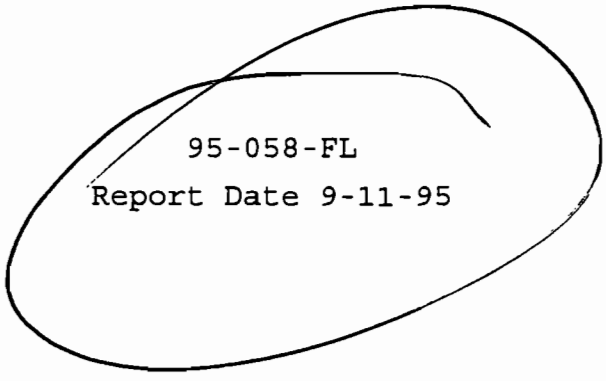

**TOTAL SOURCE ANALYSIS, INC.**

ENVIRONMENTAL TESTING CONSULTANTS

# FINAL
# BASELINE EMISSIONS
# TEST REPORT
# FOR
# JACKSONVILLE ELECTRIC
# ST. JOHNS RIVER
# POWER PARK
# UNIT 1

July 18-20 & August 8, 1995



# TOTAL SOURCE ANALYSIS, INC.
ENVIRONMENTAL TESTING CONSULTANTS

September 11, 1995

I, James Tayfel, hereby certify that the emissions tests conducted at Jacksonville Electric Authority's St. Johns River Power Park, Unit 1 are in accordance with procedures established by the USEPA. This report accurately and faithfully presents the data obtained from the tests and the results determined from analysis of this data.

James Tayfel

James Tayfel
Crew Chief

I, Carl Vineyard, P.E., hereby attest that all work on this project was completed under my supervision and this report accurately presents the emissions from the units.

Carl Vineyard, P.E.
Chief Test Engineer

I, Angel Aguiar, P.E., have reviewed the reports for completeness and accuracy.

ANGEL AGUIAR CERTIFICATE NO. 47035 STATE OF FLORIDA REGISTERED

Angel Aguiar, P.E.
Florida Professional Engineer

510 Dickson • P.O. Box 257 • Wellington, OH 44090 • (216) 647-4444 • FAX (216) 647-5288
41444 SR19 • P.O. Box 2807 • Umatilla, FL 32784 • (904) 669-3113 • FAX (904) 669-1965
599 James Rollo Ct. • P.O. Box 272 • Grain Valley, MO 64029 • (816) 224-6905 • FAX (816) 443-2515

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# INTRODUCTION

INTRODUCTION

This report presents the results of the emissions tests performed for Jacksonville Electric St. Johns River Power Park, Unit 1.

The purpose of the tests was to determine the emissions of the unit. The results of the tests can be found in Section II of this report.

The emissions testing was performed by Total Source Analysis, Inc., whose Florida Branch Office is located at 810 N. Central Avenue, Umatilla, Florida 32784.

The tests were performed on July 18/20 and August 8, 1995. The testing was performed in accordance with EPA reference methods as published in the July 1, 1994 Federal Register, - "Standards of Performance for New Stationary Sources" and subsequent revisions.

The testing equipment and sampling procedures are described in Section III of this report. The raw field data and equations used in determining final results are presented in the Appendix as well as the calibration data sheets for the applicable testing equipment.

SUMMARY OF TEST RESULTS

SUMMARY OF TEST RESULTS

The following table presents the final results of the emissons tests performed on Unit 1 at Jacksonville Electric's St. Johns River Power Park.

**PARTICULATE**

| Run No. | Location | Date | lbs/dscf | lbs/hr | lbs/MBtu |
|---|---|---|---|---|---|
| 1 | Stack | 7-18-95 | 5.09E-07 | 43.52 | .007 |
| 2 | Stack | 7-18-95 | 5.51E-07 | 45.93 | .007 |
| 3 | Stack | 7-18-95 | 5.18E-07 | 42.98 | .007 |
| **Avg.** | | | **5.26E-07** | **44.14** | **.007** |
| 1 | Stack | 7-19-95 | 2.32E-07 | 19.96 | .003 |
| 2 | Stack | 7-19-95 | 1.76E-07 | 14.89 | .002 |
| 3 | Stack | 7-19-95 | 3.47E-07 | 29.67 | .004 |
| **Avg.** | | | **2.52E-07** | **21.50** | **.003** |
| 1 | Stack | 7-20-95 | 1.00E-06 | 84.26 | .013 |
| 2 | Stack | 7-20-95 | 6.54E-07 | 56.54 | .008 |
| 3 | Stack | 7-20-95 | 6.22E-07 | 53.95 | .008 |
| **Avg.** | | | **7.60E-07** | **64.92** | **.0096** |
| 1 | Stack | 8-08-95 | 6.14E-07 | 53.87 | .008 |
| 2 | Stack | 8-08-95 | 5.64E-07 | 49.97 | .007 |
| 3 | Stack | 8-08-95 | 9.08E-07 | 81.73 | .012 |
| **Avg.** | | | **6.95E-07** | **61.85** | **.009** |

## $SO_3$

| Run No. | Location | Date | lbs/dscf | ppm | 02% |
|---|---|---|---|---|---|
| 1 | Stack | 7-18-95 | 1.686E-06 | 8.11 | 4.9 |
| 2 | Stack | 7-18-95 | 1.471E-06 | 7.07 | 5.2 |
| 3 | Stack | 7-18-95 | 1.187E-06 | 5.71 | 4.9 |
| **Avg.** | | | **1.448E-06** | **6.96** | **5.0** |
| 1 | Stack | 7-19-95 | 1.334E-06 | 6.41 | 4.2 |
| 2 | Stack | 7-19-95 | 9.278E-07 | 4.46 | 4.2 |
| 3 | Stack | 7-19-95 | 9.778E-07 | 4.70 | 4.2 |
| **Avg.** | | | **1.080E-06** | **5.19** | **4.2** |
| 1 | Stack | 7-20-95 | 1.144E-06 | 5.50 | 5.2 |
| 2 | Stack | 7-20-95 | 1.178E-06 | 5.67 | 5.2 |
| 3 | Stack | 7-20-95 | 1.141E-06 | 5.49 | 5.1 |
| **Avg.** | | | **1.154E-06** | **5.55** | **5.15** |
| 1 | Stack | 8-08-95 | 1.916E-06 | 9.22 | 5.1 |
| 2 | Stack | 8-08-95 | 1.315E-06 | 6.32 | 5.3 |
| 3 | Stack | 8-08-95 | 1.160E-06 | 5.58 | 5.3 |
| **Avg.** | | | **1.464E-06** | **7.04** | **5.2** |

CO

| Run No. | Location | Test Date | ppm | %02 |
|---|---|---|---|---|
| 1 | Stack | 7-18-95 | 11.54 | 4.92 |
| 2 | Stack | 7-18-95 | 9.21 | 5.16 |
| 3 | Stack | 7-18-95 | 10.13 | 4.90 |
| **Avg.** | | | **10.29** | **4.99** |
| 1 | Stack | 7-19-95 | 51.07 | 4.22 |
| 2 | Stack | 7-19-95 | 52.00 | 4.16 |
| 3 | Stack | 7-19-95 | 32.42 | 4.16 |
| **Avg.** | | | **45.16** | **4.18** |
| 1 | Stack | 7-20-95 | 54.99 | 5.19 |
| 2 | Stack | 7-20-95 | 66.40 | 5.16 |
| 3 | Stack | 7-20-95 | 79.60 | 5.09 |
| **Avg.** | | | **67.00** | **5.15** |
| 1 | Stack | 8-08-95 | 25.17 | 5.09 |
| 2 | Stack | 8-08-95 | 20.18 | 5.28 |
| 3 | Stack | 8-08-95 | 18.11 | 5.27 |
| **Avg.** | | | **21.15** | **5.21** |

The complete results can be found on the computer printouts following.

Total Source Analysis, Inc.
Particulate Test Analysis

JEA
SJRPP
UNIT 1
95-058

| | | | | |
|---|---|---|---|---|
| Run Number | | 1 | 2 | 3 |
| Data set | | (07) | (08) | (09) |
| Date | | 7-18-95 | 7-18-95 | 7-18-95 |
| Location | | STACK BASELINE | STACK BASELINE | STACK BASELINE |
| Start time | | 07:37 | 11:35 | 13:58 |
| End time | | 09:55 | 13:12 | 16:08 |
| Barometric Pressure | In. Hg | 29.93 | 29.93 | 29.93 |
| Static Pressure | In. H2O | -0.55 | -0.55 | -0.54 |
| Volume of Condensate | Mls | 222 | 238 | 246 |
| Volume Sampled | DCF | 79.324 | 74.776 | 76.303 |
| Meter Correction Factor | | 1.02 | 1.02 | 1.02 |
| Square Root of Delta P | | 1.126 | 1.110 | 1.110 |
| Orifice Pressure | In. H2O | 1.27 | 1.13 | 1.13 |
| Meter Temperature | Deg. F | 109 | 114 | 113 |
| Flue Temperature | Deg. F | 165 | 165 | 166 |
| Percent CO2 | % | 15.90 | 14.50 | 15.30 |
| Percent O2 | % | 4.90 | 5.20 | 4.90 |
| Diameter of Nozzle | In | 0.187 | 0.187 | 0.187 |
| Area of Flue | Sq Ft | 471.43 | 471.43 | 471.43 |
| Sample Time | Min | 120 | 120 | 120 |
| Weight Gain | Grams | 0.0174 | 0.0176 | 0.0169 |
| F Factor | DSCF/MBtu | 9780 | 9780 | 9780 |
| Absolute Flue Pressure | In. Hg | 29.89 | 29.89 | 29.89 |
| Corrected Sample Volume | DSCF | 75.31 | 70.35 | 71.91 |
| Moisture in Flue Gas | % | 12.2 | 13.7 | 13.9 |
| Molecular Weight | Lb/LbMole | 29.19 | 28.81 | 28.89 |
| Velocity of Flue Gas | FpS | 67.95 | 67.43 | 67.39 |
| Volume of Flue Gas | ACFM | 1,922,094 | 1,907,238 | 1,906,045 |
| Volume of Flue Gas | DSCFM | 1,423,811 | 1,387,911 | 1,382,507 |
| Dust Concentration | Lb/DSCF | 5.09E-07 | 5.51E-07 | 5.18E-07 |
| Dust Concentration | Lbs/Hour | 43.52 | 45.93 | 42.98 |
| Dust Concentration | Grs/ACF | 2.66E-03 | 2.83E-03 | 2.65E-03 |
| Dust Concentration | Grs/DSCF | 3.56E-03 | 3.86E-03 | 3.62E-03 |
| Isokinetic Rate | % | 108.8 | 104.3 | 107.0 |
| Particulate Emissions | Lb/MBtu | 0.007 | 0.007 | 0.007 |

Averages:

| | | | | |
|---|---|---|---|---|
| Stack Temperature | : | 165.3 | Percent O2 : | 5.0 |
| Vol Flue Gas | ACFM : | 1,911,792 | DSCFM : | 1,398,076 |
| Part Emis | Lb/DSCF : | 5.26E-07 | Lb/Hour : | 44.14 |
| | Grs/ACF : | 2.72E-03 | Grs/DSCF : | 3.69E-03 |
| | Lbs/MBtu : | 7E-03 | | |

Total Source Analysis, Inc.
Particulate Test Analysis

Jacksonville Electric Authority
St. Johns River Power Park
Unit 1
95-058
Baseline - Trial Burn

| Run Number | | 1 | 2 | 3 |
|---|---|---|---|---|
| Data set | | (04) | (05) | (06) |
| Date | | 7-19-95 | 7-19-95 | 7-19-95 |
| Location | | UNIT 1 | UNIT 1 | UNIT 1 |
| Start time | | 07:02 | 10:06 | 12:30 |
| End time | | 09:15 | 12:20 | 15:10 |
| Barometric Pressure | In. Hg | 30.01 | 30.01 | 30.01 |
| Static Pressure | In. H2O | -0.54 | -0.55 | -0.55 |
| Volume of Condensate | Mls | 246 | 263 | 258 |
| Volume Sampled | DCF | 77.789 | 77.375 | 76.610 |
| Meter Correction Factor | | 1.02 | 1.02 | 1.02 |
| Square Root of Delta P | | 1.140 | 1.137 | 1.149 |
| Orifice Pressure | In. H2O | 1.17 | 1.17 | 1.20 |
| Meter Temperature | Deg. F | 119 | 121 | 116 |
| Flue Temperature | Deg. F | 163 | 165 | 165 |
| Percent C02 | % | 15.02 | 17.01 | 17.01 |
| Percent 02 | % | 4.22 | 4.16 | 4.16 |
| Diameter of Nozzle | In | 0.187 | 0.187 | 0.187 |
| Area of Flue | Sq Ft | 471.43 | 471.43 | 471.43 |
| Sample Time | Min | 120 | 120 | 120 |
| Weight Gain | Grams | 0.0077 | 0.0058 | 0.0114 |
| F Factor | DSCF/MBtu | 9780 | 9780 | 9780 |
| Absolute Flue Pressure | In. Hg | 29.97 | 29.97 | 29.97 |
| Corrected Sample Volume | DSCF | 72.93 | 72.35 | 72.29 |
| Moisture in Flue Gas | % | 13.7 | 14.6 | 14.4 |
| Molecular Weight | Lb/LbMole | 28.85 | 29.01 | 29.04 |
| Velocity of Flue Gas | FpS | 69.00 | 68.75 | 69.44 |
| Volume of Flue Gas | ACFM | 1,951,842 | 1,944,535 | 1,964,314 |
| Volume of Flue Gas | DSCFM | 1,429,061 | 1,404,476 | 1,422,188 |
| Dust Concentration | Lb/DSCF | 2.32E-07 | 1.76E-07 | 3.47E-07 |
| Dust Concentration | Lbs/Hour | 19.96 | 14.89 | 29.67 |
| Dust Concentration | Grs/ACF | 1.20E-03 | 9.02E-04 | 1.77E-03 |
| Dust Concentration | Grs/DSCF | 1.62E-03 | 1.23E-03 | 2.43E-03 |
| Isokinetic Rate | % | 105.0 | 106.0 | 104.6 |
| Particulate Emissions | Lb/MBtu | 0.003 | 0.002 | 0.004 |

Averages:

| | | | | | |
|---|---|---|---|---|---|
| Stack Temperature | | : 164.6 | | | |
| Vol Flue Gas | ACFM | : 1,953,564 | Percent 02 | : | 4.2 |
| | | | DSCFM | : | 1,418,575 |
| Part Emis | Lb/DSCF | : 2.52E-07 | Lb/Hour | : | 21.50 |
| | Grs/ACF | : 1.3E-03 | Grs/DSCF | : | 1.77E-03 |
| | Lbs/MBtu | : 3E-03 | | | |

Total Source Analysis, Inc.
Particulate Test Analysis

JEA
SJRPP
UNIT 1
95-058

| | | | | |
|---|---|---|---|---|
| Run Number | | 1 | 2 | 3 |
| Data set | | (10) | (11) | (12) |
| Date | | 7-20-95 | 7-20-95 | 7-20-95 |
| Location | | STACK BASELINE | STACK BASELINE | STACK BASELINE |
| Start time | | 06:55 | 09:45 | 12:31 |
| End time | | 09:25 | 12:03 | 14:35 |
| Barometric Pressure | In. Hg | 30.08 | 30.08 | 30.08 |
| Static Pressure | In. H2O | -0.50 | -0.55 | -0.55 |
| Volume of Condensate | Mls | 248 | 251 | 275 |
| Volume Sampled | DCF | 76.287 | 77.627 | 78.313 |
| Meter Correction Factor | | 1.02 | 1.02 | 1.02 |
| Square Root of Delta P | | 1.121 | 1.152 | 1.167 |
| Orifice Pressure | In. H2O | 1.14 | 1.20 | 1.21 |
| Meter Temperature | Deg. F | 116 | 119 | 120 |
| Flue Temperature | Deg. F | 165 | 164 | 164 |
| Percent CO2 | % | 15.17 | 15.18 | 15.22 |
| Percent O2 | % | 5.20 | 5.16 | 5.09 |
| Diameter of Nozzle | In | 0.187 | 0.187 | 0.187 |
| Area of Flue | Sq Ft | 471.43 | 471.43 | 471.43 |
| Sample Time | Min | 120 | 120 | 120 |
| Weight Gain | Grams | 0.0327 | 0.0216 | 0.0207 |
| F Factor | DSCF/MBtu | 9780 | 9780 | 9780 |
| Absolute Flue Pressure | In. Hg | 30.04 | 30.04 | 30.04 |
| Corrected Sample Volume | DSCF | 71.88 | 72.78 | 73.29 |
| Moisture in Flue Gas | % | 14.0 | 13.9 | 15.0 |
| Molecular Weight | Lb/LbMole | 28.87 | 28.87 | 28.74 |
| Velocity of Flue Gas | FpS | 67.85 | 69.67 | 70.74 |
| Volume of Flue Gas | ACFM | 1,919,072 | 1,970,625 | 2,000,835 |
| Volume of Flue Gas | DSCFM | 1,400,050 | 1,440,016 | 1,444,038 |
| Dust Concentration | Lb/DSCF | 1.00E-06 | 6.54E-07 | 6.22E-07 |
| Dust Concentration | Lbs/Hour | 84.26 | 56.54 | 53.95 |
| Dust Concentration | Grs/ACF | 5.16E-03 | 3.37E-03 | 3.18E-03 |
| Dust Concentration | Grs/DSCF | 7.02E-03 | 4.58E-03 | 4.35E-03 |
| Isokinetic Rate | % | 105.6 | 103.9 | 104.4 |
| Particulate Emissions | Lb/MBtu | 0.013 | 0.008 | 0.008 |

Averages:

| | | | | |
|---|---|---|---|---|
| Stack Temperature | : | 164.3 | Percent O2 : | 5.2 |
| Vol Flue Gas | ACFM : | 1,963,511 | DSCFM : | 1,428,035 |
| Part Emis | Lb/DSCF : | 7.60E-07 | Lb/Hour : | 64.92 |
| | Grs/ACF : | 3.91E-03 | Grs/DSCF : | 5.32E-03 |
| | Lbs/MBtu : | 9.67E-03 | | |

Total Source Analysis, Inc.
Particulate Test Analysis

JEA
SJRPP
UNIT 1
95-058

| | | | | |
|---|---|---|---|---|
| Run Number | | 1 | 2 | 3 |
| Data set | | (13) | (14) | (15) |
| Date | | 8-8-95 | 8-8-95 | 8-8-95 |
| Location | | STACK BASELINE | STACK BASELINE | STACK BASELINE |
| Start time | | 07:45 | 11:45 | 15:00 |
| End time | | 11:10 | 14:05 | 17:12 |
| Barometric Pressure | In. Hg | 30.23 | 30.23 | 30.23 |
| Static Pressure | In. H2O | -0.53 | -0.55 | -0.55 |
| Volume of Condensate | Mls | 221 | 258 | 247 |
| Volume Sampled | DCF | 78.438 | 79.836 | 82.228 |
| Meter Correction Factor | | 1.02 | 1.02 | 1.02 |
| Square Root of Delta P | | 1.151 | 1.179 | 1.188 |
| Orifice Pressure | In. H2O | 1.25 | 1.33 | 1.29 |
| Meter Temperature | Deg. F | 119 | 121 | 114 |
| Flue Temperature | Deg. F | 170 | 170 | 170 |
| Percent CO2 | % | 14.08 | 13.94 | 13.99 |
| Percent O2 | % | 5.09 | 5.28 | 5.27 |
| Diameter of Nozzle | In | 0.187 | 0.187 | 0.187 |
| Area of Flue | Sq Ft | 471.43 | 471.43 | 471.43 |
| Sample Time | Min | 120 | 120 | 120 |
| Weight Gain | Grams | 0.0206 | 0.0192 | 0.0322 |
| F Factor | DSCF/MBtu | 9780 | 9780 | 9780 |
| Absolute Flue Pressure | In. Hg | 30.19 | 30.19 | 30.19 |
| Corrected Sample Volume | DSCF | 73.91 | 74.98 | 78.16 |
| Moisture in Flue Gas | % | 12.4 | 13.9 | 13.0 |
| Molecular Weight | Lb/LbMole | 28.92 | 28.71 | 28.84 |
| Velocity of Flue Gas | FpS | 69.71 | 71.67 | 72.06 |
| Volume of Flue Gas | ACFM | 1,971,860 | 2,027,159 | 2,038,175 |
| Volume of Flue Gas | DSCFM | 1,460,975 | 1,475,103 | 1,499,615 |
| Dust Concentration | Lb/DSCF | 6.14E-07 | 5.64E-07 | 9.08E-07 |
| Dust Concentration | Lbs/Hour | 53.87 | 49.97 | 81.73 |
| Dust Concentration | Grs/ACF | 3.22E-03 | 2.90E-03 | 4.73E-03 |
| Dust Concentration | Grs/DSCF | 4.30E-03 | 3.95E-03 | 6.35E-03 |
| Isokinetic Rate | % | 104.1 | 104.6 | 107.2 |
| Particulate Emissions | Lb/MBtu | 0.008 | 0.007 | 0.012 |

Averages:

| | | | | |
|---|---|---|---|---|
| Stack Temperature | : | 170.0 | Percent O2 : | 5.2 |
| Vol Flue Gas | ACFM : | 2,012,398 | DSCFM : | 1,478,564 |
| Part Emis | Lb/DSCF : | 6.95E-07 | Lb/Hour : | 61.85 |
| | Grs/ACF : | 3.62E-03 | Grs/DSCF : | 4.87E-03 |
| | Lbs/MBtu : | 9E-03 | | |

Total Source Analysis, Inc.
SO3 - Sulfur Analysis

JEA
SJRPP
UNIT 1
95-058

| Run Number | | 1 | 2 | 3 |
|---|---|---|---|---|
| Data set | | (01) | (02) | (03) |
| Date | | 7-18-95 | 7-18-95 | 7-18-95 |
| Location | | UNIT 1 STACK | UNIT 1 STACK | UNIT 1 STACK |
| Start time | | 07:50 | 10:40 | 13:00 |
| End time | | 09:11 | 12:00 | 14:19 |
| Barometric Pressure | In/Hg | 29.93 | 29.93 | 29.93 |
| Volume of Sample | Cu. Ft. | 38.588 | 38.448 | 37.773 |
| Meter Correction Factor | | 1.030 | 1.030 | 1.030 |
| Meter Temperature | Deg. F | 105 | 106 | 104 |
| Percent O2 | % | 4.9 | 5.2 | 4.9 |
| Volume of Solution | ML | 195 | 208 | 215 |
| Volume of Aliquot | ML | 25 | 50 | 50 |
| Normality of Barium | N | 0.0100 | 0.0100 | 0.0100 |
| Volume to Titrate Blank | ML | 0.00 | 0.00 | 0.00 |
| Volume to Titrate Sample | ML | 9.10 | 14.80 | 11.40 |
| Volume of Metered Gas | DSCF | 37.140 | 36.940 | 36.420 |
| Concentration of SO3 | LBS/DSCF | 1.686E-06 | 1.471E-06 | 1.187E-06 |
| Parts Per Million SO3 | PPM | 8.11 | 7.07 | 5.71 |

Total Source Analysis, Inc.
SO3 - Sulfur Analysis

JEA
SJRPP
UNIT 1
95-058

| Run Number | | 1 | 2 | 3 |
|---|---|---|---|---|
| Data set | | (04) | (05) | (06) |
| Date | | 7-19-95 | 7-19-95 | 7-19-95 |
| Location | | UNIT 1 STACK | UNIT 1 STACK | UNIT 1 STACK |
| Start time | | 07:00 | 09:20 | 11:30 |
| End time | | 08:21 | 10:36 | 12:36 |
| Barometric Pressure | In/Hg | 30.01 | 30.01 | 30.01 |
| Volume of Sample | Cu. Ft. | 38.617 | 38.698 | 39.312 |
| Meter Correction Factor | | 1.030 | 1.030 | 1.030 |
| Meter Temperature | Deg. F | 116 | 110 | 110 |
| Percent O2 | % | 4.2 | 4.2 | 4.2 |
| Volume of Solution | ML | 215 | 207 | 217 |
| Volume of Aliquot | ML | 50 | 50 | 50 |
| Normality of Barium | N | 0.0100 | 0.0100 | 0.0100 |
| Volume to Titrate Blank | ML | 0.00 | 0.00 | 0.00 |
| Volume to Titrate Sample | ML | 12.85 | 9.40 | 9.60 |
| Volume of Metered Gas | DSCF | 36.556 | 37.018 | 37.606 |
| Concentration of SO3 | LBS/DSCF | 1.334E-06 | 9.278E-07 | 9.778E-07 |
| Parts Per Million SO3 | PPM | 6.41 | 4.46 | 4.70 |

Total Source Analysis, Inc.
SO3 - Sulfur Analysis

JEA
SJRPP
UNIT 1
95-058

| | | | | |
|---|---|---|---|---|
| Run Number | | 1 | 2 | 3 |
| Data set | | (07) | (08) | (09) |
| Date | | 7-20-95 | 7-20-95 | 7-20-95 |
| Location | | UNIT 1 STACK | UNIT 1 STACK | UNIT 1 STACK |
| Start time | | 06:55 | 09:25 | 11:42 |
| End time | | 08:20 | 10:40 | 13:15 |
| Barometric Pressure | In/Hg | 30.08 | 30.08 | 30.08 |
| Volume of Sample | Cu. Ft. | 38.448 | 41.259 | 41.926 |
| Meter Correction Factor | | 1.030 | 1.030 | 1.030 |
| Meter Temperature | Deg. F | 111 | 111 | 114 |
| Percent O2 | % | 5.2 | 5.2 | 5.1 |
| Volume of Solution | ML | 215 | 187 | 175 |
| Volume of Aliquot | ML | 50 | 50 | 50 |
| Normality of Barium | N | 0.0100 | 0.0100 | 0.0100 |
| Volume to Titrate Blank | ML | 0.00 | 0.00 | 0.00 |
| Volume to Titrate Sample | ML | 11.10 | 14.10 | 14.75 |
| Volume of Metered Gas | DSCF | 36.800 | 39.491 | 39.920 |
| Concentration of SO3 | LBS/DSCF | 1.144E-06 | 1.178E-06 | 1.141E-06 |
| Parts Per Million SO3 | PPM | 5.50 | 5.67 | 5.49 |

Total Source Analysis, Inc.
SO3 - Sulfur Analysis

JEA
SJRPP
UNIT 1
95-058

| | | | | |
|---|---|---|---|---|
| Run Number | | 1 | 2 | 3 |
| Data set | | (10) | (11) | (12) |
| Date | | 8-8-95 | 8-8-95 | 8-8-95 |
| Location | | UNIT 1 STACK | UNIT 1 STACK | UNIT 1 STACK |
| Start time | | 07:45 | 10:40 | 12:20 |
| End time | | 09:20 | 11:50 | 13:52 |
| Barometric Pressure | In/Hg | 30.23 | 30.23 | 30.23 |
| Volume of Sample | Cu. Ft. | 37.138 | 39.168 | 39.120 |
| Meter Correction Factor | | 1.030 | 1.030 | 1.030 |
| Meter Temperature | Deg. F | 117 | 118 | 119 |
| Percent O2 | % | 5.1 | 5.3 | 5.3 |
| Volume of Solution | ML | 148 | 225 | 237 |
| Volume of Aliquot | ML | 50 | 50 | 50 |
| Normality of Barium | N | 0.0099 | 0.0099 | 0.0099 |
| Volume to Titrate Blank | ML | 0.00 | 0.00 | 0.00 |
| Volume to Titrate Sample | ML | 26.20 | 12.45 | 10.40 |
| Volume of Metered Gas | DSCF | 35.352 | 37.220 | 37.110 |
| Concentration of SO3 | LBS/DSCF | 1.916E-06 | 1.315E-06 | 1.160E-06 |
| Parts Per Million SO3 | PPM | 9.22 | 6.32 | 5.58 |

7-18-95

## SAMPLING SYSTEM BIAS CHECK AND MEASURED VALUE CORRECTION

POLLUTANT: CO
MONITOR SPAN 100

UNIT NO.: 1

| RUN NUMBER | AVERAGE MEASURED PPM | INITIAL ZERO GAS BIAS | FINAL ZERO GAS BIAS | ZERO GAS DRIFT | INITIAL UPSCALE GAS BIAS | FINAL UPSCALE GAS BIAS | UPSCALE GAS DRIFT | CALIBRATION GAS PPM | CORRECTED PPM, DRY BASIS |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 11.04 | 0.20 | 0.10 | -0.10 | 27.80 | 28.60 | 0.80 | 29.73 | 11.54 |
| 2 | 8.90 | 0.10 | 0.10 | 0.00 | 28.60 | 28.40 | -0.20 | 29.73 | 9.21 |
| 3 | 9.79 | 0.10 | 0.30 | 0.20 | 28.40 | 28.30 | -0.10 | 29.73 | 10.13 |

B12

$$C_{gas} = (C_{avg} - C_o) * C_{ma} / (C_m - C_o) \qquad \text{Eq. 6C-1}$$

where:

$C_{gas}$ = Effluent gas concentration, dry basis, ppm
$C_{avg}$ = Average gas concentration indicated by gas analyzer, dry basis, ppm
$C_o$ = Average of initial and final system calibration bias check responses for the zero gas, ppm
$C_m$ = Average of initial and final system calibration bias check responses for the upscale calibration gas, ppm
$C_{ma}$ = Actual concentration of the upscale calibration gas, ppm

SAMPLING SYSTEM BIAS CHECK AND MEASURED VALUE CORRECTION

POLLUTANT: O2
MONITOR SPAN 25

UNIT NO.: /

| RUN NUMBER | AVERAGE MEASURED ,PERCENT | INITIAL ZERO GAS BIAS | FINAL ZERO GAS BIAS | ZERO GAS DRIFT | INITIAL UPSCALE GAS BIAS | FINAL UPSCALE GAS BIAS | UPSCALE GAS DRIFT | CALIBRATION GAS PERCENT | CORRECTED PERCENT, DRY BASIS |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 5.13% | 0.80% | 0.30% | -2.00% | 11.70% | 11.00% | -2.80% | 11.60% | 4.92% |
| 2 | 5.20% | 0.30% | 0.50% | 0.80% | 11.00% | 11.40% | 1.60% | 11.60% | 5.16% |
| 3 | 5.08% | 0.50% | 0.50% | 0.00% | 11.40% | 11.30% | -0.40% | 11.60% | 4.90% |

7-19-95

## SAMPLING SYSTEM BIAS CHECK AND MEASURED VALUE CORRECTION

POLLUTANT: CO
MONITOR SPAN 100

UNIT NO.: /

| RUN NUMBER | AVERAGE MEASURED PPM | INITIAL ZERO GAS BIAS | FINAL ZERO GAS BIAS | ZERO GAS DRIFT | INITIAL UPSCALE GAS BIAS | FINAL UPSCALE GAS BIAS | UPSCALE GAS DRIFT | CALIBRATION GAS PPM | CORRECTED PPM, DRY BASIS |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 46.15 | 0.40 | 0.00 | -0.40 | 27.30 | 26.60 | -0.70 | 29.73 | 51.07 |
| 2 | 46.50 | 0.00 | 0.30 | 0.30 | 26.60 | 26.70 | 0.10 | 29.73 | 52.00 |
| 3 | 29.09 | 0.30 | 0.30 | 0.00 | 26.70 | 26.70 | 0.00 | 29.73 | 32.42 |

$$Cgas = ( Cavg - Co ) * Cma / ( Cm - Co ) \qquad \text{Eq. 6C-1}$$

where:

Cgas = Effluent gas concentration, dry basis, ppm
Cavg = Average gas concentration indicated by gas analyzer, dry basis, ppm
Co = Average of initial and final system calibration bias check responses for the zero gas, ppm
Cm = Average of initial and final system calibration bias check responses for the upscale calibration gas, ppm
Cma = Actual concentration of the upscale calibration gas, ppm

7-19-95

SAMPLING SYSTEM BIAS CHECK AND MEASURED VALUE CORRECTION

POLLUTANT: O2
MONITOR SPAN 25

UNIT NO.: /

| RUN NUMBER | AVERAGE MEASURED PERCENT | INITIAL ZERO GAS BIAS | FINAL ZERO GAS BIAS | ZERO GAS DRIFT | INITIAL UPSCALE GAS BIAS | FINAL UPSCALE GAS BIAS | UPSCALE GAS DRIFT | CALIBRATION GAS PERCENT | CORRECTED PERCENT, DRY BASIS |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 5.13% | 1.20% | 1.10% | -0.40% | 12.10% | 12.10% | 0.00% | 11.60% | 4.22% |
| 2 | 5.08% | 1.10% | 1.20% | 0.40% | 12.10% | 12.10% | 0.00% | 11.60% | 4.16% |
| 3 | 5.07% | 1.20% | 1.20% | 0.00% | 12.10% | 11.90% | -0.80% | 11.60% | 4.16% |

7-20-95

## SAMPLING SYSTEM BIAS CHECK AND MEASURED VALUE CORRECTION

POLLUTANT: CO
MONITOR SPAN 100

UNIT NO.: /

| RUN NUMBER | AVERAGE MEASURED PPM | INITIAL ZERO GAS BIAS | FINAL ZERO GAS BIAS | ZERO GAS DRIFT | INITIAL UPSCALE GAS BIAS | FINAL UPSCALE GAS BIAS | UPSCALE GAS DRIFT | CALIBRATION GAS PPM | CORRECTED PPM, DRY BASIS |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 53.61 | 0.30 | 0.20 | -0.10 | 29.10 | 29.10 | 0.00 | 29.73 | 54.99 |
| 2 | 65.10 | 0.20 | -0.20 | -0.40 | 29.10 | 29.20 | 0.10 | 29.73 | 66.40 |
| 3 | 78.47 | -0.20 | -0.30 | -0.10 | 29.20 | 29.10 | -0.10 | 29.73 | 79.60 |

$$Cgas = ( Cavg - Co ) * Cma / ( Cm - Co ) \qquad \text{Eq. 6C-1}$$

where:

Cgas = Effluent gas concentration, dry basis, ppm
Cavg = Average gas concentration indicated by gas analyzer, dry basis, ppm
Co = Average of initial and final system calibration bias check responses for the zero gas, ppm
Cm = Average of initial and final system calibration bias check responses for the upscale calibration gas, ppm
Cma = Actual concentration of the upscale calibration gas, ppm

7-20-95

SAMPLING SYSTEM BIAS CHECK AND MEASURED VALUE CORRECTION

POLLUTANT: O2
MONITOR SPAN 25

UNIT NO.:

| RUN NUMBER | AVERAGE MEASURED PERCENT | INITIAL ZERO GAS BIAS | FINAL ZERO GAS BIAS | ZERO GAS DRIFT | INITIAL UPSCALE GAS BIAS | FINAL UPSCALE GAS BIAS | UPSCALE GAS DRIFT | CALIBRATION GAS PERCENT | CORRECTED PERCENT, DRY BASIS |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 5.25% | 0.10% | 0.10% | 0.00% | 11.60% | 11.60% | 0.00% | 11.60% | 5.19% |
| 2 | 5.19% | 0.10% | 0.10% | 0.00% | 11.60% | 11.50% | -0.40% | 11.60% | 5.16% |
| 3 | 5.06% | 0.10% | 0.20% | 0.40% | 11.50% | 11.20% | -1.20% | 11.60% | 5.09% |

8-8-95

## SAMPLING SYSTEM BIAS CHECK AND MEASURED VALUE CORRECTION

POLLUTANT: CO
MONITOR SPAN 100

UNIT NO.: 1

| RUN NUMBER | AVERAGE MEASURED PPM | INITIAL ZERO GAS BIAS | FINAL ZERO GAS BIAS | ZERO GAS DRIFT | INITIAL UPSCALE GAS BIAS | FINAL UPSCALE GAS BIAS | UPSCALE GAS DRIFT | CALIBRATION GAS PPM | CORRECTED PPM, DRY BASIS |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 23.81 | 0.10 | 0.10 | 0.00 | 58.00 | 59.00 | 1.00 | 62.00 | 25.17 |
| 2 | 19.22 | 0.10 | 0.00 | -0.10 | 59.00 | 58.90 | -0.10 | 62.00 | 20.18 |
| 3 | 17.51 | 0.00 | 0.00 | 0.00 | 58.90 | 61.00 | 2.10 | 62.00 | 18.11 |

$$Cgas = ( Cavg - Co ) * Cma / ( Cm - Co ) \quad \text{Eq. 6C-1}$$

where:

Cgas = Effluent gas concentration, dry basis, ppm
Cavg = Average gas concentration indicated by gas analyzer, dry basis, ppm
Co = Average of initial and final system calibration bias check responses for the zero gas, ppm
Cm = Average of initial and final system calibration bias check responses for the upscale calibration gas, ppm
Cma = Actual concentration of the upscale calibration gas, ppm

SAMPLING SYSTEM BIAS CHECK AND MEASURED VALUE CORRECTION

POLLUTANT: O2
MONITOR SPAN 25

UNIT NO.: 1

| RUN NUMBER | AVERAGE MEASURED PERCENT | INITIAL ZERO GAS BIAS | FINAL ZERO GAS BIAS | ZERO GAS DRIFT | INITIAL UPSCALE GAS BIAS | FINAL UPSCALE GAS BIAS | UPSCALE GAS DRIFT | CALIBRATION GAS PERCENT | CORRECTED PERCENT, DRY BASIS |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 5.19% | 0.60% | 0.00% | -2.40% | 11.60% | 11.30% | -1.20% | 11.60% | 5.09% |
| 2 | 5.10% | 0.00% | 0.00% | 0.00% | 11.30% | 11.10% | -0.80% | 11.60% | 5.28% |
| 3 | 5.07% | 0.00% | 0.10% | 0.40% | 11.10% | 11.10% | 0.00% | 11.60% | 5.27% |

# SAMPLING AND ANALYTICAL PROCEDURES

TESTING EQUIPMENT - EPA METHOD 5B SAMPLING TRAIN

An Anderson Corporation Stack Sampler (Model 201415) was used at the sampling locations(s). The particulate sampling train consisted basically of a glass or stainless steel probe; a variable-heat-controlled filter oven with a calibrated Type K (Chromel/Alumel) thermocouple located at the impinger outlet; a 1/4-hp shaft sealed carbon vane vacuum pump assembly with a vacuum gauge; a control unit with an elapse time indicator, a temperature selector switch, a temperature indicator (potentiometer), temperature controllers, an inclined draft gauge, a calibrated dry gas meter, and a calibrated orifice; and an umbilical with various interconnecting hoses, fitting and valves. An appropriately sized stainless-steel nozzle, a calibrated Type K temperature sensor, a static pressure tube, a calibrated S type pitot tube and a variable-heat-controlled stainless-steel liner with a calibrated Type K (Chromel/Alumel) thermocouple are integral parts of the probe assembly.

The vacuum pump was used to control gas sampling rates. The control unit was used to control probe and oven temperatures. The control unit was also used to monitor elapsed sampling times, temperatures, velocities, static pressure, gas sampling rates and sampled gas volume.

Integrated Gas Sampling Train

Flue gas was collected at the sampling location(s) for analysis with an integrated gas sampling train. The sampling train consisted basically of a Mann-made polystyrene gas filter drying tube; a Thomas 1/20-hp sealed-head diaphragm vacuum pump, and tygon tubing with various interconnecting fittings and valves.

Analyzer (Orsat)

Flue gas concentrations were determined with a Gas Analyzer (Orsat) which measures the percentage of carbon dioxide, the percentage of oxygen and percentage of carbon monoxide to the nearest tenth of a percent.

Programmable Calculator

A Hewlett Packard, Model 32SII, programmable calculator was used to determine the isokinetic sampling rate at each sampling point.

Barometer

The barometric pressure (actual station pressure) was determined from a calibrated Aneroid barometer located near the test site which read directly in inches of mercury to the nearest hundredth of an inch.

SAMPLING PROCEDURES - EPA REFERENCE METHOD 5B (PARTICULATE)

Prior to the field testing, the following procedures were performed: All instruments were checked and calibrated. Gelman Spectro Grade, glass-fiber-mat filters with 99.9 percent retention of 0.3-micron particles were individually numbered, placed in similarly numbered glass petri dishes, oven dried at 320 degrees Fahrenheit for two to three hours, cooled in a desiccator and individually weighed on a Mettler analytical balance (Model H54AR) to the nearest 0.1-milligram, and weighed a minimum of every six hours until two consecutive weights within ±0.5 milligrams were obtained. Several 250 milliliter crucibles were desiccated for a minimum of 24 hours and weighed in the same manner as the filters and petri dishes. Also, several 200-gram quantities of Type 6-16 mesh indicating silica gel were weighed on an Ohaus beam balance and placed into separate airtight polypropylene storage bottles.

The number of sampling points and positions of the points in the flue at the sampling location(s), and the sampling time at each point were determined prior to the particulate testing. The sampling procedures were performed in accordance with the Environment Protection Agency's Reference Method 5B, "Determination of Particulate Emissions from Stationary Sources" in the July 1, 1994 Federal Register, "Standards of Performance for New Stationary Sources" and subsequent revisions.

Before each test run, a particulate sampling train was prepared in part at the sampling location(s) in the following manner: An appropriately sized sampling nozzle was installed onto the inlet of the sampling probe and capped. The probe was then dimensioned and marked with glass-cloth tape at increments that corresponded with the predetermined sampling positions in the flue. A standard impinger assembly was prepared by adding 200 milliliters of distilled water, to each of the first two glass impingers. The third glass impinger was left dry and the fourth was filled with approximately 400 grams of type 6-16 mesh indicating silica gel. The entire impinger assembly was then placed in an ice bath. A disc filter was removed from its petri dish and placed inside a filter holder. The filter holder was then placed inside a filter oven and assembled to the sampling probe outlet and the impinger unit inlet. Next, an umbilical and sampling hoses were connected to the sampling probe, filter oven, impinger unit, vacuum pump and the control unit, accordingly. The probe and oven were then heated to and held at temperatures between 300 and 340 degrees Fahrenheit. The inclined draft gauges were checked and zeroed.

As soon as the probe and oven temperatures had stabilized the entire sampling train assembly was leak-checked at a minimum of 15 inches of mercury vacuum for one minute and the leakage rate recorded. A leakage rate of less than .02 cfm and no vacuum loss was considered acceptable.

After the particulate sampling train had been assembled, as previously described, the particulate sampling was performed.

The sampling nozzle, probe and filter holder were washed with nanograde acetone. The acetone washing and acetone blank were collected in labeled polypropylene sample bottles and retained for later evaporation, desiccation and weighing.

Flue gas concentrations (percentage of $CO_2$, percentage of $O_2$, and percentage of CO) were determined by taking several orsat samples of the gas collected, simultaneously with the particulate sampling throughout the test run, by an integrated gas sampling train. The integrated gas sample was collected from the discharge of the particulate control unit. The sampling train was set at a predetermined constant flow rate to obtain an adequate sample. The concentrations for each test run were recorded on a field test form.

Prior to the particulate sampling, a preliminary temperature and velocity traverse, orsat analysis and calculations were performed to determine a correct nozzle and orifice size, and the factors that would be used in calculating the isokinetic sampling rate for each sampling point. Knowing the actual pressure differential across the pitot tube used, the isokinetic sampling rate was calculated at each sampling point using a Hewlett Packard, Model 32SII, Programmable Calculator.

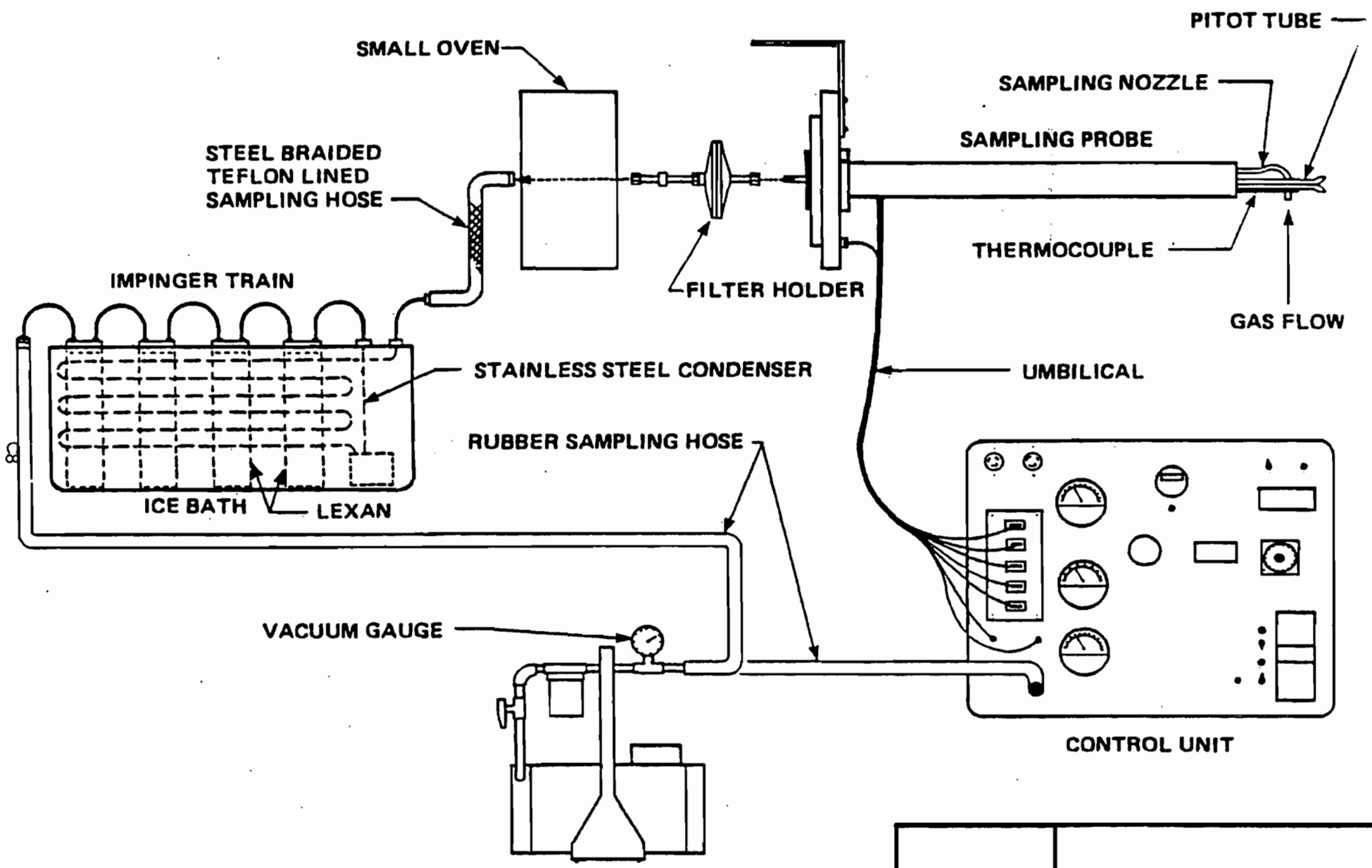
Three test runs were performed at the sampling location(s). The sampling data for each test run was recorded on a field test form during each of the sampling periods.

After the completion of a test run, the following procedures were performed: A final leak-check was performed at highest vacuum during the test for one minute and the leakage rate recorded. The flue gas moisture collected in the first three impingers was measured and recorded. The moisture laden silica gel in the fourth impinger was transferred to an appropriately marked, airtight polypropylene bottle and retained for later weighing. The weight gain of the silica gel moisture collection was added to the measured moisture condensed for that test run. The sample nozzle, probe and filter holder were capped and taken to a clean area for sample recovery. At the recovery area, the disc filter was carefully removed from the filter holder and transferred to its petri dish for later weighing.

ANALYTICAL PROCEDURES - EPA REFERENCE METHOD 5B (PARTICULATE)

After the field testing was completed, the following procedures were performed: Each silica gel moisture collection was weighed in its storage bottle on an Ohaus beam balance with sensitivity of 0.1-gram. Each disc filter and petri dish was oven dried at 320 degrees Fahrenheit for six hours and cooled in a desiccator for two hours before weighing. Each acetone washing and acetone blank was transferred from its sample bottle to a preweighed crucible for evaporation. When the acetone in a crucible had completely evaporated, it was oven dried at 320 degrees Fahrenheit for six hours and transferred to a desiccator for further drying at room temperature. Each acetone blank collected was used to determine the amount of residual weight each crucible retained due to acetone impurities. Each disc filter and petri dish, acetone washing and acetone blank was weighed on a Mettler analytical balance (Model H54AR) with a sensitivity of 0.1-milligram.

All test instruments were recalibrated to determine the deviation percentage.

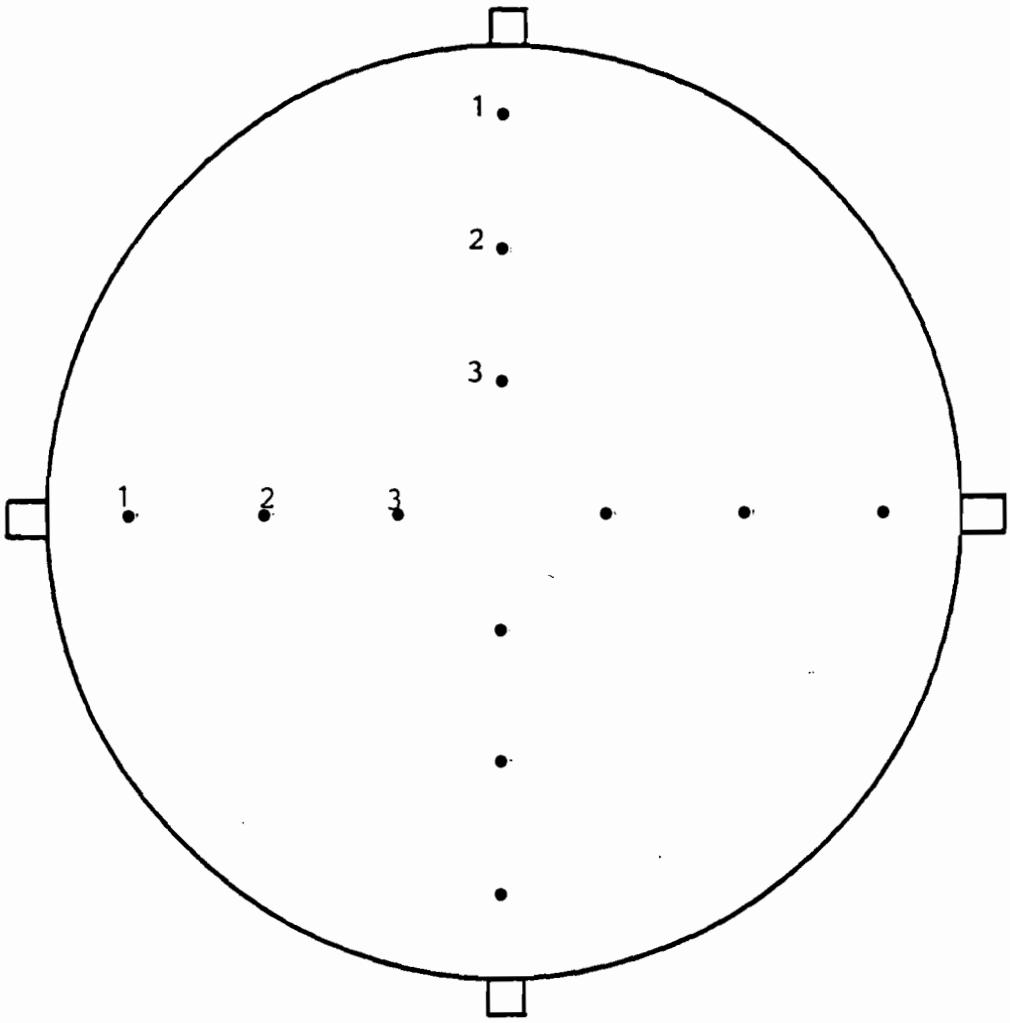



TSA

Exhibit

PARTICULATE
SAMPLING TRAIN

JEA-SJRPP UNIT 1&2
PARTICULATE SAMPLE POINTS




| POINTS | DISTANCE FROM INSIDE WALL |
|---|---|
| 1 | 12 7/8" |
| 2 | 3' 6 7/8" |
| 3 | 7' 3 " |

**DIAMETER STACK** 24' 6"

CROSS SECTION AREA 471.43 $FT^2$

NOT TO SCALE

Total Source Analysis, Inc.
*Environmental Testing Consultants*

**Exhibit**

**STACK TEST POINT LOCATIONS**

TESTING EQUIPMENT - EPA REFERENCE METHOD 8

Sulfuric Acid Mist and Sulfur Dioxide

A Nutech Corporation Stack Sampler (Model 2010) was used at the sampling location(s). The sampling train consisted basically of an effective length stainless steel probe, a standard glass impinger assembly with a calibrated Type K (Chromel/Alumel) thermocouple located at the impinger outlet; a 3/4-hp shaft sealed carbon vane vacuum pump assembly with a vacuum gauge; control unit with an elapse time indicator, a temperature selector switch, a temperature indicator (potentiometer), temperature controllers, an inclined draft gauge, a calibrated dry gas meter, and a calibrated variable-diameter orifice; and an umbilical and various interconnecting hoses, fitting and valves. An appropriately sized stainless-steel nozzle, a calibrated Type K temperature sensor, a static pressure tube, a calibrated S type pitot tube and a variable-heat-controlled stainless-steel liner with a calibrated Type K (Chromel/Alumel) thermocouple are integral parts of the probe assembly.

The vacuum pump was used to control gas sampling rates. The control unit was used to control probe temperatures. The control unit was also used to monitor elapsed sampling times, temperatures, velocities, static pressures, gas sampling rates and sampled gas volume.

Integrated Gas Sampling Train

Flue gas was collected at the sampling location(s) for analysis with an integrated gas sampling train. The sampling train consisted basically of a Mann-made polystyrene gas filter drying tube; a Thomas 1/20 hp sealed-head diaphragm vacuum pump, a Dwyer flowmeter; a plastic bag housed in a protective aluminum case, and tygon tubing with various interconnecting fittings and valves.

Analyzer (Orsat)

Flue gas concentrations were determined with a Gas Analyzer (Orsat) which measures the percentage of carbon dioxide, percentage of oxygen and percentage of carbon monoxide to the nearest tenth of a percent.

Barometer

The barometric pressure (actual station pressure) was determined from a calibrated Aneroid barometer located near the test site which read directly in inches of mercury to the nearest hundredth of an inch.

SAMPLING PROCEDURES - EPA REFERENCE METHOD 8 ($SO_3$)

Prior to the field testing, the following procedures were performed: All instruments were checked and calibrated. Before each test run a sampling train was prepared inpart at the sampling location(s) in the following manner: An appropriately sized sampling nozzle was installed onto the inlet of a sampling probe and capped. The probe was then dimensioned and marked with glass-cloth tape at increments that corresponded with the predetermined sampling point positions in the flue. A standard impinger assembly was prepared by adding 100 milliliters of 80% Isopropanol to the first glass impinger. A glass filter holder was placed between the first and second impingers to catch sulfuric acid mist carryover, and 100 milliliters of 3% hydrogen peroxide was added to the second and third impingers. The fourth impinger was left dry and the fifth was filled with 250 grams of type 6-16 mesh indicating silica gel.

The entire impinger assembly was then placed into an icebath. Next, an umbilical and sampling hoses were connected to the sampling probe and impinger unit, a vacuum pump and a control unit, accordingly. The probe was then heated to and held at approximately 248 degrees Fahrenheit. All magnehelic gauges were checked and zeroed. As soon as the probe temperatures had stabilized, the entire sampling train assembly was leak-checked at a minimum of 15 inches of mercury vacuum for one minute and the leakage rate recorded. A leakage rate of less than .02 cfm and no vacuum loss was considered acceptable.

After the sampling train had been assembled, the probe heated, and the entire system leak-checked, as previously described, the $SO_3$ sampling was performed.

Flue gas concentrations (percentage of $CO_2$, percentage of $O_2$, and percentage of CO) were determined by taking several Orsat samples of the gas collected, simultaneously with the particulate sampling throughout the test run, by an integrated gas sampling train. The integrated gas sample was collected from the discharge of the particulate control unit. The sampling train was set at a predetermined constant flow rate to obtain an adequate sample. The concentrations for each test run were recorded on a field test form.

ANALYTICAL PROCEDURES - EPA REFERENCE METHOD 8

Container number one: A 100 ml aliquot of this solution was pipetted into a 250-ml Erlenmeyer flask, then 2 to 4 drops of thorin indicator were added, and the sample was titrated to a pink endpoint using 0.0100 normality barium perchlorate. The titration was repeated with a second aliquot of sample and titration values averaged. Replicate titrations must agree within 1 percent or ±0.2 ml., whichever is greater.

Container number two: The solution in the container holding the contents of the second and third impingers were discarded.

Blanks were prepared by adding 2 to 4 drops of thorin indicator to 100 ml of 80 percent isopropanol. The blanks were titrated in the same manner as the samples.

All test instruments were recalibrated to determine the deviation percentage.

EPA METHOD 10

DETERMINATION OF CARBON MONOXIDE EMISSIONS FROM STATIONARY SOURCES

1. Principle

1.1 Principle - An integrated or continuous gas sample is extracted from a sampling point and analyzed for carbon monoxide (CO) content using a nondispersive infrared analyzer (NDIR).

2. Range and Sensitivity

2.1 Range - 0 to 1,000 ppm.

2.2 Sensitivity - minimum detectable concentration is 0.1 ppm for a 0 to 1,000 ppm span.

3. Precision and Accuracy

3.1 Precision - The precision of most NDIR analyzers is approximately ±2 percent of span.

3.2 Accuracy - The accuracy of most NDIR analyzers is approximately ±5 percent of span after calibration.

4. Apparatus

4.1 Probe - Stainless steel or sheathed Pyrex glass, equipped with a filter to remove particulate matter.

4.2 Air-cooled Condenser or Equivalent - To remove any excess moisture.

4.3 Valve - Needle valve, or Equivalent, to adjust flow rate.

4.4 Pump - Leak-free diaphragm type, or equivalent, to transport gas.

4.5 Rate Meter - Rotometer, or equivalent, to measure a flow range from 0 to 1.0 liter per minute (0.035 cfm).

4.6 Flexible Bag - Tedlar, or equivalent, with a capacity of 60 to 90 liters (2 to 3 feet). The bag was leak tested in the laboratory before using by evacuating the bag with a pump followed by a dry gas meter. When evacuation was complete, there was no flow through the meter.

5. Analysis

5.1 Carbon Monoxide Analyzer - A Horiba Model 321 or Fuji Model 730 nondispersive infrared analyzer is used. The instrument was demonstrated by the manufacturer to meet or exceed manufacturer's specifications and those described in this method.

6. Calibration Gases

6.1 Calibration Gases - Known concentration of CO in nitrogen for instrument span, prepurified grade of nitrogen for zero, and two additional concentrations corresponding approximately to 60 percent and 30 percent span. The span concentration shall not exceed 1.5 times the applicable source performance standard. The calibration gases are certified by the manufacturer to be within ±2 percent of the specified concentration.

6.2 Silica Gel - Indicating type, 6 to 16 mesh, dried at 175 degrees C (347 degrees F) for two hours.

6.3 Ascarite

7. Procedure

7.1 Continuous Sampling - Set up the equipment as shown in Figure 10-1 making sure all connections are leak free. Place the probe in the stack at a sampling point and purge the sampling line. Connect the analyzer and begin drawing sample into the analyzer. Allow 5 minutes for the system to stabilize, then record the analyzer reading as required by the test procedure. $CO_2$ content of the gas may be determined. During the sampling system bias check, the system is operated at the normal sampling rate, no adjustments to the measurement system, other than those necessary to achieve proper calibration gas flow rates at the analyzer, are made. Alternately, introduce the zero and upscale gases until a stable response is achieved. The tester determined the measurement system response time by observing the times required to achieve a stable response for both the zero and upscale gases. Note the longer of the two times as the response time. The sampling system bias check shall be considered invalid if the difference between the gas concentrations displayed by the measurement system for the analyzer calibration error check and for the sampling system bias check exceeds ±5 percent of the span for either the zero or upscale calibration gas.

# APPENDIX

Sample Calculations

# NOMENCLATURE

| | |
|---|---|
| acf | = actual cubic feet |
| acfm | = actual cubic feet per minute |
| A | = effective area of flue in square feet |
| acm | = actual cubic meters |
| acmm | = actual cubic meters per minute |
| $A_n$ | = inside area of sampling nozzle in square feet |
| $B_{ws}$ | = water vapor in gas stream, proportion by volume |
| %C | = percent carbon by weight, dry basis |
| %CO | = percent carbon monoxide by volume, dry basis |
| $\%CO_2$ | = percent carbon dioxide by volume, dry basis |
| $C_p$ | = pitot tube coeffecient |
| $D_l$ | = dust loading per heat input in pounds (grams) per million Btu (calories) per Fr constant |
| $D_l'$ | = dust loading per heat input in pounds (grams) per million Btu (calories) per Fr calculated |
| dscf | = dry standard cubic feet |
| dscfh | = dry standard cubic feet per hour |
| dscm | = dry standard cubic meters |
| dscmh | = dry standard cubic meters per hour |
| fps | = feet per second |
| $F_r$ | = ratio factor of dry flue gas volume to heat value of combusted fuel in dry standard cubic feet (meters) per million Btu (calories) |
| gms | = grams |
| gm-mole | = gram-mole |
| grs | = grains |
| $\Delta H$ | = orfice pressure drop in inches water, average |
| %H | = percent hydrogen by weight, dry basis |
| $H_c$ | = heat of combustion in Btu per pound, dry basis |
| hr | = hour |
| %I | = percent isokinetic |
| in. Hg | = inches mercury |
| lbs | = pounds |
| lb-mole | = pound-mole |
| %M | = percent moisture by volume |
| mmBtu | = million Btu |
| mmcal | = million calories |
| mm Hg | = millimeters mercury |
| mps | = meters per second |
| $M_s$ | = molecular weight in pounds (gram) per pound (gram) mole (wet basis) |
| %N | = percent nitrogen by weight, dry basis |
| $\%N_2$ | = percent nitrogen by difference, dry basis |
| %O | = percent oxygen by difference, dry basis |
| $\%O_2$ | = percent oxygen by volume, dry basis |
| $P_b$ | = barometric pressure in inches mercury |
| $P_{std}$ | = standard absolute pressure (29.92 in Hg) |
| $P_s$ | = absolute pressure in flue in inches (millimeters) mercury |
| $P_f$ | = static pressure in flue in inches water, average |
| $\sqrt{\Delta P}$ | = square root of velocity head in inches water, average |
| %S | = percent sulfur by weight, dry basis |
| scf | = standard cubic feet |
| scm | = standard cubic meters |
| $T_{std}$ | = absolute temperature of air in degrees Rankine at standard conditions (528 degrees) |
| $T_S$ | = absolute temperature of flue gas in degrees Rankin, average |
| $T_m$ | = absolute temperature at meter in degrees Rankine, average |
| $V_S$ | = velocity of flue gas in feet (meters) per second |
| $V_l$ | = volume of condensate through the impingers in milliliters |
| $V_{lc}$ | = volume of liquid collected in condenser in milliliters plus weight of liquid absorbed in silica gel in grams indicated as milliliters |
| $V_m$ | = volume of metered gas measured at meter conditions in cubic feet (meters) |
| $V_{ms}$ | = volume of metered gas corrected to dry standard conditions in cubic feet (meters) |
| $V_o$ | = volume of flue gas at actual conditions in cubic feet (meters) per minute |
| $Q_{sd}$ | = volume of flue gas corrected to dry standard conditions in cubic feet (meters) per hour |
| $V_t$ | = total volume of flue gas sampled at actual conditions in cubic feet (meters) |
| $V_w$ | = volume of water vapor in metered gas corrected to standard conditions in cubic feet (meters) |
| $V_{wc}$ | = volume of water condensed in impingers corrected to standard conditions |
| $V_{wsg}$ | = volume of water collected in silica gel corrected to standard conditions |
| $W_a$ | = total weight of dust collected per unit volume in grains (grams) per actual cubic feet (meters) |
| $W_d$ | = total weight of dust collected per unit volume in pounds (grams) per dry standard cubic feet (meters) |
| $W_g$ | = total weight of dust collected in grams |
| $W_h$ | = total weight of dust collected per unit volume in pounds (grams) per hour, dry basis |
| $W_p$ | = total weight of dust collected in pounds |
| $W_s$ | = total weight of dust collected per unit volume in grains (grams) per dry standard cubic feet (meters) |
| $W_{sg}$ | = impinger silica gel weight gain in grams |
| Y | = metered gas volume correction factor |
| $\Theta$ | = total elapsed sampling time in minutes |

(1) ABSOLUTE FLUE PRESSURE (in. Hg)

$$P_s = (\pm P_f \div 13.6) + P_b$$

(2) WATER VAPOR VOLUME IN METERED GAS CORRECTED TO STANDARD CONDITIONS (scf)

$$V_{wc} = .04707 \times V_l \qquad V_{wsg} = .04715 \times W_{sg}$$
$$V_w = V_{wc} + V_{wsg}$$

(3) METERED GAS VOLUME CORRECTED TO STANDARD CONDITIONS (scf)

$$V_{ms} = 17.64 \times Y \times V_m \frac{P_b + (\Delta H/13.6)}{T_m}$$

(4) PERCENT MOISTURE IN FLUE GAS

$$B_{ws} = \frac{V_w}{(V_{ms} + V_w)} \qquad \%M = B_{ws} \times 100$$

(5) AVERAGE RESULTS OF FLUE GAS ANALYSIS

$$\%N_2 \text{ dry} = 100 - (\%CO_2 + \%O_2 + \%CO)$$

(6) APPROXIMATE MOLECULAR WEIGHT OF FLUE GAS (WET BASIS) (lb/lb-mole)

$$M_s = (18 \times B_{ws}) + \Big((.440\ (\%CO_2) + .320\ (\%O_2) + .280\ (\%N_2 + \%CO)\Big) \times (1 - B_{ws})$$

(7) GAS VELOCITY IN FLUE (fps)

$$V_s = 85.49 \times C_p \times (\sqrt{\Delta P}\ )\text{ avg.} \sqrt{\frac{T_s}{P_s \times M_s}}$$

(8) FLUE GAS VOLUME AT ACTUAL CONDITIONS (acfm)

$$V_o = V_s \times A \times 60$$

(9) FLUE GAS VOLUME CORRECTED TO DRY STANDARD CONDITIONS (dscfh)

$$Q_{sd} = \frac{T_{std}}{29.92} \times \frac{P_s}{T_s} \times V_o \times (1 - B_{ws}) \times 60$$

(10) TOTAL FLUE GAS VOLUME SAMPLED AT ACTUAL CONDITIONS (acf)

$$V_t = \left[V_m \times Y \times \frac{T_s}{T_m} \times \left(\frac{P_b + (\Delta H/13.6)}{P_s}\right)\right] + \left(0.00267 \times V_{lc} \times \frac{T_s}{P_s}\right)$$

(11) DUST CONCENTRATION FOR INDIRECT HEATING UNIT ACTUAL CONDITIONS AND STANDARD CONDITIONS

$W_g$ = gms

$W_p = 0.002205 \times W_g$ (lb)

$W_d = \frac{V_p}{V_{ms}}$ (lb/dscf)

$W_h = W_d \times Q_{sd}$ (lb/hr dry)

$W_a = \frac{7000 \times W_p}{V_t}$ (gr/acf)

$W_s = 7000 \times W_d$ (gr/dscf)

$D_l = \frac{9780 \times 20.9 \times W_d}{(20.9 - \%O_2)}$ (lb/mmBtu with constant 9780Fr)

$F_r = \frac{10^6 \times [(3.64 \times \%H) + (1.53 \times \%C) + (0.57 \times \%S) + (0.14 \times \%N) - (0.46 \times \%O)]}{H_c}$ (dscf/mmBtu)

$D_l' = \frac{20.9 \times W_d \times F_r}{(20.9 - \%O_2)}$ (lb/mmBtu with calculated $F_r$)

(12) PERCENT OF ISOKINETIC SAMPLING

$$\%I = \frac{1.667 \times T_s \times \left\{0.00267 \times V_{lc} + \left[\frac{V_m \times Y}{T_m} \times \left(P_b + \Delta H/13.6\right)\right]\right\}}{\Theta \times V_s \times P_s \times A_n}$$

# $SO_2$ $SO_3$ NOMENCLATURE

| | | |
|---|---|---|
| %C | = | Percent carbon by weight, dry basis |
| $C_{SO_2}$ | = | Concentration of sulfur dioxide, dry basis corrected to standard conditions (lb/dscf) |
| $C_{SO_3}$ | = | Concentration of sulfur trioxide, dry basis corrected to standard conditions (lb/dscf) |
| $ESO_2$ | = | Emissions of $SO_2$ (lb/mmBtu) |
| $ESO_3$ | = | Emissions of $SO_3$ (lb/mmBtu) |
| F | = | F factor, ratio factor of dry flue gas volume to heat of combusted fuel in dry standard cubic feet per million Btu. |
| %H | = | Percent hydrogen by weight, dry basis |
| Hc | = | Heat of combustion, dry basis, Btu/lb. |
| In Hg | = | inches mercury |
| mls | = | Milliters of the standard sulfuric acid used to standardize the barium perchlorate solution |
| $Ml_t$ | = | Milliters required to titrate the standard sulfuric acid solution |
| %N | = | Percent nitrogen by weight, dry basis |
| Ns | = | Normality of sulfuric acid as labeled on bottle |
| Nt | = | normality of barium perchlorate titrant, milliequivalents/ml |
| %O | = | Percent oxygen by weight, dry basis |
| $\%O_2$ | = | Percent oxygen by volume, dry basis |
| Pb | = | Barometric pressure in inches, mercury |
| Pstd | = | Standard absolute pressure (29.92 in. Hg) |
| PPM | = | Parts per million |
| %S | = | Percent sulfure by weight, dry basis |
| Tm | = | Absolute temperature at meter in degrees Rankine, average |
| Va | = | Volume of sample aliquot titrated, ml. |
| Vm | = | Volume dry gas as measured by the dry gas meter, (dcf) |
| Vmstd | = | Volume dry gas measured by the dry gas meter corrected to standard conditions (dscf) |
| Vsoln | = | Total volume of solution in which the sulfur dioxide sample is contained, 100 ml. |
| Vt | = | Volume of barium perchlorate titrant used for the sample, ml (average of replicate titrations) |
| Vtb | = | Volume of barium perchlorate titrant used for the blank, ml. |
| Y | = | Dry gas meter calibration factor |

# EPA - $SO_3$ FORMULAS

(1) $N_t = \dfrac{(mls) \times (Ns)}{Ml_t}$

(2) $V_{mstd} = 17.64 \dfrac{(Y)\,(V_m)\,(P_b)}{Tm}$

(3) $C_{SO_3} = 1.081 \times 10^{-4} \dfrac{(V_t - V_{tb}) \quad N \quad \left(\frac{Vsoln}{Va}\right)}{V_{mstd}}$

(4) $PPM_{SO_3} = C_{SO_3} \times 4.822 \times 10^6$

(5) $ESO_3 = C_{SO_3}\,(F)\,\dfrac{20.9}{20.9 - \%O_2}$

(8) $Fr = \dfrac{10^6 \times [(3.64 \times \%H) + (1.53 \times \%C) + (0.57 \times \%S) + (0.14 \times \%N) - (0.46 \times \%O)]}{Hc}$ (dscf/mmBtu)

## SAMPLE CALCLULATION

(1) _____$N_t$ = $\dfrac{(\_\_\_\_\_mls) \times (\_\_\_\_\_N)}{\_\_\_\_\_mls}$

(2) _____dscf = $17.64 \dfrac{(\_\_\_\_\_)\,(\_\_\_\_\_cf)\,(\_\_\_\_\_"Hg)}{\_\_\_\_\_^{o}R}$

(3) _____lb/dscf = $1.081 \times 10^{-4} \dfrac{(\_\_\_\_\_ml - \_\_\_\_\_ml) \quad \_\_\_\_\_N \quad \left(\frac{\_\_\_\_\_ml}{\_\_\_\_\_ml}\right)}{\_\_\_\_\_dscf}$

(4) _____ppm = _____lb/dscf x $6.024 \times 10^6$

(5) _____lb/mBtu = _____lb/dscf x _____dscf/mBtu $\dfrac{20.9}{(20.9 - \_\_\_\_\_\%)}$

(6) _____dscf/mBtu = $\dfrac{10^6 \times [(3.64 \times \_\_\_\_\_) + (1.53 \times \_\_\_\_\_) + (0.57 \times \_\_\_\_\_) + (0.14 \times \_\_\_\_\_)]}{\_\_\_\_\_Btu/lb}$

## CO CALCULATION

$$\text{lb/dscf} = 0.726 \times 10^{-7} \times \text{PPM}$$

$$\text{lb/MBtu} = \text{lb/dscf} \times \text{F Factor} \times \frac{20.9}{(20.9 - \%O_2)}$$

$$\text{lb/hour} = \text{lb/dscf} \times \text{dscfm} \times 60 \text{ min./hr.}$$

TSA Field Data Sheets

**BEST AVAILABLE COPY**

| Client | | Date | Page | Of |
|---|---|---|---|---|
| J.E.A. S.J.R.P.P. | | 18 JULY 95 | 1 | 2 |
| Project No. | Operator | Orsat Analysis 3A | | |
| 95-058-F1 | O'NEILL, HARLEY | | | |
| Sampling Location | Run No. | $CO_2$ | $+O_2$ | $O_2$ | CO |
| Unit # 1 Stack | 1 | | | | |
| Filter No. 014 FL. 95-~~026~~ | Acetone No. | Condensate 206.0 | 16.1 SG | | | | |
| Barometric Pressure | Static Pressure | Probe Number | | | | |
| 29.93 | -.55 | A-10-1F | 15.9 | | 4.9 | |
| Nozzle Diameter | Nozzle Number | Pitot Coefficient | Pitot Number | | | | |
| .187 | FL3 | .834 | A-10-1-1F | | | | |
| Meter Corr. Factor | Meter-Orifice | | | | | | |
| 1.023 | Rac # | 3.118 | | | | | |
| Sample Pt. Time | Assumed % Moisture | Leak Test | Before | After | | | |
| 10min 120min Test | 13 | | .005 AT 15IN | .006@15" | | | |

| Sample Point | ΔP | $\sqrt{\Delta P}$ | ΔH | Temperature °F: Stack | Probe | Imp. Out | Oven | Meter In | Meter Out | Vac. Pr (in. HG) | Dry Gas Meter Reading in Cu. Ft. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Start | 0737 | | | | | | | | | | * 545.625 |
| A 1 | 1.30 | 1.140 | 2.73 | 168 | 320 | 68 | 310 | 68 | 68 | 2 | 553.655 |
| 2 | 1.35 | 1.162 | 1.22 | 165 | 325 | 67 | 312 | 112 | 104 | 2 | 560.381 |
| 3 | 1.10 | 1.049 | 0.99 | 161 | 326 | 67 | 350 | 117 | 105 | 2 | 566.329 |
| B 1 | 1.30 | 1.140 | 1.17 | 163 | 328 | 67 | 325 | 106 | 105 | 2 | 572.915 |
| 2 | 1.25 | 1.118 | 1.13 | 167 | 322 | 66 | 330 | 116 | 107 | 2 | 579.649 |
| 3 | 1.27 | 1.127 | 1.14 | 165 | 329 | 67 | 334 | 120 | 108 | 2 | 586.101 |
| C 1 | 1.31 | 1.145 | 1.18 | 164 | 325 | 66 | 332 | 111 | 108 | 2 | 592.905 |
| 2 | 1.29 | 1.136 | 1.16 | 162 | 322 | 66 | 335 | 121 | 109 | 2 | 599.388 |
| 3 | 1.21 | 1.100 | 1.09 | 167 | 330 | 67 | 340 | 123 | 111 | 2 | 605.511 |
| D 1 | 1.29 | 1.136 | 1.16 | 164 | 322 | 67 | 330 | 112 | 110 | 2 | 612.284 |
| 3 | 1.30 | 1.140 | 1.17 | 165 | 329 | 66 | 315 | 121 | 111 | 2 | 618.689 |
| 3 | 1.25 | 1.118 | 1.14 | 167 | 324 | 66 | 324 | 123 | 112 | 2 | 624.949 |
| Stop | 0955 | | | | | | | | | | |
| AV → | | (~~1.13~~ 1.126) | (1.27) | (164.8) | | | | (108.7) | | (2) | (79.324) cu/FT. |

Pitot Tube Leak Check: Before .005 AT 15 INCHES After .006 AT 15 INCHES

Integrated Bag Leak Check: Before _____ After _____

TSA

E1

Particulate Field Data Sheet

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| Client | | Date | Page | Of |
|---|---|---|---|---|
| J.E.A. S.J.R.P.P. | | 7-18-95 | 1 | 2 |

| Project No. | Operator | Orsat Analysis | | | |
|---|---|---|---|---|---|
| 95-058-F1 | H Oviedo | $CO_2$ | $+O_2$ | $O_2$ | CO |
| Sampling Location: Unit # Stack | Run No. 2 | | | | |
| Filter No. 95-015 FL | Acetone No. | Condensate 16.0 SG 222.0 mL | 14.5 | | 5.2 | |
| Barometric Pressure 29.93 | Static Pressure -.55 | Probe Number A-10-1F | 14.5 | | 5.2 | |
| Nozzle Diameter .187 | Nozzle Number FL 3 | Pitot Coefficient .834 | Pitot Number A-10-1-1F | | | | |
| Meter Corr. Factor 1.023 | Meter-Orifice Rac# | 3.118 | | | | |
| Sample Pt. Time 10min 120min Test | Assumed % Moisture | Leak Test | Before .001 AT 12 INCHES .000 AT 8 INCH | After | |

| Sample Point | ΔP | $\sqrt{\Delta P}$ | ΔH | Temperature °F: Stack | Probe | Imp. Out | Oven | Meter In | Meter Out | Vac. Pr (in. HG) | Dry Gas Meter Reading in Cu. Ft. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Start | 11:35 | | | | | | | | | | 627.147 |
| A 1 | 1.34 | 1.158 | 1.22 | 167 | 322 | 65 | 290 | 108 | 108 | 3 | 634.802 |
| 2 | 1.35 | 1.162 | 1.23 | 162 | 328 | 66 | 310 | 115 | 109 | 2 | 639.654 |
| 3 | 1.10 | 1.049 | 1.00 | 166 | 325 | 67 | 312 | 116 | 110 | 2 | 645.23 |
| B 1 | 1.21 | 1.100 | 1.10 | 165 | 329 | 67 | 320 | 109 | 105 | 2 | 651.683 |
| 2 | 1.35 | 1.162 | 1.23 | 164 | 330 | 67 | 322 | 120 | 110 | 2 | 657.135 |
| 3 | 1.12 | 1.058 | 1.02 | 164 | 328 | 66 | 322 | 123 | 111 | 2 | 664.260 |
| C 1 | 1.34 | 1.158 | 1.22 | 165 | 325 | 67 | 323 | 121 | 110 | 2 | 670.708 |
| 2 | 1.25 | 1.120 | 1.14 | 165 | 325 | 67 | 321 | 123 | 111 | 2 | 677.161 |
| 3 | 1.10 | 1.049 | 1.00 | 167 | 327 | 66 | 325 | 123 | 112 | 2 | 683.136 |
| D 1 | 1.35 | 1.162 | 1.23 | 166 | 324 | 66 | 329 | 113 | 111 | 2 | 689.762 |
| 2 | 1.32 | 1.149 | 1.20 | 162 | 325 | 67 | 330 | 121 | 111 | 2 | 696.363 |
| 3 | 1.08 | 1.039 | 0.98 | 167 | 331 | 67 | 322 | 122 | 112 | 2 | 701.923 |
| Stop | 1:12 | | | | | | | | | | |
| AV → | | (1.11 | 1.13) | (165) | | | | (114.1) | | (2) | (74.786) cu/FT. |

Pitot Tube Leak Check: Before OK After OK

Integrated Bag Leak Check: Before _____ After _____

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| | | | |
|---|---|---|---|
| Client: J.E.A. S.J.R.P.P. | | Date: 7-18-95 | Page 1 Of 2 |
| Project No.: 95-058-FI | Operator: ONEILL, HARLEY C. | | |
| Sampling Location: Unit # Stack | Run No.: 3 | | |
| Filter No.: 95-016 FL | Acetone No.: | Condensate: 16.39 FL 230 ML | SG |
| Barometric Pressure: 29.93 | Static Pressure: -.54 | Probe Number: A-10-1F | |
| Nozzle Diameter: .187 | Nozzle Number: FL 3 | Pitot Coefficient: .834 | Pitot Number: A-10-1-1F |
| Meter Corr. Factor: 1.023 | Meter-Orifice: Rac# | 3.118 | |
| Sample Pt. Time: 10min 120min Test | Assumed % Moisture: | Leak Test: Before .005 AT 12 INCH | After .005 AT 12 INCH |

Orsat Analysis

| | $CO_2$ | $+O_2$ | $O_2$ | CO |
|---|---|---|---|---|
| | 15.3 | | 4.9 | |
| | 15.3 | | 4.9 | |

| Sample Point | ΔP | $\sqrt{\Delta P}$ | ΔH | Temperature °F: Stack | Probe | Imp. Out | Oven | Meter In | Meter Out | Vac. Pr (in. HG) | Dry Gas Meter Reading in Cu. Ft. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Start | 1.58 | | | | | | | | | | 702.614 |
| A 1 | 1.35 | 1.162 | 1.23 | 164 | 323 | 67 | 329 | 109 | 108 | 2 | 710.100 |
| 2 | 1.34 | 1.158 | 1.22 | 167 | 329 | 66 | 328 | 115 | 108 | 2 | 716.774 |
| 3 | 1.38 | 1.175 | 1.26 | 166 | 325 | 66 | 325 | 119 | 109 | 2 | 723.275 |
| A 1 | 1.25 | 1.118 | 1.14 | 166 | 326 | 67 | 325 | 110 | 108 | 2 | 729.749 |
| 2 | 1.23 | 1.109 | 1.12 | 167 | 327 | 67 | 322 | 119 | 109 | 2 | 735.498 |
| 3 | 1.14 | 1.068 | 1.03 | 165 | 328 | 66 | 323 | 121 | 110 | 2 | 742.473 |
| B 1 | 1.30 | 1.140 | 1.17 | 165 | 328 | 66 | 328 | 109 | 109 | 2 | 748.681 |
| 2 | 1.32 | 1.149 | 1.19 | 166 | 327 | 67 | 325 | 120 | 110 | 2 | 754.736 |
| 3 | 1.08 | 1.039 | 0.98 | 167 | 324 | 67 | 326 | 120 | 111 | 2 | 760.975 |
| C 1 | 1.14 | 1.068 | 1.03 | 165 | 324 | 66 | 327 | 113 | 110 | 2 | 766.992 |
| 2 | 1.31 | 1.145 | 1.19 | 166 | 325 | 67 | 326 | 122 | 110 | 2 | 773.389 |
| 3 | 1.05 | 1.025 | 0.95 | 167 | 328 | 67 | 326 | 122 | 111 | 2 | 778.917 |
| Stop | 4.08 | | | | | | | | | | |
| AV → | (1.11 | 1.13) | (165.92) | | | | | (~~117~~ 113) | | (2) | (76.303) cu/FT. |

Pitot Tube Leak Check: Before ok After ok

Integrated Bag Leak Check: Before ok After ok

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Particulate Field Data Sheet

| Client | Date | Page | Of |
|---|---|---|---|
| J.E.A. S.J.R.P.P. | 7-19-95 | 1 | 2 |

| Project No. | Operator |
|---|---|
| 95-058-F1 | Harley O'Neill |

| Sampling Location | Run No. |
|---|---|
| Unit #1 Stack | 1 |

| Filter No. | Acetone No. | Condensate |
|---|---|---|
| 95-017FL | | 228 mL 17.9 SG |

| Barometric Pressure | Static Pressure | Probe Number |
|---|---|---|
| ~~29.93~~ 30.01 | -.54 | A-10-1F |

| Nozzle Diameter | Nozzle Number | Pitot Coefficient | Pitot Number |
|---|---|---|---|
| .187 | FL3 | .834 | A-10-1-1F |

| Meter Corr. Factor | Meter-Orifice | |
|---|---|---|
| 1.023 | Rac# | 3.118 |

| Sample Pt. Time | Assumed % Moisture | Leak Test | Before | After |
|---|---|---|---|---|
| 10min 120min Test | | | .001 AT 12 INCHES | , CO.5 AT 12 INCH |

Orsat Analysis

| $CO_2$ | $+O_2$ | $O_2$ | CO |
|---|---|---|---|
| | | | |
| | | | |
| | | | |
| | | | |

| Sample Point | ΔP | $\sqrt{\Delta P}$ | ΔH | Temperature °F: Stack | Probe | Imp. Out | Oven | Meter In | Meter Out | Vac. Pr (in. HG) | Dry Gas Meter Reading in Cu. Ft. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Start | 7:02 | | | | | | | | | | *779.102 |
| A 1 | 1.30 | 1.140 | 1.18 | 167 | 329 | 66 | 325 | 112 | 112 | 2 | 785.729 |
| 2 | 1.31 | 1.145 | 1.19 | 161 | 322 | 62 | 326 | 118 | 113 | 2 | 792.671 |
| 3 | 1.35 | 1.162 | 1.22 | 160 | 323 | 62 | 329 | 123 | 113 | 2 | 798.618 |
| A 1 | 1.33 | 1.153 | 1.20 | 162 | 327 | 64 | 328 | 121 | 114 | 2 | 805.439 |
| 2 | 1.21 | 1.100 | 1.10 | 163 | 325 | 62 | 328 | 126 | 115 | 2 | 811.804 |
| 3 | 1.05 | 1.025 | 0.95 | 163 | 325 | 62 | 327 | 128 | 116 | 2 | 818.142 |
| B 1 | 1.32 | 1.149 | 1.20 | 164 | 326 | 62 | 325 | 120 | 116 | 2 | 824.448 |
| 2 | 1.33 | 1.153 | 1.20 | 164 | 327 | 63 | 326 | 128 | 116 | 2 | 830.565 |
| 3 | 1.39 | 1.179 | 1.26 | 163 | 326 | 62 | 326 | 129 | 117 | 2 | 836.965 |
| C 1 | 1.31 | 1.145 | 1.19 | 163 | 324 | 64 | 329 | 118 | 117 | 2 | 843.845 |
| 2 | 1.36 | 1.166 | 1.23 | 164 | 325 | 64 | 328 | 126 | 117 | 2 | 850.385 |
| 3 | 1.25 | 1.118 | 1.13 | 164 | 322 | 64 | 328 | 129 | 118 | 2 | 856.891 |
| Stop | 0915 | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| AV → | | (1.14 | 1.17 | 163.17) | | | | (119.25) | | (2) | (77.789) |
| | | | | | | | | | | | cu/FT. |
| Tst → | 105.0 | | | | | | | | | | |

Pitot Tube Leak Check: Before OK @ 3" W.C. After O/K.

Integrated Bag Leak Check: Before O/K. After O/K.

TSA

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| Client | Date | Page | Of |
|---|---|---|---|
| J.E.A. S.J.R.P.P. | 7-19-95 | 1 | 2 |

| Project No. | Operator | Orsat Analysis |
|---|---|---|
| 95-058-F1 | ONEILL, HARLEY C. | |

| Sampling Location | Run No. | $CO_2$ | $+O_2$ | $O_2$ | CO |
|---|---|---|---|---|---|
| Unit #1 Stack | 2 | | | | |

| Filter No. | Acetone No. | Condensate | |
|---|---|---|---|
| 95-018 FL | | 245 mL | 17.5 SG |

| Barometric Pressure | Static Pressure | Probe Number |
|---|---|---|
| 30.01 | -.55 | A-10-1F |

| Nozzle Diameter | Nozzle Number | Pitot Coefficient | Pitot Number |
|---|---|---|---|
| .187 | FL 3 | .834 | A-10-1-1F |

| Meter Corr. Factor | Meter-Orifice | |
|---|---|---|
| 1.023 | Rac# | 3.118 |

| Sample Pt. Time | Assumed % Moisture | Leak Test | Before | After |
|---|---|---|---|---|
| 10min 120min Test | | | .006 AT 12 INCHES | .000 AT 12 INCHES |

| Sample Point | ΔP | $\sqrt{\Delta P}$ | ΔH | Temperature °F: Stack | Probe | Imp. Out | Oven | Meter In | Meter Out | Vac. Pr (in. HG) | Dry Gas Meter Reading in Cu. Ft. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Start | 10:06 | | | | | | | | | | *857.701 |
| A 1 | 1.25 | 1.118 | 1.132 | 165 | 322 | 66 | 324 | 115 | 115 | 2 | 864.625 |
| 2 | 1.30 | 1.140 | 1.177 | 164 | 325 | 64 | 327 | 121 | 115 | 2 | 870.995 |
| 3 | 1.05 | 1.029 | 0.951 | 164 | 327 | 61 | 327 | 125 | 115 | 2 | 877.185 |
| A 1 | 1.50 | 1.225 | 1.388 | 165 | 325 | 62 | 327 | 117 | 116 | 2 | 883.932 |
| 2 | 1.40 | 1.183 | 1.268 | 164 | 326 | 61 | 326 | 126 | 116 | 2 | 890.329 |
| 3 | 1.21 | 1.100 | 1.096 | 166 | 326 | 62 | 329 | 128 | 117 | 2 | 896.675 |
| B 1 | 1.25 | 1.118 | 1.132 | 165 | 323 | 62 | 329 | 129 | 118 | 2 | 903.985 |
| 2 | 1.35 | 1.162 | 1.222 | 165 | 324 | 63 | 328 | 130 | 116 | 2 | 909.910 |
| 3 | 1.21 | 1.100 | 1.096 | 165 | 324 | 62 | 325 | 129 | 118 | 2 | 915.434 |
| C 1 | 1.31 | 1.145 | 1.186 | 166 | 325 | 61 | 327 | 123 | 118 | 2 | 921.955 |
| 2 | 1.35 | 1.162 | 1.222 | 166 | 326 | 61 | 327 | 127 | 118 | 2 | 928.502 |
| 3 | 1.37 | 1.170 | 1.240 | 167 | 324 | 62 | 325 | 128 | 118 | 2 | 935.076 |
| Stop | 1220 | | | | | | | | | | |
| AV → | | (1.137) | (1.173) | (165.167) | | | | (120.833) | | (2) | (77.375) cu/FT. |

Pitot Tube Leak Check: Before Ok @ 2" w.c. After Ok.

Integrated Bag Leak Check: Before OK After OK.



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Particulate Field Data Sheet

| Client | Date | Page |
|---|---|---|
| J.E.A. S.J.R.P.P. | 7-19-95 | 1 of 2 |

| Project No. | Operator |
|---|---|
| 95-058-F1 | O'NEILL, HARLEY C. |

| Sampling Location | Run No. |
|---|---|
| Unit # 1 Stack | 3 |

| Filter No. | Acetone No. | Condensate |
|---|---|---|
| 95-019FL | | 240 ML 17.5 |

Orsat Analysis

| | $CO_2$ | $+O_2$ | $O_2$ | CO |
|---|---|---|---|---|
| SG. | 17.01 | 4.16 | | |

| Barometric Pressure | Static Pressure | Probe Number |
|---|---|---|
| 30.01 | -.55 | A-10-1F |

| Nozzle Diameter | Nozzle Number | Pitot Coefficient | Pitot Number |
|---|---|---|---|
| .187 | FL. 3 | .834 | A-10-1-1F |

| Meter Corr. Factor | Meter-Orifice | |
|---|---|---|
| 1.023 | Rac# | 3.118 |

| Sample Pt. Time | Assumed % Moisture | Leak Test | Before | After |
|---|---|---|---|---|
| 10min 120min Test | | | .008 AT 12 INCH | .000 AT 12 INCH |

| Sample Point | ΔP | $\sqrt{\Delta P}$ | ΔH | Temperature °F: Stack | Probe | Imp. Out | Oven | Meter In | Meter Out | Vac. Pr (in. HG) | Dry Gas Meter Reading in Cu. Ft. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Start | 12:30 | | | | | | | | | | 935.333 |
| A. 1 | 1.35 | 1.162 | 1.222 | 164 | 325 | 62 | 329 | 113 | 113 | 2 | 941.950 |
| 2 | 1.40 | 1.183 | 1.268 | 165 | 324 | 60 | 328 | 117 | 113 | 2 | 948.415 |
| 3 | 1.20 | 1.095 | 1.087 | 165 | 325 | 61 | 327 | 121 | 113 | 2 | 954.878 |
| A. 1 | 1.38 | 1.175 | 1.250 | 164 | 326 | 60 | 327 | 120 | 113 | 2 | 961.348 |
| 2 | 1.40 | 1.183 | 1.268 | 164 | 327 | 63 | 324 | 122 | 113 | 2 | 967.953 |
| 3 | 1.11 | 1.054 | 1.005 | 167 | 322 | 60 | 327 | 123 | 113 | 2 | 973.880 |
| B. 1 | 1.35 | 1.162 | 1.222 | 165 | 323 | 61 | 326 | 113 | 112 | 2 | 980.209 |
| 2 | 1.40 | 1.183 | 1.268 | 165 | 325 | 62 | 328 | 118 | 112 | 2 | 986.853 |
| 3 | 1.39 | 1.179 | 1.259 | 167 | 327 | 61 | 331 | 119 | 112 | 2 | 992.636 |
| C 1 | 1.36 | 1.166 | 1.231 | 166 | 326 | 61 | 327 | 114 | 112 | 2 | 998.876 |
| 2 | 1.43 | 1.196 | 1.285 | 168 | 327 | 64 | 325 | 121 | 112 | 2 | 005.715 |
| 3 | 1.11 | 1.054 | 1.005 | 164 | 326 | 63 | 325 | 123 | 112 | 2 | 011.943 |
| Stop | 15:10 | | | | | | | | | | |
| AV → | | (~~1.248~~ 1.149) | (1.198) | (165.333) | | | | (115.583) | | [2] | (76.610) cu/FT. |

Pitot Tube Leak Check: Before .01 @ 3" w.c. After OK

Integrated Bag Leak Check: Before OK After OK

**BEST AVAILABLE COPY**

| | | | |
|---|---|---|---|
| Client: J.E.A. S.J.R.P.P. | | Date: 20 July 95 | Page 1 Of 2 |
| Project No.: 95-058-F1 | Operator: O'NEILL, HARLEY C. | Orsat Analysis | |
| Sampling Location: Unit #1 Stack | Run No.: 1 | $CO_2$: 15.17 | $+O_2$: | $O_2$: 5.2 | CO: / |
| Filter No.: 95-020 FL | Acetone No.: | Condensate: 232 ml (15.8 SG) | | | |
| Barometric Pressure: 30.08 | Static Pressure: -5Q | Probe Number: A-10-1F | | | |
| Nozzle Diameter: .187 | Nozzle Number: FL 3 | Pitot Coefficient: .834 | Pitot Number: A-10-1-1F | ~~15.18~~ | | ~~5.16~~ | |
| Meter Corr. Factor: 1.023 | Meter-Orifice: Rac# 1 | 3.118 | | | |
| Sample Pt. Time: 10min 120min Test | Assumed % Moisture: 13 | Leak Test: Before .004 AT 7 INCHES | After .000 AT 12 INCH | | |

| Sample Point | ΔP | $\sqrt{\Delta P}$ | ΔH | Temperature °F: Stack | Probe | Imp. Out | Oven | Meter In | Meter Out | Vac. Pr (in. HG) | Dry Gas Meter Reading in Cu. Ft. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Start | 0655 | | | | | | | | | | *012.038 |
| A 1 | 1.31 | 1.145 | 1.183 | 163 | 322 | 61 | 329 | 111 | 110 | 2 | 018.214 |
| 2 | 1.35 | 1.162 | 1.220 | 164 | 323 | 60 | 324 | 114 | 110 | 2 | 024.349 |
| 3 | 1.21 | 1.100 | 1.093 | 165 | 328 | 62 | 327 | 118 | 111 | 2 | 030.449 |
| A 1 | 1.34 | 1.179 | 1.256 | 166 | 325 | 62 | 325 | 114 | 111 | 2 | 036.349 |
| 2 | 1.30 | 1.140 | 1.174 | 164 | 327 | 63 | 326 | 114 | 112 | 2 | 042.701 |
| 3 | 1.20 | 1.095 | 1.084 | 165 | 325 | 63 | 326 | 114 | 112 | 2 | 048.831 |
| B 1 | 1.36 | 1.166 | 1.229 | 165 | 327 | 62 | 327 | 112 | 111 | 2 | 055.468 |
| 2 | 1.31 | 1.145 | 1.183 | 167 | 326 | 63 | 328 | 123 | 112 | 2 | 062.413 |
| 3 | 1.20 | 1.095 | 1.084 | 166 | 327 | 63 | 325 | 128 | 114 | 2 | 069.012 |
| C 1 | 1.35 | 1.162 | 1.220 | 166 | 328 | 63 | 326 | 121 | 114 | 2 | 075.415 |
| 2 | 1.12 | 1.058 | 1.012 | 163 | 324 | 60 | 324 | 128 | 116 | 2 | 081.847 |
| 3 | 1.01 | 1.005 | 0.912 | 164 | 327 | 61 | 322 | 129 | 116 | 2 | 088.325 |
| Stop | 0925 | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| AV → | | (1.121 | 1.138 | 164.83) | | | | (115.583) | | (2) | (76.287) cu/FT. |
| 105.9 P/6 ISO | | | | | | | | | | | |

Pitot Tube Leak Check: Before OK After OK

Integrated Bag Leak Check: Before OK After OK.

TSA

Particulate Field Data Sheet

| Client | | Date | Page | Of |
|---|---|---|---|---|
| J.E.A. S.J.R.P.P. | | 20 JULY 95 | 1 | 2 |
| Project No. | Operator | Orsat Analysis | | |
| 95-058-F1 | O'NEILL, HARLEY C. | $CO_2$ | $+O_2$ | $O_2$ CO |
| Sampling Location | Run No. | | | |
| Unit # 1 Stack | 2 | | | |
| Filter No. | Acetone No. | Condensate | | |
| 95-021FL | | 235 mL | 15.6 SG | |
| Barometric Pressure | Static Pressure | Probe Number | | |
| 30.08 | -.55 | A-10-1F | 15.18 | 5.16 |
| Nozzle Diameter | Nozzle Number | Pitot Coefficient | Pitot Number | |
| .187 | FL3 | .834 | A-10-1-1F | |
| Meter Corr. Factor | Meter-Orifice | | | |
| 1.023 | Rac # | 3.118 | | |
| Sample Pt. Time | Assumed % Moisture | Leak Test | Before | After |
| 10 min | 120 min Test | | .000 AT 12 INCHES | .000 AT 9 INCHES |

| Sample Point | ΔP | $\sqrt{\Delta P}$ | ΔH | Temperature °F: Stack | Probe | Imp. Out | Oven | Meter In | Meter Out | Vac. Pr (in. HG) | Dry Gas Meter Reading in Cu. Ft. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Start | 0945 | | | | | | | | | | * 085.458 |
| C 1 | 1.35 | 1.162 | 1.230 | 164 | 322 | 62 | 329 | 114 | 114 | 2 | 095.198 |
| 2 | 1.38 | 1.175 | 1.247 | 165 | 326 | 61 | 327 | 118 | 113 | 2 | 101.874 |
| 3 | 1.20 | 1.095 | 1.064 | 166 | 325 | 61 | 326 | 122 | 113 | 2 | 108.384 |
| D 1 | 1.32 | 1.149 | 1.192 | 165 | 321 | 60 | 324 | 116 | 113 | 2 | 114.823 |
| 2 | 1.38 | 1.175 | 1.247 | 163 | 324 | 66 | 327 | 125 | 113 | 2 | 121.018 |
| 3 | 1.23 | 1.109 | 1.111 | 164 | 324 | 62 | 325 | 127 | 115 | 2 | 127.140 |
| A 1 | 1.39 | 1.179 | 1.256 | 164 | 323 | 61 | 327 | 117 | 115 | 2 | 133.813 |
| 2 | 1.40 | 1.183 | 1.265 | 165 | 325 | 62 | 326 | 128 | 116 | 2 | 140.281 |
| 3 | 1.23 | 1.109 | 1.111 | 165 | 323 | 62 | 328 | 129 | 117 | 2 | 146.686 |
| B 1 | 1.30 | 1.140 | 1.174 | 163 | 324 | 62 | 329 | 121 | 117 | 2 | 153.301 |
| 2 | 1.41 | 1.187 | 1.274 | 164 | 327 | 63 | 329 | 130 | 119 | 2 | 159.715 |
| 3 | 1.36 | 1.166 | 1.229 | 161 | 324 | 60 | 328 | 131 | 119 | 2 | 166.085 |
| Stop | 1203 | | | | | | | | | | |
| AV → | | (1.152) | (1.201) | (164.08) | | | | (119.250) | | (2) | (77.627) cu/FT. |

Pitot Tube Leak Check: Before OK After OK

Integrated Bag Leak Check: Before _____ After _____

**BEST AVAILABLE COPY**

Client: J.E.A. S.J.R.P.P. | Date: 20 July 95 | Page 1 Of 2

Project No.: 95-058-F1 | Operator: O'NEILL, HARLEY

Sampling Location: Unit # 1 Stack | Run No.: 3

Filter No.: 95-021FL | Acetone No.: | Condensate: 254 21.056 mL

Barometric Pressure: 30.08 | Static Pressure: -.55 | Probe Number: A-10-1F

Nozzle Diameter: .187 | Nozzle Number: | Pitot Coefficient: .834 | Pitot Number: A-10-1-1F

Meter Corr. Factor: 1.023 | Meter-Orifice: Rac# | 3.118

Sample Pt. Time: 10min 120min Test | Assumed % Moisture: | Leak Test: Before .006AT12INCHES After .000AT12INCHES

Orsat Analysis

| | $CO_2$ | $+O_2$ | $O_2$ | CO |
|---|---|---|---|---|
| | DK3 | | ~~5.09~~ | |
| | 15.22 | | 5.09 | |

| Sample Point | ΔP | $\sqrt{\Delta P}$ | ΔH | Temperature °F: Stack | Probe | Imp. Out | Oven | Meter In | Meter Out | Vac. Pr (in. HG) | Dry Gas Meter Reading in Cu. Ft. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Start | 12:31 | | | | | | | | | | * 166.261 |
| C 1 | 1.43 | 1.196 | 1.272 | 164 | 322 | 62 | 328 | 115 | 115 | 2 | 173.154 |
| 2 | 1.35 | 1.162 | 1.200 | 165 | 323 | 61 | 327 | 117 | 115 | 2 | 179.752 |
| 3 | 1.29 | 1.136 | 1.147 | 166 | 323 | 62 | 327 | 127 | 116 | 2 | 185.954 |
| D 1 | 1.35 | 1.168 | 1.200 | 164 | 325 | 63 | 328 | 119 | 117 | 2 | 192.450 |
| 2 | 1.30 | 1.140 | 1.156 | 164 | 322 | 60 | 326 | 128 | 117 | 2 | 198.895 |
| 3 | 1.25 | 1.118 | 1.112 | 165 | 327 | 61 | 322 | 129 | 119 | 2 | 204.965 |
| A 1 | 1.45 | 1.204 | 1.289 | 162 | 322 | 63 | 326 | 118 | 117 | 2 | 211.796 |
| 2 | 1.40 | 1.183 | 1.245 | 166 | 324 | 60 | 329 | 127 | 117 | 2 | 218.011 |
| 3 | 1.45 | 1.204 | 1.289 | 164 | 321 | 61 | 332 | 128 | 118 | 2 | 224.477 |
| B 1 | 1.32 | 1.149 | 1.174 | 162 | 322 | 61 | 330 | 124 | 117 | 2 | 231.096 |
| 2 | 1.41 | 1.187 | 1.254 | 163 | 324 | 62 | 327 | 127 | 118 | 2 | 237.701 |
| 3 | 1.35 | 1.162 | 1.200 | 164 | 325 | 62 | 326 | 127 | 118 | 2 | 244.574 |
| Stop | 14:35 | | | | | | | | | | |
| AV → | | (1.167 | 1.212 | 164.083) | | | | (120.417) | | [2] | (78.313 cu/FT.) |

Pitot Tube Leak Check: Before OK After OK

Integrated Bag Leak Check: Before _____ After _____

TSA

Particulate Field Data Sheet

**BEST AVAILABLE COPY**

| | | | | | |
|---|---|---|---|---|---|
| Client: SJRPP UNIT #2 | | | | Date: 8 Aug. 1995 | Page 1 Of 2 |
| Project No.: 95058 FL | Operator: Harley C. O'Neill | | | Orsat Analysis | |
| Sampling Location: STACK | | Run No.: 1 | | $CO_2$ / $+O_2$ / $O_2$ / CO | |
| Filter No.: 95-025-FL | Acetone No.: | Condensate: 803 mL | vs. 3 SG | | |
| Barometric Pressure: 30.23 | Static Pressure: -.53 | Probe Number: A-10-1-F | | 14.0 / 5.9 | |
| Nozzle Diameter: .187 | Nozzle Number: FL4 | Pitot Coefficient: .834 | Pitot Number: A-10-1-1F | | |
| Meter Corr. Factor: 1.023 | Meter-Orifice: 3.118 | | | | |
| Sample Pt. Time: 10 min / 120 min | Assumed % Moisture: 13% | Leak Test | Before: .003 @ 15" Hg | After: .000 @ 3" Hg | |

| Sample Point | ΔP | $\sqrt{\Delta P}$ | ΔH | Temperature °F: Stack | Probe | Imp. Out | Oven | Meter In | Meter Out | Vac. Pr (in. HG) | Dry Gas Meter Reading in Cu. Ft. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| START | 0745 | | | 170 | | | | | | | 942.880 |
| A 1 | 1.31 | 1.145 | 1.128 | 170 | 310 | 63 | 324 | 118 | 116 | 2 | 949.365 |
| 2 | 1.38 | 1.175 | 1.28 | 170 | 305 | 65 | 322 | 117 | 112 | 2 | 955.798 |
| 3 | 1.05 | 1.025 | 0.99 | 171 | 305 | 64 | 325 | 123 | 113 | 2 | 961.859 |
| B 1 | 1.32 | 1.149 | 1.23 | 170 | 316 | 67 | 329 | 115 | 113 | 2 | 968.343 |
| 2 | 1.25 | 1.118 | 1.19 | 169 | 314 | 63 | 334 | 126 | 115 | 2 | 974.754 |
| 3 | 1.15 | 1.072 | 1.11 | 168 | 304 | 65 | 329 | 130 | 117 | 2 | 980.945 |
| C 1 | 1.34 | 1.158 | 1.26 | 169 | 306 | 64 | 322 | 118 | 116 | 2 | 987.647 |
| 2 | 1.40 | 1.183 | 1.31 | 171 | 322 | 63 | 328 | 117 | 115 | 2 | 994.386 |
| 3 | 1.31 | 1.145 | 1.24 | 169 | 323 | 64 | 327 | 121 | 115 | 2 | 000.585 |
| D 1 | 1.45 | 1.204 | 1.36 | 170 | 324 | 65 | 321 | 116 | 115 | 2 | 007.476 |
| 2 | 1.50 | 1.225 | 1.43 | 170 | 325 | 65 | 322 | 125 | 116 | 3 | 014.501 |
| 3 | 1.48 | 1.217 | 1.42 | 171 | 324 | 64 | 334 | 129 | 117 | 3 | 021.318 |
| STOP | 1110 | | | | | | | | | | |
| AVR | | (1.151) | (0.246) | (169.833) | | | | (118.500) | | [2.167] | (78.438) cubic |

Pitot Tube Leak Check: Before OK After OK

Integrated Bag Leak Check: Before OK After OK

Particulate ... Data Sheet

**BEST AVAILABLE COPY**

| Client | | Date | Page | Of |
|---|---|---|---|---|
| JEA S.J.R.P.P. | | 8.8.95 | 1 | 2 |

| Project No. | Operator |
|---|---|
| 95-058 FL | HARLEY C. O'NEILL |

| Sampling Location | Run No. |
|---|---|
| Unit 1 Stack | 2 |

| Filter No. | Acetone No. | Condensate |
|---|---|---|
| 95-023-FL | | 241 mL 16.5 SG |

| Barometric Pressure | Static Pressure | Probe Number |
|---|---|---|
| 30.23 | -.55 | A-10-1F |

| Nozzle Diameter | Nozzle Number | Pitot Coefficient | Pitot Number |
|---|---|---|---|
| .187 | FL 4 | .834 | A-10-1-1F |

| Meter Corr. Factor | Meter-Orifice |
|---|---|
| 1.023 | RAC #1 3.118 |

| Sample Pt. Time | Assumed % Moisture | Leak Test | Before | After |
|---|---|---|---|---|
| 10 min. 120 min Tot | 13% | | .000 @ 15" HG | .000 @ 2" HG |

Orsat Analysis

| | $CO_2$ | $+O_2$ | $O_2$ | CO |
|---|---|---|---|---|
| | 14.0 | 19.2 | 5.2 | |
| | 14.0 | 19.2 | 5.2 | |
| | (13.94 | | 5.28) | |

| Sample Point | ΔP | $\sqrt{\Delta P}$ | ΔH | Temperature °F: Stack | Probe | Imp. Out | Oven | Meter In | Meter Out | Vac. Pr (in. HG) | Dry Gas Meter Reading in Cu. Ft. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| START | 1145 | | | | | | | | | | 021.487 |
| 1 | 1.41 | 1.187 | 1.32 | 170 | 312 | 63 | 322 | 115 | 115 | 2 | 027.998 |
| A 2 | 1.35 | 1.162 | 1.27 | 169 | 318 | 64 | 324 | 118 | 115 | 2 | 034.989 |
| 3 | 1.21 | 1.100 | 1.14 | 169 | 322 | 63 | 326 | 126 | 117 | 2 | 041.268 |
| 1 | 1.40 | 1.183 | 1.31 | 171 | 324 | 65 | 327 | 117 | 117 | 2 | 047.836 |
| B 2 | 1.34 | 1.158 | 1.25 | 170 | 324 | 66 | 325 | 126 | 117 | 2 | 054.439 |
| 3 | 1.30 | 1.140 | 1.25 | 169 | 322 | 63 | 328 | 130 | 118 | 2 | 060.775 |
| 1 | 1.46 | 1.208 | 1.36 | 171 | 323 | 63 | 327 | 119 | 118 | 2 | 067.550 |
| C 2 | 1.49 | 1.221 | 1.43 | 170 | 315 | 63 | 328 | 125 | 119 | 2 | 074.245 |
| 3 | 1.30 | 1.140 | 1.26 | 170 | 316 | 64 | 326 | 131 | 119 | 2 | 080.592 |
| | | | | ~~165~~ | ~~319~~ | ~~66~~ | ~~325~~ | ~~121~~ | ~~119~~ | 2 | |
| D 1 | 1.51 | 1.224 | 1.44 | 168 | 319 | 66 | 325 | 121 | 119 | 2 | 087.557 |
| 2 | 1.45 | 1.204 | 1.39 | 170 | 318 | 65 | 322 | 128 | 119 | 2 | 094.536 |
| 3 | 1.49 | 1.221 | 1.44 | 171 | 320 | 64 | 324 | 131 | 121 | 2 | 101.323 |
| Stop | 1405 | | | | | | | | | | |
| AVG. | | (1.179) | (1.326) | (169.83) | | | | (121.000) | | 2 | (79.836) |

Pitot Tube Leak Check: Before OK After OK

Integrated Bag Leak Check: Before OK After OK



Total Source Analysis, Inc.
Environmental Testing Consultants

# Particulate Field Data Sheet

| | | | | | |
|---|---|---|---|---|---|
| Client: JEA S.J.R.PP. | | | | Date: 8-8-95 | Page 1 Of 2 |
| Project No.: 95-05[illegible]FL | Operator: HARLEY C. O'NEILL | | | Orsat Analysis | |
| Sampling Location: Unit 1 Stack | | | Run No.: 3 | $CO_2$ / $+O_2$ / $O_2$ / CO | |
| Filter No.: 95-027-FL | Acetone No.: | Condensate: 225 mL (22.2) | | SG / / 4/98 / | |
| Barometric Pressure: 30.23 | Static Pressure: -.55 | Probe Number: A-10-1F | | 13.99 / / 5.27 / | |
| Nozzle Diameter: .187 | Nozzle Number: FL 4 | Pitot Coefficient: .834 | Pitot Number: A-10-1-1F | / / / | |
| Meter Corr. Factor: 1.023 | Meter-Orifice: Rack 4 | 3.118 | | / / / | |
| Sample Pt. Time: 10 min. 120 min test | Assumed % Moisture: 13% | Leak Test: Before .006 @ 15" HG | After .000 @ 2" HG | | |

| Sample Point | ΔP | $\sqrt{\Delta P}$ | ΔH | Temperature °F: Stack | Probe | Imp. Out | Oven | Meter In | Meter Out | Vac. Pr (in. HG) | Dry Gas Meter Reading in Cu. Ft. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Start | 1500 | | | | | | | | | | 101.425 |
| 1 | 1.49 | 1.221 | 1.38 | 170 | 315 | 62 | 321 | 112 | 112 | 2 | 108.575 |
| A 2 | 1.37 | 1.170 | 1.27 | 169 | 319 | 64 | 324 | 113 | 111 | 2 | 115.139 |
| 3 | 1.32 | 1.105 | 1.13 | 169 | 320 | 63 | 325 | 115 | 110 | 2 | 121.494 |
| 1 | 1.38 | 1.175 | 1.26 | 171 | 321 | 63 | 325 | 110 | 109 | 2 | 127.901 |
| B 2 | 1.33 | 1.153 | 1.24 | 170 | 322 | 64 | 327 | 118 | 110 | 2 | 134.469 |
| 3 | 1.21 | 1.100 | 1.13 | 170 | 320 | 62 | 326 | 122 | 111 | 2 | 140.850 |
| 1 | 1.48 | 1.217 | 1.37 | 170 | 327 | 64 | 329 | 115 | 111 | 2 | 149.550 |
| C 2 | 1.53 | 1.237 | 1.42 | 172 | 324 | 63 | 327 | 121 | 112 | 2 | 156.760 |
| 3 | 1.39 | 1.179 | 1.31 | 171 | 325 | 64 | 326 | 124 | 112 | 2 | 163.242 |
| 1 | 1.51 | 1.229 | 1.39 | 170 | 327 | 60 | 324 | 114 | 111 | 2 | 169.998 |
| D 2 | 1.55 | 1.245 | 1.43 | 171 | 326 | 61 | 325 | 118 | 111 | 2 | 176.989 |
| 3 | 1.49 | 1.221 | 1.38 | 171 | 326 | 62 | 324 | 117 | 110 | 2 | 183.653 |
| Stop | 1712 | | | | | | | | | | |
| AVG. | | (1.1885) | (1.394) | (170.33) | | | | (113.708) | | 2 | (82.228) |

Pitot Tube Leak Check: Before OK After OK

Integrated Bag Leak Check: Before OK After OK



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SO3 Field Data Sheet

| Client | | Date | Page | Of |
|---|---|---|---|---|
| J.E.A. S.J.R.P.P. | | 7-18-95 | 1 | 2 |

| Project No. | Operator | Orsat Analysis 3A | | | |
|---|---|---|---|---|---|
| 95-058-FL. | Teague | $CO_2$ | $+O_2$ | $O_2$ | CO |
| Sampling Location: Unit # 1 Stack | Run No.: 1 | | | | |
| Filter No. | Acetone No. | Condensate: 89 - 2705 | | | |
| Barometric Pressure: 29.93 | Static Pressure: -.53 | Probe Number: N-10-61 | 15.9 | | 4.9 | |
| Nozzle Diameter: .187 | Nozzle Number: F1-04 | Pitot Coefficient: .875 | Pitot Number: N-10-61-1F | | | | |
| Meter Corr. Factor: 1.03 | Meter-Orifice: 3.255 | | | | | |
| Sample Pt. Time: 5min 60min Test. | Assumed % Moisture: 13.0% | Leak Test | Before: .0149 @ 15" | After: .006 @ 16" | | |

| Sample Point | ΔP | $\sqrt{\Delta P}$ | ΔH | Temperature °F: Stack | Probe | Imp. Out | Oven | Meter In | Meter Out | Vac. Pr (in. HG) | Dry Gas Meter Reading in Cu. Ft. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Start | 750 | | | | | | | | | | 633.002 |
| C 1 | 1.5 | 1.225 | 1.479 | 162 | 313 | 67 | 309 | 94 | 96 | 1.0 | 636.39 |
| 2 | 1.3 | 1.14 | 1.281 | 163 | 310 | 67 | 312 | 96 | 103 | 1.0 | 639.54 |
| 3 | 1.0 | 1.00 | 1.003 | 162 | 317 | 64 | 312 | 99 | 106 | 1.0 | 642.87 |
| A 1 | 1.5 | 1.225 | 1.505 | 163 | 318 | 66 | 315 | 102 | 102 | 1.0 | 645.71 |
| 2 | 1.4 | 1.183 | 1.405 | 164 | 314 | 66 | 312 | 101 | 106 | 1.0 | 649.02 |
| 3 | 1.1 | 1.049 | 1.104 | 163 | 310 | 67 | 318 | 102 | 109 | 1.0 | 651.99 |
| B 1 | 1.5 | 1.225 | 1.505 | 163 | 306 | 67 | 323 | 103 | 105 | 1.0 | 655.29 |
| 2 | 1.5 | 1.225 | 1.505 | 164 | 304 | 66 | 314 | 104 | 106 | 1.0 | 658.74 |
| 3 | 1.2 | 1.095 | 1.225 | 164 | 306 | 66 | 311 | 105 | 112 | 1.0 | 661.81 |
| D 1 | 1.4 | 1.183 | 1.430 | 165 | 304 | 67 | 315 | 105 | 106 | 1.0 | 665.09 |
| 2 | 1.6 | 1.225 | 1.532 | 164 | 309 | 65 | 311 | 106 | 114 | 1.0 | 668.39 |
| 3 | 1.3 | 1.140 | 1.327 | 165 | 307 | 65 | 309 | 106 | 114 | 1.0 | 671.590 |
| Stop | 911 | | | | | | | | | | |
| AV→ | | (1.160) | (1.358) | (163.5) | | | | (104.70) | | | (38.588) Cu/FT. |
| ISO→ | 100.1% | | | | | | | | | | |

Pitot Tube Leak Check: Before OK After OK

Integrated Bag Leak Check: Before _____ After _____



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Environmental Testing Consultants

**BEST AVAILABLE COPY**

# $SO_3$ Field Data Sheet

| | | | | | |
|---|---|---|---|---|---|
| Client: J.E.A. S.J.R.P.P. | | | | Date: 7-18-95 | Page 1 Of 2 |
| Project No.: 95-058-FL. | Operator: Tessie | | | ~~Orsat~~ Analysis 3A | |
| Sampling Location: Unit # Stack | | Run No.: 2 | | $CO_2$ | $+O_2$ / $O_2$ / CO |
| Filter No. | Acetone No. | Condensate: 80 23.9 SG | | | |
| Barometric Pressure: 29.93 | Static Pressure: -.54 | Probe Number: N-10-G1 | | 14.5 | 5.2 |
| Nozzle Diameter: .187 | Nozzle Number: F104 | Pitot Coefficient: .875 | Pitot Number: N-10-G1-F1 | | |
| Meter Corr. Factor: 1.03 | Meter-Orifice: 3.255" | | | | |
| Sample Pt. Time: 5min 60min Test. | Assumed % Moisture: 13% | Leak Test | Before: 0049 @ 15" | After: .0019 @ 10" | |

| Sample Point | ΔP | $\sqrt{\Delta P}$ | ΔH | Temperature °F: Stack | Probe | Imp. Out | Oven | Meter In | Meter Out | Vac. Pr (in. HG) | Dry Gas Meter Reading in Cu. Ft. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Start | 1040 | | | | | | | | | | 682.126 |
| C 1 | 1.4 | 1.183 | 1.405 | 165 | 251 | 63 | 246 | 102 | 102 | 2.0 | 685.53 |
| 2 | 1.4 | 1.183 | 1.405 | 164 | 254 | 63 | 251 | 102 | 104 | 2.0 | 688.72 |
| 3 | 1.0 | 1.00 | 1.003 | 166 | 254 | 64 | 244 | 102 | 107 | 2.0 | 691.44 |
| D 1 | 1.5 | 1.225 | 1.505 | 165 | 257 | 62 | 242 | 104 | 105 | 2.0 | 694.88 |
| 2 | 1.4 | 1.183 | 1.405 | 165 | 256 | 62 | 253 | 104 | 106 | 3.0 | 698.27 |
| 3 | 1.1 | 1.049 | 1.095 | 165 | 255 | 63 | 262 | 104 | 110 | 3.0 | 701.44 |
| B 1 | 1.4 | 1.183 | 1.393 | 166 | 246 | 63 | 263 | 105 | 106 | 3.0 | 704.48 |
| 2 | 1.5 | 1.225 | 1.493 | 164 | 249 | 62 | 260 | 105 | 110 | 3.0 | 707.85 |
| 3 | 1.1 | 1.049 | 1.095 | 163 | 254 | 61 | 263 | 104 | 110 | 3.0 | 710.78 |
| A 1 | 1.5 | 1.225 | 1.493 | 165 | 251 | 62 | 257 | 105 | 107 | 3.0 | 714.24 |
| 2 | 1.5 | 1.225 | 1.493 | 164 | 245 | 62 | 260 | 105 | 111 | 3.0 | 717.58 |
| 3 | 1.2 | 1.095 | 1.194 | 163 | 244 | 61 | 262 | 106 | 112 | 3.0 | 720.574 |
| Stop | 200 | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| AV→ | | (1.152) | (1.350) | (164.5°) | | | | (105.83) | | | (38.448) Cu/FT. |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| I50→ | 101.3% | | | | | | | | | | |

Pitot Tube Leak Check: Before OK After OK

Integrated Bag Leak Check: Before _____ After _____

# $SO_3$ Field Data Sheet

**BEST AVAILABLE COPY** 18

| | | | | | |
|---|---|---|---|---|---|
| Client: J.E.A. S.J.R.P.P. | | | | Date: 7-~~30~~-95 | Page 1 Of 2 |
| Project No.: 95-058-FL. | Operator: Teagle | | | Orsat Analysis | |
| Sampling Location: Unit # Stack | | Run No.: 3 | | $CO_2$ | $+O_2$ / $O_2$ / CO |
| Filter No. | Acetone No. | Condensate: 79 25.2 SG. | | | |
| Barometric Pressure: 29.93 | Static Pressure: -.54 | Probe Number: N-10-G1 | | 15.3 | 4.9 |
| Nozzle Diameter: .147 | Nozzle Number: F1-04 | Pitot Coefficient: .875 | Pitot Number: N-10-G1-F1 | | |
| Meter Corr. Factor: 1.03 | | Meter-Orifice: 3.255 | | | |
| Sample Pt. Time: 5min 60min Test. | Assumed % Moisture: 13% | Leak Test | Before: .0094 @ 10" | After: .0029 @ 10" | |

| Sample Point | ΔP | $\sqrt{\Delta P}$ | ΔH | Temperature °F: Stack | Probe | Imp. Out | Oven | Meter In | Meter Out | Vac. Pr (in. HG) | Dry Gas Meter Reading in Cu. Ft. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Start | 13:00 | | | | | | | | | | 731.191 |
| C 1 | 1.5 | 1.225 | 1.493 | 166 | 256 | 65 | 241 | 101 | 102 | 4.0 | 734.60 |
| 2 | 1.3 | 1.140 | 1.294 | 167 | 254 | 65 | 247 | 101 | 104 | 4.0 | 737.69 |
| 3 | 1.0 | 1.00 | .995 | 167 | 255 | 63 | 242 | 101 | 104 | 3.0 | 740.45 |
| D 1 | 1.4 | 1.183 | 1.393 | 164 | 256 | 66 | 244 | 102 | 103 | 4.0 | 743.78 |
| 2 | 1.5 | 1.225 | 1.493 | 165 | 250 | 65 | 242 | 102 | 106 | 4.0 | 747.02 |
| 3 | 1.2 | 1.095 | 1.194 | 165 | 253 | 65 | 240 | 103 | 106 | 4.0 | 750.11 |
| A 1 | 1.4 | 1.183 | 1.393 | 167 | 259 | 63 | 255 | 104 | 105 | 3.0 | 753.40 |
| 2 | 1.4 | 1.183 | 1.393 | 167 | 261 | 62 | 257 | 103 | 104 | 3.0 | 756.70 |
| 3 | 1.0 | 1.00 | .995 | 166 | 262 | 61 | 260 | 104 | 109 | 3.0 | 759.42 |
| B 1 | 1.5 | 1.225 | 1.493 | 165 | 256 | 61 | 261 | 102 | 105 | 3.0 | 762.78 |
| 2 | 1.4 | 1.183 | 1.393 | 166 | 257 | 61 | 255 | 104 | 109 | 4.0 | 766.08 |
| 3 | 1.1 | 1.049 | 1.095 | 166 | 257 | 61 | 259 | 104 | 110 | 3.0 | 768.964 |
| Stop | 14:19 | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| AV→ | | (1.141) | (1.302) | (165.92) | | | | (104.25) | | | (37.773) Cu/FT. |
| ΔSO→ | 98.8 | | | | | | | | | | |

Pitot Tube Leak Check: Before OK After OK

Integrated Bag Leak Check: Before _____ After _____



Total Source Analysis, Inc.

# $SO_3$ Field Data Sheet

**BEST AVAILABLE COPY**

| | | | | |
|---|---|---|---|---|
| Client: J.E.A. S.J.R.P.P. | | | Date: 7-19-95 | Page 1 Of 2 |
| Project No.: 95-058-FL. | Operator: Scott Teasley | | Orsat Analysis | |
| Sampling Location: Unit # 1 Stack | | Run No.: 1 | $CO_2$: 40.456 | $+O_2$: | $O_2$: 4.22 | CO: |
| Filter No.: | Acetone No.: | Condensate: 84 | | | | |
| Barometric Pressure: 30.01 | Static Pressure: -.54 | Probe Number: N-10-61 | | | | |
| Nozzle Diameter: .184 | Nozzle Number: FH04 | Pitot Coefficient: .875 | Pitot Number: N-10-61-F1 | | | |
| Meter Corr. Factor: 1.03 | Meter-Orifice: 3.255 | | | | | |
| Sample Pt. Time: 5min 60min Test. | Assumed % Moisture: 13 | Leak Test: Before .0049 at 12" | After .006 at 12" | | | |

| Sample Point | ΔP | $\sqrt{\Delta P}$ | ΔH | Temperature °F: Stack | Probe | Imp. Out | Oven | Meter In | Meter Out | Vac. Pr (in. HG) | Dry Gas Meter Reading in Cu. Ft. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Start | 7:00 | | | | | | | | | | 779.798 |
| A 1 | 1.5 | 1.225 | 1.52 | 163 | 242 | 67 | 241 | 104 | 109 | 1.0 | 783.20 |
| 2 | 1.5 | 1.225 | 1.52 | 164 | 252 | 67 | 243 | 108 | 109 | 1.0 | 786.64 |
| 3 | 1.1 | 1.049 | 1.11 | 164 | 245 | 67 | 245 | 108 | 111 | 1.0 | 789.57 |
| B 1 | 1.5 | 1.225 | 1.52 | 164 | 259 | 67 | 240 | 109 | 110 | 1.0 | 792.95 |
| 2 | 1.4 | 1.183 | [illegible] | 164 | 259 | 67 | 247 | 109 | 115 | 1.0 | 796.32 |
| 3 | 1.1 | 1.049 | 1.13 | 164 | 263 | 67 | 253 | 110 | 115 | 1.0 | 799.26 |
| C 1 | 1.6 | 1.265 | 1.62 | 164 | 264 | 66 | 249 | 110 | 113 | 1.0 | 802.85 |
| 2 | 1.6 | 1.225 | 1.52 | 165 | 260 | 66 | 245 | 110 | 117 | 1.0 | 806.26 |
| 3 | 1.0 | 1.00 | 1.01 | 164 | 259 | 65 | 258 | 110 | 117 | 1.0 | 809.86 |
| D 1 | 1.4 | 1.183 | 1.41 | 165 | 246 | 63 | 250 | 110 | 114 | 2.0 | 812.29 |
| 2 | 1.4 | 1.183 | 1.41 | 165 | 248 | 63 | 241 | 110 | 114 | 2.0 | 815.64 |
| 3 | 1.1 | 1.049 | 1.13 | 165 | 253 | 62 | 247 | 112 | 117 | 2.0 | 818.615 |
| Stop | 821 | | | | | | | | | | |
| AV→ | | (1.155) | (1.36) | (164.25) | | | | (116.04) | | | (34.617) Cu/FT. |

6.4 lbs/hr.

$SO_3$ 99.5%

Pitot Tube Leak Check: Before _____ After _____

Integrated Bag Leak Check: Before _____ After _____

# $SO_3$ Field Data Sheet

**BEST AVAILABLE COPY**

| | | | | | |
|---|---|---|---|---|---|
| Client: J.E.A. S.J.R.P.P. | | | | Date: 7-19-90 | Page 1 Of 2 |
| Project No.: 95-058-FL. | Operator: Teague | | | Orsat Analysis | |
| Sampling Location: Unit # 1 Stack | | | Run No.: 2 | $CO_2$ | $+O_2$ / $O_2$ / CO |
| Filter No. | Acetone No. | Condensate: 80mL 29.8 SG | | | |
| Barometric Pressure: 30.01 | Static Pressure: -.54 | Probe Number: N-10-G1 | | 17.02 | 4.16 |
| Nozzle Diameter: .167 | Nozzle Number: FL-04 | Pitot Coefficient: .975 | Pitot Number: N-10-G1-F | | |
| Meter Corr. Factor: 1.03 | Meter-Orifice: 3.255 | | | | |
| Sample Pt. Time: 5min 60min Test. | Assumed % Moisture: 12 | Leak Test | Before: .000 at 10" | After: .000 at 16" | |

| Sample Point | ΔP | $\sqrt{\Delta P}$ | ΔH | Temperature °F: Stack | Probe | Imp. Out | Oven | Meter In | Meter Out | Vac. Pr (in. HG) | Dry Gas Meter Reading in Cu. Ft. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Start | 9:20 | | | | | | | | | | 824.960 |
| D 1 | 1.5 | 1.225 | 1.54 | 166 | 254 | 65 | 234 | 107 | 107 | 1.0 | 832.41 |
| 2 | 1.3 | 1.140 | 1.31 | 166 | 246 | 66 | 241 | 107 | 109 | 1.0 | 835.58 |
| 3 | 1.0 | 1.00 | 1.01 | 164 | 255 | 66 | 242 | 107 | 110 | 1.0 | 838.39 |
| C 1 | 1.5 | 1.225 | 1.52 | 166 | 245 | 64 | 240 | 110 | 113 | 2.0 | 841.83 |
| 2 | 1.4 | 1.183 | 1.44 | 167 | 253 | 64 | 246 | 110 | 115 | 2.0 | 845.23 |
| 3 | 1.1 | 1.049 | 1.8 | 165 | 258 | 64 | 251 | 111 | 115 | 2.0 | 848.21 |
| B 1 | 1.6 | 1.265 | 1.62 | 164 | 252 | 64 | 247 | 107 | 109 | 2.0 | 851.58 |
| 2 | 1.5 | 1.225 | 1.52 | 165 | 255 | 63 | 253 | 108 | 113 | 2.0 | 855.00 |
| 3 | 1.1 | 1.049 | 1.11 | 165 | 261 | 63 | 254 | 109 | 114 | 2.0 | 857.95 |
| A 1 | 1.5 | 1.225 | 1.52 | 165 | 258 | 63 | 246 | 109 | 110 | 2.0 | 861.29 |
| 2 | 1.5 | 1.225 | 1.52 | 164 | 259 | 64 | 251 | 109 | 112 | 2.0 | 864.76 |
| 3 | 1.0 | 1.00 | 1.01 | 163 | 255 | 63 | 259 | 108 | 114 | 2.0 | 867.658 |
| Stop | 10:30 | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| AV→ | | (1.151) | (1.354) | (165.16) | | | | (110.125) | | | (38.698) Cu/FT. |

ppm $SO_3$ 4.46ppm

I SO2 100.2

Pitot Tube Leak Check: Before OK After OK

Integrated Bag Leak Check: Before _____ After _____



TSA
Total Source Analysis, Inc.
Environmental Testing Consultants

# $SO_3$ Field Data Sheet

**BEST AVAILABLE COPY**

| | | | | | |
|---|---|---|---|---|---|
| Client: J.E.A. S.J.R.P.P. | | | | Date: 7-19-95 | Page 1 Of 2 |
| Project No.: 95-058-FL. | Operator: League | | | Orsat Analysis | |
| Sampling Location: Unit # 1 Stack | | Run No.: 3 | | $CO_2$ / $+O_2$ / $O_2$ / CO | |
| Filter No. | Acetone No. | Condensate: gain 5.6 gr | | 7.01 / — / 4.16 / — | |
| Barometric Pressure: 30.01 | Static Pressure: -.54 | Probe Number: N10-61 | | | |
| Nozzle Diameter: .187 | Nozzle Number: FL-04 | Pitot Coefficient: .875 | Pitot Number: N-10-61-FL | | |
| Meter Corr. Factor: 1.03 | Meter-Orifice: 3.255 | | | | |
| Sample Pt. Time: 5min 60min Test. | Assumed % Moisture: 13 | Leak Test | Before: .0069 @ 15 | After: .0129 @ 14 | |

| Sample Point | ΔP | $\sqrt{\Delta P}$ | ΔH | Temperature °F: Stack | Probe | Imp. Out | Oven | Meter In | Meter Out | Vac. Pr (in. HG) | Dry Gas Meter Reading in Cu. Ft. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Start | 1130 | | | | | | | | | | 877.925 |
| A 1 | 1.5 | 1.225 | 1.52 | 169 | 258 | 65 | 253 | 106 | 107 | 1.0 | 881.41 |
| 2 | 1.4 | 1.183 | 1.41 | 167 | 249 | 63 | 255 | 107 | 110 | 2.0 | 884.69 |
| 3 | 1.0 | 1.00 | 1.010 | 166 | 257 | 63 | 257 | 101 | 111 | 1.0 | 887.46 |
| B 1 | 1.5 | 1.225 | 1.52 | 164 | 251 | 62 | 258 | 109 | 110 | 2.0 | 890.94 |
| 2 | 1.5 | 1.225 | 1.62 | 165 | 257 | 64 | 260 | 109 | 112 | 2.0 | 894.26 |
| 3 | 1.2 | 1.095 | 1.21 | 165 | 264 | 64 | 256 | 109 | 114 | 2.0 | 897.35 |
| C 1 | 1.4 | 1.183 | 1.41 | 165 | 259 | 63 | 263 | 108 | 110 | 2.0 | 900.62 |
| 2 | 1.5 | 1.225 | 1.52 | 165 | 262 | 62 | 265 | 109 | 113 | 2.0 | 904.29 |
| 3 | 1.1 | 1.049 | 1.11 | 164 | 254 | 62 | 264 | 109 | 115 | 2.0 | 907.34 |
| D 1 | 1.6 | 1.265 | 1.62 | 167 | 258 | 61 | 254 | 109 | 110 | 2.0 | 910.73 |
| 2 | 1.5 | 1.225 | 1.52 | 166 | 259 | 62 | 259 | 110 | 115 | 2.0 | 914.01 |
| 3 | 1.2 | 1.095 | 1.21 | 164 | 256 | 62 | 261 | 111 | 115 | 2.0 | 917.243 |
| Stop | 1236 | | | | | | | | | | |
| AV→ | | (1.166) | (1.38) | (165.5) | | | | (110.208) | | | (39.312) Cu/FT. |

Pitot Tube Leak Check: Before OK After OK

Integrated Bag Leak Check: Before _____ After _____

# $SO_3$ Field Data Sheet

**BEST AVAILABLE COPY**

| | | | | | |
|---|---|---|---|---|---|
| Client: J.E.A. S.J.R.P.P. | | | | Date: 7-20-95 | Page 1 Of 2 |
| Project No.: 95-058-FL. | Operator: Teague | | | Orsat Analysis | |
| Sampling Location: Unit # 1 Stack | | Run No.: 1 | | $CO_2$ | $+O_2$ / $O_2$ / CO |
| Filter No. | Acetone No. | Condensate: 96ml | | 23.256 | |
| Barometric Pressure: 30.04 | Static Pressure: -.50 | Probe Number | | 15.17 | 5.20 |
| Nozzle Diameter: .167 | Nozzle Number: FL-04 | Pitot Coefficient: .675 | Pitot Number: N-6-61-F1 | | |
| Meter Corr. Factor: 1.03 | Meter-Orifice: 3.255 | | | | |
| Sample Pt. Time: 5min 60min Test. | Assumed % Moisture: 13 | Leak Test | Before: .008 @ 12" | After: .012 @ 12" | |

| Sample Point | ΔP | $\sqrt{\Delta P}$ | ΔH | Temperature °F: Stack | Probe | Imp. Out | Oven | Meter In | Meter Out | Vac. Pr (in. HG) | Dry Gas Meter Reading in Cu. Ft. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Start | 6:55 | | | | | | | | | | 927.871 |
| A 1 | 1.5 | 1.225 | 1.51 | 166 | 266 | 66 | 256 | 109 | 110 | 1.0 | 931.34 |
| 2 | 1.4 | 1.183 | 1.41 | 160 | 260 | 67 | 267 | 108 | 111 | 1.0 | 934.68 |
| 3 | 1.1 | 1.049 | 1.11 | 166 | 258 | 67 | 270 | 108 | 111 | 1.0 | 937.52 |
| B 1 | 1.5 | 1.225 | 1.512 | 164 | 251 | 66 | 268 | 108 | 110 | 1.0 | 940.96 |
| 2 | 1.4 | 1.183 | 1.41 | 165 | 253 | 65 | 264 | 108 | 113 | 1.0 | 944.30 |
| 3 | 1.0 | 1.00 | 1.01 | 165 | 251 | 65 | 260 | 108 | 114 | 1.0 | 947.65 |
| C 1 | 1.4 | 1.183 | 1.41 | 165 | 247 | 64 | 256 | 106 | 112 | 1.0 | 950.34 |
| 2 | 1.3 | 1.14 | 1.31 | 166 | 242 | 65 | 253 | 109 | 114 | 1.0 | 953.59 |
| 3 | 1.0 | 1.00 | 1.01 | 165 | 245 | 65 | 252 | 109 | 115 | 1.0 | 956.43 |
| D 1 | 1.6 | 1.265 | 1.61 | 165 | 246 | 63 | 260 | 109 | 112 | 1.0 | 959.94 |
| 2 | 1.5 | 1.225 | 1.51 | 165 | 250 | 63 | 256 | 109 | 114 | 1.0 | 963.38 |
| 3 | 1.0 | 1.00 | 1.01 | 165 | 245 | 63 | 250 | 110 | 116 | 1.0 | 966.319 |
| Stop | 0820 | | | | | | | | | | |
| AV→ | | (1.14) | (1.318) | (165.25) | | | | (110.75) | | | (38.448) Cu/FT. |
| ISO→ | 101.0% | | | | | | | | | | |
| $SO_3$ PPM→ | 5.50 ppm | | | | | | | | | | |

Pitot Tube Leak Check: Before O/K After O/K

Integrated Bag Leak Check: Before ____ After ____



Total Source Analysis, Inc.
Environmental Testing Consultants

# $SO_3$ Field Data Sheet

**BEST AVAILABLE COPY**

| | | | | | |
|---|---|---|---|---|---|
| Client: J.E.A. S.J.R.P.P. | | | | Date: 7-20-95 | Page 1 Of 2 |
| Project No.: 95-058-FL. | Operator: Scott Teague | | | Orsat Analysis | |
| Sampling Location: Unit # 1 Stack | | Run No.: 2 | | $CO_2$ | $+O_2$ / $O_2$ / CO |
| Filter No. | Acetone No. | Condensate: 108 mL 23.6 SG. | | | |
| Barometric Pressure: 30.04 | Static Pressure: -.50 | Probe Number: N-10-61 | | 15.18 | 5.16 |
| Nozzle Diameter: .189 | Nozzle Number: F1-04 | Pitot Coefficient: .875 | Pitot Number: N-10-61-F1 | | |
| Meter Corr. Factor: 1.03 | Meter-Orifice: 3.255 | | | | |
| Sample Pt. Time: 5min 60min Test. | Assumed % Moisture: 13 | Leak Test | Before: .003 @ 10 | After: .008 @ 5" Hg | |

| Sample Point | ΔP | $\sqrt{\Delta P}$ | ΔH | Temperature °F: Stack | Probe | Imp. Out | Oven | Meter In | Meter Out | Vac. Pr (in. HG) | Dry Gas Meter Reading in Cu. Ft. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Start | 0925 | | | | | 67 | | | | | 977.386 |
| 1 | 1.5 | 1.225 | 1.512 | 166.0 | 208 | ~~67~~ | 193 | 107 | 107 | 1.0 | 980.794 |
| D 2 | 1.4 | 1.183 | 1.411 | 166.0 | 228 | 67.0 | 211 | 110 | 106 | 1.0 | 984.086 |
| 3 | 1.4 | 1.183 | 1.411 | 166.0 | 237 | 66.0 | 217 | 113 | 107 | 1.0 | 987.631 |
| A 1 | 1.5 | 1.225 | 1.512 | 166.0 | 225 | 63.0 | 218 | 112 | 108 | 1.0 | 991.300 |
| 2 | 1.4 | 1.183 | 1.411 | 166.0 | 243 | 63.0 | 223 | 115 | 109 | 1.0 | 994.531 |
| 3 | 1.3 | 1.140 | 1.310 | 166.0 | 249 | 63.0 | 226 | 116 | 109 | 1.0 | 997.904 |
| 1 | 1.5 | 1.225 | 1.512 | 166.0 | 251 | 63.0 | 234 | 115 | 109 | 1.0 | 001.503 |
| B 2 | 1.4 | 1.183 | 1.411 | 166.0 | 252 | 63.0 | 243 | 116 | 110 | 1.0 | 005.113 |
| 3 | 1.2 | 1.095 | 1.209 | 166.0 | 249 | 63.0 | 240 | 116 | 110 | 1.0 | 008.516 |
| 1 | 1.5 | 1.225 | 1.512 | 166.0 | 253 | 63.0 | 241 | 115 | 110 | 1.0 | 011.924 |
| C 2 | 1.4 | 1.183 | 1.411 | 166.0 | 255 | 63.0 | 242 | 115 | 110 | 1.0 | 015.375 |
| 3 | 1.2 | 1.095 | 1.209 | 166.0 | 260 | 63.0 | 239 | 116 | 110 | 1.0 | 018.645 |
| Stop | 1040 | | | | | | | | | | |
| AV→ | | (1.179 | X 1.403 | X 166.0) | | | | (111.292) | | | (41,259 |
| ISO→ | 105.1% | | | | | | | | | | Cu/FT. |
| $SO_3$ ppm→ | 5.67 ppm | | | | | | | | | | |

Pitot Tube Leak Check: Before OK After OK

Integrated Bag Leak Check: Before _____ After _____

# $SO_3$ Field Data Sheet

**BEST AVAILABLE COPY**

| | | | | | |
|---|---|---|---|---|---|
| Client: J.E.A. S.J.R.P.P. | | | | Date: 7-20-95 | Page 1 Of 2 |
| Project No.: 95-058-FL. | Operator: Toyfel | | | Orsat Analysis | |
| Sampling Location: Unit # 1 Stack | | Run No.: 3 | | $CO_2$ | $+O_2$ / $O_2$ / CO |
| Filter No. | Acetone No. | Condensate: 92 mL | 24.2 SG | | |
| Barometric Pressure: 30.08 | Static Pressure: -.50 | Probe Number: N-10-61 | | 15.22 | 5.09 |
| Nozzle Diameter: .187 | Nozzle Number: FL-04 | Pitot Coefficient: .875 | Pitot Number: N-10-61-FL | | |
| Meter Corr. Factor: 1.03 | | Meter-Orifice: 3.255 | | | |
| Sample Pt. Time: 5min 60min Test. | Assumed % Moisture | Leak Test: Before .018 @ 5" Hg | After .014 @ 5" Hg | | |

| Sample Point | ΔP | $\sqrt{\Delta P}$ | ΔH | Temperature °F: Stack | Probe | Imp. Out | Oven | Meter In | Meter Out | Vac. Pr (in. HG) | Dry Gas Meter Reading in Cu. Ft. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Start | 1142 | | | | | | | | | | 029.475 |
| 1 | 1.6 | 1.265 | 1.613 | 165.0 | 244.0 | 66.0 | 219 | 113 | 109 | 1.0 | 033.325 |
| C 2 | 1.5 | 1.225 | 1.512 | 166.0 | 252.0 | 66.0 | 229 | 116 | 109 | 1.0 | 036.675 |
| 3 | 1.3 | 1.140 | 1.310 | 166.0 | 243.0 | 66.0 | 235 | 117 | 110 | 1.0 | 040.014 |
| 1 | 1.6 | 1.265 | 1.613 | 166.0 | 234.0 | 66.0 | 288 | 116 | 110 | 1.0 | 043.572 |
| B 2 | 1.5 | 1.225 | 1.512 | 166.0 | 240.0 | 66.0 | 273 | 118 | 111 | 1.0 | 047.115 |
| 3 | 1.3 | 1.140 | 1.310 | 166.0 | 238.0 | 66.0 | 243 | 118 | 112 | 1.0 | 050.419 |
| 1 | 1.6 | 1.265 | 1.613 | 166.0 | 239.0 | 67.0 | 252 | 116 | 112 | 1.0 | 054.040 |
| A 2 | 1.5 | 1.225 | 1.512 | 167.0 | 251.0 | 64.0 | 249 | 116 | 112 | 1.0 | 057.456 |
| 3 | 1.3 | 1.140 | 1.310 | 167.0 | 255.0 | 64.0 | 251 | 117 | 112 | 1.0 | 060.854 |
| 1 | 1.6 | 1.265 | 1.613 | 167.0 | 257.0 | 64.0 | 249 | 116 | 112 | 1.0 | 064.581 |
| D 2 | 1.5 | 1.225 | 1.512 | 167.0 | 258.0 | 65.0 | 256 | 119 | 113 | 1.0 | 068.161 |
| 3 | 1.3 | 1.140 | 1.310 | 167.0 | 258.0 | 64.0 | 256 | 117 | 113 | 1.0 | 071.401 |
| Stop | 1315 | | | | | | | | | | |
| AV→ | | (1.210) | (1.483) | (166.33) | | | | (113.92) | | | (41.926) Cu/FT. |
| Iso→ | 102.2% | | | | | | | | | | |
| $SO_3$ PPM→ | 5.4 | | | | | | | | | | |

Pitot Tube Leak Check: Before OK After OK

Integrated Bag Leak Check: Before _____ After _____

E21

Total Source Analysis, Inc.

Particulate Field Data Sheet

SO3 **BEST AVAILABLE COPY**

| | | | | | |
|---|---|---|---|---|---|
| Client: JEA / St. Johns | | | | Date: 8-95 | Page 1 Of 2 |
| Project No.: 95-058 - FL | Operator: C Coff | | | Orsat Analysis | |
| Sampling Location: STACK UNIT 1 | | Run No.: 1 | | $CO_2$ / $+O_2$ / $O_2$ / CO | |
| Filter No.: N/A | Acetone No.: N/A | Condensate: 108 ML | | ~~1.9~~ / ___ / ~~5.3~~ / ___ | |
| Barometric Pressure: 30.23 | Static Pressure: -.53 | Probe Number: C-10 | | 14.08 / ___ / 5.09 / ___ | |
| Nozzle Diameter: .187 | Nozzle Number: | Pitot Coefficient: .875 | Pitot Number: N10-1- | | |
| Meter Corr. Factor: 1.03 | Area of Flue | Meter-Orifice: 1-N / 3.694 | | | |
| Sample Pt. Time: 5 min | Assumed % Moisture: 13% | Leak Test: Before .008 @10" | After .015 @ 10" | | |

| Sample Point | ΔP | $\sqrt{\Delta P}$ | ΔH | Temperature °F: Stack | Probe | Imp. Out | Oven | Meter In | Meter Out | Vac. Pr (in. HG) | Dry Gas Meter Reading in Cu. Ft. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| START | 7:45 | | | | | | | | | | 240.315 |
| 1 | 1.5 | 1.225 | 1.52 | 174 | 258 | 60 | 273 | 112 | 112 | 7.0 | 243.657 |
| 2 | 1.5 | 1.225 | 1.72 | 172 | 252 | 60 | 251 | 114 | 112 | 7.0 | 246.998 |
| 3 | 1.2 | 1.095 | 1.38 | 171 | 254 | 62 | 252 | 116 | 112 | 6.0 | 249.943 |
| C1 | 1.3 | 1.140 | 1.49 | 172 | 252 | 62 | 258 | 116 | 113 | 5.0 | 253.021 |
| 2 | 1.4 | 1.183 | 1.61 | 172 | 252 | 63 | 252 | 118 | 114 | 6.0 | 256.221 |
| 3 | 1.1 | 1.049 | 1.26 | 171 | 253 | 64 | 251 | 119 | 115 | 5.0 | 259.132 |
| A1 | 1.4 | 1.183 | 1.61 | 172 | 255 | 62 | 256 | 119 | 116 | 5.0 | 262.331 |
| 2 | 1.3 | 1.140 | 1.49 | 171 | 253 | 64 | 259 | 120 | 116 | 5.0 | 265.468 |
| 3 | 1.1 | 1.049 | 1.26 | 172 | 253 | 63 | 252 | 121 | 117 | 4.0 | 268.573 |
| B1 | 1.3 | 1.140 | 1.49 | 172 | 252 | 57 | 253 | 120 | 112 | 5.0 | 271.823 |
| 2 | 1.3 | 1.140 | 1.49 | 172 | 254 | 59 | 259 | 121 | 118 | 5.0 | 274.642 |
| 3 | 1.0 | 1.000 | 1.15 | 171 | 252 | 62 | 260 | 119 | 117 | 4.0 | 277.453 |
| | | | | | | | | | | | |
| STOP | 9:20 | | | | | | | | | | |
| | | | | | | | | | | | |
| | | (1.131) | (1.473) | (171.6) | | | | (116 | 67) | | (37.138) |

Pitot Tube Leak Check: Before O.K After O.K

Integrated Bag Leak Check: Before ___ After ___



Total Source Analysis, Inc.
Environmental Testing Consultants

Client: JEA / St. Johns | **BEST AVAILABLE COPY** | Date: 8-95 | Page 1 Of 2

Project No.: 95-058-F1 | Operator: C Cobb

Sampling Location: Stack Unit 1 | Run No.: 2

Filter No.: N/A | Acetone No.: N/A | Condensate:

Barometric Pressure: 30.23 | Static Pressure: -.53 | Probe Number: G10

Nozzle Diameter: .187 | Nozzle Number: | Pitot Coefficient: 0.85 | Pitot Number:

Meter Corr. Factor: 1.03 | Area of Flue: | Meter-Orifice: 1-N | 3.697

Sample Pt. Time: 5 min | Assumed % Moisture: 13% | Leak Test: Before $CO_2$ @ 4 $O_2$ @ 15 | After 0 2 @ 15

Orsat Analysis

| $CO_2$ | $+O_2$ | $O_2$ | CO |
|---|---|---|---|
| 13.9 | | 5.28 | |

| Sample Point | ΔP | $\sqrt{\Delta P}$ | ΔH | Temperature °F: Stack | Probe | Imp. Out | Oven | Meter In | Meter Out | Vac. Pr (in. HG) | Dry Gas Meter Reading in Cu. Ft. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| START | 0:00 | | | | | | | | | | 277.968 |
| B 1 | 1.3 | 1.140 | 1.49 | 172 | 262 | 56 | 258 | 116 | 115 | 5.0 | 281.112 |
| 2 | 1.3 | 1.140 | 1.49 | 171 | 258 | 59 | 256 | 117 | 115 | 5.0 | 284.193 |
| 3 | 1.0 | 1.000 | 1.15 | 172 | 256 | 60 | 256 | 119 | 115 | 4.0 | 287.177 |
| A 1 | 1.5 | 1.225 | 1.72 | 172 | 255 | 57 | 258 | 118 | 116 | 5.0 | 290.502 |
| 2 | 1.4 | 1.183 | 1.61 | 172 | 252 | 58 | 253 | 117 | 116 | 5.0 | 293.758 |
| 3 | 1.3 | 1.140 | 1.49 | 173 | 255 | 60 | 256 | 119 | 116 | 4.0 | 296.922 |
| D 1 | 1.6 | 1.265 | 1.84 | 172 | 253 | 61 | 257 | 119 | 117 | 6.0 | 300.296 |
| 2 | 1.6 | 1.265 | 1.84 | 173 | 252 | 62 | 255 | 120 | 117 | 6.0 | 303.871 |
| 3 | 1.3 | 1.140 | 1.49 | 172 | 255 | 63 | 253 | 121 | 118 | 5.0 | 307.054 |
| C 1 | 1.5 | 1.225 | 1.72 | 173 | 253 | 58 | 248 | 121 | 118 | 5.0 | 310.401 |
| 2 | 1.5 | 1.225 | 1.72 | 172 | 252 | 61 | 255 | 121 | 119 | 5.0 | 313.768 |
| 3 | 1.2 | 1.095 | 1.38 | 171 | 256 | 63 | 257 | 121 | 118 | 4.0 | 317.136 |
| STOP | 11:50 | 1.170 | 1.578 | 172 | | | | | | | |
| | | | | | | | | 117.9 | | | |
| | | | | | | | | | | | 39.168 |

Pitot Tube Leak Check: Before O.K After O.K

Integrated Bag Leak Check: Before _____ After _____



Total Source Analysis, Inc.
Environmental Testing Consultants

| | | | |
|---|---|---|---|
| Client: JEA / St. Johns | | Date: 8-95 | Page 1 Of 2 |
| Project No.: 95-05B-F1 | Operator: C Cook | Orsat Analysis | |
| Sampling Location: STACK UNIT 1 | Run No.: 3 | $CO_2$ | $+O_2$ / $O_2$ / CO |
| Filter No.: N/A | Acetone No.: N/A | Condensate | 14.0 / 4.9 / 4.9 / |
| Barometric Pressure: 30.23 | Static Pressure: -.53 | Probe Number: 610 | 13.49 / / 5.27 / |
| Nozzle Diameter: .187 | Nozzle Number: | Pitot Coefficient: .875 | Pitot Number: |
| Meter Corr. Factor: 1.03 | Area of Flue | Meter-Orifice: 610 / 3.684 | |
| Sample Pt. Time: 5 min. | Assumed % Moisture: 13% | Leak Test: Before 007 @ 12" | After 005 @ 10" |

| Sample Point | ΔP | $\sqrt{\Delta P}$ | ΔH | Temperature °F: Stack | Probe | Imp. Out | Oven | Meter In | Meter Out | Vac. Pr (in. HG) | Dry Gas Meter Reading in Cu. Ft. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| START | 12:20 | | | | | | | | | | 317.362 |
| C1 | 1.5 | 1.225 | 1.72 | 172 | 257 | 56 | 263 | 117 | 117 | 6.0 | 320.772 |
| 2 | 1.5 | 1.225 | 1.72 | 172 | 255 | 59 | 258 | 119 | 117 | 6.0 | 324.213 |
| 3 | 1.3 | 1.140 | 1.49 | 172 | 256 | 61 | 257 | 120 | 117 | 5.0 | 327.428 |
| P1 | 1.5 | 1.225 | 1.72 | 172 | 258 | 59 | 257 | 120 | 118 | 6.0 | 330.782 |
| 2 | 1.6 | 1.265 | 1.84 | 173 | 256 | 63 | 252 | 120 | 118 | 6.0 | 334.213 |
| 3 | 1.3 | 1.140 | 1.49 | 173 | 255 | 64 | 257 | 121 | 119 | 5.0 | 337.311 |
| A1 | 1.4 | 1.183 | 1.61 | 172 | 256 | 60 | 254 | 120 | 118 | 5.0 | 340.558 |
| 2 | 1.5 | 1.225 | 1.72 | 173 | 256 | 62 | 255 | 120 | 118 | 6.0 | 343.762 |
| 3 | 1.2 | 1.095 | 1.38 | 172 | 257 | 63 | 252 | 120 | 119 | 5.0 | 347.072 |
| B1 | 1.4 | 1.183 | 1.61 | 172 | 252 | 59 | 253 | 119 | 118 | 6.0 | 350.328 |
| 2 | 1.3 | 1.140 | 1.49 | 172 | 253 | 60 | 255 | 121 | 119 | 6.0 | 353.512 |
| 3 | 1.1 | 1.049 | 1.26 | 171 | 254 | 63 | 255 | 121 | 119 | 6.0 | 356.482 |
| | | | | | | | | | | | |
| STOP | 13.52 | | | | | | | | | | |
| | | 1.175 | 1.546 | 172.2 | | | | 1190 | | | 39.120 |

Pitot Tube Leak Check: Before O.K. After O.K.

Integrated Bag Leak Check: Before _____ After _____



Total Source Analysis, Inc.
Environmental Testing Consultants

TSA CEMS Log

Client :JEA SJRPP
Site :0000
Unit : Unit 1 stack
Project :95-058
Comment : Run 1
Test Date :7/18/95 Time :07:50 thru 08:50 Page 1

| Time | 1030 O2 % | 1029 CO2 % | 1028 CO PPm |
|---|---|---|---|
| 07:50:52 | 5.08 | 16.31 | 31.54 |
| 07:51:52 | 5.19 | 16.19 | 14.61 |
| 07:52:52 | 5.13 | 16.25 | 10.76 |
| 07:53:52 | 5.19 | 16.20 | 18.61 |
| 07:54:52 | 5.23 | 16.14 | 7.68 |
| 07:55:52 | 5.40 | 15.98 | 4.99 |
| 07:56:52 | 5.33 | 16.06 | 4.10 |
| 07:57:52 | 5.21 | 16.17 | 4.89 |
| 07:58:52 | 5.05 | 16.32 | 9.27 |
| 07:59:52 | 4.99 | 16.37 | 59.33 |
| 08:00:52 | 5.10 | 16.28 | 15.44 |
| 08:01:52 | 5.23 | 16.17 | 7.00 |
| 08:02:52 | 5.48 | 15.89 | 5.29 |
| 08:03:52 | 5.41 | 15.98 | 3.58 |
| 08:04:52 | 5.06 | 16.32 | 9.78 |
| 08:05:51 | 5.27 | 16.10 | 5.99 |
| 08:06:51 | 5.28 | 16.11 | 4.48 |
| 08:07:51 | 5.10 | 16.27 | 4.09 |
| 08:08:51 | 5.22 | 16.16 | 11.85 |
| 08:09:51 | 5.25 | 16.13 | 5.58 |
| 08:10:51 | 5.07 | 16.30 | 7.18 |
| 08:11:51 | 4.82 | 16.58 | 13.23 |
| 08:12:51 | 5.04 | 16.33 | 29.54 |
| 08:13:51 | 5.02 | 16.35 | 12.53 |
| 08:14:51 | 5.18 | 16.19 | 6.99 |
| 08:15:51 | 5.64 | 15.74 | 3.89 |
| 08:16:51 | 4.86 | 16.52 | 4.38 |
| 08:17:51 | 5.20 | 16.16 | 7.37 |
| 08:18:51 | 5.32 | 16.05 | 6.09 |
| 08:19:51 | 4.96 | 16.40 | 45.21 |
| 08:20:51 | 5.22 | 16.14 | 7.68 |
| 08:21:51 | 4.88 | 16.49 | 30.39 |
| 08:22:51 | 5.39 | 15.99 | 11.33 |
| 08:23:51 | 4.89 | 16.48 | 8.97 |
| 08:24:51 | 5.07 | 16.30 | 8.27 |
| 08:25:51 | 5.17 | 16.21 | 4.99 |
| 08:26:51 | 4.96 | 16.40 | 6.38 |
| 08:27:51 | 5.16 | 16.21 | 4.18 |
| 08:28:51 | 5.10 | 16.27 | 4.49 |
| 08:29:51 | 5.27 | 16.10 | 4.38 |
| 08:30:51 | 4.87 | 16.52 | 10.60 |
| 08:31:51 | 4.97 | 16.39 | 21.02 |
| 08:32:51 | 5.15 | 16.23 | 7.96 |
| 08:33:51 | 5.10 | 16.27 | 5.08 |
| 08:34:51 | 5.05 | 16.32 | 6.58 |
| 08:35:51 | 5.14 | 16.25 | 10.60 |

Client :JEA SJRPP
Site :0000
Unit : Unit 1
Project :95-058
Comment : stack Run 1
Test Date :7/18/95 Time :07:50 thru 08:50 

| Time | 1030 O2 % | 1029 CO2 % | 1028 CO PPm |
|---|---|---|---|
| 08:36:51 | 5.04 | 16.33 | 10.27 |
| 08:37:51 | 5.26 | 16.13 | 6.89 |
| 08:38:51 | 5.10 | 16.29 | 4.48 |
| 08:39:51 | 5.11 | 16.27 | 6.78 |
| 08:40:51 | 5.18 | 16.21 | 5.69 |
| 08:41:51 | 5.07 | 16.31 | 11.13 |
| 08:42:51 | 5.06 | 16.33 | 7.18 |
| 08:43:51 | 4.85 | 16.52 | 25.74 |
| 08:44:51 | 5.12 | 16.27 | 18.53 |
| 08:45:51 | 5.27 | 16.11 | 8.07 |
| 08:46:51 | 5.08 | 16.29 | 6.49 |
| 08:47:51 | 5.09 | 16.29 | 6.09 |
| 08:48:51 | 5.03 | 16.33 | 11.90 |
| 08:49:51 | 5.0 | 16.3 | 5.2 |
| avg for 1 hr. - | 5.13 | 16.24 | 11.04 |

$C_{gas}$ = 4.92 15.49 11.54

$(D)_{NOIR}$ =

Client :JEA SJRPP
Site :0000
Unit :
Project :95-058
Comment : Run #2
Test Date :7/18/95 Time :11:00 thru 12:00:08 Page 1

| Time | 1030 O2 % | 1029 CO2 % | 1028 CO PPm |
|---|---|---|---|
| 11:00:02 | 5.26 | 15.14 | 15.22 |
| 11:01:02 | 5.07 | 15.32 | 7.57 |
| 11:02:02 | 5.13 | 15.25 | 21.90 |
| 11:03:02 | 5.32 | 15.08 | 9.68 |
| 11:04:02 | 5.16 | 15.23 | 9.47 |
| 11:05:01 | 5.25 | 15.16 | 6.38 |
| 11:06:01 | 5.27 | 15.13 | 11.13 |
| 11:07:01 | 5.24 | 15.16 | 5.48 |
| 11:08:01 | 5.24 | 15.16 | 5.29 |
| 11:09:01 | 5.28 | 15.11 | 4.09 |
| 11:10:01 | 5.33 | 15.08 | 5.29 |
| 11:11:01 | 5.26 | 15.14 | 3.69 |
| 11:12:01 | 5.17 | 15.23 | 3.58 |
| 11:13:01 | 5.10 | 15.26 | 7.76 |
| 11:14:01 | 5.31 | 15.08 | 9.96 |
| 11:15:01 | 5.30 | 15.10 | 4.89 |
| 11:16:01 | 5.27 | 15.12 | 3.58 |
| 11:17:01 | 5.18 | 15.17 | 4.49 |
| 11:18:01 | 5.31 | 15.08 | 8.75 |
| 11:19:01 | 5.00 | 15.39 | 9.07 |
| 11:20:01 | 5.23 | 15.16 | 6.89 |
| 11:21:01 | 5.23 | 15.14 | 6.68 |
| 11:22:01 | 5.28 | 15.09 | 15.43 |
| 11:23:01 | 5.14 | 15.25 | 39.54 |
| 11:24:01 | 5.33 | 15.07 | 8.48 |
| 11:25:01 | 5.23 | 15.17 | 4.98 |
| 11:26:01 | 5.19 | 15.21 | 11.14 |
| 11:27:01 | 5.41 | 14.98 | 4.58 |
| 11:28:01 | 5.46 | 14.95 | 3.97 |
| 11:29:01 | 4.91 | 15.46 | 34.20 |
| 11:30:01 | 5.02 | 15.35 | 11.46 |
| 11:31:01 | 5.17 | 15.21 | 6.78 |
| 11:32:01 | 5.11 | 15.28 | 35.42 |
| 11:33:01 | 5.25 | 15.16 | 9.07 |
| 11:34:01 | 5.28 | 15.11 | 6.49 |
| 11:35:01 | 5.59 | 14.82 | 3.88 |
| 11:36:01 | 5.05 | 15.33 | 5.78 |
| 11:37:01 | 5.02 | 15.35 | 5.29 |
| 11:38:01 | 5.32 | 15.08 | 6.09 |
| 11:39:01 | 5.22 | 15.16 | 5.08 |
| 11:40:01 | 5.04 | 15.33 | 12.51 |
| 11:41:01 | 5.01 | 15.37 | 9.87 |
| 11:42:01 | 5.02 | 15.33 | 13.75 |
| 11:43:01 | 5.53 | 14.88 | 5.39 |
| 11:44:01 | 5.11 | 15.26 | 6.78 |
| 11:45:01 | 5.34 | 15.07 | 6.28 |

Client :JEA SJRPP
Site :0000
Unit :
Project :95-058
Comment : Run #2
Test Date :7/18/95 Time :11:00 thru 12:00:08 

| Time | 1030 O2 % | 1029 CO2 % | 1028 CO PPm |
|---|---|---|---|
| 11:46:01 | 5.19 | 15.19 | 10.90 |
| 11:47:01 | 5.14 | 15.23 | 11.85 |
| 11:48:01 | 5.31 | 15.08 | 5.98 |
| 11:49:01 | 4.99 | 15.38 | 6.18 |
| 11:50:01 | 5.03 | 15.36 | 11.03 |
| 11:51:01 | 5.16 | 15.23 | 11.35 |
| 11:52:00 | 5.25 | 15.16 | 7.77 |
| 11:53:00 | 5.23 | 15.16 | 6.49 |
| 11:54:00 | 5.28 | 15.12 | 4.49 |
| 11:55:00 | 5.20 | 15.20 | 4.78 |
| 11:56:00 | 5.13 | 15.25 | 4.98 |
| 11:57:00 | 5.40 | 15.02 | 4.38 |
| 11:58:00 | 5.22 | 15.19 | 4.09 |
| 11:59:00 | 5.12 | 15.26 | 6.18 |
| 12:00:00 | 5.21 | 15.18 | 4.27 |
| 12:00:08 | 5.21 | 15.18 | 4.11 |
| Averages for 62 Points | 5.20 | 15.17 | 8.90 |
| $\bar{c}_{gas}$ → | 5.16 | 14.54 | 9.21 |

Best Available Copy

Client :JEA SJRPP
Site :0000
Unit :
Project :95-058
Comment : Rig #3
Test Date :7/18/95 Time :13:19 thru 14:22:17 Page 1

| Time | 1030 O2 % | 1029 CO2 % | 1028 CO PPm |
|---|---|---|---|
| 13:19:35 | 5.09 | 15.70 | 6.18 |
| 13:20:35 | 5.00 | 15.77 | 35.08 |
| 13:21:35 | 5.27 | 15.50 | 15.32 |
| 13:22:35 | 5.32 | 15.47 | 11.41 |
| 13:23:35 | 4.94 | 15.83 | 9.56 |
| 13:24:35 | 4.89 | 15.87 | 10.59 |
| 13:25:34 | 5.41 | 15.36 | 29.92 |
| 13:26:34 | 5.18 | 15.58 | 6.98 |
| 13:27:34 | 5.02 | 15.75 | 6.49 |
| 13:28:34 | 5.14 | 15.66 | 5.27 |
| 13:29:34 | 4.97 | 15.78 | 4.98 |
| 13:30:34 | 4.87 | 15.90 | 8.56 |
| 13:31:34 | 5.25 | 15.53 | 5.98 |
| 13:32:34 | 5.05 | 15.72 | 6.08 |
| 13:33:34 | 5.28 | 15.49 | 5.78 |
| 13:34:34 | 4.88 | 15.89 | 10.06 |
| 13:35:34 | 5.09 | 15.68 | 11.09 |
| 13:36:34 | 5.22 | 15.57 | 9.36 |
| 13:37:34 | 4.97 | 15.81 | 10.75 |
| 13:38:34 | 5.20 | 15.58 | 8.07 |
| 13:39:34 | 5.15 | 15.63 | 16.82 |
| 13:40:34 | 4.86 | 15.92 | 9.86 |
| 13:41:34 | 5.04 | 15.74 | 21.41 |
| 13:42:34 | 5.17 | 15.59 | 22.93 |
| 13:43:34 | 5.25 | 15.52 | 12.26 |
| 13:44:34 | 5.21 | 15.56 | 5.57 |
| 13:45:34 | 5.07 | 15.67 | 6.18 |
| 13:46:34 | 5.14 | 15.64 | 7.66 |
| 13:47:34 | 5.14 | 15.60 | 6.78 |
| 13:48:34 | 5.10 | 15.59 | 7.37 |
| 13:49:34 | 5.03 | 15.64 | 4.68 |
| 13:50:34 | 5.06 | 15.59 | 6.58 |
| 13:51:34 | 5.10 | 15.56 | 7.47 |
| 13:52:34 | 5.03 | 15.61 | 9.27 |
| 13:53:34 | 5.08 | 15.57 | 4.37 |
| 13:54:34 | 5.17 | 15.47 | 4.28 |
| 13:55:34 | 4.95 | 15.69 | 7.37 |
| 13:56:34 | 4.90 | 15.73 | 15.52 |
| 13:57:34 | 5.12 | 15.52 | 21.93 |
| 13:58:34 | 5.21 | 15.41 | 13.12 |
| 13:59:34 | 5.32 | 15.30 | 4.98 |
| 14:00:34 | 4.88 | 15.75 | 4.77 |
| 14:01:34 | 5.06 | 15.57 | 8.26 |
| 14:02:34 | 4.96 | 15.66 | 8.07 |
| 14:03:34 | 5.01 | 15.61 | 9.87 |
| 14:04:34 | 5.05 | 15.58 | 6.89 |

Client :JEA SJRPP
Site :0000
Unit :_____
Project :95-058
Comment : Run #3
Test Date :7/18/95 Time :13:19 thru 14:22:17 Page 2

| Time | 1030 O2 % | 1029 CO2 % | 1028 CO PPm |
|---|---|---|---|
| 14:05:34 | 4.96 | 15.66 | 8.57 |
| 14:06:34 | 5.02 | 15.61 | 8.57 |
| 14:07:34 | 5.40 | 15.22 | 4.38 |
| 14:08:34 | 4.95 | 15.66 | 4.58 |
| 14:09:34 | 5.11 | 15.51 | 9.47 |
| 14:10:34 | 4.98 | 15.63 | 16.30 |
| 14:11:34 | 5.00 | 15.61 | 11.57 |
| 14:12:33 | 5.01 | 15.62 | 8.26 |
| 14:13:33 | 5.08 | 15.54 | 5.48 |
| 14:14:33 | 5.05 | 15.60 | 5.38 |
| 14:15:33 | 5.23 | 15.39 | 5.58 |
| 14:16:33 | 4.94 | 15.67 | 15.82 |
| 14:17:33 | 5.28 | 15.34 | 6.59 |
| 14:18:33 | 4.94 | 15.69 | 8.88 |
| 14:19:33 | 5.00 | 15.62 | 12.94 |
| 14:20:33 | 5.08 | 15.53 | 10.94 |
| 14:21:33 | 5.05 | 15.56 | 5.08 |
| 14:22:17 | 5.06 | 15.55 | 6.78 |
| Averages for 64 Points | 5.08 | 15.61 | 9.79 |
| Egas → | 4.90 | 15.25 | 10.13 |

Client :JEA SJRPP
Site :0000
Unit : 1
Project :95-058
Comment : Run 1
Test Date :7/19/95 Time :07:50 thru 08:50 Page 1

| Time | 1030 O2 % | 1029 CO2 % | 1028 CO PPm |
|---|---|---|---|
| 07:50:35 | 5.22 | 16.49 | 31.98 |
| 07:51:35 | 5.08 | 16.69 | 35.17 |
| 07:52:35 | 5.16 | 16.55 | 39.91 |
| 07:53:35 | 5.00 | 16.77 | 40.08 |
| 07:54:35 | 5.01 | 15.26 | 66.94 |
| 07:55:35 | 5.18 | 15.09 | 35.22 |
| 07:56:35 | 5.11 | 14.90 | 38.06 |
| 07:57:35 | 5.32 | 14.39 | 21.77 |
| 07:58:35 | 5.33 | 14.39 | 17.73 |
| 07:59:35 | 5.30 | 14.48 | 13.76 |
| 08:00:35 | 5.18 | 14.60 | 47.35 |
| 08:01:35 | 5.36 | 14.44 | 15.23 |
| 08:02:35 | 5.11 | 14.67 | 22.32 |
| 08:03:35 | 5.26 | 14.53 | 64.48 |
| 08:04:35 | 5.21 | 14.59 | 34.42 |
| 08:05:35 | 4.80 | 14.93 | 88.95 |
| 08:06:35 | 5.38 | 14.41 | 100.03 |
| 08:07:35 | 5.33 | 14.48 | 22.42 |
| 08:08:35 | 4.92 | 14.83 | 100.05 |
| 08:09:35 | 5.29 | 14.49 | 58.82 |
| 08:10:35 | 5.28 | 14.54 | 32.58 |
| 08:11:35 | 5.02 | 14.73 | 71.39 |
| 08:12:35 | 5.27 | 14.53 | 25.00 |
| 08:13:35 | 5.16 | 14.63 | 18.83 |
| 08:14:35 | 4.96 | 14.80 | 83.16 |
| 08:15:35 | 5.28 | 14.51 | 55.47 |
| 08:16:35 | 5.21 | 14.60 | 25.75 |
| 08:17:35 | 5.01 | 14.76 | 37.85 |
| 08:18:35 | 5.17 | 14.61 | 28.21 |
| 08:19:35 | 5.09 | 14.68 | 36.57 |
| 08:20:35 | 5.38 | 14.43 | 28.84 |
| 08:21:35 | 5.01 | 14.77 | 27.44 |
| 08:22:35 | 5.16 | 14.64 | 50.78 |
| 08:23:35 | 5.02 | 14.74 | 36.44 |
| 08:24:35 | 5.28 | 14.51 | 34.00 |
| 08:25:35 | 5.05 | 14.73 | 30.63 |
| 08:26:35 | 4.99 | 14.78 | 51.79 |
| 08:27:35 | 5.30 | 14.48 | 40.75 |
| 08:28:35 | 5.07 | 14.70 | 51.69 |
| 08:29:35 | 5.04 | 14.73 | 64.52 |
| 08:30:35 | 5.14 | 14.63 | 46.54 |
| 08:31:35 | 5.05 | 14.72 | 69.14 |
| 08:32:35 | 4.96 | 14.81 | 100.03 |
| 08:33:35 | 5.20 | 14.59 | 51.59 |
| 08:34:35 | 5.10 | 14.67 | 55.55 |
| 08:35:35 | 5.04 | 14.73 | 31.73 |

Client :JEA SJRPP
Site :0000
Unit : 1
Project :95-058
Comment : Run 1
Test Date :7/19/95 Time :07:50 thru 08:50 Page 2

| Time | 1030 O2 % | 1029 CO2 % | 1028 CO PPm |
|---|---|---|---|
| 08:36:35 | 5.27 | 14.53 | 27.53 |
| 08:37:34 | 4.92 | 14.84 | 38.35 |
| 08:38:34 | 5.11 | 14.66 | 57.74 |
| 08:39:34 | 5.24 | 14.56 | 14.42 |
| 08:40:34 | 4.90 | 14.85 | 99.89 |
| 08:41:34 | 5.11 | 14.66 | 44.24 |
| 08:42:34 | 5.05 | 14.72 | 53.90 |
| 08:43:34 | 5.34 | 14.45 | 33.11 |
| 08:44:34 | 5.03 | 14.76 | 26.55 |
| 08:45:34 | 4.98 | 14.78 | 90.95 |
| 08:46:34 | 5.28 | 14.51 | 51.64 |
| 08:47:34 | 4.86 | 14.88 | 71.32 |
| 08:48:34 | 5.59 | 14.23 | 26.42 |
| 08:49:34 | 4.86 | 14.88 | 52.05 |
| Averages for 60 Points | 5.13 | 14.78 | 46.15 |
| Egas → | 4.22 | 15.02 | 51.07 |

Client :JEA SJRPP
Site :0000
Unit :1
Project :95-058
Comment :Run #2
Test Date :7/19/95 Time :09:25 thru 10:25 

| Time | 1030 O2 % | 1029 CO2 % | 1028 CO PPm |
|---|---|---|---|
| 09:25:07 | 5.08 | 16.38 | 17.09 |
| 09:26:07 | 5.11 | 16.34 | 51.99 |
| 09:27:07 | 5.17 | 16.30 | 27.27 |
| 09:28:07 | 4.81 | 16.71 | 61.87 |
| 09:29:07 | 5.10 | 16.36 | 61.16 |
| 09:30:07 | 5.24 | 16.27 | 18.25 |
| 09:31:07 | 4.80 | 16.70 | 99.96 |
| 09:32:07 | 5.37 | 16.12 | 45.46 |
| 09:33:07 | 4.98 | 16.49 | 54.22 |
| 09:34:07 | 5.25 | 16.20 | 71.91 |
| 09:35:07 | 5.15 | 16.34 | 22.21 |
| 09:36:07 | 4.88 | 16.63 | 100.02 |
| 09:37:07 | 5.23 | 16.24 | 42.45 |
| 09:38:07 | 5.04 | 16.45 | 38.88 |
| 09:39:07 | 5.13 | 16.34 | 44.93 |
| 09:40:07 | 5.19 | 16.32 | 33.89 |
| 09:41:07 | 5.04 | 16.46 | 65.87 |
| 09:42:07 | 5.04 | 16.44 | 33.45 |
| 09:43:07 | 5.39 | 16.11 | 17.45 |
| 09:44:07 | 5.02 | 16.48 | 28.91 |
| 09:45:07 | 5.07 | 16.41 | 30.56 |
| 09:46:07 | 4.98 | 16.54 | 35.89 |
| 09:47:07 | 5.28 | 16.21 | 32.20 |
| 09:48:07 | 5.17 | 16.34 | 15.41 |
| 09:49:07 | 5.23 | 16.26 | 26.52 |
| 09:50:07 | 5.02 | 16.47 | 37.01 |
| 09:51:06 | 5.14 | 16.36 | 27.55 |
| 09:52:06 | 5.16 | 16.34 | 29.85 |
| 09:53:06 | 4.97 | 16.53 | 60.91 |
| 09:54:06 | 5.10 | 16.37 | 33.19 |
| 09:55:06 | 5.12 | 16.37 | 22.12 |
| 09:56:06 | 5.28 | 16.20 | 25.46 |
| 09:57:06 | 5.34 | 16.19 | 10.65 |
| 09:58:06 | 4.85 | 16.68 | 100.02 |
| 09:59:06 | 5.24 | 16.25 | 61.35 |
| 10:00:06 | 5.00 | 16.47 | 40.14 |
| 10:01:06 | 5.17 | 16.33 | 30.04 |
| 10:02:06 | 4.93 | 16.55 | 89.54 |
| 10:03:06 | 5.16 | 16.34 | 37.35 |
| 10:04:06 | 5.24 | 16.25 | 33.43 |
| 10:05:06 | 4.96 | 16.55 | 24.34 |
| 10:06:06 | 5.04 | 16.44 | 53.79 |
| 10:07:06 | 4.89 | 16.63 | 41.55 |
| 10:08:06 | 5.13 | 16.34 | 61.47 |
| 10:09:06 | 5.00 | 16.46 | 62.36 |
| 10:10:06 | 5.13 | 16.38 | 35.52 |

Client :JEA SJRPP
Site :0000
Unit :1
Project :95-058
Comment :Run #2
Test Date :7/19/95 Time :09:25 thru 10:25



| Time | 1030 O2 % | 1029 CO2 % | 1028 CO PPm |
|---|---|---|---|
| 10:11:06 | 5.02 | 16.47 | 34.11 |
| 10:12:06 | 4.98 | 16.52 | 69.33 |
| 10:13:06 | 4.81 | 16.71 | 100.04 |
| 10:14:06 | 5.16 | 16.34 | 35.62 |
| 10:15:06 | 5.25 | 16.24 | 25.57 |
| 10:16:06 | 5.09 | 16.39 | 28.93 |
| 10:17:06 | 5.23 | 16.26 | 20.42 |
| 10:18:06 | 5.01 | 16.49 | 17.83 |
| 10:19:06 | 4.77 | 16.77 | 75.17 |
| 10:20:06 | 5.07 | 16.41 | 71.11 |
| 10:21:06 | 4.88 | 16.61 | 100.03 |
| 10:22:06 | 5.47 | 16.02 | 71.75 |
| 10:23:06 | 5.12 | 16.35 | 86.96 |
| 10:24:06 | 4.77 | 16.79 | 57.68 |
| Averages for 60 Points | 5.08 | 16.40 | 46.50 |
| Cgas → | 4.16 | 17.02 | 52.00 |

lient :JEA SJRPP
e :0000
it : 1
roject :95-058
ment : Run #3
t Date :7/19/95 Time :11:00 thru 12:00 Page 1

| Time | 1030 O2 % | 1029 CO2 % | 1028 CO PPm |
|---|---|---|---|
| 1:00:15 | 5.15 | 16.31 | 24.96 |
| 1:01:15 | 5.04 | 16.43 | 17.83 |
| 1:02:15 | 4.92 | 16.53 | 55.36 |
| 1:03:15 | 5.19 | 16.31 | 27.21 |
| 1:04:15 | 4.92 | 16.53 | 100.03 |
| 1:05:15 | 5.02 | 16.45 | 39.34 |
| 1:06:15 | 5.09 | 16.38 | 42.62 |
| 1:07:15 | 5.22 | 16.25 | 16.35 |
| 1:08:15 | 5.18 | 16.30 | 7.77 |
| 1:09:15 | 4.89 | 16.59 | 32.94 |
| 1:10:15 | 4.92 | 16.54 | 34.41 |
| 1:11:15 | 5.04 | 16.42 | 15.63 |
| 1:12:15 | 4.98 | 16.49 | 26.12 |
| 1:13:15 | 4.88 | 16.63 | 32.42 |
| 1:14:14 | 4.88 | 16.62 | 50.87 |
| 1:15:14 | 4.90 | 16.59 | 100.03 |
| 1:16:14 | 4.99 | 16.47 | 49.28 |
| 1:17:14 | 4.99 | 16.49 | 34.25 |
| 1:18:14 | 5.13 | 16.33 | 38.97 |
| 1:19:14 | 5.19 | 16.30 | 21.30 |
| 1:20:14 | 5.12 | 16.35 | 29.56 |
| 1:21:14 | 5.20 | 16.29 | 22.13 |
| 1:22:14 | 5.22 | 16.27 | 11.56 |
| 1:23:14 | 4.94 | 16.57 | 16.25 |
| 1:24:14 | 5.15 | 16.32 | 22.33 |
| 1:25:14 | 5.16 | 16.31 | 18.69 |
| 1:26:14 | 4.98 | 16.48 | 35.49 |
| 1:27:14 | 5.51 | 15.99 | 10.65 |
| 1:28:14 | 5.27 | 16.22 | 8.76 |
| 1:29:14 | 5.12 | 16.35 | 19.91 |
| 1:30:14 | 5.22 | 16.25 | 12.75 |
| 1:31:14 | 5.28 | 16.20 | 17.64 |
| 1:32:14 | 4.91 | 16.59 | 31.44 |
| 1:33:14 | 5.25 | 16.22 | 26.34 |
| 1:34:14 | 5.10 | 16.39 | 12.35 |
| 1:35:14 | 5.17 | 16.29 | 32.16 |
| 1:36:14 | 5.28 | 16.22 | 8.08 |
| 1:37:14 | 4.92 | 16.59 | 22.38 |
| 1:38:14 | 5.33 | 16.14 | 20.13 |
| 1:39:14 | 5.16 | 16.31 | 37.61 |
| 1:40:14 | 4.99 | 16.47 | 30.80 |
| 1:41:14 | 4.94 | 16.55 | 15.59 |
| 1:42:14 | 5.14 | 16.33 | 10.43 |
| 1:43:14 | 5.05 | 16.44 | 6.99 |
| 1:44:14 | 5.02 | 16.44 | 31.91 |
| 1:45:14 | 5.23 | 16.26 | 15.94 |

lient :JEA SJRPP
ite :0000
nit : C
roject :95-058
omment : Run #3
est Date :7/19/95 Time :11:00 thru 12:00 

| Time | 1030 O2 % | 1029 CO2 % | 1028 CO PPm |
|---|---|---|---|
| .1:46:14 | 5.07 | 16.41 | 23.76 |
| .1:47:14 | 5.01 | 16.47 | 47.42 |
| .1:48:14 | 4.98 | 16.49 | 35.71 |
| .1:49:14 | 4.91 | 16.61 | 24.75 |
| .1:50:14 | 4.86 | 16.65 | 61.72 |
| .1:51:14 | 5.09 | 16.39 | 18.34 |
| .1:52:14 | 4.93 | 16.56 | 21.22 |
| .1:53:14 | 5.19 | 16.30 | 61.23 |
| .1:54:14 | 5.10 | 16.36 | 37.58 |
| .1:55:14 | 5.01 | 16.46 | 27.33 |
| 1:56:14 | 5.41 | 16.06 | 15.24 |
| 1:57:14 | 5.02 | 16.46 | 13.82 |
| 11:58:14 | 4.98 | 16.49 | 22.32 |
| 11:59:14 | 5.00 | 16.45 | 39.83 |
| Averages for 60 Points | 5.07 | 16.39 | 29.09 |
| $\bar{C}$ gas → | 4.16 | 17.01 | 32.42 |

Client :JEA SJRPP
Site :0000
Unit :1
Project :95-058
Comment :Run #1
Test Date :7/20/95 Time :06:55 thru 07:55 Page 1

| Time | 1030 O2 % | 1029 CO2 % | 1028 CO PPm |
|---|---|---|---|
| 06:55:54 | 5.11 | 14.51 | 94.68 |
| 06:56:54 | 5.27 | 14.34 | 80.77 |
| 06:57:54 | 5.49 | 14.15 | 29.34 |
| 06:58:54 | 5.06 | 14.59 | 26.94 |
| 06:59:54 | 5.30 | 14.32 | 84.46 |
| 07:00:54 | 5.19 | 14.45 | 30.67 |
| 07:01:54 | 5.23 | 14.41 | 79.45 |
| 07:02:54 | 5.45 | 14.20 | 39.68 |
| 07:03:54 | 5.24 | 14.44 | 63.73 |
| 07:04:54 | 5.19 | 14.46 | 100.03 |
| 07:05:54 | 5.38 | 14.27 | 53.77 |
| 07:06:54 | 5.37 | 14.36 | 24.57 |
| 07:07:54 | 5.00 | 14.61 | 48.34 |
| 07:08:54 | 5.23 | 14.42 | 68.60 |
| 07:09:54 | 5.22 | 14.43 | 58.54 |
| 07:10:54 | 5.06 | 14.61 | 54.05 |
| 07:11:54 | 5.30 | 14.38 | 73.42 |
| 07:12:54 | 5.48 | 14.21 | 31.31 |
| 07:13:54 | 5.22 | 14.46 | 15.55 |
| 07:14:54 | 5.36 | 14.26 | 68.88 |
| 07:15:54 | 5.52 | 14.19 | 14.52 |
| 07:16:54 | 5.21 | 14.45 | 33.80 |
| 07:17:54 | 5.10 | 14.56 | 26.42 |
| 07:18:54 | 4.98 | 14.64 | 55.56 |
| 07:19:54 | 5.23 | 14.45 | 53.98 |
| 07:20:54 | 5.07 | 14.57 | 100.05 |
| 07:21:54 | 5.27 | 14.39 | 51.18 |
| 07:22:53 | 5.40 | 14.31 | 40.05 |
| 07:23:53 | 5.25 | 14.42 | 23.95 |
| 07:24:53 | 5.30 | 14.36 | 36.56 |
| 07:25:53 | 5.45 | 14.26 | 21.54 |
| 07:26:53 | 5.26 | 14.40 | 45.90 |
| 07:27:53 | 5.16 | 14.50 | 59.90 |
| 07:28:53 | 5.31 | 14.38 | 44.81 |
| 07:29:53 | 5.08 | 14.58 | 100.01 |
| 07:30:53 | 5.32 | 14.35 | 100.03 |
| 07:31:53 | 5.42 | 14.28 | 41.76 |
| 07:32:53 | 5.10 | 14.59 | 76.22 |
| 07:33:53 | 5.17 | 14.45 | 100.04 |
| 07:34:53 | 5.64 | 14.11 | 25.61 |
| 07:35:53 | 5.01 | 14.68 | 41.67 |
| 07:36:53 | 5.14 | 14.47 | 85.96 |
| 07:37:53 | 5.48 | 14.25 | 27.33 |
| 07:38:53 | 5.19 | 14.49 | 54.74 |
| 07:39:53 | 5.26 | 14.41 | 41.94 |
| 07:40:53 | 5.29 | 14.39 | 62.89 |

lient :JEA SJRPP
ite :0000
nit :1
roject :95-058
omment :Run #1
est Date :7/20/95 Time :06:55 thru 07:55



| Time | 1030 O2 % | 1029 CO2 % | 1028 CO PPm |
|---|---|---|---|
| 7:41:53 | 5.11 | 14.54 | 49.08 |
| 7:42:53 | 5.23 | 14.45 | 91.64 |
| 7:43:53 | 5.22 | 14.44 | 95.01 |
| 7:44:53 | 5.44 | 14.27 | 38.33 |
| 7:45:53 | 5.16 | 14.54 | 29.93 |
| 7:46:53 | 5.19 | 14.46 | 45.14 |
| 7:47:53 | 5.49 | 14.22 | 51.78 |
| 7:48:53 | 5.09 | 14.63 | 60.96 |
| 7:49:53 | 4.91 | 14.71 | 100.02 |
| 7:50:53 | 5.49 | 14.21 | 38.17 |
| 7:51:53 | 5.20 | 14.50 | 38.77 |
| 7:52:53 | 5.27 | 14.38 | 25.05 |
| 7:53:53 | 5.52 | 14.20 | 20.94 |
| 7:54:53 | 5.10 | 14.58 | 38.74 |
| Averages for 60 Points | 5.25 | 14.41 | 53.61 |
| $\bar{C}$ gas → | 5.195 | 15.17 | 54.99 |

Client :JEA SJRPP
Site :0000
Unit : 1
Project :95-058
Comment : Run #2
Test Date :7/20/95 Time :08:15 thru 09:15:08 Page 1

| Time | 1030 O2 % | 1029 CO2 % | 1028 CO PPm |
|---|---|---|---|
| 08:15:23 | 5.32 | 14.36 | 41.00 |
| 08:16:23 | 5.22 | 14.50 | 49.49 |
| 08:17:23 | 4.95 | 14.70 | 100.05 |
| 08:18:23 | 5.17 | 14.48 | 59.84 |
| 08:19:23 | 5.20 | 14.49 | 51.48 |
| 08:20:23 | 5.13 | 14.52 | 74.35 |
| 08:21:23 | 5.20 | 14.49 | 42.91 |
| 08:22:23 | 5.01 | 14.65 | 74.57 |
| 08:23:23 | 5.25 | 14.42 | 87.53 |
| 08:24:23 | 5.09 | 14.57 | 100.03 |
| 08:25:23 | 5.22 | 14.45 | 53.78 |
| 08:26:23 | 5.46 | 14.27 | 22.86 |
| 08:27:23 | 5.08 | 14.56 | 38.15 |
| 08:28:23 | 5.19 | 14.51 | 71.56 |
| 08:29:23 | 5.09 | 14.56 | 93.91 |
| 08:30:23 | 5.11 | 14.56 | 44.15 |
| 08:31:23 | 5.09 | 14.58 | 83.06 |
| 08:32:23 | 5.23 | 14.40 | 100.04 |
| 08:33:23 | 5.40 | 14.33 | 32.06 |
| 08:34:23 | 5.00 | 14.66 | 80.17 |
| 08:35:23 | 5.04 | 14.59 | 100.04 |
| 08:36:23 | 5.56 | 14.18 | 28.84 |
| 08:37:23 | 5.07 | 14.60 | 47.83 |
| 08:38:23 | 5.03 | 14.63 | 100.06 |
| 08:39:23 | 5.17 | 14.50 | 100.03 |
| 08:40:23 | 5.18 | 14.50 | 60.87 |
| 08:41:23 | 5.21 | 14.46 | 61.17 |
| 08:42:23 | 5.27 | 14.45 | 34.12 |
| 08:43:23 | 5.22 | 14.43 | 100.06 |
| 08:44:23 | 5.34 | 14.39 | 24.23 |
| 08:45:23 | 5.07 | 14.57 | 39.32 |
| 08:46:22 | 5.23 | 14.46 | 22.50 |
| 08:47:22 | 5.34 | 14.35 | 14.67 |
| 08:48:22 | 5.16 | 14.52 | 100.02 |
| 08:49:22 | 5.03 | 14.61 | 100.05 |
| 08:50:22 | 5.64 | 14.05 | 55.41 |
| 08:51:22 | 5.15 | 14.58 | 29.52 |
| 08:52:22 | 5.28 | 14.38 | 100.06 |
| 08:53:22 | 5.26 | 14.40 | 66.68 |
| 08:54:22 | 5.12 | 14.59 | 74.18 |
| 08:55:22 | 4.99 | 14.65 | 100.04 |
| 08:56:22 | 5.32 | 14.34 | 58.49 |
| 08:57:22 | 5.50 | 14.21 | 16.33 |
| 08:58:22 | 5.12 | 14.55 | 36.99 |
| 08:59:22 | 5.24 | 14.41 | 64.38 |
| 09:00:22 | 5.34 | 14.37 | 65.29 |

Client :JEA SJRPP
Site :0000
Unit : 1
Project :95-058
Comment : Run #2
Test Date :7/20/95 Time :08:15 thru 09:15:08 Page 2

| Time | 1030 O2 % | 1029 CO2 % | 1028 CO PPm |
|---|---|---|---|
| 09:01:22 | 5.09 | 14.54 | 100.03 |
| 09:02:22 | 5.22 | 14.45 | 52.66 |
| 09:03:22 | 5.18 | 14.47 | 100.06 |
| 09:04:22 | 5.03 | 14.57 | 100.00 |
| 09:05:22 | 5.33 | 14.34 | 75.90 |
| 09:06:22 | 5.18 | 14.50 | 51.70 |
| 09:07:22 | 5.12 | 14.49 | 100.05 |
| 09:08:22 | 5.31 | 14.39 | 32.65 |
| 09:09:22 | 5.05 | 14.59 | 87.66 |
| 09:10:22 | 5.23 | 14.42 | 61.37 |
| 09:11:22 | 5.07 | 14.57 | 46.54 |
| 09:12:22 | 5.15 | 14.51 | 40.97 |
| 09:13:22 | 5.12 | 14.53 | 72.06 |
| 09:14:22 | 5.08 | 14.57 | 98.96 |
| 09:15:08 | 5.60 | 14.06 | 48.53 |
| Averages for 61 Points | 5.19 | 14.47 | 65.10 |
| $\bar{c}$ gas → | 5.16 | 15.18 | 66.40 |

Client :JEA SJRPP
Site :0000
Unit :1
Project :95-058
Comment : Run #3
Test Date :7/20/95 Time :11:42 thru 12:42:08 Page 1

| Time | 1030 O2 % | 1029 CO2 % | 1028 CO PPm |
|---|---|---|---|
| 11:42:43 | 5.23 | 14.42 | 42.74 |
| 11:43:43 | 4.97 | 14.62 | 71.26 |
| 11:44:43 | 4.83 | 14.73 | 100.06 |
| 11:45:43 | 5.12 | 14.47 | 88.91 |
| 11:46:43 | 5.24 | 14.36 | 92.97 |
| 11:47:43 | 5.41 | 14.21 | 33.35 |
| 11:48:43 | 4.97 | 14.64 | 64.53 |
| 11:49:43 | 4.94 | 14.66 | 81.17 |
| 11:50:43 | 4.98 | 14.56 | 87.67 |
| 11:51:43 | 5.06 | 14.51 | 100.06 |
| 11:52:43 | 5.32 | 14.31 | 46.54 |
| 11:53:43 | 4.75 | 14.81 | 100.00 |
| 11:54:43 | 5.01 | 14.57 | 100.06 |
| 11:55:43 | 5.08 | 14.51 | 54.68 |
| 11:56:43 | 5.11 | 14.47 | 84.65 |
| 11:57:43 | 5.21 | 14.37 | 51.01 |
| 11:58:43 | 5.06 | 14.54 | 61.92 |
| 11:59:43 | 4.97 | 14.59 | 100.00 |
| 12:00:43 | 5.11 | 14.49 | 70.99 |
| 12:01:43 | 5.08 | 14.51 | 100.05 |
| 12:02:43 | 4.93 | 14.62 | 100.03 |
| 12:03:43 | 5.20 | 14.42 | 78.69 |
| 12:04:43 | 4.87 | 14.71 | 90.19 |
| 12:05:43 | 5.02 | 14.53 | 100.06 |
| 12:06:43 | 5.13 | 14.46 | 50.61 |
| 12:07:43 | 4.94 | 14.63 | 90.76 |
| 12:08:43 | 4.91 | 14.62 | 100.03 |
| 12:09:43 | 5.14 | 14.48 | 73.27 |
| 12:10:43 | 5.10 | 14.49 | 70.69 |
| 12:11:43 | 5.11 | 14.48 | 100.03 |
| 12:12:43 | 4.93 | 14.63 | 100.02 |
| 12:13:43 | 5.05 | 14.50 | 86.04 |
| 12:14:42 | 5.04 | 14.52 | 100.03 |
| 12:15:42 | 4.99 | 14.56 | 92.76 |
| 12:16:42 | 5.13 | 14.42 | 81.28 |
| 12:17:42 | 4.92 | 14.66 | 100.07 |
| 12:18:42 | 4.92 | 14.63 | 99.96 |
| 12:19:42 | 5.16 | 14.44 | 73.99 |
| 12:20:42 | 5.15 | 14.45 | 69.73 |
| 12:21:42 | 5.08 | 14.48 | 99.14 |
| 12:22:42 | 5.12 | 14.47 | 48.24 |
| 12:23:42 | 5.11 | 14.45 | 52.00 |
| 12:24:42 | 5.15 | 14.43 | 28.86 |
| 12:25:42 | 5.11 | 14.47 | 40.35 |
| 12:26:42 | 4.97 | 14.58 | 39.52 |
| 12:27:42 | 5.08 | 14.49 | 60.87 |

lient :JEA SJRPP
ite :0000
nit : 1
roject :95-058
omment : Run # 3
est Date :7/20/95 Time :11:42 thru 12:42:08 

| Time | 1030 O2 % | 1029 CO2 % | 1028 CO PPm |
|---|---|---|---|
| .2:28:42 | 5.07 | 14.50 | 80.91 |
| .2:29:42 | 5.10 | 14.45 | 81.02 |
| 12:30:42 | 4.89 | 14.67 | 67.87 |
| 12:31:42 | 5.10 | 14.47 | 38.57 |
| 12:32:42 | 5.02 | 14.51 | 99.97 |
| 12:33:42 | 5.18 | 14.38 | 74.88 |
| 12:34:42 | 5.05 | 14.51 | 100.05 |
| 12:35:42 | 5.11 | 14.45 | 100.00 |
| 12:36:42 | 5.08 | 14.48 | 71.59 |
| 12:37:42 | 4.94 | 14.63 | 80.37 |
| 12:38:42 | 5.05 | 14.46 | 80.41 |
| 12:39:42 | 5.26 | 14.31 | 68.90 |
| 12:40:42 | 5.01 | 14.54 | 100.03 |
| 12:41:42 | 5.11 | 14.44 | 100.00 |
| 12:42:08 | 5.18 | 14.39 | 82.37 |
| Averages for 61 Points | 5.06 | 14.51 | 78.47 |
| E gas ⇒ | 5.09 | 15.22 | 79.60 |

Client :JEA SJRPP
Site :0000
Unit :1
Project :95-058
Comment :Run#4 Used For Run#3 Rm-SB.
Test Date :7/20/95 Time :12:55 thru 13:48:15 

| Time | 1030 O2 % | 1029 CO2 % |
|---|---|---|
| 12:55:14 | 5.0 | 14.4 |
| 12:56:14 | 4.9 | 14.5 |
| 12:57:14 | 5.0 | 14.4 |
| 12:58:14 | 5.3 | 14.2 |
| 12:59:14 | 5.0 | 14.4 |
| 13:00:14 | 5.3 | 14.2 |
| 13:01:14 | 4.9 | 14.5 |
| 13:02:14 | 5.0 | 14.5 |
| 13:03:14 | 5.3 | 14.1 |
| 13:04:14 | 5.2 | 14.3 |
| 13:05:14 | 5.0 | 14.5 |
| 13:06:14 | 4.8 | 14.7 |
| 13:07:14 | 4.9 | 14.5 |
| 13:08:14 | 5.3 | 14.2 |
| 13:09:14 | 5.0 | 14.5 |
| 13:10:14 | 5.1 | 14.3 |
| 13:11:14 | 5.1 | 14.4 |
| 13:12:14 | 5.2 | 14.3 |
| 13:13:14 | 5.1 | 14.4 |
| 13:14:14 | 4.9 | 14.5 |
| 13:15:14 | 4.9 | 14.5 |
| 13:16:14 | 5.2 | 14.3 |
| 13:17:14 | 5.0 | 14.4 |
| 13:18:14 | 5.1 | 14.3 |
| 13:19:14 | 5.1 | 14.4 |
| 13:20:14 | 5.0 | 14.4 |
| 13:21:14 | 5.1 | 14.4 |
| 13:22:14 | 5.0 | 14.4 |
| 13:23:14 | 4.9 | 14.6 |
| 13:24:14 | 5.2 | 14.3 |
| 13:25:14 | 5.3 | 14.2 |
| 13:26:14 | 5.0 | 14.4 |
| 13:27:14 | 5.0 | 14.5 |
| 13:28:13 | 5.0 | 14.4 |
| 13:29:13 | 4.9 | 14.6 |
| 13:30:13 | 5.1 | 14.4 |
| 13:31:13 | 5.2 | 14.3 |
| 13:32:13 | 5.1 | 14.3 |
| 13:33:13 | 5.2 | 14.3 |
| 13:34:13 | 5.1 | 14.4 |
| 13:35:13 | 5.2 | 14.3 |
| 13:36:13 | 5.1 | 14.3 |
| 13:37:13 | 4.8 | 14.6 |
| 13:38:13 | 5.0 | 14.4 |
| 13:39:13 | 5.0 | 14.4 |
| 13:40:13 | 5.3 | 14.1 |

Client :JEA SJRPP
Site :0000
Unit :1
Project :95-058
Comment :4 Used For Run #3 Rm-5B
Test Date :7/20/95 Time :12:55 thru 13:48:15



| Time | 1030 O2 % | 1029 CO2 % |
|---|---|---|
| 13:41:13 | 4.9 | 14.4 |
| 13:42:13 | 5.2 | 14.3 |
| 13:43:13 | 5.0 | 14.3 |
| 13:44:13 | 5.1 | 14.3 |
| 13:45:13 | 5.0 | 14.4 |
| 13:46:13 | 5.0 | 14.3 |
| 13:47:13 | 5.0 | 14.4 |
| 13:48:13 | 5.0 | 14.3 |
| 13:48:15 | 5.0 | 14.3 |
| Averages for 55 Points | 5.0 | 14.3 |

$\bar{C}_{gas}$ 5.02 19.00

Client :JEA SJRPP
Site :0000
Unit :1
Project :95-058
Comment :Run# 1
Test Date :8/8/95 Time :07:35 thru 08:35:19 

| Time | 1030 O2 % | 1029 CO2 % | 1028 CO PPm |
|---|---|---|---|
| 07:35:22 | 5.35 | 13.66 | 12.66 |
| 07:36:22 | 5.42 | 13.60 | 12.66 |
| 07:37:21 | 5.21 | 13.81 | 19.36 |
| 07:38:21 | 5.12 | 13.87 | 20.14 |
| 07:39:21 | 5.42 | 13.60 | 13.17 |
| 07:40:21 | 5.19 | 13.80 | 20.78 |
| 07:41:21 | 5.40 | 13.61 | 16.57 |
| 07:42:21 | 5.18 | 13.80 | 24.09 |
| 07:43:21 | 5.25 | 13.75 | 24.73 |
| 07:44:21 | 5.09 | 13.89 | 29.46 |
| 07:45:21 | 5.31 | 13.65 | 35.38 |
| 07:46:21 | 5.44 | 13.59 | 20.84 |
| 07:47:21 | 5.36 | 13.63 | 22.74 |
| 07:48:21 | 5.31 | 13.74 | 18.63 |
| 07:49:21 | 4.97 | 13.96 | 44.27 |
| 07:50:21 | 5.41 | 13.61 | 24.94 |
| 07:51:21 | 5.14 | 13.85 | 19.61 |
| 07:52:21 | 5.40 | 13.59 | 21.92 |
| 07:53:21 | 5.24 | 13.81 | 13.99 |
| 07:54:21 | 4.93 | 14.02 | 14.41 |
| 07:55:21 | 5.39 | 13.61 | 8.06 |
| 07:56:21 | 5.11 | 13.91 | 13.99 |
| 07:57:21 | 5.06 | 13.91 | 25.05 |
| 07:58:21 | 5.39 | 13.62 | 11.13 |
| 07:59:21 | 5.18 | 13.81 | 22.63 |
| 08:00:21 | 5.16 | 13.84 | 14.34 |
| 08:01:21 | 5.21 | 13.78 | 11.25 |
| 08:02:21 | 5.18 | 13.81 | 18.94 |
| 08:03:21 | 5.20 | 13.82 | 21.02 |
| 08:04:21 | 5.08 | 13.88 | 34.70 |
| 08:05:21 | 5.32 | 13.67 | 14.78 |
| 08:06:21 | 5.10 | 13.91 | 13.32 |
| 08:07:21 | 5.10 | 13.85 | 21.95 |
| 08:08:21 | 5.36 | 13.67 | 10.94 |
| 08:09:21 | 5.23 | 13.75 | 15.27 |
| 08:10:21 | 5.01 | 13.97 | 12.05 |
| 08:11:21 | 5.07 | 13.87 | 18.92 |
| 08:12:21 | 5.49 | 13.53 | 27.96 |
| 08:13:21 | 4.93 | 14.03 | 30.46 |
| 08:14:21 | 5.13 | 13.85 | 25.30 |
| 08:15:21 | 5.08 | 13.87 | 30.02 |
| 08:16:21 | 5.25 | 13.72 | 31.90 |
| 08:17:21 | 5.37 | 13.62 | 19.53 |
| 08:18:21 | 5.02 | 13.98 | 30.84 |
| 08:19:21 | 5.04 | 13.92 | 31.20 |
| 08:20:21 | 5.26 | 13.71 | 25.13 |

Client :JEA SJRPP
Site :0000
Unit : 1
Project :95-058
Comment : Run #1
Test Date :8/8/95 Time :07:35 thru 08:35:19 Page 2

| Time | 1030 O2 % | 1029 CO2 % | 1028 CO PPm |
|---|---|---|---|
| 08:21:21 | 5.14 | 13.85 | 26.20 |
| 08:22:21 | 5.07 | 13.88 | 23.21 |
| 08:23:21 | 5.10 | 13.83 | 56.29 |
| 08:24:20 | 5.35 | 13.66 | 21.93 |
| 08:25:20 | 5.01 | 13.94 | 15.89 |
| 08:26:20 | 5.15 | 13.81 | 34.93 |
| 08:27:20 | 5.07 | 13.89 | 43.08 |
| 08:28:20 | 5.27 | 13.73 | 38.96 |
| 08:29:20 | 5.23 | 13.77 | 27.93 |
| 08:30:20 | 4.93 | 13.98 | 28.95 |
| 08:31:20 | 5.26 | 13.74 | 17.01 |
| 08:32:20 | 5.02 | 13.93 | 36.55 |
| 08:33:20 | 5.37 | 13.62 | 40.30 |
| 08:34:20 | 5.12 | 13.88 | 34.44 |
| 08:35:19 | 4.95 | 13.98 | 35.93 |
| Averages for 61 Points | 5.19 | 13.79 | 23.81 |
| | 5.087 | 14.078 | 25,172 |

Client :JEA SJRPP
File :0000
Unit :___/___
Project :95-058
Comment : Run 2
Test Date :8/8/95 Time :09:00 thru 10:01:11 Page 1

| Time | 1030 O2 % | 1029 CO2 % | 1028 CO PPm |
|---|---|---|---|
| 09:00:21 | 5.21 | 13.79 | 11.00 |
| 09:01:21 | 5.07 | 13.90 | 12.83 |
| 09:02:21 | 5.25 | 13.74 | 17.96 |
| 09:03:21 | 5.33 | 13.67 | 32.95 |
| 09:04:21 | 5.19 | 13.82 | 17.98 |
| 09:05:21 | 4.71 | 14.22 | 29.98 |
| 09:06:21 | 5.38 | 13.62 | 29.31 |
| 09:07:21 | 5.39 | 13.62 | 15.79 |
| 09:08:21 | 5.16 | 13.83 | 14.05 |
| 09:09:21 | 5.27 | 13.71 | 15.89 |
| 09:10:21 | 5.11 | 13.86 | 8.75 |
| 09:11:21 | 5.54 | 13.49 | 7.25 |
| 09:12:21 | 5.17 | 13.84 | 14.69 |
| 09:13:21 | 4.69 | 14.24 | 28.18 |
| 09:14:21 | 5.29 | 13.71 | 23.82 |
| 09:15:21 | 5.41 | 13.60 | 12.94 |
| 09:16:21 | 4.99 | 14.00 | 14.37 |
| 09:17:21 | 4.78 | 14.15 | 24.60 |
| 09:18:21 | 5.55 | 13.50 | 12.35 |
| 09:19:21 | 5.03 | 13.96 | 13.61 |
| 09:20:21 | 4.82 | 14.11 | 15.71 |
| 09:21:21 | 5.23 | 13.75 | 11.03 |
| 09:22:21 | 5.54 | 13.49 | 12.20 |
| 09:23:21 | 4.56 | 14.38 | 27.07 |
| 09:24:21 | 5.18 | 13.77 | 39.03 |
| 09:25:21 | 5.24 | 13.74 | 14.31 |
| 09:26:21 | 5.58 | 13.44 | 8.43 |
| 09:27:21 | 4.54 | 14.42 | 21.45 |
| 09:28:21 | 5.28 | 13.74 | 54.31 |
| 09:29:21 | 4.97 | 14.01 | 26.31 |
| 09:30:21 | 4.97 | 14.01 | 11.54 |
| 09:31:21 | 5.06 | 13.92 | 14.39 |
| 09:32:21 | 5.11 | 13.89 | 9.14 |
| 09:33:21 | 5.18 | 13.79 | 17.54 |
| 09:34:21 | 5.20 | 13.80 | 15.14 |
| 09:35:21 | 5.13 | 13.85 | 7.53 |
| 09:36:21 | 5.19 | 13.81 | 8.87 |
| 09:37:21 | 5.21 | 13.80 | 8.87 |
| 09:38:21 | 5.10 | 13.88 | 9.96 |
| 09:39:21 | 5.30 | 13.68 | 17.54 |
| 09:40:21 | 5.18 | 13.82 | 7.93 |
| 09:41:21 | 5.08 | 13.88 | 14.79 |
| 09:42:21 | 5.22 | 13.75 | 33.56 |
| 09:43:21 | 5.09 | 13.87 | 23.57 |
| 09:44:21 | 5.05 | 13.91 | 17.80 |
| 09:45:21 | 5.02 | 13.93 | 16.39 |

Client :JEA SJRPP
Site :0000
Unit :1
Project :95-058
Comment :Run 2
Test Date :8/8/95 Time :09:00 thru 10:01:11 

| Time | 1030 O2 % | 1029 CO2 % | 1028 CO PPm |
|---|---|---|---|
| 09:46:20 | 4.98 | 13.95 | 32.10 |
| 09:47:20 | 5.35 | 13.61 | 11.80 |
| 09:48:20 | 4.90 | 14.05 | 13.82 |
| 09:49:20 | 5.01 | 13.91 | 22.50 |
| 09:50:20 | 5.14 | 13.80 | 9.84 |
| 09:51:20 | 5.02 | 13.90 | 21.88 |
| 09:52:20 | 5.08 | 13.85 | 13.60 |
| 09:53:20 | 5.06 | 13.85 | 7.94 |
| 09:54:20 | 4.94 | 13.98 | 14.85 |
| 09:55:20 | 4.98 | 13.91 | 14.77 |
| 09:56:20 | 4.74 | 14.12 | 22.02 |
| 09:57:20 | 4.77 | 14.06 | 64.93 |
| 09:58:20 | 4.90 | 13.98 | 53.88 |
| 09:59:20 | 5.00 | 13.87 | 41.92 |
| 10:00:20 | 5.20 | 13.68 | 11.42 |
| 10:01:11 | 5.13 | 13.76 | 12.18 |
| Averages for 62 Points | 5.10 | 13.85 | 19.22 |
| | 5.282 | 13.942 | 20.179 |

lient :JEA SJRPP
i e :0000
nit :
roject :95-058
o ment : Run #3
e t Date :8/8/95 Time :10:30 thru 11:30:13 Page 1

| Time | 1030 O2 % | 1029 CO2 % | 1028 CO PPm |
|---|---|---|---|
| 10:30:40 | 4.99 | 13.95 | 17.73 |
| 10:31:40 | 5.18 | 13.78 | 14.87 |
| 10:32:40 | 4.97 | 13.96 | 18.86 |
| 10:33:40 | 5.26 | 13.70 | 16.93 |
| 10:34:40 | 5.02 | 13.94 | 28.92 |
| 10:35:40 | 5.15 | 13.78 | 35.88 |
| 10:36:40 | 4.98 | 13.98 | 13.88 |
| 10:37:40 | 5.12 | 13.83 | 19.86 |
| 10:38:40 | 5.02 | 13.94 | 10.88 |
| 10:39:40 | 4.92 | 14.00 | 14.86 |
| 10:40:40 | 5.28 | 13.71 | 8.92 |
| 10:41:40 | 5.01 | 13.94 | 10.85 |
| 10:42:40 | 5.18 | 13.78 | 12.93 |
| 10:43:40 | 5.15 | 13.81 | 8.92 |
| 10:44:40 | 5.04 | 13.92 | 13.90 |
| 10:45:40 | 5.10 | 13.86 | 46.86 |
| 10:46:40 | 5.01 | 13.94 | 17.02 |
| 10:47:40 | 5.09 | 13.86 | 16.97 |
| 10:48:40 | 5.20 | 13.78 | 12.97 |
| 10:49:40 | 5.13 | 13.84 | 15.85 |
| 10:50:40 | 5.15 | 13.81 | 28.97 |
| 10:51:40 | 4.92 | 14.03 | 22.85 |
| 10:52:40 | 5.10 | 13.88 | 31.87 |
| 10:53:40 | 5.14 | 13.85 | 10.90 |
| 10:54:40 | 5.05 | 13.91 | 9.90 |
| 10:55:40 | 5.05 | 13.90 | 20.94 |
| 10:56:40 | 5.04 | 13.90 | 16.97 |
| 10:57:40 | 5.16 | 13.81 | 11.86 |
| 10:58:40 | 5.09 | 13.88 | 6.07 |
| 10:59:40 | 5.06 | 13.89 | 7.02 |
| 11:00:40 | 4.85 | 14.09 | 6.08 |
| 11:01:40 | 5.13 | 13.83 | 13.92 |
| 11:02:40 | 5.19 | 13.81 | 14.91 |
| 11:03:39 | 5.03 | 13.95 | 21.93 |
| 11:04:39 | 5.12 | 13.85 | 13.90 |
| 11:05:39 | 5.01 | 13.95 | 8.93 |
| 11:06:39 | 4.96 | 13.99 | 33.98 |
| 11:07:39 | 5.23 | 13.76 | 17.94 |
| 11:08:39 | 5.13 | 13.84 | 13.87 |
| 11:09:39 | 4.98 | 13.94 | 11.86 |
| 11:10:39 | 5.07 | 13.89 | 11.86 |
| 11:11:39 | 5.15 | 13.82 | 7.03 |
| 11:12:39 | 5.09 | 13.89 | 12.93 |
| 11:13:39 | 5.17 | 13.81 | 10.93 |
| 11:14:39 | 5.11 | 13.87 | 9.90 |
| 11:15:39 | 4.99 | 13.95 | 12.92 |

Client :JEA SJRPP
Site :0000
Unit : 1
Project :95-058
Comment : Run#3
Test Date :8/8/95 Time :10:30 thru 11:30:13 

| Time | 1030 O2 % | 1029 CO2 % | 1028 CO PPm |
|---|---|---|---|
| 11:16:39 | 5.12 | 13.87 | 8.94 |
| 11:17:39 | 4.82 | 14.10 | 59.88 |
| 11:18:39 | 5.00 | 13.94 | 49.95 |
| 11:19:39 | 5.02 | 13.93 | 15.88 |
| 11:20:39 | 5.12 | 13.85 | 10.90 |
| 11:21:39 | 4.89 | 14.05 | 25.96 |
| 11:22:39 | 5.11 | 13.84 | 29.96 |
| 11:23:39 | 5.11 | 13.85 | 12.96 |
| 11:24:39 | 5.08 | 13.87 | 11.84 |
| 11:25:39 | 5.00 | 13.94 | 14.87 |
| 11:26:39 | 5.02 | 13.93 | 23.85 |
| 11:27:39 | 5.07 | 13.89 | 16.92 |
| 11:28:39 | 5.12 | 13.84 | 11.88 |
| 11:29:39 | 5.11 | 13.85 | 16.98 |
| 11:30:13 | 5.17 | 13.79 | 9.60 |
| Averages for 61 Points | 5.07 | 13.88 | 17.51 |
| | 5.27 | 13.99 | 18.11 |

Client :JEA SJRPP
Site :0000
Unit :_____
Project :95-058
Comment :_____
Test Date :8/8/95 Time :15:10 thru 15:52:27 Page 1

| Time | 1030 O2 % | 1029 CO2 % |
|---|---|---|
| 15:10:44 | 5.10 | 13.79 |
| 15:11:44 | 5.04 | 13.89 |
| 15:12:44 | 5.07 | 13.90 |
| 15:13:44 | 5.04 | 13.93 |
| 15:14:44 | 4.80 | 14.16 |
| 15:15:44 | 4.88 | 14.06 |
| 15:16:44 | 5.23 | 13.77 |
| 15:17:44 | 4.96 | 14.01 |
| 15:18:44 | 5.06 | 13.92 |
| 15:19:44 | 4.85 | 14.12 |
| 15:20:44 | 4.97 | 13.99 |
| 15:21:44 | 4.82 | 14.15 |
| 15:22:44 | 4.92 | 14.04 |
| 15:23:44 | 5.13 | 13.85 |
| 15:24:44 | 5.03 | 13.94 |
| 15:25:44 | 4.77 | 14.18 |
| 15:26:44 | 4.95 | 14.01 |
| 15:27:44 | 5.13 | 13.85 |
| 15:28:44 | 4.90 | 14.07 |
| 15:29:44 | 5.10 | 13.86 |
| 15:30:44 | 4.98 | 13.99 |
| 15:31:43 | 4.94 | 14.01 |
| 15:32:43 | 5.01 | 13.98 |
| 15:33:43 | 5.00 | 13.97 |
| 15:34:43 | 5.03 | 13.95 |
| 15:35:43 | 4.89 | 14.06 |
| 15:36:43 | 5.18 | 13.81 |
| 15:37:43 | 4.93 | 14.03 |
| 15:38:43 | 4.99 | 13.97 |
| 15:39:43 | 5.04 | 13.92 |
| 15:40:43 | 4.78 | 14.15 |
| 15:41:43 | 4.92 | 14.03 |
| 15:42:43 | 4.81 | 14.12 |
| 15:43:43 | 4.99 | 13.95 |
| 15:44:43 | 5.04 | 13.91 |
| 15:45:43 | 4.91 | 14.02 |
| 15:46:43 | 5.09 | 13.86 |
| 15:47:43 | 4.80 | 14.13 |
| 15:48:43 | 4.90 | 14.02 |
| 15:49:43 | 5.16 | 13.79 |
| 15:50:43 | 4.90 | 14.03 |
| 15:51:43 | 5.03 | 13.89 |
| 15:52:27 | 5.10 | 13.86 |
| Averages for 43 Points | 4.98 | 13.97 |

Test Calibration Data

ANALYZER CALIBRATION DATA

CLIENT J.E.A. S.J.R.P.P. PROJECT # 95-058-F1 DATE 7-18-95

SOURCE IDENTIFICATION Unit # Stack OPERATOR T. Roth

| CALIBRATION DATA FOR SAMPLING RUNS: 1-3 GAS TYPE: CO SPAN: 100 | CYLINDER VALUE % or ppm | ANALYZER RESPONSE | ABSOLUTE DIFFERENCE % or ppm | DIFFERENCE % OF SPAN |
|---|---|---|---|---|
| ZERO GAS $N_2$ | 0.0 | 0.0 | 0.0 | 0.0 |
| MID-RANGE GAS | 27.73 | 29.10 | .63 | .63 |
| HIGH-RANGE GAS | 62.0 | 61.9 | .10 | .10 |

| CALIBRATION DATA FOR SAMPLING RUNS: 1-3 GAS TYPE: $CO_2$ SPAN: 20 | CYLINDER VALUE % or ppm | ANALYZER RESPONSE | ABSOLUTE DIFFERENCE % or ppm | DIFFERENCE % OF SPAN |
|---|---|---|---|---|
| ZERO GAS $N_2$ | 0.0 | 0.0 | 0.0 | 0.0 |
| MID-RANGE GAS | 11.70 | 11.60 | .10 | .50 |
| HIGH-RANGE GAS | 17.2 | 17.2 | 0.0 | 0.0 |

| CALIBRATION DATA FOR SAMPLING RUNS: 1-3 GAS TYPE: $O_2$ SPAN: 25 | CYLINDER VALUE % or ppm | ANALYZER RESPONSE | ABSOLUTE DIFFERENCE % or ppm | DIFFERENCE % OF SPAN |
|---|---|---|---|---|
| ZERO GAS $N_2$ | 0.0 | 0.0 | 0.0 | 0.0 |
| MID-RANGE GAS | 11.60 | 11.60 | 0.0 | 0.0 |
| HIGH-RANGE GAS Amb | 20.90 | 20.5 | .40 | 1.60 |

$$\text{DIFFERENCE} = \frac{\text{ABSOLUTE DIFFERENCE}}{\text{SPAN VALUE}} \times 100$$

# SYSTEM CALIBRATION BIAS AND DRIFT DATA

CLIENT J.E.A. S.J.R.P.P. PROJECT # 95-058-F1 DATE 7-18-95

SOURCE INDENTIFICATION Unit # 1 Stack OPERATOR T. Roth

| RUN NO: 1<br>GAS TYPE: CO<br>SPAN: 100 | ANALYZER RESPONSE | INITIAL VALUES | | FINAL VALUES | | DRIFT % OF SPAN |
|---|---|---|---|---|---|---|
| | | SYSTEM RESPONSE | SYSTEM CAL. BIAS % OF SPAN | SYSTEM RESPONSE | SYSTEM CAL. BIAS % OF SPAN | |
| ZERO GAS | 0.0 | .20 | .26 | .1 | .10 | .16 |
| UPSCALE GAS | 29.1 | 27.8 | 1.30 | 28.6 | .50 | .80 |

Cma = 29.73 Co = .150 Cm = 28.2

| RUN NO: 1<br>GAS TYPE: $CO_2$<br>SPAN: 20 | ANALYZER RESPONSE | INITIAL VALUES | | FINAL VALUES | | DRIFT % OF SPAN |
|---|---|---|---|---|---|---|
| | | SYSTEM RESPONSE | SYSTEM CAL. BIAS % OF SPAN | SYSTEM RESPONSE | SYSTEM CAL. BIAS % OF SPAN | |
| ZERO GAS | 0.0 | .10 | .50 | .20 | 1.0 | .50 |
| UPSCALE GAS | 11.60 | 11.6 | 0.0 | 12.4 | .80 | .80 |

Cma = 11.70 Co = .150 Cm = 12.6

| RUN NO: 1<br>GAS TYPE: $O_2$<br>SPAN: 25 | ANALYZER RESPONSE | INITIAL VALUES | | FINAL VALUES | | DRIFT % OF SPAN |
|---|---|---|---|---|---|---|
| | | SYSTEM RESPONSE | SYSTEM CAL. BIAS % OF SPAN | SYSTEM RESPONSE | SYSTEM CAL. BIAS % OF SPAN | |
| ZERO GAS | 0.0 | .8 | 3.2 | .3 | 1.2 | 2.0 |
| UPSCALE GAS | 11.60 | 11.78 | .40 | 11.0 | 2.4 | 2.8 |

Cma = 11.60 Co = .550 Cm = 11.35

| RUN NO:<br>GAS TYPE:<br>SPAN: | ANALYZER RESPONSE | INITIAL VALUES | | FINAL VALUES | | DRIFT % OF SPAN |
|---|---|---|---|---|---|---|
| | | SYSTEM RESPONSE | SYSTEM CAL. BIAS % OF SPAN | SYSTEM RESPONSE | SYSTEM CAL. BIAS % OF SPAN | |
| ZERO GAS | | | | | | |
| UPSCALE GAS | | | | | | |

$$\text{SYSTEM CALIBRATION BIAS} = \frac{\text{SYSTEM CAL. RESPONSE} - \text{ANALYZER CAL. RESPONSE}}{\text{SPAN}} \times 100$$

$$\text{DRIFT} = \frac{\text{FINAL SYSTEM CAL. RESPONSE} - \text{INITIAL SYSTEM CAL. RESPONSE}}{\text{SPAN}} \times 100$$

## SYSTEM CALIBRATION BIAS AND DRIFT DATA

CLIENT J.E.A. S.J.R.P.P. PROJECT # 95-058-F1 DATE 7-18-95

SOURCE INDENTIFICATION Unit # Stack OPERATOR T. Roth

| RUN NO: 2<br>GAS TYPE: CO<br>SPAN: 100 | ANALYZER RESPONSE | INITIAL VALUES | | FINAL VALUES | | DRIFT % OF SPAN |
|---|---|---|---|---|---|---|
| | | SYSTEM RESPONSE | SYSTEM CAL. BIAS % OF SPAN | SYSTEM RESPONSE | SYSTEM CAL. BIAS % OF SPAN | |
| ZERO GAS | 0.0 | .10 | .10 | .10 | .10 | 0.0 |
| UPSCALE GAS | 29.1 | 28.1 | .50 | 28.4 | .70 | .20 |

Cma = 29.73 Co = .10 Cm = 28.5

| RUN NO: 2<br>GAS TYPE: $CO_2$<br>SPAN: 20 | ANALYZER RESPONSE | INITIAL VALUES | | FINAL VALUES | | DRIFT % OF SPAN |
|---|---|---|---|---|---|---|
| | | SYSTEM RESPONSE | SYSTEM CAL. BIAS % OF SPAN | SYSTEM RESPONSE | SYSTEM CAL. BIAS % OF SPAN | |
| ZERO GAS | 0.0 | .20 | 1.0 | .20 | 1.0 | 0.0 |
| UPSCALE GAS | 11.60 | 12.4 | .80 | 12.1 | 2.5 | 1.5 |

Cma = 11.70 Co = .20 Cm = 12.25

| RUN NO: 2<br>GAS TYPE: $O_2$<br>SPAN: 25 | ANALYZER RESPONSE | INITIAL VALUES | | FINAL VALUES | | DRIFT % OF SPAN |
|---|---|---|---|---|---|---|
| | | SYSTEM RESPONSE | SYSTEM CAL. BIAS % OF SPAN | SYSTEM RESPONSE | SYSTEM CAL. BIAS % OF SPAN | |
| ZERO GAS | 0.0 | .30 | 1.2 | .50 | 2.0 | .80 |
| UPSCALE GAS | 11.60 | 11.0 | 2.4 | 11.4 | .80 | 1.60 |

Cma = 11.60 Co = .40 Cm = 11.26

| RUN NO:<br>GAS TYPE:<br>SPAN: | ANALYZER RESPONSE | INITIAL VALUES | | FINAL VALUES | | DRIFT % OF SPAN |
|---|---|---|---|---|---|---|
| | | SYSTEM RESPONSE | SYSTEM CAL. BIAS % OF SPAN | SYSTEM RESPONSE | SYSTEM CAL. BIAS % OF SPAN | |
| ZERO GAS | | | | | | |
| UPSCALE GAS | | | | | | |

$$\text{SYSTEM CALIBRATION BIAS} = \frac{\text{SYSTEM CAL. RESPONSE} - \text{ANALYZER CAL. RESPONSE}}{\text{SPAN}} \times 100$$

$$\text{DRIFT} = \frac{\text{FINAL SYSTEM CAL. RESPONSE} - \text{INITIAL SYSTEM CAL. RESPONSE}}{\text{SPAN}} \times 100$$

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# SYSTEM CALIBRATION BIAS AND DRIFT DATA

CLIENT J.E.A. S.J.R.P.P. PROJECT # 95-058-F1 DATE 7-18-95

SOURCE INDENTIFICATION Unit # Stack OPERATOR T. Roth

| RUN NO: 3<br>GAS TYPE: CO<br>SPAN: 100 | ANALYZER RESPONSE | INITIAL VALUES | | FINAL VALUES | | DRIFT % OF SPAN |
|---|---|---|---|---|---|---|
| | | SYSTEM RESPONSE | SYSTEM CAL. BIAS % OF SPAN | SYSTEM RESPONSE | SYSTEM CAL. BIAS % OF SPAN | |
| ZERO GAS | 0.0 | .10 | .10 | .30 | .30 | .20 |
| UPSCALE GAS | 29.1 | 28.4 | .70 | 28.3 | .80 | .10 |

Cma = 29.73 Co = .20 Cm = 28.35

| RUN NO: 3<br>GAS TYPE: $CO_2$<br>SPAN: 20 | ANALYZER RESPONSE | INITIAL VALUES | | FINAL VALUES | | DRIFT % OF SPAN |
|---|---|---|---|---|---|---|
| | | SYSTEM RESPONSE | SYSTEM CAL. BIAS % OF SPAN | SYSTEM RESPONSE | SYSTEM CAL. BIAS % OF SPAN | |
| ZERO GAS | 0.0 | .20 | 1.0 | 0.0 | 0.0 | 1.0 |
| UPSCALE GAS | 11.60 | 12.1 | 2.5 | 11.9 | 1.50 | 1.0 |

Cma = 11.70 Co = .10 Cm = 12.0

| RUN NO: 3<br>GAS TYPE: $O_2$<br>SPAN: 25 | ANALYZER RESPONSE | INITIAL VALUES | | FINAL VALUES | | DRIFT % OF SPAN |
|---|---|---|---|---|---|---|
| | | SYSTEM RESPONSE | SYSTEM CAL. BIAS % OF SPAN | SYSTEM RESPONSE | SYSTEM CAL. BIAS % OF SPAN | |
| ZERO GAS | 0.0 | .50 | 2.0 | .50 | 2.0 | 0.0 |
| UPSCALE GAS | 11.60 | 11.4 | .80 | 11.3 | 1.20 | .40 |

Cma = 11.60 Co = .50 Cm = 11.35

| RUN NO:<br>GAS TYPE:<br>SPAN: | ANALYZER RESPONSE | INITIAL VALUES | | FINAL VALUES | | DRIFT % OF SPAN |
|---|---|---|---|---|---|---|
| | | SYSTEM RESPONSE | SYSTEM CAL. BIAS % OF SPAN | SYSTEM RESPONSE | SYSTEM CAL. BIAS % OF SPAN | |
| ZERO GAS | | | | | | |
| UPSCALE GAS | | | | | | |

$$\text{SYSTEM CALIBRATION BIAS} = \frac{\text{SYSTEM CAL. RESPONSE} - \text{ANALYZER CAL. RESPONSE}}{\text{SPAN}} \times 100$$

$$\text{DRIFT} = \frac{\text{FINAL SYSTEM CAL. RESPONSE} - \text{INITIAL SYSTEM CAL. RESPONSE}}{\text{SPAN}} \times 100$$

ANALYZER CALIBRATION DATA

CLIENT J.E.A. S.J.R.P.P. PROJECT # 95-058-F1 DATE 7-19-95

SOURCE IDENTIFICATION Unit # Stack OPERATOR T. Roth

| CALIBRATION DATA FOR SAMPLING RUNS: 1-3 GAS TYPE: CO SPAN: 100 | CYLINDER VALUE % or ppm | ANALYZER RESPONSE | ABSOLUTE DIFFERENCE % or ppm | DIFFERENCE % OF SPAN |
|---|---|---|---|---|
| ZERO GAS $N_2$ | 0.0 | 0.0 | 0.0 | 0.0 |
| MID-RANGE GAS | 29.73 | 29.30 | .43 | .43 |
| HIGH-RANGE GAS | 62.0 | 62.3 | .30 | .30 |

| CALIBRATION DATA FOR SAMPLING RUNS: 1-3 GAS TYPE: $CO_2$ SPAN: 20 | CYLINDER VALUE % or ppm | ANALYZER RESPONSE | ABSOLUTE DIFFERENCE % or ppm | DIFFERENCE % OF SPAN |
|---|---|---|---|---|
| ZERO GAS $N_2$ | 0.0 | 0.0 | 0.0 | 0.0 |
| MID-RANGE GAS | 11.70 | 11.8 to 11.5 | .20 .30 | 2.0 1.0 |
| HIGH-RANGE GAS | 17.2 | 17.2 | 0.0 | 0.0 |

| CALIBRATION DATA FOR SAMPLING RUNS: 1-3 GAS TYPE: $O_2$ SPAN: 25 | CYLINDER VALUE % or ppm | ANALYZER RESPONSE | ABSOLUTE DIFFERENCE % or ppm | DIFFERENCE % OF SPAN |
|---|---|---|---|---|
| ZERO GAS $N_2$ | 0.0 | 0.0 | 0.0 | 0.0 |
| MID-RANGE GAS | 11.60 | 11.70 | .10 | .46 |
| HIGH-RANGE GAS Amb | 20.90 | 20.70 | .20 | .80 |

$$\text{DIFFERENCE} = \frac{\text{ABSOLUTE DIFFERENCE}}{\text{SPAN VALUE}} \times 100$$

## SYSTEM CALIBRATION BIAS AND DRIFT DATA

CLIENT J.E.A. S.J.R.P.P. PROJECT # 95-058-F1 DATE 7-19-95

SOURCE INDENTIFICATION Unit # Stack OPERATOR T. Roth

| RUN NO: 1<br>GAS TYPE: CO<br>SPAN: 100 | ANALYZER RESPONSE | INITIAL VALUES | | FINAL VALUES | | DRIFT % OF SPAN |
|---|---|---|---|---|---|---|
| | | SYSTEM RESPONSE | SYSTEM CAL. BIAS % OF SPAN | SYSTEM RESPONSE | SYSTEM CAL. BIAS % OF SPAN | |
| ZERO GAS | 0.0 | .40 | .40 | 0 | 0.0 | .40 |
| UPSCALE GAS | 29.30 | 27.3 | 2.0 | 26.6 | 2.70 | .70 |

Cma = 29.73 Co = .20 Cm = 26.95

| RUN NO:<br>GAS TYPE: $CO_2$<br>SPAN: 20 | ANALYZER RESPONSE | INITIAL VALUES | | FINAL VALUES | | DRIFT % OF SPAN |
|---|---|---|---|---|---|---|
| | | SYSTEM RESPONSE | SYSTEM CAL. BIAS % OF SPAN | SYSTEM RESPONSE | SYSTEM CAL. BIAS % OF SPAN | |
| ZERO GAS | 0.0 | .10 | .50 | .20 | 1.0 | .50 |
| UPSCALE GAS | 11.5 | 11.7 | 1.0 | 11.4 | .50 | 1.50 |

Cma = 11.70 Co = .150 Cm = 11.55

| RUN NO:<br>GAS TYPE: $O_2$<br>SPAN: 25 | ANALYZER RESPONSE | INITIAL VALUES | | FINAL VALUES | | DRIFT % OF SPAN |
|---|---|---|---|---|---|---|
| | | SYSTEM RESPONSE | SYSTEM CAL. BIAS % OF SPAN | SYSTEM RESPONSE TS | SYSTEM CAL. BIAS % OF SPAN | |
| ZERO GAS | 0.0 | 1.2 | 4.8 | 1.1 | 4.40 | .40 |
| UPSCALE GAS | 11.70 | 12.1 | 1.6 | 12.1 | 1.60 | 0.0 |

Cma = 11.60 Co = 1.150 Cm = 12.10

| RUN NO:<br>GAS TYPE:<br>SPAN: | ANALYZER RESPONSE | INITIAL VALUES | | FINAL VALUES | | DRIFT % OF SPAN |
|---|---|---|---|---|---|---|
| | | SYSTEM RESPONSE | SYSTEM CAL. BIAS % OF SPAN | SYSTEM RESPONSE | SYSTEM CAL. BIAS % OF SPAN | |
| ZERO GAS | | | | | | |
| UPSCALE GAS | | | | | | |

$$\text{SYSTEM CALIBRATION BIAS} = \frac{\text{SYSTEM CAL. RESPONSE} - \text{ANALYZER CAL. RESPONSE}}{\text{SPAN}} \times 100$$

$$\text{DRIFT} = \frac{\text{FINAL SYSTEM CAL. RESPONSE} - \text{INITIAL SYSTEM CAL. RESPONSE}}{\text{SPAN}} \times 100$$

## SYSTEM CALIBRATION BIAS AND DRIFT DATA

CLIENT J.E.A. S.J.R.P.P. PROJECT # 95-058-F1 DATE 7-19-95

SOURCE INDENTIFICATION Unit # Stack OPERATOR T. Roth

| RUN NO: 2<br>GAS TYPE: CO<br>SPAN: 100 | ANALYZER RESPONSE | INITIAL VALUES | | FINAL VALUES | | DRIFT % OF SPAN |
|---|---|---|---|---|---|---|
| | | SYSTEM RESPONSE | SYSTEM CAL. BIAS % OF SPAN | SYSTEM RESPONSE | SYSTEM CAL. BIAS % OF SPAN | |
| ZERO GAS | 0.0 | 0.0 | 0.0 | .30 | .3a | .3a |
| UPSCALE GAS | 29.3a | 26.6 | 2.7a | 26.7 | 2.6 | .1a |

Cma = 29.73 Co = .150 Cm = 26.65

| RUN NO: 2<br>GAS TYPE: $CO_2$<br>SPAN: 20 | ANALYZER RESPONSE | INITIAL VALUES | | FINAL VALUES | | DRIFT % OF SPAN |
|---|---|---|---|---|---|---|
| | | SYSTEM RESPONSE | SYSTEM CAL. BIAS % OF SPAN | SYSTEM RESPONSE | SYSTEM CAL. BIAS % OF SPAN | |
| ZERO GAS | 0.0 | .26 | 1.0 | .30 | 1.5 | .5a |
| UPSCALE GAS | 11.5a | 11.46 | .5a | 11.30 | 1.00 | .5a |

Cma = 11.7a Co = .25a Cm = 11.35

| RUN NO: 2<br>GAS TYPE: $O_2$<br>SPAN: 25 | ANALYZER RESPONSE | INITIAL VALUES | | FINAL VALUES | | DRIFT % OF SPAN |
|---|---|---|---|---|---|---|
| | | SYSTEM RESPONSE | SYSTEM CAL. BIAS % OF SPAN | SYSTEM RESPONSE | SYSTEM CAL. BIAS % OF SPAN | |
| ZERO GAS | 0.0 | 1.1 | 4.4a | 1.2 | 4.8 | .4a |
| UPSCALE GAS | 11.7a | 12.8a | 1.6a | 12.1 | 1.6a | 0.0 |

Cma = 11.60 Co = 1.15a Cm = 12.1

| RUN NO:<br>GAS TYPE:<br>SPAN: | ANALYZER RESPONSE | INITIAL VALUES | | FINAL VALUES | | DRIFT % OF SPAN |
|---|---|---|---|---|---|---|
| | | SYSTEM RESPONSE | SYSTEM CAL. BIAS % OF SPAN | SYSTEM RESPONSE | SYSTEM CAL. BIAS % OF SPAN | |
| ZERO GAS | | | | | | |
| UPSCALE GAS | | | | | | |

$$\text{SYSTEM CALIBRATION BIAS} = \frac{\text{SYSTEM CAL. RESPONSE} - \text{ANALYZER CAL. RESPONSE}}{\text{SPAN}} \times 100$$

$$\text{DRIFT} = \frac{\text{FINAL SYSTEM CAL. RESPONSE} - \text{INITIAL SYSTEM CAL. RESPONSE}}{\text{SPAN}} \times 100$$

## SYSTEM CALIBRATION BIAS AND DRIFT DATA

CLIENT J.E.A. S.J.R.P.P. PROJECT # 95-058-F1 DATE 7-19-95

SOURCE INDENTIFICATION Unit # Stack OPERATOR T. Roth

| RUN NO: 3<br>GAS TYPE: CO<br>SPAN: 100 | ANALYZER RESPONSE | INITIAL VALUES | | FINAL VALUES | | DRIFT % OF SPAN |
|---|---|---|---|---|---|---|
| | | SYSTEM RESPONSE | SYSTEM CAL. BIAS % OF SPAN | SYSTEM RESPONSE | SYSTEM CAL. BIAS % OF SPAN | |
| ZERO GAS | 0.0 | .30 | .30 | .30 | .30 | 0.0 |
| UPSCALE GAS | 29.30 | 26.7 | 2.6 | 26.7 | 2.60 | 0.0 |

Cma = 29.73 Co = .30 Cm = 26.7

| RUN NO: 3<br>GAS TYPE: $CO_2$<br>SPAN: 20 | ANALYZER RESPONSE | INITIAL VALUES | | FINAL VALUES | | DRIFT % OF SPAN |
|---|---|---|---|---|---|---|
| | | SYSTEM RESPONSE | SYSTEM CAL. BIAS % OF SPAN | SYSTEM RESPONSE | SYSTEM CAL. BIAS % OF SPAN | |
| ZERO GAS | 0.0 | .30 | 1.50 | .20 | 1.0 | .50 |
| UPSCALE GAS | 11.50 | 11.30 | 1.00 | 11.4 | .50 | .50 |

Cma = 11.70 Co = .250 Cm = 11.35

| RUN NO: 3<br>GAS TYPE: $O_2$<br>SPAN: 25 | ANALYZER RESPONSE | INITIAL VALUES | | FINAL VALUES | | DRIFT % OF SPAN |
|---|---|---|---|---|---|---|
| | | SYSTEM RESPONSE | SYSTEM CAL. BIAS % OF SPAN | SYSTEM RESPONSE | SYSTEM CAL. BIAS % OF SPAN | |
| ZERO GAS | 0.0 | 1.2 | 4.8 | 1.2 | 4.80 | 0.0 |
| UPSCALE GAS | 11.70 | 12.1 | 1.60 | 11.9 | .80 | .80 |

Cma = 11.60 Co = 1.20 Cm = 1.20

| RUN NO:<br>GAS TYPE:<br>SPAN: | ANALYZER RESPONSE | INITIAL VALUES | | FINAL VALUES | | DRIFT % OF SPAN |
|---|---|---|---|---|---|---|
| | | SYSTEM RESPONSE | SYSTEM CAL. BIAS % OF SPAN | SYSTEM RESPONSE | SYSTEM CAL. BIAS % OF SPAN | |
| ZERO GAS | | | | | | |
| UPSCALE GAS | | | | | | |

$$\text{SYSTEM CALIBRATION BIAS} = \frac{\text{SYSTEM CAL. RESPONSE} - \text{ANALYZER CAL. RESPONSE}}{\text{SPAN}} \times 100$$

$$\text{DRIFT} = \frac{\text{FINAL SYSTEM CAL. RESPONSE} - \text{INITIAL SYSTEM CAL. RESPONSE}}{\text{SPAN}} \times 100$$

ANALYZER CALIBRATION DATA

CLIENT J.E.A. S.J.R.P.P. PROJECT # 95-058-F1 DATE 7-20-95

SOURCE IDENTIFICATION Unit #1 Stack OPERATOR T. Roth

| CALIBRATION DATA FOR SAMPLING RUNS: 1-3 GAS TYPE: CO SPAN: 100 | CYLINDER VALUE % or ppm | ANALYZER RESPONSE | ABSOLUTE DIFFERENCE % or ppm | DIFFERENCE % OF SPAN |
|---|---|---|---|---|
| ZERO GAS $N_2$ | 0.0 | 0.0 | 0.0 | 0.0 |
| MID-RANGE GAS | 29.73 | 29.40 | .33 | .33 |
| HIGH-RANGE GAS | 62.0 | 62.7 | .70 | .70 |

| CALIBRATION DATA FOR SAMPLING RUNS: 1-3 GAS TYPE: $CO_2$ SPAN: 20 | CYLINDER VALUE % or ppm | ANALYZER RESPONSE | ABSOLUTE DIFFERENCE % or ppm | DIFFERENCE % OF SPAN |
|---|---|---|---|---|
| ZERO GAS $N_2$ | 0.0 | 0.0 | 0.0 | 0.0 |
| MID-RANGE GAS | 11.70 | 11.30 | .40 | 2.0 |
| HIGH-RANGE GAS | 17.3 | 17.6 | .40 | 2.0 |

| CALIBRATION DATA FOR SAMPLING RUNS: 1-3 GAS TYPE: $O_2$ SPAN: 25 | CYLINDER VALUE % or ppm | ANALYZER RESPONSE | ABSOLUTE DIFFERENCE % or ppm | DIFFERENCE % OF SPAN |
|---|---|---|---|---|
| ZERO GAS $N_2$ | 0.0 | .10 | .10 | .40 |
| MID-RANGE GAS | 11.60 | 11.9 | .30 | 1.20 |
| HIGH-RANGE GAS Amb | 20.90 | 20.80 | .10 | .40 |

$$\text{DIFFERENCE} = \frac{\text{ABSOLUTE DIFFERENCE}}{\text{SPAN VALUE}} \times 100$$

# SYSTEM CALIBRATION BIAS AND DRIFT DATA

CLIENT J.E.A. S.J.R.P.P. PROJECT # 95-058-F1 DATE 7-20-95

SOURCE INDENTIFICATION Unit #1 Stack OPERATOR T. Roth

| RUN NO: 1<br>GAS TYPE: CO<br>SPAN: 100 | ANALYZER RESPONSE | INITIAL VALUES | | FINAL VALUES | | DRIFT % OF SPAN |
|---|---|---|---|---|---|---|
| | | SYSTEM RESPONSE | SYSTEM CAL. BIAS % OF SPAN | SYSTEM RESPONSE | SYSTEM CAL. BIAS % OF SPAN | |
| ZERO GAS | 0.0 | .30 | .30 | .20 | .20 | .10 |
| UPSCALE GAS | 29.40 | 29.10 | .30 | 29.10 | .30 | .10 |

Cma = 29.73 Co = .250 Cm = 29.10

| RUN NO: 1<br>GAS TYPE: $CO_2$<br>SPAN: 20 | ANALYZER RESPONSE | INITIAL VALUES | | FINAL VALUES | | DRIFT % OF SPAN |
|---|---|---|---|---|---|---|
| | | SYSTEM RESPONSE | SYSTEM CAL. BIAS % OF SPAN | SYSTEM RESPONSE | SYSTEM CAL. BIAS % OF SPAN | |
| ZERO GAS | 0.0 | .10 | .50 | .20 | 1.0 | .50 |
| UPSCALE GAS | 11.30 | 11.70 | .80 | 11.20 | .50 | .50 |

Cma = 11.70 Co = .150 Cm = 11.150

| RUN NO: 1<br>GAS TYPE: $O_2$<br>SPAN: 25 | ANALYZER RESPONSE | INITIAL VALUES | | FINAL VALUES | | DRIFT % OF SPAN |
|---|---|---|---|---|---|---|
| | | SYSTEM RESPONSE | SYSTEM CAL. BIAS % OF SPAN | SYSTEM RESPONSE | SYSTEM CAL. BIAS % OF SPAN | |
| ZERO GAS | 0.0 | .10 | .40 | .10 | .40 | 0.0 |
| UPSCALE GAS | 11.90 | 11.60 | 1.20 | 11.60 | 1.20 | 0.0 |

Cma = 11.60 Co = .10 Cm = 11.60

| RUN NO:<br>GAS TYPE:<br>SPAN: | ANALYZER RESPONSE | INITIAL VALUES | | FINAL VALUES | | DRIFT % OF SPAN |
|---|---|---|---|---|---|---|
| | | SYSTEM RESPONSE | SYSTEM CAL. BIAS % OF SPAN | SYSTEM RESPONSE | SYSTEM CAL. BIAS % OF SPAN | |
| ZERO GAS | | | | | | |
| UPSCALE GAS | | | | | | |

$$\text{SYSTEM CALIBRATION BIAS} = \frac{\text{SYSTEM CAL. RESPONSE} - \text{ANALYZER CAL. RESPONSE}}{\text{SPAN}} \times 100$$

$$\text{DRIFT} = \frac{\text{FINAL SYSTEM CAL. RESPONSE} - \text{INITIAL SYSTEM CAL. RESPONSE}}{\text{SPAN}} \times 100$$

# SYSTEM CALIBRATION BIAS AND DRIFT DATA

CLIENT J.E.A. S.J.R.P.P. PROJECT # 95-058-F1 DATE 7-20-95

SOURCE INDENTIFICATION Unit #1 Stack OPERATOR T. Roth

| RUN NO: 2<br>GAS TYPE: CO<br>SPAN: 100 | ANALYZER RESPONSE | INITIAL VALUES | | FINAL VALUES | | DRIFT % OF SPAN |
|---|---|---|---|---|---|---|
| | | SYSTEM RESPONSE | SYSTEM CAL. BIAS % OF SPAN | SYSTEM RESPONSE | SYSTEM CAL. BIAS % OF SPAN | |
| ZERO GAS | 0.0 | .20 | .20 | -.20 | .20 | .40 |
| UPSCALE GAS | 29.40 | 29.10 | .30 | 29.2 | .20 | .10 |

Cma = 29.73 Co = 0.0 Cm = 29.150

| RUN NO: 2<br>GAS TYPE: $CO_2$<br>SPAN: 20 | ANALYZER RESPONSE | INITIAL VALUES | | FINAL VALUES | | DRIFT % OF SPAN |
|---|---|---|---|---|---|---|
| | | SYSTEM RESPONSE | SYSTEM CAL. BIAS % OF SPAN | SYSTEM RESPONSE | SYSTEM CAL. BIAS % OF SPAN | |
| ZERO GAS | 0.0 | .20 | 1.0 | .20 | 1.0 | 0.0 |
| UPSCALE GAS | 11.30 | 11.20 | .50 | 11.20 | .50 | 0.0 |

Cma = 11.70 Co = .20 Cm = 11.20

| RUN NO: 2<br>GAS TYPE: $O_2$<br>SPAN: 25 | ANALYZER RESPONSE | INITIAL VALUES | | FINAL VALUES | | DRIFT % OF SPAN |
|---|---|---|---|---|---|---|
| | | SYSTEM RESPONSE | SYSTEM CAL. BIAS % OF SPAN | SYSTEM RESPONSE | SYSTEM CAL. BIAS % OF SPAN | |
| ZERO GAS | 0.0 | .10 | .40 | .10 | .40 | 0.0 |
| UPSCALE GAS | 11.90 | 11.60 | 1.20 | 11.50 | 1.60 | .40 |

Cma = 11.60 Co = .10 Cm = 11.550

| RUN NO:<br>GAS TYPE:<br>SPAN: | ANALYZER RESPONSE | INITIAL VALUES | | FINAL VALUES | | DRIFT % OF SPAN |
|---|---|---|---|---|---|---|
| | | SYSTEM RESPONSE | SYSTEM CAL. BIAS % OF SPAN | SYSTEM RESPONSE | SYSTEM CAL. BIAS % OF SPAN | |
| ZERO GAS | | | | | | |
| UPSCALE GAS | | | | | | |

$$\text{SYSTEM CALIBRATION BIAS} = \frac{\text{SYSTEM CAL. RESPONSE} - \text{ANALYZER CAL. RESPONSE}}{\text{SPAN}} \times 100$$

$$\text{DRIFT} = \frac{\text{FINAL SYSTEM CAL. RESPONSE} - \text{INITIAL SYSTEM CAL. RESPONSE}}{\text{SPAN}} \times 100$$

## SYSTEM CALIBRATION BIAS AND DRIFT DATA

CLIENT J.E.A. S.J.R.P.P. PROJECT # 95-058-F1 DATE 7-20-95

SOURCE INDENTIFICATION Unit #1 Stack OPERATOR T. Roth

| RUN NO: 3<br>GAS TYPE: CO<br>SPAN: 100 | ANALYZER RESPONSE | INITIAL VALUES | | FINAL VALUES | | DRIFT % OF SPAN |
|---|---|---|---|---|---|---|
| | | SYSTEM RESPONSE | SYSTEM CAL. BIAS % OF SPAN | SYSTEM RESPONSE | SYSTEM CAL. BIAS % OF SPAN | |
| ZERO GAS | 0.0 | -.20 | .20 | -.30 | .30 | .20 |
| UPSCALE GAS | 29.40 | 29.20 | .20 | 29.1 | .30 | .10 |

Cma = 29.73 Co = -.250 Cm = 29.150

| RUN NO: 3<br>GAS TYPE: $CO_2$<br>SPAN: 20 | ANALYZER RESPONSE | INITIAL VALUES | | FINAL VALUES | | DRIFT % OF SPAN |
|---|---|---|---|---|---|---|
| | | SYSTEM RESPONSE | SYSTEM CAL. BIAS % OF SPAN | SYSTEM RESPONSE | SYSTEM CAL. BIAS % OF SPAN | |
| ZERO GAS | 0.0 | .20 | 1.0 | .20 | 1.0 | 0.0 |
| UPSCALE GAS | 11.30 | 11.20 | .50 | 11.2 | .50 | 0.0 |

Cma = 11.70 Co = .20 Cm = 11.20

| RUN NO: 3<br>GAS TYPE: $O_2$<br>SPAN: 25 | ANALYZER RESPONSE | INITIAL VALUES | | FINAL VALUES | | DRIFT % OF SPAN |
|---|---|---|---|---|---|---|
| | | SYSTEM RESPONSE | SYSTEM CAL. BIAS % OF SPAN | SYSTEM RESPONSE | SYSTEM CAL. BIAS % OF SPAN | |
| ZERO GAS | 0.0 | .10 | .40 | .20 | .80 | .40 |
| UPSCALE GAS | 11.90 | 11.50 | 1.80 | 11.20 | 2.8 | 1.2 |

Cma = 11.60 Co = ~~11.55~~ .150 Cm = 11.35

| RUN NO:<br>GAS TYPE:<br>SPAN: | ANALYZER RESPONSE | INITIAL VALUES | | FINAL VALUES | | DRIFT % OF SPAN |
|---|---|---|---|---|---|---|
| | | SYSTEM RESPONSE | SYSTEM CAL. BIAS % OF SPAN | SYSTEM RESPONSE | SYSTEM CAL. BIAS % OF SPAN | |
| ZERO GAS | | | | | | |
| UPSCALE GAS | | | | | | |

$$\text{SYSTEM CALIBRATION BIAS} = \frac{\text{SYSTEM CAL. RESPONSE} - \text{ANALYZER CAL. RESPONSE}}{\text{SPAN}} \times 100$$

$$\text{DRIFT} = \frac{\text{FINAL SYSTEM CAL. RESPONSE} - \text{INITIAL SYSTEM CAL. RESPONSE}}{\text{SPAN}} \times 100$$

ANALYZER CALIBRATION DATA

Client T.E.A. S.J.R.P.P. Project # 95-058 FI Test Date 8-8-95

Source Identification Unit # 1 Stack Operator T. Roth

| Calibration Data For Sampling Runs: 1- Gas Type: Co Span: 100 | Cylinder Number | Cylinder Value % or PPM | Analyzer Response | Absolute Difference % or PPM | Difference % of Span |
|---|---|---|---|---|---|
| ZERO GAS | | 0.0 | 0.0 | 0.0 | 0.0 |
| LOW-RANGE GAS | | 14.74 | | | |
| MID-RANGE GAS | | 29.73 | 29.70 | .03 | .03 |
| HIGH-RANGE GAS | | 62.0 | 62.0 | 0.0 | 0.0 |

| Calibration Data For Sampling Runs: $O_2$ 1- Gas Type: $O_2$ Span: 25 | Cylinder Number | Cylinder Value (%) or PPM | Analyzer Response | Absolute Difference % or PPM | Difference % of Span |
|---|---|---|---|---|---|
| ZERO GAS | 0.0 | 0.0 | .10 | .10 | .40 |
| LOW-RANGE GAS | | — | | | |
| MID-RANGE GAS | | 11.60 | 11.60 | 0.0 | 0.0 |
| HIGH-RANGE GAS | | 20.90 | 2080 | .10 | .40 |

| Calibration Data For Sampling Runs: 1- Gas Type: $CO_2$ Span: 20 | Cylinder Number | Cylinder Value (%) or PPM | Analyzer Response | Absolute Difference % or PPM | Difference % of Span |
|---|---|---|---|---|---|
| ZERO GAS | | 0.0 | 0.0 | 0.0 | 0.0 |
| LOW-RANGE GAS | | — | | | |
| MID-RANGE GAS | | 10.90 | 11.0 | .10 | .50 |
| HIGH-RANGE GAS | | 17.20 | 17.1 | .10 | .50 |

| Calibration Data For Sampling Runs: 1- Gas Type: Co Span: 1000 | Cylinder Number | Cylinder Value % or PPM | Analyzer Response | Absolute Difference % or PPM | Difference % of Span |
|---|---|---|---|---|---|
| ZERO GAS | | 0.0 | 0.0 | 0.0 | 0.0 |
| LOW-RANGE GAS | | | | | |
| MID-RANGE GAS | | 302.0 | 305.4 | 3.40 | .340 |
| HIGH-RANGE GAS | | 603.5 | 603.0 | .50 | .05 |

**BEST AVAILABLE COPY**

# SYSTEM CALIBRATION BIAS AND DRIFT DATA

CLIENT J.E.A. S.J.P.P. PROJECT # 95-058-F1 TEST DATE 8-8-95

SOURCE IDENTIFICATION Unit #1 Stack OPERATOR T Roth

| RUN NO: 1<br>GAS TYPE: CO<br>SPAN: 1000 | ANALYZER RESPONSE | INITIAL VALUES | | FINAL VALUES | | DRIFT % OF SPAN |
|---|---|---|---|---|---|---|
| | | SYSTEM RESPONSE | SYSTEM CAL. BIAS % OF SPAN | SYSTEM RESPONSE | SYSTEM CAL. BIAS % OF SPAN | |
| ZERO GAS | 0.0 | .10 | .01 | .10 | .010 | 0 |
| UPSCALE GAS | 62.0 | 58.0 | .40 | 59.0 | .30 | .10 |

$C_{ma}$ = 62.0 $C_o$ = .10 $C_m$ = 58.5

| RUN NO: 1<br>GAS TYPE: $O_2$<br>SPAN: 25 | ANALYZER RESPONSE | INITIAL VALUES | | FINAL VALUES | | DRIFT % OF SPAN |
|---|---|---|---|---|---|---|
| | | SYSTEM RESPONSE | SYSTEM CAL. BIAS % OF SPAN | SYSTEM RESPONSE | SYSTEM CAL. BIAS % OF SPAN | |
| ZERO GAS | .10 | .60 | 2.0 | 0.0 | .4 | 2.4 |
| UPSCALE GAS | 11.60 | 11.60 | 0.0 | ~~11.0~~ 11.3 | 1.2 | 1.2 |

$C_{ma}$ = 11.6% $C_o$ = .30 $C_m$ = 11.45

| RUN NO: 1<br>GAS TYPE: $CO_2$<br>SPAN: 20 | ANALYZER RESPONSE | INITIAL VALUES | | FINAL VALUES | | DRIFT % OF SPAN |
|---|---|---|---|---|---|---|
| | | SYSTEM RESPONSE | SYSTEM CAL. BIAS % OF SPAN | SYSTEM RESPONSE | SYSTEM CAL. BIAS % OF SPAN | |
| ZERO GAS | 0.0 | .10 | .50 | 0.1 | .5 | 0 |
| UPSCALE GAS | 11.0 | 10.50 | 2.5 | 10.9 | ~~2.0~~ .50 | 2.0 |

$C_{ma}$ = 10.90 $C_o$ = .10 $C_m$ = 10.7

| RUN NO:<br>GAS TYPE:<br>SPAN: | ANALYZER RESPONSE | INITIAL VALUES | | FINAL VALUES | | DRIFT % OF SPAN |
|---|---|---|---|---|---|---|
| | | SYSTEM RESPONSE | SYSTEM CAL. BIAS % OF SPAN | SYSTEM RESPONSE | SYSTEM CAL. BIAS % OF SPAN | |
| ZERO GAS | | | | | | |
| UPSCALE GAS | | | | | | |

$$\text{SYSTEM CALIBRATION BIAS} = \frac{\text{SYSTEM CAL. RESPONSE} - \text{ANALYZER CAL. RESPONSE}}{\text{SPAN}} \times 100$$

$$\text{DRIFT} = \frac{\text{FINAL SYSTEM CAL. RESPONSE} - \text{INITIAL SYSTEM CAL. RESPONSE}}{\text{SPAN}} \times 100$$

# SYSTEM CALIBRATION BIAS AND DRIFT DATA

CLIENT J.E.A. S.J.R.F.F. PROJECT # 95-058-F1 TEST DATE 8-8-95

SOURCE IDENTIFICATION Unit #1 Stack OPERATOR T. Roth

| RUN NO: 2<br>GAS TYPE: $C_o$<br>SPAN: 1060 | ANALYZER RESPONSE | INITIAL VALUES | | FINAL VALUES | | DRIFT % OF SPAN |
|---|---|---|---|---|---|---|
| | | SYSTEM RESPONSE | SYSTEM CAL. BIAS % OF SPAN | SYSTEM RESPONSE | SYSTEM CAL. BIAS % OF SPAN | |
| ZERO GAS | 0.0 | .10 | .010 | 0.0 | ~~0.0~~ 0.0 | .01 |
| UPSCALE GAS | 62.0 | 59.0 | .30 | 58.9 | .31 | .01 |

$C_{ma}$ = 62.0 $C_o$ = .05 $C_m$ = 58.95

| RUN NO: 2<br>GAS TYPE: $O_2$<br>SPAN: 25 | ANALYZER RESPONSE | INITIAL VALUES | | FINAL VALUES | | DRIFT % OF SPAN |
|---|---|---|---|---|---|---|
| | | SYSTEM RESPONSE | SYSTEM CAL. BIAS % OF SPAN | SYSTEM RESPONSE | SYSTEM CAL. BIAS % OF SPAN | |
| ZERO GAS | 0.0 | 0.0 | .4 | 0.0 | 0.0 | 0.0 |
| UPSCALE GAS | 11.60 | 11.3 | 1.2 | 11.1 | 2.0 | 0.8 |

$C_{ma}$ = 11.60 $C_o$ = 0.0 $C_m$ = 11.

| RUN NO: 2<br>GAS TYPE: $C_{O_2}$<br>SPAN: 21 | ANALYZER RESPONSE | INITIAL VALUES | | FINAL VALUES | | DRIFT % OF SPAN |
|---|---|---|---|---|---|---|
| | | SYSTEM RESPONSE | SYSTEM CAL. BIAS % OF SPAN | SYSTEM RESPONSE | SYSTEM CAL. BIAS % OF SPAN | |
| ZERO GAS | 0.0 | 0.1 | .5 | 0.1 | ~~0.5~~ 0.5 | 0.0 |
| UPSCALE GAS | 11.0 | 10.9 | .50 | 10.8 | 1.0 | .50 |

$C_{ma}$ = 10.90 $C_o$ = .10 $C_m$ = 10.8

| RUN NO:<br>GAS TYPE:<br>SPAN: | ANALYZER RESPONSE | INITIAL VALUES | | FINAL VALUES | | DRIFT % OF SPAN |
|---|---|---|---|---|---|---|
| | | SYSTEM RESPONSE | SYSTEM CAL. BIAS % OF SPAN | SYSTEM RESPONSE | SYSTEM CAL. BIAS % OF SPAN | |
| ZERO GAS | | | | | | |
| UPSCALE GAS | | | | | | |

$$\text{SYSTEM CALIBRATION BIAS} = \frac{\text{SYSTEM CAL. RESPONSE} - \text{ANALYZER CAL. RESPONSE}}{\text{SPAN}} \times 100$$

$$\text{DRIFT} = \frac{\text{FINAL SYSTEM CAL. RESPONSE} - \text{INITIAL SYSTEM CAL. RESPONSE}}{\text{SPAN}} \times 100$$

SYSTEM CALIBRATION BIAS AND DRIFT DATA

CLIENT JEA - SJRPP PROJECT # 95-058 FL DATE 8-8-95

SOURCE INDENTIFICATION Unit # 1 STACK OPERATOR Tuffel

| RUN NO: 3<br>GAS TYPE: CO<br>SPAN: 1000 | ANALYZER RESPONSE | INITIAL VALUES | | FINAL VALUES | | DRIFT % OF SPAN |
|---|---|---|---|---|---|---|
| | | SYSTEM RESPONSE | SYSTEM CAL. BIAS % OF SPAN | SYSTEM RESPONSE | SYSTEM CAL. BIAS % OF SPAN | |
| ZERO GAS | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| UPSCALE GAS | 62.0 | 58.9 | .31 | 61.0 | .10 | .21 |

Cma = 62.0 Co = 0.0 Cm = 59.95

| RUN NO: 3<br>GAS TYPE: $O_2$<br>SPAN: 25 | ANALYZER RESPONSE | INITIAL VALUES | | FINAL VALUES | | DRIFT % OF SPAN |
|---|---|---|---|---|---|---|
| | | SYSTEM RESPONSE | SYSTEM CAL. BIAS % OF SPAN | SYSTEM RESPONSE | SYSTEM CAL. BIAS % OF SPAN | |
| ZERO GAS | 0.0 | 0.0 | 0.0 | .10 | .40 | .40 |
| UPSCALE GAS | 11.6 | 11.1 | 2.0 | 14.1 | 2.0 | 0.6 |

Cma = 11.60 Co = .05 Cm = 11.10

| RUN NO: 3<br>GAS TYPE: $CO_2$<br>SPAN: 20 | ANALYZER RESPONSE | INITIAL VALUES | | FINAL VALUES | | DRIFT % OF SPAN |
|---|---|---|---|---|---|---|
| | | SYSTEM RESPONSE | SYSTEM CAL. BIAS % OF SPAN | SYSTEM RESPONSE | SYSTEM CAL. BIAS % OF SPAN | |
| ZERO GAS | 0.0 | 0.1 | 0.5 | .20 | 1.0 | .50 |
| UPSCALE GAS | 11.0 | 10.8 | 1.0 | 10.9 | .50 | .50 |

Cma = 10.90 Co = .150 Cm = 10.85

| RUN NO:<br>GAS TYPE:<br>SPAN: | ANALYZER RESPONSE | INITIAL VALUES | | FINAL VALUES | | DRIFT % OF SPAN |
|---|---|---|---|---|---|---|
| | | SYSTEM RESPONSE | SYSTEM CAL. BIAS % OF SPAN | SYSTEM RESPONSE | SYSTEM CAL. BIAS % OF SPAN | |
| ZERO GAS | | | | | | |
| UPSCALE GAS | | | | | | |

Cma = Co = Cm =

$$\text{SYSTEM CALIBRATION BIAS} = \frac{\text{SYSTEM CAL. RESPONSE} - \text{ANALYZER CAL. RESPONSE}}{\text{SPAN}} \times 100$$

$$\text{DRIFT} = \frac{\text{FINAL SYSTEM CAL. RESPONSE} - \text{INITIAL SYSTEM CAL. RESPONSE}}{\text{SPAN}} \times 100$$



$$C_{gas} = \bar{C} - Co \times \frac{Cma}{Cm - Co}$$

Gas Certification Sheets

Scott Specialty Gases, Inc.
1290 COMBERMERE STREET, TROY, MI 48083 (313) 589-2950 FAX: (313) 589-2134

# CERTIFICATE OF ANALYSIS: EPA PROTOCOL GAS

**Customer**
TOTAL SOURCE ANALYSIS
510 DICKSON STREET
WELLINGTON, OH, 44090

**Assay Laboratory**
Scott Specialty Gases, Inc.
1290 Combermere
Troy, MI 48083

**Purchase Order** 1344
**Scott Project #** 558885

## ANALYTICAL INFORMATION

Certified to exceed the minimum specifications of EPA Protocol 1 Procedure #G1, Section Number 3.0.4

**Cylinder Number** ALM023664
**Cylinder Pressure** 1900 psig
**Certification Date** 12-8-93
**Previous Certification Dates** None
**Expiration Date** 12-7-96

### ANALYZED CYLINDER

| Components | Certified Concentration | Analytical Uncertainty* |
|---|---|---|
| Carbon Monoxide | 14.74 ppm | ±1% NIST Directly Traceable |

**Balance Gas: Nitrogen**

*Analytical uncertainty is inclusive of usual known error sources which at least includes reference standard error & precision of the measurement processes.

### REFERENCE STANDARD

| Type | Expiration Date | Cylinder Number | Concentration |
|---|---|---|---|
| CRM 1678 | 5-12-94 | AAL6302 | 45.76 PPM CO IN $N_2$ |

### INSTRUMENTATION

| Instrument/Model/Serial # | Last Date Calibrated | Analytical Principle |
|---|---|---|
| CO: Beckman/867/0100157 | 11-10-93 | Non-Dispersive Infrared |

## ANALYZER READINGS (Z=Zero Gas R=Reference Gas T=Test Gas r=Correlation Coefficient)

| Components | First Triad Analysis | Second Triad Analysis | Calibration Curve |
|---|---|---|---|
| Carbon Monoxide | Date: 11-29-93 Response Units: mv<br>Z1=0.00 R1=46.80 T1=15.20<br>R2=46.80 Z2=0.00 T2=15.20<br>Z3=0.00 T3=15.20 R3=46.80<br>Avg. Conc. of Cust. Cyl. 14.74 ppm | Date: 12-8-93 Response Units: mv<br>Z1=0.00 R1=46.80 T1=15.20<br>R2=46.80 Z2=0.00 T2=15.20<br>Z3=0.00 T3=15.20 R3=46.80<br>Avg. Conc. of Cust. Cyl. 14.74 ppm | Concentration=A+Bx+Cx$^2$+Dx$^3$+Ex$^4$<br>r=0.99999 CRM 1678<br>Constants: A=0.3465483<br>B=0.9339077 C=0.00095399<br>D=-0.000003327 E=0 |
| | | | Concentration=A+Bx+Cx$^2$+Dx$^3$+Ex$^4$ |
| | | | Concentration=A+Bx+Cx$^2$+Dx$^3$+Ex$^4$ |

**Special Notes**

Analyst Tim Sanderson

# Scott Specialty Gases, Inc.

1290 COMBERMERE STREET, TROY, MI 48083 (810) 589-2950 FAX:(810) 589-2134

## CERTIFICATE OF ANALYSIS: EPA PROTOCOL GAS

**Customer**
TOTAL SOURCE ANALYSIS
510 DICKSON STREET
WELLINGTON, OH 44090-1171

**Assay Laboratory**
Scott Specialty Gases, Inc
1290 Combermere
Troy, MI 48083

**Purchase Order :** 2004
**Scott Project # :** 575700

### ANALYTICAL INFORMATION

This certification was performed according to EPA Traceability Protocol For Assay and Certification of Gaseous Calibration Standards; Procedure G1; September, 1993.

**Cylinder Number :** ALM028243
**Cylinder Pressure + :** 1900 psig
**Certificate Date :** 1/13/95
**Previous Certificate Date :** None
**Expiration Date :** 1/13/98

ANALYZED CYLINDER

| Components | Certified Concentration | Analytical Uncertainty* |
|---|---|---|
| Carbon Monoxide | 29.73 ppm | ±1% NIST Directly Traceable |

**Balance Gas:** Nitrogen

+Do not use when cylinder presssure is below 150 psig.
*Analytical accuracy is inclusive of usual known error sources which at least include precision of the measurement processes.

REFERENCE STANDARD

| Type | Expiration Date | Cylinder Number | Concentration |
|---|---|---|---|
| NTRM 1679 | 8/11/96 | ALM037782 | 97.10 ppm Carbon Monoxide in Nitrogen |

INSTRUMENTATION

| Instrument/Model/Serial # | Last Date Calibrated | Analytical Principle |
|---|---|---|
| CO:Horiba/OPE-135/565607092 | 1/13/95 | Non-Dispersive Infared |

### ANALYZER READINGS (Z=Zero Gas R=Reference Gas T=Test Gas r=Correlation Coefficient)

| Components | First Triad Analysis | Second Triad Analysis | Calibration Curve |
|---|---|---|---|
| Carbon Monoxide | Date: 1/6/95 Response Units: mv<br>Z1=0.00 R1=80.00 T1=25.00<br>R2=80.00 Z2=0.00 T2=25.00<br>Z3=0.00 T3=25.00 R3=80.00<br>Avg. Conc. of Cust. Cyl. 29.67 ppm | Date: 1/13/95 Response Units: mv<br>Z1=0.00 R1=80.00 T1=25.10<br>R2=80.00 Z2=0.00 T2=25.10<br>Z3=0.00 T3=25.10 R3=80.00<br>Avg. Conc. of Cust. Cyl. 29.79 ppm | Concentration=A+Bx+Cx$^2$+Dx$^3$+Ex$^4$<br>r=1.00000 NTRM 1679<br>Constants: A=0.059415000<br>B=1.202500000 C=-0.001100400<br>D=0.000015397 E=0.000000000 |

**Special Notes**

Mail

H2

**Analyst**

MISP/P-1

610-691-2474
FAX # 610-758-8384

# LIQUID CARBONIC

**CYLINDER GAS PRODUCTS**

EAST COAST REGION
145 SHIMERSVILLE RD., BETHLEHEM, PA 18015

# *CERTIFICATE OF ANALYSIS / EPA PROTOCOL GAS*

CUSTOMER S/T CANTON P.O NUMBER 49763

## *REFERENCE STANDARD*

| COMPONENT | NIST SRM NO. | CYLINDER NO. | CONCENTRATION |
|---|---|---|---|
| CARBON MONOXIDE | 49.7 PPM GMIS VS. 1678C | CAL-6763 | 48.2 PPM |

## *ANALYZER READINGS*

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

COMPONENT CARBON MONOXIDE 49.7 PPM ANALYZER MAKE-MODEL-S/N SIEMENS ULTRAMAT 5E EE-E00

ANALYTICAL PRINCIPLE NON-DISPERSIVE INFRARED LAST CALIBRATION DATE 03/31/95

FIRST ANALYSIS DATE 04/17/95 SECOND ANALYSIS DATE 04/25/95

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Z | 0.00 | R | 50.8 | C | 63.4 | CONC. | 62.0 | Z | 0.00 | R | 50.6 | C | 63.2 | CONC. 62.1 |
| R | 50.8 | Z | 0.00 | C | 63.4 | CONC. | 62.0 | R | 50.6 | Z | 0.00 | C | 63.2 | CONC. 62.1 |
| Z | 0.00 | C | 63.4 | R | 50.8 | CONC. | 62.0 | Z | 0.00 | C | 63.2 | R | 50.6 | CONC. 62.1 |
| U/M | PPM | | | | | MEAN TEST ASSAY | 62.0 | U/M | PPM | | | | | MEAN TEST ASSAY 62.1 |

THIS CYLINDER NO. SA6640
HAS BEEN CERTIFIED ACCORDING TO SECTION EPA-600/R93/224
OF TRACEABILITY PROTOCOL NO. REV. 9/93
PROCEDURE G1
CERTIFIED ACCURACY ± 1 % NIST TRACEABLE
CYLINDER PRESSURE 1650 PSIG
CERTIFICATION DATE 04/25/95
EXPIRATION DATE 04/25/98

CERTIFIED CONCENTRATION

| | |
|---|---|
| CARBON MONOXIDE | 62.0 ppm |
| NITROGEN | BALANCE |

ANALYZED BY Daniel J. Day DANIEL J. DAY, H3

CERTIFIED BY Robert Hillard ® ROBERT HILLARD

# Scott Specialty Gases, Inc.

1290 COMBERMERE STREET, TROY, MI 48083 (810) 589-2950 FAX:(810) 589-2134

## CERTIFICATE OF ANALYSIS: EPA PROTOCOL GAS

**Customer**
TOTAL SOURCE ANALYSIS
510 DICKSON STREET
WELLINGTON, OH 44090-1171

**Assay Laboratory**
Scott Specialty Gases, Inc
1290 Combermere
Troy, MI 48083

**Purchase Order :** 1477
**Scott Project # :** 568881

### ANALYTICAL INFORMATION

This certification was performed according to EPA Traceability Protocol For Assay and Certification of Gaseous Calibration Standards; Procedure G1; September, 1993.

**Cylinder Number :** ALM049209
**Cylinder Pressure + :** 1900 psig
**Certificate Date :** 7/25/94
**Previous Certificate Date :** None
**Expiration Date :** 7/25/97

**ANALYZED CYLINDER**

| Components | Certified Concentration | Analytical Uncertainty* |
|---|---|---|
| Carbon Dioxide | 10.9 % | ±1% NIST Directly Traceable |

**Balance Gas:** Nitrogen

+Do not use when cylinder presssure is below 150 psig.
*Analytical accuracy is inclusive of usual known error sources which at least include precision of the measurement processes.

**REFERENCE STANDARD**

| Type | Expiration Date | Cylinder Number | Concentration |
|---|---|---|---|
| SRM 2745 | 11/3/96 | SX20311 | 15.75 % % Carbon Dioxide in Nitrogen |

**INSTRUMENTATION**

| Instrument/Model/Serial # | Last Date Calibrated | Analytical Principle |
|---|---|---|
| CO2:Horiba/PIR-2000/02609015 | 7/14/94 | Non-Dispersive Infrared |

### ANALYZER READINGS (Z=Zero Gas R=Reference Gas T=Test Gas r=Correlation Coefficient)

| Components | First Triad Analysis | Second Triad Analysis | Calibration Curve |
|---|---|---|---|
| Carbon Dioxide | Date: 7/25/94 Response Units: mv<br>Z1=0.00 R1=120.90 T1=95.90<br>R2=120.90 Z2=0.00 T2=95.90<br>Z3=0.00 T3=95.90 R3=120.90<br>Avg. Conc. of Cust. Cyl. 10.9 % | | Concentration=A+Bx+Cx$^2$+Dx$^3$+Ex$^4$<br>r=1.00000 SRM 2745<br>Constants: A=-1.415500000<br>B=0.140570000 C=-0.000842590<br>D=0.000005416 E=0.000000000 |

**Special Notes**

Analyst Rhonda Lundy



MSP/P-1

# AGA Gas, Inc.

Specialty & Medical Gases Division

## CERTIFICATE OF ANALYSIS

### EPA PROTOCOL

**PERFORMED ACCORDING TO SECTION 2.2, PROCEDURE G1**

**Production Number:** 12940090
**Cylinder Number:** CC7791
**Cylinder Pressure:** 2000 psi

**NOTICE, THIS CYLINDER IS NOT TO BE USED WHEN PRESSURE IS UNDER 150 psig**

| Certified Component | Certified Concentration | Date of Certification | Analytical Method |
|---|---|---|---|
| Carbon Dioxide | 14.7 ± 1% | 1/23/95 | Non-Dispersive Infrared |

**Expiration Date:** 1/23/98
**Balance Gas:** Nitrogen

***REFERENCE STANDARD DATA:***

| SRM Number | Cylinder Number | Concentration |
|---|---|---|
| GMIS | CC4109 | 13.93% Carbon Dioxide |

***CERTIFIED AT:***

AGA Gas Inc.
Specialty & Medical Gas Division
8421 Montcova Road
Maumee, Ohio 43537

Michael Sickmiller
Quality Control Supervisor

# Scott Specialty Gases, Inc.

1290 COMBERMERE STREET, TROY, MI 48083 (810) 589-2950 FAX:(810) 589-2134


## CERTIFICATE OF ANALYSIS: EPA PROTOCOL GAS

**Customer**
TOTAL SOURCE ANALYSIS
510 DICKSON STREET
WELLINGTON, OH 44090-1171

**Assay Laboratory**
Scott Specialty Gases, Inc
1290 Combermere
Troy, MI 48083

**Purchase Order :** 1477
**Scott Project # :** 568881

### ANALYTICAL INFORMATION

This certification was performed according to EPA Traceability Protocol For Assay and Certification of Gaseous Calibration Standards; Procedure G1; September, 1993.

**Cylinder Number :** ALM049101
**Cylinder Pressure + :** 1900 psig
**Certificate Date :** 7/25/94
**Previous Certificate Date :** None
**Expiration Date :** 7/25/97

ANALYZED CYLINDER

| Components | Certified Concentration | Analytical Uncertainty* |
|---|---|---|
| Carbon Dioxide | 17.2 % | ±1% NIST Directly Traceable |

**Balance Gas: Nitrogen**

+Do not use when cylinder presssure is below 150 psig.
*Analytical accuracy is inclusive of usual known error sources which at least include precision of the measurement processes.

REFERENCE STANDARD

| Type | Expiration Date | Cylinder Number | Concentration |
|---|---|---|---|
| SRM 2745 | 11/3/96 | SX20311 | 15.75 % % Carbon Dioxide in Nitrogen |

INSTRUMENTATION

| Instrument/Model/Serial # | Last Date Calibrated | Analytical Principle |
|---|---|---|
| CO2:Horiba/PIR-2000/02609015 | 7/14/94 | Non-Dispersive Infrared |

### ANALYZER READINGS (Z=Zero Gas R=Reference Gas T=Test Gas r=Correlation Coefficient)

| Components | First Triad Analysis | Second Triad Analysis | Calibration Curve |
|---|---|---|---|
| Carbon Dioxide | Date: 7/25/94 Response Units: mv<br>Z1=0.00 R1=120.90 T1=127.10<br>R2=120.90 Z2=0.00 T2=127.10<br>Z3=0.00 T3=127.10 R3=120.90<br>Avg. Conc. of Cust. Cyl. 17.2 % | | Concentration=A+Bx+Cx$^2$+Dx$^3$+Ex$^4$<br>r=1.00000 SRM 2745<br>Constants: A=-1.415500000<br>B=0.140570000 C=-0.000842590<br>D=0.000005416 E=0.000000000 |

**Special Notes**

Analyst Rhonda Lundy

Air Produc[illegible] and Chemicals, Inc.
SPECIALTY G[illegible] DEPARTMENT
12722 S. WENTWORTH AVENUE
CHICAGO, IL 60628



# Certificate of Analysis - EPA Protocol Gas Standard



PERFORMED ACCORDING TO EPA TRACEABILITY PROTOCOL FOR ASSAY AND CERTIFICATION OF GASEOUS CALIBRATION STANDARDS (PROCEDURE #G1

Customer:
APCI
5420 WARNER RD.
VALLEY VIEW
CLEVELAND OH 44125

PO: Rel:

Notes:

Order No: 231-019520
Batch No: 861-23317
Cylinder No: SG9133258B
Cylinder Pressure*: 2000 psig
Certification Date: 01/23/95
Expiration Date: 01/23/98

| *** Certified Concentration *** | | ********* Reference Standards ********* | | | ********** Analytical Instrumentation ********* | | | |
|---|---|---|---|---|---|---|---|---|
| Component | Certified Concentration | Cylinder # | Standard Number | Concentration | Instrument Make/Model | Serial Number | Last Calibration | Measurement Principal |
| OXYGEN | 11.6 ±.10 % | SG9113455BAL | GMIS | 15.0500 % | Shimadzu GC-8A | 32029 | 01/18/95 | GC-TCD |

Balance Gas: Nitrogen

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* Standard should not be used below 150 psig

H7

Analyst: Shaher Aboor
Shaher Aboor

Approved By: Robert McNear
Robert McNear

# Scott Specialty Gases, Inc.

1290 COMBERMERE STREET, TROY, MI 48083 (810) 589-2950 FAX:(810) 589-2134

## CERTIFICATE OF ANALYSIS: EPA PROTOCOL GAS

**Customer**
TOTAL SOURCE ANALYSIS
510 DICKSON STREET
WELLINGTON, OH 44090-1171

**Assay Laboratory**
Scott Specialty Gases, Inc
1290 Combermere
Troy, MI 48083

**Purchase Order :** 1433
**Scott Project # :** 565319

### ANALYTICAL INFORMATION

This certification was performed according to EPA Traceability Protocol For Assay and Certification of Gaseous Calibration Standards; Procedure G1; September, 1993.

**Cylinder Number :** ALM028068
**Cylinder Pressure + :** 1900 psig
**Certificate Date :** 4/28/94
**Previous Certificate Date :** None
**Expiration Date :** 4/28/97

**ANALYZED CYLINDER**

| Components | Certified Concentration | Analytical Uncertainty* |
|---|---|---|
| Carbon Monoxide | 302.0 ppm | ±1% NIST Directly Traceable |

**Balance Gas: Nitrogen**

+Do not use when cylinder presssure is below 150 psig.
*Analytical accuracy is inclusive of usual known error sources which at least include precision of the measurement processes.

**REFERENCE STANDARD**

| Type | Expiration Date | Cylinder Number | Concentration |
|---|---|---|---|
| CRM 1681 | 7/19/95 | ALM-024827 | 966.1 ppm Carbon Monoxide in Nitrogen |

**INSTRUMENTATION**

| Instrument/Model/Serial # | Last Date Calibrated | Analytical Principle |
|---|---|---|
| CO : Beckman/864/102528 | 4/15/94 | Non-Dispersive Infrared |

### ANALYZER READINGS (Z=Zero Gas R=Reference Gas T=Test Gas r=Correlation Coefficient)

Components: Carbon Monoxide

**First Triad Analysis**

| Date: 3/15/94 | Response Units: mv | |
|---|---|---|
| Z1=0.00 | R1=100.00 | T1=35.40 |
| R2=100.00 | Z2=0.00 | T2=35.40 |
| Z3=0.00 | T3=35.40 | R3=100.00 |
| Avg. Conc. of Cust. Cyl. 302.0 ppm | | |

**Second Triad Analysis**

| Date: 4/28/94 | Response Units: mv | |
|---|---|---|
| Z1=0.00 | R1=100.00 | T1=35.40 |
| R2=100.00 | Z2=0.00 | T2=35.40 |
| Z3=0.00 | T3=35.40 | R3=100.00 |
| Avg. Conc. of Cust. Cyl: 302.0 ppm | | |

**Calibration Curve**

| Concentration=A+Bx+Cx$^2$+Dx$^3$+Ex$^4$ | |
|---|---|
| r=1.00000 | CRM 1681 |
| Constants: | A=-0.182760000 |
| B=7.918200000 | C=0.017444000 |
| D=0.000000000 | E=0.000000000 |

**Special Notes**



Analyst Don Eichler, Jr

# Scott Specialty Gases, Inc.

1290 COMBERMERE STREET, TROY, MI 48083 (810) 589-2950 FAX:(810) 589-2134

## CERTIFICATE OF ANALYSIS: EPA PROTOCOL GAS

**Customer**
TOTAL SOURCE ANALYSIS
510 DICKSON STREET
WELLINGTON, OH 44090-1171

**Assay Laboratory**
Scott Specialty Gases, Inc
1290 Combermere
Troy, MI 48083

**Purchase Order :** 1433
**Scott Project # :** 565319

### ANALYTICAL INFORMATION

This certification was performed according to EPA Traceability Protocol For Assay and Certification of Gaseous Calibration Standards: Procedure G1; September, 1993.

**Cylinder Number :** ALM012900
**Cylinder Pressure + :** 1900 psig
**Certificate Date :** 4/28/94
**Previous Certificate Date :** None
**Expiration Date :** 4/28/97

**ANALYZED CYLINDER**

| Components | Certified Concentration | Analytical Uncertainty* |
|---|---|---|
| Carbon Monoxide | 603.5 ppm | ±1% NIST Directly Traceable |

**Balance Gas:** Nitrogen

+Do not use when cylinder presssure is below 150 psig.
*Analytical accuracy is inclusive of usual known error sources which at least include precision of the measurement processes.

**REFERENCE STANDARD**

| Type | Expiration Date | Cylinder Number | Concentration |
|---|---|---|---|
| CRM 1681 | 7/19/95 | ALM-024827 | 966.1 ppm Carbon Monoxide in Nitrogen |

**INSTRUMENTATION**

| Instrument/Model/Serial # | Last Date Calibrated | Analytical Principle |
|---|---|---|
| CO : Beckman/864/102528 | 4/15/94 | Non-Dispersive Infrared |

### ANALYZER READINGS (Z=Zero Gas R=Reference Gas T=Test Gas r=Correlation Coefficient)

| Components | First Triad Analysis | Second Triad Analysis | Calibration Curve |
|---|---|---|---|
| Carbon Monoxide | Date: 2/8/94 Response Units: mv<br>Z1=0.00 R1=100.00 T1=68.50<br>R2=100.00 Z2=0.00 T2=66.50<br>Z3=0.00 T3=66.50 R3=100.00<br>Avg. Conc. of Cust. Cyl. 603.5 ppm | Date: 4/28/94 Response Units: mv<br>Z1=0.00 R1=100.00 T1=68.50<br>R2=100.00 Z2=0.00 T2=68.50<br>Z3=0.00 T3=68.50 R3=100.00<br>Avg. Conc. of Cust. Cyl: 603.5 ppm | Concentration=A+Bz+Cz$^2$+Dz$^3$+Ez$^4$<br>r=1.00000 CRM 1681<br>Constants: A=-0.162760000<br>B=7.918200000 C=0.017444000<br>D=0.000000000 E=0.000000000 |

**Special Notes**



Analyst Don Eichler, Jr

Calibrations of Test Equipment

# DRY GAS METER CALIBRATION SHEET

CLIENT: SHOP Q.A.Q.C.
PROJECT NUMBER: 95-000-FL
MODULE: RAC # 1
ORIFICE: 3.118

RUN BY: T.ROTH
DATE: 5/18/95
BAROMETRIC PRESSURE 29.95

| DELTA H IN.H2O | Vw Initial | Vw Final | Vw Cub.Feet | Vd Initial | Vd Final | Vd Cub.Feet | Tw F | TDi F | TDo F | Td F | Time Min |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0.5 | 29.000 | 33.385 | 4.385 | 285.647 | 290.041 | 4.394 | 69.0 | 98.0 | 86.0 | 92.00 | 10.0 |
| 1.0 | 34.000 | 39.943 | 5.943 | 290.621 | 296.595 | 5.974 | 69.5 | 100.0 | 87.0 | 93.50 | 10.0 |
| 1.5 | 41.000 | 48.119 | 7.119 | 297.683 | 304.940 | 7.257 | 69.5 | 101.0 | 87.0 | 94.00 | 10.0 |
| 2.0 | 49.000 | 57.076 | 8.076 | 305.898 | 314.198 | 8.300 | 69.5 | 101.0 | 88.0 | 94.50 | 10.0 |
| 3.0 | 58.000 | 67.565 | 9.565 | 315.362 | 325.274 | 9.912 | 70.0 | 102.0 | 88.0 | 95.00 | 10.0 |

| DELTA H IN.H2O | DELTA H 13.6 | MC/Y | Yi |
|---|---|---|---|
| 0.50 | 0.0368 | 1.040 | -0.017 |
| 1.00 | 0.0735 | 1.037 | -0.014 |
| 1.50 | 0.1103 | 1.023 | 0.001 |
| 2.00 | 0.1471 | 1.014 | 0.009 |
| 3.00 | 0.2206 | 1.003 | 0.020 |

| DELTA Ha | DELTA Ha @i |
|---|---|
| 1.395 | 0.184 |
| 1.518 | 0.061 |
| 1.585 | -0.006 |
| 1.641 | -0.062 |
| 1.757 | -0.177 |

METER CORR. FACTOR: **1.023**

ORIFICE: 3.118

DELTA H@i: 1.579

WHERE:
AH = Orifice Setting
Vw = Volume of Gas of Wet Test Meter
Vd = Volume of Gas of Dry Gas Meter
Tw = Temperature of Fluid in Wet Test Meter
Tdi = Inlet Temperature of Dry Gas Meter
Tdo = Outlet Temperature of Dry Gas Meter
Td = Average Temperature of Dry Gas Meter
Time = Time Required to pull specific cubic feet
Mc = Dry Gas Meter Correction Factor
A Ha = Orifice setting that equates to .75 cfm of air at standard conditions
A Hai = Ha tolerance; tolerance for individual values (+/-) .20 from average
Yi = Ratio of reading of Wet Teat Meter to Dry Gas Meter; tolerance for individual values (+/-) .02 from average

EQUATIONS: Mc (Y)

$$\frac{Vw\ Pb\ (Td + 460)}{Vd\ (Pb + AH/13.6)(Tw + 460)}$$

AH (a)

$$\frac{0.0317\ AH}{Pb\ (Td + 460)} \left| \frac{(Tw + 460)Time}{Vw} \right|^2$$

SHOP Q.A.Q.C.
95-000-FL
RAC # 1
5/18/95

# ORIFICE CALCULATIONS

INITIAL

| DELTA H | Ft/Min | $X^2$ |
|---|---|---|
| 0.5 | 0.4394 | 0.1931 |
| 1.0 | 0.5974 | 0.3569 |
| 1.5 | 0.7257 | 0.5266 |
| 2.0 | 0.8300 | 0.6889 |
| 3.0 | 0.9912 | 0.9825 |

POSSIBLE COMBINATIONS

| | | | | |
|---|---|---|---|---|
| 1 | (3.0 - 2.0) | 1 | 3.4063 | -9.26% |
| 2 | (3.0 - 1.5) | 2 | 3.2907 | -5.55% |
| 3 | (3.0 - 1.0) | 3 | 3.1970 | -2.55% |
| 4 | (3.0 - .50) | 4 | 3.1669 | -1.59% |
| 5 | (2.0 - 1.5) | 5 | 3.0815 | 1.16% |
| 6 | (2.0 - 1.0) | 6 | 3.0119 | 3.39% |
| 7 | (2.0 - .50) | 7 | 3.0252 | 2.96% |
| 8 | (1.5 - 1.0) | 8 | 2.9454 | 5.52% |
| 9 | (1.5 - .50) | 9 | 2.9979 | 3.84% |
| 10 | (1.0 - .50) | 10 | 3.0522 | 2.09% |

**AVERAGE ORIFICE** **3.1175**

# Dry Gas Meter Calibration Sheet

Client: _____ Run By: Bruce, Horwedel

Project No.: _____ Date: 5/31/95

Module: 09 N Barometric Press.: 29.38

Orifice: 3.255

| ΔH in. $H_2O$ | Vw initial | Vw final | Vw ft.³ | Vd initial | Vd final | Vd ft.³ | tw °F | tdi °F | tdo °F | td | Time θ min. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| .5 | 872.153 | 880.603 | 4.450 | 736.424 | 738.814 | 4.530 | 68 | 77 | 69 | 73 | 10 |
| 1.0 | 882.115 | 888.158 | 6.043 | 741.30 | 747.26 | 5.956 | 68 | 80 | 70 | 75 | 10 |
| 1.5 | 891.495 | 896.678 | 7.183 | 748.536 | 755.64 | 7.024 | 68 | 82 | 71 | 76.5 | 10 |
| 2.0 | 898.225 | 906.388 | 8.364 | 756.923 | 765.119 | 8.146 | 68 | 83 | 72 | 77 | 10 |
| 3.0 | 912.438 | 922.412 | 9.981 | 771.194 | 781.070 | 9.876 | 69 | 89 | 73 | 77.5 | 10 |

| ΔH | ΔH / 13.6 | Mc(Y) = Vw Pb(td + 460) / Vd(Pb + ΔH/13.6)(tw + 460) | Yi | ΔHS (For Small Orifice Only) = 0.0317ΔH / Pb (td + 460) [(tw + 460) θ² / Vw] | ΔHai |
|---|---|---|---|---|---|
| .5 | .0368 | 1.03 | | 1.425 | |
| 1.0 | .0737 | 1.03 | | 1.540 | |
| 1.5 | .110 | 1.03 | | 1.630 | |
| 2.0 | .147 | 1.03 | | 1.640 | |
| 3.0 | .221 | 1.03 | | 1.692 | |
| Average | | 1.03 | | 1.585 | |

ΔH = Orifice Setting

Vw = Volume of Gas of Wet Test Meter

Vd = Volume of Gas of Dry Gas Meter

tw = Temperature of Fluid in Wet Test Meter

tdi = Inlet Temperature of Dry Gas Meter

tdo = Outlet Temperature of Dry Gas Meter

td = Average Temperature of Dry Gas Meter

θ = Time required to pull specified cubic feet

Mc = Dry Gas Meter Correction Factor

ΔHa = Orifice setting that would pull .75 cfm of air at standard conditions

Yi = Ratio of reading of wet test meter to dry test meter ±.02 from average

| DeltaH | Vd3 |
|---|---|
| .5 | 4.530 |
| 1.0 | 5.950 |
| 1.5 | 7.076 |
| 2.0 | 8.146 |
| 3.0 | 9.876 |

**Possible Combinations**

(3.0 - 2.0) / (.975 - .663)= 3.207
(3.0 - 1.5) / (.975 - .500)= 3.160
(3.0 - 1.0) / (.975 - .354)= 3.218
(3.0 - .5) / (.975 - .205)= 3.246
(2.0 - 1.5) / (.663 - .500)= 3.069
(2.0 - 1.0) / (.663 - .354)= 3.230
(2.0 - .5) / (.663 - .205)= 3.272
(1.5 - 1.0) / (.500 - .354)= 3.408
(1.5 - .5) / (.500 - .205)= 3.384
(1.0 - .5) / (.354 - .205)= 3.359

**Average orifice: 3.255**

# Dry Gas Meter Calibration Sheet

Client _____ Run By Brent A. Meyer

Project No. _____ Date 7-17-95

Module 01/N Barometric Press. 29.54

Orifice 3.694

| ΔH in. $H_2O$ | Vw initial | Vw final | $Vw_3$ ft.$^3$ | Vd initial | Vd final | $Vd_3$ ft.$^3$ | tw °F | tdi °F | tdo °F | td | Time θ min. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| .5 | 917.205 | 921.161 | 3.956 | 055.715 | 059.566 | 3.851 | 83.5 | 87 | 85 | 86 | 10 |
| 1.0 | 921.484 | 926.971 | 5.487 | 059.862 | 066.227 | 5.369 | 83.5 | 86 | 84 | 85 | 10 |
| 1.5 | 927.218 | 933.869 | 6.651 | 065.466 | 071.936 | 6.470 | 84 | 87 | 85 | 86 | 10 |
| 2.0 | 943.348 | 950.985 | 7.637 | 081.127 | 088.569 | 7.451 | 84 | 89 | 85 | 87 | 10 |
| 3.0 | 951.222 | 960.671 | 9.449 | 088.786 | 097.892 | 9.106 | 84 | 90 | 86 | 88 | 10 |

| ΔH | ΔH / 13.6 | Mc(Y) = Vw $^3$Pb(td + 460) / Vd(Pb + ΔH/13.6)(tw + 460) | Yi | ΔHa (For Small Orifice Only) = 0.0317ΔH / Pb (td + 460) × [(tw + 460) θ / Vw]$^2$ | ΔHai |
|---|---|---|---|---|---|
| .5 | .0368 | 1.03 | | 1.855 | |
| 1.0 | .0737 | 1.02 | | 1.932 | |
| 1.5 | .110 | 1.03 | | 1.972 | |
| 2.0 | .147 | 1.03 | | 1.991 | |
| 3.0 | .221 | 1.04 | | 1.947 | |
| Average | | 1.03 | | 1.939 | |

ΔH = Orifice Setting

Vw = Volume of Gas of Wet Test Meter

Vd = Volume of Gas of Dry Gas Meter

tw = Temperature of Fluid in Wet Test Meter

tdi = Inlet Temperature of Dry Gas Meter

tdo = Outlet Temperature of Dry Gas Meter

td = Average Temperature of Dry Gas Meter

θ = Time required to pull specified cubic feet

Mc = Dry Gas Meter Correction Factor

ΔHa = Orifice setting that would pull .75 cfm of air at standard conditions

Yi = Ratio of reading of wet test meter to dry test meter ±.02 from average

ΔHai = Ha tolerance for individual values ±.20 from average.

| DeltaH | Vd3 |
|---|---|
| .5 | 3.851 |
| 1.0 | 5.365 |
| 1.5 | 6.470 |
| 2.0 | 7.437 |
| 3.0 | 9.106 |

01/N

Possible Combinations

(3.0 - 2.0) / (.829 - .553)= 3.621
(3.0 - 1.5) / (.829 - .418)= 3.653
(3.0 - 1.0) / (.829 - .287)= 3.694
(3.0 - .5) / (.829 - .148)= 3.671
(2.0 - 1.5) / (.553 - .418)= 3.718
(2.0 - 1.0) / (.553 - .287)= 3.769
(2.0 - .5) / (.553 - .148)= 3.705
(1.5 - 1.0) / (.418 - .287)= 3.823
(1.5 - .5) / (.418 - .148)= 3.699
(1.0 - .5) / (.287 - .148)= 3.583

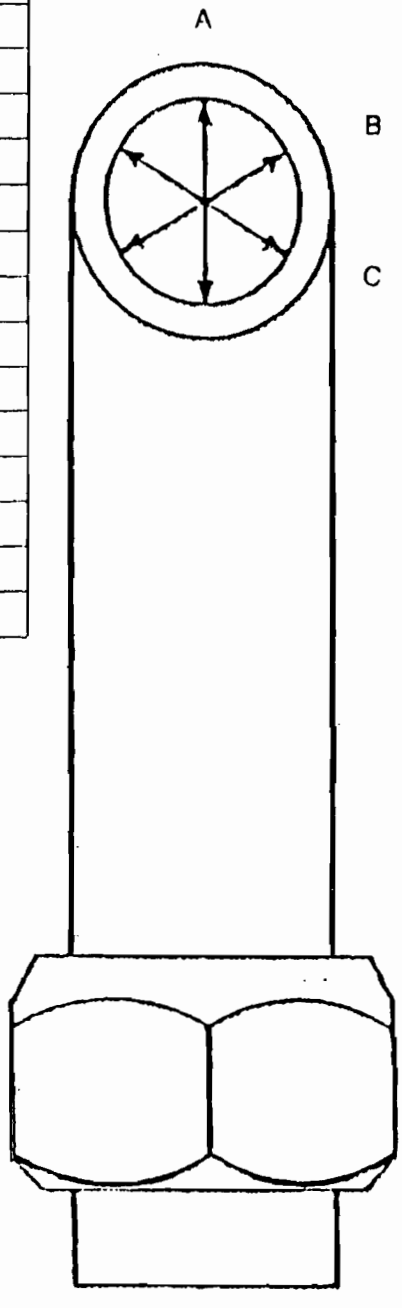
Average orifice: 3.694

# Nozzle Calibration

Sized By J. Roth Shop QA QC.

| Date | Nozzle | Dimension A | Dimension B | Dimension C | Difference | Avg. Diameter |
|---|---|---|---|---|---|---|
| 2-21-95 | FI-01 | .120 | .120 | .120 | .000 | .120 |
| 2-21-95 | FI-02 | .139 | .139 | .140 | .001 | .139 |
| 2-21-95 | FI-03 | .186 | .188 | .187 | .002 | .187 |
| 2-21-95 | FI-04 | .187 | .187 | .187 | .000 | .187 |
| 2-21-95 | FI-05 | | | | | |
| 2-21-95 | FI-06 | .231 | .230 | .232 | .002 | .231 |
| 2-21-95 | FI-07 | .250 | .249 | .249 | .001 | .249 |
| 2-21-95 | FI-08 | .248 | .249 | .248 | .001 | .248 |
| 2-21-95 | FI-09 | .250 | .250 | .250 | .000 | .250 |
| 2-21-95 | FI-10 | .250 | .250 | .250 | .000 | .250 |
| 2-21-95 | FI-11 | .252 | .252 | .251 | .001 | .252 |
| 2-21-95 | FI-12 | .375 | .374 | .375 | .001 | .375 |
| 2-21-95 | FI-13 | .302 | .302 | .301 | .001 | .302 |
| 2-21-95 | FI-14 | .305 | .306 | .306 | .001 | .306 |
| 2-21-95 | FI-15 | .314 | .315 | .315 | .001 | .315 |
| 2-21-95 | FI-16 | .374 | .375 | .374 | .001 | .374 |
| 2-21-95 | FI-17 | .372 | .373 | .372 | .001 | .372 |
| 2-21-95 | FI-18 | .371 | .372 | .372 | .001 | .373 |
| 2-21-95 | FI-19 | .370 | .369 | .371 | .002 | .370 |
| 2-21-95 | FI-20 | .438 | .437 | .438 | .001 | .438 |
| 2-21-95 | FI-22 | .501 | .502 | .503 | .002 | .502 |
| 2-21-95 | FI-21 | .496 | .495 | .496 | .001 | .496 |
| 2-21-95 | FI-23 | .501 | .501 | .501 | .000 | .501 |
| 2-21-95 | FI-24 | .501 | .500 | .501 | .001 | .501 |
| 2-21-95 | FI-25 | .494 | .495 | .494 | .001 | .494 |
| 2-21-95 | FI-27 | .496 | .495 | .498 | .002 | .498 |
| 2-22-95 | FI-26 | .753 | .753 | .753 | .000 | .753 |

All Dimensions are in inches.




Total Source Analysis, Inc.
*Environmental Testing Consultants*

# Pitot Calibration Form

Client Shop Quality
Project No. _____
Test Location Umatilla, FL.

Run By T. Roth / J. Taylor
Date 2-27-95
Pitot No. A-10-1-1-FL

● "A" Side Calibration

| Run No. | △Pstd cm $H_2O$ (in $H_2O$) | △P (s) cm $H_2O$ (in. $H_2O$) | $C_p$(s) | Deviation $C_p(s)-\bar{C}_p(A)$ |
|---|---|---|---|---|
| 1 | .840 | 1.200 | .828 | -0.360 |
| 2 | .860 | 1.267 | .816 | -0.407 |
| 3 | .903 | 1.200 | .859 | -0.297 |
| | Average | $\bar{C}_p$ (Side A) | .834 | -0.355 |

●● "B" Side Calibration

| Run No. | △Pstd cm $H_2O$ (in $H_2O$) | △P (s) cm $H_2O$ (in. $H_2O$) | $C_p$(s) | Deviation $C_p(s)-\bar{C}_p(B)$ |
|---|---|---|---|---|
| 1 | .840 | 1.200 | .828 | -0.360 |
| 2 | .860 | 1.233 | .827 | -0.373 |
| 3 | .903 | 1.200 | .859 | -0.297 |
| | Average | $\bar{C}_p$ (Side B) | .838 | -0.343 |

Calculations:

$$C_p(s) = 0.99\sqrt{\frac{\Delta P\ (standard)}{\Delta P\ (s)}}$$

Deviation = $C_p$ (s) = $\bar{C}_p$ (A or B)

$$\text{Average Deviation} = \sigma\ (A \text{ or } B) = \frac{\sum_{1}^{3} |C_p(s) - \bar{C}_p(A \text{ or } B)|}{3}$$

$|\bar{C}_p(\text{Side A}) - \bar{C}_p(\text{Side B})| =$ -.012

Nozzle size used for Calibrations (inches) 1/4" FI-003

Intercomponent Spacings During Calibrations:

Pitot - Nozzle: ± 3/4"

Pitot - Thermocouple: 1/2"

Pitot - Probe Sheath: 1/2"

# Pitot Calibration Form

Client Shop Quality
Project No. _____
Test Location Umatilla, FL.

Run By T. Roth / J. Tayfel
Date 2-27-95
Pitot No. N-10-G 1 F

● "A" Side Calibration

| Run No. | △Pstd cm $H_2O$ (in $H_2O$) | △P (s) cm $H_2O$ (in. $H_2O$) | $C_p(s)$ | Deviation $C_p(s)-\bar{C}_p(A)$ |
|---|---|---|---|---|
| 1 | .840 | 1.133 | .852 | -0.293 |
| 2 | .860 | 1.100 | .875 | -0.240 |
| 3 | .903 | 1.100 | .897 | -0.197 |
| | Average | $\bar{C}_p$ (Side A) | .875 | -0.243 |

●● "B" Side Calibration

| Run No. | △Pstd cm $H_2O$ (in $H_2O$) | △P (s) cm $H_2O$ (in. $H_2O$) | $C_p(s)$ | Deviation $C_p(s)-\bar{C}_p(B)$ |
|---|---|---|---|---|
| 1 | .840 | 1.133 | .852 | -0.293 |
| 2 | .860 | 1.133 | .863 | -0.273 |
| 3 | .903 | 1.133 | .884 | -0.230 |
| | Average | $\bar{C}_p$ (Side B) | .866 | -0.265 |

Calculations:

$$C_p(s) = 0.99\sqrt{\frac{\Delta P\ (standard)}{\Delta P\ (s)}}$$

Deviation = $C_p(s) = \bar{C}_p$ (A or B)

$$\text{Average Deviation} = \sigma\ (A \text{ or } B) = \frac{\sum_{1}^{3} |C_p(s) - \bar{C}_p (A \text{ or } B)|}{}$$

$|\bar{C}_p(\text{Side A}) - \bar{C}_p(\text{Side B})| = .022^3$

Nozzle size used for Calibrations (inches) 3/8" F1-017
Intercomponent Spacings During Calibrations:
Pitot - Nozzle: 3/4"
Pitot - Thermocouple: 1 1/2"
Pitot - Probe Sheath: 1 1/2"

Total Source Analysis, Inc.
*Environmental Testing Consultants*

Laboratory Reports

# Analytical Data Sheet

BEST AVAILABLE COPY

Client JEA - SJRPP Project No. 95-058-EL Date July 18, '95

Run No. 1
Filter No. 95-014
Acetone No. 1-2
Amount liquid lost during transport 0
Acetone blank volume, ml 100ml
Acetone wash volume, ml 100ml
Acetone blank concentration, mg/mg (equation 5-4)** _____
Acetone wash blank, mg (equation 5-5)** _____

| Container Number | Weight of Particulate Collected, g | | |
|---|---|---|---|
| | Final Weight | Tare Weight | Weight Gain |
| 1 | .5887 | .5859 | .0028 |
| 2 | 73.5001 | 73.4855 | .0146 |
| Total | | | |
| | | Less acetone blank | .0000 |
| | | Weight of particulate matter | .0174 |

| | Volume of Liquid Water Collected | |
|---|---|---|
| | Impinger Volume, ml. | Silica Gel Weight, g |
| Final | 406 | 266.1 |
| Initial | 200 | 250.0 |
| Liquid collected | 206 | 16.1 |
| Total Volume Collected | 222.1 | g* ml |

Run No. 2
Filter No. 95-015
Acetone No. 2-2
Amount liquid lost during transport 0
Acetone blank volume, ml 100ml
Acetone wash volume, ml 100ml
Acetone blank concentration, mg/mg (equation 5-4)** _____
Acetone wash blank, mg (equation 5-5)** _____

| Container Number | Weight of Particulate Collected, g | | |
|---|---|---|---|
| | Final Weight | Tare Weight | Weight Gain |
| 1 | .5883 | .5857 | .0026 |
| 2 | 70.1648 | 70.1498 | .0150 |
| Total | | | |
| | | Less acetone blank | .0000 |
| | | Weight of particulate matter | .0176 |

| | Volume of Liquid Water Collected | |
|---|---|---|
| | Impinger Volume, ml. | Silica Gel Weight, g |
| Final | 422 | 266 |
| Initial | 200 | 250.0 |
| Liquid collected | 222 | 16.0 |
| Total Volume Collected | 238 | g* ml |

Run No. 3
Filter No. 95-016
Acetone No. 3-2
Amount liquid lost during transport 0
Acetone blank volume, ml 100ml
Acetone wash volume, ml 100ml
Acetone blank concentration, mg/mg (equation 5-4)** _____
Acetone wash blank, mg (equation 5-5)** _____

| Container Number | Weight of Particulate Collected, g | | |
|---|---|---|---|
| | Final Weight | Tare Weight | Weight Gain |
| 1 | .5933 | .5902 | .0031 |
| 2 | 70.8660 | 70.8522 | .0138 |
| Total | | | |
| | | Less acetone blank | .0000 |
| | | Weight of particulate matter | .0169 |

| | Volume of Liquid Water Collected | |
|---|---|---|
| | Impinger Volume, ml. | Silica Gel Weight, g |
| Final | 430 | 266.3 |
| Initial | 200 | 250.0 |
| Liquid collected | 230 | 16.3 |
| Total Volume Collected | 246.3 | g* ml |

Run No. Blank Acetone
Filter No. NA
Acetone No. _____
Amount liquid lost during transport 0
Acetone blank volume, ml 100ml
Acetone wash volume, ml _____
Acetone blank concentration, mg/mg (equation 5-4)** _____
Acetone wash blank, mg (equation 5-5)** _____

| Container Number | Weight of Particulate Collected, g | | |
|---|---|---|---|
| | Final Weight | Tare Weight | Weight Gain |
| 1 | | | |
| 2 | 70.1444 | 70.1444 | .0000 |
| Total | | | |
| | | Less acetone blank | |
| | | Weight of particulate matter | |

| | Volume of Liquid Water Collected | |
|---|---|---|
| | Impinger Volume, ml. | Silica Gel Weight, g |
| Final | | |
| Initial | | |
| Liquid collected | | |
| Total Volume Collected | | g* m |

*Convert weight of water to volume by dividing total weight increase by density of water (1g/ml): $\frac{\text{Increase, g}}{\text{1g/ml}}$ = Volume Water, ml

**See Federal Register, Method 5, 6.6, & 6.7.

# Analytical Data Sheet

Client JEA SJRPP Project No. 95-058 Date July 19 '95

Run No. 1
Filter No. 95-017
Acetone No. FL-01
Amount liquid lost during transport -0-
Acetone blank volume, ml 100ml
Acetone wash volume, ml 100ml
Acetone blank concentration, mg/mg (equation 5-4)** _____
Acetone wash blank, mg (equation 5-5)** -0-

| Container Number | Weight of Particulate Collected g | | |
|---|---|---|---|
| | Final Weight | Tare Weight | Weight Gain |
| 1 | .5878 | .5841 | .0037 |
| 2 | 73.4409 | 73.4369 | .0040 |
| Total | | | .0077 |
| | | Less acetone blank | .0000 |
| | | Weight of particulate matter | .0077 |

| | Volume of Liquid Water Collected | |
|---|---|---|
| | Impinger Volume, ml. | Silica Gel Weight, g |
| Final | 428 | 267.9 |
| Initial | 200 | 250.0 |
| Liquid collected | 228 | 17.90 |
| Total Volume Collected | 245.9 | g* ✓ml |

Run No. 2
Filter No. 95-018
Acetone No. FL-01
Amount liquid lost during transport -0-
Acetone blank volume, ml 100ml
Acetone wash volume, ml 100ml
Acetone blank concentration, mg/mg (equation 5-4)** _____
Acetone wash blank, mg (equation 5-5)** -0-

| Container Number | Weight of Particulate Collected g | | |
|---|---|---|---|
| | Final Weight | Tare Weight | Weight Gain |
| 1 | .5899 | .5886 | .0013 |
| 2 | 70.0920 | 70.0875 | .0045 |
| Total | | | .0058 |
| | | Less acetone blank | .0000 |
| | | Weight of particulate matter | .0058 |

| | Volume of Liquid Water Collected | |
|---|---|---|
| | Impinger Volume, ml. | Silica Gel Weight, g |
| Final | 445.0 | 267.5 |
| Initial | 200.0 | 250.0 |
| Liquid collected | 245.0 | 17.50 |
| Total Volume Collected | 262.5 | g* ✓ml |

Run No. 3
Filter No. 95-019 FL
Acetone No. FL-01
Amount liquid lost during transport -0-
Acetone blank volume, ml 100ml
Acetone wash volume, ml 100ml
Acetone blank concentration, mg/mg (equation 5-4)** _____
Acetone wash blank, mg (equation 5-5)** -0-

| Container Number | Weight of Particulate Collected g | | |
|---|---|---|---|
| | Final Weight | Tare Weight | Weight Gain |
| 1 | .5874 | .5854 | .0020 |
| 2 | 70.8202 | 70.8108 | .0094 |
| Total | | | .0114 |
| | | Less acetone blank | .0000 |
| | | Weight of particulate matter | .0114 |

| | Volume of Liquid Water Collected | |
|---|---|---|
| | Impinger Volume, ml. | Silica Gel Weight, g |
| Final | 440.0 | 267.5 |
| Initial | 200.0 | 250.0 |
| Liquid collected | 240.0 | 17.5 |
| Total Volume Collected | 257.5 | g* ✓ml |

Run No. _____
Filter No. _____
Acetone No. _____
Amount liquid lost during transport _____
Acetone blank volume, ml _____
Acetone wash volume, ml _____
Acetone blank concentration, mg/mg (equation 5-4)** _____
Acetone wash blank, mg (equation 5-5)** _____

| Container Number | Weight of Particulate Collected g | | |
|---|---|---|---|
| | Final Weight | Tare Weight | Weight Gain |
| 1 | | | |
| 2 | | | |
| Total | | | |
| | | Less acetone blank | |
| | | Weight of particulate matter | |

| | Volume of Liquid Water Collected | |
|---|---|---|
| | Impinger Volume, ml. | Silica Gel Weight, g |
| Final | | |
| Initial | | |
| Liquid collected | | |
| Total Volume Collected | | g* |

*Convert weight of water to volume by dividing total weight increase by density of water (1g/ml): $\frac{\text{Increase, g}}{1\text{g/ml}}$ = Volume Water, ml

**See Federal Register, Method 5, 6.6, & 6.7.

# Analytical Data Sheet

Client J.E.A. SJRPP Project No. 95-058-FL Date 7-21-95

Run No. 1
Filter No. 95-020 FI
Acetone No. FI01
Amount liquid lost during transport -0-
Acetone blank volume, ml 100 ml
Acetone wash volume, ml 100 ml
Acetone blank concentration, mg/mg (equation 5-4)** _____
Acetone wash blank, mg (equation 5-5)** _____

| Container Number | Weight of Particulate Collected, g | | |
|---|---|---|---|
| | Final Weight | Tare Weight | Weight Gain |
| 1 | .5913 | .5846 | .0067 |
| 2 | 73.4629 | 73.4369 | .0260 |
| Total | | | .0327 |
| | | Less acetone blank | .0000 |
| | | Weight of particulate matter | .0327 |

| | Volume of Liquid Water Collected | |
|---|---|---|
| | Impinger Volume, ml. | Silica Gel Weight, g |
| Final | 432.0 | 265.8 |
| Initial | 200.0 | 250.0 |
| Liquid collected | 232.0 | 15.8 |
| Total Volume Collected | 247.8 | g* / ml |

Run No. 2
Filter No. 95-021-FI
Acetone No. FI-01
Amount liquid lost during transport -0-
Acetone blank volume, ml 100 ml
Acetone wash volume, ml 100 ml
Acetone blank concentration, mg/mg (equation 5-4)** _____
Acetone wash blank, mg (equation 5-5)** _____

| Container Number | Weight of Particulate Collected, g | | |
|---|---|---|---|
| | Final Weight | Tare Weight | Weight Gain |
| 1 | .5909 | .5883 | .0026 |
| 2 | 70.1065 | 70.0875 | .0190 |
| Total | | | .0216 |
| | | Less acetone blank | .0000 |
| | | Weight of particulate matter | .0216 |

| | Volume of Liquid Water Collected | |
|---|---|---|
| | Impinger Volume, ml. | Silica Gel Weight, g |
| Final | 435.0 | 265.6 |
| Initial | 200.0 | 250.0 |
| Liquid collected | 235.0 | 15.6 |
| Total Volume Collected | 250.6 | g* / ml |

Run No. 3
Filter No. 95-022FL
Acetone No. FL-01
Amount liquid lost during transport -0-
Acetone blank volume, ml 100 ml
Acetone wash volume, ml 100 ml
Acetone blank concentration, mg/mg (equation 5-4)** _____
Acetone wash blank, mg (equation 5-5)** _____

| Container Number | Weight of Particulate Collected, g | | |
|---|---|---|---|
| | Final Weight | Tare Weight | Weight Gain |
| 1 | .5952 | .5917 | .0035 |
| 2 | 70.8280 | 70.8108 | .0172 |
| Total | | | .0207 |
| | | Less acetone blank | .0000 |
| | | Weight of particulate matter | .0207 |

| | Volume of Liquid Water Collected | |
|---|---|---|
| | Impinger Volume, ml. | Silica Gel Weight, g |
| Final | 454.0 | 271.0 |
| Initial | 200.0 | 250.0 |
| Liquid collected | 254.0 | 21.0 |
| Total Volume Collected | 275.0 | g* / ml |

Run No. _____
Filter No. _____
Acetone No. _____
Amount liquid lost during transport _____
Acetone blank volume, ml _____
Acetone wash volume, ml _____
Acetone blank concentration, mg/mg (equation 5-4)** _____
Acetone wash blank, mg (equation 5-5)** _____

| Container Number | Weight of Particulate Collected, g | | |
|---|---|---|---|
| | Final Weight | Tare Weight | Weight Gain |
| 1 | | | |
| 2 | | | |
| Total | | | |
| | | Less acetone blank | |
| | | Weight of particulate matter | |

| | Volume of Liquid Water Collected | |
|---|---|---|
| | Impinger Volume, ml. | Silica Gel Weight, g |
| Final | | |
| Initial | | |
| Liquid collected | | |
| Total Volume Collected | | g* / ml |

*Convert weight of water to volume by dividing total weight increase by density of water (1g/ml): $\frac{\text{Increase, g}}{1\text{g/ml}}$ = Volume Water, ml

**See Federal Register, Method 5, 6.6, & 6.7.



1g/ml 0.9982

# Analytical Data Sheet

Client JEA - SJRPP Project No. 95-058 Date AUG 9 '95

Run No. 1
Filter No. 95-025
Acetone No.
Amount liquid lost during transport 0
Acetone blank volume, ml 100
Acetone wash volume, ml 100
Acetone blank concentration, mg/mg (equation 5-4)**
Acetone wash blank, mg (equation 5-5)**

| Container Number | Weight of Particulate Collected g | | |
|---|---|---|---|
| | Final Weight | Tare Weight | Weight Gain |
| 1 | .5893 | .5834 | .0059 |
| 2 | 60.4549 | 60.4400 | .0149 |
| Total | | | .0208 |
| | | Less acetone blank | .0002 |
| | | Weight of particulate matter | .0206 |

| | Volume of Liquid Water Collected | |
|---|---|---|
| | Impinger Volume, ml. | Silica Gel Weight, g |
| Final | 403 | 268.3 |
| Initial | 200 | 250 |
| Liquid collected | 203 | 18.3 |
| Total Volume Collected | | g* ml |

Run No. 2
Filter No. 95-023
Acetone No.
Amount liquid lost during transport 0
Acetone blank volume, ml 100
Acetone wash volume, ml 100
Acetone blank concentration, mg/mg (equation 5-4)**
Acetone wash blank, mg (equation 5-5)**

| Container Number | Weight of Particulate Collected g | | |
|---|---|---|---|
| | Final Weight | Tare Weight | Weight Gain |
| 1 | .5909 | .5893 | .0016 |
| 2 | 71.0430 | 71.0252 | .0178 |
| Total | | | .0194 |
| | | Less acetone blank | .0002 |
| | | Weight of particulate matter | .0192 |

| | Volume of Liquid Water Collected | |
|---|---|---|
| | Impinger Volume, ml. | Silica Gel Weight, g |
| Final | 441 | 266.5 |
| Initial | 200 | 250 |
| Liquid collected | 241 | 16.5 |
| Total Volume Collected | | g* ml |

Run No. 3
Filter No. 95-027
Acetone No.
Amount liquid lost during transport
Acetone blank volume, ml
Acetone wash volume, ml
Acetone blank concentration, mg/mg (equation 5-4)**
Acetone wash blank, mg (equation 5-5)**

| Container Number | Weight of Particulate Collected g | | |
|---|---|---|---|
| | Final Weight | Tare Weight | Weight Gain |
| 1 | .6094 | .6037 | .0057 |
| 2 | 70.8457 | 70.8190 | .0267 |
| Total | | | .0324 |
| | | Less acetone blank | .0002 |
| | | Weight of particulate matter | .0322 |

| | Volume of Liquid Water Collected | |
|---|---|---|
| | Impinger Volume, ml. | Silica Gel Weight, g |
| Final | 425 | 272.2 |
| Initial | 200 | 250 |
| Liquid collected | 225 | 22.2 |
| Total Volume Collected | | g* ml |

Run No. ACETONE BLANK
Filter No.
Acetone No.
Amount liquid lost during transport
Acetone blank volume, ml
Acetone wash volume, ml
Acetone blank concentration, mg/mg (equation 5-4)**
Acetone wash blank, mg (equation 5-5)**

| Container Number | Weight of Particulate Collected g | | |
|---|---|---|---|
| | Final Weight | Tare Weight | Weight Gain |
| 1 | | | |
| 2 | 73.4317 | 73.4315 | .0002 |
| Total | | | |
| | | Less acetone blank | |
| | | Weight of particulate matter | |

| | Volume of Liquid Water Collected | |
|---|---|---|
| | Impinger Volume, ml. | Silica Gel Weight, g |
| Final | | |
| Initial | | |
| Liquid collected | | |
| Total Volume Collected | | g* ml |

*Convert weight of water to volume by dividing total weight increase by density of water (1g/ml): $\frac{\text{Increase, g}}{\text{1g/ml}}$ = Volume Water, ml

**See Federal Register, Method 5, 6.6, & 6.7.

DAY ONE, BASELINE

# $SO_3$ Analysis Sheet

Client JEA - SJRPP Analysis Run By HES Date July 18, '95

Project No. 95-058-FL Plant Site JACKSONVILLE, FL

Barium Perchlorate Normality .0100 = Mls $H_2SO4$ X Normality / Mls Barium Titrated = X

| Sampling Location | Run No. | Sample # | Volume of Solution | Volume of Aliquot | Volume to Titrate |
|---|---|---|---|---|---|
| Unit 1 stack | | Blank | 1000 | 50ml | 0.0/0.0 |
| | | | | | |
| | 1 | 1 | 195 | 25/25 | 9.1/9.1 |
| | | | | | |
| | | | | | |
| | | | | | |
| | 2 | 2 | 208 | 50 | 14.7/14.9 |
| | | | | | |
| | | | | | |
| | | | | | |
| | 3 | 3 | 215 | 50 | 11.5/11.3 |
| | | | | | |
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DAY 2 BASELINE

# $SO_3$ Analysis Sheet

Client JEA-SJRPP Analysis Run By HES Date JULY 19, 1995

Project No. 95-058-FL Plant Site JACKSONVILLE, FL

Barium Perchlorate Normality .0100 = Mls $H_2SO4$ X Normality / Mls Barium Titrated = X

| Sampling Location | Run No. | Sample # | Volume of Solution | Volume of Aliquot | Volume to Titrate |
|---|---|---|---|---|---|
| UNIT 1 STACK | | BLANK | 1000 | 50 ml | 0.0/0.0 |
| | 1 | 1 | 215ml | 50ml | 12.8/12.9 |
| | 2 | 2 | 207ml | 50ml | 9.8/9.3/9.5 |
| | 3 | 3 | 217ml | 50ml | 9.5/9.7/ |

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Day 3 Baseline

# $SO_3$ Analysis Sheet

Client J.E.A. S.J.R.P.P. Analysis Run By T. Roth Date July 20, 1995

Project No. 95-058-F1. Plant Site Jacksonville, Fla

Barium Perchlorate Normality .0100 = Mls $H_2SO_4$ X Normality / Mls Barium Titrated = X

| Sampling Location | Run No. | Sample # | Volume of Solution | Volume of Aliquot | Volume to Titrate |
|---|---|---|---|---|---|
| Unit #1 Stack | | Blank | 1000mL | 50ml | 0.0 / 0.0 |
| | 1 | 1 | 215mL. | 50ml | 11.2 / 11.0 |
| | | | | | |
| | | | | | |
| | | | | | |
| | 2 | 2 | 187ml | 50ml | 13.7 / 14.0 / 14.2 |
| | | | | | |
| | | | | | |
| | | | | | |
| | 3 | 3 | 175ml | 50ml | 14.8 / 14.7 |
| | | | | | |
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Client JEA - SJRPP Analysis Run By _____ Date ~~July~~ Aug. 08 '95

Project No. 95-058-FL Plant Site JACKSONVILLE, FL

Barium Perchlorate Normality .0099 = Mls $H_2SO_4$ X Normality / Mls Barium Titrated = 25.0 X .02 / 50.70

| Sampling Location | Run No. | Sample # | Volume of Solution | Volume of Aliquot | Volume to Titrate |
|---|---|---|---|---|---|
| Unit 1 stack | | Blank | 1000 | 50 ml | 0.0 / 0.0 |
| | 1 | 1 | 148 ml | 50 ml | 26.1 / 26.3 |
| | 2 | 2 | 225 | 50 mL | 12.4 / 12.5 |
| | 3 | 3 | 237 | 50 ml. | 10.3 / 10.5 |

J8

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**TOTAL SOURCE ANALYSIS, INC.**

ENVIRONMENTAL TESTING CONSULTANTS

510 Dickson • P.O. Box 257 • Wellington, OH 44090

41444 SR19 • P.O. Box 2807 • Umatilla, FL 32784

599 James Rollo Ct. • P.O. Box 272 • Grain Valley, MO 64029

930 Tate Blvd. • Suite 104 • Hickory, NC 28602