HORIZON

AIR MEASUREMENT SERVICES, INC.

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Revision Number: 0

RESULTS OF THE BIENNIAL CRITERIA SOURCE TEST ON THE SIMI VALLEY LANDFILL FLARE NO. 2 (John Zink)

VCAPCD Permit to Operate #1395

Prepared for:

Simi Valley Landfill and Recycling Center
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Simi Valley, California 93065

Prepared by:

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HORIZON

R MEASUREMENT SERVICES, INC.

October 21, 2003

Mr. Jim Riley
Simi Valley Landfill and Recycling Center
2801 Madera Road
Simi Valley, California 93065

Dear Mr. Riley:

Please find enclosed four copies of the final report entitled "Results of the Biennial Criteria Source Test on the Simi Valley Landfill Flare No. 2 (John Zink)."

If you have any questions, please call me at (805) 498-8781.

Sincerely,

HORIZON AIR MEASUREMENT SERVICES, INC.

Scott H. Bunch
Project Manager

SB:lmg

Enclosures

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1. INTRODUCTION

Under the requirements of Ventura County Air Pollution Control District (VCAPCD) Permit to Operate #1395, Simi Valley Landfill and Recycling Center (SVLRC) is required to conduct a biennial source test on the landfill gas flare located at the landfill to determine emissions of criteria pollutants. Horizon Air Measurement Services, Inc. (Horizon) had been retained for this purpose.

All testing/analytical procedures conformed to the Source Test Protocol (Horizon # W07-036-TP) of August 2003. Sampling and analytical procedures utilized in the testing program are provided, in detail, in Section 4 of this report. All testing was completed on September 17, 2003.

The criteria pollutants and associated emission parameters tested for and the associated Permit limits are provided in Table 1-1. The destruction efficiency of the flare with respect to ROC was also determined as well as the landfill gas heating value, composition and C_1 to C_3 reduced sulfur compound (including H_2S) concentration. Three replicate test runs were completed for each parameter of interest.

A summary of the criteria emissions results and the associated Permit limits are provided in Section 2. A more detailed description and discussion of the criteria pollutants results and air toxics are provided in Section 5. Results of the QA/QC procedures are discussed in Section 6.

During testing, the flare was operating under normal operating conditions. Landfill gas flow rate was 1563 standard cubic feet per minute (scfm), based upon the facility's continuous flow monitor/recorder (see Appendix E). Flare temperature was set at 1700°F Fahrenheit (°F). Stack temperature thermocouple readings were verified throughout the initial portion of the testing program. A description of the flare and landfill gas collection system and its operation during testing is summarized in Section 3 of this report. All pertinent documentation can be found in the Appendices.

Table 1-1
Simi Valley Landfill
Flare No. 2 (John Zink)
September 17, 2003

Parameter	Permit Limit
Reactive Organic Compounds (ROC)	1.09 lb/hr
Oxides of Nitrogen	0.05 lb/MMBtu 3.75 lb/hour
Carbon Monoxide	0.2 lb/MMBtu 15.00 lb/hour
ROC Destruction Efficiency	98.0%
Fuel Consumption*	2,044 MMSCF/year 991,340 MMBtu/year

* Total for two existing flares at SVLFRC.

2. SUMMARY OF RESULTS

2.1 Criteria Pollutants

The results of the criteria testing test program are summarized in Table 2-1. Emission rate of ROC, NO_x and CO were within the allowable emission limits under the Permit to Operate #1395.

Emission rate of NO_X averaged 1.58 lb/hr and 0.0337 lb/MMBtu which is well below the VCAPCD Rule 74.17.1 limit of 3.75 lb/hr and 0.05 lb/MMBtu, respectively. Emissions of CO averaged less than 0.400 lb/hr and less than 0.0085 lb/MMBtu which is well below the VCAPCD Rule 74.17.1 limit of 15.00 lb/hr and 0.2 lb/MMBtu. The ROC destruction efficiency average of 99.5% is within the Rule 74.17.1 limit of 98%.

A more detailed discussion of the criteria testing results are provided in Section 5.

Table 2-1
Summary of Results
Simi Valley Landfill
Flare No. 2 (John Zink)
September 17, 2003

	Emission Rate								Allowable Emissions	
	Run 1		Run 2		Run 3		Average			
	(lb/hr)	(lb/MMBtu)	(lb/hr)	(lb/MMBtu)	(lb/hr)	(lb/MMBtu)	(lb/hr)	(lb/MMBtu)	(lb/hr)	(lb/MMBtu)
Reactive Organic Compounds (ROC), as CH_4	0.157	NA	0.055	NA	0.231	NA	0.1477	NA	1.09	NA
Oxides of Nitrogen, as NO_2	1.60	0.0341	1.59	0.0342	1.55	0.0327	1.58	0.0337	3.75	0.06
Carbon Monoxide	<0.399	<0.0085	<0.393	<0.0085	<0.407	<0.0086	<0.400	<0.0085	15.00	0.20
	Destruction Efficiency									
							Average			
Reactive Organic Compounds	99.4%	----	99.7%	----	99.3%	----	99.5%	----	98.0%	

3. PROCESS DESCRIPTION

The landfill gas collection system consists of a series of landfill gas collection wells, a gas collection manifold, a pumping system and the landfill gas flare. Landfill gas, collected from various wells located throughout the landfill, is manifolded to a common duct. The landfill gas then passes through a condensation collection system, a blower, then to the flare.

The landfill gas flare consists of an insulated steel cylinder eleven feet in diameter (outside diameter) and 50 feet tall. The four sample ports utilized are located 45 feet from ground level and five feet from the top of the flare. Landfill gas was supplied to the flare burners at a rate of approximately 1563 standard cubic feet per minute (scfm). Flare combustion temperature was maintained at a set point of 1700°F to ensure complete combustion and is monitored by a facility thermocouple recording temperature. The flare was equipped with automatic air control louvers and a temperature controller to maintain the pre-set flare temperature. A flame failure detector automatically shuts off gas flow from the blower in the event of a flame out.

4. SAMPLING/ANALYSES

Criteria Pollutants

The target compounds quantified as part of the criteria pollutant testing and the associated sampling methods are provided in Table 4-1. Three, replicate test runs were conducted for each parameter of interest using the procedures detailed in subsequent subsections. All methods followed the applicable CARB/EPA testing procedure without modification with the exception of EPA Method 25 as detailed in Section 4.2.

4.1 Sampling Location

4.1.1 Flare Exhaust

Sample ports are located on the flare approximately 45 feet above ground level and five feet from the flare exit. Two sample ports were utilized. Twenty-four traverse points (12 per port) were utilized for velocity, oxides of nitrogen, carbon monoxide and ROC sampling.

4.1.2 Flare Inlet - Landfill Gas

Reactive organic compound, fixed gas, and moisture samples were obtained from the landfill gas feed duct at a location at least two diameters downstream and one diameter upstream from a flow disturbance. Landfill gas flow rate was monitored using the on-line, calibrated flow meter operated by Simi Valley Landfill. The flow meter is corrected to standard temperature/pressure and gas density.

Table 4-1
Test Methods
Simi Valley Landfill
Flare No. 2 (John Zink)
September 17, 2003

Parameter	Test Method
Inlet and Outlet	
Flow Rate	Continuous, On-Line Monitor (Inlet) CARB Method 2 (Outlet)
Fixed Gases (O_2, CO_2, N_2)	CARB Method 100/EPA Method 3A (Outlet) CARB Method 3/EPA Method 3 (Inlet)
Moisture	Wet Bulb/Dry Bulb CARB Method 4 (Outlet)
ROC/Methane	EPA Method 25 (Inlet) EPA Method 25 (Outlet)
Outlet Only	
Carbon Monoxide	CARB Method 100/EPA Method 10
Sulfur Dioxide	Calculated (Based on the inlet reduced sulfur compounds concentration and flow rate)
Oxides of Nitrogen	CARB Method 100/EPA Method 7E
Inlet Only	
C_1-C_3 Sulfur Compounds (with H_2S)	Tedlar Bag/GC-Hall Detection & GC/MS
Heating Value	ASTM D3588-91

4.2 Methane and Reactive Organic Compounds (ROC)

Methane and Reactive Organic Compounds (ROC) concentration were determined at the landfill gas flare inlet and exhaust using modified EPA Method 25 or EPA Method 25C as provided in VCAPCD Rule 74.17. The modification eliminates the use of a condensate trap and filter in the sample collection system.

Method 25 samples were collected using the SUMMA canister Method outlined in EPA Method 25C as depicted in Appendix A.

The organic content of the sample collected in each SUMMA canister is measured by injecting a portion into the FID/TCA analysis system which uses a two phase gas chromatography (GC) column to separate carbon monoxide (CO), methane (CH_4), and carbon dioxide (CO_2) from each other and from the total gaseous non-methane organics (TGNMO) which are eluted as backflush. All eluted components are first oxidized to CO_2 by a hopcalite catalyst and then reduced to methane by a nickel catalyst. The resulting methane is detected using the flame ionization detector. A gas standard containing CO, CH_4, CO_2 and propane, prepared by Scott Specialty Gases, traceable to NBS, is used to calibrate the FID/TCA analysis system.

4.3 Moisture

4.3.1 Inlet

Moisture content of the stack gas was determined using a wet bulb/dry bulb thermometer.

4.3.2 Outlet

Moisture content of the stack gas was determined in accordance with CARB/EPA Method 4 "Determination of Moisture Content in Stack Gases" as outlined in Appendix A.

4.4 Flow Rate

4.4.1 Inlet

Inlet flow rate was determined using the facility's calibrated on-line flow meter and recorder.

4.4.2 Outlet

The flare exhaust flow rate was determined using EPA/CARB Method 2 as detailed in Appendix A.

4.5 Oxides of Nitrogen, Carbon Monoxide, Carbon Dioxide, Oxygen (Continuous Emissions Monitoring)

Three test runs were conducted at the landfill gas flare exhaust. Twenty-four points, per Method 1, were sampled. All sampling was performed under the guidelines of CARB Method 100/EPA Method 7E, CARB Method 100/EPA Method 3A and CARB Method 100/EPA Method 10 for the determination of NO_x, O_2, CO_2 and CO concentration. A description of Horizon's CEMS and the applicable EPA Methods, are detailed in Appendix A.

4.6 Hydrogen Sulfide (H_2S), and C_1 - C_3 Sulfur Compounds

Hydrogen sulfide and C_1 - C_3 sulfur compounds samples were collected at the inlet of the flare using the Tedlar bag collection system. All samples were analyzed within 24 hours of collection using SCAQMD Method 307.91 as described in Appendix A.

5. RESULTS DISCUSSION

The following subsections present and discuss the results of the criteria testing program.

5.1 Criteria Pollutants

Three replicate test runs were conducted for each criteria compound of interest. The results of the criteria testing program are provided in Table 5-1.

Table 5-1
Summary of Results
Simi Valley Landfill
Flare No. 2 (John Zink)
September 17, 2003

	LANDFILL GAS			FLARE EXHAUST		
Run Number	1	2	3	1	2	3
STACK GAS CHARACTERISTICS						
Temperature, degrees F	-	-	-	1549	1579	1624
Moisture, %				9.6	8.7	8.5
Flow Rate, acfm	-	-	-	79761	78893	83386
Flow Rate, dscfm	1577	1569	1544	18284	17992	18644
Fixed Gases						
Oxygen, %	0.93	-	-	12.38	12.36	12.48
Carbon Dioxide, %	39.36	-	-	8.09	8.04	7.79
Methane, %	48.00	-	-			
BTU Value, Btu/scf	498	-	-	-	-	-
EMISSIONS						
Oxides of Nitrogen						
ppm	-	-	-	12.21	12.29	11.56
ppm @ 3 % O2	-	-	-	25.66	25.78	24.59
lb/hr	-	-	-	1.600	1.586	1.546
lb/MMBtu	-	-	-	0.0341	0.0342	0.0327
Carbon Monoxide						
ppm	-	-	-	< 5.00	< 5.00	< 5.00
ppm @ 3 % O2	-	-	-	< 10.51	< 10.48	< 10.63
lb/hr	-	-	-	< 0.399	< 0.393	< 0.407
lb/MMBtu	-	-	-	< 0.0085	< 0.0085	< 0.0086
Total Non-Methane Hydrocarbons (Reactive Organic Compounds)						
ppm, as Methane	6680	4020	8070	3.44	1.22	4.96
lb/hr, as Methane	26.27	15.73	31.07	0.157	0.055	0.231
Sulfur Compounds						
Hydrogen Sulfide, ppm	34.9	-	-		-	-
Total Sulfur, ppm as H2S	49.0	-	-		-	-
Oxides of Sulfur**						
lb/hr	-	-	-	0.776	-	-

* Flow Rate calculated stoichiometrically
** Calculated from sulfur balance

6. QA/QC SUMMARY

All QA/QC requirements of each respective Method were adhered to throughout the testing program. Also, the guidelines of Horizon's corporate QA/QC manual, as appearing in the Test Plan, were followed by all sampling and analytical personnel. In addition, QA/QC measures taken which were beyond their respective Method requirements were incorporated into the testing program and are discussed in detail herein.

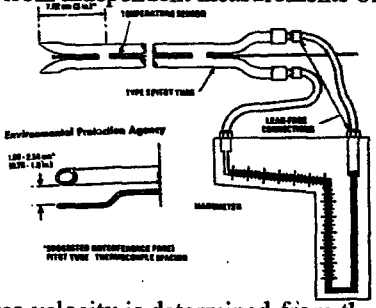
6.1 Continuous Emission Monitoring (CEM) - EPA Method 7E/10/3A

All CEM system performance checks, as detailed in Section 3, were within specifications including analyzer linearity, calibration drift, leak checks and system bias checks. The on-site CEM system performance checks can be found in Appendix A.

APPENDIX A - Test Method Descriptions

Method:	**Sample Velocity Traverses for Stationary Sources**
Applicable for Methods:	EPA Method 1, SCAQMD Method 1.1, CARB Method 1
Principle:	To aid in the representative measurements of pollutant emissions and/or total volumetric flow rate from a stationary source, a measurement site where the effluent stream is flowing in a known direction is selected, and the cross section of the stack is divided into a number of equal areas. A traverse point is then located within these equal areas. The method cannot be used when, 1) flow is cyclonic or swirling, 2) stack is small than about 0.30 meter (12 inches) in diameter or 3) the measurement of the site is less than two stack or duct diameters downstream or less than a half diameter upstream from the flow disturbance.

Method:	**Stack Gas Velocity and Volumetric Flow Rate**
Applicable for Methods:	EPA Method 2, CARB 2, SCAQMD Method 2.1
Principle:	The average gas velocity in a stack gas is determined from the gas density and from measurement of the average velocity head with a type S or standard pitot tube.
Sampling Procedure:	Set up the apparatus as shown in the figure. Measure the velocity head and temperature at the traverse points specified by EPA Method 2, CARB Method 2 or SCAQMD Method 2.1. Measure the static pressure in the stack and determine the atmospheric pressure. The stack gas molecular weight is determined from independent measurements of O_2, CO_2 and H_2O concentrations.



Sample Recovery: and Analyses:	The stack gas velocity is determined from the measured average velocity head, the measured dry concentrations of O_2 and CO_2 and the measured concentration of H_2O. The velocity is determined from the following set of equations:

Where,

ΔP = velocity head, inches in H_2O
Ts = gas/temperature, degrees R
Ps = absolute static pressure
Mwd = dry molecular weight
Mw = molecular weight
Cp = pitot flow coefficient

Dry molecular weight of stack gas

$$Mwd = 0.44\ (\%CO_2) + 0.32\ (\%O_2) + 0.28\ (\%N_2 + \%CO)$$

Molecular weight of stack gas, wet basis

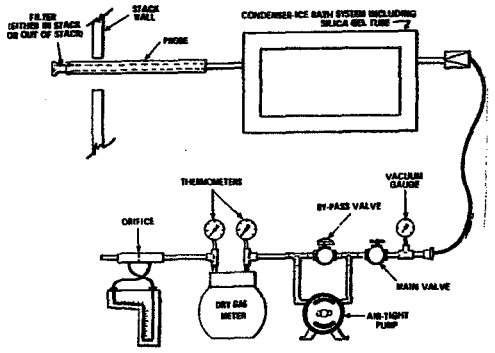
$$M_w = (M_{wd}\ x\ M_d) + 18\ (1 - M_d)$$

$$Where,\ M_d = \frac{100 - Bws}{100}$$

Stack gas velocity

$$(V_s)\ avg. = (5130)\ C_p\ x\ \sqrt{\Delta P}\ avg.\ x\ \sqrt{T_s}\ x\ \left(\frac{1}{P_s\ x\ M_w}\right)^{1/2}$$

Method:	**Determination of Moisture in Stack Gases**
Applicable for Methods:	EPA Method 4, ARB 1-4, SCAQMD Method 4.1
Principle:	A gas sample is extracted at a constant rate from the source; moisture is removed from the stream and determined either volumetrically or gravimetrically.
Sampling Procedure:	Set up train as shown in the following figure. Sample is drawn at a constant rate through a sufficiently heated probe. The probe is connected to the impinger train by Teflon or glass tubing. The train consists of two greenburg smith impinger (SCAQMD 4.1) or one modified and 1 greenburg smith impinger (CARB & EPA) each containing 100 ml of water, an empty impinger as a knock-out and an impinger containing silica gel to protect the pump from moisture.



Sample Recovery: and Analyses:	Following testing, moisture content is determined gravimetrically or volumetrically from initial and final impinger contents weights or volume.

TABLE 1

CONTINUOUS EMISSIONS MONITORING LABORATORY - TRUCK

NO_X CHEMILUMINESCENT ANALYZER -- THERMO ELECTRON MODEL 10 A

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
Operating Ranges (ppm)	2.5, 10, 25, 100, 250, 1000, 2500, 10000
Output	0-1 volt

O_2 ANALYZER, FUEL TYPE -- TELEDYNE MODEL 326RA

Response Time (0-90%)	60 seconds
Accuracy	± 1% of scale at constant temperature ± 1% of scale of ± 5% of reading, whichever is greater, over the operation temperature range.
Operating Ranges (%)	0-5, 0-25, 0-100
Output	0-1 volt

O_2 ANALYZER, PARAMAGNETIC -- SERVOMEX MODEL 1400B

Response Time (0-90%)	15 seconds
Accuracy	0.1% oxygen
Linearity	± 1% scale
Operating Ranges (%)	0-25, 0-100
Output	0-1 volt

CO GAS FILTER CORRELATION -- THERMO ELECTRON MODEL 48H

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
Operating Ranges (ppm)	50, 100, 250, 500, 1000, 2500, 5000, 10,000, 25,000, 50,000
Output	0-1 volt

CO_2 INFRARED GAS ANALYZER -- HORIBA - MODEL PIR 2000

Response Time (0-90%)	5 seconds
Zero Drift	± 1% of full scale in 24 hours
Span Drift	± 1% of full scale in 24 hours
Linearity	± 2% of full scale
Resolution	Less than 1% of full scale
Operating Ranges (%)	0-5, 0-15, 0-25
Output	0-1 volt

RATFISCH FID TOTAL HYDROCARBON ANALYZER -- MODEL 55CA

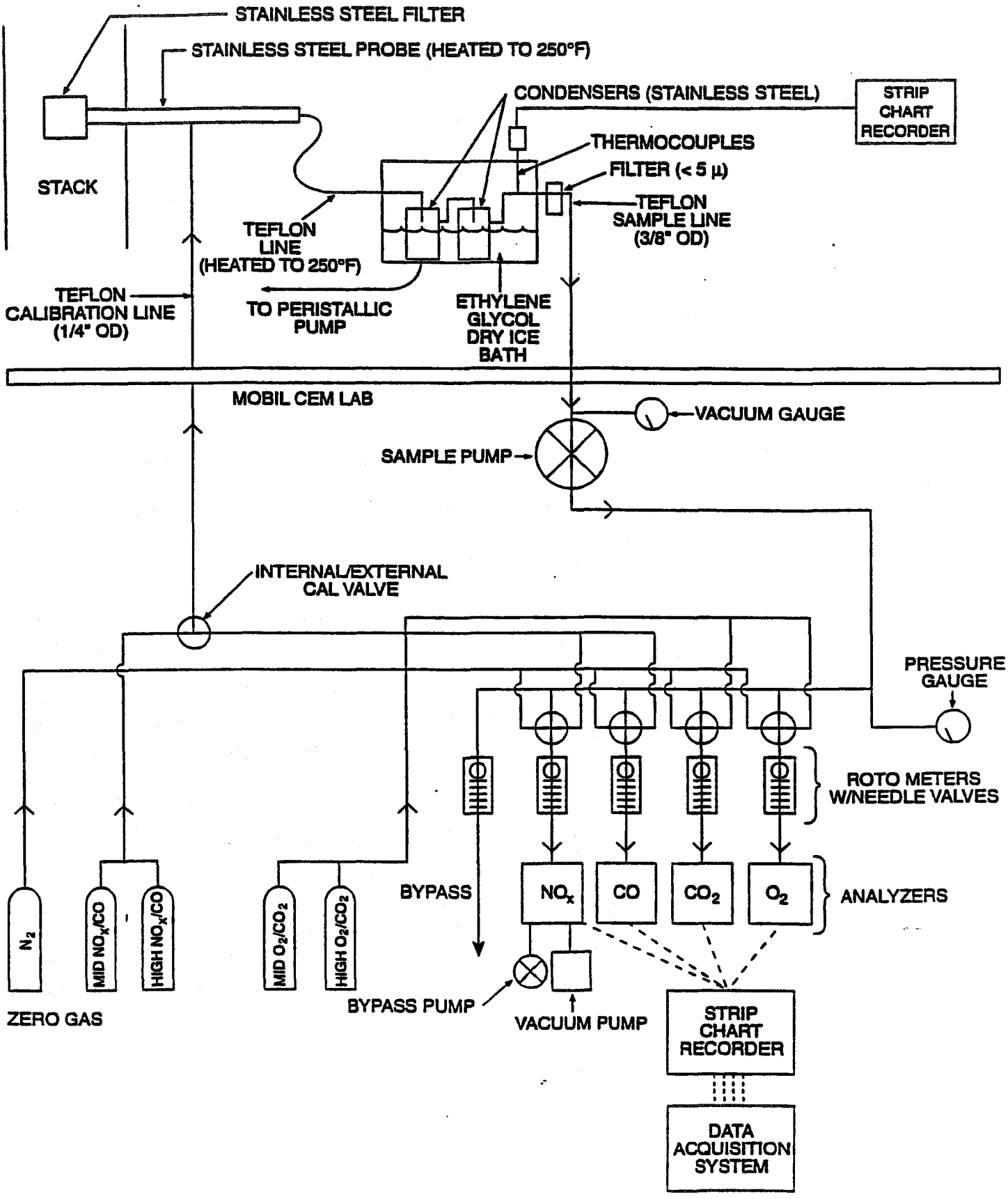
Response Time (0-90%)	5 seconds
Zero Drift	± 1% full scale in 24 hours
Span Drift	± 1% full scale in 24 hours
Linearity	± 1% full scale - constant
Accuracy	± 1% full scale at constant temp.
Operating Ranges (ppm)	10, 100, 1000, 10,000
Output	0 - 10 volts

LINSEIS MODEL L2045 FOUR PEN STRIP CHART RECORDER

Pen Speed	up to 120 cm/min
Measuring Response	0-20 volts
Linearity Error	0.25%
Accuracy	0.3%
Zero Suppression	Manual (from 1 to 10X full scale)

LINEAR 3 PEN CONTINUOUS -- MODEL 595 STRIP CHART

Pen Response	20 inches/second
Measuring Response	1 Mv through 5V
Zero Set	Electronically adjustable full scale with 1 full scale of zero suppression
Accuracy	Total limit of error ± 0.5%



CEM System Schematic

Method: **NO/NO_X by Continuous Analyzer**

Applicable Reference Methods: EPA 7E, EPA 20; CARB 100, BAAQMD ST-13A, SCAQMD 100.1

Principle: A sample is continuously withdrawn from the flue gas stream, conditioned and conveyed to the instrument for direct readout of NO or NO_X.

Analyzer: TECO Model 10AR

Measurement Principle: Chemiluminescence

Accuracy: 1% of full scale

Ranges: 0-2.5, 0-10, 0-25, 0-250, 0-1000, 0-2500, 0-10,000 ppm

Output: 0-10 V

Inferences: Compounds containing nitrogen (other than ammonia) may cause interference.

Response Time: 90%, 1.5 seconds (NO mode) and 1.7 seconds (NO_X mode)

Sampling Procedure: A representative flue gas sample is collected and conditioned using the CEM system described previously. If EPA Method 20 is used, that method's specific procedures for selecting sample points are used.

Analytical Procedure: The oxides of nitrogen monitoring instrument is a chemiluminescent nitric oxide analyzer. The operational basis of the instrument is the chemiluminescent reaction of NO and ozone (O_3) to form NO_2 in an excited state. Light emission results chemiluminescence is monitored through an optical filter by a high sensitivity photomultiplier tube, the output of which is electronically processed so it is linearly proportional to the NO concentration. The output of the instrument is in ppmV.

When NO_2 is expected to be present in the flue gas, a supercooled water dropout flask will be placed in the sample line to avoid loss of NO_2. Since NO_2 is highly soluble in water, "freezing out" the water will allow the NO_2 to reach the analyzers for analysis. The analyzer measures NO only. In the NO_X mode, the gas is passed through a moly converter which converts NO_2 to NO and a total NO_X measurement is obtained. NO_2 is determined as the difference between NO and NO_X. Use of a moly converter instead of a stainless steel converter eliminates NH_3 interference; NH_3 is converted to NO with a stainless converter, but not with a moly converter.

Method: **Oxygen (O_2) by Continuous Analyzer**

Applicable Reference Methods: EPA 3A, EPA 20, CARB 100, BAAQMD ST-14, SCAQMD 100.1

Principle: A sample is continuously withdrawn from the flue gas stream, conditioned and conveyed to the instrument for direct readout of O_2 concentration.

Analyzer: Teledyne Model 326R

Measurement Principle: Electrochemical cell

Ranges: 0-5, 0-25% 0-100%

Accuracy: 1% of full scale

Output: 0-1 V

Interferences: Halogens and halogenated compounds will cause a positive interference. Acid gases will consume the fuel cell and cause a slow calibration drift.

Response Time: 90% <60 seconds

Sampling Procedure: A representative flue gas sample is collected and conditioned using the CEM system described previously. If Method 20 is used, that method's specific procedures for selecting sample points are used. Otherwise, stratification checks are performed at the start of a test program to select single or multiple-point sample locations.

Analytical Procedure: An electrochemical cell is used to measure O_2 concentration. Oxygen in the flue gas diffuses through a Teflon membrane and is reduced on the surface of the cathode. A corresponding oxidation occurs at the anode internally and an electric current is produced that is proportional to the concentration of oxygen. This current is measured and conditioned by the instrument's electronic circuitry to give an output in percent O_2 by volume.

Method: **Carbon Dioxide (CO_2) by Continuous Analyzer**

Applicable Reference EPA 3A, CARB 100, BAAQMD ST-5, SCAQMD 100.1

Principle: A sample is continuously drawn from the flue gas stream, conditioned conveyed to the instrument for direct readout of CO_2 concentration.

Analyzer: PIR 2000

Measurement Principle: Non-dispersive infrared (NDIR)

Accuracy: 1% of full scale

Ranges: 0-5, 0-15%

Output: 0-1 V

Interferences: A possible interference includes water. Since the instrument receives dried sample gas, this interference is not significant.

Response Time: 5 seconds

Sampling Procedure: A representative flue gas sample is collected and conditioned using the CEM system described previously.

Analytical Procedure: Carbon dioxide concentrations are measured by short path length non-dispersive infrared analyzers. These instruments measure the differential in infrared energy absorbed from energy beams passed through a reference cell (containing a gas selected to have minimal absorption of infrared energy in the wavelength absorbed by the gas component of interest) and a sample cell through which the sample gas flows continuously. The differential absorption appears as a reading on a scale of 0-100%.

Method: **Carbon Monoxide (CO) by NDIR/Gas Filter Correlation**

Applicable Reference Methods: EPA 10; CARB 1-100; BAAQMD ST-6, SCAQMD 100.1

Principle:	A sample is continuously drawn from the flue gas stream, conditioned and conveyed to the instrument for direct readout of CO concentration.
Analyzer:	TECO, Model 48H
Measurement Principle:	NDIR/Gas Filter Correlation
Precision:	0.1% ppm
Ranges:	0-50, 0-100, 0-250, 0-500, 0-1000, 0-2500, 0-5000, 0-10000, 0-2500, 0-3,000 ppm
Output:	0-1 V
Interferences:	Negligible interference from water and CO_2
Rise/Fall times (0-95%)	1 minute @ 1 lpm flow, 30 second integration time
Sampling Procedure:	A representative flue gas sample is collected and conditioned using the CEM system described previously. Sample point selection has been described previously.

Analytical Procedure: Radiation from an infrared source is chopped and then passed through a gas filter which alternates between CO and N_2 due to rotation of a filter wheel. The radiation then passes through a narrow band-pass filter and a multiple optical pass sample cell where absorption by the sample gas occurs. The IR radiation exits the sample cell and falls on a solid state IR detector.

Method:	**Hydrocarbons by Total Carbon Analyses**
Reference:	EPA Method 25 (modified without condensate trap)
Principle:	Gaseous samples are collected in 6-liter SUMMA polished stainless steel canisters. The canisters are then pressurized with nitrogen and analyzed for methane and total non methane hydrocarbons (TNMHC).
Sampling Procedure:	Samples are collected, in duplicate, using 6-liter SUMMA polished stainless steel canisters which are evacuated to less than 10 mm Hg absolute. The tanks are pressurized and evacuated three times with ultrapure nitrogen and leak checked prior to use. A gas flow metering device and stainless steel shutoff valve is located just upstream of the canister. Representative, integrated samples are collected through a heat conditioned 1/4" stainless steel probe. The gas samples are metered into the canisters through the vacuum regulator maintaining a constant flow rate throughout each sampling period. The sampling apparatus is checked for leaks prior to the sampling program by attaching the probe end to an absolute pressure gauge and vacuum pump in series. The sample lines were evacuated to less than 10 mm Hg and the gauge shutoff valve is then closed. The sample lines are deemed to be leak-free if no loss of vacuum occurs as indicated by the vacuum gauge. During sampling the tank pressures are monitored with a 0-30 inch vacuum gauge to ensure integrated sampling.
Analytical Procedure:	Samples are analyzed for methane and total non methane hydrocarbons (TNMHC) by total combustion analyses (TCA)/flame ionization detection.

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Tandem Gas Chromatographic/Mass Spectroscopic-Electrolytic Conductivity Detector (GC/MS-ELCD) Method for Determination of Total Sulfur in Gas Samples

AtmAA, Inc.
03-060

3/30/93

This method measures selected reduced sulfur species, including but not limited to hydrogen sulfide, carbonyl sulfide, methyl mercaptan, ethyl mercaptan, dimethyl sulfide, carbon disulfide, isopropyl mercaptan, n-propyl mercaptan, and dimethyl disulfide in gaseous sample matrices using gas chromatographic separation and a mass spectrometric and electrolytic conductivity detector (ELCD), where the ELCD measures hydrogen sulfide only. A non-polar methyl silicon capillary gas chromatographic column is used for component separation and selected ion monitoring is used for component quantification. Component quantification is obtained using a multi-component external standard prepared by Scott Specialty Gases. The lower detection limit varies by component but is at least 0.1 ppmv ethyl mercaptan (component of lowest sensitivity) for a 0.31 ml sample volume injection. The upper quantitation limit has not been determined but is at least beyond 80 ppmv dimethyl disulfide, for which response remained linear from 0.1 ppmv to 80 ppmv.

Hydrogen sulfide is measured using an electrolytic conductivity detector operated in the oxidative sulfur mode. A Chromosil 310 column, operated isothermally at 45°C. is used to separate H_2S from other sulfur components. A fixed volume loop injection is used in the analysis for H_2S.

Lower Detection Limits (LDL's):

Using a 1 ml injection volume for H_2S by electrolytic conductivity detector and 0.40 ml injection volume for GC/MS measured sulfur compounds, the following LDL's are obtained:

	(ppmv)
Hydrogen sulfide	0.5
Carbonyl sulfide	0.03
Methyl mercaptan	0.03
Ethyl mercaptan	0.04
Dimethyl sulfide	0.02
Carbon disulfide	0.02
i-propyl mercaptan	0.03
n-propyl mercaptan	0.03
Dimethyl disulfide	0.02

Equipment:

A Hewlett-Packard 5890 series II gas chromatograph (GC), Hewlett-Packard 5971A Mass Selective Detector, 486 MS/DOS computer and HP operating software are used for all sulfur species except H_2S. The GC is fitted with a heated 6-port Valco 1/16" line, sample injection valve. All gas transfer lines to the sample loop are fused silica lined Restek tubing. The fixed volume (0.40 ml) sample loop is Teflon. The transfer line from the valve to the column is cleaned and treated blank 0.53 mm OD fused silica line with polyimide coating.

H_2S is measured using a Varian 1400 GC with the Hall oxidative quartz tube furnace and electrolytic cell attached. Nitrogen is used as carrier and oxygen is used as the combustion gas.

Multi-component gaseous standards are prepared by Scott Specialty Gas and are contained in two separate aluminum cylinders and a Scotty IV canister as follows:

Cylinder A (CAL12250)		Cylinder B (CAL3563)	
Carbonyl sulfide	15.2 ppmv	Hydrogen sulfide	12.3 ppm
Ethyl mercaptan	13.4 ppmv	Methyl mercaptan	22.6 ppm
Carbon disulfide	16.1 ppmv	Dimethyl sulfide	20.3 ppmv
		Dimethyl disulfide	

Scotty IV (mix 252)

Hydrogen Sulfide 93.8 ppmv

Gas tight clean glass volumetric syringes of 10, 20, & 50 ml capacity, with smooth glass barrel (not sintered glass) are used to make volumetric dilutions of sample or standard.

GC/MS SIM parameters:

	Dwell per ion	start time	Ions
Group 1:	75 msec.	8.0 min.	60
Group 2:	75 msec.	10.0 min.	47,48,64
Group 3:	75 msec.	14.5 min.	47,62,76,78,43,61
Group 4:	75 msec.	19.5 min.	79,94,122,142,15[illegible], 128

Components monitored:

Group 1: carbonyl sulfide
Group 2: methyl mercaptan
Group 3: ethyl mercaptan, dimethyl disulfide, carbon disulfide, isopropyl mercaptan, n-propyl mercaptan
Group 4: dimethyl sulfide

Component	Quantitation ion	Confirmation ion
carbonyl sulfide	60	none
methyl mercaptan	47	48
ethyl mercaptan	62	47
dimethyl sulfide	62	47
carbon disulfide	76	78
iso-propyl mercaptan	76	43,47,61
n-propyl mercaptan	76	43,47,61
dimethyl disulfide	94	79

Sulfur dioxide is analyzed by monitoring mass 64 which is included in Group 2 ions.

Calibration:

Gaseous standards can be analyzed prior to or after a set of samples. Response factors are determined from a single point standard calibration. Multi-point calibrations are performed to verify linearity. Consistency of standard response with continuing calibrations is observed to indicate performance of multi-point calibration.

Samples containing components at less than the stated LDL can be analyzed by cryogenically focusing a measured volume of gaseous sample onto a glass bead filled Teflon loop immersed in liquid argon. The sample is thermally transferred upon injection by immersing the sample loop in near boiling temperature water. The LDL obtained by this technique is calculated as:

$$LDL_{cryo} = (\text{cryo volume}/0.40) * LDL_{0.40}$$

Acceptable volumes for cryogenic concentration range from 3 to 100 ml. and are determined based on amounts of other components in the sample such as water, carbon dioxide or hydrocarbons.

Procedure:

A volumetric sample of landfill or source collected gas is transferred from a Tedlar® bag to the 6-port valve injection line using a glass syringe of approximately 10 ml. A Teflon loop of 0.40 ml volume is used to inject the sample. When sample concentrations exceed that of the standard, appropriate volumetric sample dilutions are made using the glass syringes with dry nitrogen diluent. Immediately after sample injection, the GC/MS is started. Standards are analyzed in the same manner as samples. Appropriate component peaks are monitored and integrated after sample analysis data set has been obtained.

Hydrogen sulfide is measured using the electrolytic conductivity detector by a separate direct fixed loop valve injection using heated Teflon loop, transfer lines, and Teflon Chromosil 310 GC column.

A response factor for a standard component is calculated as:

rf = std. amt. / std. area

Sample concentration is calculated using the response factor:

conc. = rf x sample area

At least 10% of samples in a sample set, or minimum of one sampl per set are analyzed twice to determine precision. A separat report showing repeat analyses results is included with a analytical report of sulfur component concentrations per e sample set. Repeat analyses must agree within +/- 10% except fo component concentrations less than 1 ppmv. A nitrogen blank analyzed between standards and samples to verify that there is component carry-over. Samples are analyzed as soon after they ar ived as possible, preferably same day and within four hours o ection. Data is being gathered to determine stability sulfur compounds in Tedlar® bag containers in an effort to exten sample holding time. Samples are usually analyzed before standard to prevent carry-over, since most sulfur components measured landfill gas samples are lower in concentration than those in t standards.

GC/MS Analysis Conditions:

GC conditions: a 30 M x 0.2 mm, 0.50 um film methyl silicon PONA column from Hewlett-Packard is temperature programmed as fol ow :

-65 degrees C, hold min.
15 degrees C min. to 220 degrees C, hold 5 min.

Valve oven Temp. 150 degrees C
GC/MS transfer line 180 degrees C
Carrier gas is helium, pressure regulated at 21 psi.

MS Conditions:

MS calibration is performed periodically prior to performing analyses using PFTBA (perfluoro-tributylamine) as supplied by Hewlett-Packard and as controlled by HP software under the mid-range auto tine program.
Solvent delay = 8 min.

Hall Detector/GC Analysis Conditions:

6' x 1/8" Teflon, Chromosil 310 analytical column
45 degrees C, isothermal
Valve oven & transfer line Temp. 105 degrees C.
Carrier gas is nitrogen, flow rate 18 cc/min.
Oxygen oxidation gas, flow rate 18 cc/min.
Quartz tube oxidation oven Temp. 650 degrees C.

APPENDIX B - Computer Printout of Results

Table 5-2
Trace Organic Species
Destruction Efficiency Results
Simi Valley Landfill
Flare #2 (John Zink)
September 17, 2003

Run 1		INLET Flow rate	1577 dscfm		OUTLET Flow rate	18284 dscfm	
Species	Conc. (ppm)	Conc. (mg/dscf)	Em. Rate (lb/hr)	Conc. (ppm)	Conc. (mg/dscf)	Em. Rate (lb/hr)	Dest. Eff. (%)
TNMHC	6680	1.26E+02	2.63E+01	3.44	6.48E-02	1.57E-01	99.40

Run 2		INLET Flow rate	1569 dscfm		OUTLET Flow rate	17992 dscfm	
Species	Conc. (ppm)	Conc. (mg/dscf)	Em. Rate (lb/hr)	Conc. (ppm)	Conc. (mg/dscf)	Em. Rate (lb/hr)	Dest. Eff. (%)
TNMHC	4020	7.58E+01	1.57E+01	1.22	2.30E-02	5.47E-02	99.65

Run 3		INLET Flow rate	1544 dscfm		OUTLET Flow rate	18644 dscfm	
Species	Conc. (ppm)	Conc. (mg/dscf)	Em. Rate (lb/hr)	Conc. (ppm)	Conc. (mg/dscf)	Em. Rate (lb/hr)	Dest. Eff. (%)
TNMHC	8070	1.52E+02	3.11E+01	4.96	9.35E-02	2.31E-01	99.26

SCAQMD Method 307.91

Facility: Simi Valley Landfill
Source: Flare #2 (John Zink)
Job No.: W07-036
Date: 03/17/03

Sulfur Compounds

Speciated Compound	Concentration ppm, as H2S	No. of S molecules in Compound	Total S ppm, as H2S	SO2 Conc. mg/dscf	* Avg. Inlet Flow Rate dscfm	SO2 Rate lb/hr
Hydrogen Sulfide	34.9	1	34.90	2.67	1564	0.553
Carbonyl Sulfide	0.22	1	0.22	0.02	1564	0.003
Methyl mercaptan	3.42	1	3.42	0.26	1564	0.054
Ethyl mercaptan	0.09	1	0.09	0.01	1564	0.001
Dimethyl sulfide	9.37	1	9.37	0.72	1564	0.148
Carbon disulfide	0.10	2	0.20	0.02	1564	0.003
Dimethyl disulfide	0.16	2	0.32	0.02	1564	0.005
iso-propyl mercaptan	0.42	1	0.42	0.03	1564	0.007
n-propyl mercaptan	0.06	1	0.06	0.00	1564	0.001
Total			49.00			0.776

* Based on the average flow rate of all three runs

Facility: Simi Valley Landfill
Source: Flare #2 (John Zink)
Job No.: W07-036
Date: 03/17/03

Run Number	******		1		2		3
Load	******		as Found		as Found		as Found
EPA F-Factor	dscf/MMBtu		9518		9518		9518
Stack Flow Rate	dscfm		18284		17992		18644
Oxygen	%		12.38		12.36		12.48
Carbon Dioxide	%		8.09		8.04		7.79
Oxides of Nitrogen							
Concentration	ppm		12.21		12.29		11.56
Concentration @ 3 % O2	ppm		25.66		25.78		24.59
Concentration	lb/dscf		1.46E-06		1.47E-06		1.38E-06
Emission Rate	lb/MMBtu		0.0341		0.0342		0.0327
Emission Rate	lb/hr		1.600		1.586		1.546
Carbon Monoxide							
Concentration	ppm	<	5.00	<	5.00	<	5.00
Concentration @ 3 % O2	ppm	<	10.51	<	10.48	<	10.63
Concentration	lb/dscf	<	3.64E-07	<	3.64E-07	<	3.64E-07
Emission Rate	lb/MMBtu	<	0.0085	<	0.0085	<	0.0086
Emission Rate	lb/hr	<	0.399	<	0.393	<	0.407

Facility: Simi Valley Landfill
Source: Flare #2 (John Zink)
Job No.: W07-036
Date: 03/17/03

STANDARD TEMPERATURE	Degrees F	68		
RUN NUMBER	******	1	2	3
CLOCK TIME: INITIAL	******	847	1045	1230
CLOCK TIME: FINAL	******	1012	1158	1345
AVG. STACK TEMPERATURE	Degrees F	1549	1579	1624
AVG. SQUARE DELTA P	Inches H20	0.1329	0.1307	0.1366
BAROMETRIC PRESSURE	Inches HG	28.85	28.85	28.85
SAMPLING TIME	Minutes	60	60	60
SAMPLE VOLUME	Cubic Feet	45.719	46.134	46.282
AVG. METER TEMP.	Degrees F	72	84	92
AVG. DELTA H	Inches H20	1.70	1.70	1.70
DGM CALIB. FACTOR [Y]	******	0.9851	0.9851	0.9851
WATER COLLECTED	Milliliters	97	86	83
CO 2	Percent	8.09	8.04	7.79
O 2	Percent	12.38	12.36	12.36
CO	Percent			
CH4	Percent			
N 2	Percent	79.53	79.60	79.84
STACK AREA	Square Inches	12868.0	12868.0	12868.0
STATIC PRESSURE	Inches WG.	-0.030	-0.020	-0.030
PITOT COEFFICIENT	******	0.84	0.84	0.84
SAMPLE VOLUME DRY	DSCF	43.26	42.69	42.27
WATER AT STD.	SCF	4.6	4.1	3.9
MOISTURE	Percent	9.6	8.7	8.5
MOLE FRACTION DRY GAS	******	0.90	0.91	0.92
MOLECULAR WT.DRY	lb/lb Mole	29.79	29.78	29.74
EXCESS AIR	Percent	144	143	142
MOLECULAR WT. WET	lb/lb Mole	28.66	28.76	28.75
STACK GAS PRESSURE	Inches HG	28.85	28.85	28.85
STACK VELOCITY	AFPM	893	883	933
VOLUMETRIC FLOWRATE, DRY ST	DSCFM	18284	17992	18644
VOLUMETRIC FLOWRATE, ACTUAl	ACFM	79761	78893	83386

EXPANSION AND F-FACTOR CALC. METHOD

Client:	Simi Valley Landfill	Date:	03/17/03
Location:	Simi Valley, CA	Job #:	W07-036
Unit:	Flare #2 (John Zink)	Run#:	1

Fuel temperature		deg. F	Std. Temp.	**68**	deg. F
Fuel Pressure		psi			
Fuel Flow Rate		cfm	Fuel Flow	**1577**	dscfm
Exhaust Outlet O2	**12.38**	%			
Barometric Pressure	**28.85**				

COMPONENTS		MOLE %	HHV btu/ft3	LLV btu/ft3	Exp Factor dscf/scf fuel
Oxygen		**0.93**			0.009
Nitrogen		**10.97**			0.110
Carbon Dioxide		**39.36**			0.394
Methane		**48.00**	484.84	436.55	4.114
Ethane	C2	**0.738**	13.06	11.95	0.113
Propane	C3		0.00	0.00	0.000
Iso-Butane	C4		0.00	0.00	0.000
N-Butane			0.00	0.00	0.000
Iso-Pentane	C5		0.00	0.00	0.000
N-Pentane			0.00	0.00	0.000
Hexane	C6		0.00	0.00	0.000
Heptane	C7		0.00	0.00	0.000
Octane	C8		0.00	0.00	0.000
Nonane	C9		0.00	0.00	
Total		**100.00**	**497.90**	**448.49**	**4.74**

CALCULATIONS

EXHAUST FLOW RATE, Q = (scfm*Exp Fac)*(20.92(20.92-%O2)

18318 DSCFM

EPA F-Factor = (scf exhaust/scf fuel)/(btu/scf fuel)*(1000000 btu/MMbtu)

9518 dscf/Mmbtu

EXPANSION AND F-FACTOR CALC. METHOD

Client:	Simi Valley Landfill	Date:	03/17/03
Location:	Simi Valley, CA	Job #:	W07-036
Unit:	Flare #2 (John Zink)	Run#:	2

Fuel temperature		deg. F	Std. Temp.		deg. F
Fuel Pressure		psi			
Fuel Flow Rate		cfm	Fuel Flow	**1569**	dscfm
Exhaust Outlet O2	**12.36**	%			
Barometric Pressure	**28.85**				

COMPONENTS		MOLE %	HHV btu/ft3	LLV btu/ft3	Exp Factor dscf/scf fuel
Oxygen		**0.93**			0.009
Nitrogen		**10.97**			0.110
Carbon Dioxide		**39.36**			0.394
Methane		**48.00**	484.84	436.55	4.114
Ethane	C2	**0.738**	13.06	11.95	0.113
Propane	C3		0.00	0.00	0.000
Iso-Butane	C4		0.00	0.00	0.000
N-Butane			0.00	0.00	0.000
Iso-Pentane	C5		0.00	0.00	0.000
N-Pentane			0.00	0.00	0.000
Hexane	C6		0.00	0.00	0.000
Heptane	C7		0.00	0.00	0.000
Octane	C8		0.00	0.00	0.000
Nonane	C9		0.00	0.00	
Total		**100.00**	**497.90**	**448.49**	**4.74**

CALCULATIONS

EXHAUST FLOW RATE, Q = (scfm*Exp Fac)*(20.92(20.92-%O2)

18180 DSCFM

EPA F-Factor = (scf exhaust/scf fuel)/(btu/scf fuel)*(1000000 btu/MMbtu)

9518 dscf/Mmbtu

EXPANSION AND F-FACTOR CALC. METHOD

Client:	Simi Valley Landfill	Date:	03/17/03
Location:	Simi Valley, CA	Job #:	W07-036
Unit:	Flare #2 (John Zink)	Run#:	3

Fuel temperature		deg. F	Std. Temp.		deg. F
Fuel Pressure		psi			
Fuel Flow Rate		cfm	Fuel Flow	**1544**	dscfm
Exhaust Outlet O2	**12.48**	%			
Barometric Pressure	**28.85**				

COMPONENTS		MOLE %	HHV btu/ft3	LLV btu/ft3	Exp Factor dscf/scf fuel
Oxygen		**0.92**			0.009
Nitrogen		**10.85**			0.109
Carbon Dioxide		**38.95**			0.390
Methane		**47.50**	479.75	431.97	4.071
Ethane	C2	**0.73**	12.92	11.82	0.111
Propane	C3		0.00	0.00	0.000
Iso-Butane	C4		0.00	0.00	0.000
N-Butane			0.00	0.00	0.000
Iso-Pentane	C5		0.00	0.00	0.000
N-Pentane			0.00	0.00	0.000
Hexane	C6		0.00	0.00	0.000
Heptane	C7		0.00	0.00	0.000
Octane	C8		0.00	0.00	0.000
Nonane	C9		0.00	0.00	
Total		**98.95**	**492.67**	**443.78**	**4.69**

CALCULATIONS

EXHAUST FLOW RATE, Q = (scfm*Exp Fac)*(20.92(20.92-%O2)

17953 DSCFM

EPA F-Factor = (scf exhaust/scf fuel)/(btu/scf fuel)*(1000000 btu/MMbtu)

9518 dscf/Mmbtu

SCAQMD Method 100.1 Bias Adjustment

Facility: **Simi Valley Landfill**
Source: **Flare #2 (John Zink)**
Job No.: **W07-036**
Date: **03/17/03**

Run No. 1

Parameter	Measured Conc. (ppm,%)	Reference Span gas (ppm.%)	Initial Bias Zero (ppm.%)	Final Bias Zero (ppm.%)	Average Bias Zero (ppm.%)	Initial Bias Span (ppm.%)	Final Bias Span (ppm.%)	Average Bias Span (ppm.%)	Bias Adjusted Conc. (ppm.%)
NOx	11.83	10.10	0.00	0.03	0.01	9.70	9.88	9.79	12.21
O2	12.32	12.01	0.05	0.00	0.03	12.13	11.78	11.95	12.38
CO	2.07	200.00	0.00	0.50	0.25	201.00	200.00	200.50	1.82
CO2	7.97	7.00	0.04	0.00	0.02	6.80	7.00	6.90	8.09

Run No. 2

Parameter	Measured Conc. (ppm,%)	Reference Span gas (ppm.%)	Initial Bias Zero (ppm.%)	Final Bias Zero (ppm.%)	Average Bias Zero (ppm.%)	Initial Bias Span (ppm.%)	Final Bias Span (ppm.%)	Average Bias Span (ppm.%)	Bias Adjusted Conc. (ppm.%)
NOx	12.22	10.10	0.03	0.23	0.13	9.88	10.25	10.06	12.29
O2	12.17	12.01	0.00	0.20	0.10	11.78	11.88	11.83	12.36
CO	1.46	200.00	0.50	0.00	0.25	200.00	195.00	197.50	1.23
CO2	8.04	7.00	0.00	0.02	0.01	7.00	7.00	7.00	8.04

Run No. 3

Parameter	Measured Conc. (ppm,%)	Reference Span gas (ppm.%)	Initial Bias Zero (ppm.%)	Final Bias Zero (ppm.%)	Average Bias Zero (ppm.%)	Initial Bias Span (ppm.%)	Final Bias Span (ppm.%)	Average Bias Span (ppm.%)	Bias Adjusted Conc. (ppm.%)
NOx	11.68	10.10	0.23	0.35	0.29	10.25	10.23	10.24	11.56
O2	12.36	12.01	0.20	0.20	0.20	11.88	11.93	11.90	12.48
CO	0.84	200.00	0.00	0.00	0.00	195.00	193.50	194.25	0.86
CO2	7.79	7.00	0.02	0.02	0.02	7.00	7.00	7.00	7.79

Client:	Waste Management	Date:	09/17/03
Job No.:	W07-036	Run #:	1
Site:	Simi Valley Landfill	Fuel:	L.F.G.
Unit:	Flare #2 (John Zink)	Std. O2:	3

	O2 %	CO2 %	NOx ppm	CO ppm
Range:	25.00	20.00	25.00	500.00
Span:	12.01	7.00	10.10	200.00
Low:				
High:	20.90	12.01	21.00	398.00

** POST-TEST DRIFT **

Values				
Zero:	0.00	0.00	0.00	1.00
Span:	12.00	7.00	10.10	200.00
Percent Drift				
Zero:	0.00	0.00	0.00	0.20
Span:	-0.04	0.00	0.00	0.00

** RAW AVERAGE CONCENTRATION **

Average:		**12.32**	**7.97**	**11.83**	**2.07**
O2 adjust:	3.0			24.68	4.31
Date	Time	O2	CO2	NOx	CO
17-Sep-03	847	12.70	7.65	11.13	1.67
17-Sep-03	848	12.62	7.74	11.26	2.07
17-Sep-03	849	12.45	7.88	11.66	2.13
17-Sep-03	850	12.60	7.75	11.31	2.63
17-Sep-03	851	12.32	8.01	11.85	2.75
17-Sep-03	852	12.43	7.91	11.57	2.75
17-Sep-03	853	12.22	8.11	12.13	2.75
17-Sep-03	854	12.54	7.83	11.46	2.93
17-Sep-03	855	12.36	7.99	11.86	3.13
17-Sep-03	856	12.61	7.75	11.38	3.21
17-Sep-03	857	12.40	7.96	11.76	3.13
17-Sep-03	858	12.48	7.85	11.48	3.21
17-Sep-03	859	12.56	7.80	11.30	3.21
17-Sep-03	900	12.75	7.60	10.99	3.21
17-Sep-03	901	12.39	7.95	11.60	3.06
17-Sep-03	902	12.00	8.27	12.36	3.21
17-Sep-03	903	12.15	8.14	12.08	3.12
17-Sep-03	904	12.09	8.18	12.34	3.15
17-Sep-03	905	12.41	7.91	11.59	3.12
17-Sep-03	906	12.30	8.01	11.89	2.97
17-Sep-03	907	11.92	8.35	12.64	2.92
17-Sep-03	908	12.15	8.12	12.06	3.20
17-Sep-03	909	12.62	7.71	11.07	2.74

17-Sep-03	910	12.72	7.63	10.86	2.62
17-Sep-03	911	12.34	7.95	12.32	2.62
17-Sep-03	912	12.33	7.96	12.23	2.27
17-Sep-03	913	12.31	7.96	12.19	2.20
17-Sep-03	914	12.27	8.01	12.14	2.12
17-Sep-03	915	12.19	8.08	12.28	2.12
17-Sep-03	916	12.24	8.03	12.19	1.94
17-Sep-03	917	12.21	8.06	12.21	2.03
17-Sep-03	942	12.24	8.01	11.85	0.71
17-Sep-03	943	12.13	8.14	12.14	1.03
17-Sep-03	944	12.07	8.19	12.26	1.41
17-Sep-03	945	12.03	8.21	12.45	1.71
17-Sep-03	946	12.65	7.67	10.97	1.74
17-Sep-03	947	12.16	8.12	12.16	1.74
17-Sep-03	948	12.38	7.91	11.64	1.65
17-Sep-03	949	12.31	7.97	11.65	1.65
17-Sep-03	950	12.22	8.04	11.79	1.65
17-Sep-03	951	12.29	7.98	11.67	1.65
17-Sep-03	952	12.21	8.05	11.98	1.65
17-Sep-03	953	12.06	8.19	12.24	1.65
17-Sep-03	954	12.15	8.10	12.19	1.65
17-Sep-03	955	12.39	7.89	11.60	1.65
17-Sep-03	956	12.19	8.09	12.13	1.65
17-Sep-03	957	12.24	8.04	11.98	1.65
17-Sep-03	958	12.32	7.99	11.74	1.37
17-Sep-03	959	12.55	7.79	11.40	1.56
17-Sep-03	1000	12.19	8.12	12.07	1.40
17-Sep-03	1001	12.38	7.93	11.70	1.25
17-Sep-03	1002	12.06	8.19	12.26	1.43
17-Sep-03	1003	12.16	8.09	12.07	1.46
17-Sep-03	1004	12.24	8.03	11.95	1.31
17-Sep-03	1005	12.20	8.06	12.10	1.46
17-Sep-03	1006	12.48	7.79	11.43	1.25
17-Sep-03	1007	12.28	8.00	11.85	1.16
17-Sep-03	1008	12.64	7.63	11.09	1.07
17-Sep-03	1009	12.50	7.79	11.48	1.15
17-Sep-03	1010	12.03	8.20	12.48	1.07
17-Sep-03	1011	12.07	8.17	12.26	1.07
17-Sep-03	1012	12.37	7.91	11.53	1.15

Client:	Waste Management	Date:	09/17/03
Job No.:	W07-036	Run #:	2
Site:	Simi Valley Landfill	Fuel:	L.F.G.
Unit:	Flare #2 (John Zink)	Std. O2:	3

	O2 %	CO2 %	NOx ppm	CO ppm
Range:	25.00	20.00	25.00	500.00
Span:	12.01	7.00	10.10	200.00
Low:				
High:	20.90	12.01	21.00	398.00

** POST-TEST DRIFT **

Values				
Zero:	0.00	0.00	0.05	0.00
Span:	11.95	7.00	10.20	195.00
Percent Drift				
Zero:	0.00	0.00	0.20	0.00
Span:	-0.24	0.00	0.40	-1.00

** RAW AVERAGE CONCENTRATION **

Average:		**12.17**	**8.04**	**12.22**	**1.46**
O2 adjust:	3.0			25.05	3.00
Date	Time	O2	CO2	NOx	CO
17-Sep-03	1045	12.39	7.76	11.36	0.68
17-Sep-03	1046	12.47	7.76	11.21	0.68
17-Sep-03	1047	12.65	7.61	10.67	1.06
17-Sep-03	1048	12.58	7.69	10.92	1.39
17-Sep-03	1049	12.53	7.75	10.88	1.63
17-Sep-03	1050	12.34	7.93	11.39	1.72
17-Sep-03	1051	12.14	8.09	12.07	2.04
17-Sep-03	1052	12.02	8.21	12.39	2.48
17-Sep-03	1053	11.94	8.28	12.76	2.71
17-Sep-03	1054	11.80	8.40	13.13	2.52
17-Sep-03	1055	11.70	8.52	13.34	2.41
17-Sep-03	1056	11.78	8.42	12.80	2.60
17-Sep-03	1057	11.89	8.33	12.74	2.71
17-Sep-03	1058	11.62	8.56	13.54	2.71
17-Sep-03	1059	11.91	8.30	12.87	2.71
17-Sep-03	1100	12.25	8.01	12.00	2.52
17-Sep-03	1101	12.34	7.94	11.94	2.09
17-Sep-03	1102	12.23	8.03	12.07	2.26
17-Sep-03	1103	12.34	7.95	11.86	1.63
17-Sep-03	1104	12.45	7.84	11.82	1.63
17-Sep-03	1105	12.30	7.99	12.13	1.63
17-Sep-03	1106	12.04	8.21	12.77	1.45
17-Sep-03	1107	11.85	8.37	13.26	1.57

17-Sep-03	1108	11.83	8.40	13.28	1.39
17-Sep-03	1109	11.98	8.27	12.92	1.23
17-Sep-03	1110	12.05	8.20	12.76	1.20
17-Sep-03	1111	12.23	8.04	11.99	1.14
17-Sep-03	1112	12.25	8.02	11.74	1.14
17-Sep-03	1113	12.12	8.14	12.07	1.14
17-Sep-03	1114	11.99	8.23	12.66	1.14
17-Sep-03	1115	11.91	8.30	13.12	1.14
17-Sep-03	1128	11.76	8.30	13.20	0.60
17-Sep-03	1129	11.90	8.19	12.90	0.67
17-Sep-03	1130	12.05	8.08	12.65	0.78
17-Sep-03	1131	12.08	8.06	12.58	1.25
17-Sep-03	1132	12.09	8.06	12.42	1.61
17-Sep-03	1133	11.86	8.26	12.93	1.61
17-Sep-03	1134	11.86	8.26	12.93	1.61
17-Sep-03	1135	12.13	8.01	12.28	1.61
17-Sep-03	1136	12.01	8.14	12.49	1.61
17-Sep-03	1137	12.09	8.05	12.37	1.61
17-Sep-03	1138	12.16	8.00	12.20	1.61
17-Sep-03	1139	11.93	8.23	12.65	1.61
17-Sep-03	1140	12.00	8.14	12.57	1.61
17-Sep-03	1141	12.26	7.92	12.01	1.61
17-Sep-03	1142	12.19	7.98	12.11	1.45
17-Sep-03	1143	11.99	8.17	12.72	1.51
17-Sep-03	1144	12.26	7.92	12.06	1.39
17-Sep-03	1145	12.61	7.61	11.39	1.21
17-Sep-03	1146	12.52	7.71	11.33	1.11
17-Sep-03	1147	12.28	7.93	12.04	1.11
17-Sep-03	1148	12.22	7.98	12.08	1.11
17-Sep-03	1149	12.54	7.68	11.49	1.11
17-Sep-03	1150	12.56	7.67	11.43	1.02
17-Sep-03	1151	12.75	7.48	11.08	0.97
17-Sep-03	1152	12.88	7.35	10.84	0.82
17-Sep-03	1153	12.26	7.93	12.27	0.82
17-Sep-03	1154	12.27	7.90	12.12	0.82
17-Sep-03	1155	12.26	7.91	12.05	0.64
17-Sep-03	1156	12.38	7.79	11.72	0.64
17-Sep-03	1157	12.00	8.13	12.43	0.64
17-Sep-03	1158	12.25	7.89	12.00	0.64

Client:	Waste Management	Date:	09/17/03
Job No.:	W07-036	Run #:	3
Site:	Simi Valley Landfill	Fuel:	L.F.G.
Unit:	Flare #2 (John Zink)	Std. O2:	3

	O2 %	CO2 %	NOx ppm	CO ppm
Range:	25.00	20.00	25.00	500.00
Span:	12.01	7.00	10.10	200.00
Low:				
High:	20.90	12.01	21.00	398.00

** POST-TEST DRIFT **

Values				
Zero:	0.13	0.00	0.25	0.00
Span:	11.95	7.00	10.20	196.00
Percent Drift				
Zero:	0.50	0.00	1.00	0.00
Span:	-0.24	0.00	0.40	-0.80

** RAW AVERAGE CONCENTRATION **

Average:		**12.36**	**7.79**	**11.68**	**0.84**
O2 adjust:	3.0			24.48	1.76
Date	Time	O2	CO2	NOx	CO
17-Sep-03	1230	12.12	7.92	11.39	0.39
17-Sep-03	1231	12.28	7.79	10.93	0.63
17-Sep-03	1232	12.23	7.85	10.99	0.63
17-Sep-03	1233	11.96	8.08	11.63	0.83
17-Sep-03	1234	12.10	7.95	11.20	1.09
17-Sep-03	1235	12.15	7.90	11.05	1.30
17-Sep-03	1236	12.34	7.74	10.68	1.37
17-Sep-03	1237	12.43	7.69	10.59	1.37
17-Sep-03	1238	12.24	7.98	12.30	1.24
17-Sep-03	1239	12.31	7.91	12.13	1.21
17-Sep-03	1240	12.28	7.94	11.86	1.18
17-Sep-03	1241	12.23	7.98	12.24	1.09
17-Sep-03	1242	12.11	8.09	12.41	1.15
17-Sep-03	1243	12.09	8.10	12.58	1.09
17-Sep-03	1244	12.54	7.70	11.51	1.24
17-Sep-03	1245	12.40	7.82	11.70	1.15
17-Sep-03	1246	12.30	7.91	12.00	1.15
17-Sep-03	1247	12.48	7.74	11.52	1.12
17-Sep-03	1248	12.38	7.82	11.69	1.09
17-Sep-03	1249	12.22	7.97	12.29	1.09
17-Sep-03	1250	12.41	7.78	11.87	1.15
17-Sep-03	1251	12.06	8.09	12.72	1.09
17-Sep-03	1252	12.30	7.87	12.13	1.09

17-Sep-03	1253	12.23	7.95	12.24	1.08
17-Sep-03	1254	12.22	7.93	12.17	1.08
17-Sep-03	1255	12.26	7.90	11.98	1.08
17-Sep-03	1256	12.32	7.84	11.89	1.08
17-Sep-03	1257	12.15	7.98	12.35	1.08
17-Sep-03	1258	12.15	7.99	12.42	1.08
17-Sep-03	1259	11.92	8.19	12.86	1.08
17-Sep-03	1300	12.22	7.91	12.12	1.08
17-Sep-03	1315	12.13	7.94	12.40	0.05
17-Sep-03	1316	12.20	7.90	12.32	0.05
17-Sep-03	1317	12.66	7.47	11.25	0.12
17-Sep-03	1318	12.69	7.46	11.04	0.61
17-Sep-03	1319	12.72	7.43	10.88	0.61
17-Sep-03	1320	12.41	7.74	11.53	0.61
17-Sep-03	1321	12.54	7.60	11.33	0.61
17-Sep-03	1322	12.38	7.75	11.57	0.61
17-Sep-03	1323	12.63	7.51	11.06	0.60
17-Sep-03	1324	12.17	7.94	12.19	0.60
17-Sep-03	1325	12.81	7.35	10.81	0.60
17-Sep-03	1326	12.28	7.87	11.81	0.50
17-Sep-03	1327	12.28	7.86	11.88	0.39
17-Sep-03	1328	12.46	7.68	11.50	0.60
17-Sep-03	1329	12.45	7.71	11.54	0.60
17-Sep-03	1330	12.45	7.70	11.56	0.60
17-Sep-03	1331	12.14	8.00	12.46	0.60
17-Sep-03	1332	12.57	7.60	11.30	0.60
17-Sep-03	1333	12.65	7.53	11.01	0.60
17-Sep-03	1334	12.66	7.52	10.92	0.60
17-Sep-03	1335	12.44	7.73	11.39	0.60
17-Sep-03	1336	12.16	7.98	12.41	0.60
17-Sep-03	1337	12.84	7.34	10.75	0.60
17-Sep-03	1338	12.64	7.55	11.15	0.60
17-Sep-03	1339	12.76	7.42	10.97	0.60
17-Sep-03	1340	12.06	8.08	12.60	1.42
17-Sep-03	1341	12.28	7.86	12.03	0.60
17-Sep-03	1342	12.61	7.55	11.17	0.60
17-Sep-03	1343	12.83	7.33	10.65	0.25
17-Sep-03	1344	12.41	7.73	11.73	0.60
17-Sep-03	1345	12.57	7.59	11.38	1.89

Method 100.1 Performance Data

Facility: Simi Valley Landfill
Source: Flare #2 (John Zink)
Job No.: W07-036
Test Date: 03/17/03

PRETEST					SYSTEM BIAS
LEAK CHECK	PASSED				PreTest
	** LINEARITY CHECK **				
RANGE :	25 O2	20 CO2	500 CO	25 NOx	
ZERO					NOx
Instrument	0.00	0.00	1.0	0.00	9.70
Cylinder	0.00	0.00	0.0	0.00	10.10
Difference (%)	0.00	0.00	0.2	0.00	-1.60
					pass
LOW LEVEL					O2
Instrument					12.13
Cylinder					12.08
Difference (%)					0.20
					pass
MID LEVEL					CO
Instrument	12.08	7.00	201.5	10.10	201.0
Cylinder	12.01	7.00	200.0	10.10	201.5
Difference (%)	0.26	0.00	0.3	0.00	-0.1
					pass
HIGH LEVEL					CO2
Instrument	20.58	12.26	403.0	20.75	6.80
Cylinder	20.90	12.01	398.0	21.00	7.00
Difference (%)	-1.30	1.25	1.0	-1.00	-1.00
					pass

POST TEST					Post test
LEAK CHECK	PASSED				
	O2	CO2	CO	NOx	
ZERO					NOx
Instrument	0.13	0.00	0.0	0.25	10.25
Cylinder	0.00	0.00	0.0	0.00	10.20
Difference (%)	0.52	0.00	0.0	1.00	0.20
					pass
LOW LEVEL					O2
Instrument					11.88
Cylinder					11.95
Difference (%)					-0.30
					pass
MID LEVEL					CO
Instrument	11.95	7.00	196.0	10.20	195.0
Cylinder	12.01	7.00	200.0	10.10	196.0
Difference (%)	-0.24	0.00	-0.8	0.40	-0.2
					pass
HIGH LEVEL					CO2
Instrument	20.58	12.36	400.0	21.08	7.00
Cylinder	20.90	12.01	398.0	21.00	7.00
Difference (%)	-1.30	1.75	0.4	0.30	0.00
					pass

System Response Time (seconds)			
	#1	#2	#3
Upscale			
NOx	58	55	55
CO	30	25	24
O2	29	26	26
CO2	28	25	24
Downscale			
NOx	57	53	52
CO	30	25	23
O2	27	24	29
CO2	25	23	21

NO2 to NO Converter Effeciency (%)			
	cylinder	instr.	effeciency
ppm	19.2	18.825	98.05

APPENDIX C - Laboratory Results

AtmAA Inc.
23917 Craftsman Rd., Calabasas, CA 91302 • (818) 223-3277 • FAX (818) 223-8250
environmental consultant
laboratory services

LABORATORY ANALYSIS REPORT

Total Gaseous Non-Methane Organics (TGNMO) Methane
Analysis in Tank Samples

Report Date: October 7, 2003
Client: Horizon
Site: Simi Valley Landfill
Project No.: W07-036
Date Received: September 18, 2003
Date Analyzed: September 19, 2003

ANALYSIS DESCRIPTION

Total gaseous non-methane organics (TGNMO) was measured by flame ionization detection/ total combustion analysis (FID/TCA) Method 25. % level methane was measured by thermal conductivity detection / gas chromatography (TCD/GC).

AtmAA Lab No.	Sample ID	Methane (ppmv)	TGNMO (ppmv)
02613-1	Tank 17	15.1	5.25
02613-2	Tank 18	<1	2.98
02613-3	Tank 39	<1	5.75
02613-4	Tank D	470000	6900
02613-5	Tank T	466000	6810
02613-6	Tank U	470000	7980
02613-8	Tank 22	<1	3.44
02613-9	Tank 26	<1	1.22
02613-10	Tank 38	<1	4.96
02613-11	Tank J	466000	6680
02613-12	Tank K	260000	4020
02613-13	Tank L	469000	8070

TGNMO is total gaseous non-methane (excluding ethane) organics reported as ppm methane. No ethane was found in any sample at a lower detection limit of <1 ppmv for outlets, and <20 ppmv for inlets.

Michael L. Porter
Laboratory Director

QUALITY ASSURANCE SUMMARY
(Repeat Analysis)

Project No.: W07-036
Date Received: September 18, 2003
Date Analyzed: September 19, 2003

Components	Sample ID	Repeat Analysis Run #1	Repeat Analysis Run #2	Mean Conc.	% Diff. From Mean
		(Concentration in ppmv)			
Methane	Tank 17	15.2	14.9	15.1	1.0
	Tank D	470000	469000	470000	0.11
	Tank 22	<1	<1	---	---
	Tank J	466000	465000	466000	0.11
TGNMO	Tank 17	5.21	5.29	5.25	0.76
	Tank D	6930	6880	6900	0.36
	Tank 22	3.58	3.29	3.44	4.2
	Tank J	6450	6920	6680	3.5
	Tank K	4110	3940	4020	2.1

A set of 12 Tank samples, laboratory numbers 02613-(1-13), was analyzed for total gaseous non-methane organics (TGNMO), and methane. Agreement between repeat analyses is a measure of precision and is shown in the column "% Difference from Mean." Repeat analyses are an important part of AtmAA's quality assurance program. The average% Difference from Mean for 8 repeat measurements from the set of 12 Tank samples is 1.5%.

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LABORATORY ANALYSIS REPORT

Hydrogen Sulfide and Reduced Sulfur Compounds
Analysis in Inlet Tedlar Bag Sample

Report Date: September 23, 2003
Client: Horizon
Project Location: WMNA / Simi Valley LF
Client Project No.: W07-036
Date Received: September 17, 2003
Date Analyzed: September 17, 2003

ANALYSIS DESCRIPTION

Hydrogen sulfide was analyzed by gas chromatography with a Hall electrolytic conductivity detector operated in the oxidative sulfur mode. All other components were measured by GC/ Mass Spec.

AtmAA Lab No.: 02603-3
Sample I.D.: W0736-TB-F2

Components	*(Concentration in ppmv)*
Hydrogen sulfide	34.9
Carbonyl sulfide	0.22
Methyl mercaptan	3.42
Ethyl mercaptan	<0.09
Dimethyl sulfide	9.37
Carbon disulfide	0.10
isopropyl mercaptan	0.42
n-propyl mercaptan	<0.06
Dimethyl disulfide	0.16
TRS	48.9

TRS - total reduced sulfur

Michael L. Porter
Laboratory Director

QUALITY ASSURANCE SUMMARY
(Repeat Analyses)

Client Project No.: W07-036
Date Received: September 17, 2003
Date Analyzed: September 17, 2003

Components	Sample ID	Repeat Analysis Run #1	Repeat Analysis Run #2	Mean Conc.	% Diff. From Mean
		(Concentration in ppmv)			
Hydrogen sulfide	W0736-TB-F2	35.9	33.9	34.9	2.9
Carbonyl sulfide	W0736-TB-F2	0.23	0.22	0.22	2.2
Methyl mercaptan	W0736-TB-F2	3.36	3.49	3.42	1.9
Ethyl mercaptan	W0736-TB-F2	<0.09	<0.09	---	---
Dimethyl sulfide	W0736-TB-F2	9.30	9.44	9.37	0.75
Carbon disulfide	W0736-TB-F2	0.11	0.10	0.10	4.8
iso-propyl mercaptan	W0736-TB-F2	0.42	0.43	0.42	1.2
n-propyl mercaptan	W0736-TB-F2	<0.06	<0.06	---	---
Dimethyl disulfide	W0736-TB-F2	0.18	0.15	0.16	9.1

One Tedlar bag sample, laboratory number 02603-3, was analyzed for hydrogen sulfide and reduced sulfur compounds. Agreement between repeat analyses is a measure of precision and is shown above in the column "% Difference from Mean". Repeat analyses are an important part of AtmAA's quality assurance program. The average % Difference from Mean for 7 repeat measurements from the one Tedlar bag sample is 3.3%.

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laboratory services

Calculated values for Specific Volume, BTU and F (factor)

Report Date: September 23, 2003
Client: Horizon
Project Location: WMNA / Simi Valley LF
Client Project No.: W07-036
Date Received: September 17, 2003
Date Analyzed: September 17 & 18, 2003
AtmAA Lab No.: 02603-3 / W0736-TB-F2

Specific volume, BTU, and F factor are calculated using labortatory analysis results for methane, carbon dioxide, nitrogen, oxygen, total gaseous non-methane organics (TGNMO), and sulfur compounds in equations that include assumed values for the specific volume of gases (CH_4, CO_2, N_2, O_2, Ar) and for TGNMO $(CH_2)_n$. The specific volume of gases were taken from the Air Products Speciality Gases catalogue, 1992, and represents as is gas at 70° F and 1 atm. The F factor is calculated according to the equation in ASTM D-3588.

Component	Mole %	Wt %	C,H,O,N,S, Wt.%	
Methane	47.50	26.96	Carbon	37.11
Carbon dioxide	38.95	60.80	Hydrogen	6.79
Nitrogen	10.85	10.78	Oxygen	45.26
Oxygen	0.92	1.04	Nitrogen	10.78
Argon	0.041	0.058	Argon	0.06
$(CH_2)_n$	0.73	0.36	Sulfur	0.00

Specific Volume	13.507
BTU/ft^3	485
BTU/ lb.	6546
F (factor)	9501

dry gas at 70° F, 1 atm, where CH4 - 1008 & TGNMO - 804 BTU/cu.ft.

Component	Specific volume reference values *	
Methane	24.1	(ft^3/lb)
Carbon dioxide	8.74	
Nitrogen	13.8	
Oxygen	12.1	
Argon	9.7	
$(CH_2)_n$	21	

* reference, Air Products Specialty Gases Catalogue, 1992

CHAIN OF CUSTODY RECORD

Client/Project Name	Project Location
Waste Mgt. / Simi Valley LF	Simi Valley CA
Project No.	**Field Logbook No.**
W07-036	
Sampler: (*Signature*)	**Chain of Custody Tape No.**

Sample No./ Identification	Date	Time	Lab Sample Number	Type of Sample	SCAQMD 307.91 (C1-C3 Silica Gel x H2S)	ASTM D1826-77 (LHV)					REMARKS
W0736-TB-F2	9/17/03		02603-3	5L Tedlar Bag	X	X					Flare #2 Inlet

ANALYSES

Relinquished by: (*Signature*)	Date	Time	Received by: (*Signature*)	Date	Time
	9/17/03	14:40		9/17/03	14:40
Relinquished by: (*Signature*)	Date	Time	Received by: (*Signature*)	Date	Time
Relinquished by: (*Signature*)	Date	Time	Received for Laboratory: (*Signature*)	Date	Time
Sample Disposal Method:	Disposed of by: (*Signature*)			Date	Time

SAMPLE COLLECTOR

HORIZON AIR MEASUREMENT SERVICES, INC
996 Lawrence Drive, Suite 108
Newbury Park, CA 91320
(805) 498-8781 Fax (805) 498-3173

ANALYTICAL LABORATORY

Atm AA
Calabasas, CA

№ 7879

APPENDIX D - Field Data Sheets

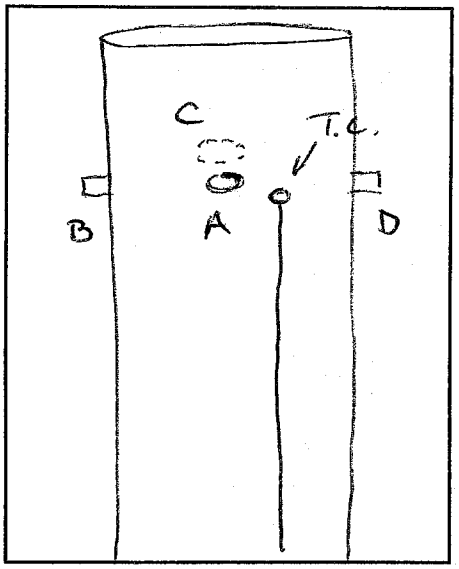
VELOCITY DATA SHEET - METHOD 2

Facility:	Simi Valley LF	**Baro. Press:**	28.85 ~~.63~~	**D_1 upstream:**	0.46
Source:	Flare #2	**Static Press:**	-.03	**D_1 downstream:**	4.1
Job #:	W07-036	**Pitot Tube #:**	INC # 10	**Stack Diameter:**	128"
Date:	9/17/03	**Pitot Tube Type:**	"S"	**Leak Check**	
Operator:	CH	**Magnahelic:**	~~#2~~	**Initial:**	**Final:**
Run #:	1			✓ ✓	✓ ✓

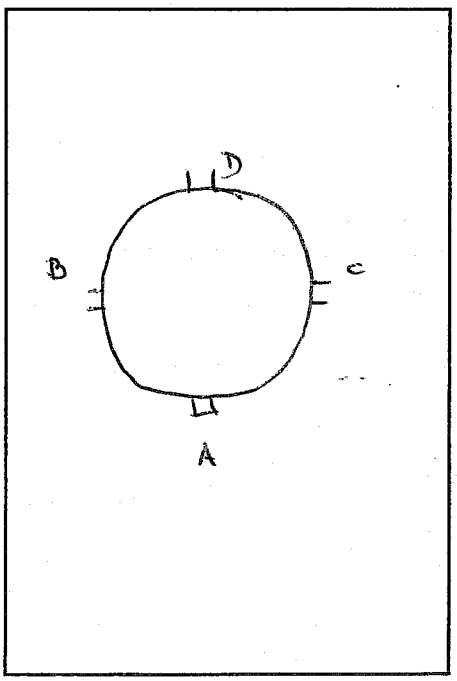
Point #	Position in.	Velocity Head in. H_2O	Stack Temp °F	Cyclonic Flow Angle
A 12	125.3	.03	1630	
11	119.4	.02	1627	
10	112.8	.005	1622	
9	105.3	.005	1622	
8	96.0	.02	1620	
7	82.4	.03	1608	
6	45.5	.03	1599	
5	32.0	.02	1597	
4	22.6	.005	1596	
3	15.1	.02	1589	
2	8.5	.02	1589	
1	2.6	~~.02~~ .02	1591	
B 12		.03	1481	
11		.02	1478	
10		.02	1483	
9		.005	1485	
8		.005	1491	
7		.03	1501	
6		.03	1501	
5		.02	1505	
4		.02	1499	
3		.02	1489	
2		.02	1482	
1		.01	1478	
Average		$\sqrt{\Delta P}$= 0.1329	T_s= 1548.5	∠=

SB SB

Side View



Top View



PARTICULATE FIELD DATA

PLANT Simi Valley L.F.
DATE 09/17/03
LOCATION Simi Valley CA
OPERATOR TW / SB
SOURCE Flare #2 OUTLET
RUN NO. 1
SAMPLE BOX NO. ~~07~~ TW 010

TIME START 0547

METER BOX NO. 5
METER ΔH @ 1.6866
Y= 0.9851
PROBE I.D. NO. SS 6'
NOZZLE DIAMETER, in. NA
STACK DIAMETER, in. 1256"
PROBE HEATER SETTING NA
HEATER BOX SETTING NA
Δ Cp FACTOR NA
FILTER NO. NA

ASSUMED MOISTURE, % NA
AMBIENT TEMPERATURE 65°F
BARO. PRESS. 28.55
STATIC PRESS. NA
NOMAGRAPH INDEX NA

PRE TEST LEAK CHECK
METER 2.005 @ 15 in. Hg
PITOTS NA @ NA in. Hg
ORSAT

P#	TIME	T_s °F	Δ P in H_2O	√Δ P	Δ H in H_2O	Vm ft^3	$T_{m\ IN}$ °F	T_m OUT °F	OVEN °F	IMP. OUT °F	VAC (in Hg
Set	00				1.7	157.706	64	64	NA	55	3
	05				1.7	161.5	68	64		55	3
	10				1.7	165.2	74	64		56	3
	15				1.7	169.0	77	66		56	3
	20				1.7	172.9	79	67		56	3
	25				1.7	176.7	81	69		56	3
	30				1.7	180.535	69	69		55	3
	35				1.7	184.3	74	70		55	2½
	40				1.7	188.1	79	69		57	2½
	45				1.7	191.9	82	70		56	2½
	50				1.7	195.7	84	72		56	2½
	55				1.7	199.6	86	73		56 57	2½
	60				—	203.425	—	—		—	—
Avg.					1.70	45.719		72.3			

TIME END = 1012

SB SB SB

Volume of Liquid Water Collected	Impinger Volume 1	2	3	4	Silica Gel Wght. 5
Final	166	116	4		266
Initial	100	100	0		255
Liquid Collected	66	16	4		11
Total Vol. Collected					97

SB

POST TEST LEAK CHECKS
Meter 2.005 @ 15 in. Hg
Pitots NA @ in. Hg
Orsat NA

Orsat Meas.	Time	CO_2	O_2	CO	N_2
1					
2					
3					

Nozzle Cal	D_1	D_2	D_3	Average

VELOCITY DATA SHEET - METHOD 2

Facility:	Simi Valley	**Baro. Press:**	28.85	**D_1 upstream:**	0.46
Source:	Flare #2	**Static Press:**	-.02	**D_1 downstream:**	4.1
Job #:	NO7-036	**Pitot Tube #:**	SNC# 10	**Stack Diameter:**	128"
Date:	9/17/03	**Pitot Tube Type:**	"S"	**Leak Check**	
Operator:	CH	**Magnahelic:**	#2	**Initial:**	**Final:**
Run #:	2			✓ ✓	✓ ✓

Point #	Position in.	Velocity Head in. H_2O	Stack Temp °F	Cyclonic Flow Angle
A 12	125.3	.02	1593	
11	119.4	.03	1590	
10	112.8	.005	1587	
9	105.3	.02	1590	
8	96.6	.02	1590	
7	82.4	.005	1595	
6	45.5	.03	1593	
5	32.0	.02	1591	
4	22.6	.02	1585	
3	15.1	.01	1583	
2	8.5	.02	1580	
1	2.1	.03	1584	
B 12		.03	1565	
11		.02	1562	
10		.005	1560	
9		~~.005~~ .01	1564	
8		~~.005~~ .01	1569	
7		~~.005~~ .02	1570	
6		.02	1581	
5		.005	1575	
4		.03	1571	
3		.03	1570	
2		.02	1570	
1		.01	1569	
Average		$\sqrt{\Delta P}$= 0.13~~07~~	T_s= 1578.6	∠=

SB SB

Side View

SEE RUN 1

Top View

PARTICULATE FIELD DATA

PLANT Simi Valley
DATE 09/17/09
LOCATION Simi Valley CA
OPERATOR TRU 1 SD
SOURCE Flare #2 OUTLET
RUN NO. 2
SAMPLE BOX NO. C7

TIME START 1045

METER BOX NO. #5
METER ΔH @ 1.6566
Y= 0.9951
PROBE I.D. NO. 556"
NOZZLE DIAMETER, in. NA
STACK DIAMETER, in. 128"
PROBE HEATER SETTING NA
HEATER BOX SETTING NA
Δ Cp FACTOR NA
FILTER NO. NA

ASSUMED MOISTURE, %
AMBIENT TEMPERATURE 78°F
BARO. PRESS.
STATIC PRESS. NA
NOMAGRAPH INDEX NA

PRE TEST LEAK CHEC.
METER <.005 @ 15 in. Hg
PITOTS NA @ in. Hg
ORSAT NA

P#	TIME	T_s °F	Δ P in H_2O	√Δ P	Δ H in H_2O	Vm ft^3	$T_{m\,IN}$ °F	T_m OUT °F	OVEN °F	IMP. OUT °F	VAC (in Hg
Set	00				1.7	204.099	75	75	NA	53	2 1/2
	05				1.7	208.1	91	74		54	2 1/2
	10				1.7	211.9	85	75		56	2 1/2
	15				1.7	215.9	88	76		56	2 1/2
	20				1.7	219.7	90	78		56	2 1/2
	25				1.7	223.5	91	79		55	2
	30			Bot change	1.7	227.335	92	83		57	2 1/2
	35				1.7	231.2	90	82		57	2 1/2
	40				1.7	235.1	93	83		56	2 1/2
	45				1.7	239.0	95	85		56	2
	50				1.7	242.9	96	85		57	2
	55				1.7	246.8	98	87		57	2
	60				—	250.233	—	—		—	—
Avg.					1.70	46.134		84.4			

TIME END = 1112

SB SB SB

Volume of Liquid Water Collected	Impinger Volume 1	2	3	4	Silica Gel Wght. 5
Final	146	115	6		2683
Initial	100	100	0		2660
Liquid Collected	48	15	6		17
Total Vol. Collected					86

SB

POST TEST LEAK CHECKS
Meter <.005 @ 15 in. Hg
Pitots NA @ NA in. Hg
Orsat

Orsat Meas.	Time	CO_2	O_2	CO	N_2
1					
2					
3					

Nozzle Cal	D_1	D_2	D_3	Average

0.96

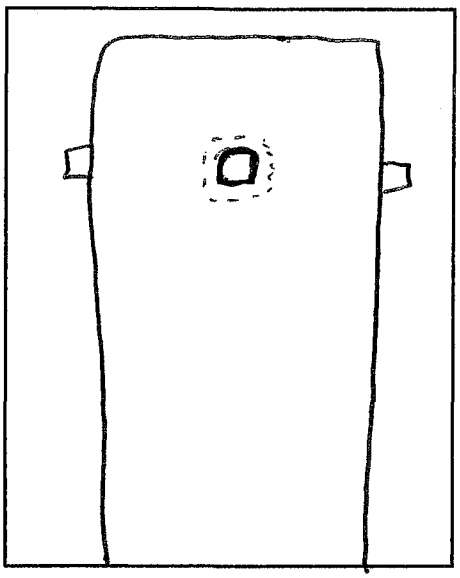
VELOCITY DATA SHEET - METHOD 2

Facility:	Simi Valley LF	**Baro. Press:**	28.85	**D_1 upstream:**	0.46
Source:	Flare #2	**Static Press:**	-.03	**D_1 downstream:**	4.1
Job #:	W07-030	**Pitot Tube #:**	10	**Stack Diameter:**	128"
Date:	9-17-03	**Pitot Tube Type:**	115"	**Leak Check**	
Operator:	CH	**Magnahelic:**	#2	**Initial:** ✓ ✓	**Final:** ✓ ✓
Run #:	3				

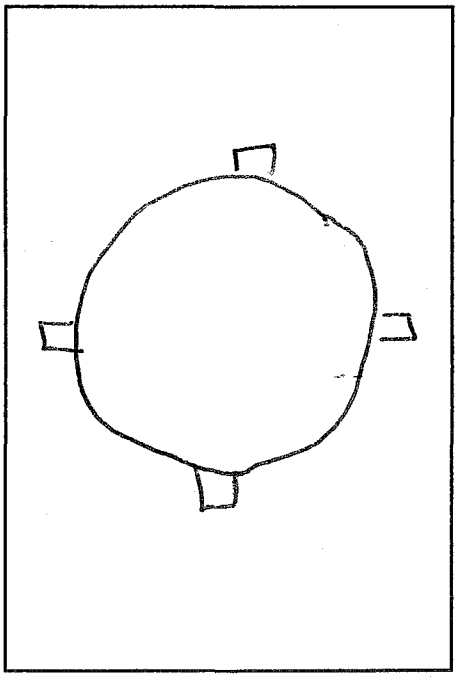
Point #	Position in.	Velocity Head in. H_2O	Stack Temp °F	Cyclonic Flow Angle
A12	125.3	.005	1639	
11	119.4	.005	1640	
10	112.8	~~.005~~ .01	1643	
9	105.3	~~.005~~ .01	1640	
8	96.0	.02	1642	
7	82.4	.03	1641	
6	45.5	.03	1640	
5	32.0	.02	1649	
4	22.6	.03	1648	
3	15.1	.02	1647	
2	8.5	.02	1645	
1	2.6	.01	1640	
B12		~~.005~~ .02	1643	
11		~~.005~~ .02	1612	
10		~~.005~~ .01	1610	
9		~~.005~~ .02	1612	
8		~~.005~~ .02	1606	
7		.02	1601	
6		.03	1598	
5		.03	1597	
4		.03	1595	
3		.02	1594	
2		.02	1596	
1		.02	1599	
Average		$\sqrt{\Delta P}$=0.1366	T_s=1624.0	∠=

SB SB

Side View



Top View



PARTICULATE FIELD DATA

PLANT Simi Valley L.F.
DATE 09/17/03
LOCATION Simi Valley L.F.
OPERATOR TW / SD
SOURCE Flare #2 Outlet
RUN NO. 3 OUTLET MM
SAMPLE BOX NO. C7

TIME START 1230

METER BOX NO. 5
METER ΔH @ 1.6 4866
Y= 0.9851
PROBE I.D. NO. 6'SS
NOZZLE DIAMETER, in. NA
STACK DIAMETER, in. 128"
PROBE HEATER SETTING NA
HEATER BOX SETTING NA
Δ Cp FACTOR NA
FILTER NO. NA

ASSUMED MOISTURE, % NA
AMBIENT TEMPERATURE 87 °F
BARO. PRESS. 28.85
STATIC PRESS. NA
NOMAGRAPH INDEX NA

PRE TEST LEAK CHECK
METER .005 @ 15 in. Hg
PITOTS NA @ NA in. Hg
ORSAT NA

P#	TIME	T_s °F	Δ P in H_2O	√Δ P	Δ H in H_2O	Vm ft^3	$T_{in\ IN}$ °F	T_m OUT °F	OVEN °F	IMP. OUT °F	VAC (in Hg
Sur	00				1.7	250.906	86	86	NA	53	2 1/2
	05				1.7	254.6	92	83		55	2 1/2
	10				1.7	258.7	96	86		55	2 1/2
	15				1.7	262.5	97	86		55	2 1/2
	20				1.7	266.3	97	88		55	2 1/2
	25				1.7	270.4	99	89		52	2 1/2
	30				1.7	274.033	90	88		57	2 1/2
	35				1.7	277.9	93	88		55	2 1/2
	40				1.7	281.8	94	89		55	2 1/2
	45				1.7	285.7	97	90		57	2 1/2
	50				1.7	289.6	98	90		57	2 1/2
	55				1.7	293.3	99	91		57	2 1/2
	60				—	297.188	—	—	↓	—	—
Avg.					1.70	46.282		91.5			

TIME END = 1345

SB SB SD

Volume of Liquid Water Collected	Impinger Volume 1	2	3	4	Silica Gel Wght. 5
Final	160	116	4		269
Initial	100	100	0		266
Liquid Collected	60	16	4		3
Total Vol. Collected					83

SD

POST TEST LEAK CHECKS
Meter .004 @ 15 in. Hg
Pitots NA @ NA in. Hg
Orsat NA

Orsat Meas.	Time	CO_2	O_2	CO	N_2
1					
2					
3					

Nozzle Cal	D_1	D_2	D_3	Average

CAS

TOTAL COMBUSTION ANALYSIS
SCAQMD METHOD 25
FIELD SAMPLING DATA SHEET

Job #: W07-036
Facility: Simi Valley CA L.F.
Location: Simi Valley, CA
Date: 09/17/03
Operator: TW / SB

Control Device: Flare #2
Sample Location: INLET
Ambient Temp.: ~73°F
Baro. Pressure: 28.85

SAMPLE A (R1)

Tank #: V **Trap #:** NA
Initial Vacuum: 1.5 torr 30"
Final Vacuum: 14" Hg

Start: 0847 Stop: 0947

TIME (min.)	VACUUM ("Hg)	FLOW (cc/min)
00	~~30~~ SB 29	160
05	28	
10	26.5	
15	25	
20	24	
25	23	
30	21.5	
35	20	
40	19	
45	18	
50	16.5	
55	15	
60	14	

SAMPLE B (R2)

Tank #: I **Trap #:** NA
Initial Vacuum: 1.5 torr / 30"
Final Vacuum:

Start: 1045 Stop

TIME (min.)	VACUUM ("Hg)	FLOW (cc/min)
00	29" ~~30~~ SB	160
05	27.5	
10	26	
15	25	
20	23	
25	22	
30	20.5	
35	19	
40	17.5	
45	16	
50	15	
55	13.5	
60	12	

EAK RATE

Pre Test : JJ TW
Post Test: JJ SB

SCAQMD METHOD 25
FIELD SAMPLING DATA SHEET

Job #: WO7 - 036
Facility: Simi Valley Landfill
Location: Simi Valley, CA
Date: 9/17/03
Operator: SB / TW

Control Device: Flare #2
Sample Location: Inlet
Ambient Temp.: ~80°F
Baro. Pressure: 28.85

SAMPLE A (R3)

Tank #: L **Trap #:** NA
Initial Vacuum: 0.0 torr
Final Vacuum:

SAMPLE B

Tank #: NA **Trap #:** NA
Initial Vacuum: NA
Final Vacuum: NA

Start Time: 1230 Stop 1330

TIME (min.)	VACUUM ("Hg)	FLOW (cc/min)
00	30	160
05	28	
10	26.5	
15	25	
20	23	
25	21.5	
30	20	
35	18	
40	16.5	
45	15	
50	13	
55	11.5	
60	10	

~~End Time:~~

TIME (min.)	VACUUM ("Hg)	FLOW (cc/min)
00		
05		
10		
15		
20		
25		
30		
35		
40		
45		
50		
55		
60		

LEAK RATE

Pre Test : √ SB
Post Test: √ SB

TOTAL COMBUSTION ANALYSIS
SCAQMD METHOD 25
FIELD SAMPLING DATA SHEET

Job #: W07-036
Facility: Simi Valley L.F.
Location: Simi Valley, CA
Date: 09/17/03
Operator: CH / TN

Control Device: Flare #2
Sample Location: OUTLET
Ambient Temp.: ~73°F
Baro. Pressure: 28.85

(R1) **SAMPLE A**

Tank #: 22 **Trap #:** NA
Initial Vacuum: 1.5 torr / 30"
Final Vacuum:
START → 08:47
END → 09 47

TIME (min.)	VACUUM ("Hg)	FLOW (cc/min)
00	30	160
05	28	
10	27	
15	25	
20	24	
25	23	
30	22	
35	20	
40	18	
45	16	
50	14	
55	11	
60	10	

(R2) **SAMPLE B**

Tank #: 26 **Trap #:** NA
Initial Vacuum: 1.5 torr / 30"
Final Vacuum:
START → 10.45
END → 11 45

TIME (min.)	VACUUM ("Hg)	FLOW (cc/min)
00	30	160
05	29	
10	27	
15	25	
20	24	
25	23	
30	22	
35	20	
40	18	
45	16	
50	15	
55	13	
60	10	

EAK RATE

Pre Test : √ / TN
Post Test: JJ

051

TOTAL COMBUSTION ANALYSIS
SCAQMD METHOD 25
FIELD SAMPLING DATA SHEET

Job #: W07-036
Facility: Simi Valley L.F
Location: Simi Valley
Date: 09/17/03
Operator: CH / TW

Control Device: Flare #2
Sample Location: OUTLET F-2
Ambient Temp.: ^
Baro. Pressure: 28.85

SAMPLE A (R3)

Tank #: 38 **Trap #:** NA
Initial Vacuum: 1 turn / 30 "
Final Vacuum:
START: 12:30
FINISH: 1:26

TIME (min.)	VACUUM ("Hg)	FLOW (cc/min)
00	30"	160
05	28	
10	26	
15	25	
20	23	
25	20	
30	19	
35	18	
40	16	
45	15	
50	12	
55	11	
60	10	

SAMPLE B

Tank #: — **Trap #:** —
Initial Vacuum: —
Final Vacuum: —

TIME (min.)	VACUUM ("Hg)	FLOW (cc/min)
00		
05		
10		
15		
20		
25		
30		
35		
40		
45		
50		
55		
60		

LEAK RATE

Pre Test : V
Post Test: V

052

APPENDIX E - Operating Data

Flare #2 **CALCULATION DATA SHEET** W07-036

Moisture Correction for Inlet Flows

Run #1

$$1712.7 \text{ scf} \times \left(\frac{100 - 7.9}{100}\right) = \underline{1572.4 \text{ DSCF}}$$

Run #2

$$1709.3 \text{ scf} \times \left(\frac{100 - 8.2}{100}\right) = \underline{1569.1 \text{ DSCF}}$$

Run #3

$$1687.7 \text{ scf} \times \left(\frac{100 - 8.5}{100}\right) = \underline{1544.2 \cdot \text{DSCF}}$$

OPERATING DATA
FOR LANDFILL FLARES

Facility: Simi Valley Landfill Date: 9/17/03

Job No.: W07-038 Run #: 1, 2

Source: Flare #2 (John Zink)

Time Run#1	Landfill Gas Flow (SCFM)	Condensate Injection (_____)	Flare Temerature (°F)	Fuel Pressure (_____)	Fuel Temp (°F)
0855	1722	NA	1717	NA	NA
0905	1711		1721		
0915	1720		1705		
0945	1714		1711		
0955	1702		1700		
1005	1707		1707		
Avg.	1712.7		1710.2		
Run #2	-	-	-	-	-
1050	1725		1720		
1100	1703		1711		
1110	1704		1713		
1135	1713		1719		
1145	1697		1712		
1155	1714		1711		
Avg.	1709.3		1714.3		

Run #1 Wet Bulb 109
Dry Bulb 130

7.9%

Run #2 Wet Bulb 114
Dry Bulb 138

8.2%

OPERATING DATA
FOR LANDFILL FLARES

Facility: Simi Valley Landfill Date: 9/17/03

Job No.: W07-036 Run #: 3

Source: Flare #2 (John Zink)

Time Run#3	Landfill Gas Flow (SCFM)	Condensate Injection ( )	Flare Temerature (°F)	Fuel Pressure ( )	Fuel Temp (°F)
1235	1685	NA	1726	NA	NA
1245	1700		1709		
1255	1702		1707		
1320	1685		1713		
1330	1679		1713		
1340	1675		1722		
Avg	1687.7		1715.0		

Run#3 Wet Bulb 115 °F

Dry Bulb 142 °F

8.5%

Horizon Air Measurement Services, Inc.

H:\WPDOCS\FORMS\Fuel Gas Flow Rate For Landfill Flares

C80

APPENDIX F - Correspondences

Ventura County
Air Pollution
Control District

669 County Square Drive
Ventura, California 93003

tel 805/645-1400
fax 805/645-1444
www.vcapcd.org

Michael Villegas
Air Pollution Control Officer

September 11, 2003

Horizon Air Measurement Services, Incorporated
Attn: Lori M. Gillum, Office Manager
996 Lawrence Drive, Suite 108
Newbury Park, CA 91320

Subject: Source Test Protocol Approval

Dear Ms. Gillum:

We have reviewed the source test protocol for Waste Management, Incorporated's 44 MMBTU/hr McGill Environmental System and 75 MMBTU/hr John Zink landfill gas flares located at the Simi Valley Landfill and Recycling Center, 2801 Madera Road, Simi Valley, CA 93065. We find that the protocol is acceptable. You are authorized to conduct the source tests on September 17 and 18, 2003. Please contact us 2 working days prior to this date to confirm the test date, so that we can arrange to observe the tests.

Thank you for your cooperation in this matter. If you have any questions, please contact air quality engineer Lyle Olson at 805/645-1413.

Sincerely,

Keith Duval, Manager
Compliance and Employer Transportation Program Division

c. Scott Tignac, District Manger, Waste Management, Incorporated
James Riley, Environmental Engineer, Waste Management, Incorporated

STP01395

APPENDIX G - Calibration Data

PRAXAIR

Praxair
5700 South Alameda Street
Los Angeles, CA 90058
Telephone: (323) 585-2154
Facsimile: (714) 542-6689

CERTIFICATE OF ANALYSIS

CUSTOMER HORIZON AIR

DATE 03/19/03

P.O NUMBER

REF. NUMBER 82300200

REQUESTED COMPOSITION

GAS	CONCENTRATION
NITROGEN DIOXIDE (AS NOX)	19 ppm
NITROGEN	BALANCE
ANALYTICAL ACCURACY ± 2 %	
NITRIC OXIDE	

ANALYTICAL METHOD

INSTRUMENT	ANALYTICAL PRINCIPLE
Thermo Env. 42H S/N 42H-44979-273	Chemiluminescence

VALUES NOT VALID BELOW 150 PSIG.
CONC. OF NO2 LAST ASSAYED ON 06/24/92 WAS 19.2 ppm.

THIS CYLINDER NO.	CC 115548
CYLINDER PRESSURE	750 **PSIG**
EXPIRATION DATE	09/19/03
CLASSIFICATION	PRIMARY STANDARD
BATCH NUMBER	N/A
LOT NUMBER	109106510
PART NUMBER	EV NINX19MP-AS
CYLINDER SIZE	AS **CGA** 660 55 **CFT**

CERTIFIED CONCENTRATION

NITROGEN DIOXIDE (AS NOX)	19.2 ppm
NITROGEN	BALANCE
ANALYTICAL ACCURACY ± 2 %	
NITRIC OXIDE	0.6 ppm

ANALYZED BY JOSEPH CHARLES

CERTIFIED BY DOUG GRANT

Praxair
5700 South Alameda Street
Los Angeles, CA 90058
Telephone: (323) 585-2154
Facsimile: (714) 542-6689

CERTIFICATE OF ANALYSIS / EPA PROTOCOL GAS

CUSTOMER HORIZON AIR MEASUREMENTS **P.O NUMBER** 8181

REFERENCE STANDARD

COMPONENT	NIST SRM NO.	CYLINDER NO.	CONCENTRATION
NITRIC OXIDE	vs.SRM#2628	CC 137315	9.50 ppm

ANALYZER READINGS

R=REFERENCE STANDARD *Z=ZERO GAS* *C=GAS CANDIDATE*

1. COMPONENT NITRIC OXIDE **ANALYZER MAKE-MODEL-S/N** Thermo Env. 42H S/N 42H-44979-273

ANALYTICAL PRINCIPLE CHEMILUMINESCENCE **LAST CALIBRATION DATE** 05/02/03

FIRST ANALYSIS DATE 10/29/02 **SECOND ANALYSIS DATE** 05/05/03

Z	-0.09	R	10.06	C	10.35	CONC.	10.1	Z	-0.03	R	10.74	C	11.38	CONC.	10.1
R	10.04	Z	-0.09	C	10.42	CONC.	10.1	R	10.72	Z	-0.03	C	11.40	CONC.	10.1
Z	-0.08	C	10.45	R	10.09	CONC.	10.1	Z	-0.03	C	11.39	R	10.73	CONC.	10.1
U/M	ppm			MEAN TEST ASSAY		10.1	U/M	ppm			MEAN TEST ASSAY			10.1	

[NOx] = 10.1 ppm (For reference only).
All values not valid below 150 psig.
NO: first analysis on 10/29/02 was against GMIS 9.77 ppm NO/N2.

THIS CYLINDER NO. SA 4275 **CERTIFIED CONCENTRATION**
HAS BEEN CERTIFIED ACCORDING TO SECTION EPA-600/R97/121 NITRIC OXIDE 10.1 ppm
OF TRACEABILITY PROTOCOL NO. Rev. 9/97 NITROGEN BALANCE
PROCEDURE G1
CERTIFIED ACCURACY ± 1 **% NIST TRACEABLE**
CYLINDER PRESSURE 2000 **PSIG**
CERTIFICATION DATE 05/05/03
EXPIRATION DATE 05/05/05 **TERM** 24 MONTHS

ANALYZED BY JOSEPH CHARLES ***CERTIFIED BY*** MICHAEL TSANG

PRAXAIR

Praxair
5700 South Alameda Street
Los Angeles, CA 90058
Telephone: (323) 585-2154
Facsimile: (714) 542-6689

CERTIFICATE OF ANALYSIS / EPA PROTOCOL GAS

CUSTOMER HORIZON AIR **P.O NUMBER**

REFERENCE STANDARD

COMPONENT	NIST SRM NO.	CYLINDER NO.	CONCENTRATION
NITRIC OXIDE GMIS	vs.SRM#1683	CC 95448	22.4 ppm

ANALYZER READINGS

R=REFERENCE STANDARD *Z=ZERO GAS* *C=GAS CANDIDATE*

1. **COMPONENT** NITRIC OXIDE GMIS **ANALYZER MAKE-MODEL-S/N** Thermo Env. 42H S/N 42H-44979-273

ANALYTICAL PRINCIPLE Chemiluminescence **LAST CALIBRATION DATE** 08/09/02

FIRST ANALYSIS DATE 08-20-02 **SECOND ANALYSIS DATE** 08-27-02

Z	0	R	22.6	C	21.0	CONC.	20.8	Z	0.0	R	22.66	C	21.02	CONC.	20.8
R	22.5	Z	0	C	21.0	CONC.	20.9	R	22.65	Z	0.0	C	21.03	CONC.	20.8
Z	0	C	21.1	R	22.7	CONC.	20.8	Z	0.0	C	21.03	R	22.67	CONC.	20.8
U/M	ppm			MEAN TEST ASSAY			20.8	U/M	ppm			MEAN TEST ASSAY			20.8

NOx values for reference only.
All values not valid below 150 psig.

THIS CYLINDER NO. SA 7833
HAS BEEN CERTIFIED ACCORDING TO SECTION EPA-600/R97/121
OF TRACEABILITY PROTOCOL NO. Rev. 9/97
PROCEDURE G1
CERTIFIED ACCURACY ± 1 **% NIST TRACEABLE**
CYLINDER PRESSURE 2000 **PSIG**
CERTIFICATION DATE 08/27/02
EXPIRATION DATE 08/27/04 **TERM** 24 MONTHS

CERTIFIED CONCENTRATION

NITRIC OXIDE	20.8 ppm
NITROGEN	BALANCE
NOx	21.0 ppm

ANALYZED BY PHU TIEN NGUYEN ***CERTIFIED BY*** MICHAEL TSANG

PRAXAIR

Praxair
5700 South Alameda Street
Los Angeles, CA 90058
Telephone: (323) 585-2154
Facsimile: (714) 542-6689

CERTIFICATE OF ANALYSIS

CUSTOMER HORIZON AIR MEASUREMENTS

DATE 08/06/03

P.O NUMBER

REF. NUMBER 22593800

REQUESTED COMPOSITION

GAS	CONCENTRATION
CARBON DIOXIDE	7 %
OXYGEN	12 %
NITROGEN	BALANCE
ANALYTICAL ACCURACY	±1 %

ANALYTICAL METHOD

INSTRUMENT	ANALYTICAL PRINCIPLE
METTLER ID5, S/N:1865166	GRAVIMETRIC
METTLER ID5, S/N:1865166	GRAVIMETRIC

Values not valid below 150 psig.

THIS CYLINDER NO.	CC 168083
CYLINDER PRESSURE	2000 **PSIG**
EXPIRATION DATE	12/31/06
CLASSIFICATION	PRIMARY STANDARD
BATCH NUMBER	N/A
LOT NUMBER	109311104
PART NUMBER	EV NICDOXP1-AS
CYLINDER SIZE	AS **CGA** 590 148 **CFT**

CERTIFIED CONCENTRATION

CARBON DIOXIDE	7.00 %
OXYGEN	12.01 %
NITROGEN	BALANCE
ANALYTICAL ACCURACY	±1 %

ANALYZED BY JACK FU

CERTIFIED BY TY TRIPLETT

PRAXAIR

Praxair
5700 South Alameda Street
Los Angeles, CA 90058
Telephone: (323) 585-2154
Facsimile: (714) 542-6689

CERTIFICATE OF ANALYSIS

CUSTOMER HORIZON AIR

DATE 08/27/02

P.O NUMBER

REF. NUMBER 00874800

REQUESTED COMPOSITION

GAS	CONCENTRATION
CARBON DIOXIDE	12 %
NITROGEN	BALANCE
ANALYTICAL ACCURACY ±1 %	

ANALYTICAL METHOD

INSTRUMENT	ANALYTICAL PRINCIPLE
METTLER ID5, S/N:1865166	GRAVIMETRIC

VALUE NOT VALID BELOW 150 PSIG.

THIS CYLINDER NO.	SA 2515
CYLINDER PRESSURE	2000 **PSIG**
EXPIRATION DATE	08/27/05
CLASSIFICATION	PRIMARY STANDARD
BATCH NUMBER	N/A
LOT NUMBER	109223508
PART NUMBER	EV NICD12P-AS
CYLINDER SIZE	AS **CGA** 580 143 **CFT**

CERTIFIED CONCENTRATION

CARBON DIOXIDE	12.01 %
NITROGEN	BALANCE
ANALYTICAL ACCURACY ±1 %	

ANALYZED BY JOSEPH CHARLES

CERTIFIED BY TY TRIPLETT

PRAXAIR

Praxair
5700 South Alameda Street
Los Angeles, CA 90058
Telephone: (323) 585-2154
Facsimile: (714) 542-6689

CERTIFICATE OF ANALYSIS / EPA PROTOCOL GAS

CUSTOMER HORIZON AIR MEASUREMENTS **P.O NUMBER** 8181

REFERENCE STANDARD

COMPONENT	NIST SRM NO.	CYLINDER NO.	CONCENTRATION
CARBON MONOXIDE GMIS	vs. 2636a	CC 117260	250 ppm

ANALYZER READINGS

R=REFERENCE STANDARD *Z=ZERO GAS* *C=GAS CANDIDATE*

1. **COMPONENT** CARBON MONOXIDE GMIS **ANALYZER MAKE-MODEL-S/N** Siemens Ultramat 5E S/N A12-729

ANALYTICAL PRINCIPLE NDIR **LAST CALIBRATION DATE** 04/03/03

FIRST ANALYSIS DATE					12/20/02	**SECOND ANALYSIS DATE**					04/30/03
Z 0	**R** 250.0	**C** 200.0	**CONC.** 200			**Z** 0	**R** 250.0	**C** 200.0	**CONC.** 200		
R 250.0	**Z** 0	**C** 201.0	**CONC.** 201			**R** 250.0	**Z** 0	**C** 200.0	**CONC.** 200		
Z 0	**C** 201.0	**R** 250.0	**CONC.** 201			**Z** 0	**C** 200.0	**R** 250.0	**CONC.** 200		
U/M ppm		**MEAN TEST ASSAY** 201				**U/M** ppm		**MEAN TEST ASSAY** 200			

Values not valid below 150 psig

THIS CYLINDER NO. SA 20048
HAS BEEN CERTIFIED ACCORDING TO SECTION EPA-600/R97/121
OF TRACEABILITY PROTOCOL NO. Rev. 9/97
PROCEDURE G1
CERTIFIED ACCURACY ± 1 **% NIST TRACEABLE**
CYLINDER PRESSURE 2000 **PSIG**
CERTIFICATION DATE 04/30/03
EXPIRATION DATE 04/30/06 **TERM** 36 MONTHS

CERTIFIED CONCENTRATION

CARBON MONOXIDE	200 ppm
NITROGEN	BALANCE

ANALYZED BY PHU TIEN NGUYEN ***CERTIFIED BY*** THANHTRUC NGOC NGUYEN

PRAXAIR

Praxair
5700 South Alameda Street
Los Angeles, CA 90058
Telephone: (323) 585-2154
Facsimile: (714) 542-6689

CERTIFICATE OF ANALYSIS / EPA PROTOCOL GAS

CUSTOMER HORIZON AIR MEASUREMENTS **P.O NUMBER** 8180

REFERENCE STANDARD

COMPONENT	NIST SRM NO.	CYLINDER NO.	CONCENTRATION
CARBON MONOXIDE GMIS	vs.SRM#1680	CC 86522	500 ppm

ANALYZER READINGS

R=REFERENCE STANDARD *Z=ZERO GAS* *C=GAS CANDIDATE*

1. **COMPONENT** CARBON MONOXIDE GMIS **ANALYZER MAKE-MODEL-S/N** Siemens Ultramat 5E S/N A12-729

ANALYTICAL PRINCIPLE NDIR **LAST CALIBRATION DATE** 05/03/03

FIRST ANALYSIS DATE 04/28/03 **SECOND ANALYSIS DATE** 05/05/03

Z 0	R 500.0	C 397.5	CONC. 398		Z 0	R 500.0	C 398.0	CONC. 398			
R 500.0	Z 0	C 387.5	CONC. 398		R 500.0	Z 0	C 398.0	CONC. 398			
Z 0	C 397.5	R 500.0	CONC. 398		Z 0	C 398.0	R 500.0	CONC. 398			
U/M ppm		MEAN TEST ASSAY 398			U/M ppm		MEAN TEST ASSAY 398				

Values not valid below 150 psig

THIS CYLINDER NO. SGAL 2116
HAS BEEN CERTIFIED ACCORDING TO SECTION EPA-600/R97/121
OF TRACEABILITY PROTOCOL NO. Rev. 9/97
PROCEDURE G1
CERTIFIED ACCURACY ± 1 **% NIST TRACEABLE**
CYLINDER PRESSURE 2000 **PSIG**
CERTIFICATION DATE 05/05/03
EXPIRATION DATE 05/05/06 **TERM** 36 MONTHS

CERTIFIED CONCENTRATION

CARBON MONOXIDE	398 ppm
NITROGEN	BALANCE

ANALYZED BY THANH TRUC NGOC NGUYEN

CERTIFIED BY PHU TIEN NGUYEN

C C 6

Control Box Calibration Data

Date: 02/05/03 **Calibrated by:** FJOTorres

Meter Box Number: 5 **Barometric Pressure:** 29.30

Wet Test Meter Cf: 1.0013

	Gas Volumes			Temperatures			Time	Y	H@
Orifice setting (H)	Wet Test (cu.ft)	Dry Gas Initial (cu.ft)	Dry Gas Final (cu.ft)	DGM Initial (°F)	DGM final (°F)	WTM (°F)	(min)		
0.5	7.054	436.875	444.083	67	76	65	17	0.9903	1.6258
1.0	19.763	504.138	524.342	69	77	66	34	0.9891	1.6595
1.5	13.236	524.559	538.157	77	80	67	19	0.9913	1.7218
2.0	16.216	474.603	491.257	73	79	66	20	0.9876	1.6962
3.0	11.951	461.997	474.270	71	78	66	12	0.9829	1.6903
4.0	16.120	445.166	461.642	69	77	66	14	0.9824	1.6908
						AVERAGE		0.9873	1.6807

Reviewed by:

Magnehelic Gauge Calibration Data

Range: 0.0-0.25

Date: 07/02/03 **Calibrated by:** Ferodie Jesus Orara Torres

BAROMETRIC PRESURE: 29.30 **Reference:** 0.0-0.25" MANOMETER

SYSTEM LEAK CHECKS (Y/N): Y

POINT LEAK CHECK (Y/N): Y

Magnahelic Box # 2

Serial # R2001212AN7

MAG	MAN R1	MAN R2	MAN R3	MEAN	MEAN/MAG
0.05	0.05	0.05	0.05	0.050	1.000
0.10	0.10	0.10	0.10	0.100	1.003
0.15	0.15	0.15	0.15	0.149	0.996
0.20	0.20	0.20	0.20	0.201	1.003
0.25	0.25	0.25	0.25	0.249	0.997

Correction Factor: 0.9999

Date: 7/2/03

Checked by:

IU-2
Apex

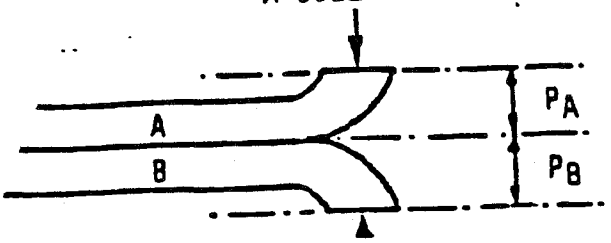
TYPE S PITOT TUBE INSPECTION DATA FORM

Tubing diameter, D_t 0.355 in.

Pitot Tube Assembly Level? (Yes) / No

Pitot Tube Openings Damaged? Yes / (No)

A-SIDE PLANE



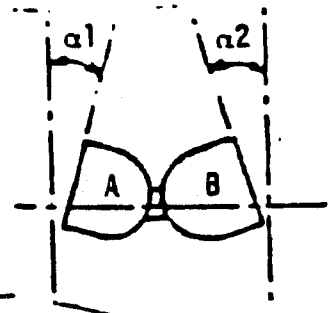
NOTE: 0.983

$\{1.05\ D_t < P < 1.50\ D_t$

$P_A = P_B$

P_A = 0.492 in.

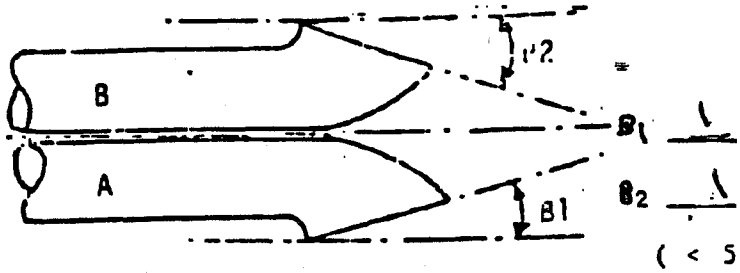
P_B = 0.492 in.



α_1 = 1 °

α_2 = 1 °

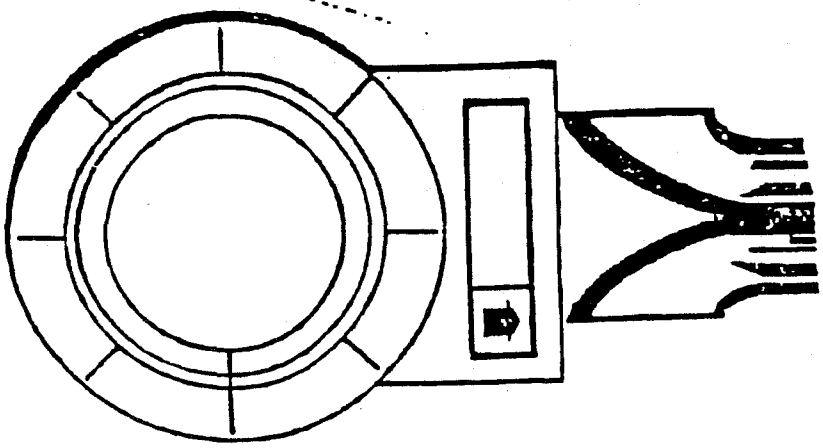
(<10°)

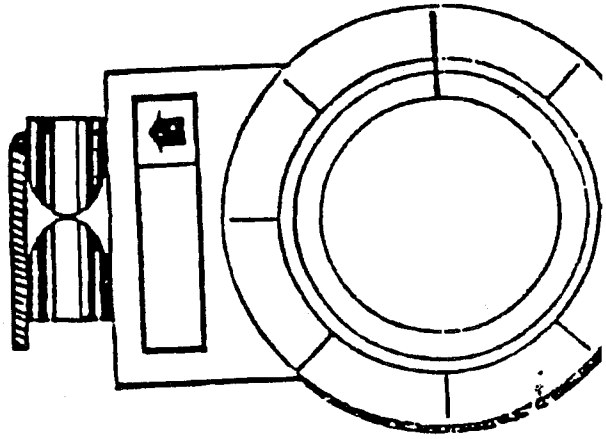


B_1 1

B_2 1

(< 5





Level Position to Find γ = 0 °

Z = A sin γ = 0.000 in. (< 1/8 in.)

Level Position to find θ = 1

W = A sin θ = 0.0172 In. (< 1/

Comments

Checked by: TW DATE: 01/30/03

Calibration Required? NO

000

STACK TEMPERATURE SENSOR CALIBRATION DATA- APEX PROBE ASSEMBLIES

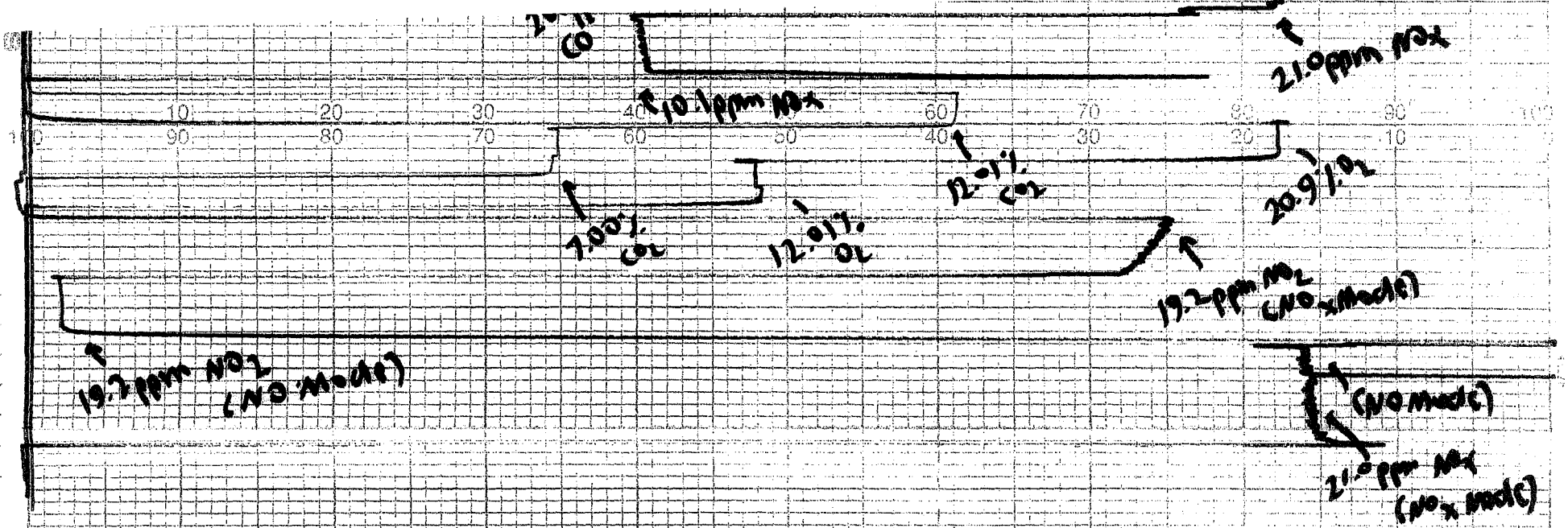
Date: 01/30/03
Calibrated by: Travis Williams

THERMOCOUPLE ID:

	ICE WATER						ABSOLUTE T DIFF., %			BOILING WATER						ABSOLUTE T DIFF., %			BOILING OIL						ABSOLUTE T DIFF., %		
	REF			TC						REF			TC						REF			TC					
	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
Stainless Steel Probes																											
4-2	32	32	32	32	32	31	0.0	0.0	0.2	212	212	212	212	212	213	0.0	0.0	-0.1	539	539	538	540	540	539	-0.1	-0.1	-0.1
4-3	32	32	32	32	32	33	0.0	0.0	-0.2	212	211	211	211	211	211	0.1	0.0	0.0	369	369	369	369	369	369	0.0	0.0	0.0
6-2	32	32	32	33	33	32	-0.2	-0.2	0.0	211	212	212	212	212	212	-0.1	0.0	0.0	370	370	370	370	369	370	0.0	0.1	0.0
6-3	32	32	32	33	32	32	-0.2	0.0	0.0	212	212	212	213	213	213	-0.1	-0.1	-0.1	536	536	536	536	536	537	0.0	0.0	-0.1
6-4	32	32	32	32	32	32	0.0	0.0	0.0	211	212	212	211	212	212	0.2	0.0	0.0	369	369	369	369	369	370	0.0	0.0	-0.1
A6-5	32	32	32	32	33	33	0.0	-0.2	-0.2	212	212	212	212	212	213	0.0	0.0	-0.1	535	535	535	534	535	535	0.1	0.0	0.0
A6-1	32	32	32	33	33	32	-0.2	-0.2	0.0	212	212	212	213	213	213	-0.1	-0.1	-0.1	540	540	540	540	540	540	0.0	0.0	0.0
A6-2	32	32	32	33	33	32	-0.2	-0.2	0.0	212	212	212	212	212	213	0.0	0.0	-0.1	541	542	542	541	542	541	0.0	0.0	0.1
10-1	32	32	32	32	32	32	0.0	0.0	0.0	212	212	212	212	212	212	0.0	0.0	0.0	540	539	539	540	540	539	0.0	-0.1	0.0
Inconel																											
10-2 inc	32	32	32	33	33	33	-0.2	-0.2	-0.2	212	212	212	213	213	213	-0.1	-0.1	-0.1	542	542	542	541	541	542	0.1	0.1	0.0
6-1 inc	32	32	32	33	33	32	-0.2	-0.2	0.0	212	212	212	213	213	213	-0.1	-0.1	-0.1	541	541	540	541	541	540	0.0	0.0	0.0
Loose Thermocouple																											
6-5L	32	32	32	33	32	32	-0.2	0.0	0.0	212	212	212	212	212	213	0.0	0.0	-0.1	540	540	540	539	540	541	0.1	0.0	-0.1
7-1L	32	32	32	32	31	32	0.0	0.2	0.0	212	212	212	212	213	213	0.0	-0.1	-0.1	540	540	540	539	539	539	0.1	0.1	0.1
M17-1	32	32	32	33	33	32	-0.2	-0.2	0.0	212	212	212	211	212	212	0.1	0.0	0.0	370	370	369	369	369	369	0.1	0.1	0.0
3-1	32	32	32	32	32	32	0.0	0.0	0.0	212	212	212	212	213	212	0.0	-0.1	0.0	540	540	540	539	540	540	0.1	0.0	0.0
5-1	32	32	32	32	32	32	0.0	0.0	0.0	212	212	212	213	213	212	-0.1	-0.1	0.0	540	540	540	540	540	541	0.0	0.0	-0.1
7-2	32	32	32	31	31	32	0.2	0.2	0.0	212	212	212	211	211	211	0.1	0.1	0.1	524	524	525	525	525	526	-0.1	-0.1	-0.1
6-7	32	32	32	32	32	32	0.0	0.0	0.0	212	212	212	212	212	212	0.0	0.0	0.0	535	535	535	535	534	535	0.0	0.1	0.0
6-8	32	32	32	32	32	31	0.0	0.0	0.2	212	212	212	212	212	213	0.0	0.0	-0.1	521	521	521	520	520	521	0.1	0.1	0.0
8-3	32	32	32	32	32	31	0.0	0.0	0.2	212	212	212	211	211	212	0.1	0.1	0.0	514	514	514	514	514	513	0.0	0.0	0.1

Note: If absolute temperature values of the reference thermometer being calibrated and the stack temperature sensors agree within 1.5 percent at each of the three calibration points, no correction is needed.

APPENDIX H - Strip Charts



WO7-036 Waste Management Simi Valley Landfill Simi Valley, CA 9/17/07 BY SB, TW, CH

19.2 ppm NO_2 (as NOx) - CC115548

10.1 ppm NOx - SA4275

21.0 ppm NOx - SA7833

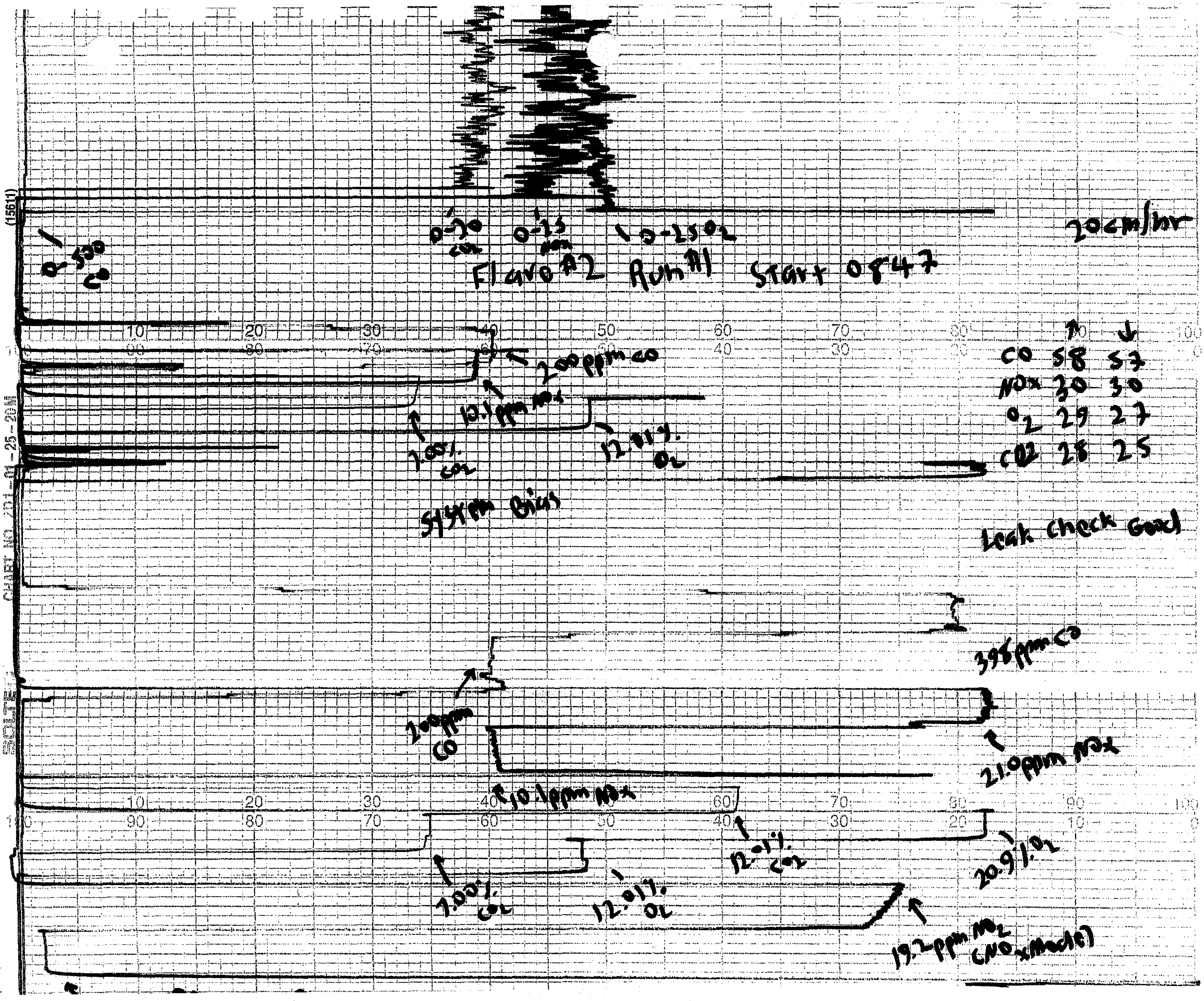
200 ppm CO - SA20048

398 ppm CO - SG-AL2116

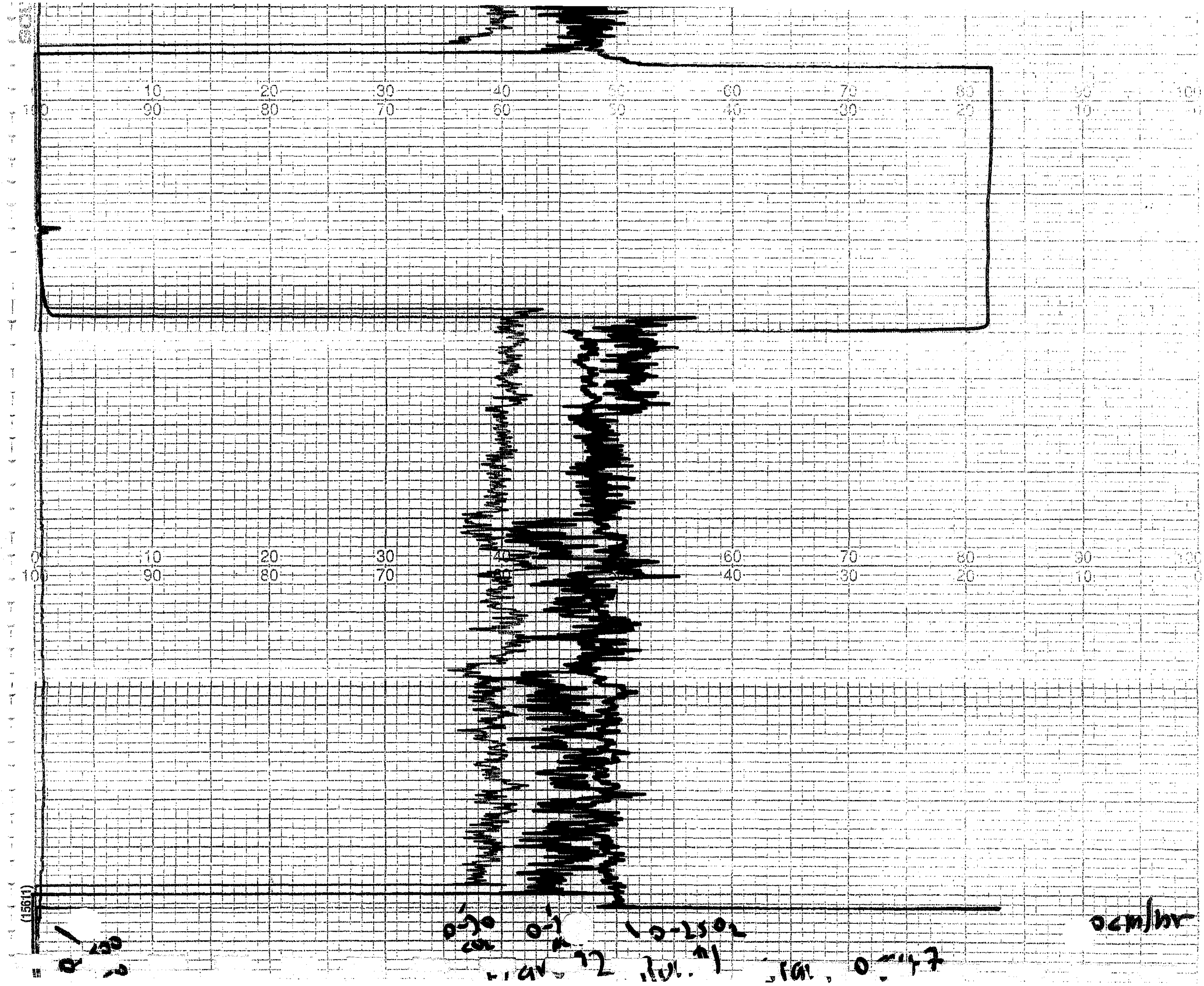
7.00% CO_2 / 12.01% O_2 - CC168083

12.01% CO_2 - SA2515

(15611)



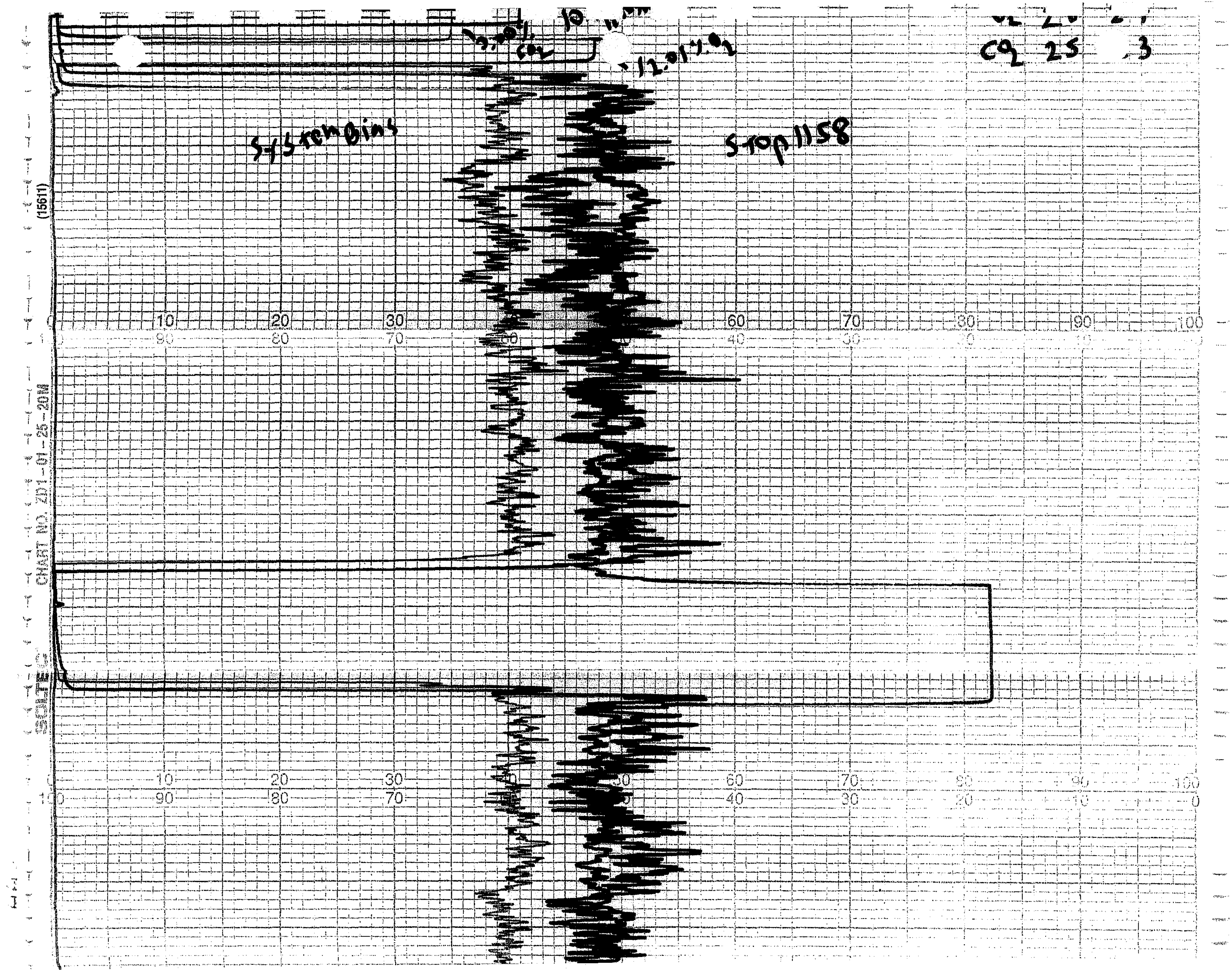
0-500 CO
0-20 CO2
0-25 NOx
0-25 O2
20cm/hr
Flavo #2 Run #1 Start 0847
CO 58 57
NOx 30 30
O2 29 27
CO2 28 25
200ppm CO
10.1ppm NOx
7.00% CO2
12.01% O2
System Bias
Leak check Good
395ppm CO
200ppm CO
21.0ppm NOx
10.1ppm NOx
12.01% CO2
20.9% O2
7.00% CO2
12.01% O2
19.2ppm NO2 (NOx mode)
CHART NO 201-01-25-20M
(15611)



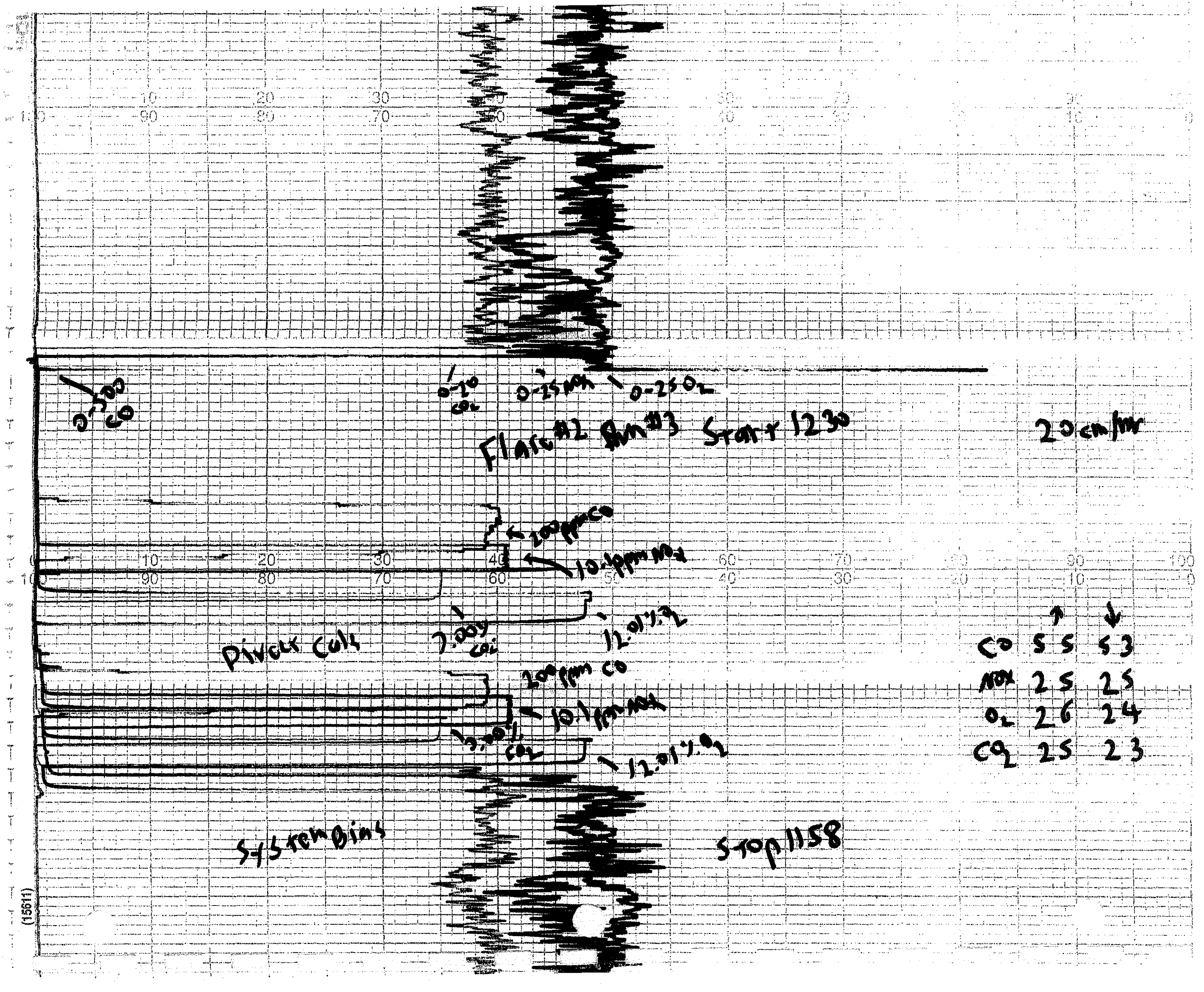
(15611)
0 10 20 30 40 50 60 70 80 90 100
100 90 80 70 60 50 40 30 20 10 0

(15611)
CHART NO. 20Y-01-25-20M

(15611)



System Begins
Stop 1158
CO_2 25 3
12.01% O_2
(15611)
CHART NO. ZD1-01-25-20M


0-500 CO
0-20 CO2
0-25 NOx
0-25 O2
Flare #2 Run #3 Start 1230
20 cm/hr
200 ppm CO
10.1 ppm NOx
7.00% CO2
12.01% O2
Pivot Cals
CO 55 53
NOx 25 25
O2 26 24
CO2 25 23
System Bias
Stop 1158
(15611)

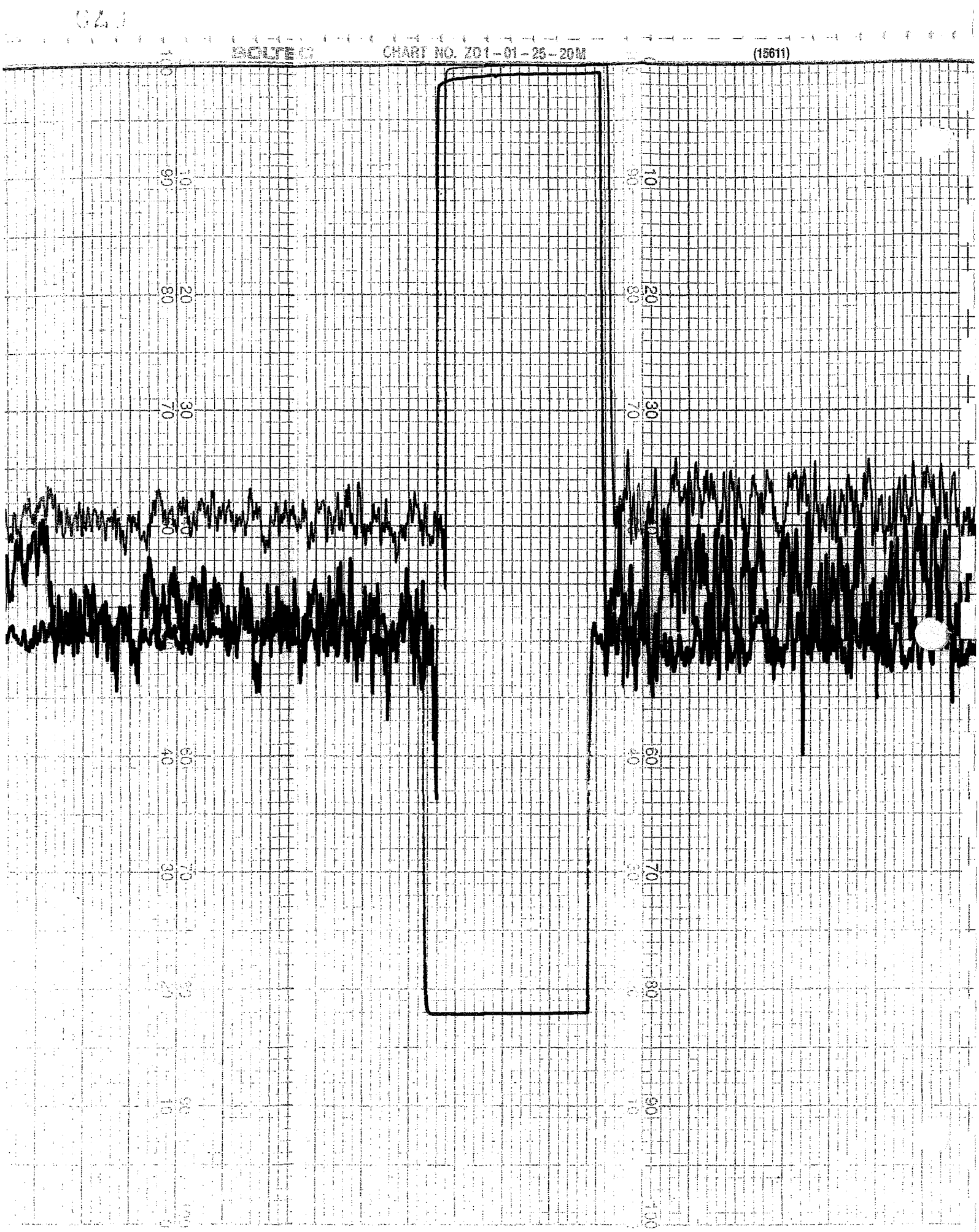
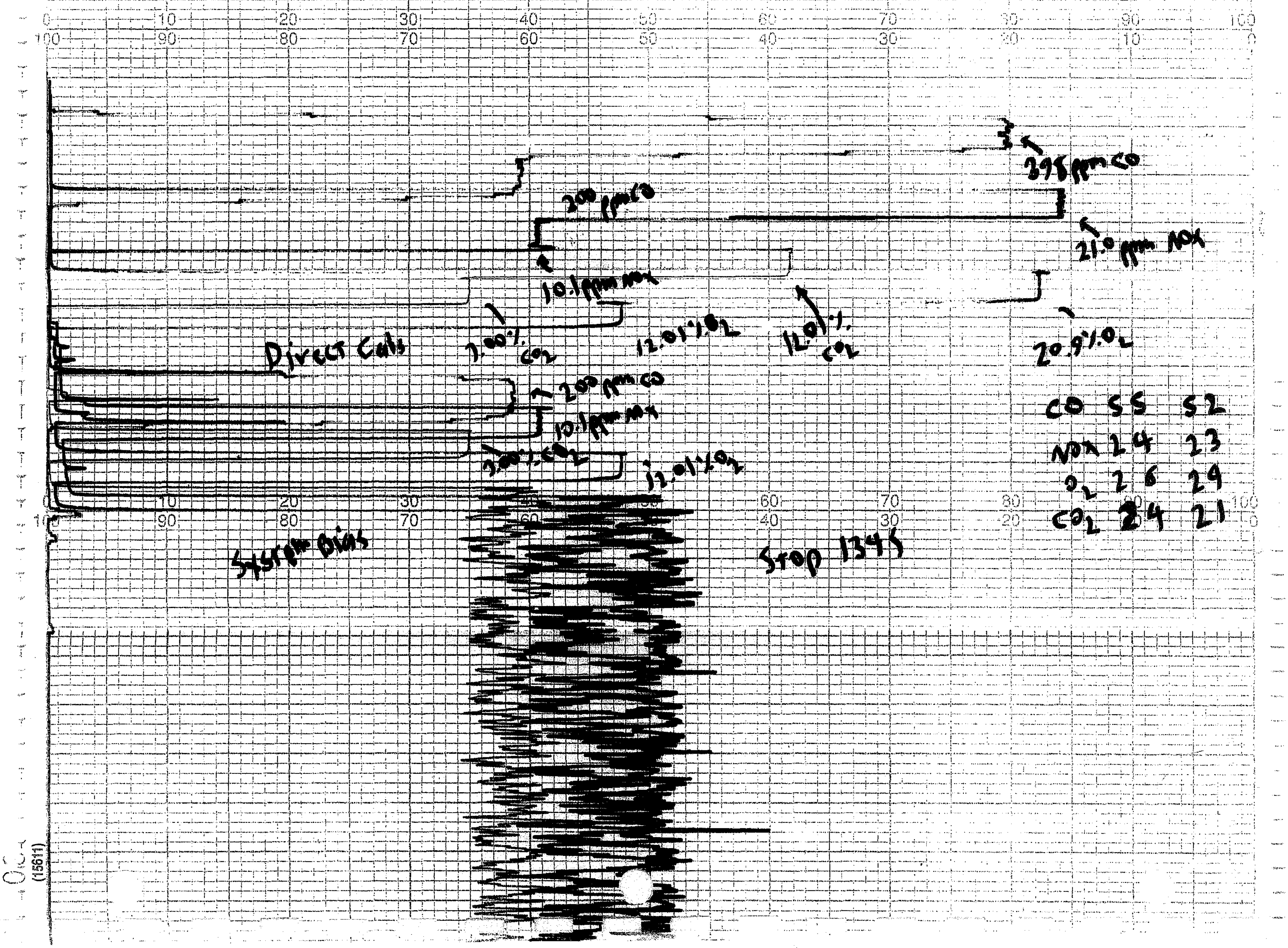


CHART NO. ZD1-01-25-20M
(15611)



395 ppm CO
200 ppm CO
21.0 ppm NOX
10.1 ppm NOX
20.9% O2
12.0% CO2
12.01% O2
7.00% CO2
Direct Cals
200 ppm CO
10.1 ppm NOX
7.00% CO2
12.01% O2
CO 55 52
NOX 24 23
O2 26 29
CO2 24 21
System Bias
Stop 1345
(15611)