Stella Cheese
P. O. Box 1379
Tulare, California 93274

Superior Mohawk Boiler

Prepared by:

Steiner Environmental, Inc.
4930 Boylan Street
Bakersfield, California 93308

INITIAL COMPLIANCE TEST

July 30, 1993

San Joaquin Valley Unified Air Pollution Control District
Permit Number S-0817-0001-00

Report PS-93-3186/Project 7378-93

Test Team Leader: Darryl Meloche

Approved by : Jim Steiner

Jim Steiner, Project Manager
August 12, 1993

TABLE OF CONTENTS

SECTION 1

INTRODUCTION

At the request of Stella Cheese, Steiner Environmental, Inc. undertook a series of emission tests on the effluent of a boiler located at their plant located in Tulare, California. The purpose of these tests was to determine compliance with San Joaquin Valley Unified Air Pollution Control District (SJVUAPCD) rules and regulations. These tests were conducted on July 30, 1993.

Stella Cheese has installed a Superior Mohawk Model 4-3753 natural gas fired boiler. This boiler is equipped with a low NO_x burner and flue gas recirculation (FGR) for NO_x control.

Triplicate tests for NO_x, CO, CO_2 and O_2 were conducted on the effluent of the boiler using CARB Method 1-100. Triplicate flowrate and moisture tests were performed using EPA Methods 2/4. A sample of the natural gas fired in the boiler was collected and analyzed for CHNOS, specific gravity, moisture and BTU using ASTM methods.

Messrs. Darryl Meloche and Scott Wine of Steiner Environmental, Inc. conducted these tests. Mr. Frank Miranda of Stella Cheese was present to oversee the operation of the boiler. Mr. Greg LeFlore of the SJVUAPCD was on site to observe the tests.

Section 2 of this report summarizes the test matrix for this program.

SECTION 2

TEST MATRIX

Table 2-1 summarizes the tests performed on this program. The boiler is rated at 31.5 MMBtu/hr and the heat input during these tests was 26 MMBtu/hr (82.5% of capacity).

Section 3 presents the test results.

TABLE 2-1. STELLA CHEESE SUPERIOR MOHAWK BOILER TEST MATRIX

Date	Test No.	Test Parameter	Test Time	Test Condition
07/30/93	1	$NO_x/CO/CO_2/O_2$ Flowrate/H_2O	11:12 am - 12:12 pm 11:15 am - 12:06 pm	27 MMBtu/hr
	2	$NO_x/CO/CO_2/O_2$ Flowrate/H_2O	12:22 pm - 1:22 pm 12:22 pm - 1:21 pm	25 MMBtu/hr
	3	$NO_x/CO/CO_2/O_2$ Flowrate/H_2O	1:47 pm - 2:47 pm 1:50 pm - 2:41 pm	26 MMBtu/hr

SECTION 3

TEST RESULTS

Table 3-1 summarizes the results of the tests performed on the boiler. NO_x and CO emissions are limited to 0.037 lb/MMBtu and 0.035 lb/MMBtu, respectively. Measured NO_x and CO emissions averaged 0.034 lb/MMBtu and 0.004 lb/MMBtu, respectively.

TABLE 3-1. SUMMARY OF SOURCE TEST RESULTS

Company : STELLA CHEESE Test Date: JULY 30,1993 APCD No.:S-0817-0001-00 Unit No. : SUPERIOR MOHAWK BOIL

POLLUTANT	INLET Concentration gr/scf	INLET Concentration @12% CO2	INLET Concentration ppm(v)	INLET Mass Flow Rate lb/hr	OUTLET Concentration gr/scf	OUTLET Concentration @12% CO2	OUTLET Concentration ppm(v)	OUTLET Concentration @O2 CORR*	OUTLET Mass Flow Rate lb/hr	Removal Percent	Emission Factor Outlet
Particulate avg.											
Sulfate avg.											lb/MMBtu as Sulfur
SO2 (wet) avg.											lb/MMBtu as Sulfur
NOx as NO2 (dry) avg.							28.73 28.17 29.73 28.88	28.07 27.35 28.86 28.09	0.88 0.85 0.91 0.88		0.0338 lb/MMBtu
HC (> C1) avg.											
CO avg.							4.18 4.42 7.57 5.39	4.09 4.29 7.35 5.24	0.08 0.08 0.14 0.10		0.0038
avg.											

Scrubber Liquor Analysis : Chlorides - mg/l Specific Gravity -

For Kern County Use Only

Comments : 3.0 % O2 correction.

SECTION 4

SAMPLING EQUIPMENT AND PROCEDURES

This section of the report describes the equipment and procedures used to conduct the gaseous tests on this program.

4.1 PRELIMINARY MEASUREMENTS

Before conducting the stack tests a series of preliminary measurements were made to determine:

- The location of the sampling site and the number and location of the sampling points to be used (EPA Method 1)

4.2 PREPARATION OF THE MOISTURE/FLOWRATE SAMPLING TRAIN

All sampling train components were cleaned in the laboratory (soap and water, tap water rinse, distilled water rinse, and IPA rinse) to eliminate previous contamination. The sampling train components were EPA Method 2/4 equipment used to measure moisture and flowrate consisted of:

- A straight stainless steel nozzle for constant rate sampling
- A heated Pyrex glass sampling probe (6 feet long) equipped with an S-type pitot tube and a thermocouple to measure stack velocity, pressure and temperature
- A heated Pyrex glass filter holder containing an untared 100-mm Whatman 934 AH glass fiber filter

- A Pyrex glass impinger train in an icebath (impingers 1 and 2 contained 100-ml distilled water; bubbler 3 was dry; bubbler 4 contained a weighed amount of silica gel)
- An umbilical to connect the probe and sample box to the control module
- A control module containing a vacuum pump, a calibrated dry gas meter and a calibrated orifice meter to measure the pressure, temperature and flowrate throughout the train.

The sampling train was charged in the mobile lab using freshly prepared reagents. Each impinger and its contents was weighed to the nearest 0.1 gm on a calibrated electronic balance. The sampling point locations were marked on the probe using a high-temperature marker. The sampling train was completely assembled and lifted to the sampling site.

4.3 SAMPLING PROCEDURES FOR MOISTURE/FLOWRATE SAMPLING TRAIN

Prior to a test, the sampling train was heated and leak checked at 15-inches Mercury to insure leakage was less than 0.02 cfm or 4% of the average sampling rate. The S-type pitot tube was also leak checked. The sampling train was installed on the unirail and the probe was inserted into the stack at the farthest point. A constant sampling rate was calculated using an HP-41CV calculator for each sampling point on the traverse (8 points per traverse; 2 traverses at 90°). Each point was sampled for an equal period of time (1.875 minutes) and all pertinent data were recorded on the data sheet every 1.875 minutes for each point. The probe and sample box were maintained at 250°F throughout the traverse. The gases leaving the impinger train were maintained at <68°F. At the end of a traverse, the probe was withdrawn from the stack and the

entire sampling train was transferred intact to the next sampling port. Another traverse of the stack was completed and the sampling train was withdrawn for the final leak check. This leak check was performed at 15-inches Mercury or at the highest vacuum achieved during the test. The S-type pitot tube was also checked at this time. The impinger train was sealed with aluminum foil and lowered to the mobile lab for sample recovery.

4.4 SAMPLE RECOVERY PROCEDURES FOR MOISTURE/FLOWRATE SAMPLING TRAIN

Sample recovery for the impinger train occurred in the mobile lab. Each impinger was removed from the icebath, wiped dry and weighed to the nearest 0.1 gm. The contents of impingers 1 and 2 and bubblers 3 and 4 were discarded. The sampling train was then recharged in preparation for the next test.

4.5 SAMPLING PROCEDURES FOR CONTINUOUS MONITORING

The continuous monitors used in the Steiner Environmental Mobile Monitoring Lab are shown in Table 4-1. Figure 4-1 is a schematic of the continuous monitoring system. The procedures used to continuously monitor stack gases for NO_x, CO, CO_2 and O_2 strictly followed CARB Method 1-100.

Sample was taken from the stack (at a single point) using a 316 stainless steel probe. A heated Balston filter holder and fiberglass filter (99.9999 percent efficiency retention of 0.6 micron particles) was connected to the outlet of the probe. Sample gas was transported through heated Teflon sample line (maintained at >250°F) by a Teflon-lined diaphragm pump to a 316 stainless steel refrigeration type conditioner (Hankison Model E-4G-SS). The sample gas was passed through the

TABLE 4-1. CONTINUOUS MONITORING LAB - TRAILER 3

NO_x CHEMILUMINESCENT ANALYZER -- THERMO ELECTRON MODEL 10

Response Time (0-90%)	1.5 sec -- NO mode; 1.7 sec -- NO_x mode
Zero Drift	Negligible after 1/2 hour warmup
Linearity	±1% of full scale
Accuracy	Derived from the NO or NO_2 calibration gas, ±1% of full scale
Output	0-10 V
Operating Ranges	0-2.5, 10, 25, 100, 250, 1000, 2500 and 10,000 ppm
Flowrate = 2 scfh	0-2.5

O_2 ANALYZER, FUEL TYPE -- TELEDYNE MODEL 326

Response Time (0-90%)	60 seconds
Accuracy	±1% of scale at constant temperatures; ±1% of scale of ±5% of reading, whichever is greater, over the operating temperature range
Output	0-1 V
Operating Ranges	0-5%, 10%, 25% O_2
Flowrate	2 scfh

CO_2/CO INFRARED ANALYZER -- ANARAD MODEL AR-600

Response Time (0-90%)	5 seconds
Zero Drift	±1%
Span Drift	±1%
Linearity	1%
Resolution	Less than 1% of full scale
Output	0-1 V
Operating Ranges	0-20% CO_2/0-5% CO
Flowrate	1000 cc/min

CO GAS FILTER CORRELATION -- THERMO ELECTRON MODEL 48

Response Time (0-95%)	1 minute
Zero Drift	±0.2 ppm CO
Span Drift	Less than 1% full scale in 24 hours
Linearity	±1% full scale, all ranges
Accuracy	±0.1 ppm CO
Output	0-10 V
Operating Ranges	1, 2, 5, 10, 20, 50, 100, 200, 500, 1000 ppm
Flowrate	.5 - 2 lpm

STRIP CHART RECORDERS (2) -- LINSEIS 7025

Pen Response	0.35 seconds Full Scale
Input Spans	1, 2, 5, 10, 20, 50, 100 mV
Zero Set	Stable access entire chart-width ±100%
Accuracy	.35% of Span
Dead Band	.15% of Span
Linearity	.25% of Span
Chart Speed	1, 2, 5, 10, 20, 50, 100 cm/min; 1, 2, 5, 10, 20, 50 cm/hr; fast advance 100 cm/min; LED indicator; forward and reverse selector
Recording Pen	Fiber tip pen
Chart Width	250 mm

SCOTSMAN TRAILER

Fully Insulated	Air Conditioned -- 8 feet x 14 feet x 11 feet

1. Filter 0.6 μ, 99.9999 percent efficient
2. Duct
3. 316 stainless steel probe
4. 3/8-inch, heated (250°F) Teflon
5. Four-pass conditioner-dryer, 316 stainless steel internals
6. 3/8-inch, unheated Teflon
7. Teflon-lined sample pump
8. 3/8-inch unheated Teflon
9. Rotameter
10. 1/4-inch Teflon tubing
11. Calibration gas manifold
12. Calibration gas selector valve
13. Calibration gas cylinders
14. Backpressure regulator
15. Auxiliary analysis port

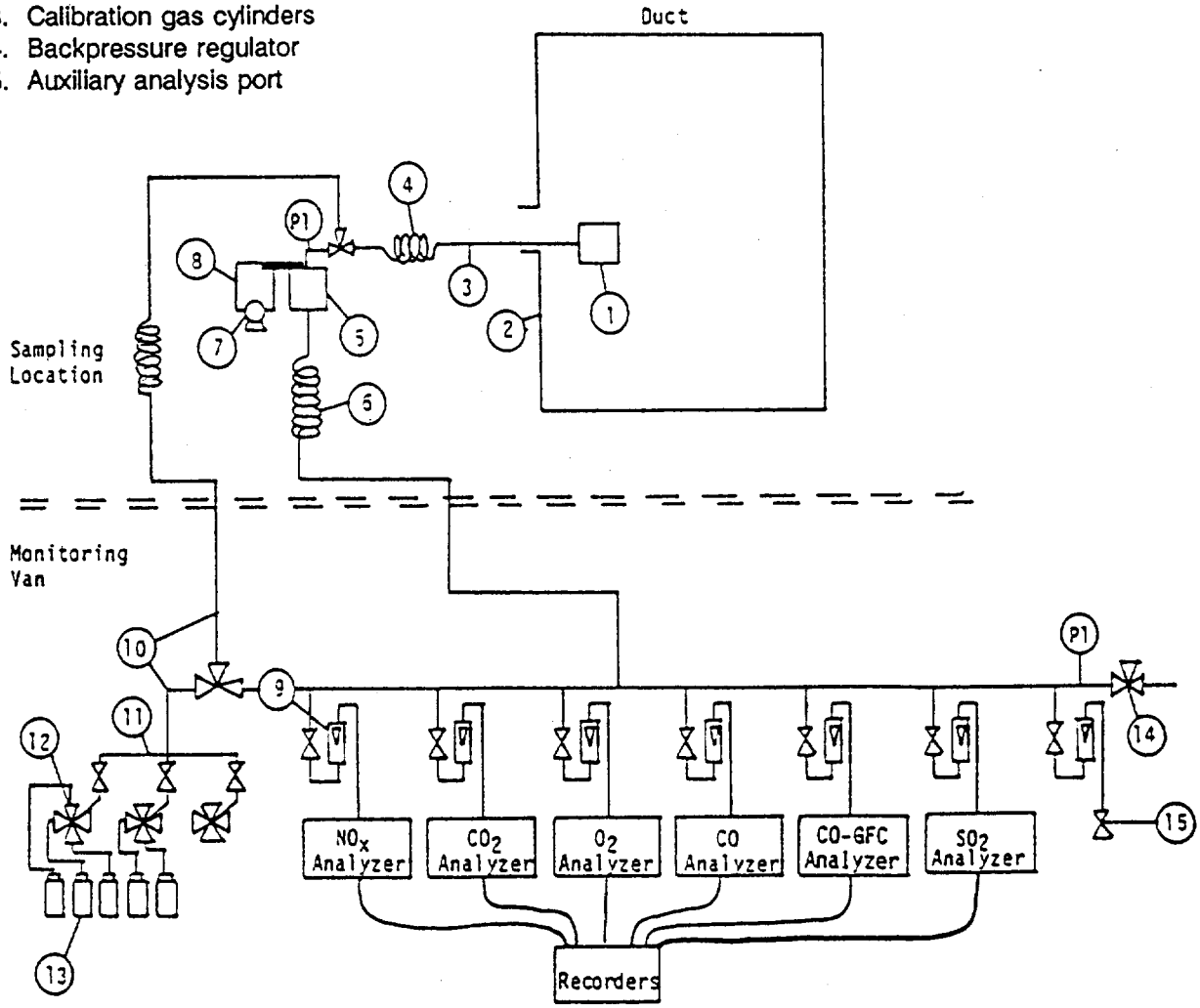


FIGURE 4-1. SCHEMATIC OF CONTINUOUS MONITORING SYSTEM

conditioner two separate times under vacuum before entering the pump, then two additional times under pressure. The clean, dry sample gas (-35°F) was then transported to the continuous analyzer system through an unheated Teflon line. A series of flowmeters, valves, and regulators maintain constant flow through the system at a constant pressure.

Calibrations of the continuous analyzers were performed using EPA Protocol 1 calibration gases (±1%) for NO_x and NBS certified calibration gases (±1%) for CO, CO_2 and O_2. Copies of the gas certifications are included in the appendix of this report. All pertinent data (date, time, test locations, analyzer range, cal gas value) were recorded on both the field data sheets and continuous analyzer strip charts in the field.

At the start of a test day, a leak check was performed. The sample probe was removed from the stack and the end was sealed. A leak check was successful only if pressure at the analyzer system and flow through the rotameters to the individual analyzers all dropped to zero. A mandatory leak check was performed at the completion of each test day.

An initial calibration was performed at the start of a test period by introducing zero and span gases for each analyzer and making the necessary adjustments. Calibration gas values were recorded on the continuous monitor strip charts and field data sheets. A calibration check was completed at the end of a test and adjustments (if necessary) to the analyzers were made in preparation for another test.

An external calibration of the sampling system was performed at the start of a test day. EPA Protocol 1 gas was flowed through the entire sampling system from the probe tip. The response of the analyzers had to be within ±5% of the certified tank value before testing could proceed. An external calibration was also performed at the end of each test day.

Test data were collected by recording 10-minute averages from the strip chart recordings onto the field data sheets. Data collected over the test period were averaged and reported. A fuel analysis was used to calculate the F-factor, dscf/MMBtu corrected to zero percent O_2 (standard conditions 60°F, 29.92 inches Mercury), as described in 40 CFR 60.45. The pollutant concentration and the F-factor were used to calculate an emission factor in lb/MMBtu.

SECTION 5

ANALYTICAL PROCEDURES

This section of the report describes the procedures used to analyze the samples collected during the test program.

5.1 FUEL

A sample of the fuel fired during this test program was collected and sent to Pacific Gas Technology for analysis. Analysis was performed by PGT in accordance with EPA Title 40 Section 60.45. The specific procedures are itemized in Table 5-1. The results appear at the end of this section.

TABLE 5-1. FUEL ANALYSIS METHODS

LABORATORY TEST PROCEDURES FOR FUEL OILS AND FUEL GASES

Reference: EPA Title 40, Section 60.45

FUEL OIL TESTS:	
Sediment and Water, Vol. %	ASTM D4007-81
Gravity by Hydrometer (API)	ASTM D1298-80
API Gravity Corrected to 60°F	ASTM Table 5A
Gross Calorific Value (Btu/lb)	ASTM D2015-77
Ultimate Analysis (C, H, O, N, S, wt. %)	
Carbon, Hydrogen	ASTM D3178-73
Nitrogen (chemiluminescence detector)	ASTM D3431-80
Sulfur	ASTM D2622-82
Ash	ASTM D482
Oxygen	ASTM D3176-74
GASEOUS FUELS BY GAS-LIQUID CHROMATOGRAPHY:	
Gas Analysis	ASTM D1945-81
Sulfur Analysis	CPA B16
Calculation of Gross Calorific Value	ASTM D3588-81
Component Weight %, F-factor calculations	EPA 40:60.45
PROCEDURES FOR SCRUBBER LIQUOR ANALYSIS:	
Specific Gravity	ASTM D1429
Chlorides	ASTM D512-67

PACIFIC GAS TECHNOLOGY

2122 Q Street
Bakersfield, California 93301
805/324-1317
Fax: 805/324-2746

GAS ANALYSIS BY CHROMATOGRAPH

STEINER ENVIRONMENTAL, INC
4930 Boylan Street
Bakersfield, CA 93308

Attention: Jim Steiner

SAMPLED: 30-Jul-93
SUBMITTED: 2-Aug-93
REPORTED: 5-Aug-93
LAB No.: 6474-7

Sample ID : STELLA CHEESE
BOILER
NATURAL GAS

STEINER ID No. : 33914

ANALYZED GAS	MOLE %	WT %	CHONS WT %	
OXYGEN	0.04	0.07	CARBON	73.25
NITROGEN	0.76	1.18	HYDROGEN	23.08
CARBON DIOXIDE	1.36	3.32	OXYGEN	2.49
HYDROGEN	ND	0.00	NITROGEN	1.18
CARBON MONOXIDE	ND	0.00	SULFUR	0.00
HYDROGEN SULFIDE	ND	0.00		
METHANE	89.45	79.61		
ETHANE	6.50	10.84		
PROPANE	1.53	3.74		
iso-BUTANE	0.12	0.39		
n-BUTANE	0.17	0.55		
iso-PENTANE	0.03	0.12		
n-PENTANE	0.02	0.08		
HEXANE +	0.02	0.10		
TOTAL:	100.00			

SPECIFIC GRAVITY * : 0.622

SPECIFIC VOLUME : 21.13 cu ft/lb

TOTAL SULFUR as Hydrogen Sulfide : ppm (GC/FPD)

TOTAL * BTU/cu ft	DRY :	1069	NET * BTU/cu ft	DRY :	965
	WET :	1051		WET :	948
BTU/lb	:	22596	BTU/lb	:	20394

* CALCULATED ACCORDING TO : ASTM D-3588

SECTION 6

QUALITY ASSURANCE

6.1 MOISTURE/FLOWRATE SAMPLING EQUIPMENT

A detailed record of repair and maintenance to each sampling train is kept. Preventative maintenance to each system is performed periodically to avoid complete component breakdown during a field test.

A detailed record of sampling system calibrations is also kept. Calibration data for the sampling nozzles, pitot tubes, dry gas meters and orifice meters are available for review. Results of the EPA Quality Assurance Branch biannual audits of the dry gas meter and orifice meter combinations are also logged and verify our in-house calibration data. The calibration data for the equipment used on this program can be found in the appendix.

A comparison of the volumetric stack gas flowrates measured by pitot tube and calculated from the fuel gas readings appreas in Table 6-1. Good agreement was obtained.

6.2 LAB ANALYSIS

All field samples are assigned a label and an ID number. This ID is also affixed to a chain-of-custody log and to the field data sheet to eliminate any chance of sample mixup.

Prior to analysis, all glassware is thoroughly cleaned (soap and water, tap water rinse, distilled water rinse, IPA rinse) to eliminate

any contamination. The evaporating dishes used to evaporate the washings are treated the same as a sample (dried in an oven, desiccated and weighed repeatedly at 6-hour intervals until a constant weight is achieved). The glassware used to measure volumes and make transfers and dilutions are all NBS Class A to insure accurate measurements. All weighings are carried out on a Sartorius Research Model R160P electronic semi-micro balance supported by a marble table in a separate room from the main analytical laboratory. The balance is calibrated regularly against an NBS Class S-1 weight.

All reagents used in the field and in the laboratory are ACS reagent grade and blanks of these reagents are evaluated for every set of tests. Blanks are taken in the field from the squeeze bottles and not the original container. Records are kept on these blanks to insure consistent quality of the reagents.

6.3 CONTINUOUS MONITORS QUALITY ASSURANCE

The NO_x analyzer was calibrated before and after each test using an EPA Protocol 1 gas (±1%) traceable to NBS. The CO, CO_2 and O_2 analyzers are calibrated before and after each test using a NBS certified gas mixture (±1%). Copies of the calibration gas certificates appear in the appendix of this report.

A sampling system check was performed at the beginning and end of each test day. This was done by introducing an EPA Protocol 1 gas at the sampling probe and measuring the system response. The purpose of this was to check the system for leaks and sample loss.

Multi-point calibration linearity checks of the continuous analyzers were performed on May 5, 1991 through May 16, 1991. These

results were well within CARB limitations of ±2% of full scale. Tables 6-1 through 6-6 list the results of these checks.

TABLE 6-1. MEASURED VERSUS CALCULATED FLOWRATES

Test No.	Measured	Calculated	% Difference
1	4,221	4,371	-3.6
2	4,158	4,068	2.2
3	4,186	4,123	1.5

$$\% \ Difference = \frac{Measured - Calculated}{Measured} \times 100$$

TABLE 6-2. NO_x CALIBRATION SUMMARY

Monitoring Trailer: 3		Calibrated by: JP 5/9/91	
Analyzer:	TECO	Calibrator Manufacturer:	Environics
Model:	10 AR	Model:	201-1520
Serial Number:	15311-154	Serial Number:	1122
NO_x Standard:	CC7204, CC72048		
Concentration:	9760 ppm, 1039 ppm		
Cylinder Pressure:	2000 psi, 2000 psi		

NO_x CALIBRATION AND LINEARITY CHECKS

Range 0-2500 ppm

Calibration Points	Flow, Dil. cc/min	Flow, Std. cc/min	NO_x out ppm	Chart ppm	% Difference +2% Full Scale
Zero	2944.8	0	0	0	0
80% URL	2332.9	603.8	2005	2005.0	0
1	2487.1	450.7	1497	1502.5	+ 0.22
2	2638.9	302.0	1002	1010.0	+ 0.32
3	2790.6	152.3	505	505.0	0

Range 0-1000 ppm

Calibration Points	Flow, Dil. cc/min	Flow, Std. cc/min	NO_x out ppm	Chart ppm	% Difference +2% Full Scale
Zero	4919.8	0	0	0	0
80% URL	4515.9	402.0	798.0	798	0
1	4616.3	303.2	601.5	602	+ 0.05
2	4716.6	204.1	405.0	409	+ 0.40
3	4814.5	103.6	205.5	207	+ 0.15

TABLE 6-2. NO_x CALIBRATION AND LINEARITY CHECKS (Concluded)

TECO Model 10-AR/Trailer #3/May 9, 1991

Range 0-100 ppm

Calibration Points	Flow, Dil. cc/min	Flow, Std. cc/min	NO_x out ppm	Chart ppm	% Difference +2% Full Scale
Zero	9339.6	0	0	0	0
80% URL	9256.4	76.9	80.4	80.4	0
1	9278.4	56.9	59.5	60.1	+ 0.6
2	9298.0	38.2	39.9	39.8	+ 0.1
3	9320.1	19.5	20.3	19.9	- 0.4

Range 0-25 ppm

Calibration Points	Flow, Dil. cc/min	Flow, Std. cc/min	NO_x out ppm	Chart ppm	% Difference +2% Full Scale
Zero	4916.6	0	0	0	0
80% URL	4821.9	94.7	20.00	20.00	0
1	4846.3	70.1	14.80	15.02	+ 0.88
2	4865.4	46.9	9.90	10.00	+ 0.40
3	4890.4	23.8	5.03	5.03	0

Range 0-10 ppm

Calibration Points	Flow, Dil. cc/min	Flow, Std. cc/min	NO_x out ppm	Chart ppm	% Difference +2% Full Scale
Zero	9335.3	0	0	0	0
80% URL	9263.8	72.3	8.04	8.04	0
1	9283.3	53.4	5.95	5.92	- 0.3
2	9298.0	35.8	3.99	3.93	- 0.6
3	9320.0	18.3	2.03	2.02	- 0.1

TABLE 6-3. CO CALIBRATION SUMMARY

Monitoring Trailer: 3		Calibrated by: JP 5/13/91	
Analyzer:	ANARAD	Calibrator Manufacturer:	Environics
Model:	AR 602	Model:	201-1520
Serial Number:	2340	Serial Number:	1122
CO Standard:	ALM17548, ALM15154		
Concentration:	42490 ppm, 22560 ppm, 10430 ppm		
Cylinder Pressure:	2000 psi, 2000 psi, 2000 psi		

CO CALIBRATION AND LINEARITY CHECKS

Range 0-50,000 ppm

Calibration Points	Flow, Dil. cc/min	Flow, Std. cc/min	CO out ppm	Chart ppm	% Difference +2% Full Scale
Zero	* NA	* NA	0	0	0
80% URL	* NA	* NA	42490	42490	0
1	* NA	* NA	22560	22600	+ 0.08
2	* NA	* NA	10430	10100	- 0.66

* Used Concentrated Gas Cylinders

TABLE 6-4. CO CALIBRATION SUMMARY

Monitoring Trailer: 3		Calibrated by: JP 5/10/91	
Analyzer:	TECO	Calibrator Manufacturer:	Environics
Model:	48	Model:	201-1520
Serial Number:	25149-219	Serial Number:	1122
CO Standard:	CC81181, CC345		
Concentration:	10430 ppm, 1001 ppm		
Cylinder Pressure:	2000 psi, 2000 psi		

CO CALIBRATION AND LINEARITY CHECKS

Range 0-1000 ppm

Calibration Points	Flow, Dil. cc/min	Flow, Std. cc/min	CO out ppm	Chart ppm	% Difference +2% Full Scale
Zero	7368.0	0	0	0	0
80% URL	6809.1	558.9	791.2	791.2	0
1	6948.6	420.3	594.5	598.0	+ 0.35
2	7090.5	281.1	397.7	411.0	+ 1.30
3	9160.9	179.4	200.3	211.0	+ 1.10

Range 0-500 ppm

Calibration Points	Flow, Dil. cc/min	Flow, Std. cc/min	CO out ppm	Chart ppm	% Difference +2% Full Scale
Zero	7371.6	0	0	0	0
80% URL	7090.5	281.1	397.7	397.7	0
1	7161.5	211.8	299.6	307.5	+ 1.58
2	2890.9	56.0	198.3	201.0	+ 0.54
3	2917.8	28.3	100.2	100.5	+ 0.06

TABLE 6-4. CO CALIBRATION AND LINEARITY CHECKS (Concluded)

TECO Model 48/Trailer #3/May 10, 1991

Range 0-100 ppm

Calibration Points	Flow, Dil. cc/min	Flow, Std. cc/min	CO out ppm	Chart ppm	% Difference +2% Full Scale
Zero	8838.0	0	0	0	0
80% URL	8140.4	697.6	79.0	79.0	0
1	8319.1	524.1	59.3	59.1	- 0.2
2	8492.9	350.9	39.7	39.8	+ 0.1
3	8671.5	177.2	20.0	20.3	+ 0.3

Range 0-20 ppm

Calibration Points	Flow, Dil. cc/min	Flow, Std. cc/min	CO out ppm	Chart ppm	% Difference +2% Full Scale
Zero	4917.8	0	0	0	0
80% URL	4838.9	78.9	16.05	16.05	0
1	4858.6	58.3	11.90	12.08	+ 0.9
2	4878.2	39.1	7.96	8.02	+ 0.3
3	4897.7	19.9	4.04	4.14	+ 0.5

Range 0-10 ppm

Calibration Points	Flow, Dil. cc/min	Flow, Std. cc/min	CO out ppm	Chart ppm	% Difference +2% Full Scale
Zero	8845.5	0	0	0	0
80% URL	8774.3	71.2	8.04	8.04	0
1	8796.3	52.6	5.94	6.05	+ 1.1
2	8813.5	35.3	3.99	4.15	+ 1.6
3	9711.6	19.7	2.02	2.10	+ 0.8

TABLE 6-5. CO_2 CALIBRATION SUMMARY

Monitoring Trailer: 3		Calibrated by: JP 5/16/91	
Analyzer:	ANARAD	Calibrator Manufacturer:	Environics
Model:	AR 602	Model:	201-1520
Serial Number:	2340	Serial Number:	1122
CO_2 Standard:	CC86353		
Concentration:	41.2%		
Cylinder Pressure:	1000 psi		

CO_2 CALIBRATION AND LINEARITY CHECKS

Range 0-20 %

Calibration Points	Flow, Dil. cc/min	Flow, Std. cc/min	CO_2 out %	Chart %	% Difference +2% Full Scale
Zero	1998.0	--	0	0	0
80% URL	1278.1	719.9	16.21	16.21	0
1	1451.9	531.0	12.05	12.30	+ 1.25
2	1628.1	355.2	8.06	8.20	+ 0.70
3	1801.9	179.3	4.07	4.16	+ 0.45

TABLE 6-6. O_2 CALIBRATION SUMMARY

Monitoring Trailer: 3		Calibrated by: JP 5/14/91	
Analyzer:	Teledyne	Calibrator Manufacturer:	Environics
Model:	326A	Model:	201-1520
Serial Number:	44535	Serial Number:	1122
O_2 Standard:	A14722		
Concentration:	45%		
Cylinder Pressure:	1750 psi		

O_2 CALIBRATION AND LINEARITY CHECKS

Range 0-25 %

Calibration Points	Flow, Dil. cc/min	Flow, Std. cc/min	O_2 out %	Chart %	% Difference +2% Full Scale
Zero	1991.8	--	0	0	0
80% URL	1094.6	897.2	20.2	20.20	0
1	1836.1	943.5	15.3	15.25	- 0.20
2	2139.6	618.9	10.1	10.38	+ 1.10
3	2445.5	311.0	5.08	5.30	+ 0.88

Range 0-10 %

Calibration Points	Flow, Dil. cc/min	Flow, Std. cc/min	O_2 out %	Chart %	% Difference +2% Full Scale
Zero	4441.1	--	0	0	0
80% URL	3632.5	808.6	8.19	8.19	0
1	3828.2	596.8	6.07	6.11	+ 0.3
2	4024.0	398.8	4.06	4.20	+ 1.4
3	4219.8	201.2	2.05	2.21	+ 1.6

TABLE 6-6. O_2 CALIBRATION AND LINEARITY CHECKS (Concluded)

Teledyne Model 326A/Trailer #3/May 14, 1991

Range 0-5 %

Calibration Points	Flow, Dil. cc/min	Flow, Std. cc/min	O_2 out %	Chart %	% Difference +2% Full Scale
Zero	7885.8	–	0	0	0
80% URL	7166.4	719.4	4.10	4.10	0
1	7340.2	530.6	3.03	3.08	+ 1.0
2	7513.9	354.7	2.03	2.10	+ 1.4
3	7687.7	179.3	1.03	1.11	+ 1.6

APPENDIX A

STEINER ENVIRONMENTAL RAW DATA

Steiner Environmental, Inc.

SAMPLING POINT LOCATION DATA SHEET

Plant STELLA CHEESE

Date 7-30-93

Test Location HRSG-OUT

Upstream Dist./Dia. 52.0" / 2.0 Ø

Downstream Dist./Dia. 180" / 6.9 Ø

No. of Sampling Points 16

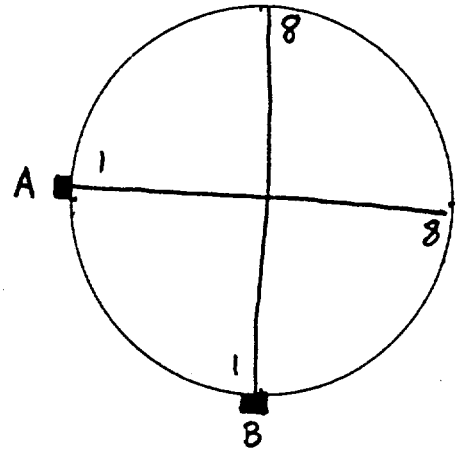
Stack Dimension 26.0"

Coupling Length 3.0"

4-inch MPT/FPT/Flange

HAS HOOKS 3' PROBE & RAILS
50' ROPE 100' POWER

* MAY WANT TO BRING TRANSFORMER



XEQ PNT

Sample Point	Dist	Sample Point	Dist	Sample Point	Dist	Sample Point	Dist
1	3.8						
2	5.7						
3	8.0						
4	11.4						
5	20.6						
6	24.0						
7	26.3						
8	28.2						

SAMPLING POINT RELOCATION:

Steiner Environmental, Inc.

VELOCITY TRAVERSE DATA SHEET

Plant STELLA CHEESE

Date 7-30-93

Test Location HRSG - OUT

Static Pressure (in. wg) 0.19

Barometric Pressure 30.20

Probe Type/Length GL / 6'

Pitot Coefficient 0.84

Stack Dimension 26.0"

RUN # 1

Time: 1150 Time: 1158 Time: _____ Time: _____

Smpl Pt.	ΔP	T_s	Smpl Pt.	ΔP	T_s	Smpl Pt.	ΔP	T_s	Smpl Pt.	ΔP	T_s
A-1	0.23	336	B-1	0.26	329						
2	0.265	342	2	0.27	332						
3	0.26	343	3	0.28	339						
4	0.26	345	4	0.28	342						
5	0.27	345	5	0.25	343						
6	0.27	343	6	0.25	345						
7	0.24	338	7	0.22	341						
8	0.24	334	8	0.23	340						

SAMPLING POINT RELOCATION

Pitot ✓ O.K.

Avg. $\sqrt{\Delta P}$ = 0.5044

Avg. ΔP = 0.2547

Avg. T_s = 339.81

VelTrav.Frm (1/91)

Steiner Environmental, Inc.

VELOCITY TRAVERSE DATA SHEET

Plant STELLA CHEESE
Date 7-30-93
Test Location HRSG - OUT
Static Pressure (in. wg) 0.15
Barometric Pressure 30.18
Probe Type/Length GL / 6'
Pitot Coefficient 0.84
Stack Dimension 26.0"
RUN #2

Time: 1305 Time: 1313 Time: _____ Time: _____

Smpl Pt.	ΔP	T_s	Smpl Pt.	ΔP	T_s	Smpl Pt.	ΔP	T_s	Smpl Pt.	ΔP	T_s
A-1	0.23	329	B-1	0.25	325						
2	0.25	339	2	0.27	336						
3	0.26	341	3	0.29	340						
4	0.26	342	4	0.28	342						
5	0.25	344	5	0.24	343						
6	0.265	345	6	0.225	345						
7	0.24	340	7	0.21	339						
8	0.23	336	8	0.23	335						

SAMPLING POINT RELOCATION

Pitot ✓ O.K.

Avg. $\sqrt{\Delta P}$ = 0.4983
Avg. ΔP = 0.2488
Avg. T_s = 338.81

VelTrav.Frm (1/91)

Steiner Environmental, Inc.

VELOCITY TRAVERSE DATA SHEET

Plant STELLA CHEESE
Date 7-30-93
Test Location HRSG - OUT
Static Pressure (in. wg) 0.16
Barometric Pressure 30.21
Probe Type/Length GL / 6'
Pitot Coefficient 0.84
Stack Dimension 26.0"
Run # 3

Time: 1427 Time: 1434 Time: _____ Time: _____

Smpl Pt.	ΔP	T_s	Smpl Pt.	ΔP	T_s	Smpl Pt.	ΔP	T_s	Smpl Pt.	ΔP	T_s
A-1	0.23	328	B-1	0.25	330						
2	0.26	334	2	0.27	334						
3	0.26	339	3	0.27	336						
4	0.27	343	4	0.29	341						
5	0.25	345	5	0.26	343						
6	0.26	346	6	0.245	345						
7	0.23	340	7	0.23	338						
8	0.23	338	8	0.22	332						

SAMPLING POINT RELOCATION

Pitot ✓ O.K.

Avg. $\sqrt{\Delta P}$ = 0.5012
Avg. ΔP = 0.2516
Avg. T_s = 338.25

VelTrav.Frm (1/91)

Steiner vironmental, Inc.

PLANT STELLA CHEESE TEST TYPE M-4 FIELD TEST DATA SHEET (Page 1 of 1)

Date 7-30-93 Barometric Pressure 30.20
Test Location HRSG-OUT Static in.wg. 0.19
Run Number #1 Probe Type/Length GL/6'
Stack Diameter 26.0" Pitot Coefficient 0.84
Operator SCD Meter Box No./γ #21314 / 1.0053
Filter No. N/A Nozzle No./Size STRAIGHT

IMPINGER VOLUMES/WEIGHTS				GAS COMPOSITION			
Contents	Final	Initial	Net	Time	CO_2	O_2	CO
DI	638.3	533.3	105.0				
DI	629.4	620.9	8.5				
DRY	455.0	453.7	1.3				
				Leakrate	cfm		"Hg
S.G.	738.2	731.1	7.1	Initial	0.003		15"
		TOTAL	121.9	Final	0.002		5"

Sample Point	Time	ΔP in wg	ΔH in wg	Gas Meter Volume Ft^3	TEMPERATURE °F Stack	Probe	Oven	Imp.	Gas Meter In	Gas Meter Out	Pump Vacuum in.Hg	$\sqrt{\Delta P}$	Comments
1	1115		3.0	100.000	*	N/A	N/A	76	97	98	4.5	*	*Avg. Taken
				104.467				70	95	96			From Velocity
	10			108.964				69	95	95			Traverse
				113.435				70	94	94			
	20			117.891				70	93	93			
				122.325				70	93	93			
END TEST	1145			126.808									
T/A	30 MIN		3.0	26.808	339.8				94.	67		0.5044	

A-6

FIELDDAT.FRM.F1B

Steiner vironmental, Inc.

PLANT STELLA CHEESE TEST TYPE M-4 FIELD TEST DATA SHEET (Page 1 of 1)

Date 7-30-93 Barometric Pressure 30.18
Test Location HRSG-OUT Static in.wg. 0.15
Run Number #2 Probe Type/Length GL/6'
Stack Diameter 26.0" Pitot Coefficient 0.84
Operator SW Meter Box No./γ #21314 / 1.0053
Filter No. N/A Nozzle No./Size STRAIGHT

IMPINGER VOLUMES/WEIGHTS				GAS COMPOSITION			
Contents	Final	Initial	Net	Time	CO_2	O_2	CO
DI	633.2	530.2	103.0				
DI	552.0	541.0	11.0				
DRY	443.2	441.3	1.9				
				Leakrate	cfm		"Hg
S.G.	703.3	695.5	7.8	Initial	0.004		15"
		TOTAL	123.7	Final	0.002		5"

Sample Point	Time	ΔP in wg	ΔH in wg	Gas Meter Volume Ft^3	TEMPERATURE °F Stack	Probe	Oven	Imp.	Gas Meter In	Gas Meter Out	Pump Vacuum in.Hg	√ΔP	Comments
1	1222		3.0	127.400	*	N/A	N/A	77	96	96	5.0	*	*Avg. Taken
				131.876				67	96	96			From Velocity
	10			136.318				67	98	97			TRAVERSE
				140.761				65	98	97			
	20			145.249				68	100	97			
				149.724				64	101	98			
ENDTEST				154.219									
T/A	30 MIN		3.0	26.818	338.81				97.	50		0.4983	

A-7

FIELDDAT.FRM.F18

Steiner Environmental, Inc.

PLANT STELLA CHEESE TEST TYPE M-4. FIELD TEST DATA SHEET (Page 1 of 1)

Date 7-30-93 Barometric Pressure 30.21
Test Location HRSG-OUT Static in.wg. 0.16
Run Number #3 Probe Type/Length GL/6'
Stack Diameter 26.0" Pitot Coefficient 0.84
Operator SW Meter Box No./γ #21314 / 1.0053
Filter No. N/A Nozzle No./Size STRAIGHT

IMPINGER VOLUMES/WEIGHTS			
Contents	Final	Initial	Net
DI	644.9	541.7	103.2
DI	639.7	629.4	10.3
DRY	456.8	455.0	1.8
S.G.	745.6	738.2	7.4
		TOTAL	122.7

GAS COMPOSITION			
Time	CO_2	O_2	CO
Leakrate	cfm		"Hg
Initial	0.006		15"
Final	0.002		5"

Sample Point	Time	ΔP in wg	ΔH in wg	Gas Meter Volume Ft^3	TEMPERATURE °F Stack	Probe	Oven	Imp.	Gas Meter In	Gas Meter Out	Pump Vacuum in.Hg	√ΔP	Comments
1	1350		3.0	154.800	*	N/A	N/A	75	101	101	5.0	*	*Avg. Taken
				159.269				69	100	101			From Velocity
	10			163.754				68	102	100			Traverse
				168.227				68	102	100			
	20			172.698				70	103	101			
				177.203				69	102	101			
END TEST	1420			181.626									
T/A	30 MIN		3.0	26.826	338.25				101.	18			

FIELDDAT.FRM.F1B

Steine[illegible]nvironmental, Inc.

CONTINUOUS MONITOR DATA SHEET

Plant STELLA Cheese
Date 7-30-93 Run No. 1+2
Test Location Boiler
Operator DM
Fuel Type Natural Gas Trailer No. 3

APCD Witness/Number Greg LaFore
Client Rep Frank Mirana
Generator Type
Burner Type
O_2 Controller Type

[Dry Uncorrected]

Time	Sample Point	O_2 %	CO_2 %	CO ppm	SO_2 ppm	NO ppm	NO_x ppm	Comments
		8.55	15.82	175.8			86.2	Span Gas Value
		0.0	0.0	0.0			0.0	Zero
		8.40	15.64	174.5			86.1	Bias Span
		0.05	0.0	0.0			0.0	Bias Zero
		0.04						QA ✓ leak ✓
								recal → CO 0-100ppm
				87.5				Span value (CO only)
				0.0				Zero
1112		2.64	10.20	3.0			28.8	Run #1
1122		2.68	10.18	2.4			28.7	33914 N.G. All
1132		2.60	10.26	4.0			28.8	
1142		2.60	10.18	4.7			29.1	
1152		2.46	10.04	36			28.9	
1202		2.40	10.08	7.4			29.7	
		0.0	0.0	0.0			0.0	Zero
		8.47	15.42	87.5			87.8	Span
								ADJUST
1222		2.60	10.26	3.3			28.3	Run #2
1232		2.43	10.40	3.5			28.9	
1242		2.50	10.42	2.9			28.6	
1252		2.30	10.54	8.0			28.0	
1302		2.52	10.40	3.6			26.7	
1312		2.38	10.40	5.2			26.5	

Miscellaneous Information

CALIBRATION GASES
NO_x CC28647
SO_2
CO CC42657
$CO/CO_2/O_2$ CC40344 CC50006

Wet Bulb: _____ Dry Bulb: _____
Barometric Press: _____

RESPONSE TIME
Upscale: _____ Downscale: _____
Upscale: _____ Downscale: _____
Upscale: _____ Downscale: _____

PROCESS DATA
Fuel Flow: _____
Steam Flow: _____
Rating: _____

CONVERTER GAS

	Cal Gas Values	Actual Values
NO		
NO_2		

Conv. Efficiency: _____

Steine[illegible]nvironmental, Inc.

CONTINUOUS MONITOR DATA SHEET

Plant STELLA Cheese
Date 7-30-93 Run No. 2 + 3
Test Location Boiler
Operator DM
Fuel Type Natural Gas Trailer No. 3

APCD Witness/Number Greg LaFore
Client Rep Frank Murana
Generator Type
Burner Type
O_2 Controller Type

[Dry Uncorrected]

Time	Sample Point	O_2 %	CO_2 %	CO ppm	SO_2 ppm	NO ppm	NO_x ppm	Comments
		8.55	15.82	87.5			86.2	Span Gas Value
		0.0	0.0	0.0			-1.0	Zero
		8.50	16.04	87.5			86.2	Span
								ADJUST
1347		2.44	10.46	8.2			29.5	Run #3
1357		2.52	10.40	6.3			29.3	
1407		2.46	10.48	7.7			30.3	
1417		2.60	10.50	6.4			30.7	
1427		2.39	10.76	7.7			31.7	
1437		2.40	11.04	9.0			31.8	
		0.02	0.0	0.0			1.6	Zero
		8.55	16.08	87.0			87.9	Span
		0.04	0.0	0.0			1.4	Bias Zero
		8.30	15.82	87.0			87.7	Bias Span
		0.07						QAV Leak ✓

Miscellaneous Information

CALIBRATION GASES

NO_x
SO_2
CO
$CO/CO_2/O_2$

Wet Bulb: _____ Dry Bulb: _____
Barometric Press: _____

RESPONSE TIME

Upscale: _____ Downscale: _____
Upscale: _____ Downscale: _____
Upscale: _____ Downscale: _____

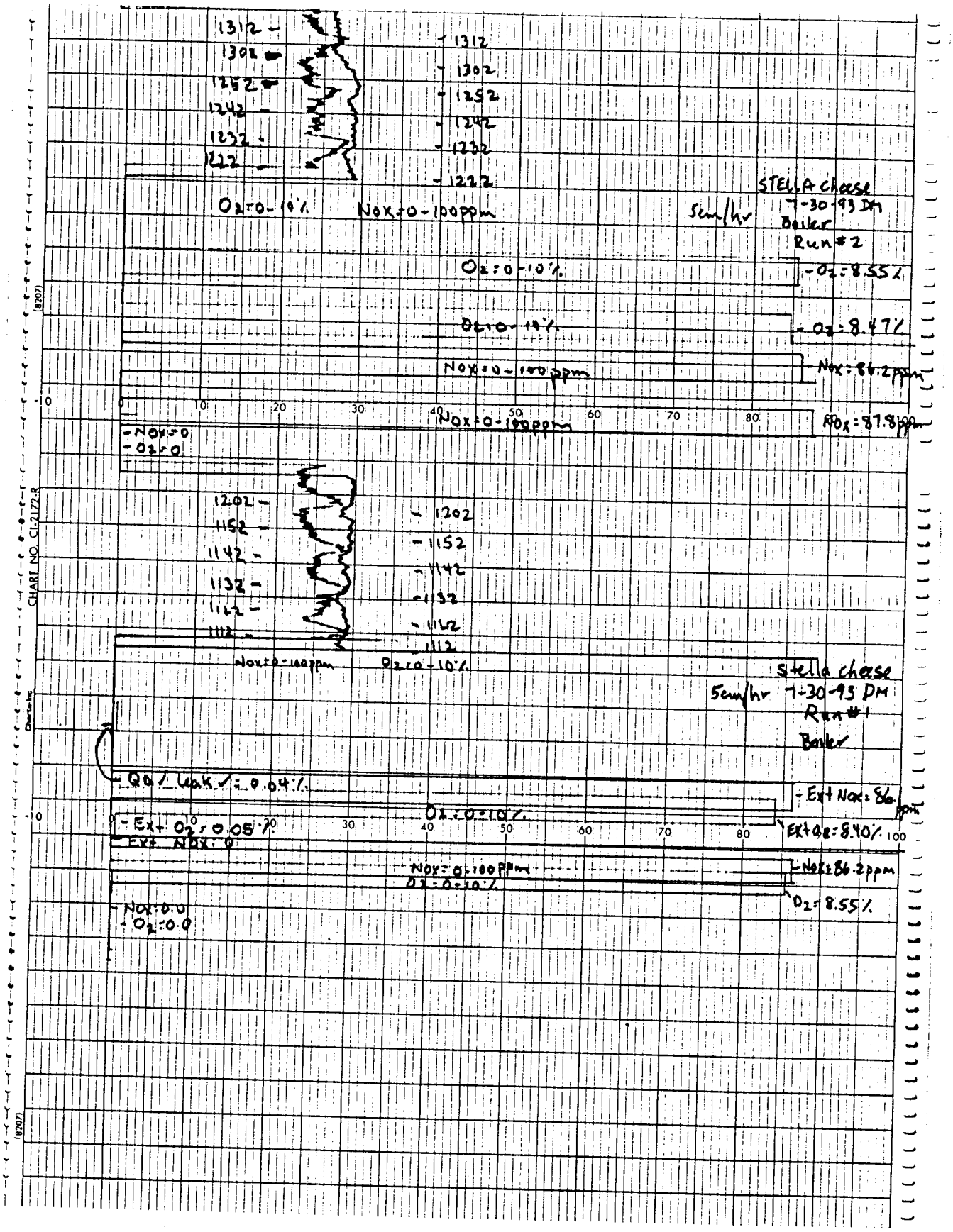
PROCESS DATA

Fuel Flow:
Steam Flow:
Rating:

CONVERTER GAS

	Cal Gas Values	Actual Values
NO		
NO_2		

Conv. Efficiency:


1312
1302
1252
1242
1232
1222
O2=0-10%
NOx=0-100ppm
STELLA cheese
7-30-93 PM
Boiler
Run #2
5cm/hr
O2=8.55%
O2=8.47%
NOx=86.2ppm
RNOx=87.8ppm
1202
1152
1142
1132
1122
1112
NOx=0-100ppm
O2=0-10%
Stella cheese
5cm/hr 7-30-93 PM
Run #1
Boiler
QD/ Leak/=0.04%
Ext NOx=86.
Ext O2=8.40%
Ext O2=0.05%
Ext NOx=0
NOx=0-100ppm
O2=0-10%
NOx=86.2ppm
O2=8.55%
NOx=0.0
O2=0.0
CHART NO. C1-2172-R
(8207)

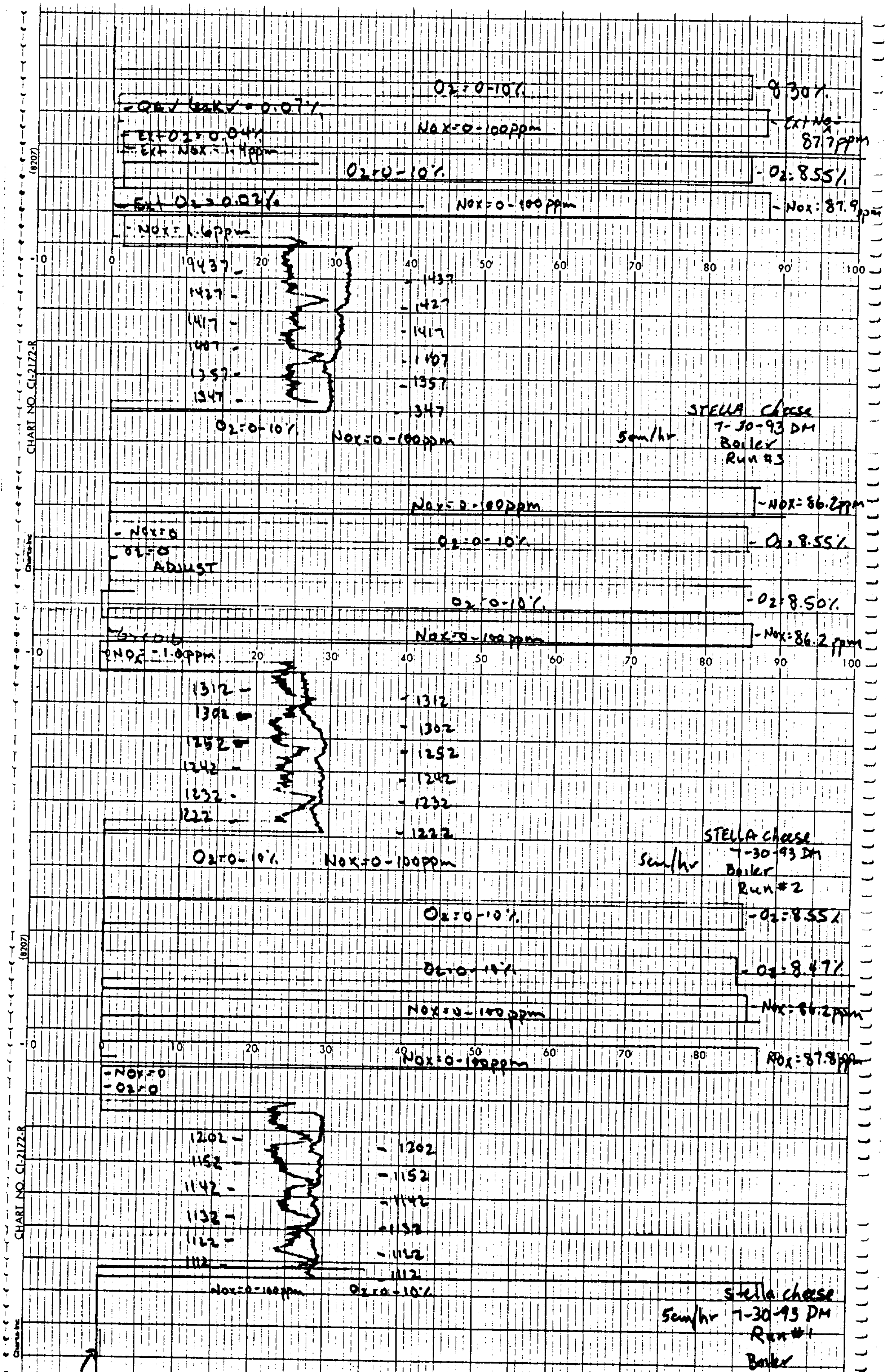
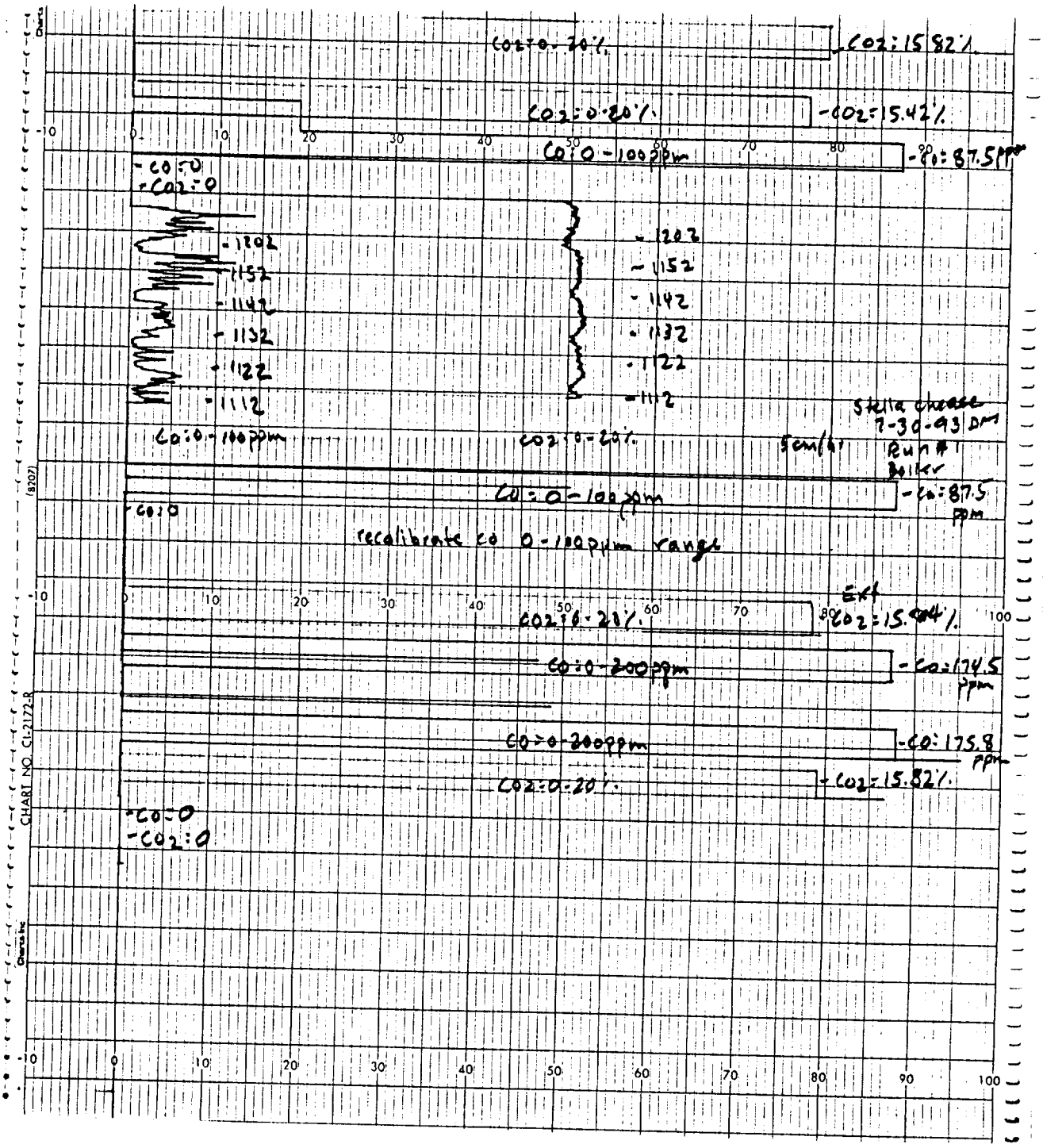
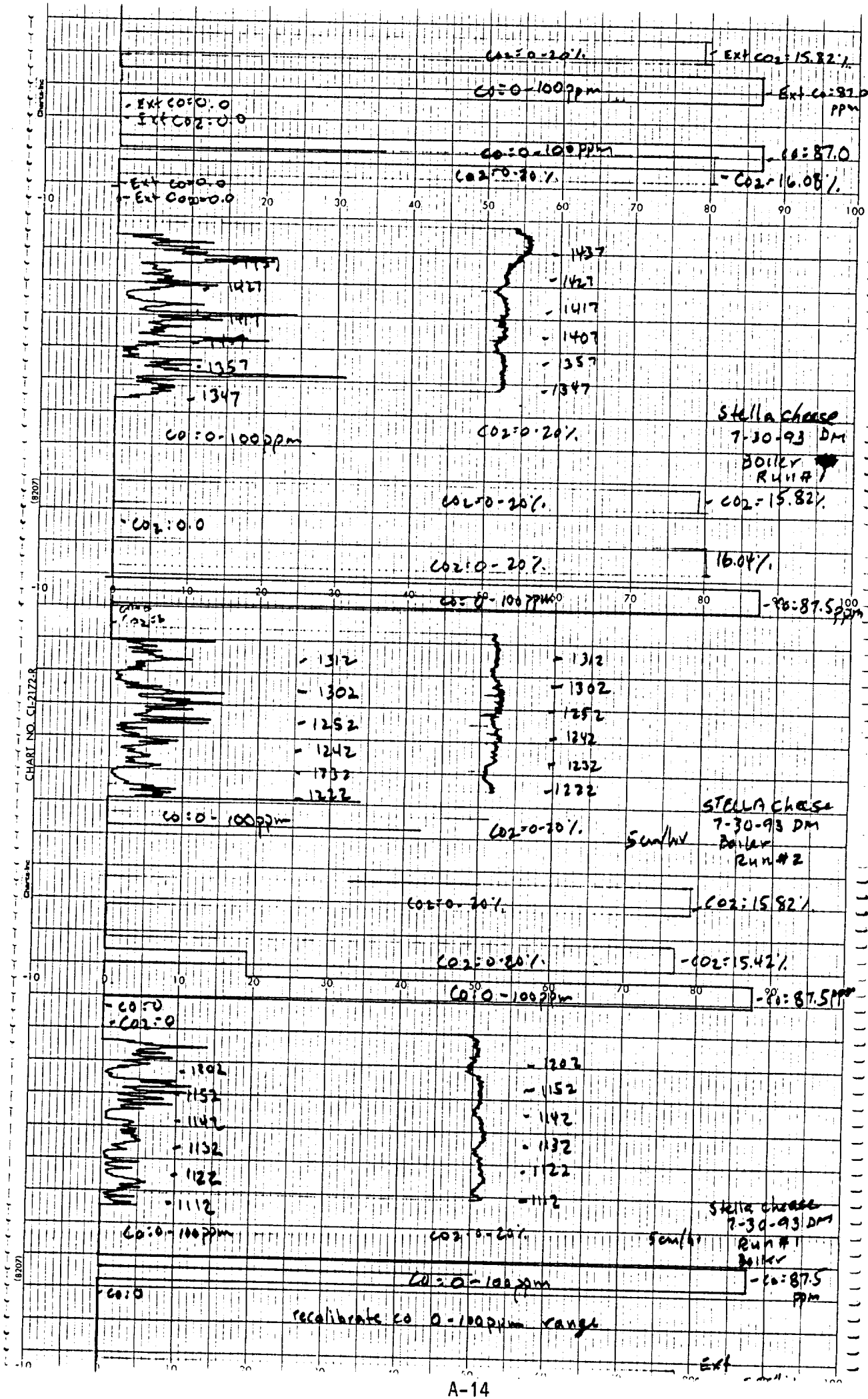


CHART NO CI-2172-R
(8207)
O2=0-10%
-8.30%
-QA✓ Leak✓=0.07%
NOX=0-100ppm
Ext NOx: 87.7ppm
Ext O2=0.04%
Ext NOx=1.4ppm
O2=0-10%
-O2:8.55%
Ext O2=0.03%
NOX=0-100ppm
-NOx: 87.9ppm
NOx=1.6ppm
0 10 20 30 40 50 60 70 80 90 100
1437
1427
1417
1407
1357
1347
O2=0-10%
NOX=0-100ppm
5cm/hr
STELLA Cheese
7-30-93 DM
Boiler
Run #3
NOX=0-100ppm
-NOX=86.2ppm
-NOX=0
-O2=0
ADJUST
O2=0-10%
-O2:8.55%
O2=0-10%
-O2:8.50%
NOX=0-100ppm
-NOx:86.2ppm
NOx=1.0ppm
0 10 20 30 40 50 60 70 80 90 100
1312
1302
1252
1242
1232
1222
O2=0-10%
NOX=0-100ppm
5cm/hr
STELLA cheese
7-30-93 DM
Boiler
Run #2
O2=0-10%
-O2:8.55%
O2=0-10%
-O2:8.47%
NOX=0-100ppm
-NOx:86.2ppm
0 10 20 30 40 50 60 70 80 90 100
NOX=0-100ppm
NOx=87.8ppm
-NOX=0
-O2=0
1202
1152
1142
1132
1122
1112
NOX=0-100ppm
O2=0-10%
5cm/hr
stella cheese
7-30-93 DM
Run #1
Boiler


CO2: 0-20%
CO2: 15.82%
CO2: 0-20%
CO2: 15.42%
CO: 0-100 ppm
CO: 87.5 ppm
CO: 0
CO2: 0
1202
1152
1142
1132
1122
1112
CO: 0-100 ppm
CO2: 0-20%
5 cm/hr
Stella Chase
7-30-93 DM
Run #1
Boiler
CO: 0-100 ppm
CO: 87.5 ppm
CO: 0
recalibrate CO 0-100 ppm range
CO2: 0-20%
CO2: 15.84%
CO: 0-200 ppm
CO: 174.5 ppm
CO: 0-200 ppm
CO: 175.8 ppm
CO2: 0-20%
CO2: 15.82%
CO: 0
CO2: 0
CHART NO. CI-2122-R
(9207)


CO2=0-20%
Ext CO2=15.82%
CO=0-100ppm
Ext CO=87.0 ppm
- Ext CO=0.0
- Ext CO2=0.0
CO=0-100ppm
- CO=87.0
CO2=0-20%
- CO2=16.08%
- Ext CO=0.0
- Ext CO2=0.0
1437
1427
1417
1407
1357
1347
CO=0-100ppm
CO2=0-20%
Stella cheese
7-30-93 DM
Boiler
Run#1
CO2=0-20%
- CO2=15.82%
- CO2:0.0
CO2=0-20%
16.04%
CO=0-100ppm
-CO=87.5ppm
1312
1302
1252
1242
1232
1222
CO=0-100ppm
CO2=0-20%
5cm/hr
STELLA Cheese
7-30-93 DM
Boiler
Run#2
CO2=0-20%
CO2=15.82%
CO2=0-20%
-CO2=15.42%
CO=0-100ppm
-CO=87.5ppm
- CO=0
- CO2=0
1202
1152
1142
1132
1122
1112
CO=0-100ppm
CO2=0-20%
5cm/hr
Stella cheese
7-30-93 DM
Run#1
Boiler
CO=0-100ppm
-CO=87.5 ppm
CO=0
recalibrate CO 0-100ppm range
Ext
CHART NO. CL-2122-R
(8207)

A. CALIBRATION AND CORRECTION DATA

Company : STELLA CHEESE

Station : SUPERIOR MOHAWK BOILER

Date : 7/30/93
Test Run : 1
Test Condition: GAS 100%

Concentration : Drift Uncorrected (A) / Corrected (B)

Point #	%O2 A	%O2 B	%CO2 A	%CO2 B	ppm CO A	ppm CO B	ppm SO2 A	ppm SO2 B	ppm NOx A	ppm NOx B
1	2.64	2.64	10.20	10.22	3.00				28.80	28.76
2	2.68	2.69	10.18	10.24	2.40				28.70	28.57
3	2.60	2.61	10.26	10.37	4.00				28.80	28.58
4	2.60	2.61	10.18	10.33	4.70				29.10	28.79
5	2.46	2.48	10.04	10.23	3.60				28.90	28.50
6	2.40	2.42	10.08	10.32	7.40				29.70	29.20
MEAN		2.58		10.29	4.18					28.73

	%O2	%CO2	ppm CO	ppm SO2	ppm NOx
Zero Check	0.00	0.00	0.00		0.00
Span Check	8.47	15.42	87.50		87.80
Cal. Gas	8.55	15.82	87.50		86.20
Scf	-0.00156	-0.00421			0.00309
Zcf	0.00000	0.00000			0.00000

Scf, Span Drift Correction Factor = (% Drift / 100) / # of Readings
Zcf, Zero Drift Correction Factor = Zero Drift / # of Readings
Cz, Zero Corr. Concentration = measured value - [Zcf x (Point # - 0.5)]
B, Corrected Concentration = Cz / [1 + (Scf x (Point # - 0.5))]

A. CALIBRATION AND CORRECTION DATA

Company : STELLA CHEESE
Station : SUPERIOR MOHAWK BOILER

Date : 7/30/93
Test Run : 2
Test Condition: GAS 100%

	Concentration : Drift Uncorrected (A) / Corrected (B)									
	%O2		%CO2		ppm CO		ppm SO2		ppm NOx	
	A	B	A	B	A	B	A	B	A	B
Point #										
1	2.60	2.60	10.26	10.25	3.30				28.30	28.36
2	2.43	2.43	10.40	10.36	3.50				28.90	29.07
3	2.50	2.51	10.42	10.36	2.90				28.60	28.88
4	2.30	2.31	10.54	10.46	8.00				28.00	28.39
5	2.52	2.53	10.40	10.29	3.60				26.70	27.21
6	2.38	2.39	10.40	10.27	5.20				26.50	27.13
MEAN		2.46		10.33	4.42					28.17

	%O2	%CO2	ppm CO	ppm SO2	ppm NOx
Zero Check	0.00	0.00	0.00		-1.00
Span Check	8.50	16.04	87.50		86.20
Cal. Gas	8.55	15.82	87.50		86.20
Scf	-0.00097	0.00232			0.00193
Zcf	0.00000	0.00000			-0.16667

Scf, Span Drift Correction Factor = (% Drift / 100) / # of Readings
Zcf, Zero Drift Correction Factor = Zero Drift / # of Readings
Cz, Zero Corr. Concentration = measured value - [Zcf x (Point # - 0.5)]
B, Corrected Concentration = Cz / [1 + (Scf x (Point # - 0.5))]

A. CALIBRATION AND CORRECTION DATA

Company : STELLA CHEESE
Station : SUPERIOR MOHAWK BOILER

Date : 7/30/93
Test Run : 3
Test Condition: GAS 100%

Concentration : Drift Uncorrected (A) / Corrected (B)

Point #	%O2 A	%O2 B	%CO2 A	%CO2 B	ppm CO A	ppm CO B	ppm SO2 A	ppm SO2 B	ppm NOx A	ppm NOx B
1	2.44	2.44	10.46	10.45	8.20	8.20			29.50	29.36
2	2.52	2.52	10.40	10.36	6.30	6.31			29.30	28.89
3	2.46	2.45	10.48	10.41	7.70	7.72			30.30	29.62
4	2.60	2.59	10.50	10.40	6.40	6.42			30.70	29.75
5	2.39	2.38	10.76	10.63	7.70	7.73			31.70	30.47
6	2.40	2.39	11.04	10.88	9.00	9.05			31.80	30.30
MEAN		2.46		10.52		7.57				29.73

	%O2	%CO2	ppm CO	ppm SO2	ppm NOx
Zero Check	0.02	0.00	0.00		1.60
Span Check	8.55	16.08	87.00		87.90
Cal. Gas	8.55	15.82	87.50		86.20
Scf	-0.00039	0.00274	-0.00095		0.00019
Zcf	0.00333	0.00000	0.00000		0.26667

Scf, Span Drift Correction Factor = (% Drift / 100) / # of Readings
Zcf, Zero Drift Correction Factor = Zero Drift / # of Readings
Cz, Zero Corr. Concentration = measured value - [Zcf x (Point # - 0.5)]
B, Corrected Concentration = Cz / [1 + (Scf x (Point # - 0.5))]

B. ZERO AND SPAN DRIFT PERCENT CALCULATIONS

Company : STELLA CHEESE Date : 7/30/93

Station : SUPERIOR MOHAWK BOILER

Run 1	O2 (%)	CO2 (%)	CO (ppm)	SO2 (ppm)	NOx (ppm)
Initial Span	8.55	15.82	87.50		86.20
Measured Span	8.47	15.42	87.50		87.80
Zero Drift	0.00	0.00	0.00		0.00
Final, Actual Span	8.47	15.42	87.50		87.80
Percent Drift	-0.9	-2.5	0.0		1.9

Run 2	O2 (%)	CO2 (%)	CO (ppm)	SO2 (ppm)	NOx (ppm)
Initial Span	8.55	15.82	87.50		86.20
Measured Span	8.50	16.04	87.50		86.20
Zero Drift	0.00	0.00	0.00		-1.00
Final, Actual Span	8.50	16.04	87.50		87.20
Percent Drift	-0.6	1.4	0.0		1.2

Run 3	O2 (%)	CO2 (%)	CO (ppm)	SO2 (ppm)	NOx (ppm)
Initial Span	8.55	15.82	87.50		86.20
Measured Span	8.55	16.08	87.00		87.90
Zero Drift	0.02	0.00	0.00		1.60
Final, Actual Span	8.53	16.08	87.00		86.30
Percent Drift	-0.2	1.6	-0.6		0.1

Final, Actual Span = Measured Span - Zero Drift

Percent Drift = (Final, Actual Span - Initial Span) / Initial Span x 100

SOURCE TEST CALCULATIONS

PLANT : STELLA CHEESE
SUPERIOR MOHAWK BOILER

RUN NO.: 1
DATE : JULY 30,1993

STANDARD TEMP.: 60 DEG. F

METER TEMP.	= 94.67 DEG. F	STATIC PRESS.	=	0.19	in. H2O
STACK TEMP.	= 339.81 DEG. F	Cp	=	0.840	
SQ.RT. dP	= 0.5044 in. H2O	STACK I.D.	=	26.00	inch
METER ORIFICE	= 3.00 in. H2O	DUCT LENGTH	=		inch
METER VOLUME	= 26.808 Cu.Ft.	DUCT WIDTH	=		inch
METER Y	= 1.0053	STACK AREA	=	3.687	Sq.Ft.
BAR. PRESSURE	= 30.20 in.Hg	TEST TIME	=	30.00	min.
COND.(Vlc)	= 121.9 ml	NOZZLE DIA.	=		inch

GAS ANALYSIS = 2.58 % O2 0.00 % CO
10.29 % CO2 87.13 % N2

Sq Ft.

****

Vm(std) = [T(std) + 460 / 29.92] x Vm x Y x (Pb + (dH / 13.6)) / (Tm + 460)..... = 25.688 dscf

Vw(std) =(8.9148 x 10e-5) x (Tstd + 460) x Vic = 5.651 scf

Bws = Vw(std) / (Vm(std) + Vw(std))..... = 0.180 | Lower Bws value used.

Bws @ Saturated Conditions = Vapor Press. of H2O @ Dew Point Temp. / (Ps, in.Hg.) ..... = 1.000

%EA =(%O2 - 0.5%CO)/(0.264%N2 - (%O2-0.5%CO)) x 100 = 12.63

Md =(.44 x %CO2)+(.32 x %O2)+[.28 x (%N2 + %CO)] = 29.75

Ms = (Md x (1-Bws)) + (18.0 x Bws)..... = 27.63

P(stack) = Pbar + [Pstatic / 13.6] ..... = 30.21 in. Hg

vs = 85.49 x CP x (Sq.Rt.dP) x [Sq.Rt.(Ts + 460) / (Ms x Ps)] ..... = 35.45 ft/sec

Qs = vs x As x 60 ..... = 7,843 acf/min

Qs(std) = Qs x (1-Bws)x((Tstd + 460)/(Ts + 460)) x (Ps/29.92) ..... = 4,221 dscf/min

I = (Ts+460) x [(0.002669 x Vlc) + (Vm(std)/(Tstd + 460)/ 29.92] x 100 / (Time x Ps x An x vs x 60) = %

SOURCE TEST CALCULATIONS

PLANT : STELLA CHEESE
SUPERIOR MOHAWK BOILER

RUN NO.: 2
DATE : JULY 30,1993

STANDARD TEMP.: 60 DEG. F

METER TEMP.	=	97.5 DEG. F	STATIC PRESS.	=	0.15	in. H2O
STACK TEMP.	=	338.81 DEG. F	Cp	=	0.840	
SQ.RT. dP	=	0.4983 in. H2O	STACK I.D.	=	26.00	inch
METER ORIFICE	=	3.00 in. H2O	DUCT LENGTH	=		inch
METER VOLUME	=	26.818 Cu.Ft.	DUCT WIDTH	=		inch
METER Y	=	1.0053	STACK AREA	=	3.687	Sq.Ft.
BAR. PRESSURE	=	30.18 in.Hg	TEST TIME	=	30.00	min.
COND.(Vlc)	=	123.7 ml	NOZZLE DIA.	=		inch

GAS ANALYSIS : 2.46 % O2 0.00 % CO
10.33 % CO2 87.21 % N2

Sq.Ft.

****

Vm(std) = [T(std) + 460 / 29.92] x Vm x Y x (Pb + (dH / 13.6)) / (Tm + 460)..... = 25.551 dscf

Vw(std) =(8.9148 x 10e-5) x (Tstd + 460) x Vic = 5.734 scf

Bws = Vw(std) / (Vm(std) + Vw(std))..... = 0.183 | Lower Bws value used.

Bws @ Saturated Conditions = Vapor Press. of H2O @ Dew Point Temp. / (Ps, in.Hg.) ..... = 1.000

%EA =(%O2 - 0.5%CO)/(0.264%N2 - (%O2-0.5%CO)) x 100 = 11.96

Md =(.44 x %CO2)+(.32 x %O2)+[.28 x (%N2 + %CO)] = 29.75

Ms = (Md x (1-Bws)) + (18.0 x Bws)..... = 27.60

P(stack) = Pbar + [Pstatic / 13.6] ..... = 30.19 in. Hg

vs = 85.49 x CP x (Sq.Rt.dP) x [Sq.Rt.(Ts + 460) / (Ms x Ps)] ..... = 35.04 ft/sec

Qs = vs x As x 60 ..... = 7,751 acf/min

Qs(std) = Qs x (1-Bws)x((Tstd + 460)/(Ts + 460)) x (Ps/29.92) ..... = 4,158 dscf/min

I = (Ts+460) x [(0.002669 x Vlc) + (Vm(std)/(Tstd + 460)/ 29.92] x 100 / (Time x Ps x An x vs x 60) = . %

SOURCE TEST CALCULATIONS

PLANT : STELLA CHEESE
SUPERIOR MOHAWK BOILER

RUN NO.: 3
DATE : JULY 30,1993

STANDARD TEMP.: 60 DEG. F

METER TEMP.	= 101.18 DEG. F	STATIC PRESS.	=	0.16	in. H2O
STACK TEMP.	= 338.25 DEG. F	Cp	=	0.840	
SQ.RT. dP	= 0.5012 in. H2O	STACK I.D.	=	26.00	inch
METER ORIFICE	= 3.00 in. H2O	DUCT LENGTH	=		inch
METER VOLUME	= 26.826 Cu.Ft.	DUCT WIDTH	=		inch
METER Y	= 1.0053	STACK AREA	=	3.687	Sq.Ft.
BAR. PRESSURE	= 30.21 in.Hg	TEST TIME	=	30.00	min.
COND.(Vlc)	= 122.7 ml	NOZZLE DIA.	=		inch

GAS ANALYSIS : 2.46 % O2 0.00 % CO
10.52 % CO2 87.02 % N2

Sq.Ft.

****

Vm(std) = [T(std) + 460 / 29.92] x Vm x Y x (Pb + (dH / 13.6)) / (Tm + 460)..... = 25.416 dscf

Vw(std) =(8.9148 x 10e-5) x (Tstd + 460) x Vlc = 5.688 scf

Bws = Vw(std) / (Vm(std) + Vw(std))..... = 0.183 ! Lower Bws value used

Bws @ Saturated Conditions = Vapor Press. of H2O @ Dew Point Temp. / (Ps, in.Hg.) ..... = 1.000

%EA =(%O2 - 0.5%CO)/(0.264%N2 - (%O2-0.5%CO)) x 100 = 11.99

Md =(.44 x %CO2)+(.32 x %O2)+[.28 x (%N2 + %CO)] = 29.78

Ms = (Md x (1-Bws)) + (18.0 x Bws)..... = 27.63

P(stack) = Pbar + [Pstatic / 13.6] ..... = 30.22 in. Hg

vs = 85.49 x CP x (Sq.Rt.dP) x [Sq.Rt.(Ts + 460) / (Ms x Ps)] ..... = 35.19 ft/sec

Qs = vs x As x 60 ..... = 7,785 acf/min

Qs(std) = Qs x (1-Bws)x((Tstd + 460)/(Ts + 460)) x (Ps/29.92) ..... = 4,186 dscf/min

I = (Ts+460) x [(0.002669 x Vlc) + (Vm(std)/(Tstd + 460)/ 29.92] x 100 / (Time x Ps x An x vs x 60) = %

FUEL / FLOWRATE CALCULATIONS

PLANT ..... STELLA CHEESE
SOURCE ..... SUPERIOR MOHAWK BOILER Temp. Std.: 60
DATE ..... JULY 30,1993 Press. Std: 29.92

FUEL FLOWRATE DATA :

	RUN 1	RUN 2	RUN 3
Barometric Press., in.Hg.	29.92	29.92	29.92
Brake Horsepower			
Fuel Flow, scfh			
Oxygen, %	2.58	2.46	2.46
Fuel Flow, acfh	26631.00	25006.00	25400.00
Fuel Press, psig	0.00	0.00	0.00
" " psia	14.70	14.70	14.70
Fuel Temp, dF	87.40	88.80	90.00

FUEL ANALYSIS DATA :

	RUN 1	RUN 2	RUN 3
Btu/scf, Gross Cal. Value:	1069.00	1069.00	1069.00
Btu/lb, Gross Cal. Value :	22596.00	22596.00	22596.00
Hydrogen, Wt.% :	23.08	23.08	23.08
Carbon, Wt.% :	73.25	73.25	73.25
Sulfur, Wt.% :	0.00	0.00	0.00
Nitrogen, Wt.% :	1.18	1.18	1.18
Oxygen, Wt.% :	2.49	2.49	2.49

CALCULATIONS :

	RUN 1	RUN 2	RUN 3	AVERAGE
F-Factor,dscf/MMBtu :	8,503.60	8,503.60	8,503.60	8,503.60
Fuel Rate, scfh :	25291.10	23687.28	24008.01	24328.80
Heat Rate, MMBtu/hr :	27.036	25.322	25.665	26.007
Flue gas flowrate, dscfm :	4371.37	4067.52	4122.60	4187.16

* F-Factor = 10E6 x [3.64(%H) + 1.53(%C) + 0.57(%S) + 0.14(%N) - 0.46(%O2)] / (Btu/lb) x [(Tstd + 460) / 528]

* scfh = fuel acfh x [Pb + (P,psig x 2.036 in.Hg/psi) / (T fuel + 460)] x [(Tstd + 460) / Pstd]
  where: psig = psia - 14.7

* MMBtu/hr = scfh x (Btu/scf) / 10E6

* dscfm = MMBtu/hr x dscf/MMBtu x (1hr/60min) x [20.9 / (20.9- %O2)]

EMISSION RATE CALCULATIONS

PLANT : STELLA CHEESE
SOURCE : SUPERIOR MOHAWK BOILER

Temp. Std. : 60 dF
Press. Std.: 29.92 in. Hg. 3 % O2 Correction

Run No.	1	2	3	AVERAGE
Date	7/30/93	7/30/93	7/30/93	
Oxygen (%)	2.58	2.46	2.46	2.50
Qs(std), dscfm	4,221	4,158	4,186	4,188
NOx, ppm	28.73	28.17	29.73	28.88
SO2, ppm				
CO, ppm	4.18	4.42	7.57	5.39
HC, ppm				
F-Factor	8503.60	8503.60	8503.60	8503.60
NOx, MW = 46.005				
NOx, lb/hr	0.88	0.85	0.91	0.88
NOx, ppm @ O2	28.07	27.35	28.86	28.09
NOx, lb/MMBtu	0.0338	0.0329	0.0348	0.0338
SO2, MW = 64.058				
SO2, lb/hr				
SO2, ppm @ O2				
SO2, lb/MMBtu				
CO, MW = 28.010				
CO, lb/hr	0.08	0.08	0.14	0.10
CO, ppm @ O2	4.09	4.29	7.35	5.24
CO, lb/MMBtu	0.0030	0.0031	0.0054	0.0038
HC, MW = 16.043				
HC, lb/hr				
HC, ppm @ O2				
HC, lb/MMBtu				

* lb/hr = 8.223E-5 x Qs(std) x MW x ppm / (Tstd + 460)

* ppm @ O2 = ppm measured x [(20.9 - O2% correction) / (20.9 - %O2 measured)]

* lb/MMBtu = F-Factor x MW x [1.3711E-6 / (Tstd + 460)] x [20.9 / (20.9 - O2%)] x ppm

* lb/Bbl = (lb/MMBtu) x (MMBtu/Bbl)

DRY GAS METER / ORIFICE METER CALIBRATION DATA

Date .....MAY 10, 1993
Bar. Press, in.Hg 28.00
Meter Box No. ... 21314

Dry Gas Meter No. ... 658977
Standard Test Meter # 2409881
Operator ..... JM

STANDARD TEST METER			DRY TEST METER				
Press. dHs (in. H2O)	Temp. Ts (dF)	Volume Vs (ft3)	Press. dH (in. H2O)	Temp. Tdi (dF)	Temp. Tdo (dF)	Volume Vd (ft3)	Time t (min)
	76.0	974.337		81	80	895.138	
-1.0	77.0	951.976	0.5	80	76	872.900	56.0
Avg/Net :	76.5	22.361			79	22.238	
	77.0	951.842		80	76	872.763	
-1.5	72.0	924.178	1.0	72	72	845.421	51.0
Avg/Net :	74.5	27.664			75	27.342	
	74.0	923.744		77	76	845.009	
-2.0	73.0	895.830	1.5	78	75	817.256	42.0
Avg/Net :	73.5	27.914			77	27.753	
	74.0	895.640		77	75	817.088	
-2.9	71.0	871.492	2.0	77	76	793.200	32.0
Avg/Net :	72.5	24.148			76	23.888	
	74.0	871.100		78	76	792.800	
-3.4	72.0	848.087	3.0	78	75	770.161	25.0
Avg/Net :	73.0	23.013			77	22.639	

$$y = Vs \times (Pbar + (dHs / 13.6)) \times (Avg.\ Td + 460) / [\ Vd \times (Pbar + (dH / 13.6)) \times (\ Ts + 460)]$$

$$Ko = [(Vs/t) \times [(Tdo + 460) / (Ts + 460)] \times [(Pbar + (dHs/13.6) / (Pbar + (dH/13.6)] / [((Tdo + 460) \times dH) / (Pbar + (dH/13.6)) \times (Mm)]^{0.5}$$

dH :	0.5	1.0	1.5	2.0	3.0	Avg.	Std.Dev.
y :	1.0067	1.0061	1.0022	1.0050	1.0067	1.0053	0.0017
Ko :	0.6929	0.6643	0.6654	0.6536	0.6487	0.6650	0.0153

y : 0.17 % Relative Std. Dev.

Ko : 2.31 % Relative Std. Dev.

SCOTT-MARRIN, INC.

6531 BOX SPRINGS BLVD. • RIVERSIDE, CA 92507
TELEPHONE (714) 653-6780 • FAX (714) 653-2430

REPORT OF ANALYSIS
EPA PROTOCOL GAS MIXTURES

STEI01

TO:

SUE POWERS
STEINER ENVIRONMENTAL
4930 BOYLAN ST
BAKERSFIELD, CA 93308-

DATE : 03/30/93

CUSTOMER ORDER NUMBER: SP-2750-90REL92

PAGE 1

COMPONENT	CONCENTRATION (v/v)	REFERENCE STANDARD	ANALYZER MAKE, MODEL, S/N, DETECTION	EXPIRATION DATE	REPLICATE ANALYSIS DATA	
CYLINDER NO.: CC28647						
			Monitor Labs Model 8440		03/19/93	03/29/93
Nitric Oxide	86.2 ± 0.9 ppm	GMIS	S/N 136	03/29/95	86.2 ppm	86.0 ppm
NOx	86.2 ppm	Cylinder #	Continuous		86.3 ppm	86.0 ppm
Nitrogen, O2-Free	Balance	CC106651	Chemiluminescence		86.3 ppm	86.1 ppm
Cylinder Pressure: 2000 psig		@ 98.9 ppm	Last Cal Date: 01/12/93		Mean: 86.3 ppm	86.0 ppm
CYLINDER NO.: CC104180						
			Monitor Labs Model 8440		03/19/93	03/29/93
Nitric Oxide	85.6 ± 0.9 ppm	GMIS	S/N 136	03/29/95	85.5 ppm	85.8 ppm
NOx	85.6 ppm	Cylinder #	Continuous		85.2 ppm	85.8 ppm
Nitrogen, O2-Free	Balance	CC106651	Chemiluminescence		85.2 ppm	85.7 ppm
Cylinder Pressure: 2000 psig		@ 98.9 ppm	Last Cal Date: 01/12/93		Mean: 85.3 ppm	85.8 ppm

ppm = umole/mole   % = mole-%

The above analyses were performed in accordance with EPA-1987 Traceability Protocol # 1, Section 3.0.4, Procedure G1.

Analyst: Steve Kozy   Approved: [signature]

S.B. Kozy   J.T. Marrin

The only liability of this company for gas which fails to comply with this analysis shall be replacement or reanalysis thereof by the company without extra cost.

STANDARD CALIBRATION GASES IN ALUMINUM CYLINDERS

SCOTT-MARRIN, INC.
6531 BOX SPRINGS BLVD. • RIVERSIDE, CA 92507
TELEPHONE (714) 653-6780 • FAX (714) 653-2430

REPORT OF ANALYSIS
EPA PROTOCOL GAS MIXTURES

STEI01

TO:
Sue Powers
Steiner Environmental Services
4930 Boylan Street
Bakersfield, CA 93308-

DATE : 01/26/93

CUSTOMER ORDER NUMBER: SP-2750-90REL83

COMPONENT	CONCENTRATION(v/v)	REFERENCE STANDARD	ANALYZER MAKE,MODEL,S/N,DETECTION	EXPIRATION DATE	REPLICATE ANALYSIS DATA	
CYLINDER NO.: CC42657						
			Carle Insts Model 8000		01/18/93	01/25/93
Carbon Monoxide	87.5 ± 0.9 ppm	GMIS	S/N 8249	01/25/96	87.4 ppm	87.3 ppm
		Cylinder #	Methanation/FID		87.8 ppm	87.2 ppm
Nitrogen	Balance	CC81223	Gas Chromatography		87.7 ppm	87.3 ppm
Cylinder Pressure: 2000 psig		@ 100.5 ppm	Last Cal Date: 11/27/92		Mean: 87.5 ppm	87.3 ppm
CYLINDER NO.: CC81148						
			Carle Insts Model 8000		01/18/93	01/25/93
Carbon Monoxide	86.2 ± 0.9 ppm	GMIS	S/N 8249	01/25/96	86.1 ppm	86.7 ppm
		Cylinder #	Methanation/FID		85.9 ppm	85.8 ppm
Nitrogen	Balance	CC81223	Gas Chromatography		86.2 ppm	86.4 ppm
Cylinder Pressure: 2000 psig		@ 100.5 ppm	Last Cal Date: 11/27/92		Mean: 86.1 ppm	86.3 ppm
CYLINDER NO.: CC60194						
			Carle Insts Model 8000		01/13/93	01/20/93
Carbon Monoxide	5.22 ± 0.10 ppm	GMIS	S/N 8249	01/20/96	5.18 ppm	5.25 ppm
		Cylinder #	Methanation/FID		5.19 ppm	5.24 ppm
Nitrogen	Balance	CC163	Gas Chromatography		5.24 ppm	5.23 ppm
Cylinder Pressure: 2000 psig		@ 9.82 ppm	Last Cal Date: 11/27/92		Mean: 5.20 ppm	5.24 ppm

ppm = umole/mole % = mole-%

The above analyses were performed in accordance with EPA-1987 Traceability Protocol # 1, Section 3.0.4, Procedure G1.

Analyst: Mark Monson
M.J. Monson

Approved:
J.T. Marrin

SCOTT-MARRIN, INC.
6531 BOX SPRINGS BLVD. • RIVERSIDE, CA 92507
TELEPHONE (909) 653-6780 • FAX (909) 653-2430

REPORT OF ANALYSIS
NIST TRACEABLE GAS MIXTURES

STEI01
TO:
SUE POWERS
STEINER ENVIRONMENTAL INC
4930 BOYLAN ST
BAKERSFIELD, CA 93308-

DATE: 06/03/93

CUSTOMER ORDER NUMBER: SP-2750-90 R.94 / Reanalysis

CYLINDER NUMBER	COMPONENT	CONCENTRATION(v/v)	NIST TRACEABLE REFERENCE STANDARD
CC7472	Nitrogen Dioxide	38.3 ± 0.8 ppm	SRM 2627
	Nitrogen	Balance	
	Cylinder Pressure:	1000 psig	
CC40344	Carbon Monoxide	48.1 ± 0.5 ppm	SRM 2614a
	Carbon Dioxide	10.27 ± 0.10 %	SRM 1675b
	Oxygen	8.55 ± 0.09 %	SRM 2658a
	Nitrogen	Balance	
	Cylinder Pressure:	1700 psig	

ppm = umole/mole % = mole-%

The above analyses are traceable to the National Institute of Standards and Technology by intercomparison with the reference standards listed above. Where indicated, volumetric and gravimetric reference standards are traceable thru use of our analytical balance. NIST Report No. MMAP 232.09/202491.

alyst: _____
M.S. Calhoun

Approved: _____
J.T. Marrin

SCOTT-MARRIN, INC.
6531 BOX SPRINGS BLVD. • RIVERSIDE, CA 92507
TELEPHONE (714) 653-6780 • FAX (714) 653-2430

REPORT OF ANALYSIS
NIST TRACEABLE GAS MIXTURES

STEI01
TO:
SUE POWERS
STEINER ENVIRONMENTAL
4930 BOYLAN ST
BAKERSFIELD, CA 93308-

DATE: 03/30/93

CUSTOMER ORDER NUMBER: SP 2750 90 R.86

CYLINDER NUMBER	COMPONENT	CONCENTRATION(v/v)	NIST TRACEABLE REFERENCE STANDARD
CC114765	Carbon Dioxide	8.39 ± 0.08 %	SRM 1674b
	Oxygen	2.591 ± 0.026 %	SRM 2657
	Nitrogen	Balance	
CC50645	Carbon Dioxide	8.15 ± 0.08 %	SRM 1674b
	Oxygen	10.73 ± 0.11 %	SRM 2658a
	Nitrogen	Balance	
CC50006	Carbon Dioxide	15.82 ± 0.16 %	SRM 1675b
	Oxygen	4.06 ± 0.04 %	SRM 2658a
	Nitrogen	Balance	

ppm = umole/mole % = mole-%

The above analyses are traceable to the National Institute of Standards and Technology by intercomparison with the reference standards listed above.
Where indicated, volumetric and gravimetric reference standards are traceable thru use of our analytical balance. NIST Report No. MMAP 232.09/202491.

Analyst: _____
M.S. Calhoun

Approved: _____
J.T. Marrin

APPENDIX B

BOILER OPERATING DATA

Steiner Environmental, Inc.

UNIT OPERATING DATA	
Company Name: STELLA Cheese	Date: 7-30-98
Unit Tested: Boiler	Barometric Pressure ("Hg): 30.20
Manufacturer & Model No.: Low Nox Superior Mohawk Boiler 4-3753	Dry Bulb Temp (°F): 83 89 92
Type of Pollution Control Device: FGR	Wet Bulb Temp (°F): 69 70 70

BOILER/HEATER DATA	RATED	ACTUAL		
		Run #1	Run #2	Run #3
Steam Flow (lb/hr)				
Steam Pressure (psi)	Venting	50	45	45
Heat Input (MM8tu/hr)	31.5			
Product Throughput (barrels/day)				

INTERNAL COMBUSTION ENGINE DATA	RATED	ACTUAL		
		Run #1	Run #2	Run #3
Brake Horsepower (BHp)				
Kilowatts (KW)				
Revolutions Per Minute (RPM)				

GAS TURBINE DATA	RATED	ACTUAL		
		Run #1	Run #2	Run #3
Megawatts (MW)				
Water/Fuel Ratio				
Combuster Inlet Pressure (psi)				

BATCH PLANT DATA	RATED	ACTUAL		
		Run #1	Run #2	Run #3
Charge/Process Rate				
Pull Rate				

FUEL DATA		ACTUAL		
		Run #1	Run #2	Run #3
Fuel Usage	CFh (corrected)	26631	25006	25400
Fuel Temperature *	°F	87.4	88.8	90.0
Fuel Pressure *	PSIG	32	32	33

* Not required if fuel usage is at standard conditions.

Forms 1A: UNIT-OP.DAT

Note: the gas meter reading in CFh (corrected) the "corrected" refers to pressured only