 Field Sampling Summary

After consideration of the program requirements, TRC provided a team of two experienced professionals to conduct the field effort. The personnel and their responsibilities during this test program were as follows:

David A. Wells - Team Leader and Continuous Emission Monitoring (CEM) Operator
Thomas Lundin - Moistures and Volumetric Flow Rate Measurements

3.1.1 Pre-Sampling Preparation

Equipment was inspected for proper operation and durability prior to calibration. All calibrations were performed prior to and at the conclusion of the emissions test program as shown below:

- Pitot tubes (QA Handbook Section 3.12, pp. 1-13 and USEPA Reference Method 2) - measured for appropriate spacing and dimensions or calibrated in a wind tunnel. Rejection criteria given on the calibration sheet. Post-test check to inspect for damage.

- Thermocouples (QA Handbook Section 3.4,2,pp. 15-18) - verified against a mercury-in-glass thermometer at three points including the anticipated measurement range. Acceptance limits - impinger ±2• F; DGM ±5.4• F; stack ±1.5 percent of stack temperature.

- Field barometer (QA Handbook Section 3.4.2, pp. 18-19) - compared against a mercury-in-glass barometer or use the airport station's barometric pressure and correct for elevation. Acceptance criteria - ± 0.02 in. Hg; post-test check - same.

- Dry gas meters (QA Handbook Section 3.4.2, pp. 1-12 and USEPA Method 5 Section 5.3) - calibrated against a wet test meter. Acceptance criteria - pretest $Y_i = Y \pm 0.2$; post test $Y = \pm 0.05\ Y_i$.

3.2 Sampling Methods

3.2.1 Flow Rate Measurements

Velocity measurements at the sampling locations were made following EPA Reference Methods 1 and 2 simultaneously with the total hydrocarbon sampling. A Type-S pitot tube with an attached water manometer was used to measure the exhaust velocities at the sampling ports. An attached Type-K thermocouple with remote digimite was used to determine gas temperature.

3.2.2 CO_2 and O_2 Measurement

Tedlar Bag® flue gas samples were taken concurrently with the VOC sampling. A Fyrite analyzer was used to determine percent by volume of O_2 and CO_2.

3.2.3 Moisture Measurement

Moisture was measured simultaneously on the exhaust using the impinger train technique stated in USEPA Method 4 for each test run. After completion of each test run the volumes of the first, second, and third impingers were measured and recorded. The silica gel from the last impinger was returned to its original container and weighed to obtain a final weight.

3.2.4 Total Hydrocarbons

TRC conducted total hydrocarbons (THC) monitoring at the Blood Drier following (USEPA RM25A). TRC followed procedures outlined in the EPA publication 340/1-83-016 regarding setup and operation of its THC analyzer.

The THC analyzer system consists of three subsystems: sample acquisition, sample analysis, and a data acquisition system. The sample acquisition sample line is designed to deliver a representative sample of the stack gas stream to the sample analysis subsystem. A heat traced sample line was used to eliminate in-line condensation prior to the THC analyzer.

Sample analysis was achieved using a JUM VE-7 total hydrocarbon analyzer. Accurate interpretation of each analyzers response requires the systematic calibration of the instrument against gases of known concentrations. A calibration equation is determined from a linear regression of known gas concentrations versus instrument response. The equation used to convert instrument signal to concentration units follows:

$$\text{Concentration} = m\,(\text{response}) + b$$

where: m = slope of calibration curve
response = instrument signal (volts)
b = y-intercept of calibration curve

The data acquisition subsystem consists of an ESC 8800 Datalogger and an Esterline Angus strip chart recorder. The average total hydrocarbon concentration for each test run was calculated from average measurements recorded at one-minute intervals over the entire duration of each test run. Once the THC system was set up it was connected to a power source and brought on line. Sample line and signal wires were run between the sampling and THC system location, and the sample probe was selected and placed in the stack facing away from the gas stream.

The initial phase of the instrumental analysis method required the calibration of the THC analyzer system. Prior to the start of the first test run, system calibration using zero and an upscale propane in nitrogen gas was performed. Following these initial system checks, further calibrations were performed at the end of each test run using a zero and an upscale propane in nitrogen gas.

3.2.5 Methane

TRC conducted total hydrocarbons (THC) monitoring at the Blood Drier following (USEPA RM25A). TRC followed procedures outlined in the EPA publication 340/1-83-016 regarding setup and operation of its Methane analyzer.

The methane analyzer system consists of three subsystems: sample acquisition, sample analysis, and a data acquisition system. The sample acquisition sample line is designed to deliver a representative sample of the stack gas stream to the sample analysis subsystem. A heat traced sample line was used to eliminate in-line condensation prior to the methane analyzer.

Sample analysis was achieved using a California Analytical 300M-HFID methane analyzer. Accurate interpretation of each analyzers response requires the systematic calibration of the instrument against gases of known concentrations. A calibration equation is determined from a linear regression of known gas concentrations versus instrument

The data acquisition subsystem consists of an ESC 8800 Datalogger and an Esterline Angus strip chart recorder. The average methane concentration for each test run was calculated from average measurements recorded at one-minute intervals over the entire duration of each test run. Once the methane system was set up it was connected to a power source and brought on line. Sample line and signal wires were run between the sampling and methane system location, and the sample probe was selected and placed in the stack facing away from the gas stream.

The initial phase of the instrumental analysis method required the calibration of the methane analyzer system. Prior to the start of the first test run, system calibration using zero, high, mid, and low range methane gasses was performed. Following these initial system checks, further calibrations were performed at the end of each test run using a zero and high range methane in air gas.

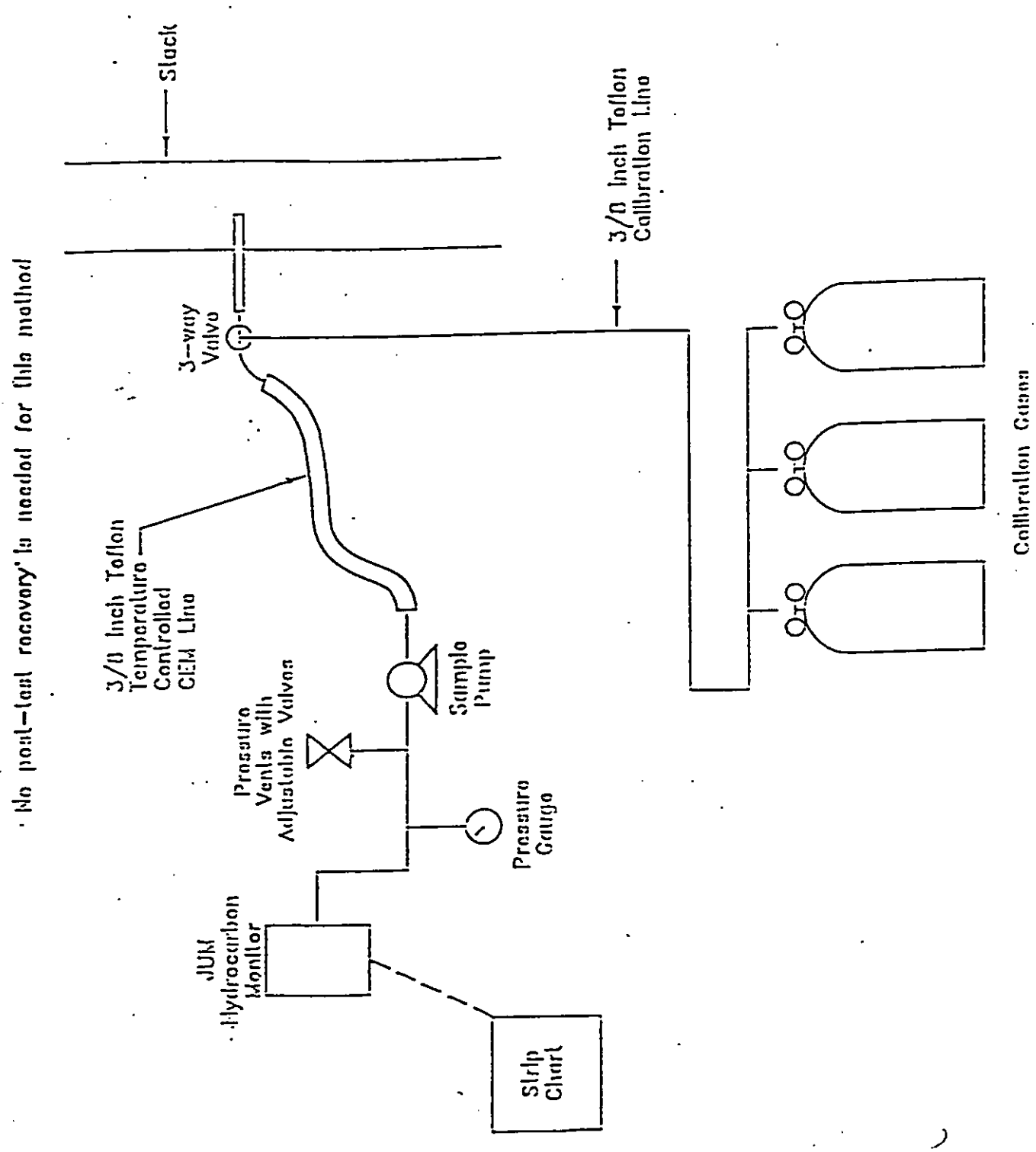

Figure 3-1 Method 25A Sampling Train

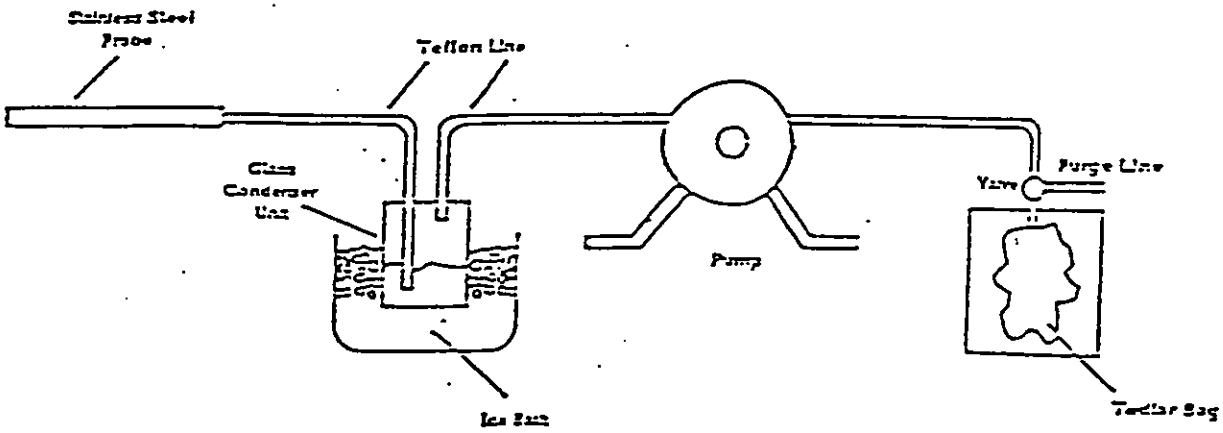

Figure 3-2 Method 2 and 4 Sampling

SECTION 4
DATA REPORTING

4.1 Data Reporting

A flow chart depicting the measurement data reporting scheme is shown in Figure 4-1. Figure 4-2 presents the analytical data validation and reporting scheme routinely used at TRC.

All data was reported in standard units depending on the measurement and the ultimate use of the data. The bulk of the data was computer processed and reported as follows:

- Gas Properties:
  - a. Moisture %
  - b. Flow rate, dscfm and acfm
  - c. Pressure, in. Hg
  - d. Temperature, • F

- ppmv Total non-methane Hydrocarbons:
- lbs/hr as Methane.

Results of the testing conducted at the IBP plant on the Blood Drier are contained in Table 4-1.

Table 4-1. Test Results - Blood Drier

IBP Dakota City Neb. Blood Drier (West)

Run No.	1	2	3	
Date	Sept 9, 1997	Sept 9, 1997	Sept 9, 1997	
Start Time	19:21	20:46	21:58	
Stop Time	20:31	21:48	23:02	AVERAGES
Barometric Pressure, in. Hg	29.20	29.20	29.20	29.20
Net Sampling Time, minutes	30.0	30.0	30.0	30.0
Volume Metered, cf	23.239	24.22	24.22	23.890
Avg. DGM Temp, F	79.2	84.30	87.20	83.6
AVG Delta H, in of H2O	2.00	2.00	2.00	2.00
AVG Delta H, in of Hg	0.1471	0.1471	0.1471	0.1471
DGM Calibration Factor	1.002	1.002	1.002	1.002
Volume of Gas Collected, dscf	22.358	23.079	22.958	22.799
Total Water Collected, mL	72.5	72.0	75.0	73.2
Volume of Water Vapor, scf	3.418	3.395	3.536	3.450
Moisture, %	13.3	12.8	13.3	13.1
Dry Mole Fraction, 100-%M	0.8674	0.8718	0.8665	0.8686
CO2 at Stack, % dry	0.7	0.9	1.0	0.9
O2 at Stack, % dry	20.2	20.2	20.0	20.1
CO + N2, % dry	79.1	78.9	79.0	79.0
Dry Molecular Weight, lb/lb mole	28.92	28.95	28.96	28.94
Wet Molecular Weight, lb/lb mole	27.47	27.55	27.50	27.51
Stack Diameter, in	22" x 18"	22" x 18"	22" x 18"	
Stack Area, sq. in. (@ pitot meas. location)	396.0	396.0	396.0	396.0
Static Pressure, in. of H2O	1.90	2.00	2.00	1.97
Stack Pressure, in. of Hg	29.34	29.35	29.35	29.34
Avg. Stack Temp., F	212.2	212.2	211.8	212.1
Avg. Sqroot of Delta P	0.9547	0.9655	0.9562	0.9588
SDE Average	24.752	25.032	24.784	24.856
Pitot Coefficient	0.84	0.84	0.84	0.84
Stack Gas Velocity, afpm	3757.0	3793.8	3759.6	3770.1
Stack Flowrate, wet acfm	10,332	10,433	10,339	10,368
Stack Flowrate, dry scfm	6,903	7,007	6,906	6,939
Stack Flowrate, dry scf/hr	414,159	420,434	414,383	
Stack Flowrate, wet scf/hr	4.7748E+05	4.8228E+05	4.7821E+05	
Total Hydrocarbons ppmv as CH4	8.76	6.46	7.81	7.68
Total Hydrocarbons Lb/Hr as CH4	0.150	0.113	0.134	0.132

Calculations

Analyte	CH4	CH4	CH4
FWhc lbs/lb-mole	16.01	16.01	16.01
Stack Flowrate, dry scf/hr	414,159	420,434	414,383
Moisture, %	13.3	12.8	13.3
Cppmv	13.78	7.91	11.65
Cppmv minus CH4	8.76	6.46	7.81
Hydrocarbons Emissions (lbs/hr)	0.150	0.113	0.134

Lbs/Hr = Cppmv minus CH4 * FWhc * (Stack Flowrate(dscf/hr) / 60) * (1.554 * 10^-7)

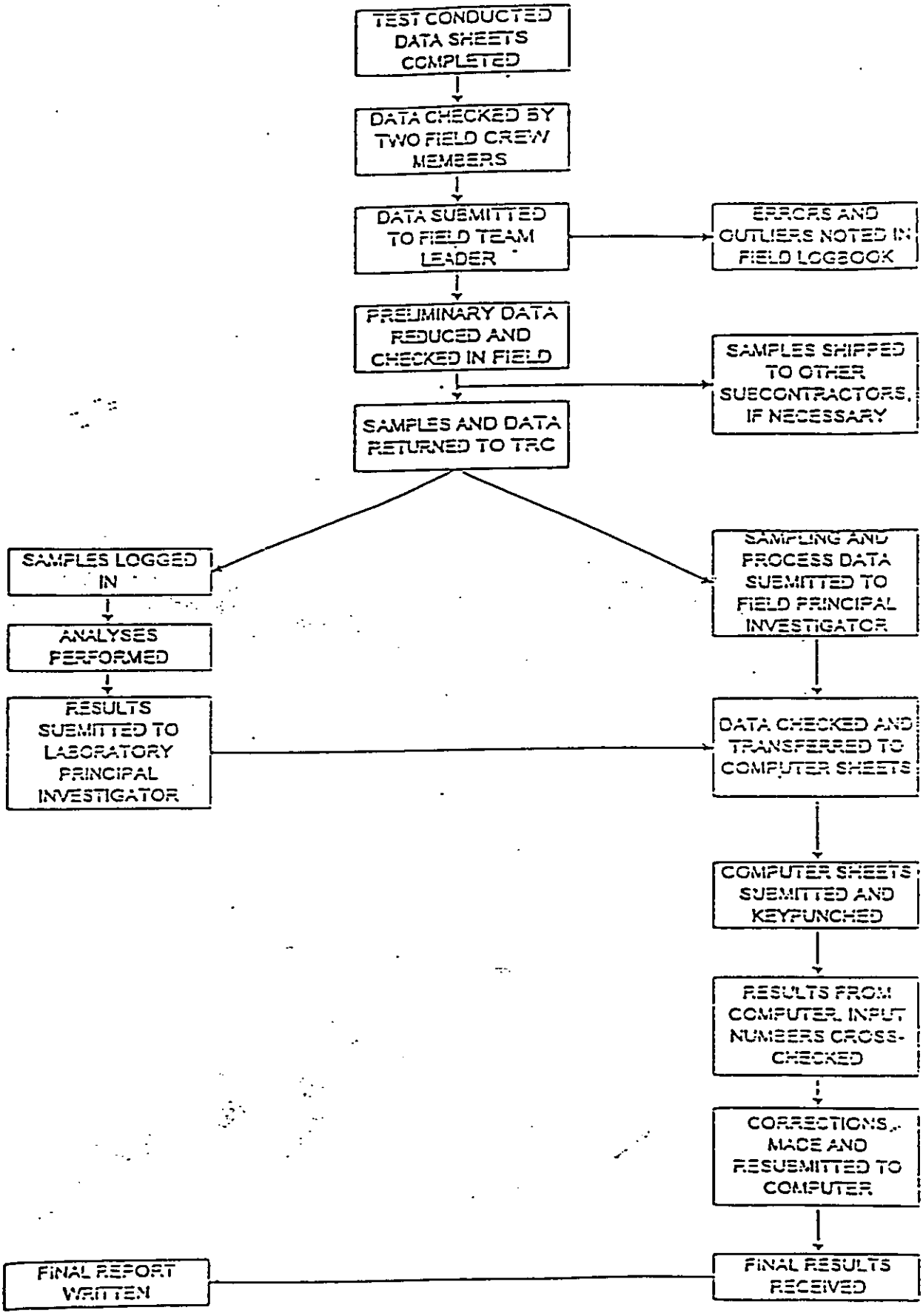

Figure 4-1. Measurement Data Flow Scheme

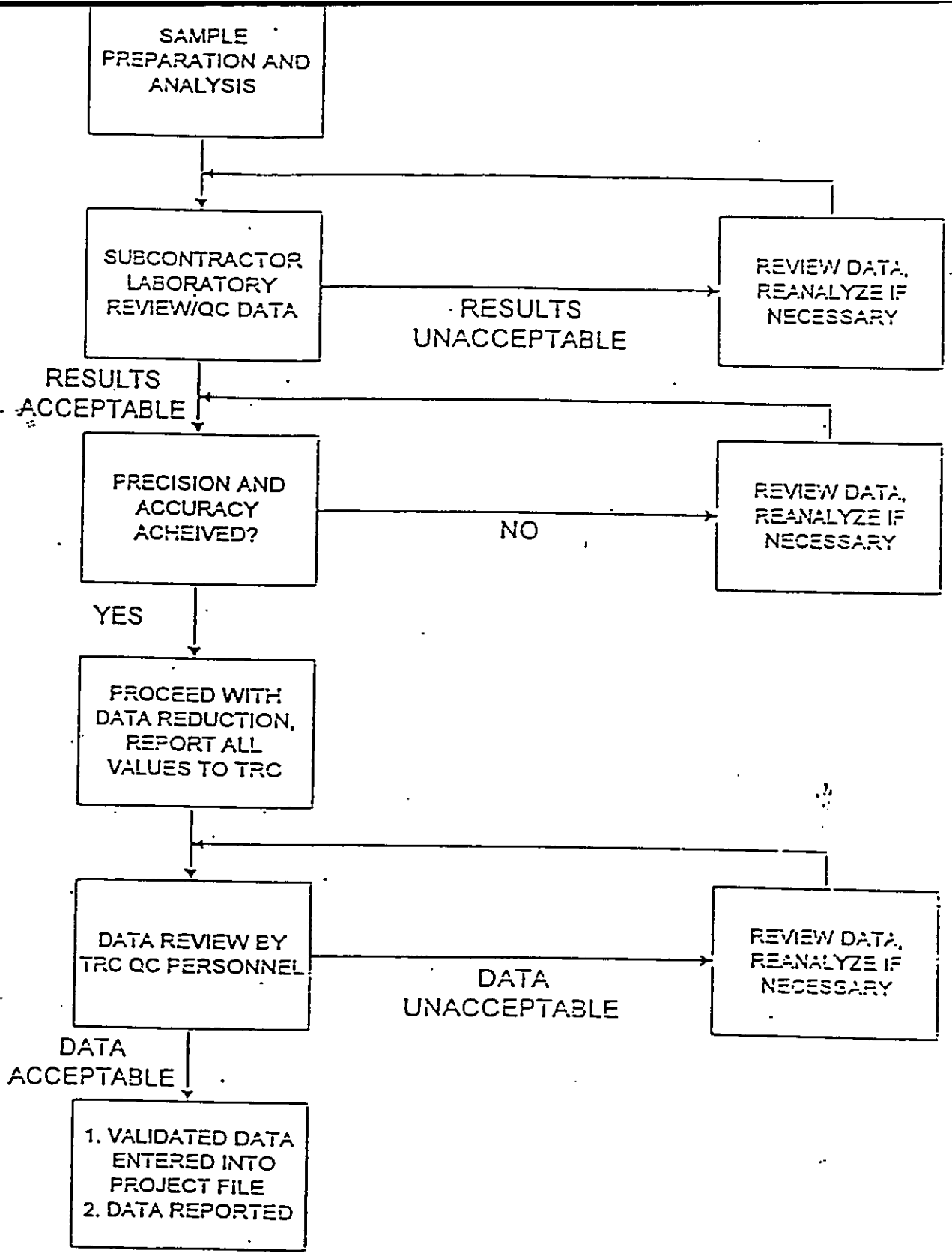

Figure 4-2. Analytical Data Report Scheme

APPENDIX A

RAW FIELD DATA SHEETS AND DATA LOGGER PRINTOUTS

IBP Dakota City Neb. Blood Drier (West)

Run No.	1	2	3	
Date	Sept 9, 1997	Sept 9, 1997	Sept 9, 1997	
Start Time	19:21	20:46	21:58	
Stop Time	20:31	21:48	23:02	AVERAGES
Barometric Pressure, in. Hg	29.20	29.20	29.20	29.20
Net Sampling Time, minutes	30.0	30.0	30.0	30.0
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DGM Calibration Factor	1.002	1.002	1.002	1.002
Volume of Gas Collected, dscf	22.358	23.079	22.958	22.799
Total Water Collected, mL	72.5	72.0	75.0	73.2
Volume of Water Vapor, scf	3.418	3.395	3.536	3.450
Moisture, %	13.3	12.8	13.3	13.1
Dry Mole Fraction, 100-%M	0.8674	0.8718	0.8665	0.8686
CO2 at Stack, % dry	0.7	0.9	1.0	0.9
O2 at Stack, % dry	20.2	20.2	20.0	20.1
CO + N2, % dry	79.1	78.9	79.0	79.0
Dry Molecular Weight, lb/lb mole	28.92	28.95	28.96	28.94
Wet Molecular Weight, lb/lb mole	27.47	27.55	27.50	27.51
Stack Diameter, in	22" x 18"	22" x 18"	22" x 18"	
Stack Area, sq. in. (@ pitot meas. location)	396.0	396.0	396.0	396.0
Static Pressure, in. of H2O	1.90	2.00	2.00	1.97
Stack Pressure, in. of Hg	29.34	29.35	29.35	29.34
Avg. Stack Temp., F	212.2	212.2	211.8	212.1
Avg. Sqroot of Delta P	0.9547	0.9655	0.9562	0.9588
SDE Average	24.752	25.032	24.784	24.856
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Total Hydrocarbons ppmv as CH4	8.76	6.46	7.81	7.68
Total Hydrocarbons Lb/Hr as CH4	0.150	0.113	0.134	0.132

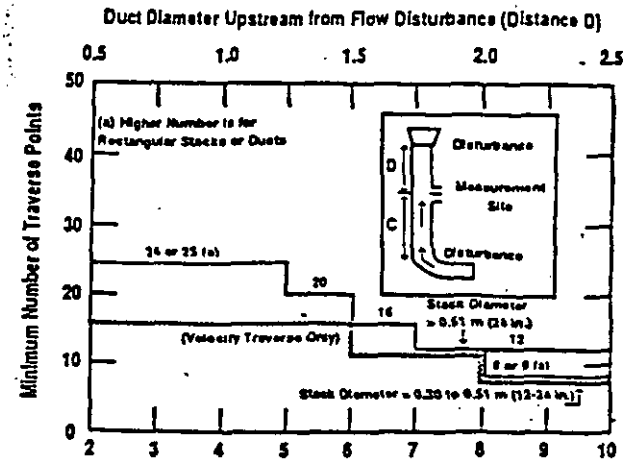
Calculations

Analyte	CH4	CH4	CH4
FWhc lbs/lb-mole	16.01	16.01	16.01
Stack Flowrate, dry scf/hr	414,159	420,434	414,383
Moisture, %	13.3	12.8	13.3
Cppmv	13.78	7.91	11.65
Cppmv minus CH4	8.76	6.46	7.81
Hydrocarbons Emissions (lbs/hr)	0.150	0.113	0.134

Lbs/Hr = Cppmv minus CH4 * FWhc * (Stack Flowrate(dscf/hr) / 60) * (1.554 * 10^-7)

Traverse Point Location for Circular and Rectangular Ducts

Project No.: 22214-0
Client: IBP DAKOTA CITY
Date: 9/9/97
Sampling Location: BLOOD DRYER
Internal Stack Diameter: 22 x 18
Nipple Length: —
Total Stack Diameter: —
Nearest Upstream Disturbance (C): 46"
Nearest Downstream Disturbance (D): 11"
Calculator: DW



Rectangular Duct Equivalent Diameter Determination = $\frac{2 \times L \times W}{L + W}$

Traverse Point Number	1 Fraction of Stack ID ($\frac{1}{100}$)	2 Stack ID	3 Traverse Point (1 x 2=Point)	4 Nipple Length	5 Traverse Point Inside of Far Wall to Outside of Port Nipple (3 + 4 = Point)
1	.125	18	2.25	—	2.25
2	.375		6.75		6.75
3	.625		11.25		11.25
4	.875		15.75		15.75
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					

Location of Traverse Points in Circular Stacks

	4	6	8	10	12	14	16	18	20	22	24
1	5.7	4.4	3.2	2.6	2.1	1.8	1.6	1.4	1.3	1.1	1.1
2	25.0	14.6	10.5	8.2	6.7	5.7	4.9	4.4	3.9	3.5	3.2
3	75.0	29.6	19.4	14.6	11.8	9.9	8.5	7.5	6.7	6.0	5.5
4	93.3	70.4	32.3	22.6	17.7	14.6	12.5	10.9	9.7	8.7	7.9
5		85.4	67.7	34.2	25.0	20.1	16.9	14.6	12.9	11.6	10.5
6		95.6	80.6	65.8	35.6	26.9	22.0	18.8	16.5	14.6	13.2
7			89.5	77.4	64.4	36.6	28.3	23.6	20.4	18.0	16.1
8			96.8	85.4	75.0	63.4	37.5	29.6	25.0	21.8	19.4
9				91.8	82.3	73.1	62.5	38.2	30.6	26.2	23.0
10				97.4	88.2	79.9	71.7	61.8	38.8	31.5	27.2
11					93.3	85.4	78.0	70.4	61.2	39.3	32.3
12					97.9	90.1	83.1	76.4	69.4	60.7	39.8
13						94.3	87.5	81.2	75.0	68.5	60.2
14						98.2	91.5	85.4	79.6	73.8	67.7
15							95.1	89.1	83.5	78.2	72.8
16							98.4	92.5	87.1	82.0	77.0
17								95.6	90.3	85.4	80.6
18								98.6	93.3	88.4	83.9
19									96.1	91.3	86.8
20									98.7	94.0	89.5
21										96.5	92.1
22										98.3	94.5
23											96.8
24											98.9

Location of Traverse Points in Rectangular Stacks

	2	3	4	5	6	7	8	9	10	11	12
1	25.0	16.7	12.5	10.0	8.3	7.1	6.3	5.6	5.0	4.5	4.2
2	75.0	50.0	37.5	30.0	25.0	21.4	18.8	15.7	15.0	13.6	12.5
3		83.3	62.5	50.0	41.7	35.7	31.3	27.8	25.0	22.7	20.8
4			87.5	70.0	58.3	50.0	43.8	38.9	35.0	31.8	29.2
5				90.0	75.0	64.3	56.3	50.0	45.0	40.9	37.5
6					91.7	78.6	68.8	61.1	55.0	50.0	45.8
7						92.9	81.3	72.2	65.0	59.1	54.2
8							93.8	83.3	75.0	68.2	62.5
9								94.4	85.0	77.3	70.8
10									95.0	85.4	79.2
11										95.5	87.5
12											95.8

TRC

Run 1

DATE:	Sept 9, 1997	CLIENT REP:	Rechelle Kruse
PLANT:	IBP	WITNESSED?:	yes
VOC TYPE	CH4	BURNER TYPE:	N/A
OPERATOR:	SM, DW	GENERATOR TYPE:	N/A
TEST LOCATION:	Blood Drier (W)	O2 GENERATOR TYPE:	N/A

CALIBRATION GASES

O2	CO2	CH4	SO2	NOx	THC outlet
0	0	0	0	0	0
N/A	N/A	29.12	N/A		30
N/A	N/A	47.83	N/A		59.67
		83.35			77.7

END TIME	SAMPLE POINT	O2 %	CO2 %	SO2 ppm	THC Outlet ppm	CH4 ppm	NOx ppm	COMMENTS a
19:21	1	20.2	0.7		14.301	4.984		
20:31								
	AVERAGES	20.2	0.7	ERR	14.30	4.984	ERR	

Barometric Pres: 29.2

EFFLUENT GAS CONCENTRATION, WET BASIS, PPM

	O2	CO2	SO2	THC Outlet	CH4	NOx
PRE ZERO	0		0	0.1	0.15	0
POST ZERO	0		0	0.9	0.05	0
ACT SPAN	N/A	N/A	N/A	77.7	29.12	N/A
PRE SPAN	0		0	77.6	29.2	0
POST SPAN	0		0	79	27.6	0
GAS CONC.	ERR	ERR	ERR	13.78	5.03	ERR

EFFLUENT GAS CONC CALCULATION

GAS CONC. = (Avg Stk Conc - Avg Zero Cal) * (Span Conc/(Avg Span Cal - Avg Zero Cal))

IBP DAKOTA CITY, NE
BLOOD DRIER
9/9/97

01 8.227 6.380
02 21.17 12.01
03 .3994 .3864
04 .0000D .0000D
05 .0000D .0000D
06 -.0014D -.0011D
07 0021D -.0017D

Tue - 09/09/97 DAY= 252 19:21:03 — START R1 BLOOD DRIER

01 13.79 8.227
02 40.95 21.17
03 .3813 .3994
04 .0000D .0000D
05 .0000D .0000D
06 -.0004D -.0014D
07 -.0011D -.0021D

Tue - 09/09/97 DAY= 252 19:22:03

01 10.44 13.79
02 29.39 40.95
03 .3810 .3813
04 .0000D .0000D
05 .0000D .0000D
06 -.0007D -.0004D
07 -.0004D -.0011D

Tue - 09/09/97 DAY= 252 19:23:02

01 4.577 10.44
02 10.27 29.39
03 .3696 .3810
04 0000D .0000D
05 .0000D .0000D
06 -.0024D -.0007D
07 -.0011D -.0004D

Tue - 09/09/97 DAY= 252 19:24:02

01 4.280 4.577
02 9.838 10.27
03 .3673 .3696
04 .0000D .0000D
05 .0000D .0000D
06 -.0017D -.0024D
07 -.0014D -.0011D

Tue - 09/09/97 DAY= 252 19:25:02

01 4.121 4.280
02 9.605 9.838
03 .3737 .3673
04 .0000D .0000D
05 .0000D .0000D
06 -.0011D -.0017D
07 -.0014D -.0014D

Tue - 09/09/97 DAY= 252 19:26:02

01 923 4.121 49.358
02 .74 9.605 131.963
03 .3575 .3737
04 .0000D .0000D
05 .0000D .0000D
06 -.0007D -.0011D
07 -.0011D -.0014D

```
02  12.30    10.74
03  .3893    .3575
04  .0000D   .0000D
05  .0000D   .0000D
06 -.0014D -.0007D
07 -.0011D -.0011D

T   - 09/09/97  DAY= 252 19:28:02

01  3.603    3.667
02  11.37    12.30
03  .3893    .3893
04  .0000D   .0000D
05  .0000D   .0000D
06 -.0007D -.0014D
07 -.0021D -.0011D

Tue - 09/09/97  DAY= 252 19:29:02

01  3.417    3.603
02  11.86    11.37
03  .3830    .3893
04  .0000D   .0000D
05  .0000D   .0000D
06 -.0007D -.0007D
07 -.0031D -.0021D

Tue - 09/09/97  DAY= 252 19:30:02

01  3.306    3.417
02  13.03    11.86
03  .3754    .3830
04  .0000D   .0000D
05  .0000D   .0000D
06  .0014D -.0007D
07  .0004D -.0031D

Tue - 09/09/97  DAY= 252 19:31:02

01  3.205    3.306
02  14.66    13.03
03  .3669    .3754
04  .0000D   .0000D
05  .0000D   .0000D
06 -.0021D -.0014D
07 -.0011D -.0004D

Tue - 09/09/97  DAY= 252 19:32:02

01  3.050    3.205
02  12.86    14.66
03  .3727    .3669
04  .0000D   .0000D
05  .0000D   .0000D
06 -.0004D -.0021D
07 -.0004D -.0011D

Tue - 09/09/97  DAY= 252 19:33:02

01  2.859    3.050    72.465
02  13.67    12.86    221.713
03  .3566    .3727
04  .0000D   .0000D
05  .0000D   .0000D
06 -.0014D -.0004D
07 -.0017D -.0004D

Tue - 09/09/97  DAY= 252 19:34:03
```

```
04   .0000D   .0000D
05   .0000D   .0000D
06  -.0011D  -.0014D
07  -.0011D  -.0017D

Tue - 09/09/97  DAY= 252 19:35:02

01    .852    3.643
02   14.46    13.56
03   .3646    .3659
04   .0000D   .0000D
05   .0000D   .0000D
06  -.0017D  -.0011D
07  -.0014D  -.0011D

Tue - 09/09/97  DAY= 252 19:36:02

01   3.954    3.852
02   15.87    14.46
03   .3361    .3646
04   .0000D   .0000D
05   .0000D   .0000D
06  -.0017D  -.0017D
07  -.0014D  -.0014D

Tue - 09/09/97  DAY= 252 19:37:02

01   4.207    3.954
02   17.69    15.87
03   .3541    .3361
04   .0000D   .0000D
05   .0000D   .0000D
06  -.0007D  -.0017D
07  -.0007D  -.0014D

Tue - 09/09/97  DAY= 252 19:38:02

01   4.632    4.207
02   19.00    17.69
03   .3629    .3541
04   .0000D   .0000D
05   .0000D   .0000D
06   .0000D  -.0007D
07  -.0007D  -.0007D

Tue - 09/09/97  DAY= 252 19:39:02

01   5.067    4.632
02   20.70    19.00
03   .3456    .3629
04   .0000D   .0000D
05   .0000D   .0000D
06  -.0014D   .0000D
07  -.0011D  -.0007D

Tue - 09/09/97  DAY= 252 19:40:02

01   5.053    5.067      102.873
02   19.44    20.70      342.433
03   .3720    .3456
04   .0000D   .0000D
05   .0000D   .0000D
06   .0007D  -.0014D
07  -.0007D  -.0011D

Tue - 09/09/97  DAY= 252 19:41:02

01   5.039    5.053
```

06 -.0014D -.0007D
07 -.0014D -.0007D

Tue - 09/09/97 DAY= 252 19:42:02

01 4.938 5.039
02 18.68 19.06
03 3737 .3696
04 .0000D .0000D
05 .0000D .0000D
06 -.0017D -.0014D
07 -.0004D -.0014D

Tue - 09/09/97 DAY= 252 19:43:02

01 4.905 4.938
02 16.87 18.68
03 .3717 .3737
04 .0000D .0000D
05 .0000D .0000D
06 -.0004D -.0017D
07 -.0004D -.0004D

Tue - 09/09/97 DAY= 252 19:44:02

01 4.919 4.905
02 16.75 16.87
03 .3713 .3717
04 .0000D .0000D
05 .0000D .0000D
06 -.0004D -.0004D
07 -.0017D -.0004D

Tue - 09/09/97 DAY= 252 19:45:03

01 4.803 4.919
02 17.17 16.75
03 .3856 .3713
04 .0000D .0000D
05 .0000D .0000D
06 -.0011D -.0004D
07 -.0011D -.0017D

Tue - 09/09/97 DAY= 252 19:46:03

01 4.275 4.803
02 14.94 17.17
03 .3828 .3856
04 .0000D .0000D
05 .0000D .0000D
06 -.0011D -.0011D
07 -.0021D -.0011D

Tue - 09/09/97 DAY= 252 19:47:02

01 4.327 4.275
02 13.23 14.94
03 .3646 .3828
04 .0000D .0000D
05 .0000D .0000D
06 -.0014D -.0011D
07 0007D -.0021D

Tue - 09/09/97 DAY= 252 19:48:02

01 4.585 4.327 140.664
02 13.70 13.23 472.833
03 .3862 .3646

Tue - 09/09/97 DAY= 252 19:49:02

01	4.736	4.585
02	13.12	13.70
03	.3849	.3862
04	.0000D	.0000D
05	.0000D	.0000D
06	-.0014D	-.0011D
07	-.0017D	-.0007D

Tue - 09/09/97 DAY= 252 19:50:02

01	4.482	4.736
02	13.24	13.12
03	.3970	.3849
04	.0000D	.0000D
05	.0000D	.0000D
06	-.0004D	-.0014D
07	-.0007D	-.0017D

Tue - 09/09/97 DAY= 252 19:51:02

01	4.552	4.482
02	12.22	13.24
03	.4174	.3970
04	.0000D	.0000D
05	.0000D	.0000D
06	-.0007D	-.0004D
07	-.0007D	-.0007D

Tue - 09/09/97 DAY= 252 19:52:02

01	4.566	4.552
02	.944	12.22
03	.3815	.4174
04	.0000D	.0000D
05	.0000D	.0000D
06	-.0014D	-.0007D
07	-.0014D	-.0007D

Tue - 09/09/97 DAY= 252 19:53:02

01	4.497	4.566
02	9.532	9.944
03	.4007	.3815
04	.0000D	.0000D
05	.0000D	.0000D
06	-.0004D	-.0014D
07	-.0014D	-.0014D

Tue - 09/09/97 DAY= 252 19:54:03

01	4.623	4.497	168.12
02	9.375	9.532	540.264
03	.3856	.4007	
04	.0000D	.0000D	
05	.0000D	.0000D	
06	.0004D	-.0004D	
07	-.0011D	-.0014D	

Tue - 09/09/97 DAY= 252 19:55:02

01	4.919	4.623	
02	-1.801	9.375	FLAME OUT
03	.4059	.3856	
04	.0000D	.0000D	
05	.0000D	.0000D	

```
01   4.820    4.919
02  -13.93-  -1.801-
03   .3687    .4059
04  -.0011D   .0000D
05  -.0004D   .0000D
06  -.0014D  -.0004D
07   0007D   -.0007D

Tue - 09/09/97  DAY= 252 19:57:02

01   4.769    4.820
02  -2.104+  -13.93-
03   .3852    .3687
04   .0000D  -.0011D
05   .0000D  -.0004D
06  -.0011D  -.0014D
07  -.0000D  -.0007D

Tue - 09/09/97  DAY= 252 19:58:03

01   4.944    4.769
02   23.22+  -2.104+
03   .4009    .3852
04  -.0007D   .0000D
05  -.0007D   .0000D
06  -.0011D  -.0011D
07  -.0011D  -.0000D

Tue - 09/09/97  DAY= 252 19:59:02

01   4.837    4.944
02   6.419+   23.22+
03   .3985    .4009
04    0011D  -.0007D
05   .0011D  -.0007D
06   .0004D  -.0011D
07  -.0000D  -.0011D

Tue - 09/09/97  DAY= 252 20:00:03

01   4.852    4.837
02   17.10+   6.419+
03   .4052    .3985
04   .0008D  -.0011D
05   .0000D  -.0011D
06  -.0004D   .0004D
07  -.0011D  -.0000D

Tue - 09/09/97  DAY= 252 20:01:02

01   4.947    4.852
02   2.736+   17.10+
03   .4159    .4052
04  -.0025D   .0008D
05  -.0021D   .0000D
06  -.0011D  -.0004D
07  -.0000D  -.0011D

Tue - 09/09/97  DAY= 252 20:02:02

01   .921     4.947
02   6.74+    2.736+
03   .4301    .4159
04   .0011D  -.0025D
05  -.0000D  -.0021D
06  -.0000D  -.0011D
07  -.0014D  -.0000D
```

FLAME OUT 10 min 19:56 - 20:06

```
02  16.40+   16.74+
03  .4072    .4301
04 -.0028D   .0011D
05 -.0025D  -.0000D
06  .0004D  -.0000D
07 -.0000D  -.0014D

T   - 09/09/97  DAY= 252 20:04:02

01  4.789    4.915
02  26.37    16.40+
03  .2059    .4072
04 -.0018D  -.0028D
05 -.0031D  -.0025D
06 -.0004D   .0004D
07 -.0014D  -.0000D

Tue - 09/09/97  DAY= 252 20:05:02

01  4.747    4.789
02  14.89    26.37
03  .2426    .2059
04 -.0024D  -.0018D
05 -.0017D  -.0031D
06 -.0007D  -.0004D
07 -.0017D  -.0014D

Tue - 09/09/97  DAY= 252 20:06:02

01  4.716    4.747
02  16.92    14.89
03  .4326    .2426
04 -.0031D  -.0024D
05 -.0028D  -.0017D
06  .0011D  -.0007D
07  .0000D  -.0017D

Tue - 09/09/97  DAY= 252 20:07:02

01  4.667    4.716
02  17.01    16.92
03  .4144    .4326
04 -.0054D  -.0031D
05 -.0051D  -.0028D
06 -.0007D  -.0011D
07 -.0004D   .0000D

Tue - 09/09/97  DAY= 252 20:08:03

01  4.646    4.667
02  16.88    17.01
03  .4153    .4144
04 -.0034D  -.0054D
05 -.0034D  -.0051D
06 -.0011D  -.0007D
07 -.0004D  -.0004D

Tue - 09/09/97  DAY= 252 20:09:03

01  4.584    4.646
02  15.37    16.88
03  .3998    .4153
04  .0021D  -.0034D
05 -.0018D  -.0034D
06 -.0007D  -.0011D
07 -.0007D  -.0004D

Tue - 09/09/97  DAY= 252 20:10:02
```

FLAME OUT RELIGHT

191.48
621.334

04 -.0054D -.0021D
05 -.0054D -.0018D
06 -.0011D -.0007D
07 -.0000D -.0007D

Tue - 09/09/97 DAY= 252 20:11:03

01 .649 4.700
02 14.69 14.68
03 .3947 .3817
04 -.0048D -.0054D
05 -.0051D -.0054D
06 -.0014D -.0011D
07 -.0004D -.0000D

Tue - 09/09/97 DAY= 252 20:12:03

01 4.743 4.649
02 14.05 14.69
03 .4130 .3947
04 -.0055D -.0048D
05 -.0041D -.0051D
06 -.0004D -.0014D
07 -.0014D -.0004D

Tue - 09/09/97 DAY= 252 20:13:02

01 4.934 4.743
02 13.85 14.05
03 .3981 .4130
04 -.0075D -.0055D
05 -.0062D -.0041D
06 .0007D -.0004D
07 -.0011D -.0014D

Tu - 09/09/97 DAY= 252 20:14:02

01 4.801 4.934
02 13.84 13.85
03 .3947 .3981
04 -.0031D -.0075D
05 -.0034D -.0062D
06 -.0011D .0007D
07 -.0011D -.0011D

Tue - 09/09/97 DAY= 252 20:15:02

01 5.023 4.801
02 13.92 13.84
03 .3984 .3947
04 -.0045D -.0031D
05 -.0051D -.0034D
06 -.0011D -.0011D
07 -.0014D -.0011D

Tue - 09/09/97 DAY= 252 20:16:02

01 4.989 5.023 225.319
02 12.57 13.92 718.934
03 .4404 .3984
04 -.0065D -.0045D
05 .0045D -.0051D
06 .0004D -.0011D
07 -.0004D -.0014D

Tue - 09/09/97 DAY= 252 20:17:02

01 5.294 4.989

06 -.0017D -.0004D
07 -.0021D -.0004D

Tue - 09/09/97 DAY= 252 20:18:02

01 5.159 5.294
02 8.987 8.709
03 3964 .3961
04 .0057D -.0092D
05 -.0051D -.0085D
06 -.0004D -.0017D
07 -.0011D -.0021D

Tue - 09/09/97 DAY= 252 20:19:03

01 5.559 5.159
02 10.46 8.987
03 .4363 .3964
04 -.0089D -.0057D
05 -.0085D -.0051D
06 -.0007D -.0004D
07 -.0007D -.0011D

Tue - 09/09/97 DAY= 252 20:20:02

01 5.372 5.559
02 9.974 10.46
03 .4265 .4363
04 -.0082D -.0089D
05 -.0092D -.0085D
06 -.0011D -.0007D
07 -.0024D -.0007D

Tue - 09/09/97 DAY= 252 20:21:02

01 .200 5.372
02 9.689 9.974
03 .4319 .4265
04 -.0082D -.0082D
05 -.0085D -.0092D
06 -.0000D -.0011D
07 -.0004D -.0024D

Tue - 09/09/97 DAY= 252 20:22:02

01 5.181 5.200
02 9.547 9.689
03 .4081 .4319
04 -.0071D -.0082D
05 -.0051D -.0085D
06 -.0007D -.0000D
07 -.0014D -.0004D

Tue - 09/09/97 DAY= 252 20:23:03

01 5.104 5.181
02 9.503 9.547
03 .4350 .4081
04 -.0048D -.0071D
05 -.0035D -.0051D
06 -.0011D -.0007D
07 -.0017D -.0014D

Tue - 09/09/97 DAY= 252 20:24:02

01 5.115 5.104 267.303
02 10.46 9.503 796.263
03 .4282 .4350

Tue - 09/09/97 DAY= 252 20:25:02

01	5.205	5.115
02	9.798	10.46
03	.4113	.4282
04	-.0082D	-.0119D
05	0075D	-.0102D
06	.0007D	-.0000D
07	-.0004D	-.0007D

Tue - 09/09/97 DAY= 252 20:26:02

01	5.230	5.205
02	9.872	9.798
03	.4067	.4113
04	-.0084D	-.0082D
05	-.0094D	-.0075D
06	.0004D	-.0007D
07	-.0011D	-.0004D

Tue - 09/09/97 DAY= 252 20:27:03

01	5.539	5.230
02	10.16	9.872
03	.4106	.4067
04	-.0085D	-.0084D
05	-.0109D	-.0094D
06	-.0024D	.0004D
07	-.0011D	-.0011D

VOC's	CH4
14.301	4.984

Tue - 09/09/97 DAY= 252 20:28:02

01	5.350	5.539
02	.693	10.16
03	3862	.4106
04	-.0075D	-.0085D
05	-.0072D	-.0109D
06	-.0024D	-.0024D
07	-.0017D	-.0011D

Tue - 09/09/97 DAY= 252 20:29:02

01	5.269	5.350
02	10.28	9.693
03	.3961	.3862
04	-.0102D	-.0075D
05	-.0085D	-.0072D
06	-.0021D	-.0024D
07	-.0011D	-.0017D

Tue - 09/09/97 DAY= 252 20:30:02

01	5.149	5.269	299.045 (60)
02	11.98	10.28+	858.046 (60)
03	.4099	.3961	
04	-.0109D	-.0102D	
05	-.0085D	-.0085D	
06	-.0011D	-.0021D	
07	-.0000D	-.0011D	

Tu - 09/09/97 DAY= 252 20:31:02

MOISTURE DETERMINATION

Plant Name: IBP DAKOTA CITY Unit: Blood Dryer	Ambient Temperature: 75 F
Date: 9/9/97	Barometric Pressure: (BP): 29.20 Elevation: ground
Sampling Location: Blood Dryer Elevation: 20'	Probe Length & Type: 8' SS
Run Number: 1	Meter Box Number: 1 Gamma: (Y): 1.0017
Operator: DW, TL Reviewer:	Leak Check: Pre-test: 0.001 Post-test: 0.001

Traverse Point Number	Elapsed Time	Clock Time	Gas Meter Reading (Ft³)	DELTA H (in H₂O)	Impinger Temperature (F°)	Gas Meter Temperature INLET °F	Gas Meter Temperature OUTLET °F	Pump Vacuum (Hg")
1	0	6:40 1840	246.985	2.0	65 F	77	74	10
			250.8	↓	61	78	77	10
	10		254.9		60	79	77	10
			258.8		58	82	78	10
	20		262.9		59	83	79	10
			266.8		62	83	80	10
	30	1910	270.224					
			Vm = 23.239	ΔH = 2.0		Avg.:	Avg.:	

T_m = 79.2

Analytical Data

	Impinger #1 Weight g	Impinger #2 Weight g	Impinger #3 Weight g	Silica Gel Weight g	
Final	132	120	2	215.5	69.5
Initial	100	100	—	200	
Net Gain	32 +	20 +	2 +	15.5 =	V_L (grams) Total

14.71%

Moisture Calculation:

Net volume of gas through dry gas meter at meter conditions = V_m = 23.239 cu. ft.

Average absolute meter temperature (T_m + 460) = 539.2 °R

$$\text{Percent moisture} = M = \frac{4.707\,(ml)}{.04707\,(ml) + \frac{17.64\,(Y)\,(Vm)\,(BP)}{(Tm + 460)}}$$

TRC

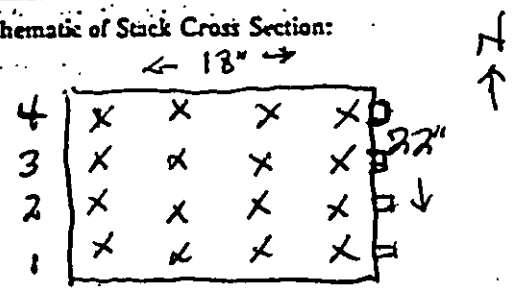
REF: CFR 60, App. A, Method 4

VELOCITY TRAVERSE

Plant: FBP / DAKOTA CITY, NB	Date: 9-9-97
Unit Number: BLOOD DRYER	Stack Diameter (in.): 22 x 18
Load Condition: Norm	Stack Gauge Pressure ("H_2O): (+) 1.9
Run No.: 1	Operators: DW / TL
Project No.: 22214 -	
Barometric Pressure at Ground Level ("Hg): 29.20	
Pitot Tube ID:	
Pitot Tube Coefficient: .84	
Estimated Stack CO_2%: CO_2 (.7) O%: (20.2) O_2 H_2O%:	
Platform Elevation (feet):	

Port Change Pitot Leak Check	Pass	Fail
Port #1	✓	—
Port #2	✓	—
Port #3	✓	—
Port #4	✓	—

Schematic of Stack Cross Section:



$\sqrt{\Delta P}$ AVG = .9547

Ts AVG = 212.2

.9639

	Traverse Point Number	Velocity Head (In H_2O)	Stack Temp. (F)
1	1	1.05	213
	2	1.20	213
	3	.97	214
	4	.95	211
2	1	.97	211
	2	.89	213
	3	.85	213
	4	.81	213
	Average:		

	Traverse Point Number	Velocity Head (In H_2O) INACCESSABLE	Stack Temp. (F)
3	1	NOT	
	2	ACCESSABLE	
	3	WITH PITOT	
	4		
4	1	.74	213
	2	.82	212
	3	.87	212
	4	.87	211
	Average:		

Reference: 40 CFR 60, Appendix A, Method 2

TRC

Run 2

DATE:	Sept 9, 1997	CLIENT REP:	Rechelle Kruse
PLANT:	IBP	WITNESSED?:	yes
VOC TYPE	CH4	BURNER TYPE:	N/A
OPERATOR:	SM, DW	GENERATOR TYPE:	N/A
TEST LOCATION:	Blood Drier (	O2 GENERATOR TYPE:	N/A

CALIBRATION GASES

O2	CO2	CH4	S02	NOx	THC outlet
0	0	0	0	0	0
N/A	N/A	29.12	N/A		30
N/A	N/A	47.83	N/A		59.67
		83.35			77.7

END TIME	SAMPLE POINT	O2 wet	CO2 %	SO2 ppm	THC Outlet ppm	CH4 ppm	NOx ppm	COMMENTS a
20:46	1	20.2	0.9		8.47	1.478		
21:48								
	AVERAGES	20.2	0.9	ERR	8.47	1.478	ERR	

Barometric Pres: 29.2

EFFLUENT GAS CONCENTRATION, WET BASIS, PPM

	O2	CO2	THC Inlet	THC Outlet	CH4	NOx
PRE ZERO	0		0	0.9	0.05	0
POST ZERO	0		0	0.2	0.13	0
ACT SPAN	N/A	N/A	N/A	30	29.12	N/A
PRE SPAN	0		0	29.8	27.6	0
POST SPAN	0		0	31.4	28.5	0
GAS CONC.	ERR	ERR	ERR	7.907	1.446	ERR

EFFLUENT GAS CONC CALCULATION

GAS CONC. = (Avg Stk Conc - Avg Zero Cal) * (Span Conc/(Avg Span Cal - Avg Zero Cal))

IBP DAKOTA CITY, NE
WEST BLOOD DRIER
9/9/97 VOC'S + CH4

```
01  1.419 - 1.369
02  7.636 - 5.573
03  .4181   .4099
04 -.0108D -.0099D
05 -.0077D -.0092D
06 -.0004D -.0014D
07  .0007D -.0014D

Tue - 09/09/97  DAY= 252 20:46:03 — START RZ

01  9.116 - 1.419
02  13.60 - 7.636
03  .4137   .4181
04 -.0095D -.0108D
05 -.0072D -.0077D
06 -.0011D -.0004D
07 -.0011D -.0007D

Tue - 09/09/97  DAY= 252 20:47:03

01  10.36 - 9.116
02  18.41 - 13.60
03  .4437   .4137
04 -.0086D -.0095D
05 -.0086D -.0072D
06 -.0004D -.0011D
07 -.0014D -.0011D

Tue - 09/09/97  DAY= 252 20:48:02

01  3.929 - 10.36
02  12.33 - 18.41
03  .4358   .4437
04  .0111D -.0086D
05  .0091D -.0086D
06 -.0021D -.0004D
07 -.0021D -.0014D

Tue - 09/09/97  DAY= 252 20:49:02

01  1.293 - 3.929
02  8.857 - 12.33
03  .4065   .4358
04 -.0116D -.0111D
05 -.0089D -.0091D
06 -.0007D -.0021D
07 -.0004D -.0021D

Tue - 09/09/97  DAY= 252 20:50:02

01  1.345 - 1.293
02  9.360 - 8.857
03  .4424   .4065
04 -.0082D -.0116D
05 -.0082D -.0089D
06 -.0011D -.0007D
07 -.0021D -.0004D

Tue - 09/09/97  DAY= 252 20:51:02

01  1.304 - 1.345   28.766
02  9.218 - 9.360   79.411
03  .4335   .4424
04 -.0077D -.0082D
05 -.0087D -.0082D
06 -.0011D -.0011D
07 -.0011D -.0021D
```

```
02   7.694    9.218
03   .3879    .4335
04  -.0068D  -.0077D
05  -.0075D  -.0087D
06  -.0017D  -.0011D
07  -.0014D  -.0011D

T   - 09/09/97  DAY= 252 20:53:02

01   .9657    1.021
02   7.718    7.694
03   .4103    .3879
04  -.0082D  -.0068D
05  -.0095D  -.0075D
06   .0004D  -.0017D
07  -.0021D  -.0014D

Tue - 09/09/97  DAY= 252 20:54:02

01   1.025    .9657
02   7.277    7.718
03   .3997    .4103
04  -.0091D  -.0082D
05  -.0084D  -.0095D
06  -.0011D   .0004D
07  -.0011D  -.0021D

Tue - 09/09/97  DAY= 252 20:55:03

01   .9132    1.025
02   8.256    7.277
03   .4147    .3997
04  -.0105D  -.0091D
05  -.0112D  -.0084D
06   .0011D  -.0011D
07   .0007D  -.0011D

Tue - 09/09/97  DAY= 252 20:56:02

01   1.074    .9132
02   8.329    8.256
03   .4035    .4147
04  -.0051D  -.0105D
05  -.0045D  -.0112D
06  -.0007D  -.0011D
07  -.0007D  -.0007D

Tue - 09/09/97  DAY= 252 20:57:02

01   1.043    1.074
02   7.872    8.329
03   .4262    .4035
04  -.0058D  -.0051D
05  -.0065D  -.0045D
06   .0004D  -.0007D
07  -.0011D  -.0007D

Tue - 09/09/97  DAY= 252 20:58:02

01   1.120    1.043    35.411
02   7.467    7.872    134.024
03   .4074    .4262
04  -.0091D  -.0058D
05  -.0077D  -.0065D
06  -.0011D   .0004D
07  -.0004D  -.0011D

Tue - 09/09/97  DAY= 252 20:59:03
```

04 -.0068D -.0091D
05 -.0058D -.0077D
06 -.0014D -.0011D
07 -.0014D -.0004D

Tue - 09/09/97 DAY= 252 21:00:03

01 .095 1.177
02 7.088 7.181
03 .4367 .3967
04 -.0075D -.0068D
05 -.0078D -.0058D
06 -.0007D -.0014D
07 -.0007D -.0014D

Tue - 09/09/97 DAY= 252 21:01:03

01 1.046 1.095
02 7.176 7.088
03 .4282 .4367
04 -.0051D -.0075D
05 -.0058D -.0078D
06 -.0000D -.0007D
07 -.0007D -.0007D

Tue - 09/09/97 DAY= 252 21:02:02

01 .6831 1.046
02 7.643 7.176
03 .4160 .4282
04 -.0062D -.0051D
05 -.0048D -.0058D
06 -.0011D -.0000D
07 -.0004D -.0007D

Tue - 09/09/97 DAY= 252 21:03:02

01 .5718 .6831
02 7.817 7.643
03 .3961 .4160
04 -.0061D -.0062D
05 -.0044D -.0048D
06 -.0011D -.0011D
07 -.0014D -.0004D

Tue - 09/09/97 DAY= 252 21:04:03

01 .6594 .5718
02 7.885 7.817
03 .4015 .3961
04 -.0075D -.0061D
05 -.0034D -.0044D
06 -.0014D -.0011D
07 -.0011D -.0014D

Tue - 09/09/97 DAY= 252 21:05:02

01 .5734 .6594 41.2167
02 9.322 7.885 180.136
03 .4380 .4015
04 -.0068D -.0075D
05 .0068D -.0034D
06 .0000D -.0014D
07 .0000D -.0011D

Tue - 09/09/97 DAY= 252 21:06:02

06 -.0000D .0000D
07 -.0021D .0000D

Tue - 09/09/97 DAY= 252 21:07:02

01 .9110 .6513
02 9.482 9.375
03 4007 .4106
04 -.0074D -.0072D
05 -.0044D -.0055D
06 -.0004D -.0000D
07 -.0011D -.0021D

Tue - 09/09/97 DAY= 252 21:08:03

01 .9037 .9110
02 8.866 9.482
03 .3984 .4007
04 -.0055D -.0074D
05 -.0041D -.0044D
06 -.0004D -.0004D
07 -.0007D -.0011D

Tue - 09/09/97 DAY= 252 21:09:02

01 1.160 .9037
02 9.797 8.866
03 .4346 .3984
04 -.0065D -.0055D
05 -.0045D -.0041D
06 -.0011D -.0004D
07 -.0007D -.0007D

Tue - 09/09/97 DAY= 252 21:10:02

01 1.402 1.160
02 9.201 9.797
03 .4143 .4346
04 -.0038D -.0065D
05 -.0028D -.0045D
06 -.0000D -.0011D
07 -.0000D -.0007D

Tue - 09/09/97 DAY= 252 21:11:02

01 1.540 1.402
02 9.390 9.201
03 .4268 .4143
04 -.0057D -.0038D
05 -.0051D -.0028D
06 -.0004D -.0000D
07 -.0004D -.0000D

Tue - 09/09/97 DAY= 252 21:12:02

01 1.301 1.540
02 9.545 9.390
03 .3873 .4268
04 -.0075D -.0057D
05 -.0048D -.0051D
06 -.0011D -.0004D
07 .0011D -.0004D

Tue - 09/09/97 DAY= 252 21:13:02

01 1.300 1.301 50.3857
02 8.439 9.545 262.231
03 .4018 .3873

Tue - 09/09/97 DAY= 252 21:14:02

01 1.356 1.300
02 8.694 8.439
03 .4065 .4018
04 0055D -.0062D
05 0058D -.0075D
06 -.0004D -.0011D
07 -.0017D -.0017D

Tue - 09/09/97 DAY= 252 21:15:02

01 1.454 1.356
02 8.342 8.694
03 .3934 .4065
04 -.0081D -.0055D
05 -.0071D -.0058D
06 -.0007D -.0004D
07 -.0004D -.0017D

Tue - 09/09/97 DAY= 252 21:16:02

01 1.663 1.454
02 8.535 8.342
03 .4123 .3934
04 -.0072D -.0081D
05 -.0038D -.0071D
06 -.0021D -.0007D
07 .0000D -.0004D

Tue - 09/09/97 DAY= 252 21:17:02

01 1.669 1.663
02 .920 8.535
03 .4005 .4123
04 -.0085D -.0072D
05 -.0065D -.0038D
06 -.0004D -.0021D
07 -.0014D .0000D

Tue - 09/09/97 DAY= 252 21:18:02

01 1.584 1.669
02 9.339 8.920
03 .3971 .4005
04 -.0081D -.0085D
05 -.0057D -.0065D
06 -.0014D -.0004D
07 -.0024D -.0014D

Tue - 09/09/97 DAY= 252 21:19:03

01 1.830 1.584
02 8.575 9.339
03 .3964 .3971
04 -.0095D -.0081D
05 -.0085D -.0057D
06 -.0014D -.0014D
07 -.0011D -.0024D

Tue - 09/09/97 DAY= 252 21:20:02

01 1.785 1.830 61.7267
02 9.042 8.575 323.678
03 .3886 .3964
04 -.0058D -.0095D
05 -.0075D -.0085D

01 1.755 1.785
02 8.674 9.042
03 .4021 .3886
04 -.0094D -.0058D
05 -.0077D -.0075D
06 .0007D -.0011D
07 0014D -.0007D

Tue - 09/09/97 DAY= 252 21:22:03

01 1.561 1.755
02 8.949 8.674
03 .4282 .4021
04 -.0089D -.0094D
05 -.0078D -.0077D
06 -.0007D -.0007D
07 -.0021D -.0014D

Tue - 09/09/97 DAY= 252 21:23:02

01 1.609 1.561
02 9.129 8.949
03 .4319 .4282
04 -.0082D -.0089D
05 -.0065D -.0078D
06 -.0007D -.0007D
07 -.0004D -.0021D

Tue - 09/09/97 DAY= 252 21:24:02

01 1.596 1.609
02 8.230 9.129
03 .4272 .4319
04 0079D -.0082D
05 .0072D -.0065D
06 -.0007D -.0007D
07 -.0017D -.0004D

Tue - 09/09/97 DAY= 252 21:25:02

01 1.608 1.596
02 8.366 8.230
03 .3927 .4272
04 -.0088D -.0079D
05 -.0054D -.0072D
06 -.0011D -.0007D
07 -.0007D -.0017D

Tue - 09/09/97 DAY= 252 21:26:03

01 1.483 1.608
02 7.567 8.366
03 .3889 .3927
04 -.0051D -.0088D
05 -.0035D -.0054D
06 .0004D -.0011D
07 -.0000D -.0007D

Tue - 09/09/97 DAY= 252 21:27:02

01 .238 1.483 72.5767
02 .004 7.567 381.597
03 .3812 .3889
04 -.0116D -.0051D
05 -.0105D -.0035D
06 -.0014D .0004D
07 -.0004D -.0000D

02 -.2097- 7.004
03 .4067 .3812
04 -.0088D -.0116D
05 -.0071D -.0105D
06 -.0011D -.0014D
07 -.0024D -.0004D

T - 09/09/97 DAY= 252 21:29:03

01 .8154 1.130
02 -2.093+ -.2097-
03 .3876 .4067
04 -.0079D -.0088D
05 -.0062D -.0071D
06 -.0004D -.0011D
07 -.0007D -.0024D

FLAME OUT
2 min

Tue - 09/09/97 DAY= 252 21:30:02

01 .6056 .8154
02 7.333 -2.093+
03 .3565 .3876
04 -.0075D -.0079D
05 -.0051D -.0062D
06 -.0021D -.0004D
07 -.0011D -.0007D

Tue - 09/09/97 DAY= 252 21:31:02

01 .9288 .6056
02 7.334 7.333
03 .3944 .3565
04 -.0078D -.0075D
05 -.0072D -.0051D
06 .0014D -.0021D
07 .0014D -.0011D

Tue - 09/09/97 DAY= 252 21:32:02

01 .9508 .9288
02 7.550 7.334
03 .4011 .3944
04 -.0061D -.0078D
05 -.0037D -.0072D
06 -.0004D -.0014D
07 -.0014D -.0014D

Tue - 09/09/97 DAY= 252 21:33:03

01 1.009 .9508
02 7.860 7.550
03 .3822 .4011
04 -.0092D -.0061D
05 -.0072D -.0037D
06 -.0000D -.0004D
07 -.0000D -.0014D

Tue - 09/09/97 DAY= 252 21:34:02

01 .9938 1.009
02 7.759 7.860
03 .3781 .3822
04 .0092D -.0092D
05 -.0099D -.0072D
06 -.0007D -.0000D
07 -.0021D -.0000D

77,0647 (48)
419.433

Tue - 09/09/97 DAY= 252 21:35:02

```
04 -.0124D -.0092D
05 -.0138D -.0099D
06 -.0014D -.0007D
07 -.0014D -.0021D

Tue - 09/09/97  DAY= 252 21:36:03

01  .9261  1.027
02  7.843  7.441
03  .4103   .3707
04 -.0085D -.0124D
05 -.0109D -.0138D
06 -.0004D -.0014D
07 -.0014D -.0014D

Tue - 09/09/97  DAY= 252 21:37:02

01  .7839  .9261
02  7.608  7.843
03  .4302   .4103
04 -.0102D -.0085D
05 -.0099D -.0109D
06 -.0007D -.0004D
07 -.0017D -.0014D

Tue - 09/09/97  DAY= 252 21:38:02

01  .9575  .7839
02  7.268  7.608
03  .4001   .4302
04 -.0081D -.0102D
05 -.0101D -.0099D
06  .0004D -.0007D
07  0014D -.0017D

Tue - 09/09/97  DAY= 252 21:39:03

01  1.069  .9575
02  7.698  7.268
03  .3893   .4001
04 -.0082D -.0081D
05 -.0092D -.0101D
06 -.0007D  .0004D
07 -.0011D -.0014D

Tue - 09/09/97  DAY= 252 21:40:02

01  1.010  1.069
02  7.887  7.698
03  .4076   .3893
04 -.0082D -.0082D
05 -.0051D -.0092D
06  .0004D -.0007D
07  .0004D -.0011D

Tue - 09/09/97  DAY= 252 21:41:02

01  1.006  1.010     83.8442  (55)
02  7.509  7.887     472.687  (55)
03  .3565   .4076
04 -.0072D -.0082D
05 -.0068D -.0051D
06 -.0007D  .0004D
07 -.0011D  .0004D

Tue - 09/09/97  DAY= 252 21:42:02
```

06 -.0011D -.0007D
07 .0000D -.0011D

Tue - 09/09/97 DAY= 252 21:43:02

01 .9505 .9722
02 7.356 7.411
03 .4123 .3844
04 -.0119D -.0067D
05 -.0095D -.0064D
06 -.0014D -.0011D
07 -.0017D .0000D

Tue - 09/09/97 DAY= 252 21:44:06

01 1.020 .9505
02 7.098 7.356
03 .3971 .4123
04 -.0102D -.0119D
05 -.0085D -.0095D
06 -.0007D -.0014D
07 -.0011D -.0017D

VOC'S	CH4
8.470	1.478

Tue - 09/09/97 DAY= 252 21:45:02

01 .9528 1.020
02 7.097 7.098
03 .4144 .3971
04 -.0111D -.0102D
05 -.0104D -.0085D
06 -.0000D -.0007D
07 -.0011D -.0011D

Tue - 09/09/97 DAY= 252 21:46:02

01 1.137 .9528
02 7.420 7.097
03 .4113 .4144
04 -.0089D -.0111D
05 -.0099D -.0104D
06 -.0017D -.0000D
07 -.0017D -.0011D

Tue - 09/09/97 DAY= 252 21:47:02

01 1.253 1.137 90,1297 (61)
02 7.628 7.420 516,697 (61)
03 .3873 .4113
04 -.0106D -.0089D
05 -.0089D -.0099D
06 -.0011D -.0017D
07 -.0011D -.0017D

Tue - 09/09/97 DAY= 252 21:48:02
REPEAT READ 00

MOISTURE DETERMINATION

Plant Name: IBP Dakota City Unit: Blood Dryer	Ambient Temperature: 75°F
Date: 9/9/97	Barometric Pressure: (BP): 29.20 Elevation: ground
Sampling Location: Blood Dryer Elevation: 20'	Probe Length & Type: 3' SS
Run Number: 2	Meter Box Number: 1 Gamma: (Y): 1.0017
Operator: DW, TL Reviewer:	Leak Check: Pre-test: 0.005 Post-test: 0.005

Traverse Point Number	Elapsed Time	Clock Time	Gas Meter Reading (Ft³)	DELTA H (in H_2O)	Impinger Temperature (F°)	Gas Meter Temperature INLET °F	Gas Meter Temperature OUTLET °F	Pump Vacuum (Hg")
1	0	2040	270.311	2.0	64	82	81	9
			274.3		61	84	81	9
	10		278.4		58	86	82	9
			282.4		54	87	82	9
	20		286.4		56	89	83	9
			290.5		59	90	85	9
	30	2110	294.526					9
			Vm = 24.215	ΔH = 2.0		Avg.:	Avg.:	

T_m = 84.3

Analytical Data

	Impinger #1 Weight g	Impinger #2 Weight g	Impinger #3 Weight g	Silica Gel Weight g	
Final	134	122	2	214	72.0
Initial	100	100	—	200	
Net Gain	34 +	22 +	2 +	14 =	V_t (grams) Total

14.76%

Moisture Calculation:

Net volume of gas through dry gas meter at meter conditions = V_m = 24.215 cu. ft.

Average absolute meter temperature (T_m + 460) = 544.3 °R

$$\text{Percent moisture} = M = \frac{4.707\,(ml)}{.04707\,(ml) + \frac{17.64\,(Y)\,(Vm)\,(BP)}{(Tm + 460)}}$$

TRC

REF: CFR 60, App. A, Method 4

VELOCITY TRAVERSE

Plant: IBP	Date: 9/9/97
Unit Number: Blood Drier	Stack Diameter (in.): 22 x 18
Load Condition: Norm	Stack Gauge Pressure ("H_2O): 2.0
Run No.: 2	Operators: DW, TL
Project No.: 22214-	
Barometric Pressure at Ground Level ("Hg): 29.60	
Pitot Tube ID: 321	
Pitot Tube Coefficient: .84	Port Change Pitot Leak Check — Pass / Fail
Estimated Stack CO_2%: 9 O_2%: 10.2 H_2O%: ___	Port #1 ___ ___
Platform Elevation (feet): 20'	Port #2 ___ ___
Schematic of Stack Cross Section: R1	Port #3 ___ ___
	Port #4 ___ ___
	$\sqrt{\Delta P_{avg}}$ = .9655
	T_{savg} = 212.2

Traverse Point Number	Velocity Head (In H_2O)	Stack Temp. (F)
1	1.05	213
2	1.02	213
3	1.00	211
4	.99	212
1	.98	212
2	1.05	212
3	.85	213
4	.84	213
Average:		

Traverse Point Number	Velocity Head (In H_2O)	Stack Temp. (F)
1	NA+	
2	ACCESIBLE	
3		
4		
1	.80	212
2	.85	212
3	.88	212
4	.90	212
Average:		

Reference: 40 CFR 60, Appendix A, Method 2

TRC

Run 3

DATE:	Sept 9, 1997	CLIENT REP:	Rechelle Kruse
PLANT:	IBP	WITNESSED?:	N/A
VOC TYPE	CH4	BURNER TYPE:	N/A
OPERATOR:	SM, DW	GENERATOR TYPE:	N/A
TEST LOCATION:	Blood Drier (	O2 GENERATOR TYPE:	N/A

CALIBRATION GASES

O2	CO2	CH4	S02	NOx	THC outlet
0	0	0	0	0	0
N/A	N/A	29.12	N/A		30
N/A	N/A	47.83	N/A		59.67
		83.35			77.7

END TIME	SAMPLE POINT	O2 wet	CO2 ppm	SO2 ppm	THC Outlet ppm	CH4 ppm	NOx ppm	COMMENTS a
21:58	1	20	1		12.281	3.861		
23:02								
	AVERAGE	20	1	ERR	12.28	3.861	ERR	

Barometric Pres: 29.2

EFFLUENT GAS CONCENTRATION, WET BASIS, PPM

	O2	CO2	THC Outlet	CH4	NOx
PRE ZERO	0	0	0.2	0.13	0
POST ZER	0	0	0.2	0.05	0
ACT SPAN	N/A	N/A	30	29.12	N/A
PRE SPAN	0	0	31.4	28.5	0
POST SPA	0	0	31.2	28.8	0
GAS CON	ERR	ERR	ERR	11.654	3.845	ERR

EFFLUENT GAS CONC CALCULATION

GAS CONC. = (Avg Stk Conc - Avg Zero Cal) * (Span Conc/(Avg Span Cal - Avg Zero Cal))

IBP DAKOTA CITY, NE
w BLOOD DRIER VOC'S + city
9/9/97

CN#R1>

01	34.41	1.193
02	40.11	6.148
03	.4124	.4211
04	0025D	-.0062D
05	0046D	-.0079D
06	-.0007D	-.0014D
07	-.0004D	-.0007D

Tue - 09/09/97 DAY= 252 21:58:02 ~START .R3

01	59.01	34.41
02	76.23	40.11
03	.4077	.4124
04	.0028D	-.0025D
05	-.0022D	-.0046D
06	.0000D	-.0007D
07	.0000D	-.0004D

Tue - 09/09/97 DAY= 252 21:59:02

01	55.50	59.01
02	78.67	76.23
03	.4277	.4077
04	.0049D	.0028D
05	.0042D	-.0022D
06	.0000D	.0000D
07	-.0008D	.0000D

Tue - 09/09/97 DAY= 252 22:00:03

01	3.198	55.50
02	3.21	78.67
03	.4057	.4277
04	-.0093D	.0049D
05	-.0076D	.0042D
06	.0004D	.0000D
07	-.0011D	-.0008D

Tue - 09/09/97 DAY= 252 22:01:02

01	1.506	1.444
02	8.648	8.393
03	.3961	.4228
04	-.0082D	-.0118D
05	-.0078D	-.0111D
06	-.0000D	-.0000D
07	-.0017D	-.0007D

Tue - 09/09/97 DAY= 252 22:06:02

01	1.372	1.506
02	8.913	8.648
03	.4065	.3961
04	-.0068D	-.0082D
05	-.0102D	-.0078D
06	-.0007D	-.0000D
07	-.0017D	-.0017D

T[illegible] - 09/09/97 DAY= 252 22:07:02

01	1.322	1.372	156.318
02	8.968	8.913	234.749
03	.4147	.4065	
04	-.0109D	-.0068D	
05	-.0095D	-.0102D	

```
01   .9648   1.322
02  10.01    8.968
03   .3974    .4147
04 -.0037D -.0109D
05 -.0057D -.0095D
06 - .0011D  .0000D
07  .0011D -.0017D

Tue - 09/09/97  DAY= 252 22:09:03

01  1.062    .9648
02  9.517   10.01
03   .4214   .3974
04 -.0062D -.0037D
05 -.0051D -.0057D
06 -.0028D -.0011D
07 -.0011D -.0011D

Tue - 09/09/97  DAY= 252 22:10:02

01  1.042    1.062
02  9.557    9.517
03   .4167   .4214
04 -.0024D -.0062D
05 -.0028D -.0051D
06 -.0014D -.0028D
07 -.0007D -.0011D

Tue - 09/09/97  DAY= 252 22:11:02

01  1.060    1.042
02  9.044    9.557
03   .4168   .4167
04  .0041D -.0024D
05  .0044D -.0028D
06 -.0007D -.0014D
07 -.0021D -.0007D

Tue - 09/09/97  DAY= 252 22:12:03

01  1.201    1.060
02  9.087    9.044
03   .4018   .4168
04 -.0051D -.0041D
05 -.0061D -.0044D
06 -.0031D -.0007D
07 -.0017D -.0021D

Tue - 09/09/97  DAY= 252 22:13:03

01  1.211    1.201
02  9.628    9.087
03   .3944   .4018
04 -.0034D -.0051D
05 -.0021D -.0061D
06 -.0004D -.0031D
07 -.0017D -.0017D

Tue - 09/09/97  DAY= 252 22:14:02

01  .201     1.211      (64.059)
02  .693     9.628      300.285
03   .3994   .3944
04 -.0078D -.0034D
05 -.0072D -.0021D
06 -.0014D -.0004D
07 -.0007D -.0017D
```

```
02  8.797    8.693
03  .4071    .3994
04 -.0077D -.0078D
05 -.0071D -.0072D
06 -.0011D -.0014D
07 -.0024D -.0007D

T   - 09/09/97  DAY= 252 22:16:03

01  1.294  1.103
02  8.322  8.797
03  .3957    .4071
04 -.0055D -.0077D
05 -.0035D -.0071D
06 -.0007D -.0011D
07 -.0011D -.0024D

Tue - 09/09/97  DAY= 252 22:17:02

01  1.469  1.294
02  8.470  8.322
03  .3703    .3957
04 -.0055D -.0055D
05 -.0055D -.0035D
06 -.0014D -.0007D
07 -.0017D -.0011D

Tue - 09/09/97  DAY= 252 22:18:02

01  1.239  1.469
02  8.908  8.470
03  .3967    .3703
04 -.0065D -.0055D
05 -.0061D -.0055D
06(   0004D -.0014D
07  .0000D -.0017D

Tue - 09/09/97  DAY= 252 22:19:02

01  1.200  1.239
02  8.616  8.908
03  .3874    .3967
04 -.0061D -.0065D
05 -.0041D -.0061D
06 -.0014D  .0004D
07 -.0017D -.0000D

Tue - 09/09/97  DAY= 252 22:20:03

01  1.223  1.200
02  8.292  8.616
03  .4245    .3874
04 -.0041D -.0061D
05 -.0051D -.0041D
06 -.0004D -.0014D
07 -.0007D -.0017D

Tue - 09/09/97  DAY= 252 22:21:02

01  1.432  1.223    173.0198
02  8.449  8.292    360.139
03   3967    .4245
04  .0045D -.0041D
05 -.0058D -.0051D
06 -.0011D -.0004D
07 -.0007D -.0007D

Tue - 09/09/97  DAY= 252 22:22:02
```

04 -.0061D -.0045D
05 -.0041D -.0058D
06 -.0007D -.0011D
07 -.0007D -.0007D

Tue - 09/09/97 DAY= 252 22:23:03

01 .080 1.902
02 9.152 8.326
03 .3981 .3683
04 -.0058D -.0061D
05 -.0045D -.0041D
06 -.0014D -.0007D
07 -.0014D -.0007D

Tue - 09/09/97 DAY= 252 22:24:02

01 2.276 2.080
02 9.613 9.152
03 .4157 .3981
04 -.0028D -.0058D
05 -.0024D -.0045D
06 -.0004D -.0014D
07 -.0000D -.0014D

Tue - 09/09/97 DAY= 252 22:25:02

01 2.550 2.276
02 10.52 9.613
03 .4120 .4157
04 -.0024D -.0028D
05 -.0021D -.0024D
06 -.0011D -.0004D
07 -.0004D -.0000D

Tue - 09/09/97 DAY= 252 22:26:02

01 2.506 2.550
02 9.692 10.52
03 .3613 .4120
04 -.0017D -.0024D
05 -.0027D -.0021D
06 -.0014D -.0011D
07 -.0021D -.0004D

Tue - 09/09/97 DAY= 252 22:27:03

01 2.081 2.506
02 9.461 9.692
03 .4038 .3613
04 -.0051D -.0017D
05 -.0048D -.0027D
06 -.0007D -.0014D
07 -.0014D -.0021D

Tue - 09/09/97 DAY= 252 22:28:02

01 1.826 2.081 188,2408
02 9.419 9.461 426,322
03 .3852 .4038
04 -.0041D -.0051D
05 -.0041D -.0048D
06 -.0004D -.0007D
07 -.0007D -.0014D

Tue - 09/09/97 DAY= 252 22:29:02

```
01  1.930   1.826
02  9.951   9.419
03  .3703   .3852
04 -.0027D -.0041D
05 -.0024D -.0041D
06  .0004D -.0004D
07  .0007D -.0007D

Tue - 09/09/97  DAY= 252 22:30:02

01  2.200   1.930
02  10.70   9.951
03  .3740   .3703
04 -.0011D -.0027D
05 -.0007D -.0024D
06 -.0004D -.0004D
07 -.0007D -.0007D

Tue - 09/09/97  DAY= 252 22:31:02

01  2.196   2.200
02  10.77   10.70
03  .3869   .3740
04 -.0014D -.0011D
05 -.0011D -.0007D
06 -.0017D -.0004D
07 -.0011D -.0007D

Tue - 09/09/97  DAY= 252 22:32:02

01  2.114   2.196
02  10.24   10.77
03  .4047   .3869
04  .0004D -.0014D
05  .0004D -.0011D
06 -.0011D -.0017D
07 -.0014D -.0011D

Tue - 09/09/97  DAY= 252 22:33:03

01  2.054   2.114
02  10.12   10.24
03  .3717   .4047
04  .0000D -.0004D
05  .0000D -.0004D
06 -.0014D -.0011D
07 -.0011D -.0014D

Tue - 09/09/97  DAY= 252 22:34:02

01  2.203   2.054
02  9.641   10.12
03  .4004   .3717
04  .0000D  .0000D
05  .0000D  .0000D
06 -.0024D -.0014D
07 -.0011D -.0011D

Tue - 09/09/97  DAY= 252 22:35:02

01  2.072   2.203      303.0098
02  9.683   9.641      497.427
03  .3613   .4004
04  .0000D  .0000D
05  .0000D  .0000D
06 -.0017D -.0024D
07 -.0024D -.0011D
```

```
02  9.865    9.683
03  .3930    .3613
04 -.0004D   .0000D
05 -.0004D   .0000D
06 -.0011D -.0017D
07 -.0004D -.0024D

T   - 09/09/97  DAY= 252 22:37:02

01  1.698    1.948
02  9.245    9.865
03  .4136    .3930
04  .0000D -.0004D
05  .0000D -.0004D
06 -.0011D -.0011D
07 -.0017D -.0004D

Tue - 09/09/97  DAY= 252 22:38:02

01  1.449    1.698
02  10.09    9.245
03  .3592    .4136
04  .0000D   .0000D
05  .0000D   .0000D
06 -.0021D -.0011D
07 -.0004D -.0017D

Tue - 09/09/97  DAY= 252 22:39:02

01  1.509    1.449
02  9.638    10.09
03  .3847    .3592
04 -.0004D   .0000D
05 -.0004D   .0000D
06  .0014D -.0021D
07  .0017D -.0004D

Tue - 09/09/97  DAY= 252 22:40:02

01  1.822    1.509
02  9.848    9.638
03  .3859    .3847
04  .0000D -.0004D
05  .0000D -.0004D
06 -.0007D -.0014D
07 -.0014D -.0017D

Tue - 09/09/97  DAY= 252 22:41:02

01  1.813    1.822
02  9.359    9.848
03  .3849    .3859
04 -.0007D   .0000D
05 -.0007D   .0000D
06  .0000D -.0007D
07 -.0028D -.0014D

Tue - 09/09/97  DAY= 252 22:42:02

01  2.189    1.813      315.4378
02  9.842    9.359      565.044
03  .3697    .3849
04  .0000D -.0007D
05  .0000D -.0007D
06 -.0007D   .0000D
07 -.0007D -.0028D

Tue - 09/09/97  DAY= 252 22:43:02
```

```
04   .0000D   .0000D
05   .0000D   .0000D
06  -.0014D  -.0007D
07  -.0007D  -.0007D

Tue - 09/09/97  DAY= 252 22:44:02

01    .364   2.399
02   10.76   10.37
03   .3835   .3740
04  -.0007D   .0000D
05  -.0007D   .0000D
06  -.0004D  -.0014D
07  -.0028D  -.0007D

Tue - 09/09/97  DAY= 252 22:45:02

01   1.911   2.364
02   10.10   10.76
03   .3960   .3835
04   .0000D  -.0007D
05   .0000D  -.0007D
06  -.0017D  -.0004D
07   .0000D  -.0028D

Tue - 09/09/97  DAY= 252 22:46:02

01   1.451   1.911
02   10.42   10.10
03   .3693   .3960
04  -.0004D   .0000D
05  -.0004D   .0000D
06  -.0011D  -.0017D
07  -.0007D   .0000D

Tue - 09/09/97  DAY= 252 22:47:02

01   1.369   1.451
02   10.20   10.42
03   .4004   .3693
04   .0000D  -.0004D
05   .0000D  -.0004D
06  -.0014D  -.0011D
07  -.0000D  -.0007D

Tue - 09/09/97  DAY= 252 22:48:02

01   1.022   1.369
02   9.078   10.20
03   .3833   .4004
04   .0000D   .0000D
05   .0000D   .0000D
06  -.0007D  -.0014D
07  -.0024D  -.0000D

Tue - 09/09/97  DAY= 252 22:49:02

01   .7450   1.022      226.6988 (49)
02   9.298   9.078      635.27 (49)
03   .3517   .3833
04   .0000D   .0000D
05   .0000D   .0000D
06   .0011D  -.0007D
07  -.0004D  -.0024D

Tue - 09/09/97  DAY= 252 22:50:02
```

```
01   .8384   .7450
02  9.158   9.298
03   .3815   .3517
04 -.0007D   .0000D
05 -.0007D   .0000D
06   0004D -.0011D
07   0004D -.0004D

Tue - 09/09/97  DAY= 252 22:51:02

01   .8452   .8384
02  8.653   9.158
03   .4057   .3815
04 -.0004D -.0007D
05 -.0004D -.0007D
06 -.0007D -.0004D
07 -.0004D -.0004D

Tue - 09/09/97  DAY= 252 22:52:03

01   .8651   .8452
02  10.70   8.653
03   .3798   .4057
04   .0000D -.0004D
05   .0000D -.0004D
06 -.0011D -.0007D
07 -.0007D -.0004D

Tue - 09/09/97  DAY= 252 22:53:02

01   .5781   .8651
02  9.894   10.70
03   3629   .3798
04   0000D   .0000D
05   .0000D   .0000D
06 -.0024D -.0011D
07 -.0021D -.0007D

Tue - 09/09/97  DAY= 252 22:54:02

01   .5925   .5781
02  9.340   9.894
03   .3823   .3629
04   .0000D   .0000D
05   .0000D   .0000D
06 -.0014D -.0024D
07 -.0017D -.0021D

Tue - 09/09/97  DAY= 252 22:55:02

01   .4299   .5925      230.848 (55)
02  9.221   9.340       692.236 (55)
03   .3737   .3823
04   .0000D   .0000D
05   .0000D   .0000D
06 -.0014D -.0014D
07 -.0007D -.0017D

Tue - 09/09/97  DAY= 252 22:56:02
```

```
01   .5010    .4299
02  9.107    9.221
03   .3842    .3737
04   .0000D   .0000D
05   .0000D   .0000D
06  -.0014D  -.0014D
07   0021D  -.0007D

Tue - 09/09/97  DAY= 252 22:57:02

01   .6039    .5010
02  10.43    9.107
03   .3897    .3842
04   .0000D   .0000D
05   .0000D   .0000D
06  -.0014D  -.0014D
07  -.0021D  -.0021D

Tue - 09/09/97  DAY= 252 22:58:03

01   .8083    .6039
02  10.11    10.43
03   .3744    .3897
04   .0000D   .0000D
05   .0000D   .0000D
06  -.0011D  -.0014D
07  -.0011D  -.0021D

Tue - 09/09/97  DAY= 252 22:59:02

01   .7606    .8083
02  9.664    10.11
03   .3669    .3744
04   0000D   .0000D
05   .0000D   .0000D
06  -.0014D  -.0011D
07  -.0021D  -.0011D

Tue - 09/09/97  DAY= 252 23:00:02

01   .9670    .7606
02  8.915    9.664
03   .3856    .3669
04   .0000D   .0000D
05   .0000D   .0000D
06  -.0007D  -.0014D
07   .0000D  -.0021D

Tue - 09/09/97  DAY= 252 23:01:02

01  1.032     .9670
02  8.675    8.915
03   .3680    .3856
04   .0000D   .0000D
05   .0000D   .0000D
06  -.0011D  -.0007D
07   .0000D   .0000D

Tue - 09/09/97  DAY= 252 23:02:02
REPEAT READ 00
```

235.5208 (61)
749.137 (61)

VOC'S
12.280

CH4
3.861

MOISTURE DETERMINATION

Plant Name: IBP Dakota City Unit: Blood Drier	Ambient Temperature: 70°F
Date: 9/9/97	Barometric Pressure: (BP): 29.020 Elevation: ground
Sampling Location: Blood Drier out Elevation: 70'	Probe Length & Type: 8' SS
Run Number: 3	Meter Box Number: 1 Gamma: (Y): 1.0017
Operator: Dun, TL Reviewer:	Leak Check: Pre-test: 0.001 Post-test: 0.001

Traverse Point Number	Elapsed Time	Clock Time	Gas Meter Reading (Ft³)	DELTA H (in H₂O)	Impinger Temperature (F°)	Gas Meter Temperature INLET °F	Gas Meter Temperature OUTLET °F	Pump Vacuum (Hg")
1	0	21:58	294.617	2.0	65	85	84	10
			298.6		60	87	84	10
	10		302.7		55	88	85	10
			306.7		55	90	86	10
	20		310.7		58	91	86	10
			314.8		60	93	87	10
	30	22:28	318.833					
			Vm = 24.216	ΔH = 2.0		Avg.:	Avg.:	

T_m = 87.2

Analytical Data

	Impinger #1 Weight g	Impinger #2 Weight g	Impinger #3 Weight g	Silica Gel Weight g	
Final	135	118	4	218	75 ml
Initial	100	100	—	200	
Net Gain	35 +	18 +	4 +	18 =	V_i (grams) Total

15.46%

Moisture Calculation:

Net volume of gas through dry gas meter at meter conditions = V_m = 24.216 cu. ft.

Average absolute meter temperature (T_m + 460) = 547.2 °R

$$\text{Percent moisture} = M = \frac{4.707\,(ml)}{.04707\,(ml) + \frac{17.64\,(Y)\,(Vm)\,(BP)}{(Tm + 460)}}$$

REF: CFR 60, App. A, Method 4

TRC

VELOCITY TRAVERSE

Plant: IBP DAKOTA CITY, NE	Date: 9/9/97
Unit Number: Blood Drier	Stack Diameter (in.): 22x18
Load Condition: Norm	Stack Gauge Pressure (" H_2O): + 2.0
Run No.: 3	Operators: DW, TL
Project No.: 22214-	
Barometric Pressure at Ground Level (" Hg): 29.00	
Pitot Tube ID: 321	
Pitot Tube Coefficient: .84	Port Change Pitot Leak Check — Pass / Fail
Estimated Stack CO_2%: 1 O_2%: 10 H_2O%: __	Port #1 ___ ___
Platform Elevation (feet): 20'	Port #2 ___ ___
Schematic of Stack Cross Section:	Port #3 ___ ___
R1	Port #4 ___ ___
	$\sqrt{\Delta P}$avg = .9562
	Tsavg = 211.8

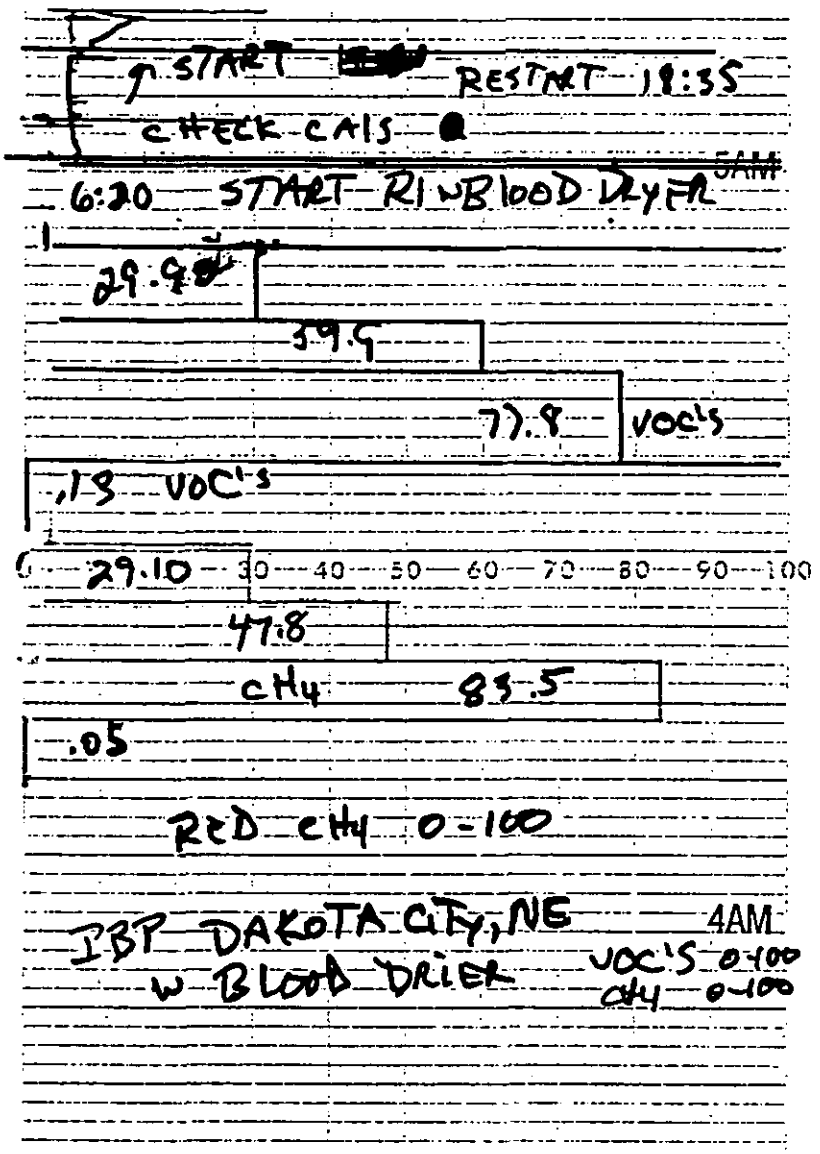
Traverse Point Number	Velocity Head (In H_2O)	Stack Temp. (F)
1	1.07	211
2	1.15	211
3	1.00	212
4	.96	212
1	.95	212
2	.90	212
3	.91	211
4	.80	212
Average:		

Traverse Point Number	Velocity Head (In H_2O)	Stack Temp. (F)
1	NOT	
2	ACCEPTIBLE	
3		
4		
1	.80	213
2	.80	213
3	.83	211
4	.84	211
Average:		

Reference: 40 CFR 60, Appendix A, Method 2

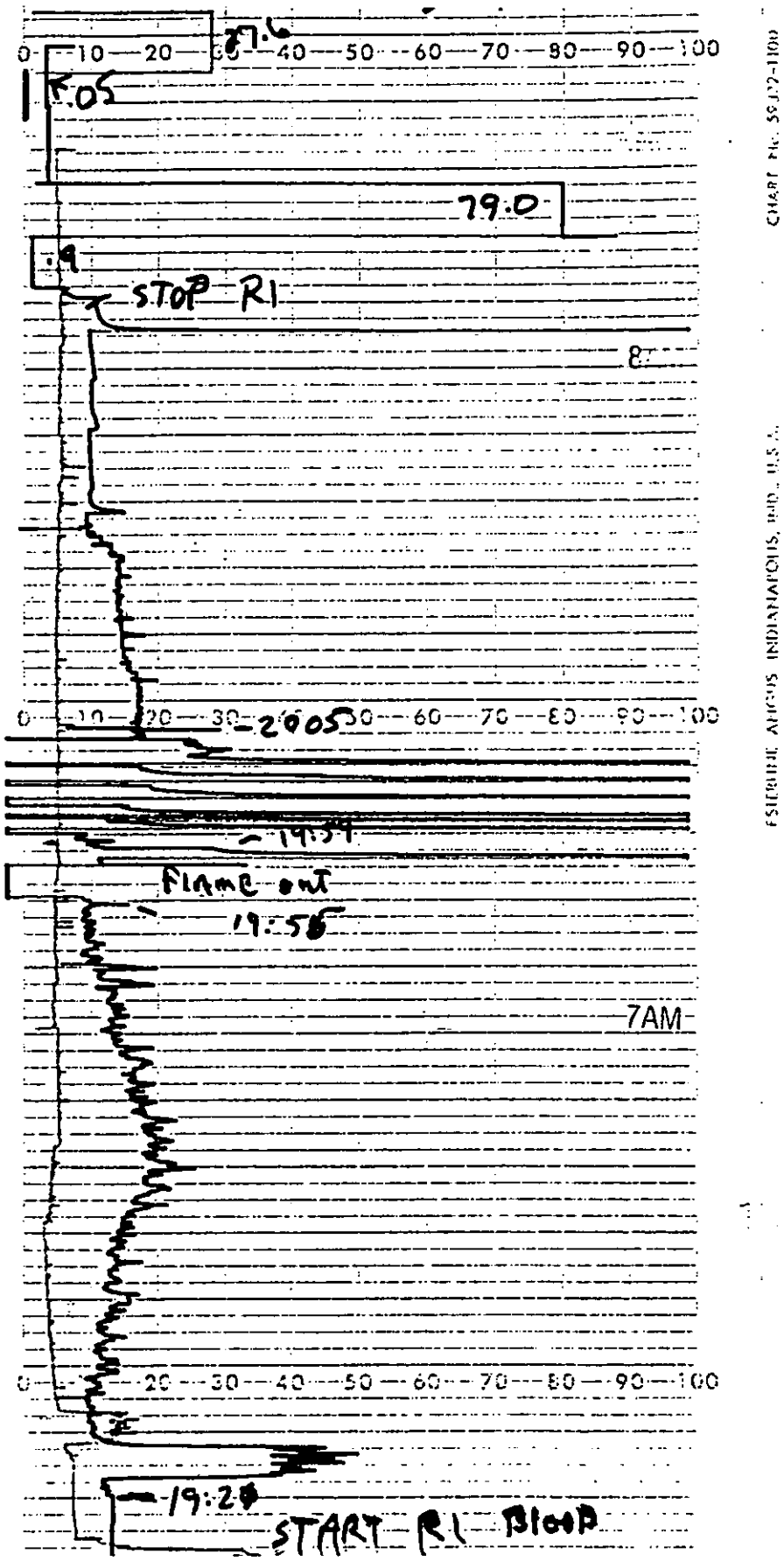
TRC

linearity 0-100 SCALE

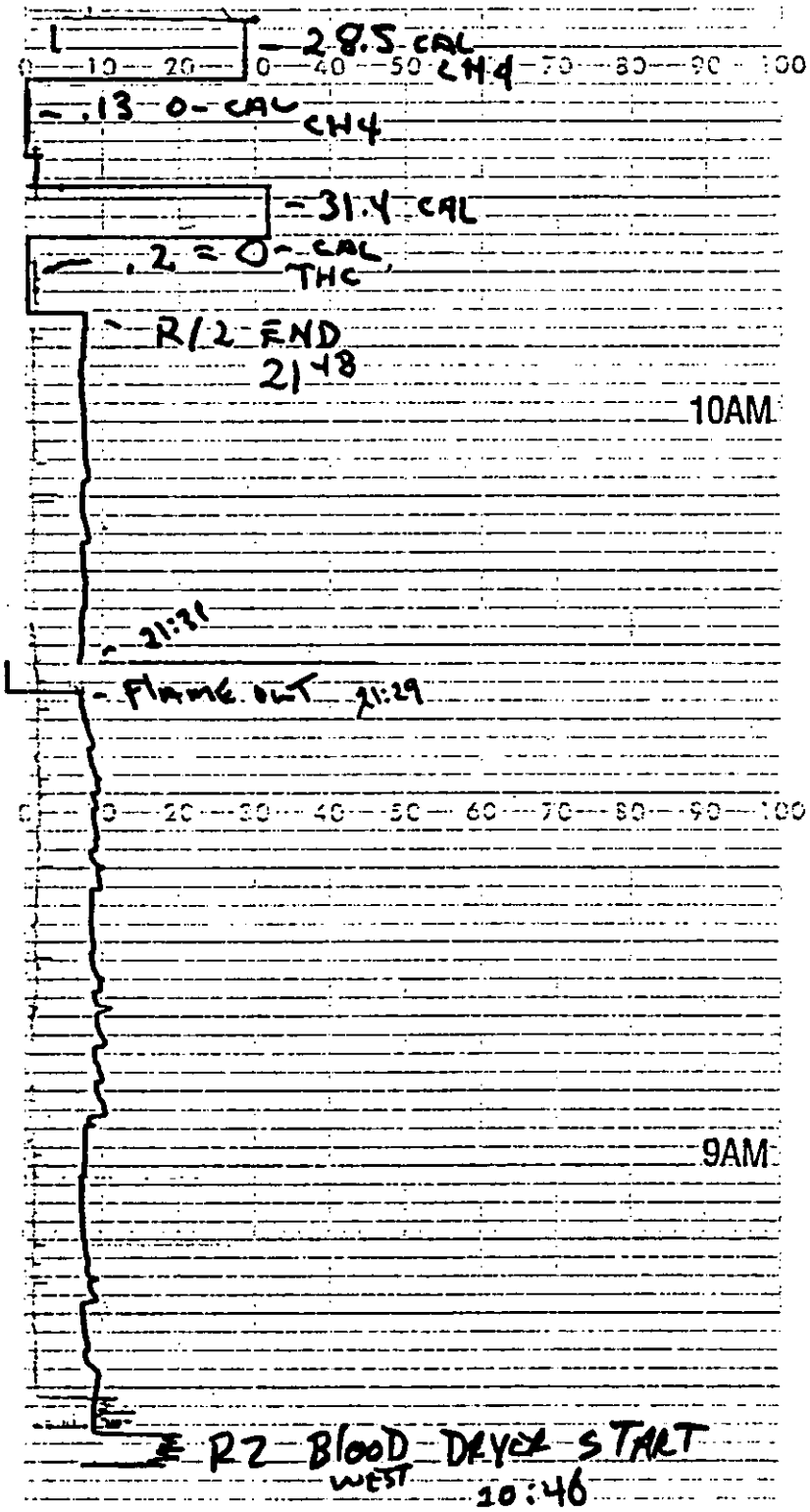


ESTERBROOK ARGUS INDIANAPOLIS, IND., U.S.A.

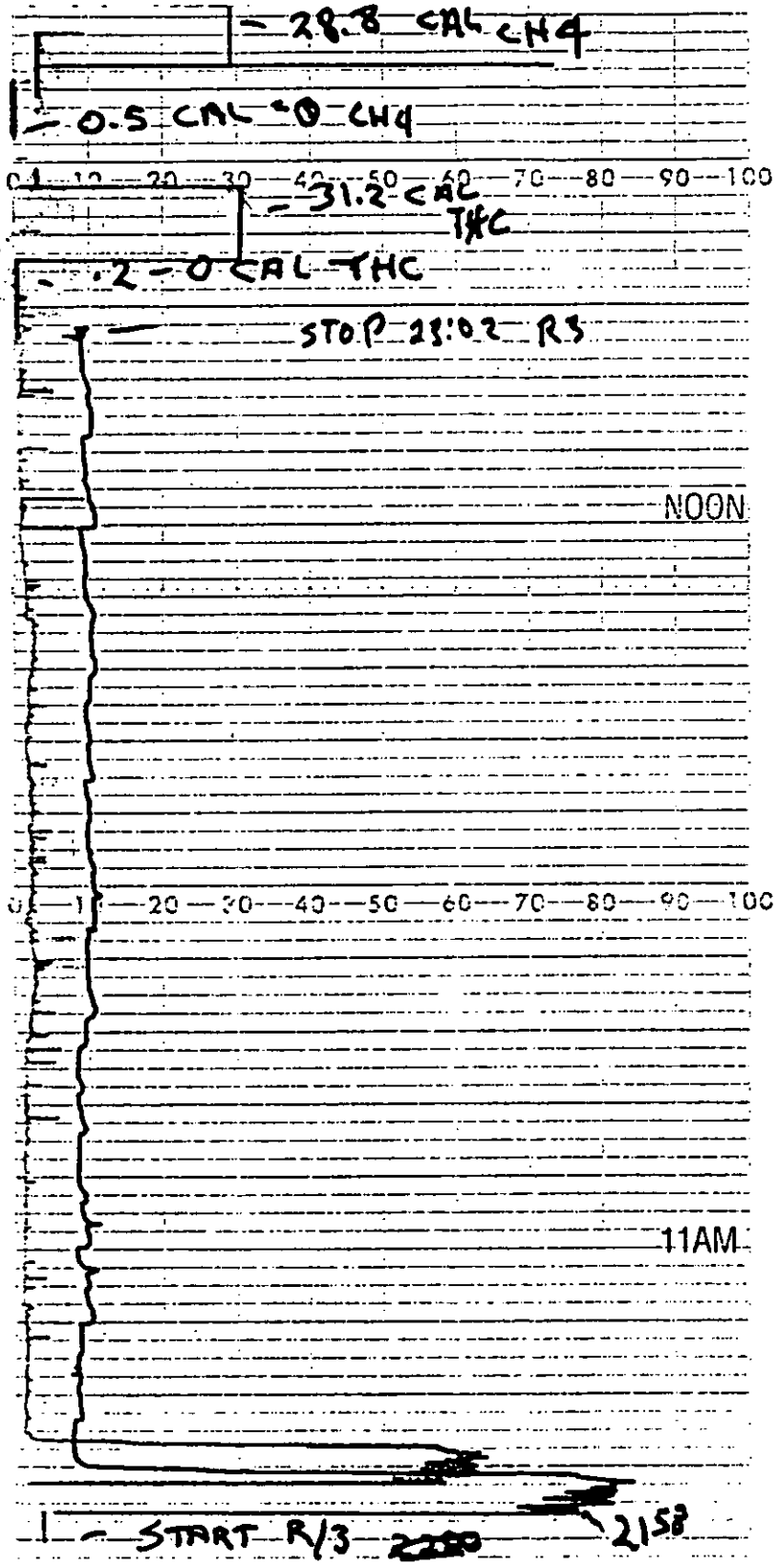
RUN 1 0-100 SCALE



RUN 2 0-100 SCALE



RUN 3 0-100 SCALE



APPENDIX B

PROCESS DATA

SLAUGHTER HEAD KILL AND HOURS

08/15/97

	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY	WEEKLY
A SHIFT KILL	2,442	1,811	1,900	2,442	2,442	0	11,037
A SHIFT HOURS	8.00	6.00	7.00	8.00	8.00	0.00	37.00
A SHIFT ACTUAL SUNSHINE	12	12	0	15	15	0	54
A SHIFT PAID SUNSHINE	0.25	0.25	0	0.25	0.25	0	1
B SHIFT KILL	0	2,442	2,391	2,442	2,442	2,363	12,080
B SHIFT HOURS	0.00	8.00	8.00	8.00	8.00	7.75	39.75
B SHIFT ACTUAL SUNSHINE	0	12	0	7	7	7	33
B SHIFT PAID SUNSHINE	0	0.25	0	0	0	0	0.25
TOTAL HEAD	2,442	4,253	4,291	4,884	4,884	2,363	23,117
TOTAL HOURS	8.00	14.00	15.00	16.00	16.00	7.75	76.75
						A SHIFT	34.75
						B SHIFT	38.25
						NET HOURS	73.00

PROCESSING HEAD CUT& HOURS

	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY	WEEKLY
A SHIFT HEAD CUT	2,464.0	2,461.5	2,236.0	2,474.5	2,482.5	1,910.0	14,028.5
A SHIFT HOURS	8.00	8.00	7.75	8.00	8.00	6.25	46.00
B SHIFT HEAD CUT	2,653.5	2,689.0	2,685.5	2,620.5	2,704.0	2,662.0	16,014.5
B SHIFT HOURS	8.00	8.00	8.00	8.00	8.00	7.75	47.75
TOTAL HEAD CUT	5,117.5	5,150.5	4,921.5	5,095.0	5,186.5	4,572.0	30,023.0
TOTAL HOURS	16.00	16.00	15.75	16.00	16.00	14.00	93.75
						NET HOURS	
						A SHIFT	44.50
						B SHIFT	46.25
						NET HOURS	90.75

EXTENSION HEAD CUT AND HOURS

	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY	WEEKLY
A SHIFT HEAD CUT	830.0	836.5	757.0	831.5	864.5	800.0	4,919.5
A SHIFT HOURS	8.00	8.00	8.00	8.00	8.00	7.00	47.00
B SHIFT HEAD CUT	794.0	800.0	820.0	804.0	806.0	789.0	4,813.0
B SHIFT HOURS	8.00	8.00	8.00	8.00	8.00	7.50	47.50
TOTAL HEAD CUT	1,624.0	1,636.5	1,577.0	1,635.5	1,670.5	1,589.0	9,732.5
TOTAL HOURS	16.00	16.00	16.00	16.00	16.00	14.50	94.50
						NET HOURS	
						A SHIFT	45.50
						B SHIFT	46.00
						NET HOURS	91.50

Post-it® Fax Note 7671

Date	# of pages ▶
To Rochell Craig	From
Co./Dept.	Co.
Phone #	Phone #
Fax # 3317	Fax #

** TOTAL PAGE.001 **

Blood Operator Log

Date 9-9-97

No Blood 5:30 AM

		9:45 A.M.	168/150/175	E 62			Full		5.1	110°	1½
		14.4 12.6 8.0	165/140/150	E 63			Full		5.1	110°	1½
		10.0 12.9 8.0	181/160/188	E 65			Full		6.2	110°	1½
		14.2 12.8 7.8	180/150/182	E 63			Full		6.1	110°	1½
		14.5 13.9 8.0	180/141/179	E 60			Full		6.1	110°	1½
		10-2 10.2 8.0	165/140/175	E.55%			Full Speed		6.1	110°	1½ lbs
		10-8 12.1 6.3	165/140/176	E. 58%			Full speed		6.6	110	1½ lbs
		12.6 11.2 6.3	165/150/179	E. 58%			40 speed		6.6	110°	1½ lbs
		11.9 11.0 6.8	169/150/179	E. 60%			40 speed		6.6	110°	1½ lbs
		11-6 12.6 9.0	169/150/179	E. 35%			40 speed		6.6	110°	1½ lbs
		11-6 10.3 8.9	179/150/180	E. 40%			40 speed		6.5	110°	1½ lbs
		11.0 12.0 8.9	179/150/180	E. 40%			40 speed		6.5	110°	1½ lbs
		11.1 12.0 8.0	179/150/180	E. 50%			40 speed		6.5	110°	1½ lbs
		12.2 13.0 8.0	178/150/150	E. 45%			40 speed		6.5	110°	1½ lbs
		10.8 11.2 8.7	179/150/152	E. 45%			40 speed		6.5	110°	1½ lbs
		11.2 10.1 8.7	178/150/185	E. 45%			40 speed		6.5	110°	1½ lbs
		13.8 11.9 9.5	178/150/185	E. 45%			40 speed		6.5	110°	1½ lbs
		14.5 9.8 10.5	300 148 1¾	30.6			40 "		7.7	110°	1½
		13.4 11.4 9.6	300 148 1¾	30.6			40 "		78	110°	1½
		12.6 10.4 9.4	300 148 1¾	30.6			40 "		77	110	1½
		14.3 10.7 9.7	300 148 1¾	30.6			40 "		77	110	1½

COMMENTS

4-15 p.m. Low on Blood. Start 5:05 p.m. Dryer

IBP Form No. 976

Beef Blood - Natural Gas
Dakota City Blood VOC Test

Tested September 9, 1997 at Dakota City on Dupps Ring Dryer

Test #1	0.15
Test #2	0.113
Test #3	0.134
	0.132

Dakota City Head Kill hd/day	4253
Blood Dryer Operating Hours	24.00
Blood Yield lbs/hd	8.7
Raw Blood Shipped in from outside lbs	280950
Raw Dakota City Blood lbs	174,863

	lbs/hr	tons/hr raw	tons/hr Finished
Blood Processed per dryer	6330.74	3.17	0.55

Emission Rate (lb/ton)	0.204
Heat Capacity MMBtu/hr	7.04
Emission Factor VOC- NG	2.78E-06
VOC emission from Combus	0.0195712
VOC emission from blood	0.11276213

APPENDIX C

EQUIPMENT CALIBRATION

PRETEST DRY GAS METER CALIBRATION DATA FORM (ENGLISH UNITS)

METER BOX NUMBE 1

DRY GAS METER NUMBER: 1197397

DATE: 07/02/97

FERENCE TEST METER NUMBER 27865

DELTA-H@	0	0.5	1	1.5	2	2.5	3	3.5	4
Vwr	427.276	432.620	440.052	449.010	455.391	471.452	478.198	483.646	489.274
Vdr	672.985	678.390	685.928	695.018	701.492	717.813	724.688	730.249	735.975
Tw		71	72	72	72	73	73	73	74
Tdi		77	82	87	89	91	93	94	95
Tdo		75	77	79	81	84	85	86	86
Td(AVE)		76	79.5	83	85	87.5	89	90	90.5
THETA		13.1	13.0	13.0	8.0	18.0	7.0	5.1	5.0
VAC.		1	1	1	1	1	1	1	1
Yi		0.9968	0.9973	1.0020	1.0046	1.0045	1.0031	1.0020	1.0031
DELTA-H@i		1.7163	1.7564	1.8017	1.7864	1.7829	1.8290	1.7336	1.7895
Vw		5.344	7.432	8.958	6.381	16.061	6.746	5.448	5.628
Vd		5.405	7.538	9.09	6.474	16.321	6.875	5.561	5.726
Vd/Min.		0.4141762	0.5798462	0.6992308	0.80925	0.9067222	0.9821429	1.0903922	1.1452

Y(AVE)	1.0017
DELTA-H@(AVE)	1.7745
Pbar	28.97

CALIBRATED BY D.W.

Vwr=REFERENCE TEST METER READING
Vdr=DRY GAS METER READING
Vw=GAS VOLUME PASSING THROUGH THE REFERENCE TEST METER, CUBIC FEET
Vd=GAS VOLUME PASSING THROUGH THE DRY GAS METER, CUBIC FEET
Tw=TEMPERATURE OF THE GAS IN THE REFERENCE TEST METER, DEGREES F
Tdi=TEMPERATURE OF THE INLET GAS OF THE DRY GAS METER, DEGREES F
Tdo=TEMPERATURE OF THE OUTLET GAS OF THE DRY GAS METER, DEGREES F
Td=AVERAGE TEMPERATURE OF THE GAS IN THE DRY GAS METER, DEGREES F
DELTA-H=PRESSURE DIFFERENTIAL ACROSS ORIFICE, in. WATER
Yi=RATIO OF ACCURACY OF REFERENCE TEST METER TO DRY GAS METER FOR EACH RUN
Y=AVERAGE RATIO OF ACCURACY OF REFERENCE TEST METER TO DRY GAS METER
DELTA-H@i=ORIFICE PRESSURE DIFFERENTIAL THAT EQUATES TO 0.75 cfm OF AIR AT 68 DEGREES F AND 29.92 INCHES OF Hg., INCHES OF WATER
DELTA-H@=AVERAGE ORIFICE PRESSURE DIFFERENTIAL THAT EQUATES TO 0.75 cfm OF AIR AT 68 DEGREES F AND 29.92 INCHES OF Hg.,INCHES OF WATER
TOLERENCE OF Yi=PLUS OR MINUS 0.020 FROM Y
TOLERENCE OF DELTA-H@i=PLUS OR MINUS 0.20 FROM DELTA-H@
Pbar=BAROMETRIC PRESSURE,in. Hg.
THETA=TIME OF CALIBRATION RUN, Min.

Thermocouple Calibration Form

Meter Box #1

Thermocouple Number	Temperature Reading #1	Reference Temp #1	Temperature Reading #2	Reference Temp #2	Temperature Reading #3	Reference Temp #3
1	72	73	180	181	289	286
2	72	73	179	181	290	286
3	73	73	181	181	290	286
4	74	73	180	181	289	286
5	73	73	180	181	289	286
6	40	39	73	74	107	108
7	39	39	72	74	107	108

Calibrated By: SRM
Date: 4-8-96

Criteria:Absolute temp reading cant excede 1.5% of Absolute reference temp

PRETEST DRY GAS METER CALIBRATION DATA FORM (ENGLISH UNITS)

METER BOX NUMBER	1
DRY GAS METER NUMBER	1197397
DATE	09/30/97
REFERENCE TEST METER NUMBER	27865

DELTA-H		2.00	2.00	2.00					
Vwr	495.749	508.304	514.499	518.461					
Vdr	753.179	765.880	772.168	776.184					
Tw		70	70	70					
Tdi		79	81	83					
Tdo		71	72	74					
Td(AVE)		75.0	76.5	78.5					
THETA		16.0	8.0	5.0					
VAC.		5.0	10.0	15.0					
Yi		0.9928	0.9923	0.9974					
DELTA-H@i		1.8508	1.8951	1.8032					
Vw		12.555	6.195	3.962					
Vd		12.701	6.288	4.016					
Vd/Min.		0.7938	0.7860	0.8032					

Y(AVE)	0.9942
DELTA-H@(AVE)	1.8497
Pbar	29.21

CALIBRATED BY DW

Vwr=REFERENCE TEST METER READING

Vdr=DRY GAS METER READING

Vw=GAS VOLUME PASSING THROUGH THE REFERENCE TEST METER, CUBIC FEET

Vd=GAS VOLUME PASSING THROUGH THE DRY GAS METER, CUBIC FEET

Tw=TEMPERATURE OF THE GAS IN THE REFERENCE TEST METER, DEGREES F

Tdi=TEMPERATURE OF THE INLET GAS OF THE DRY GAS METER, DEGREES F

Tdo=TEMPERATURE OF THE OUTLET GAS OF THE DRY GAS METER, DEGREES F

Td=AVERAGE TEMPERATURE OF THE GAS IN THE DRY GAS METER, DEGREES F

DELTA-H=PRESSURE DIFFERENTIAL ACROSS ORIFICE, in. WATER

Yi=RATIO OF ACCURACY OF REFERENCE TEST METER TO DRY GAS METER FOR EACH RUN

Y=AVERAGE RATIO OF ACCURACY OF REFERENCE TEST METER TO DRY GAS METER

DELTA-H@i=ORIFICE PRESSURE DIFFERENTIAL THAT EQUATES TO 0.75 cfm OF AIR AT 68 DEGREES F AND 29.92 INCHES OF Hg., INCHES OF WATER

DELTA-H@=AVERAGE ORIFICE PRESSURE DIFFERENTIAL THAT EQUATES TO 0.75 cfm OF AIR AT 68 DEGREES F AND 29.92 INCHES OF Hg.,INCHES OF WATER

TOLERENCE OF Yi=PLUS OR MINUS 0.020 FROM Y

TOLERENCE OF DELTA-H@i=PLUS OR MINUS 0.20 FROM DELTA-H@

Pbar=BAROMETRIC PRESSURE,in. Hg.

THETA=TIME OF CALIBRATION RUN, Min.

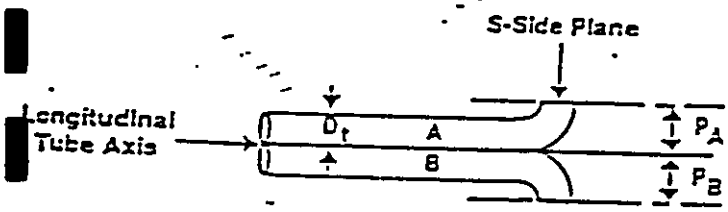
Type S Pitot Inspection Form

Pitot Tube No. 321

Tubing Diameter, D_t 3/8 in. $\left(\frac{3}{16} < D_t < \frac{3}{16}\right)$

Pitot Tube Assembly Level? Yes/No

Pitot Tube Opening Damaged? Yes/No



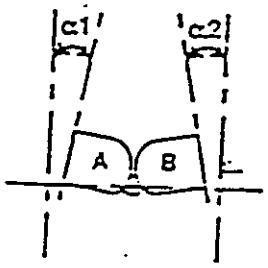
Note:

$1.05\ D_t < P < 1.50\ D_t$

$P_A = P_B$

P_A = 7/16 in.

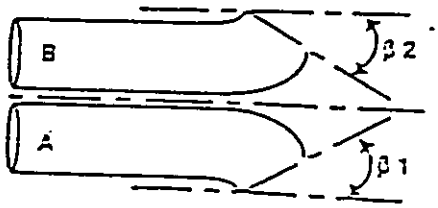
P_B = 7/16 in.



α1 = 1°

α2 = 0°

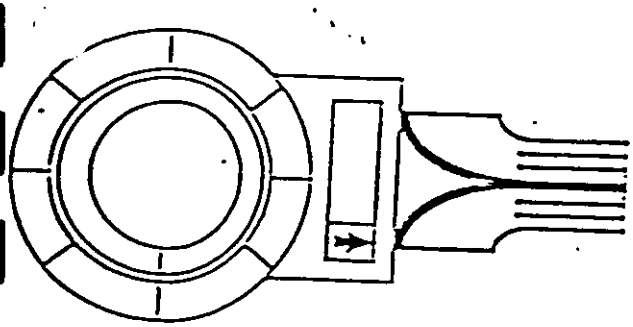
(< 10°)

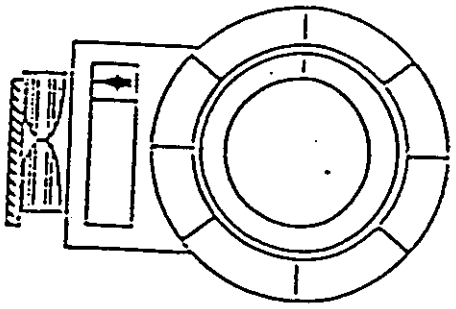


β1 = 0°

β2 = 0°

(< 5°)





Level Position to find γ = 0

Z = A' sin γ 0 in. (< 1/8 in.)

Level Position to find θ = 0

W = A' sin θ 0 in. (< 1/32 in.)

Comments:

Checked by: DW

Date: 5/17/97

Calibration Required? NO

D_t = External Tube Diameter

A' = Distance Between Tips (P_A + P_B) inches

BAROMETER CALIBRATION FORM

Barometer # 1
Cal'd Against Hg BAROMETER

DATE	REFERENCE BAROMETER (in. Hg.)	DIAL BAROMETER (in. Hg.)	DIFFERENCE
8/12/97	29.36	29.37	+.01
9/29/97	28.72	28.71	-.01

APPENDIX D

EXAMPLE CALCULATIONS

CALCULATION FORMULAS

Linearity Percent Difference = $\frac{\text{Analyzer Response - Cylinder Value}}{\text{Span}} \times 100$

Bias System Bias = $\frac{\text{System Response - Analyzer Response}}{\text{Span}} \times 100$

Drift System Drift = $\frac{\text{System Response - Previous System Response}}{\text{Span}} \times 100$

Moisture Moisture = $\frac{\text{100 x Volume water vapor (scf)}}{\text{(Volume Gas (dscf) + Volume water vapor)}}$

Stack Area Area = 3.14 x Radius^2

AFPM Actual Feet per Minute = 5130 x .84 x SDE Avg x (1 / (stack pres. Hg x wet MW)) ^.5

ACFM Actual Cubic Feet/Min = AFPM x Stack Area (sqaure feet)

DSCFM Dry Std. Cubic Feet/Min = $\frac{\text{(ACFM x 528 x Dry Mole Fraction x Stack pres. Hg)}}{\text{(29.92 x (Stack Temperature + 460))}}$

DSCF/HR Dry Std. Cubic Feet/Hr = SCFM x 60 min

Humidity Humidity (gal H2O/gal. air Taken From Chart (Wet bulb / Dry bulb temps)

EFFLUENT GAS CONC CALCULATION

GAS CONC. = (Avg Stk Conc - Avg Zero Cal) x (Span Conc/(Avg Span Cal - Avg Zero Cal))

LBS/HR CH4 Pounds per Hour as Methane = PPMv (VOC's less Methane) x 16.01 x DSCFM x 1.554E-7

LBS/HR Carbon Pounds per Hour as Carbon = PPMv (VOC's less Methane) x 12.01 x DSCFM x 1.554E-7

Since the stack gas total hydrocarbon concentrations will be measured as methane and the stack methane gas will be measured, the methane fraction can be subtracted straight out of the stack gas concentrations.

The calibration of the FID (JUM) analyzer will be with Propane as a Methane concentration. The following is an example:

FID (JUM): Propane ($C_3 H_8$) = 17 ppm. There are three Carbons in propane. Calibrate as 51 ppm CH_4.
FID (CAI): Methane (CH_4) = 50 ppm. There is only one Carbon in methane. Calibrate as 50 ppm CH_4.

Propane equivalent to Methane would be 17 x 3 = 51 ppm as methane.

80 ppm (JUM) - 60 ppm (CAI) = 20 ppm total hydrocarbons as methane.

The final test results will be reported in lbs/hr as Carbon.