

Note: This is a reference cited in *AP 42, Compilation of Air Pollutant Emission Factors, Volume I Stationary Point and Area Sources*. AP42 is located on the EPA web site at www.epa.gov/ttn/chief/ap42/

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Waste Management of North America, Inc.
Bay Area District
2000 Embarcadero • Oakland, California 94606
Suite 300 • 415/532-1400

Altamont

LFG EFD AP42
3 53 36

June 23, 1988
5-1C 2A

Rating = B
Lacking some process data
& emission calcs.

Mr. John Swanson
Permit Services Division
Bay Area Quality Management District
939 Ellis Street
San Francisco, CA 94109

Attention: Mr. Craig Ullery

Reference: Application Number 409
Equipment Location
10840 Altamont Pass Road
Livermore, CA 94550

Gentlemen:

Pursuant to Condition No. 8 and 9 of our Authority to Construct, enclosed are the required landfill gas characterization (Attachment A), and source test data (Attachment B).

After a review of the characterization results, sample number 04-757-2, we are requesting that the landfill gas be sampled and analyzed, and results be resubmitted. These results show that the concentration of Vinyl Chloride, Methylene Chloride, Benzene, TCE, and Tetrachloroethylene appear to be unusually high. We propose to complete the sampling and submittal of the results by July 6, 1988.

ATTACHMENT A

LANDFILL GAS CHARACTERIZATION

MAY 2 1988

ANALYTICAL REPORT
BAY AREA DIST.

BROWN AND CALDWELL LABORATORIES

1255 POWELL STREET EMERYVILLE, CA 94608 • (415) 428-2300

LOG NO: E88-04-757

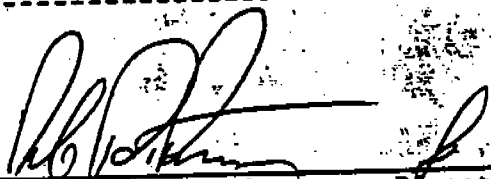
Received: 07 APR 88
Reported: 29 APR 88

Mr. Chris Choate
Waste Management, Inc.
2000 Embarcadero, Suite 300
Oakland, California 94606

REPORT OF ANALYTICAL RESULTS

Page 1

LOG NO	SAMPLE DESCRIPTION, VAPOR SAMPLES					DATE SAMPLED
04-757-1	147					07 APR 88
04-757-2	148					07 APR 88
04-757-3	149					07 APR 88
04-757-4	150					07 APR 88
04-757-5	152					07 APR 88
		ALL				
PARAMETER	04-757-1	04-757-2	04-757-3	04-757-4	04-757-5	
Calderon Landfill Gases						Arden
1,2-Dichloroethane, PPB	<20	550	<20	<20	130	
Benzene, PPB	<500	3700	<500	<500	910	
Carbon Tetrachloride, PPB	<5	<5	<5	<5	<5	
Chloroform, PPB	<2	11	21	110	10	
Ethylene Dibromide, PPB	<1	<1	<1	<1	<1	
Methylene chloride, PPB	<60	33000	<60	<60	13000	
Tetrachloroethylene, PPB	<10	2300	<10	<10	2100	
1,1,1-Trichloroethane, PPB	<10	280	<10	<10	470	
Trichloroethylene, PPB	<10	6900	<10	<10	3100	
Vinyl chloride, PPB	<500	55000	<500	<500	33000	
Fixed Gas Characterization						
Carbon Dioxide, Percent	<0.01	37	<0.01	<0.01	35	
Methane, Percent	<0.01	46	<0.01	<0.01	51	
Nitrogen, Percent	95	11	80	80	11	
Oxygen, Percent	5	2	20	20	1	


Steve Fisher, Laboratory Director

INLET

Avg =

INLET



WMNA

JUN 21 1988

BAY AREA DIST.

June 20, 1988
Project 247-11.02

Mr. Chris E. Choate, P.E.
District Engineer
Waste Management of North America
2000 Embarcadero, Suite 300
Oakland, CA 94606

Re: Source Test - Altamont Landfill

Dear Chris:

The Bay Area Air Quality Maintenance District's (BAAQMD) Authority to Construct (AC) for the gas collection and flare station at the Altamont Landfill requires that a source test be run on the two flares installed at the site. TMA/Norcal conducted the source test on June 1, 1988. The results are attached. Prior to testing, we were notified by the source test division of the BAAQMD that testing for individual oxides of nitrogen and for particulates would not be required.

It should be noted that the NO_x of emissions were measured at 31.2 to 38.4 pounds per day, TNMHC emissions at zero and CO emissions at 110.4 to 223.2 pounds per day. (See Tables I and II). These emissions should be acceptable to the BAAQMD. The test report should be forwarded to Craig Ullery at BAAQMD.

Should you have any questions, please call me.

Very truly yours,

EMCON Associates

Robert E. Van Heut
Robert E. Van Heut
Executive Manager

REVH:sp

TMA Thermo Analytical Inc.

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Appendix I	Flow Data
Appendix II	Field Data
Appendix III	Strip Chart
Appendix IV	Gas Calibration Sheets

2-Emcon

June 9, 1988

Instruments: The following continuous monitors were used:

Infrared CO/CO₂ NDIR Analyzer Model #7752/7020
Ratfish FID, THC Analyzer Model RS55
Teco Model 14A NO-NO₂-NO_x Analyzer
TAI Series 325 A O₂ Monitor

The velocity and volumetric air flow was determined at each of the specified traverse points (ST-18) by an S-type pitot tube and magnehelic pressure gauge. The gas temperature was measured with a potentiometer and thermocouple.

Comments: All strip chart data from the continuous monitoring instruments, air flow and emission calculations, standard gases calibration certifications, and field data sheets are appended to this report.

Submitted by:

Michelle S. Pappas for

Juan J. Rios
Technical Director

JJR/aer

TABLE II

Unit Tested: Flare 1469-1
 Operating Temperature: 1700°F
 Sampling Date: June 2, 1988
 Sampling Location: Altamont Landfill

TEST #	1	2	3	AVG
Time	1149 - 1219	1255 - 1325	1342 - 1410	1557
Duct Temp. °F				53,460
Volume Flow, CFM				12,651
Volume Flow, SDCFM				8.0
Water Vapor, vol %				11.7
Oxygen %	11.6	11.4	12.0	8.6
Carbon Dioxide %	8.3	8.8	8.7	18
NO _x Concentration, ppm (v/v)	18	17	18	1.6
NO _x Emissions as NO ₂ , lbs/hr	1.6	1.6	1.6	ND
TNMHC Concentration, ppm (v/v)	ND	ND	ND	ND
TNMHC Emissions as C ₁ , lbs/hr	ND	ND	ND	156
CO Concentration, ppm (v/v)	152	170	145	8.6
CO Emissions, lbs/hr	8.3	9.3	8.0	

NO_x - Oxides of Nitrogen

NO₂ - Nitrogen Dioxide

TNMHC - Total Nonmethane Hydrocarbons

CO - Carbon Monoxide

SITE

h

T.

THERMO ANALYTICAL

Client: EMCON FLARE 1434-1 Date Tested: 6/1/89

Test No.: 1 Time: 1920

Gas Flow Rate Data

Point	h	T.	Vel. Ft/Sec
1	.075	1492	29.8
2	.005	1492	7.7
3	.01	1492	10.9
4	.01	1492	10.9
5	.01	1492	10.9
6	.01	1492	10.9
7	.01	1492	10.9
8	.01	1492	10.9
9	.01	1492	10.9
1	.005	1492	7.7
2	.005	1492	7.7
3	.01	1492	10.9
4	.01	1492	10.9
5	.01	1492	10.9
6	.01	1492	10.9
7	.01	1492	10.9
8	.01	1492	10.9
9	.01	1492	10.9

$$V_s = C_p [h \cdot (T + 460)]^{.5} [1/M.W. \cdot P_o]^{.5} \cdot 85.49$$

Conc. of CO2 = 8.4 % Conc. of O2 = 11.9 %

Conc. of H2O = 7.3 %

Avg. Gas Velocity; V_s , Avg. 11.4 Ft/SecPitot Tube Correction Factor, C_p .84

Duct Gas Molecular Weight, M.W. 29.07

Duct Pressure, Ps. 29.3 "Hg Barometric Pressure 29.3 "Hg

Duct Size Round 110 In. Diameter Static Pressure -.04 "H2O

Duct Area 66 Sq. Ft Avg. Gas Temp. 1492

Gas Flow Rate 11.4 Ft/Sec * 66 Sq. Ft * 60 = 45144 CFM

$$45144 \text{ CFM} \cdot 530 / 1952 \cdot 29.3 / 29.92 \cdot (1.00 - 7.3 / 100 \cdot \text{H}_2\text{O}) = 11127 \text{ SCFM}$$

M.W. Factor = .0342

Standard Cond. Temp. 70



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2000 Embarcadero • Oakland, California 94606
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Attention: Mr. Craig Ullery

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Gentlemen:

Pursuant to Condition No. 8 and 9 of our Authority to Construct, enclosed are the required landfill gas characterization (Attachment A), and source test data (Attachment B).

After a review of the characterization results, sample number 04-757-2, we are requesting that the landfill gas be sampled and analyzed, and results be resubmitted. These results show that the concentration of Vinyl Chloride, Methylene Chloride, Benzene, TCE, and Tetrachloroethylene appear to be unusually high. We propose to complete the sampling and submittal of the results by July 6, 1988.



Mr. John Swanson

June 23, 1988

Page -2-

The source emission test result of the two flares shows the NOx emissions were measured at 31.2 to 38.4 pounds per day, These emission are within acceptable ranges of the Authority to Construct.

Should you have any questions please call me.

Sincerely,

Chris Choate, P.E.

District Engineer

CC:nl

cc88045.n

Enclosures

cc: Doug Strauch (w/enclosures)
Dave Edwards (w/enclosures)
Bob Barber (w/enclosures)

cc: Stan T.

ATTACHMENT A

LANDFILL GAS CHARACTERIZATION

MAY 2 1988



BROWN AND CALDWELL LABORATORIES

1255 POWELL STREET EMERYVILLE, CA 94608 • (415) 428-2300

ANALYTICAL REPORT
BAY AREA DIST.

LOG NO: E88-04-757

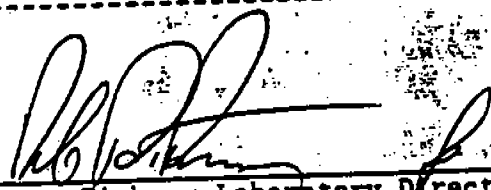
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REPORT OF ANALYTICAL RESULTS

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		ALL				
PARAMETER	04-757-1	04-757-2	04-757-3	04-757-4	04-757-5	
Calderon Landfill Gases						Arken
1,2-Dichloroethane, PPB	<20	550	<20	<20	130	
Benzene, PPB	<500	3700	<500	<500	910	
Carbon Tetrachloride, PPB	<5	<5	<5	<5	<5	
Chloroform, PPB	<2	11	21	110	10	
Ethylene Dibromide, PPB	<1	<1	<1	<1	<1	
Methylene chloride, PPB	<60	33000	<60	<60	13000	
Tetrachloroethylene, PPB	<10	2300	<10	<10	2100	
1,1,1-Trichloroethane, PPB	<10	280	<10	<10	470	
Trichloroethylene, PPB	<10	6900	<10	<10	3100	
Vinyl chloride, PPB	<500	55000	<500	<500	33000	
Fixed Gas Characterization						
Carbon Dioxide, Percent	<0.01	37	<0.01	<0.01	35	
Methane, Percent	<0.01	46	<0.01	<0.01	51	
Nitrogen, Percent	95	11	80	80	11	
Oxygen, Percent	5	2	20	20	1	


Steve Fisher, Laboratory Director

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INLET

Avg =

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INLET

ATTACHMENT B

SOURCE TEST DATA



WMNA

JUN 21 1988

BAY AREA DIST.

June 20, 1988
Project 247-11.02

Mr. Chris E. Choate, P.E.
District Engineer
Waste Management of North America
2000 Embarcadero, Suite 300
Oakland, CA 94606

Re: Source Test - Altamont Landfill

Dear Chris:

The Bay Area Air Quality Maintenance District's (BAAQMD) Authority to Construct (AC) for the gas collection and flare station at the Altamont Landfill requires that a source test be run on the two flares installed at the site. TMA/Norcal conducted the source test on June 1, 1988. The results are attached. Prior to testing, we were notified by the source test division of the BAAQMD that testing for individual oxides of nitrogen and for particulates would not be required.

It should be noted that the NO_x of emissions were measured at 31.2 to 38.4 pounds per day, TNMHC emissions at zero and CO emissions at 110.4 to 223.2 pounds per day. (See Tables I and II). These emissions should be acceptable to the BAAQMD. The test report should be forwarded to Craig Ullery at BAAQMD.

Should you have any questions, please call me.

Very truly yours,

EMCON Associates

Robert E. Van Heut
Robert E. Van Heut
Executive Manager

REVH:sp

TMA Thermo Analytical Inc.

TMA Thermo Analytical Inc.

EMCON
1921 RINGWOOD AVENUE
SAN JOSE, CA 95131

ATTN: ROBERT E. VAN HEVIT, P.E.

Reference: TMA/Norcal C.N. 2170-189

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APPENDICES

Appendix I Flow Data

Appendix II Field Data

Appendix III Strip Chart

Appendix IV Gas Calibration Sheets

TMA/Norcal

2030 Wright Avenue

P.O. Box 4040

Richmond, CA 94804-0040

(415) 235-2633

June 9, 1988

Emcon

1921 Ringwood Avenue

San Jose, CA 95131

Attention: Robert E. Van Heuit, P.E.

Reference: TMA/Norcal C.N. 2170-189

Subject: Source emissions test results of two flares serial # 1469-1 and # 1434-1.

Sampling Date: June 2, 1988.

Sampling Location: Altamont Landfill, Altamont Pass, CA.

Sampling Personnel: Juan Rios and Guy Worthington of TMA/Norcal, Richmond, CA.

Parameters Used:

- Flow (SDCFM)
- Moisture (%)
- Oxygen (%)
- Carbon Dioxide (%)
- Nitrogen Oxides (ppm & lbs/hr)
- Total nonmethane hydrocarbons as C₁ (ppm & lbs/hr)
- Carbon Monoxide (ppm & lbs/hr)

Testing Program: Each flare was tested separately and in triplicate with continuous monitoring instruments for a 30-minute duration for each test.

Sampling Methods: Sampling methods were as described in the Source Test methods of the Bay Area Air Quality Management District (BAAQMD) as given in the following:

ST 18	Stack Travers Point Determination
ST 17	Stack Gas Velocity and Volumetric Flow Rate
ST 23	Stack Gas Water Vapor Determination
ST 14	Oxygen, Continuous Sampling
ST 5	Carbon Dioxide, Continuous Sampling
ST 13A	Oxides of Nitrogen, Continuous Sampling
ST 7	Non-methane Organic Carbon/Total Hydrocarbon Continuous
ST C	Carbon Monoxide, Continuous Sampling

2-Emcon

June 9, 1988

Instruments: The following continuous monitors were used:

Infrared CO/CO₂ NDIR Analyzer Model #7752/7020
Ratfish FID, THC Analyzer Model RS55
Teco Model 14A NO-NO₂-NO_x Analyzer
TAI Series 325 A O₂ Monitor

The velocity and volumetric air flow was determined at each of the specified traverse points (ST-18) by an S-type pitot tube and magnehelic pressure gauge. The gas temperature was measured with a potentiometer and thermocouple.

Comments: All strip chart data from the continuous monitoring instruments, air flow and emission calculations, standard gases calibration certifications, and field data sheets are appended to this report.

Submitted by:

Michelle S. Payte for

Juan J. Rios
Technical Director

JJR/aer

TABLE I

Unit Tested: Flare 1434-1
 Operating Temperature: 1680°F
 Sampling Date: June 2, 1988
 Sampling Location: Altamont Landfill

TEST #	1	2	3	AVG
Time				
Duct Temp. °F				1492
Volume Flow, CFM				45,144
Volume Flow, SDCFM				11,127
Water Vapor, vol %				7.3
Oxygen %	11.8	11.9	11.9	11.9
Carbon Dioxide %	8.9	8.4	8.4	8.6
NO _x Concentration, ppm (v/v)	18	16	17	17
NO _x Emissions as NO ₂ , lbs/hr	1.5	1.3	1.4	1.4
TNMHC Concentration, ppm (v/v)	ND	ND	ND	ND
TNMHC Emissions as C ₁ , lbs/hr	ND	ND	ND	ND
CO Concentration, ppm (v/v)	95	118	115	109
CO Emissions, lbs/hr	4.6	5.7	5.6	5.3

NO_x - Oxides of Nitrogen

NO₂ - Nitrogen Dioxide

TNMHC - Total Nonmethane Hydrocarbons

CO - Carbon Monoxide

TABLE II

Unit Tested: Flare 1469-1
 Operating Temperature: 1700°F
 Sampling Date: June 2, 1988
 Sampling Location: Altamont Landfill

TEST #	1	2	3	AVG
Time	1149 - 1219	1255 - 1325	1342 - 1410	1557
Duct Temp. °F				53,460
Volume Flow, CFM				12,651
Volume Flow, SDCFM				8.0
Water Vapor, vol %				11.7
Oxygen %	11.6	11.4	12.0	11.7
Carbon Dioxide %	8.3	8.8	8.7	8.6
NO _x Concentration, ppm (v/v)	18	17	18	18
NO _x Emissions as NO ₂ , lbs/hr	1.6	1.6	1.6	1.6
TNMHC Concentration, ppm (v/v)	ND	ND	ND	ND
TNMHC Emissions as C ₁ , lbs/hr	ND	ND	ND	ND
CO Concentration, ppm (v/v)	152	170	145	156
CO Emissions, lbs/hr	8.3	9.3	8.0	8.6

NO_x - Oxides of Nitrogen

NO₂ - Nitrogen Dioxide

TNMHC - Total Nonmethane Hydrocarbons

CO - Carbon Monoxide

APPENDIX I
FLOW DATA

SITE

h

T.

THERMO ANALYTICAL

Client: EMCON FLARE 1434-1 Date Tested: 6/1/89

Test No.: 1 Time: 1920

Gas Flow Rate Data

Point	h	T.	Vel. Ft/Sec
1	.075	1492	29.8
2	.005	1492	7.7
3	.01	1492	10.9
4	.01	1492	10.9
5	.01	1492	10.9
6	.01	1492	10.9
7	.01	1492	10.9
8	.01	1492	10.9
9	.01	1492	10.9
1	.005	1492	7.7
2	.005	1492	7.7
3	.01	1492	10.9
4	.01	1492	10.9
5	.01	1492	10.9
6	.01	1492	10.9
7	.01	1492	10.9
8	.01	1492	10.9
9	.01	1492	10.9

$$V_s = C_p [h \cdot (T + 460)]^{.5} [1/M.W. \cdot P_s]^{.5} \cdot 85.49$$

Conc. of CO2 = 8.4 %

Conc. of O2 = 11.9 %

Conc. of H2O = 7.3 %

Avg. Gas Velocity; V_s , Avg. 11.4 Ft/SecPitot Tube Correction Factor, C_p .84

Duct Gas Molecular Weight, M.W. 29.07

Duct Pressure, P_s 29.3 "Hg

Barometric Pressure 29.3 "Hg

Duct Size Round 110 In. Diameter

Static Pressure -.04 "H2O

Duct Area 66 Sq. Ft

Avg. Gas Temp. 1492

Gas Flow Rate 11.4 Ft/Sec $\cdot$ 66 Sq. Ft $\cdot$ 60 = 45144 CFM

$$45144 \text{ CFM} \cdot 530 / 1952 \cdot 29.3 / 29.92 \cdot (1.00 - 7.3 / 100 \text{ H}_2\text{O}) = 11127 \text{ SDCFM}$$

M.W. Factor = .0342

Standard Cond. Temp. 70

THERMO ANALYTICAL

Client : EMCON FLARE 1469-1 Date Tested : 6/1/88

Test No. : 2 Time : 1342

GAS SAMPLE DATA

Avg Gas Meter Pressure 0 "Hg

Avg Gas Meter Temp 90

Barometric Pressure 29.3 "Hg

Condensate 28 ml

Sample Volume 16.91 CF

Condensed Water Vapor:

$$V_w = 0.00267 \times 28 \times 530 / 29.92 = 1.32 \text{ SDCF}$$

Corrected Meter Volume:

$$V_o = 16.91 \times 29.3 / 29.92 \times 530 / 550 = 15.96 \text{ SDCF}$$

Percent Water Vapor:

$$\% \text{ H}_2\text{O} = 1.32 / 17.28 \times 100 = 7.7 \%$$

THERMO ANALYTICAL

Client : EMCON 1469-1

Date Tested : 6/1/88

Test No. : 1

Time : 1238

GAS SAMPLE DATA

Avg Gas Meter Pressure 0 "Hg

Avg Gas Meter Temp 91

Barometric Pressure 29.3 "Hg

Condensate 43 ml

Sample Volume 24.32 CF

Condensed Water Vapor:

$$V_w = 0.00267 * 43 * 530 / 29.92 = 2.03 \text{ SDCF}$$

Corrected Meter Volume:

$$V_o = 24.32 * 29.3 / 29.92 * 530 / 551 = 22.91 \text{ SDCF}$$

Percent Water Vapor:

$$\% \text{ H}_2\text{O} = 2.03 / 24.94 * 100 = 8.2 \%$$

THERMO ANALYTICAL

Client : EMCON FLARE 1434-1 Date Tested : 6/1/88

Test No. : 112 Time : 1829

GAS SAMPLE DATA

Avg Gas Meter Pressure 0.2 Hg

Avg Gas Meter Temp 91

Barometric Pressure 29.3 Hg

Condensate 28 ml

Sample Volume 17.82 CF

Condensed Water Vapor:

$$V_w = 0.00267 * 28 * 530 / 29.92 = 1.32 \text{ SDCF}$$

Corrected Meter Volume:

$$V_o = 17.82 * 29.3 / 29.92 * 530 / 551 = 16.79 \text{ SDCF}$$

Percent Water Vapor:

$$\% \text{ H}_2\text{O} = 1.32 / 18.11 * 100 = 7.3 \%$$

THERMO ANALYTICAL

Client : EMCON FLARE 1434-1 Date Tested : 6/1/88

Test No. : 1 Time : 1740

GAS SAMPLE DATA

Avg Gas Meter Pressure 0 "Hg

Avg Gas Meter Temp 91

Barometric Pressure 29.3 "Hg

Condensate 28 ml

Sample Volume 17.88 CF

Condensed Water Vapor:

$$V_w = 0.00267 \times 28 \times 530 / 29.92 = 1.32 \text{ SDCF}$$

Corrected Meter Volume:

$$V_o = 17.88 \times 29.3 / 29.92 \times 530 / 551 = 16.84 \text{ SDCF}$$

Percent Water Vapor:

$$\% \text{ H}_2\text{O} = 1.32 / 18.17 \times 100 = 7.3 \%$$

.SITE

THERMO ANALYTICAL

Client : EMCON FLARE 1469-1 Date Tested : 6/1/88

Test No. : 1 Time : 1420

Gas Flow Rate Data

Point	h	T	Vel. Ft/Sec
1	.015	1557	13.5
2	.015	1557	13.5
3	.015	1557	13.5
4	.015	1557	13.5
5	.015	1557	13.5
6	.015	1557	13.5
7	.015	1557	13.5
8	.015	1557	13.5
9	.015	1557	13.5
1	.015	1557	13.5
2	.015	1557	13.5
3	.015	1557	13.5
4	.015	1557	13.5
5	.015	1557	13.5
16	.015	1557	13.5
17	.015	1557	13.5
18	.015	1557	13.5
19	.015	1557	13.5

$$Vs = C_p [h \cdot (T + 460)]^{.5} [1/M.W. \cdot Ps]^{.5} \cdot 85.49$$

Conc. of CO2 = 8.7 %

Conc. of O2 = 12 %

Conc. of H2O = 8 %

Avg. Gas Velocity; Vs, Avg. 13.5 Ft/Sec

Pitot Tube Correction Factor, Cp .84

Duct Gas Molecular Weight, M.W. 29.03

Duct Pressure, Ps. 29.29 "Hg

Barometric Pressure 29.3 "Hg

Duct Size Round 110 In. Diameter

Static Pressure -.095 "H2O

Duct Area 66 Sq. Ft

Avg. Gas Temp. 1557

Gas Flow Rate 13.5 Ft/Sec $\times$ 66 Sq. Ft $\times$ 60 = 53460 CFM

53460 CFM $\times$ 530 / 2017 $\times$ 29.29 / 29.92 $\times$ (1.00 - 8 / 100% H2O) = 12651 SDCFM

M.W. Factor = .0342

Standard Cond. Temp. 70

APPENDIX II

FIELD DATA

51% of 1500 CFM

DATE: 6-1-88
 PLANT: ACAMONT
 SAMPLE TYPE: H₂O, VELDUM,
 DUCT LOCATION: LANDFILL

Thermo-Analytical Norcal Co.
 AIR POLLUTION ANALYSIS

Source Test Field Data Sheet

DUCT DIAM: 9'2"
 FITTING SIZE:
 WALL THICKNESS:
 DUCT STATIC PRESS: -0.04

#1434-1
 Test Number
 35' FLARE

TIFFINBLE NO.
 NOZZLE DIAM
 NOZZLE TYPE
 GAS COLLECTOR
 METER NO. 062
 BAROMETRIC PRESS. 29.30
 DRAFT GAGE Red Mag
 TRAVERSE PITOT TUBE 9'S
 MONITORING PITOT TUBE 25MB / 28 MB
 CONDENSATE

PITOT TRAVERSE				PITOT MONITOR				SAMPLING							REMARKS	
Point	45.5" In from Cent.	Time	Duct Temp °F	Ah "1120	Vel FPS	Duct Temp °F	Vol FPS	Time	Point	Water Rate CFM	Water Temp °F	Water Press "H ₂ O	Vol Ft ³	Orif. Sett.	Pump Vac.	
1	7.8	100.5	1542					1740	9	1	92/93	9	816.50			
2	12.9	100.5	1542					1810	9	1	90/92	9	104.38			
3	16.5	101														
4	25.0	101														
5	33.0	101														
6	44.7	101														
7	76.3	101														
8	85.0	101														
9	76.0	101						1820	9	1	90/92	0	104.38			
10	102.5	101						1850	9	1	89/91	1	122.20			
11	106.1															
12	113.2															
1	105	1470											17.82			
2	100.5															
3	101															
4	101															
5	101															
6	101															
7	101															
8	101															
9	101															
10	100.5															
11																
12																

gfw

589.4 1500 ftm. 8.126 ft

DATE: 6-1-88
 PLANT: ACTAMONT SANITARY AIR POLLUTION ANALYSIS
 LANDFILL
 SAMPLE TYPE: VER 1 M. O
 DUCT LOCATION:
 DUCT DIAH: 9.6" - 10" (ID = 9.2") 110"
 FITTING SIZE: 3" MAGE
 WALL THICKNESS: 2" ART LENS 1/2"
 DUCT STATIC PRESS: -0.095
 Source Test Field Data Sheet
 1469-1
 Test Number
 40' FLARE

THIMBLE NO.
 NOZZLE DIAH
 NOZZLE TYPE
 GAS COLLECTOR
 METER NO.
 BAROMETRIC PRESS.
 DRAFT GAGE
 TRAVERSE PITOT TUBE
 MONITORING PITOT TUBE
 CONDENSATE

PITOT TRAVERSE					PITOT MONITOR			SAMPLING						REMARKS		
Point	Radius from center	Time: 1420		Duct Temp °F	Vel FPS	Alt	Duct Temp °F	Time	Point	Meter Rate CFH	Meter Temp °F	Meter Press inHg	Vol Ft³	Orif. Sett.	Pump Vac.	
		Alt	Vel FPS													
1	7.8"	0.05	155					1238			90/91	0	023.31			
2	12.9	0.05						1301			85/90		036.6			
3	18.3	0.05						1321			85/90		047.63			
4	28.0	0.05									94.5		024.32			
5	33.0	0.05														
6	44.3	0.05														
7	76.3	0.05														
8	88.0	0.05														
9	76.0	0.05						1342			88/92	0	047.63			
10	102.5							1408			42.88		044.38			
11	108.1												16.81			
12	113.2															
1		0.02	1670													
2		0.05														
3		0.05														
4		0.05														
5		0.05														
6		0.05														
7		0.05														
8		0.05														
9		0.05														
10																
11																
12																

bu

APPENDIX III

STRIP CHART

SUMMARY OF SETUP PARAMETERS PROGRAM 3- ENCON CHART : V

DATE : 6/1/88

TIME : 10:41:27

CHART SPEED : 1 CM/MIN

CONSTANTS

1 0.0000E+00 2 0.0000E+00 3 0.0000E+00 4 0.0000E+00 5 0.0000E+00 6 0.0000E+00

OPTIONS AVAILABLE ARE

1 PRINT TIME OF DAY

7 DISABLE AUTORANGING

CHAN	TITLE	UNITS	SCALE FACTOR	ZERO	ANALOG SENSITIVITY	ANALOG ZERO
1	NOX	PPH	1.0000E+00 VOLTS/ PPM	0.0000E+00 PPM	1.0000E+02 PPM /CM	0.0000E+00 PPM
2	O2	PCT	4.0000E-05 VOLTS/ PCT	0.0000E+00 PCT	2.5000E+00 PCT /CM	0.0000E+00 PCT
3	THC	PPH	1.0000E-02 VOLTS/ PPM	0.0000E+00 PPM	1.0000E+02 PPM /CM	0.0000E+00 PPM
4	CO	PPH	1.0000E-06 VOLTS/ PPM	0.0000E+00 PPM	1.0000E+03 PPM /CM	0.0000E+00 PPM
5	CO2	PCT	5.0000E-04 VOLTS/ PCT	0.0000E+00 PCT	2.0000E+00 PCT /CM	0.0000E+00 PCT
6	-	-	-	-	-	-
7	-	-	-	-	-	-
8	-	-	-	-	-	-
9	-	-	-	-	-	-
10	-	-	-	-	-	-
11	-	-	-	-	-	-
12	-	-	-	-	-	-

* ↓ INDICATES AUTOMATIC RANGE CHANGE IN FOLLOWING DIGITAL CHANNEL

TO START CHART JUST PRESS RUN

TO STOP CHART JUST PRESS STOP

TO END CHART PRESS SFT THEN END

TO CHANGE PARAMETERS ENTER A NUMBER THEN PRESS ENTR SEE MANUAL

1 CHART SPEED

4 PEN DROP

7 ANALOG ZERO

2 SET CHANNEL

5 DIGITAL ZERO

8 ANALOG SENSITIVITY

3 PEN LIFT

6 CHANNEL SCALE

9 SET CONSTANT

PRESS RUN TO START CHART OR PRESS END TO RETURN TO START

1 SCALE = 1.0000E-02

ALTMONT
LAND FILL
June 2, 1988

Test Two
Flares

zero

TIME H M S	1 NOX PPH	2 O2 PCT	3 THC PPH	4 CO PPH	5 CO2 PCT
10:43:37	-37.680	20.930	-0.0139	9530.0	7.7810
10:44:36	-38.200	20.650	0.0227	EEEE	19.630
10:45:36	-38.180	20.720	0.0166	381.40	.13820
10:46:36	-38.200	20.710	0.0188	383.20	.14480
10:47:36	-38.630	20.760	0.0184	382.60	.16030
10:48:36	-460.00	24.610	184.00	423.80	6.2790
10:49:36	-36.450	20.520	99.940	3537.0	18.690
10:50:36	-36.800	20.460	88.790	-105.50	.14060
10:51:36	-38.260	20.580	82.640	-106.40	-.16150
10:52:36	-38.060	20.580	79.830	113.20	-.14660
10:53:36	-37.780	20.710	78.830	55.430	-.16800
10:54:36	-21.920	20.550	78.220	44.110	-.19490
10:55:36	.19170	20.370	78.040	83.750	-.21570
10:56:36	.26750	20.370	3.0040	174.30	-.15200
10:57:36	.23210	20.440	2.2440	125.10	-.11800
10:58:36	.23910	20.350	.60940	78.960	-0.0762
10:59:36	.24350	20.690	-1.6270	64.370	-.14300
11:00:36	.14960	20.780	343.20	97.750	0.0810
11:01:36	89.550	20.220	342.50	517.10	3.3300
11:02:36	89.290	19.540	293.20	505.70	3.3450
11:03:36	66.610	18.540	291.90	537.30	3.3050
11:04:36	66.450	18.060	290.00	512.60	3.2810

11:06:36 66.030 9.1340 287.70 487.00 3.3840

11:07:36 66.150 9.2240 286.30 470.90 3.4430

11:08:36 65.780 9.0970 289.40 511.40 3.3130

11:09:36 67.580 8.9860 288.40 473.20 3.4310

11:10:36 70.130 9.1420 287.80 495.90 3.3670

11:11:36 661.60 9.1120 286.80 472.90 3.4270

11:12:36 686.80 9.1870 285.80 466.10 3.3980

11:13:36 681.00 4.9690 284.60 3738.0 9.3500

11:14:36 473.40 4.4550 283.50 3910.0 9.7430

11:15:36 665.00 4.3960 282.90 3884.0 9.6370

11:16:36 726.20 4.1940 282.70 4512.0 9.5700

11:17:36 751.10 4.2910 288.80 4513.0 9.7180

11:18:36 747.90 4.2620 288.30 4547.0 9.6320

11:19:36 740.50 4.2760 287.90 4485.0 9.6320

11:20:36 740.20 4.2170 288.00 4484.0 9.6670

11:21:36 6.6460 16.570 271.10 4549.0 9.6290

11:22:36 2.0360 20.750 27.990 66.160 0.0536

11:23:36 1.6240 33.640 999.60 361.80 1.4340

11:24:36 1.2760 21.460 990.70 114.70 1.76770

11:25:36 .95380 19.930 7769.0 83.750 1.73730

FLARE START
#1 TEST 1

SCALE = 1.0000E-03

ASEN = 1.0000E+03

E/arp
#1469-1

11:27:36	.54640	20.180	8342.0	54.540	.72600
11:28:36	.34530	19.940	7393.0	93.280	.58770

11:29:36	.24890	19.960	8585.0	35.160	.76360
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11:30:36	.17070	20.150	8143.0	75.700	.74630
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11:31:36	.12900	20.370	6550.0	53.050	.59490
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11:32:36	39.490	11.850	798.00	372.20	8.4280
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11:33:36	184.80	8.0940	172.10	8143.0	13.830
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11:34:36	39.700	9.9620	77.930	467.30	8.4640
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11:35:36	38.430	8.2930	53.240	245.20	10.950
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11:36:36	41.120	8.2250	41.090	143.00	10.710
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11:37:36	29.690	8.7920	30.800	184.20	10.390
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11:38:52	20.590	11.140	24.300	152.80	8.5340
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11:39:52	17.200	13.030	2.1710	64.460	4.7510
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11:41:07	17.560	12.920	1.4040	87.420	4.6760
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11:42:07	19.890	12.100	-4.0430	105.50	7.7470
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11:43:07	20.700	11.310	-4.0330	101.00	8.4140
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11:44:07	21.740	11.250	-7.3270	155.80	8.4620
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11:45:07	48.030	11.070	-8.0940	123.30	8.4720
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11:46:07	69.650	11.720	-7.8430	135.40	8.5270
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11:47:07	70.340	11.040	262.10	1381.0	4.3780
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11:48:07	70.670	12.010	281.30	404.80	3.4140
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STOP

SCALE = 1.0000E+02

STOP

ASSEN = 1.0000E+02

1531
 F1212 1419-1
 1700°F

NOX O₂ THC CO CO₂

11:49:07	20.360	12.010	-10.800	124.80	8.0970
11:50:07	18.320	12.430	-12.100	103.70	7.2650
11:51:07	20.130	11.430	-13.060	101.60	8.4700
11:52:07	19.880	11.850	-14.120	113.80	8.4760
11:53:07	19.290	11.220	-15.390	176.20	8.6130
11:54:07	18.890	12.410	-14.850	121.60	7.5830
11:55:07	18.620	12.330	-15.190	-75.100	6.8940
11:56:07	18.280	11.800	-15.570	158.20	8.4600
11:57:07	18.730	12.400	-15.710	141.80	8.0030
11:58:07	19.220	11.270	-15.400	135.40	8.7480
11:59:07	18.630	11.020	-15.530	132.60	8.8160
12:00:07	19.720	10.800	-15.420	137.10	8.9660
12:01:07	18.490	11.130	-16.130	144.80	8.7420
12:02:07	18.710	11.160	-15.990	171.60	8.8600
12:03:07	18.750	11.730	-16.260	123.90	8.3330
12:04:07	19.380	11.270	-16.360	184.10	8.7100
12:05:07	18.950	11.860	-16.450	168.30	8.0060
12:06:07	18.130	11.210	-16.410	193.10	8.5290
12:07:07	16.890	11.160	-16.400	171.90	8.9150
12:08:07	18.690	11.100	-16.890	148.40	8.8100
12:09:07	15.640	12.960	-16.030	139.70	7.0600
12:10:07	16.550	11.540	-0.0171	135.30	8.1890

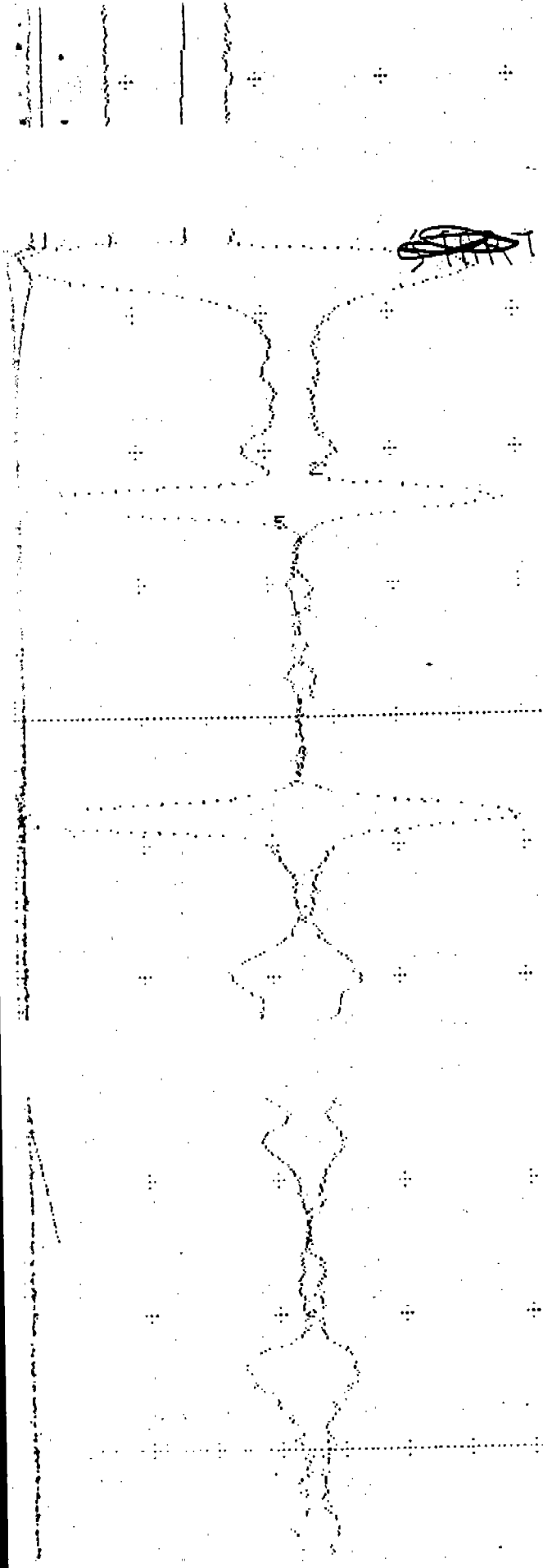
12:12:07	18.410	11.020	-0.0168	179.10	8.5180
12:13:07	18.370	11.000	-0.0101	134.40	8.9220
12:14:07	19.100	10.980	-0.0129	123.30	9.0000
12:15:07	17.410	11.060	-0.0128	166.60	8.7150
12:16:07	17.800	11.720	-0.0141	168.00	8.1830
12:17:07	17.050	11.780	-0.0134	175.50	8.2390
12:18:07	15.750	11.960	0.0087	224.70	8.4490
12:19:07	15.640	13.190	0.0267	178.10	7.2930
	<u>18</u>	<u>11.6</u>	<u>0</u>	<u>152</u>	<u>8.3</u>

End

12:20:07	.17200	20.660	0.0152	157.60	.15020
12:21:07	0.0942	20.400	-0.0028	112.00	.13110
12:22:07	.11120	20.310	-65.510	143.60	0.0530
12:23:07	17.230	12.290	-16.470	158.50	7.9040
12:24:07	.11170	20.720	-16.440	196.10	0.0816
12:25:07	0.0763	20.660	-19.120	55.730	0.0792
12:26:07	0.0802	20.320	4.2270	-107.20	-.17160
12:27:07	0.0433	20.580	3.5170	-109.90	-.17340
12:28:07	0.0431	20.680	3.5570	-92.090	-.13590
12:29:07	0.0717	20.640	2.6590	81.360	-.14720

2.5.5

12:30:07	65.270	20.620	304.70	115.30	-0.0742
12:31:07	67.430	9.2910	311.30	554.60	3.0910
12:32:07	68.030	9.4100	294.40	571.30	3.0500



12:34:07	68.800	9.0680	293.00	512.40	3.4130
12:35:07	68.880	9.1200	287.40	483.70	3.3970
12:36:07	3.9750	10.170	23.610	318.90	1.7200
12:37:07	15.780	12.840	32.540	123.60	7.5280
12:38:07	16.530	12.180	19.600	103.40	8.0800
12:39:07	15.570	12.820	15.340	162.40	7.3480
12:40:07	17.120	13.680	10.290	150.50	5.8040
12:41:07	17.280	11.820	6.7090	177.30	8.6010
12:42:07	17.460	10.930	5.9500	163.60	9.1110
12:43:07	17.450	11.240	3.8100	156.10	8.8720
12:44:07	15.890	11.130	1.5700	176.40	8.9290
12:45:07	15.590	12.680	5.8420	119.20	7.8200
12:46:07	16.820	11.310	3.2030	148.40	8.8060
12:47:07	14.100	13.500	2.9130	157.00	6.7550
12:48:07	15.350	11.950	16.820	140.90	8.4290
12:49:07	16.810	11.810	33.220	142.40	8.6320
12:50:07	16.920	11.080	6.6670	160.60	8.8620
12:51:07	17.140	11.100	1.6600	168.60	8.8410
12:52:07	15.050	12.970	.42830	87.920	7.2120
12:53:07	17.200	11.820	.14550	139.10	8.6240
12:54:07	16.150	12.060	1.0490	148.40	8.6000

Flare #1469-1

STAFF TEST 2

12:55:07	17.590	11.050	.17400	138.50	8.0180
12:56:07	17.570	10.960	-.17530	119.80	8.9860
12:57:07	14.660	11.780	-0.0853	140.00	8.6340
12:58:07	17.550	11.360	.26380	188.30	8.9720
12:59:07	17.520	11.230	.12490	185.10	8.9800
13:00:07	17.450	11.080	-.40160	197.90	8.9530
13:01:07	14.940	11.930	-.33450	146.00	8.4260
13:02:07	15.680	11.980	-1.0260	137.10	8.6650
13:03:07	17.340	11.180	-.29370	182.70	8.8630
13:04:07	17.440	11.290	-.57910	196.10	8.8750
13:05:07	17.040	11.160	-2.1360	208.30	8.9640
13:06:07	17.950	11.160	-2.5460	211.30	9.0030
13:07:07	18.200	11.130	-2.5010	178.50	9.0690
13:08:07	18.910	10.660	-1.9470	163.30	8.3480
13:09:07	17.820	11.150	-1.5360	201.70	8.2890
13:10:07	17.510	11.350	-1.7290	204.50	8.9420
13:11:07	17.690	11.120	-2.0680	159.70	8.9080
13:12:07	17.480	11.720	-2.1800	123.90	8.7280
13:13:07	17.570	11.160	-2.6330	151.10	8.9560
13:14:07	18.110	11.120	-2.3930	184.50	9.1050
13:15:07	16.950	12.010	-2.5540	144.30	8.3130
13:16:07	17.140	11.090	-2.3320	139.70	8.9680
13:17:07	17.320	11.530	-1.1460	163.90	8.6390
13:18:07	16.820	11.970	-.96780	194.00	8.4170
13:19:07	15.930	12.440	-.43720	143.30	7.7630

13:21:07	18.340	10.960	-3.0750	161.20	9.0160
13:22:07	18.280	11.070	-2.7060	156.70	9.0800
13:23:07	18.420	11.000	-2.9760	180.60	9.2000
13:24:07	18.010	11.130	-3.1300	168.00	9.0700
13:25:07	16.400	11.760	-3.3500	169.20	8.5300
	<u>17</u>	<u>11.4</u>	<u>0</u>	<u>170</u>	<u>8.6</u>

End

13:26:07	.13960	20.500	11.590	159.40	0.0876
13:27:07	0.0980	20.340	7.7250	183.20	0.0608
13:28:07	0.0863	20.250	4.9590	91.500	-1.13880
13:29:07	0.0931	20.310	5.3520	111.40	-1.10370
13:30:07	0.0787	20.310	4.4530	77.490	-1.11080
13:31:07	0.0737	13.350	1.4940	474.40	2.7230

ZESC

13:32:07	0.0746	9.1200	260.20	551.00	3.3410
13:33:07	67.370	8.9410	259.10	527.50	3.3790
13:34:07	68.520	8.9180	269.20	547.80	3.4200
13:35:07	68.640	8.9560	269.40	542.70	3.4000
13:36:07	69.450	8.9260	269.70	487.00	3.4170
13:37:07	68.970	9.8570	269.50	471.20	3.3580
13:38:07	68.920	9.8420	269.30	505.10	3.3620
13:39:07	69.080	9.5220	269.80	561.00	3.3820
13:40:07	69.230	9.3280	268.80	484.90	3.3730
13:41:07	69.420	9.1200	268.20	475.60	3.3580

SPAN

Flare # 1407-1
TEST 3

13:43:07	18.590	11.430	-3.8620	172.80	9.0330
13:44:07	18.050	11.070	-5.7340	178.20	9.4990
13:45:07	18.560	11.280	-5.9040	185.00	9.2450
13:46:07	18.250	11.830	-4.6810	166.60	9.0040
13:47:07	16.770	12.240	-7.8640	137.40	8.2560
13:48:07	17.800	11.990	-7.6090	178.20	8.7840
13:49:07	18.240	12.040	-7.7020	164.50	8.9440
13:50:07	18.650	11.660	-8.9460	132.60	9.0380
13:51:07	18.930	11.300	-9.7120	124.50	9.3100
13:52:07	18.640	11.720	-9.8680	132.00	9.1020
13:53:07	18.300	11.810	-9.9200	134.40	8.9730
13:54:07	15.500	13.160	-8.8210	143.30	7.4820
13:55:07	18.580	11.980	-10.270	130.80	8.9020
13:56:07	18.060	11.720	-10.180	121.30	9.2130
13:57:07	17.450	12.330	-9.6890	124.80	8.8010
13:58:07	16.840	12.770	-9.7960	123.60	7.7370
13:59:07	17.900	11.750	-10.000	126.90	8.8840
14:00:07	19.150	11.240	-11.290	154.90	9.2810
14:01:07	18.900	11.070	-12.130	161.80	9.3170
14:02:07	18.010	11.820	-12.050	141.80	8.8640
14:03:07	17.620	11.750	-11.730	140.90	8.9150
14:04:07	16.350	12.650	-11.250	131.70	7.8450
14:05:07	14.390	13.120	-11.030	120.10	7.5700
14:06:07	16.420	12.390	-10.960	132.90	8.5230
14:07:07	17.690	12.070	-11.460	114.40	8.7400
14:08:07	15.780	12.870	-11.140	138.20	7.6740

End

14:10:07	17.070	12.130	-12.410	143.90	8.1430
	18	12.0	0	145	8.7

14:11:07	68.760	9.2170	278.20	491.10	3.3840
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14:12:07	.25490	19.230	3.1380	65.570	.23120
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14:13:07	.13600	20.990	-1.8170	169.50	0.0673
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14:14:07	.10590	21.010	-2.2810	146.00	0.0917
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14:15:07	68.380	9.4550	276.50	494.80	3.3790
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14:16:07	69.180	9.2990	283.50	502.20	3.3760
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14:17:07	69.160	9.2390	282.30	493.50	3.4170
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14:18:07	69.150	9.1120	281.50	472.90	3.4310
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14:19:07	69.120	9.1420	293.30	502.50	3.4
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14:20:07	69.080	9.1570	293.30	480.70	3.3750
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14:21:07	69.060	9.0450	291.90	500.10	3.3800
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Flare #1434-1
TEST

1350 OF

16:02:21	1.5480	72.730	-73.620	474.20	1.4270
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16:57:28	14.480	19.290	252.10	263.40	6.8360
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16:58:28	23.470	10.180	91.030	104.00	10.380
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16:59:28	22.720	9.8720	-1.85490	101.30	10.550
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17:00:28	18.860	10.820	-1.8110	84.840	9.3530
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START

17:02:28	16.790	12.140	-15.630	54.240	8.4020
17:03:28	17.900	11.890	-16.890	98.350	8.9520
17:04:28	17.760	11.850	-18.540	104.90	8.8760
17:05:28	17.400	11.770	-19.630	75.100	8.5000
17:06:28	17.340	12.060	-20.640	71.820	8.6890
17:07:28	16.490	12.140	-20.790	53.840	8.4090
17:08:28	17.780	11.860	-21.750	79.870	8.7320
17:09:28	17.350	11.840	-22.340	162.40	8.7760
17:10:28	18.140	11.510	-22.970	98.550	9.0540
17:11:28	18.120	11.170	-22.940	101.00	9.1020
17:12:28	17.710	11.750	-23.370	124.50	8.9290
17:13:28	17.660	11.660	-23.460	109.00	8.9440
17:14:28	17.250	11.710	-23.360	86.130	8.7
17:15:28	17.320	11.750	-24.310	115.60	8.76
17:16:28	17.820	11.670	-24.600	111.10	9.0540
17:17:28	18.190	11.060	-25.200	98.450	9.2190
17:18:28	18.550	11.140	-25.240	78.980	8.8940
17:19:28	18.290	11.250	-25.220	94.770	9.2130
17:20:28	18.830	11.130	-25.770	114.10	9.3770
17:21:28	18.830	11.140	-26.260	113.80	9.2080
17:22:28	18.150	11.080	-26.240	58.710	9.0560
17:23:28	17.650	11.720	-25.890	114.40	8.7830
17:24:28	18.130	11.300	-26.880	105.80	9.1260
17:25:28	18.020	11.210	-26.500	105.20	8.9630
17:26:28	17.340	11.870	-26.340	96.260	8.7930

ENC

17:29:28 16.700 12.310 -26.620 117.70 8.0680
16 11.8 0 95 8.9

17:29:28 .15020 18.470 -14.410 59.310 .25630

17:30:28 0.0634 20.530 -14.880 43.210 -.15430

17:31:28 0.0486 20.450 -2.7880 61.990 -.20680

17:32:28 0.0678 20.520 -12.050 25.630 -.13840

17:33:28 0.0615 20.360 -5.4330 33.080 -.17880

17:34:28 0.0834 20.600 -.62210 107.20 -.20500

2050

LSW
4 PM

17:35:28 65.330 20.550 214.70 89.710 -.18350

17:36:28 70.720 9.2310 291.50 478.30 3.3910

17:37:28 70.820 9.2310 289.90 454.20 3.3500

17:38:28 71.670 9.0150 289.10 459.20 3.4440

17:39:28 71.950 8.8940 289.30 468.20 3.3750

TP512

17:40:28 12.780 12.950 -2.7610 165.40 7.2490

17:41:28 16.450 11.800 -10.640 147.30 8.4710

17:42:28 16.880 11.250 -12.600 142.70 8.7030

17:43:28 16.820 11.480 -12.460 109.60 8.6710

17:44:28 16.710 11.800 -12.890 115.40 8.6200

17:45:28 16.670 11.940 -12.890 113.50 8.3870

17:46:28 16.920 11.590 -13.470 126.30 8.6580

17:47:28 17.140 11.640 -13.300 123.60 8.6750

17:48:28 17.290 11.570 -13.290 138.50 8.5720

17:50:28	16.390	11.840	-13.000	107.20	8.5250
17:51:28	17.590	11.750	-12.590	133.20	8.8750
17:52:28	17.190	11.400	-13.630	104.60	8.7430
17:53:28	17.190	11.400	-13.730	139.40	8.7140
17:54:28	17.170	11.650	-13.670	112.60	8.7060
17:55:28	17.020	11.750	-13.450	137.10	8.6570
17:56:28	15.090	12.620	-12.580	121.40	7.4550
17:57:28	14.400	12.620	-11.180	79.280	7.1600
17:58:28	14.260	12.410	-10.930	108.10	7.9500
17:59:28	15.900	12.270	-12.440	98.350	7.6540
18:00:28	15.220	12.190	-11.520	70.930	7.8830
18:01:28	17.300	11.710	-12.350	118.30	8.4710
18:02:28	17.080	11.820	-13.050	84.940	8.5350
18:03:28	17.200	11.750	-13.790	116.50	8.7230
18:04:28	16.760	11.790	-13.500	147.50	8.4880
18:05:28	17.470	11.620	-14.100	132.60	8.7290
18:06:28	17.170	11.710	-14.250	124.20	8.7470
18:07:28	17.590	11.690	-14.190	115.00	8.7340
18:08:28	17.420	11.680	-15.190	97.750	8.7910
18:09:28	17.340	11.680	-15.170	126.60	8.6280
18:10:28	15.770	12.260	-14.090	98.350	7.8060
	<u>16</u>	<u>11.9</u>	<u>5</u>	<u>118</u>	<u>8.4</u>
18:11:28	0.0768	19.960	10.580	92.690	-1.17400
18:12:28	0.0447	19.960	-8.1720	27.120	-1.17700
18:13:28	0.0527	20.020	-2.8690	55.730	-1.44460

END

18:15:28 0.0389 20.190 2.7410 82.260 -.22710
 18:16:28 0.0341 19.990 18.420 28.910 -.21810
 18:17:28 .11290 19.890 6.2430 67.060 -.26760
 18:18:28 .10680 20.110 9.3920 82.650 -.23900
 18:19:28 0.0436 20.010 -13.120 87.030 -.19610
 18:20:28 0.0313 20.220 19.300 37.550 -.16920
 18:21:28 0.0337 19.880 2.7400 57.520 -.22940
 18:22:28 0.0637 20.160 1.5980 65.570 -.22710
 18:23:28 72.030 9.1050 302.50 478.60 3.3910

18:24:28 72.440 8.9860 306.90 471.80 3.3610
 18:25:28 72.130 9.1200 294.60 462.20 3.3600
 18:26:28 72.320 9.1050 286.30 454.50 3.3640
 18:27:28 73.530 9.1200 287.40 410.40 3.4530
 18:28:28 73.160 9.0970 289.10 495.30 3.3670

18:29:28 ~~14.260~~ ~~13.180~~ ~~3.0090~~ ~~44.400~~ ~~3.6200~~
 18:30:28 17.450 11.670 1.9530 62.880 8.4400
 18:31:28 16.970 12.030 1.4730 78.380 8.3940
 18:32:28 15.770 12.210 .33750 64.920 7.8730
 18:33:28 16.810 11.710 0.0243 104.00 8.5340
 18:34:28 17.200 11.820 -0.0570 129.00 8.6270
 18:35:28 16.980 11.920 -1.74180 137.60 8.6670
 18:36:28 16.960 11.780 -1.30070 123.90 8.6200

18:33:28	17.540	11.720	-1.34400	81.960	8.5710
18:39:28	16.850	11.780	-1.3460	142.70	8.5290
18:40:28	17.390	11.720	-1.21000	98.950	8.7410
18:41:28	16.510	12.000	.24100	78.980	8.3160
18:42:28	16.990	11.730	1.6170	77.490	8.5790
18:43:28	15.420	12.040	1.2190	134.10	8.3480
18:44:28	16.490	11.910	1.4930	92.990	8.2710
18:45:28	16.390	11.980	1.3730	94.840	8.3280
18:46:28	16.740	11.780	.79880	120.10	8.4250
18:47:28	15.390	12.350	2.4500	178.20	7.6820
18:48:28	16.100	12.320	2.0070	104.00	8.0620
18:49:28	15.800	12.170	.94100	114.10	8.0550
18:50:28	16.230	12.040	.88660	166.00	8.1990
18:51:28	16.220	11.930	1.9530	129.40	8.3520
18:52:28	16.480	11.940	1.4540	112.00	8.3920
18:53:28	17.240	11.620	.58820	124.50	8.8750
18:54:28	16.330	12.070	1.3300	95.670	8.3170
18:55:28	16.560	12.190	.91920	135.00	8.2600
18:56:28	16.240	12.070	.97690	115.00	8.0820
18:57:28	16.710	11.840	1.4970	137.10	8.2740
18:58:28	16.590	11.670	1.2370	84.040	8.3260
18:59:28	16.310	11.660	.50820	174.40	8.6490
19:00:28	<u>16.6</u> 0.0732	<u>11.9</u> 20.230	<u>5</u> 8.9520	<u>115</u> 129.40	<u>5.4</u> .11080
19:01:28	0.0439	19.940	7.9320	81.640	-1.24850
19:02:28	0.0573	19.820	7.8270	82.850	-1.22710

End

STOP

19:04:28 70.600 9.1200 297.60 537.00 3.3260

19:05:28 70.550 9.0450 298.40 538.20 3.3910

APPENDIX IV
GAS CALIBRATION SHEETS



Industrial Gases

RARE & SPECIALTY GASES DEPT.

ANALYTICAL REPORT

To: Atlas Welding Supply
1224 6th Street
Berkely, CA. 94710

Date Reported: 9/21/87

Reference: PO#3884
SO#558865-00
Test#SC0987084

Material Submitted: Propane, Carbon Dioxide, Nitrogen Gas Mixture

Information Requested: Ratio Analysis

Method of Analysis: Gas Chromatograph

Result of Investigation: Cyl# 80-8265

<u>Component</u>	<u>Specification</u>	<u>Concentration</u>
Propane	80-100 ppm	96.2 ppm
Carbon Dioxide	2000 ppm	2020 ppm
Nitrogen	Balance	Balance

By

PRINCIPAL GAS ANALYST

This report states accurately the results of the investigation made upon the materials submitted to the Analytical Laboratory. The Laboratory has endeavored to use its resources to determine, and to present, the information requested objectively; HOWEVER, such investigation is undertaken and this report is rendered, on the condition that, under no circumstances (including negligence), shall The BOC Group, Inc. have any liability in excess of its established charge for such investigation. There is NO WARRANTY OF FITNESS FOR ANY PURPOSE, and any use of this report or the information contained herein shall be at the sole risk of the user.



RARE & SPECIALTY GASES DEPT

ANALYTICAL REPORT

To: Atlas Welding Supply
1224 6th Street
Berkeley, Ca. 94710

Date Reported: 12/15/86

Reference: 554539-00
Test No.: SC1286019
Po No.: 1492

Material Submitted: Oxygen/Carbon Dioxide/Carbon Monoxide/Nitrogen gas mixture

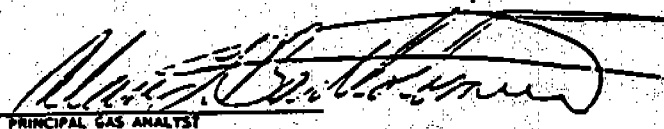
Information Requested: Ratio Analysis

Method of Analysis: Oxygen Analyzer/Gas Chromatograph

Result of Investigation: Cyl. No.: LL-10512

<u>Component</u>	<u>Specification</u>	<u>Concentration</u>
Oxygen	8 to 10%	9.08% $\pm$ 0.18
Carbon Dioxide	3 to 4%	3.42% $\pm$ 0.07
Carbon Monoxide	400 to 500 ppm	487 ppm $\pm$ 10 ppm
Nitrogen	Balance	Balance

By



PRINCIPAL GAS ANALYST

"This report states accurately the results of the investigation made upon the materials submitted to the Analytical Laboratory. Every effort has been made to determine objectively, the information requested; HOWEVER, in connection with its rendering of this report, AIRCO shall have no liability in excess of its established charge for the service. Any use of this report or the information contained herein shall be at the sole risk of the user."



Industrial Gases

RARE & SPECIALTY GASES DEPT.

ANALYTICAL REPORT

To: Atlas Welding Supply
1224 6th Street
Berkeley, CA. 94710

Date Reported: 9/21/87

Reference: PO#3884
SO#558865-00
Test# SC0987082

Material Submitted: Carbon Monoxide, Carbon Dioxide, Oxygen, Nitrogen
Gas Mixture

Information Requested: Ratio Analysis

Method of Analysis: Gas Chromatograph, Oxygen Analyzer

Result of Investigation: Cyl# LL438

<u>Component</u>	<u>Specification</u>	<u>Concentration</u>
Carbon Monoxide	4000-5000 ppm	4555 ppm
Carbon Dioxide	9-11%	9.69%
Oxygen	3-5%	4.22%
Nitrogen	Balance	Balance

By

PRINCIPAL GAS ANALYST

This report states accurately the results of the investigation made upon the materials submitted to the Analytical Laboratory. The Laboratory has endeavored to use its resources to determine, and to present, the information requested objectively. HOWEVER, such investigation is undertaken and this report is rendered, on the condition that, under no circumstances (including negligence), shall The BOC Group, Inc. have any liability in excess of its established charge for such investigation. There is NO WARRANTY OF FITNESS FOR ANY PURPOSE, and any use of this report or the information contained herein shall be at the sole risk of the user.

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