Los Gatos Tomato Products

Compliance
Emissions Testing
Test Dates: Feb 14, Mar 27,
Apr 11, 1991

BEST ENVIRONMENTAL, INC.
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Hayward, California 94545
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April 24, 1991

Los Gatos Tomato Products
P.O. Box 429
Huron, CA 93234

Attn: Mr. Dave Pompiano

Subject: **Compliance Emissions Testing**

Test Date: February 14, March 27, & April 11, 1991.

Sampling Location: Outlets of Boilers #1 & 2 at the Los Gatos Tomato Products facility near Huron, California.

Sampling Personnel: Regan Best, Sherman Smith and Dan Ashlin of BEST ENVIRONMENTAL.

Process Description: Los Gatos Tomato Products operates two Cleaver-Brooks boilers for steam production. The boilers are fired with natural gas and rated at 75,000 lbs/hr steam.

Test Program: Boiler emissions were continuously monitored for CO, 02, CO2, THC and NOx concentration at the boiler outlets. Triplicate fourty minute test runs with calibrations before and after each run were performed on the boilers. Boiler #1 was tested on 2/14/91 and Boiler #2 on 3/27/91. Boiler #1 was retested on 4/11/91 due to high TNMHC levels found during the 2/14/91 test. Fuel rate data was recorded for each test. Volumetric flowrate measurements were taken at the boiler outlets. All tests were performed with the boilers on high fire.

Sampling Methods: The following Source Test Methods of the California Air Resouces Board (CARB) and the U.S. Environmental Protection Agency were used:

Method 1-100	CO2, NOx, O2, CO, THC, Continuous Sampling
EPA Method 19	Emission Rate Determination using F-factor
EPA Method 1 & 2	Volumetric Flowrate Determination

Instrumentation:

Horiba Model PIR-2000 CO2 Analyzer

Infrared Ind. Model 2200 O2 Analyzer

Thermo Electron Model 10 NOx Analyzer

Thermo Electron Model 48 CO Analyzer

Bendix Model 8401 Total Hydrocarbon Analyzer

Test Results: Table 1 presents the results of the Boiler #1 emissions tests performed on 2/14/91. Average NOx concentration and NOx @ 3% O2 were 27.7 and 27.1 ppm, respectively. Average NOx emission facter and emission rate were 0.033 lbs/MMBtu and 2.90 lbs/hr. Average CO concentration and emission rate were 75.7 ppm and 4.84 lbs/hr. Average TNMHC concentration and emission rate were 24.0 ppm and 0.88 lbs/hr. Fuel rate was 1,408 SCFM. Boiler #1 failed to achieve the compliance standard of 15 ppm TNMHC 3% and 0.51 lbs/hr on this test day.

Table 2 presents the results of the Boiler #2 emissions tests performed on 3/27/91. Average NOx concentration and NOx @ 3% O2 were 26.2 and 26.1 ppm, respectively. Average NOx emission facter and emission rate were 0.032 lbs/MMBtu and 2.63 lbs/hr. Average CO concentration and emission rate were 94.4 ppm and 5.78 lbs/hr. Average TNMHC concentration and emission rate were 2.9 ppm and 0.10 lbs/hr. Fuel rate was 1,336 SCFM.

Table 3 presents the results of the Boiler #1 emissions tests performed on 4/11/91. Average NOx concentration and NOx @ 3% O2 were 28.1 and 27.5 ppm, respectively. Average NOx emission facter and emission rate were 0.033 lbs/MMBtu and 2.72 lbs/hr. Average CO concentration and emission rate were 79.8 ppm and 4.72 lbs/hr. Average TNMHC concentration and emission rate were 0.8 ppm and 0.0003 lbs/hr. Fuel rate was 1,311 SCFM.

Strip chart recordings, field data sheets and calibration gas certifications are contained in the appendix to this report.

If there are any questions concerning this report, please contact Regan Best at (415) 784-0708.

Submitted by,

Sherman Smith

Sherman Smith
Environmental Consultant

TABLE 1
Los Gatos Tomato Boiler No.1
TEST RESULTS

TEST	1	2	3	AVERAGE
TEST LOCATION	OUTLET	OUTLET	OUTLET	
TEST DATE	2-14-91	2-14-91	2-14-91	
TEST TIME	1538-1618	1642-1722	1725-1805	
FUEL RATE, SDCFM	1,408	1,408	1,408	1,408
MMBtu/hr	87.8	87.8	87.8	87.8
O2, %	2.6	2.7	2.6	2.6
CO2, %	10.4	10.4	10.4	10.40
NOx, ppm	28.00	28.00	27.00	27.67
NOx, ppm corr. 3%, O2	27.39	27.54	26.41	27.1
NOx, Lbs/MMBtu	0.033	0.034	0.032	0.033
NOx, lbs/hr	2.93	2.94	2.82	2.90
CO, ppm	77.0	75.0	75.0	75.7
CO, Lbs/MMBtu	0.056	0.055	0.055	0.055
CO, lbs/hr	4.91	4.81	4.79	4.84
TNMTHC, ppm	25.0	27.0	20.0	24.0
TNMTHC, Lbs/MMBtu	0.0104	0.0113	0.0083	0.0100
TNMTHC, lbs/hr	0.91	0.99	0.73	0.88

Where,
CO = Carbon Monoxide
NOx = Oxides of Nitrogen
CO2 = Carbon Monoxide
TNMTHC = Total Non-Methane Hydrocarbons
MMBtu/hr = Million BTU per Hour Input
ppm = Parts Per Million Concentration
lbs/hr = Pounds Per Hour Emission Rate
lbs/MMBtu = Pounds per Million BTU Emission Factor

See retest Table (3)

Calculations,

$$\text{lbs/MMBtu} = \text{ppm} \times 8740 \times 2.59 \times 10^{-9} \times \text{Mol. Wt.} \times (20.9/20.9-\text{O2})$$

$$\text{MMBtu/hr} = 1040\ \text{Btu/cf} \times \text{fuel SCFM} \times 60\text{min/hr} \times 10^{-6}$$

$$\text{lbs/hr} = \text{MMBtu/hr} \times \text{lbs/MMBtu}$$

$$\text{NOx corr. 3\% O2} = \text{NOx ppm} \times (17.9/\ 20.9-\ \text{O2})$$

TABLE 2
Los Gatos Tomato Boiler No.2
TEST RESULTS

TEST	1	2	3	AVERAGE
TEST LOCATION	OUTLET	OUTLET	OUTLET	
TEST DATE	3-27-91	3-27-91	3-27-91	
TEST TIME	1320-1400	1413-1453	1501-1541	
FUEL RATE, SDCFM	1,336	1,336	1,336	1,336
MMBtu/hr	82.8	82.8	82.8	82.8
O2, %	2.8	2.9	3.1	2.9
CO2, %	10.7	10.5	10.4	10.53
NOx, ppm	26.90	26.40	25.30	26.20
NOx, ppm corr. 3%, O2	26.60	26.25	25.44	26.1
NOx, Lbs/MMBtu	0.032	0.032	0.031	0.032
NOx, lbs/hr	2.68	2.65	2.57	2.63
CO, ppm	114.5	92.5	76.3	94.4
CO, Lbs/MMBtu	0.084	0.068	0.057	0.070
CO, lbs/hr	6.97	5.66	4.72	5.78
THC, ppm	5.3	1.5	2.0	2.9
THC, Lbs/MMBtu	0.0022	0.0006	0.0009	0.0012
THC, lbs/hr	0.18	0.05	0.07	0.10

Where,

CO = Carbon Monoxide
NOx = Oxides of Nitrogen
CO2 = Carbon Monoxide
THC = Total Hydrocarbons
MMBtu/hr = Million BTU per Hour Input
ppm = Parts Per Million Concentration
lbs/hr = Pounds Per Hour Emission Rate
lbs/MMBtu = Pounds per Million BTU Emission Factor

Calculations,

$$\text{lbs/MMBtu} = \text{ppm} \times 8740 \times 2.59 \times 10^{-9} \times \text{Mol. Wt.} \times (20.9/20.9-O2)$$

$$\text{MMBtu/hr} = 1040\ \text{Btu/cf} \times \text{fuel SCFM} \times 60\text{min/hr} \times 10^{-6}$$

lbs/hr = MMBtu/hr x lbs/MMBtu

NOx corr. 3% O2 = NOx ppm x (17.9/ 20.9- O2)

TABLE 3
Los Gatos Tomato Boiler No.1
TEST RESULTS

TEST	1	2	3	AVERAGE
TEST LOCATION	OUTLET	OUTLET	OUTLET	
TEST DATE	4-11-91	4-11-91	4-11-91	
TEST TIME	1408-1448	1500-1540	1548-1628	
FUEL RATE, SDCFM	1,311	1,311	1,311	1,311
MMBtu/hr	81.3	81.3	81.3	81.3
O2, %	2.6	2.7	2.6	2.6
CO2, %	10.5	10.4	10.4	10.43
NOx, ppm	28.00	28.00	28.20	28.07
NOx, ppm corr. 3%, O2	27.39	27.54	27.58	27.5
NOx, Lbs/MMBtu	0.033	0.034	0.034	0.033
NOx, lbs/hr	2.71	2.73	2.73	2.72
CO, ppm	80.7	80.0	78.8	79.8
CO, Lbs/MMBtu	0.059	0.058	0.057	0.058
CO, lbs/hr	4.77	4.75	4.66	4.72
THC, ppm	2.0	0.5	0.0	0.8
THC, Lbs/MMBtu	0.0008	0.0002	0.0000	0.0003
THC, lbs/hr	0.07	0.02	0.00	0.03

Where,

CO = Carbon Monoxide
NOx = Oxides of Nitrogen
CO2 = Carbon Monoxide
THC = Total Hydrocarbons
MMBtu/hr = Million BTU per Hour Input
ppm = Parts Per Million Concentration
lbs/hr = Pounds Per Hour Emission Rate
lbs/MMBtu = Pounds per Million BTU Emission Factor

Calculations,

$$\text{lbs/MMBtu} = \text{ppm} \times 8740 \times 2.59 \times 10^{-9} \times \text{Mol. Wt.} \times (20.9/20.9-O2)$$

$$\text{MMBtu/hr} = 1040\ \text{Btu/cf} \times \text{fuel scfm} \times 60\text{min/hr} \times 10^{-6}$$

lbs/hr = MMBtu/hr x lbs/MMBtu

NOx corr. 3% O2 = NOx ppm x (17.9/20.9-O2)

APPENDIX

CONTINUOUS MONITOR DATA SHEET

Plant Los Gatos Tomatoe
Date 2-14-91
Test Location Boiler #1
Run Number 1-2
Operator SS/DA

Ambient Temperature 65°F
Barometric Pressure 29.57
Static Pressure Duct
Fuel

	Time	Sample Point	Fuel Flow	Dry Uncorrected O_2 %	Dry Uncorrected CO_2 %	Dry Uncorrected CO ppm	Dry Uncorrected SO_2 ppm	Dry Uncorrected NO ppm	Dry Uncorrected NO_x ppm	3% O_2 Dry ppm	3% O_2 Dry NO_x ppm	Hydrocarbons THC	Hydrocarbons CH_4	Hydrocarbons Non CH_4	TOC ppm	CO_2 ppm	VOC ppm	Comments
Run 1	1538	span		7.66	11.84	397			91.8			5592						
	1548	1		2.5	10.4	78			28			200						
	1558	2		2.7	10.3	75			28			200	175	25				
	1608	3		2.7	10.4	75			28			200						
	1618	4		2.5	10.4	80			28			200						
		AVG		(2.6)	(10.4)	(77)			(28)			(200)	175	(25)				
		zero		0	0	0			1			(-30)						
		cal		7.66	11.84	400			92			5600						
Run 2	1642	span		7.66	11.84	397			91.8			5592						
	1652	1		2.7	10.4	75			28			200						
	1702	2		2.7	10.4	73			28			200						
	1712	3		2.7	10.4	75			28			210						
	1722	4		2.5	10.4	75			28			200						Sp avg.
		AVE		(2.7)	(10.4)	(75)			(28)			(202)	175	(27)				zero
		ZERO		0	0	2.5			1			0						span
		CAL		7.66	11.84	407			92			5600						
Run 3	1725	span		7.66	11.84	397			91.8			5592						
	1735	1		2.5	10.4	73			27			200						
	1745	2		2.5	10.4	78			28			210	195					
	1755	3		2.6	10.4	75			27			230						
	1805	4		2.6	10.4	75			27			220						
		AVG		7.66	11.84	4.05			(27)			(215)	(195)	(20)				zero
		zero		0	0	0			-1			0						
		CAL		7.66	11.84	4.05			91.5			5600						

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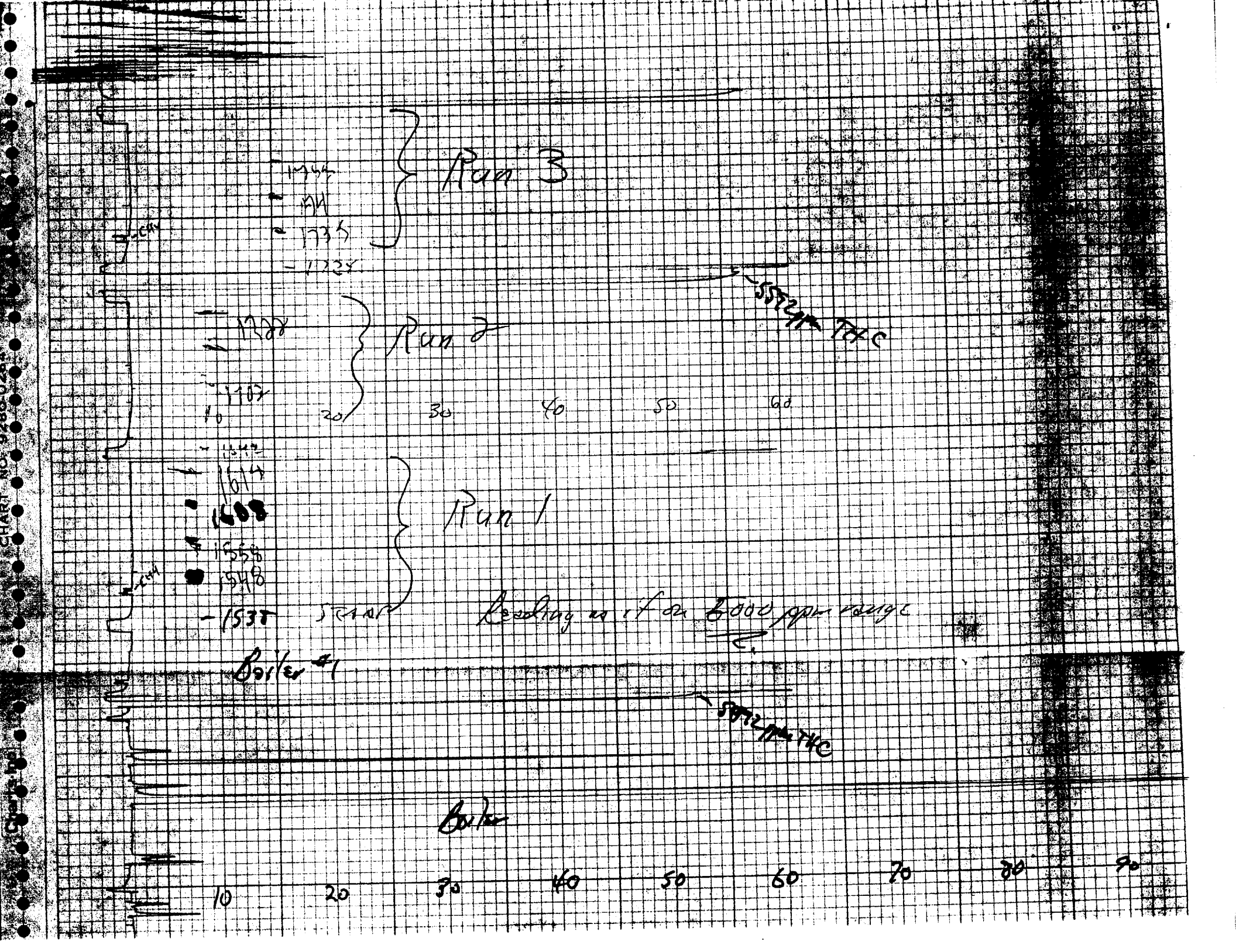
Run 2

Run 1


Run 3
Run 2
Run 1
Cooling as if on 6000 ppm range
Boiler #1
Boiler
10
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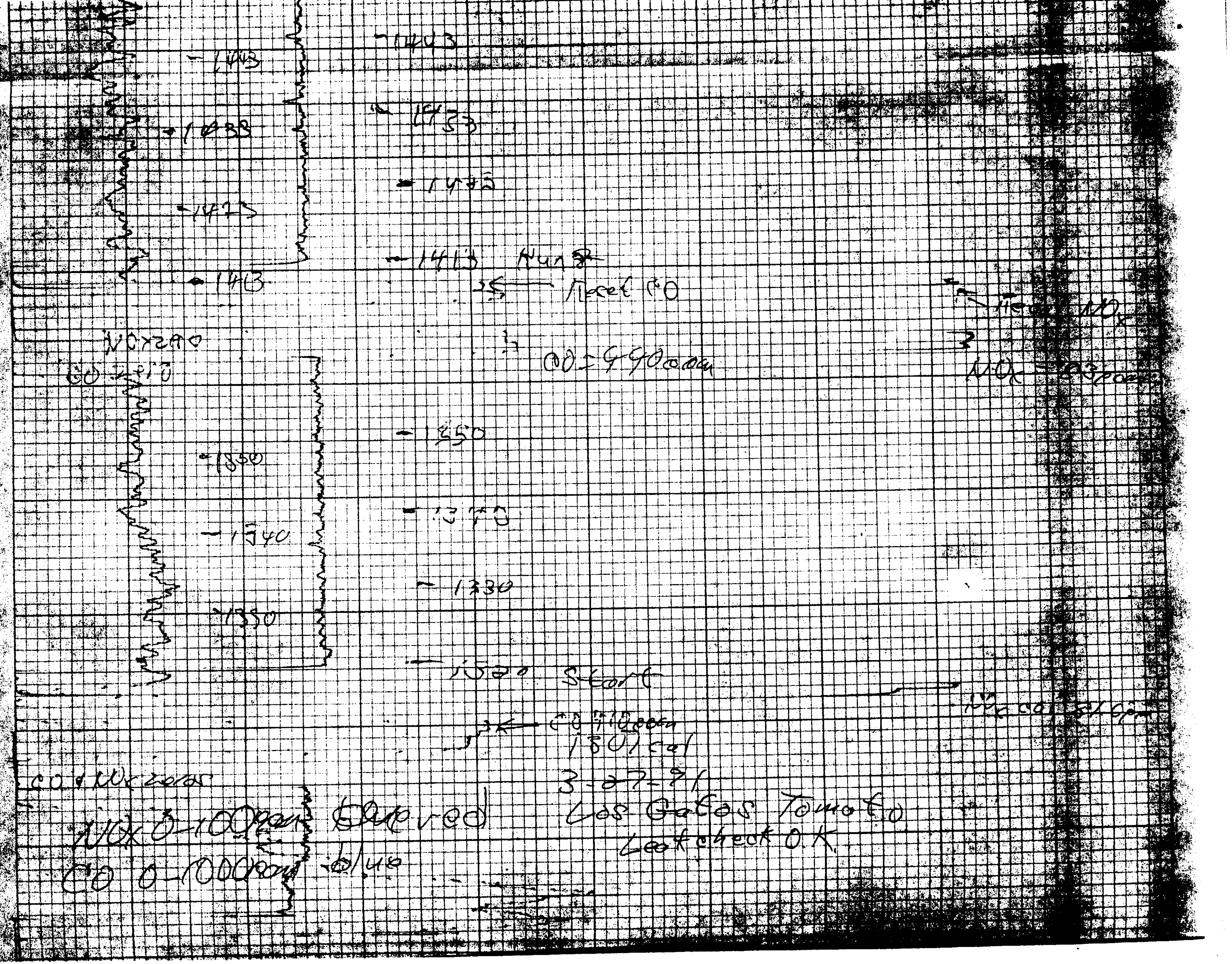
CONTINUOUS MONITOR DATA SHEET

Plant: Los Gatos Tomato
Date: 3-27-91
Test Location: Boiler 2
Run Number: 1, 2, 3
Operator: RB / DA

Ambient Temperature: ~60
Barometric Pressure: 29.65
Static Pressure Duct:
Fuel: Nat. Gas

Time	Sample Point	Fuel Flow	Dry Uncorrected O_2 %	Dry Uncorrected CO_2 %	Dry Uncorrected CO ppm	Dry Uncorrected SO_2 ppm	Dry Uncorrected NO ppm	Dry Uncorrected NO_x ppm	3% O_2 Dry ppm	3% O_2 Dry NO_x ppm	Hydrocarbons THC	Hydrocarbons CH_4	Hydrocarbons Non CH_4	TOC ppm	CO2 ppm	VOC ppm	Comments
			7.6	12.2	410			81.6			90						Cal check O.K.
1330	Cal		2.75	10.7	120			27			6						
30	Start 1		2.7	10.7	125			27			6						
40			2.8	10.7	105			27			5						
50			2.8	10.7	108			26.5			4						
1400	End		(2.8)	(10.7)	(114.5)			(27)			(5.3)						average
			0	+0.15	0			0			+1						zero
			7.6	12.4	457			83			88						span
1413	Start 2		2.8	10.5	100			26.5			2						
13			2.8	10.5	95			26.5			2						
33			3.0	10.4	85			26.5			1						
45			2.9	10.5	96			26			1						
1453	End		(2.9)	(10.5)	(92.5)			(26.9)			(1.5)						average
			+0.05	0	0			0			0						zero
			7.6	12.2	410			80			81						span
1501			3.1	10.3	80			25			0						
11			3.1	10.4	80			25			0						
21			3.	10.4	75			25			0						
31			3.1	10.4	75			26			0						
1541	End		(3.1)	(10.4)	(76.3)			(25.3)			(0)						average
																	zero
			+0.05	0	0			0			-7						span
			7.6	12.2	408			83			92						



NOx 290
CO 1210
1850
1540
1350
1450
1370
1330
Start
CO 910ppm
1801 cal
3-27-91
Los Gatos Tomato
Leak check O.K.
CO & NOx zero
NOx 0-100ppm red
CO 0-1000ppm blue

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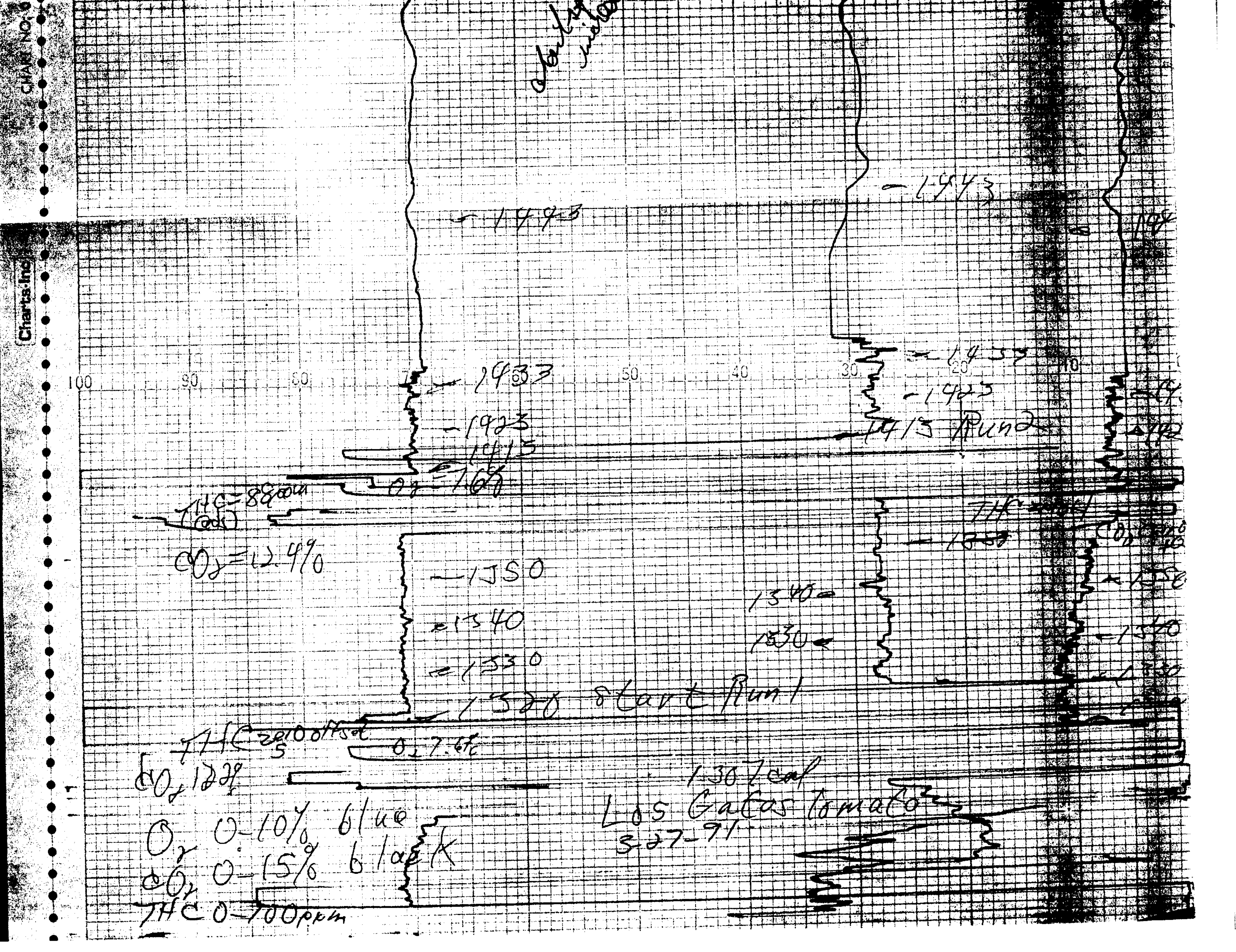

Charts-Inc
1443
1433
1423
1413 Run 2
1350
1340
1330
1320 Start Run 1
CO2=12.4%
O2 7.6%
1:30 Zeal
Los Gatos tomato
3-27-91
O2 0-10% blue
CO2 0-15% black
THC 0-100ppm

STACK VOLUMETRIC FLOW RATE DETERMINATION

2.8% O_2
10.5 CO_2
16.8% H_2O
MW_s 27.88

Stack gas velocity at stack conditions (ft/sec)

$$V_s = 85.49\ (C_p)\ (\sqrt{\Delta P})_{avg} \sqrt{\frac{T_{s,avg} + 460}{P_s\ MW_s}} = 61.48$$

(.84) (.891)

Stack gas volume at standard conditions (scfm)

$$Q_s = 60\ (1 - B_{wo})\ V_{s_{avg}}\ A_s \left(\frac{528}{T_{s,avg} + 460}\right)\left(\frac{P_s}{29.92}\right) = 14,946$$

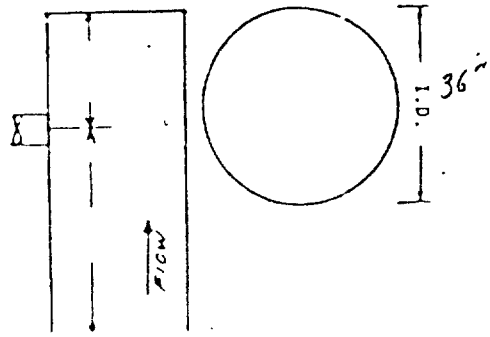
(1-.167) (7.07)

VELOCITY TRAVERSE DATA

Traverse Point Number	Velocity Head in. H_2O	Distance from inside wall (in.)	Stack Temperature (T_s), °F	Velocity Head in. H_2O	$\sqrt{\Delta P}$	Stack Temperature (T_s), °F
1	.70		305°		.837	
2	.72				.849	
3	.80				.894	
4	.95				.975	
5	.83				.911	
6	.60		290°		.775	
1	.82		305°		.906	
2	.84				.917	
3	.90				.949	
4	.89				.943	
5	.79				.889	
6	.72		295°		.849	
Average			299		.891	

Plant Los Gatos Tomato
Sampling Site Unit #2 Boiler
Remarks
Barometric Pressure, in. Hg 29.65
Static Pressure in Stack (P_g) in. Hg +.13
Operators SS/DA Date 3/27/91

Pitot Tube Factor .84

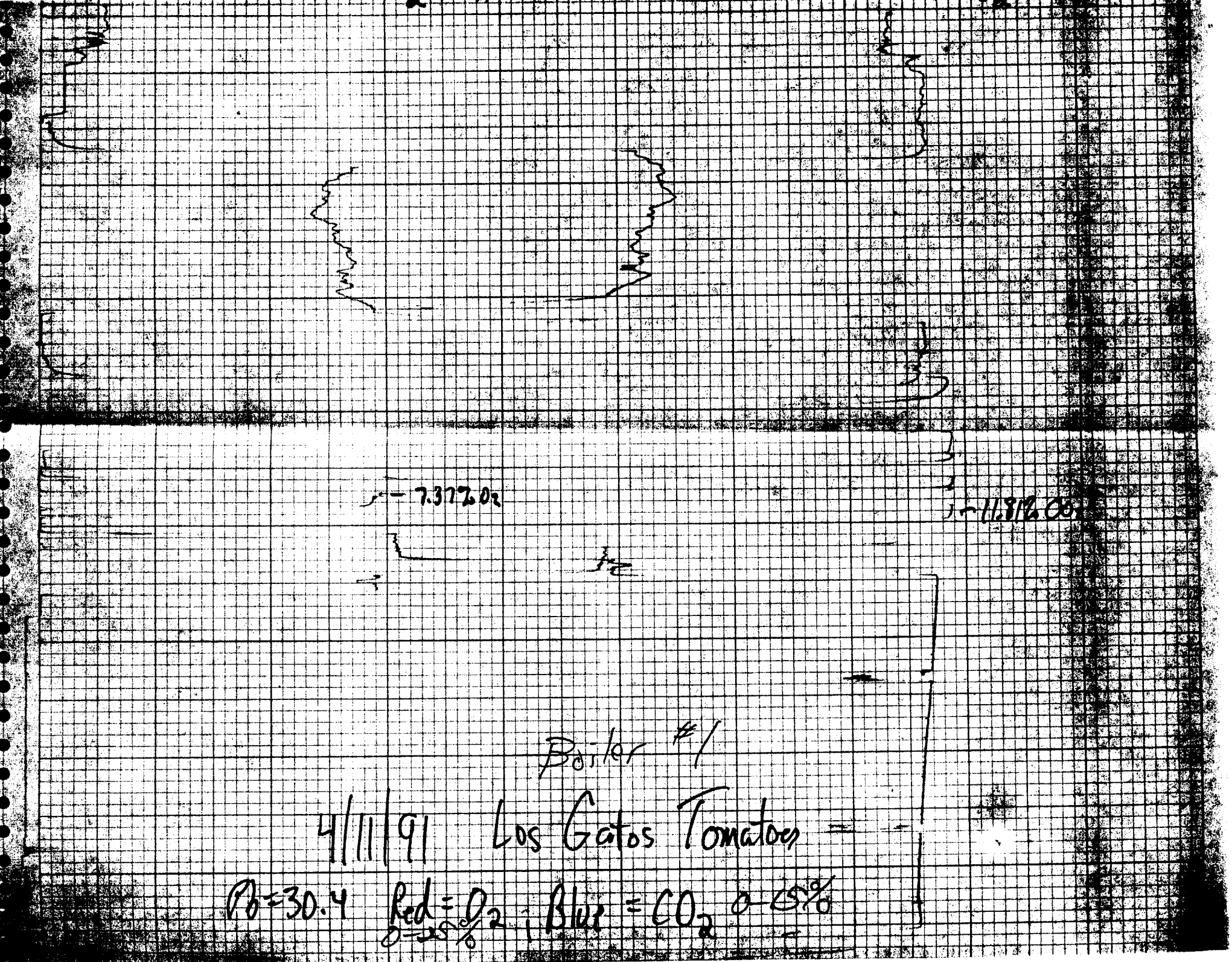


CONTINUOUS MONITOR DATA SHEET

Plant Los Gatos Tomatoes
Date 4/11/91
Test Location Boiler #1
Run Number 1, 2, 3
Operator CT/SS

Ambient Temperature
Barometric Pressure 30.4
Static Pressure
Fuel Nat Gas

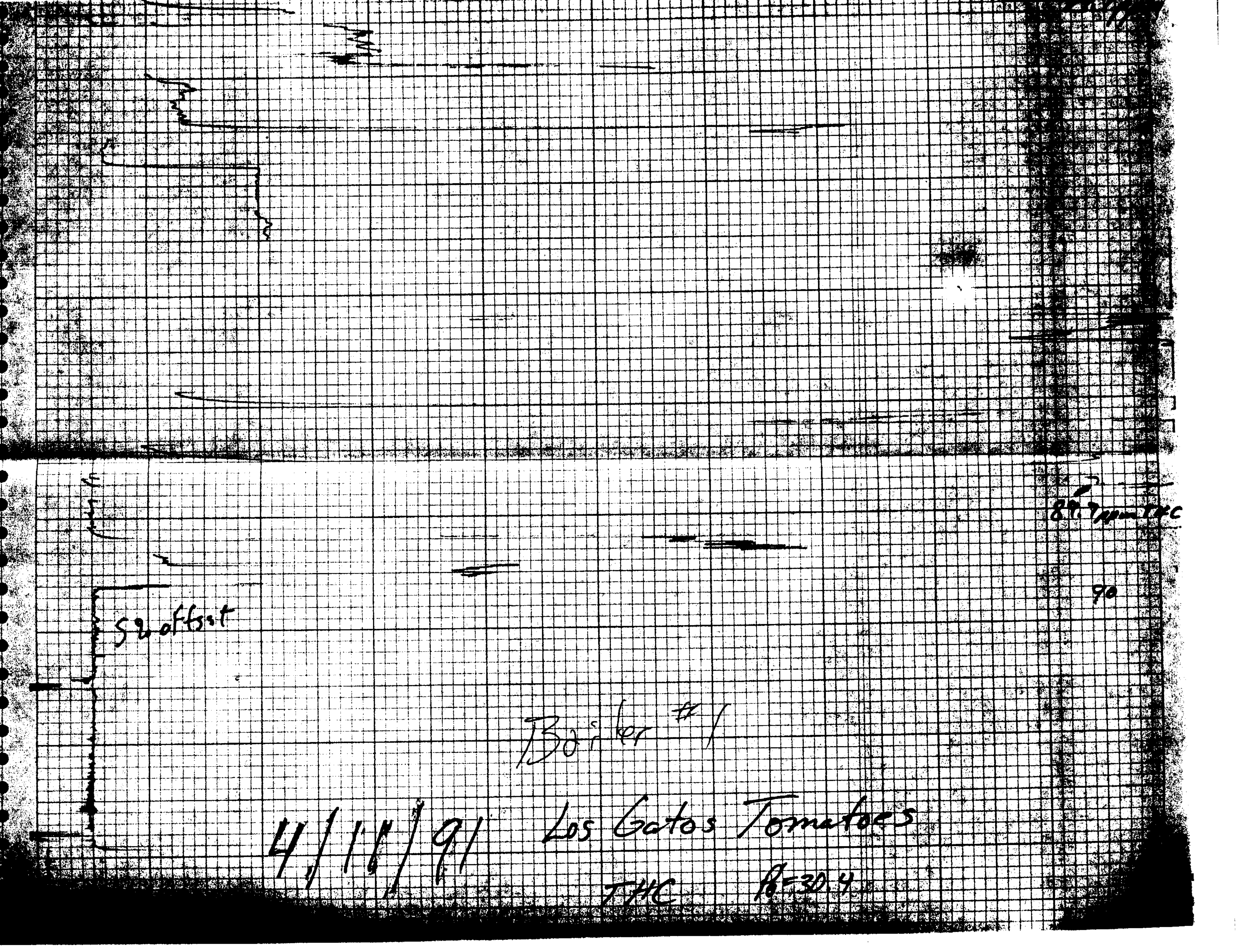
Time	Sample Point	Fuel Flow	Dry Uncorrected: O_2 %	CO_2 %	CO ppm	SO2 ppm (corrected for drift)	NO ppm	NO_x ppm	3% O_2 Dry: ppm	NO_x ppm	Hydrocarbons: THC	CH_4	Non CH_4	Comments
														Run #1
1408	cal/start		7.37	11.81	388			81.6			89.7			
1418			2.7	10.4	82.5	82.5		27.9			5.5	3.5	2.0	
1428			2.6	10.5	85	81.2		28		27.4	3.5			555 cfm gas @ 8-5 psi
1438			2.6	10.5	87	80.0		28			3.0			
1448			2.6	10.4	90	79		28			3.0			100 ÷ 10.8 × 3600
~~1458~~														× 14.7 ÷ 14.7 = 78,684 cfh
AVE			2.6	10.45	88	80.7		28			3.8	3.5	2.0	
ZERO			0	0	15			0.5			−2.0			
CAL			7.4	11.88	405			80.9			89			1,311 scfm gas
1500	cal/start		7.37	1681	388			81.6			89.7			
1510			2.7	10.4	80			28			5.8			Run 2
1520			2.6	10.4	80			28			5.0	4.5	.5	
1530			2.6	10.4	80			28.3			4.8			
1540			2.7	10.4	80			28			4.7			
AVE			2.65	10.4	80			28						
ZERO			0	0	5			.2			0			
Cal			7.3	11.8	392			82			90			
1548	cal/start		7.37	11.81	388			81.6			89.7			Run 3
1558			2.6	10.4	82.5			28			4.9			
1608			2.6	10.4	72.5			28			4.4	4.4	0	
1618			2.6	10.4	77.5			28.2			4.2			
1628			2.6	10.4	72.5			28.4			4.2	4.2	0	
AVE			2.6	10.4	78.8			28.2			4.4	4.3	0	
ZERO			0	0	10			.4			0			
CAL			7.4	11.78	395			82.5			89.3			

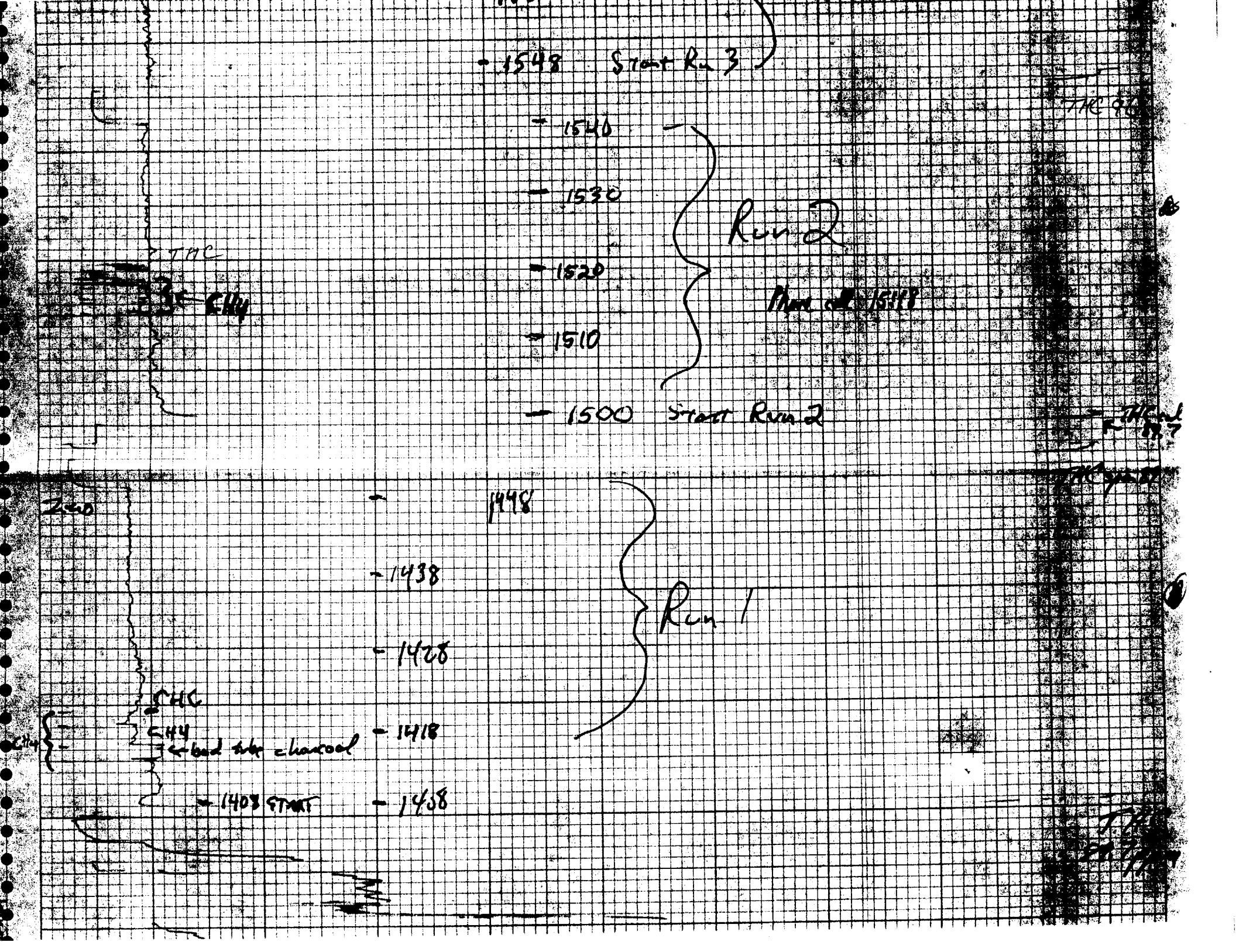


Boiler #1

4/11/91 Los Gatos Tomatoes

Po=30.4 Red = O2 ; Blue = CO2 0-5%


89.7 ppm THC
90
52 offset
Boiler #1
4/18/91 Los Gatos Tomatoes
THC
R=30.4


1548 Start Run 3
1540
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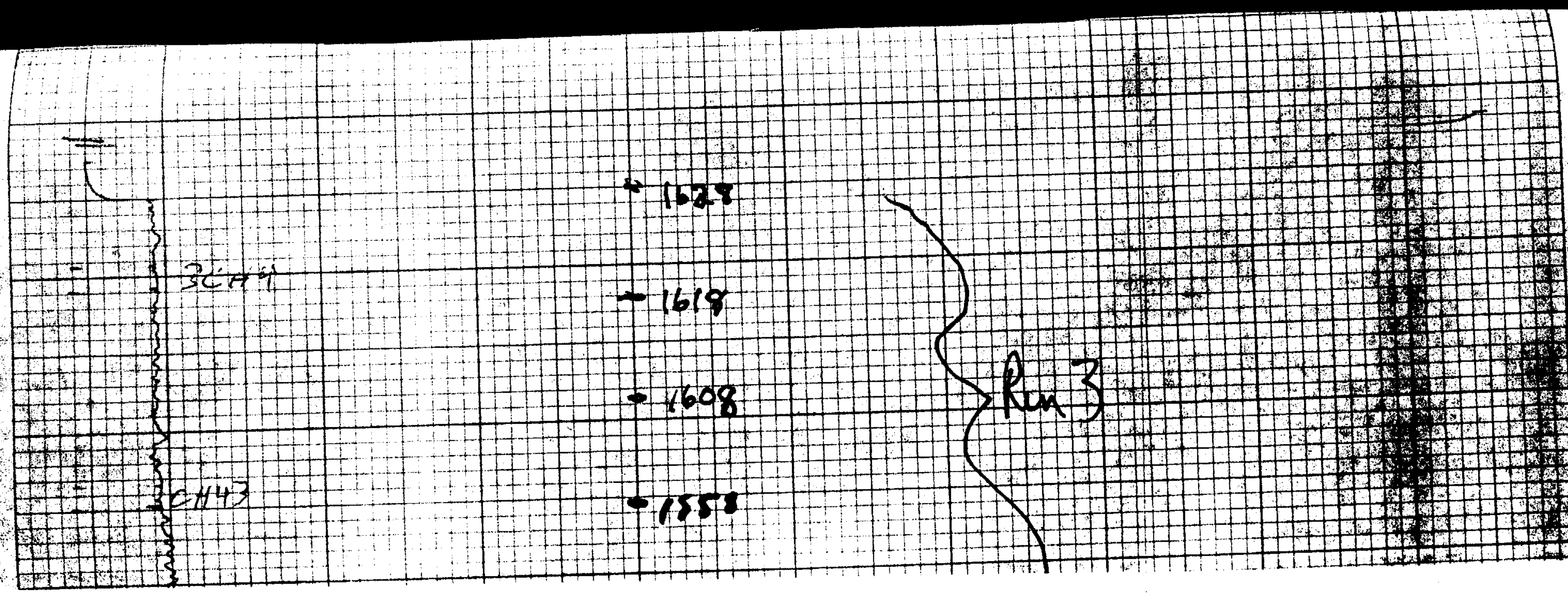
1500 Start Run 2
Run 2
Run 1
1448
1438
1428
1418
1408 START
1438
THC
CH4
end tube charcoal


1628
1618
1608
1558
Run 3

STACK VOLUMETRIC FLOWRATE DETERMINATION

Date 4/11/91 Client Los Gatos Tomato Operators SS/DA
Time Barometric (Pb) Static
Location Boiler 1 Outlet Pressure Pressure +0.21
Pitot Factor .84 Duct dimen. 36" ID.
CO2% 10.4 Stack Area(As) 7.07
O2% 2.6 Round duct=π r2 ÷ 144 (radius in inches)
H2O%

Velocity Traverse Data Remarks

Inches from wall	Port &pt.	Time	Delta P	Stack Temp	sqrt. ^P
1.0	1		.70	302	.837
2.4	2		.70	300	.837
4.25	3		.70	300	.837
6.37	4		.71	299	.843
9.0	5		.76	298	.872
12.8	6		.78	300	.883
23.2	7		.90	296	.949
27.0	8		.88	298	.938
29.6	9		.80	298	.895
31.75	10		.78	298	.883
33.6	11		.60	296	.775
35.0	12		.60	298	.775
	1		.70	306	.837
	2		.68	305	.825
	3		.75	303	.866
	4		.80	300	.894
	5		.85	299	.922
	6		.83	302	.911
	7		.88	298	.938
	8		.87	297	.933
	9		.80	295	.895
	10		.81	297	.900
	11		.81	295	.900
	12		.79	295	.889
Averages				298.9	.874

Stack Gas Velocity
@ Stack conditions
(feet per second)

Vs = 85 49 x (Cp) x
sqrt^p avg. x
sqrt[Tsavgx460/PsxMWs]

Where,
Vs=velocity stack
Cp=pitot factor
Ts=Stack Temperature
Ps=Stack pressure
MWs=Molecular Wt.gas
where,
MWs=MWd x(1-Bwo)+18(Bwo)

MWd=.44(%CO2)+.32(%O2)
+.28(%CO+%N2)

Bwo=%moisture/100
Ps=static/13.6 + Pb

Stack Gas Volume at
Standard Conditions
Qs = SCFM

Qs=60(1-Bwo) x Vsavg
x As x (528/Tsavg+460)
x (Ps/29.92)

Vs=

Qs= 14,860

Notes/Comments

SCOTT-MARRIN, INC.
2001 THIRD ST. • UNIT H • RIVERSIDE, CA 92507
TELEPHONE (714) 784-1240

REPORT OF ANALYSIS
EPA PROTOCOL GAS MIXTURES

BEST01

DATE : 08/02/90

TO:
DAN CARTNER
BEST ENVIRONMENTAL
27343 INDUSTRIAL BLVD.
HAYWARD, CA 94545

CUSTOMER ORDER NUMBER: 8168

PAGE 1

COMPONENT	CONCENTRATION(v/v)	REFERENCE STANDARD	ANALYZER MAKE,MODEL,S/N,DETECTION	EXPIRATION DATE	REPLICATE ANALYSIS DATA	
CYLINDER NO.:	CC42792					
			Monitor Labs Model 8440		07/17/90	07/24/90
Nitric Oxide	91.8 ± 0.9 ppm	GMIS	S/N 136	01/24/92	92.0 ppm	91.6 ppm
		Cylinder #	Continuous		91.8 ppm	91.5 ppm
Nitrogen,O2-Free Balance		CC83831	Chemiluminescence		91.9 ppm	91.8 ppm
Cylinder Pressure: 2000 psig		@ 101.8 ppm	Last Cal Date: 07/30/90		Mean: 91.9 ppm	91.6 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: J.W. Gay

Approved: J.T.Marrin

SCOTT-MARRIN, INC.
2001 THIRD ST. • UNIT H • RIVERSIDE, CA 92507
TELEPHONE (714) 784-1240

REPORT OF ANALYSIS
EPA PROTOCOL GAS MIXTURES

BEST01

TO:

DAN CARTNER
BEST ENVIRONMENTAL
27343 INDUSTRIAL BLVD. #E
HAYWARD, CA 9454

DATE : 09/27/90

CUSTOMER ORDER NUMBER: 8205

COMPONENT	CONCENTRATION(v/v)	REFERENCE STANDARD	ANALYZER MAKE,MODEL,S/N,DETECTION	EXPIRATION DATE	REPLICATE ANALYSIS DATA	
CYLINDER NO.: CC93353						
			Monitor Labs Model 8440		09/14/90	09/24/90
Nitric Oxide	81.6 ± 0.8 ppm	GMIS	S/N 136	03/24/92	81.4 ppm	82.3 ppm
		Cylinder #	Continuous		81.2 ppm	81.7 ppm
Nitrogen,O2-Free Balance		CC83831	Chemiluminescence		81.0 ppm	82.1 ppm
Cylinder Pressure: 2000 psig		@ 101.9 ppm	Last Cal Date: 07/30/90		Mean: 81.2 ppm	82.0 ppm
CYLINDER NO.: CC93357						
			Monitor Labs Model 8440		09/17/90	09/26/90
Nitric Oxide	201.9 ± 2.0 ppm	GMIS	S/N 136	03/26/92	202.7 ppm	201.8 ppm
		Cylinder #	Continuous		202.6 ppm	201.6 ppm
Nitrogen,O2-Free Balance		CC49697	Chemiluminescence		201.8 ppm	200.6 ppm
Cylinder Pressure: 2000 psig		@ 254.5 ppm	Last Cal Date: 07/30/90		Mean: 202.4 ppm	201.4 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
S.B. Kozy

Approved:
J.T.Marrin

SCOTT-MARRIN, INC.
2001 THIRD ST. • UNIT H • RIVERSIDE, CA 92507
TELEPHONE (714) 784-1240

REPORT OF ANALYSIS
CALIBRATION GAS MIXTURES

BEST01
TO:
REGAN BEST
BEST ENVIRONMENTAL
27343 INDUSTRIAL BLVD. #E
HAYWARD, CA 94545

DATE : 03/05/91

CUSTOMER ORDER NUMBER: 8250

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CYLINDER NO.: CC60374

COMPONENT	CONCENTRATION (v/v)
Propane	19.80 $\pm$ 0.40 ppm
Methane	30.3 $\pm$ 0.6 ppm
Air	Balance

CYLINDER NO.: CC62457

COMPONENT	CONCENTRATION (v/v)
Carbon Dioxide	11.81 $\pm$ 0.24 %
Oxygen	7.37 $\pm$ 0.15 %
Carbon Monoxide	388 $\pm$ 8 ppm
Nitrogen	Balance

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ppm = umole/mole   % = mole-%

Analyst: M.J. Monson

Approved: 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.

SCOTT-MARRIN, INC.
2001 THIRD ST. • UNIT H • RIVERSIDE, CA 92507
TELEPHONE (714) 784-1240

REPORT OF ANALYSIS
EPA PROTOCOL GAS MIXTURES

BEST01

TO:
DAN CARTNER
BEST ENVIRONMENTAL
27343 INDUSTRIAL BLVD., E
HAYWARD, CA 94545

DATE : 10/05/90

CUSTOMER ORDER NUMBER: 8205

PAGE 1

COMPONENT	CONCENTRATION(v/v)	REFERENCE STANDARD	ANALYZER MAKE,MODEL,S/N,DETECTION	EXPIRATION DATE	REPLICATE ANALYSIS DATA	
CYLINDER NO.: CC62120						
			Carle Insts Model 8000		09/27/90	10/04/90
Carbon Monoxide	397 ± 4 ppm	GMIS	S/N 8249	04/04/91	399 ppm	398 ppm
		Cylinder #	Methanation/FID		397 ppm	393 ppm
		CC28362	Gas Chromatography		398 ppm	393 ppm
		@ 495 ppm	Last Cal Date: 09/11/90		Mean: 398 ppm	395 ppm
			Varian Model 1860		09/26/90	
Carbon Dioxide	11.84 ± 0.12 %	GMIS	S/N None	03/26/91	11.82 %	
		Cylinder #	Thermal Conductivity		11.83 %	
		CC60263	Gas Chromatography		11.86 %	
		@ 17.62 %	Last Cal Date: 07/19/90		Mean: 11.84 %	
			Varian Model 1860		09/24/90	
Oxygen	7.66 ± 0.08 %	GMIS	S/N None	03/24/91	7.65 %	
		Cylinder #	Thermal Conductivity		7.65 %	
Nitrogen	Balance	CC62350	Gas Chromatography		7.68 %	
Cylinder Pressure: 2000 psig		@ 9.68 %	Last Cal Date: 07/25/90		Mean: 7.66 %	

ppm = umole/mole % = mole-%

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

Analyst: J.W. Gay Approved: 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

SMI SCOTT-MARRIN, INC.
2001 THIRD ST. • UNIT H • RIVERSIDE, CA 92507
TELEPHONE (714) 784-1240

REPORT OF ANALYSIS
CALIBRATION GAS MIXTURES

BEST01

DATE : 01/24/91

TO:

REGAN BEST
BEST ENVIRONMENTAL
27343 INDUSTRIAL BLVD.,#E
HAYWARD, CA 94545

CUSTOMER ORDER NUMBER: 8236

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CYLINDER NO.: CC28068

COMPONENT	CONCENTRATION (v/v)
Oxygen	7.58 ± 0.15 %
Carbon Dioxide	12.22 ± 0.24 %
Carbon Monoxide	410 ± 8 ppm
Nitrogen	Balance

CYLINDER NO.:

COMPONENT	CONCENTRATION (v/v)

ppm = umole/mole   % = mole-%

Analyst: *Mark Monson*
M.J. Monson

Approved: *[signature]*
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.