Chapter 117 Stack Test Report Review for the MECT Program

Date Reviewed:	6/6/2018	Reviewer:	Joseph Thomas
Customer Reference No.:	CN600131395	Company Name:	Rohm and Haas Texas Incorporated
Regulated Entity Reference No.:	RN100223205	Site Name:	Rohm and Haas Texas Deer Park
Portfolio Number:	P0607	County:	Harris

Test Details

Criteria	Test Details
FIN:	ZHR-3
EPN:	ZHR-3
Unit Type:	Heater
Test Company:	METCO Environmental
Source Type:	☒ Major ☐ Minor ☐ Electric Generation Utility
Test date:	3/9/2007

Are the Test Results Acceptable for MECT Compliance

☒ Yes: acceptable under §101.354(a)

☐ Yes: acceptable under §101.354(b)

☐ No: results not used and the regional office notified

General Review

Review	Yes/No	Explanation
Were the Chapter §117.8000 test methods used?	Y	Methods 1, 2, 3A, and 7E used.
Was the average unit load tested at maximum capacity or as near as practicable? See SOP for guidance.		IMS – 40 MMBtu/hr Test – 71 MMBtu/hr
Was the test load operating rate for each run within ±20% of the average load?	Y	
Did each unit have three one-hour test runs or at least 180 minutes of test data or have written approval from the region for shorter test runs?	Y	
Was the average of the test runs used for compliance per §117.8000(b)?	Y	

Review Notes

Cover sheet of test report shows wrong FIN (ZHR-5). Average operated load > both above values in April 2017.

METCO ENVIRONMENTAL
P.O. Box 598
Addison, TX 75001
(972) 931-7127

SOURCE EMISSIONS SURVEY
OF
ROHM & HAAS TEXAS, INC.
HR-1 PREHEATER STACK (EPN 35-HR-5)
DEER PARK, TEXAS
TCEQ PERMIT 751
FIN ZHR-5

MARCH 2007

FILE NUMBER 07-120

"I certify that I have personally checked and am familiar with the information submitted herein, and based on my inquiries of those individuals immediately responsible for obtaining the information, I believe the submitted information is true, accurate, and complete."

James R. Monfries
Senior Quality Assurance Manager

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SOURCE EMISSIONS SURVEY
ROHM & HAAS TEXAS, INC.
HR-1 PREHEATER STACK (EPN 35-HR-5)
DEER PARK, TEXAS
TCEQ PERMIT 751
FIN ZHR-5
FILE NUMBER 07-120

INTRODUCTION

METCO Environmental, 1100 Gulf Freeway, Suite 100, Calder Ridge Business Park, League City, Texas, conducted a source emissions survey of Rohm & Haas Texas, Inc., located at 1900 Tidal Road, Deer Park, Texas, on March 9, 2007. The purpose of these tests was to determine the concentrations of oxides of nitrogen and carbon monoxide being emitted to the atmosphere via the HR-1 Preheater Stack (EPN 35-HR-5), in order to comply with the requirement of 30 TAC 117.211 to conduct an initial demonstration of compliance, under the Houston/Galveston area NO_x SIP. Three tests were performed while the unit was operating at an average heat input rate of 71 MMBTU/hr.

The sampling was performed by the following METCO personnel: Jervey Cheveallier – Project Supervisor and Daniel Moore.

The sampling followed the procedures set forth in the Code of Federal Regulations, Title 40, Chapter I, Part 60, Appendix A, Methods 3A, 7E,10, and 19; and in the "Sampling Procedures Manual, Texas Air Control Board, Revised July 1986".

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SUMMARY OF RESULTS

HR-1 Preheater Stack (EPN 35-HR-5)

Run Number	Oxides of Nitrogen Emissions (dry ppm*)	(lbs/hr)	(lbs/mmBtu)	Carbon Monoxide Emissions (dry ppm*)	(lbs/hr)	(lbs/mmBtu)
1	16.20	1.40	0.020	< 0.01	< 0.01	< 0.001
2	15.07	1.30	0.018	0.11	0.01	< 0.001
3	15.05	1.38	0.019	0.02	< 0.01	< 0.001
Average	15.77	1.36	0.019	< 0.05	< 0.01	< 0.001
Allowable Emission Rate	---	≤ 1.08	---	---	≤ 3.33	---

* Corrected to 3 percent oxygen.

SUMMARY OF RESULTS

HR-1 Preheater Stack (EPN 35-HR-5)

Run Number	1	2	3
Date	03/09/07	03/09/07	03/09/07
Time	0855-0955	1043-1143	1210-1420
Stack Flow Rate - DSCFM*	13,363	13,446	13,557
% O_2 - % Vol.	4.78	4.88	5.01
Unit Heat Input – mmBtu/hr	71.000	71.000	71.000
Oxides of Nitrogen Emissions - dry ppm	14.59	13.49	14.25
Oxides of Nitrogen Emissions - dry ppm**	16.20	15.07	16.05
Oxides of Nitrogen Emissions - lbs/hr	1.40	1.30	1.38
Oxides of Nitrogen Emissions - lbs/mmBtu	0.020	0.018	0.019
Carbon Monoxide Emissions - dry ppm	< 0.01	0.10	0.02
Carbon Monoxide Emissions - dry ppm**	< 0.01	0.11	0.02
Carbon Monoxide Emissions - lbs/hr	< 0.01	0.01	< 0.01
Carbon Monoxide Emissions - lbs/mmBtu	< 0.001	< 0.001	< 0.001

* 29.92 "Hg, 68°F (760 mm Hg, 20°C) calculated according to EPA Method 19.

** Corrected to 3 percent oxygen.

DISCUSSION OF RESULTS

The three tests for oxides of nitrogen and carbon monoxide appeared to be valid representations of the actual emissions during the tests. All leak checks performed on the reference method monitors sampling system showed no leaks before or after each test. The zero and calibration drift tests of the reference method monitors were stable with no variations greater than 3.0 percent. The calibration error check, sampling system bias check, and NO_2 to NO conversion efficiency check performed on the reference method monitors prior to testing were valid.

The NO_2 to NO conversion efficiency check was performed on March 9, 2007, from 0751-0821. The results were as follows:

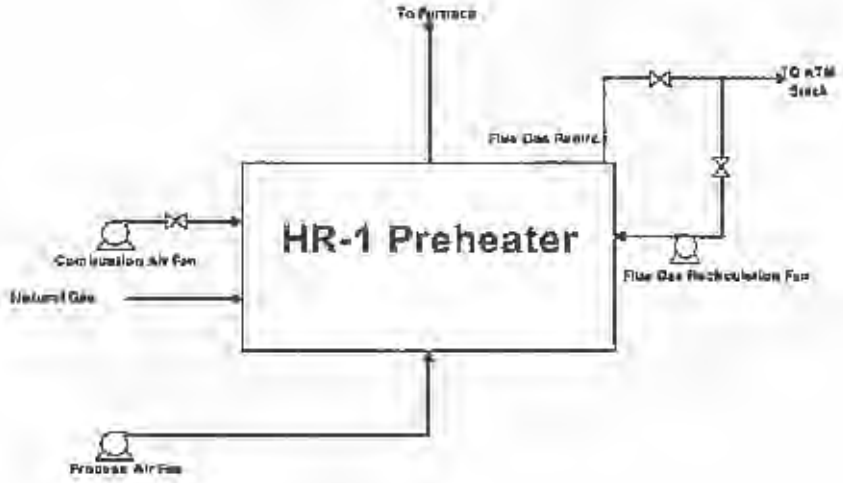
Highest peak value observed: 17.4 ppm
Value observed after 30 minutes: 17.3 ppm
NO_2 to NO conversion efficiency (%) = (Value observed after 30 minutes/Highest peak value observed) x 100
(17.3/17.4) x 100 = 99.4%

The required allowable as found in 40 CFR, Part 60, Appendix A, Method 7E, is 98.0%. Therefore, the NO_2 to NO conversion efficiency check was valid.

The calculated emissions (pounds per hour) of oxides of nitrogen for the three tests showed a range of -4.4 percent to +2.9 percent variation from the mean value.

The concentrations of carbon monoxide for one of the three tests were below the minimum detectable limit of the method.

PROCESS SCHEMATIC AND DESCRIPTION



Air is heated in the preheater then the heated air is used upstream to support combustion in the furnace.

DESCRIPTION OF SAMPLING LOCATION

The sampling location on the HR-1 Preheater Stack (EPN 35-HR-5) is 54 feet above the ground. The sampling port is located 36 feet (8.00 stack diameters) downstream from a constriction in the stack and 10 feet (2.22 stack diameters) upstream from the outlet of the stack.

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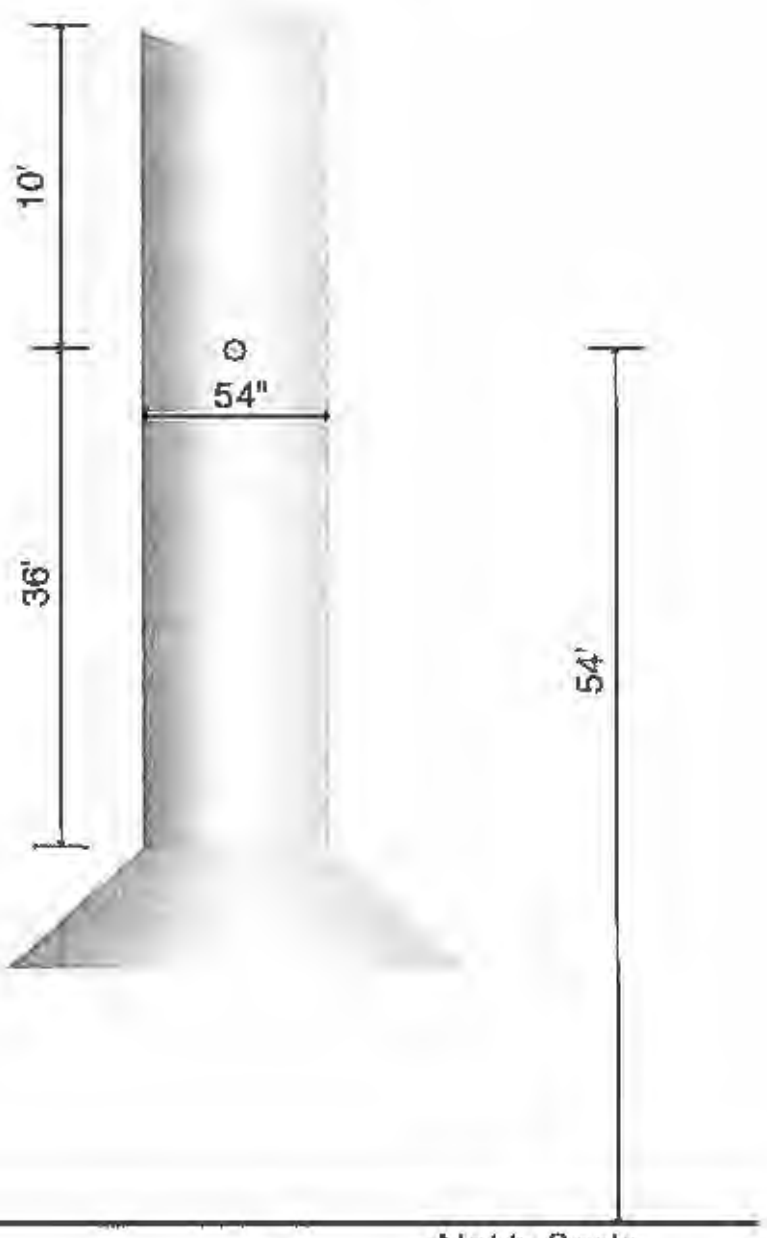
SAMPLING LOCATION

HR-1 Preheater Stack (EPN 35-HR-5)



SAMPLING AND ANALYTICAL PROCEDURES

The sampling followed the procedures set forth in the Code of Federal Regulations, Title 40, Chapter I, Part 60, Appendix A, Methods 3A, 7E,10, and 19; and in the "Sampling Procedures Manual, Texas Air Control Board, Revised July 1985".

The flow rate was calculated according to EPA Method 19.

The reference method monitors sampling system was leak-checked at the end of the sampling probe before sampling, and again at the conclusion of sampling.

Oxides of Nitrogen

The oxides of nitrogen sampling was performed according to EPA Method 7E. A Thermo Environmental Model 10S Oxides of Nitrogen Analyzer (Serial Number 10S-49429-282) was used to monitor the concentrations of oxides of nitrogen during each run. The reference method analyzer was operated at a range of 0 to 100 parts per million, with a calibration span of 94.00 parts per million. A multi-point calibration was performed on the reference method analyzer prior to testing. An analyzer calibration error check, a sampling system bias check, and a NO_2 to NO conversion efficiency check were also conducted prior to testing. After each run, the zero and calibration drift of the reference method monitor was checked.

The calibration gases were as follows:

Zero Nitrogen

45.1 ppm NO in N_2 (ALM 42345)

94.0 ppm NO in N_2 (BLM 1763)

The reference method sampling system consisted of a heated probe, a chilled condenser, and a Teflon sample line. The calibration gases for the bias and drift checks were introduced upstream of the chilled condenser.

Calibration gas certifications are included in Appendix C.

Carbon Monoxide

The carbon monoxide sampling was performed according to EPA Method 10 using the continuous sampling procedure. A Thermo Environmental Model 48 Carbon Monoxide Analyzer (Serial Number 4833-527-245) was used to monitor the concentrations of carbon monoxide during each run. The reference method analyzer was operated at a range of 0 to 100 parts per million, with a calibration span of 82.90 parts per million. A multi-point calibration was performed on the reference method analyzer prior to testing. An analyzer calibration error check and a sampling system bias check were also conducted prior to testing. After each run, the zero and calibration drift of the reference method monitor was checked.

The calibration gases were as follows:

Zero Nitrogen
43.7 ppm CO in N_2 (ALM 59276)
82.9 ppm CO in N_2 (LL 6768)

The reference method sampling system consisted of a heated probe, a chilled condenser, and a Teflon sample line. The calibration gases for the bias and drift checks were introduced upstream of the chilled condenser.

Calibration gas certifications are included in Appendix C.

Oxygen

The oxygen sampling was performed according to EPA Method 3A. A Teledyne Model 326 Oxygen Analyzer (Serial Number 146228) was used to monitor the concentrations of oxygen during each run. The reference method analyzer was operated at a range of 0 to 25 percent, with a calibration span of 20.9 percent. A multi-point calibration was performed on the reference method analyzer prior to testing. An analyzer calibration error check and a sampling system bias check were also conducted prior to testing. After each run, the zero and calibration drift of the reference method monitor was checked.

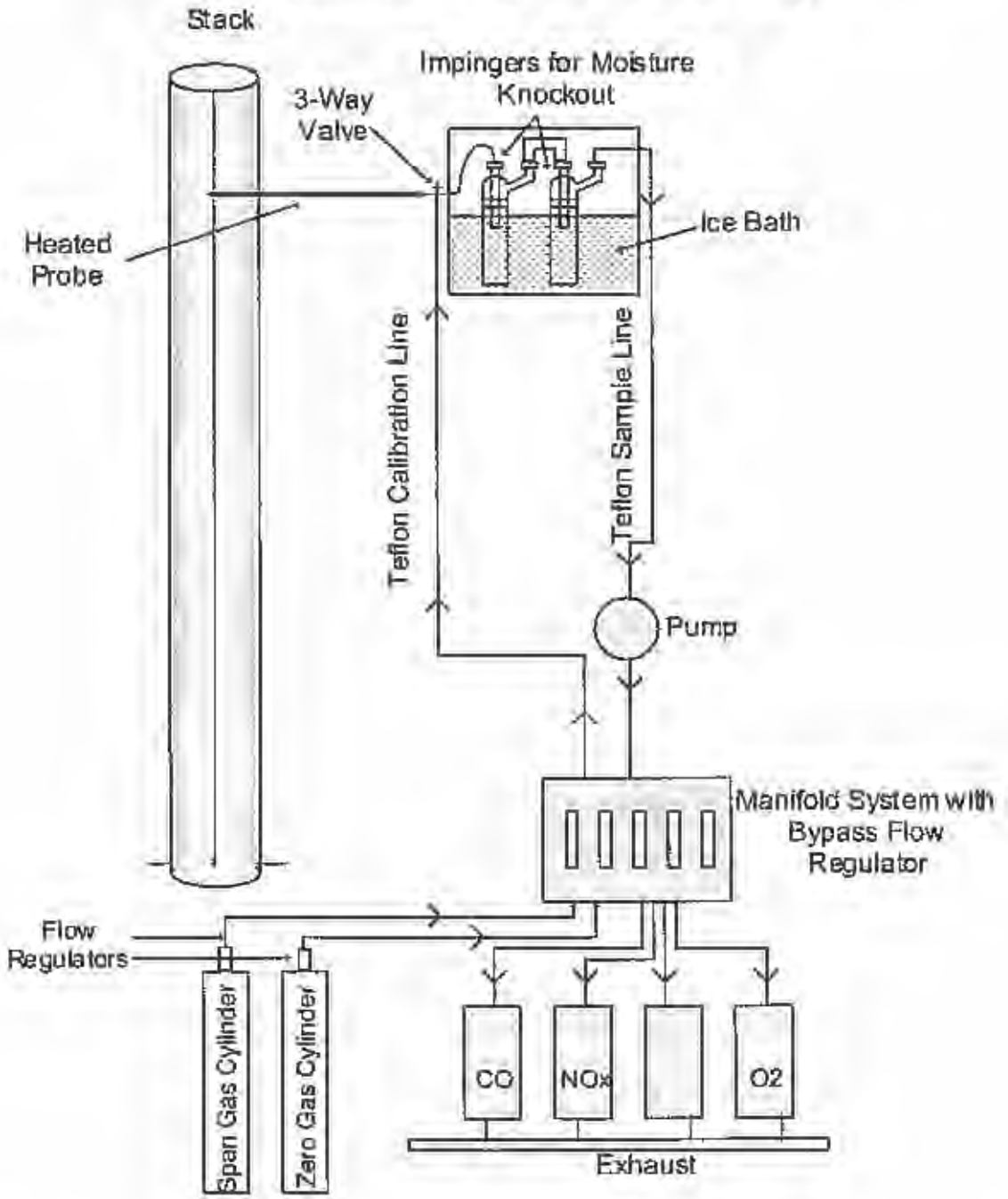
The calibration gases were as follows:

	Zero Nitrogen
12.00	percent O_2 in N_2 (ALM 7619)
20.90	percent O_2 in air (ALM 2836)

The reference method sampling system consisted of a heated probe, a chilled condenser, and a Teflon sample line. The calibration gases for the bias and drift checks were introduced upstream of the chilled condenser.

Calibration gas certifications are included in Appendix C.

Reference Method Monitors Sampling System (EPA Methods 3A, 7E, and 10)



DESCRIPTION OF TESTS

Personnel from METCO Environmental arrived at the plant at 7:00 a.m. on Friday, March 9, 2007. After meeting with plant personnel and attending a brief safety orientation, the equipment was moved onto the HR-1 Preheater Stack (EPN 35-HR-5). The reference method monitors were calibrated and the equipment was prepared for testing. The first test for oxides of nitrogen and carbon monoxide began at 8:55 a.m. Testing was delayed at 1:00 p.m. due to plant power problems. Testing resumed at 2:10 p.m. and continued until completion of the third test at 2:20 p.m.

The reference method monitors were calibrated and secured for transport. The equipment was moved off of the stack and loaded into the sampling van. The data was transported to METCO Environmental's laboratory in Dallas, Texas, for further evaluation.

Operations at Rohm & Haas Texas, Inc., HR-1 Preheater Stack (EPN 35-HR-5), located in Deer Park, Texas, were completed at 3:45 p.m. on Friday, March 9, 2007.

APPENDICES

A. Location of Sampling Points
B. Example Calculations
C. Calibration Gas Cylinders Certifications
D. Reference Method Monitors Data
E. Plant Operational Data
F. Resumes of Test Personnel

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APPENDIX A

Location of Sampling Points
HR-1 Preheater Stack (EPN 35-HR-5)

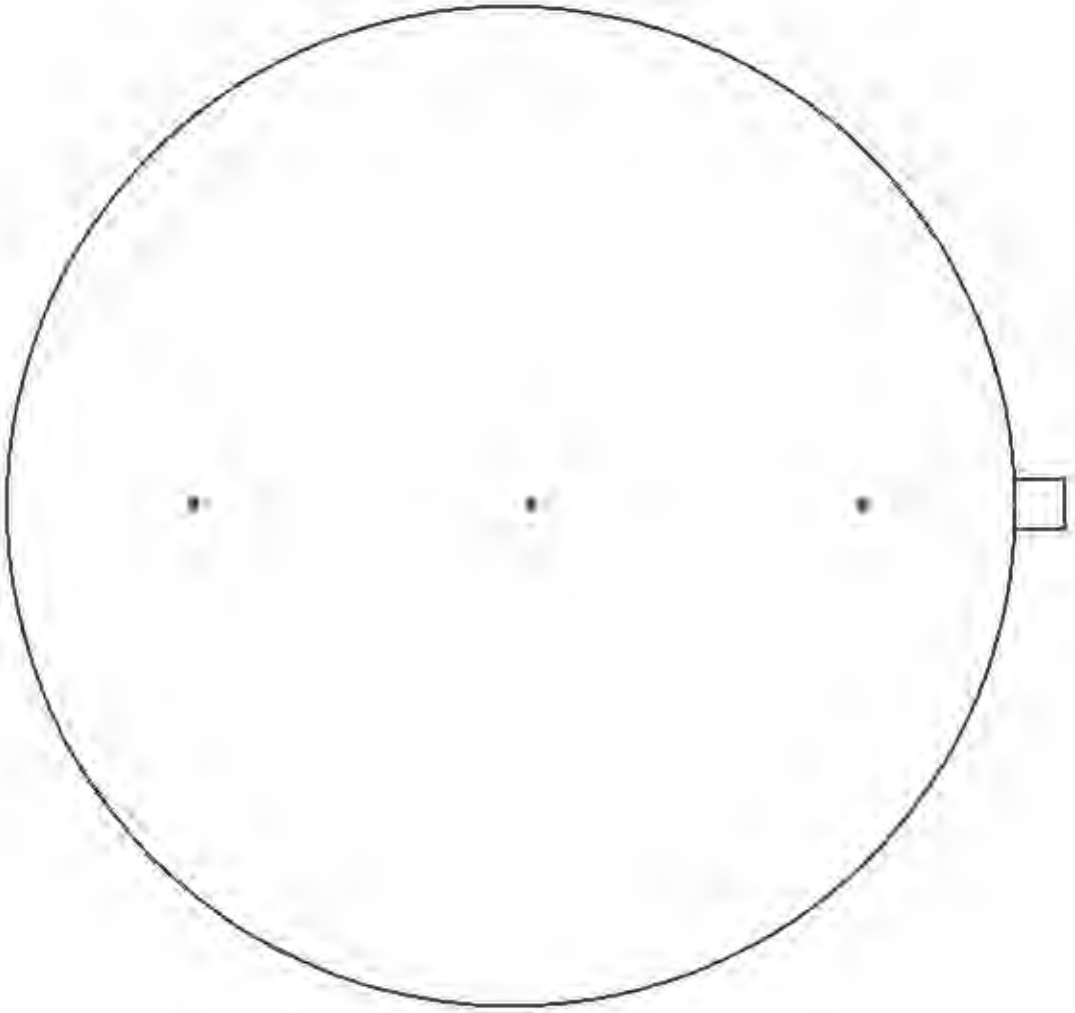
The sampling port is located 36 feet (8.00 stack diameters) downstream from a constriction in the stack and 10 feet (2.22 stack diameters) upstream from the outlet of the stack. The locations of the sampling points were calculated as follows:

Port and Wall Thickness	=	10 inches
Inside Stack Diameter	=	54 inches

Point Number	Percent of Diameter From Wall	Distance From Wall
1	16.7	9"
2	50.0	27"
3	83.3	45"

APPENDIX A

Location of Sampling Points
HR-1 Preheater Stack (EPN 35-HR-5)



APPENDIX B

Example Calculations

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EXAMPLE CALCULATIONS

lbs/hr = ppm x CF x 60 min/hr x DSCFM*

CF = Conversion Factor for ppm to lbs/scf*

Compound	Conversion Factor
NO_x	1.194×10^{-7}
CO	7.273×10^{-8}

* 29.92 "Hg, 68°F (760 mm Hg, 20°C)

EXAMPLE CALCULATIONS

$$\text{lbs/million Btu} = \frac{\text{ppm} \times \text{CF} \times F_d \text{ factor} \times 20.9\%O_2}{20.9\%O_2 - \%O_2 \text{ measured}}$$

CF = Conversion factor for ppm to lbs/dscf*

Compound	Conversion Factor
NO_x	1.194×10^{-7}
CO	7.273×10^{-8}

F_d = Oxygen based F factor

Fuel	F_d Factor
Natural Gas	8,710 dscf*/million Btu

* 29.92 "Hg, 68°F (760 mm Hg, 20°C)

EXAMPLE CALCULATIONS

$$E_{corr.} = E_{meas.} \times \frac{20.9\% O_2 - \% O_{2\,corr.}}{20.9\% O_2 - \% O_{2\,meas.}}$$

$E_{corr.}$ = Emission Rate corrected for Oxygen
$E_{meas.}$ = Emission Rate measured
$\% O_{2\,corr.}$ = The Oxygen content to be corrected to (ie. 3.0% O_2)
$\% O_{2\,meas.}$ = The Oxygen content measured

APPENDIX C

Calibration Gas Cylinders Certifications

DATA CLASS

Scott Specialty Gases

Dual-Analyzed Calibration Standard

9810 BAY AREA BLVD,PASADENA,TX 77507 Phone: 281-474-5800 Fax: 281-474-58

CERTIFICATE OF ACCURACY: EPA Protocol Gas

Assay Laboratory

SCOTT SPECIALTY GASES
9810 BAY AREA BLVD
PASADENA,TX 77507

P.O. No.: 11606
Project No.: 04-47182-005

Customer

METCO ENVIRONMENTAL

3226 COMMANDER DR
CARROLLTON TX 75006

ANALYTICAL INFORMATION

This certification was performed according to EPA Traceability Protocol For Assay & Certification of Gaseous Calibration Standards, Procedure G-1; September, 1997.

Cylinder Number: ALM042345 Certification Date: 05Sep2006 Exp. Date: 05Sep2008
Cylinder Pressure***: 1950 PSIG

COMPONENT	CERTIFIED CONCENTRATION (Moles)		ANALYTICAL ACCURACY**	TRACEABILITY
NITRIC OXIDE	45.1	PPM	+/- 1%	Direct NIST and NMI
NITROGEN - OXYGEN FREE		BALANCE		
TOTAL OXIDES OF NITROGEN	45.1	PPM		Reference Value Only

*** Do not use when cylinder pressure is below 150 psig.
** Analytical accuracy is based on the requirements of EPA Protocol Procedure G1, September 1997.

REFERENCE STANDARD

TYPE/SRM NO.	EXPIRATION DATE	CYLINDER NUMBER	CONCENTRATION	COMPONENT
NTRM 1683	15Aug2009	AAc070185	48.82 PPM	NITRIC OXIDE

INSTRUMENTATION

INSTRUMENT/MODEL/SERIAL#	DATE LAST CALIBRATED	ANALYTICAL PRINCIPLE
FTIR/1602651	15Aug2006	FTIR

ANALYZER READINGS

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

First Triad Analysis | Second Triad Analysis | Calibration Curve

NITRIC OXIDE

Date: 30Aug2006	Response Unit:PPM	
Z1=-0.14792	R1=49.51008	T1=45.19806
R2=49.68552	Z2=0.00737	T2=45.22583
Z3=0.07751	T3=45.23860	R3=49.73429
Avg. Concentration:	45.21	PPM

Date: 05Sep2006	Response Unit: PPM	
Z1=-0.04446	R1=50.06316	T1=45.08947
R2=50.09622	Z2=-0.01030	T2=45.09603
Z3=0.03328	T3=45.21237	R3=50.25884
Avg. Concentration:	44.99	PPM

Concentration= A+Bx+Cx2+Dx3+Ex4	
r=9.999978E-1	
Constants:	A=0.000000E+0
B=9.778256E-1	C=1.770000E-4
D=0.000000E+0	E=0.000000E+0

Special Notes: FOLIO ITEM 0810

APPROVED BY: Lara Nash

RATA CLASS

Scott Specialty Gases

Dual-Analyzed Calibration Standard

9810 BAY AREA BLVD,PASADENA,TX 77507 Phone: 281-474-5800 Fax: 281-474-58

CERTIFICATE OF ACCURACY: EPA Protocol Gas

Assay Laboratory

SCOTT SPECIALTY GASES
9810 BAY AREA BLVD
PASADENA,TX 77507

P.O. No.: 11606
Project No.: 04-47182-008

Customer

METCO ENVIRONMENTAL

3226 COMMANDER DR
CARROLLTON TX 75006

ANALYTICAL INFORMATION

This certification was performed according to EPA Traceability Protocol For Assay & Certification of Gaseous Calibration Standards; Procedure G-1; September, 1997.

Cylinder Number: BLM001763 Certification Date: 06Sep2006 Exp. Date: 05Sep2008
Cylinder Pressure***: 1849 PSIG

COMPONENT	CERTIFIED CONCENTRATION (Moles)		ANALYTICAL ACCURACY**	TRACEABILITY
NITRIC OXIDE	94.0	PPM	+/- 1%	Direct NIST and NMi
NITROGEN - OXYGEN FREE		BALANCE		
TOTAL OXIDES OF NITROGEN	94.6	PPM		Reference Value Only

*** Do not use when cylinder pressure is below 150 psig.

** Analytical accuracy is based on the requirements of EPA Protocol Procedure G1, September 1997.

REFERENCE STANDARD

TYPE/SRM NO.	EXPIRATION DATE	CYLINDER NUMBER	CONCENTRATION	COMPONENT
NTRM 1684	01Jun2009	AAL070844	98.40 PPM	NITRIC OXIDE

INSTRUMENTATION

INSTRUMENT/MODEL/SERIAL#	DATE LAST CALIBRATED	ANALYTICAL PRINCIPLE
FTIR//1602651	18Aug2006	FTIR

ANALYZER READINGS

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

First Triad Analysis | Second Triad Analysis | Calibration Curve

NITRIC OXIDE

Date: 30Aug2006	Response Unit:PPM	
Z1=0.16459	R1=98.11841	T1=93.62741
R2=98.20818	Z2=0.04148	T2=93.64012
Z3=0.02664	T3=93.34918	R3=98.44874
Avg. Concentration:	93.78	PPM

Date: 05Sep2006	Response Unit: PPM	
Z1=0.04752	R1=98.38933	T1=93.72826
R2=98.60346	Z2=0.02251	T2=94.48192
Z3=0.22493	T3=94.59563	R3=98.80186
Avg. Concentration:	94.17	PPM

Concentration = A + Bx + Cx2 + Dx3 + Ex4	
r = 0.999962+1	
Constants:	A = 0.00000E+0
B = 9.97412E-1	C = 7.30000E-5
D = 0.00000E+0	E = 0.00000E+0

Special Notes: FOLIO ITEM 0815

APPROVED BY: _____
Lara Nash

RATA CLASS

Scott Specialty Gases

Dual-Analyzed Calibration Standard

9810 BAY AREA BLVD,PASADENA,TX 77507 Phone: 281-474-5800 Fax: 281-474-59

CERTIFICATE OF ACCURACY: EPA Protocol Gas

Assay Laboratory

SCOTT SPECIALTY GASES
9810 BAY AREA BLVD
PASADENA,TX 77507

P.O. No.: 11700
Project No.: 04-49128-001

Customer

METCO ENVIRONMENTAL

3226 COMMANDER DR
CARROLLTON TX 75006

ANALYTICAL INFORMATION

This certification was performed according to EPA Traceability Protocol For Assay & Certification of Gaseous Calibration Standards; Procedure G-1; September, 1997.

Cylinder Number: ALM059276 Certification Date: 28Nov2006 Exp. Date: 27Nov2009
Cylinder Pressure*** 2015 PSIG

COMPONENT	CERTIFIED CONCENTRATION (Moles)		ANALYTICAL ACCURACY**	TRACEABILITY
CARBON MONOXIDE	43.7	PPM	+/- 1%	Direct NIST and NMI
NITROGEN		BALANCE		

*** Do not use when cylinder pressure is below 150 psig.

** Analytical accuracy is based on the requirements of EPA Protocol Procedure G1, September 1997.

REFERENCE STANDARD

TYPE/SRM NO.	EXPIRATION DATE	CYLINDER NUMBER	CONCENTRATION	COMPONENT
NTRM 1678	15Aug2009	ALM038728	51.13 PPM	CARBON MONOXIDE

INSTRUMENTATION

INSTRUMENT/MODEL/SERIAL#	DATE LAST CALIBRATED	ANALYTICAL PRINCIPLE
FTIR/1602551	02Nov2006	FTIR

ANALYZER READINGS

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

First Triad Analysis | Second Triad Analysis | Calibration Curve

CARBON MONOXIDE

Date: 21Nov2006	Response Unit: PPM	
Z1 = 0.00423	R1 = 50.05594	T1 = 43.53698
R2 = 50.07990	Z2 = 0.00632	T2 = 43.54586
Z3 = 0.02236	T3 = 43.56028	R3 = 50.05159
Avg. Concentration:	43.75	PPM

Date: 28Nov2006	Response Unit: PPM	
Z1 = 0.00519	R1 = 50.03351	T1 = 43.45703
R2 = 50.02206	Z2 = 0.00617	T2 = 43.51083
Z3 = 0.00732	T3 = 43.52310	R3 = 50.04783
Avg. Concentration:	43.31	PPM

Concentration = A + Bx + Cx2 + Dx3 + Ex4	
r = 0.999995-1	
Constants:	A = 0.000000E+0
B = 9.954665E-1	C = 5.710000E-4
D = 2.000000E-6	E = 0.000000E+0

Special Notes: FOLIO: 0210

APPROVED BY: _____
Lara Nash

RATA CLASS

Scott Specialty Gases

Dual-Analyzed Calibration Standard

9810 BAY AREA BLVD,PASADENA,TX 77507 Phone: 281-474-5800 Fax: 281-474-585

CERTIFICATE OF ACCURACY: EPA Protocol Gas

Assay Laboratory

SCOTT SPECIALTY GASES
8810 BAY AREA BLVD
PASADENA,TX 77507

P.O. No.: 11512
Project No.: 04-44983-006

Customer

METCO ENVIRONMENTAL

3226 COMMANDER DR
CARROLLTON TX 75006

ANALYTICAL INFORMATION

This certification was performed according to EPA Traceability Protocol For Assay & Certification of Gaseous Calibration Standards; Procedure G-1; September, 1997.

Cylinder Number: LL6768 Certification Date: 13Jun2006 Exp. Date: 12Jun2009
Cylinder Pressure***: 1927 PSIG

COMPONENT	CERTIFIED CONCENTRATION (Moles)		ANALYTICAL ACCURACY**	TRACEABILITY
CARBON MONOXIDE	82.9	PPM	+/- 1%	Direct NIST and NMI
NITROGEN		BALANCE		

*** Do not use when cylinder pressure is below 150 psig.
** Analytical accuracy is based on the requirements of EPA Protocol Procedure G1, September 1997.

REFERENCE STANDARD

TYPE/SRM NO.	EXPIRATION DATE	CYLINDER NUMBER	CONCENTRATION	COMPONENT
NTRM 1679	02Apr2007	ALM015479	94.90 PPM	CARBON MONOXIDE

INSTRUMENTATION

INSTRUMENT/MODEL/SERIAL#	DATE LAST CALIBRATED	ANALYTICAL PRINCIPLE
FTIR//1602661	02Jun2006	FTIR

ANALYZER READINGS

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

CARBON MONOXIDE

First Triad Analysis

Date: 05Jun2006	Response Unit: PPM	
Z1=0.00442	R1=95.30665	T1=82.34641
R2=95.46503	Z2=0.00923	T2=83.48483
Z3=0.02875	T3=83.60466	R3=95.47382
Avg. Concentration:	82.97	PPM

Second Triad Analysis

Date: 13Jun2006	Response Unit: PPM	
Z1=0.02649	R1=95.61105	T1=83.29120
R2=95.51759	Z2=0.03737	T2=83.43233
Z3=0.03738	T3=83.47103	R3=95.68468
Avg. Concentration:	82.84	PPM

Calibration Curve

Concentration=A+Bx+Cx2+Dx3+Ex4	
r=9.99999E-1	
Constants:	A=0.00000E+0
B=9.91465E-1	C=4.81000E-[illegible]
D=2.00000E-6	E=0.00000E+0

Special Notes: FOLIO # 0215

APPROVED BY: Lara Nash

C-5

RATA CLASS

Scott Specialty Gases

Dual-Analyzed Calibration Standard

9810 BAY AREA BLVD,PASADENA,TX 77507 Phone: 281-474-5800 Fax: 281-474-58

CERTIFICATE OF ACCURACY: EPA Protocol Gas

Assay Laboratory

SCOTT SPECIALTY GASES
9810 BAY AREA BLVD
PASADENA,TX 77507

P.O. No.: 11758
Project No.: 04-51325-002

Customer

METCO ENVIRONMENTAL

3226 COMMANDER DR
CARROLLTON TX 75006

ANALYTICAL INFORMATION

This certification was performed according to EPA Traceability Protocol For Assay & Certification of Gaseous Calibration Standards; Procedure G-1; September, 1997.

Cylinder Number: ALM007619 Certification Date: 30Jan2007 Exp. Date: 30Jan2010
Cylinder Pressure***: 1920 PSIG

COMPONENT	CERTIFIED CONCENTRATION (Moles)		ANALYTICAL ACCURACY**	TRACEABILITY
CARBON DIOXIDE	12.2	%	+/- 1%	Direct NIST and NMI
OXYGEN	12.0	%	+/- 1%	Direct NIST and NMI
NITROGEN		BALANCE		

*** Do not use when cylinder pressure is below 150 psig.
** Analytical accuracy is based on the requirements of EPA Protocol Procedure G1, September 1997.

REFERENCE STANDARD

TYPE/SRM NO.	EXPIRATION DATE	CYLINDER NUMBER	CONCENTRATION	COMPONENT
NTRM 1675	04Jul2008	K001494	13.93 %	CARBON DIOXIDE
NTRM 2350	01May2009	K003567	23.48 %	OXYGEN

INSTRUMENTATION

INSTRUMENT/MODEL/SERIAL#	DATE LAST CALIBRATED	ANALYTICAL PRINCIPLE
MTIA/M200/171109	28Jan2007	GAS CHROMATOGRAPHY
SERVOMEX/MODEL 244A/701/716	23Jan2007	PARAMAGNETIC

ANALYZER READINGS

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

First Triad Analysis — Second Triad Analysis — Calibration Curve

CARBON DIOXIDE

First Triad Analysis:

Date: 30Jan2007 Response Unit:AREA
Z1=0.00000 R1=1060133. T1=928894.6
R2=1066670. Z2=0.00000 T2=928822.8
Z3=0.00000 T3=928820.3 R3=1066597.
Avg. Concentration: 12.16 %

Calibration Curve:

Concentration=A+Bx+Cx2+Dx3+Ex4
r=.9999963
Constants: A=-.02679209
B=.0000131134 C=
D= E=

OXYGEN

First Triad Analysis:

Date: 30Jan2007 Response Unit:VOLTS
Z1=0.00000 R1=0.98600 T1=0.50560
R2=0.98600 Z2=0.00030 T2=0.50590
Z3=0.00030 T3=0.50540 R3=0.98540
Avg. Concentration: 12.05 %

Calibration Curve:

Concentration=A+Bx+Cx2+Dx3+Ex4
r=.9999986
Constants: A=.005400437
B=23.62349333 C=
D= E=

APPROVED BY: RAMIEN ROUHANI C-5 SUPERVISOR: SUSAN BRANDON

Scott Specialty Gases

FROM: 9810 BAY AREA BLVD
PASADENA TX 77507
Phone: 281-474-5800 Fax: 281-474-5857

CERTIFICATE OF ANALYSIS

METCO ENVIRONMENTAL

3226 COMMANDER DR

CARROLLTON TX 75006

PROJECT #: 04-44226-002
PO#: REPL #4213
ITEM #: 0401022 AL
DATE: 25Apr2006

CYLINDER #: ALM002836
FILL PRESSURE: 02000 PSIG

PURE MATERIAL: AIR CAS# 132259-10-0

GRADE: HYDROCARBONFREE

PURITY: -

IMPURITY	MAXIMUM CONCENTRATIONS
O2	20 TO 21%
CO	0.5 PPM
CO2	1 PPM
H2O	5 PPM
THC(CH4)	0.1 PPM

ANALYST: Nora Pike

APPENDIX D

Reference Method Monitors Data

HR-1 Preheater Stack (EPN 35-HR-5)
Oxides of Nitrogen
Concentration

Run Number	Measured (ppm)	Adjusted (ppm*)
1	14.66	14.59
2	13.53	13.49
3	14.09	14.25

*Calculated according to equation 7E-5.

HR-1 Preheater Stack (EPN 35-HR-5)
Carbon Monoxide
Concentration

Run Number	Measured (ppm)	Adjusted (ppm*)
1	0.00	< 0.01
2	0.10	0.10
3	0.02	0.02

*Calculated according to equation 7E-5.

HR-1 Preheater Stack (EPN 35-HR-5)
Oxygen
Concentration

Run Number	Measured (%)	Adjusted (%*)
1	4.84	4.78
2	4.87	4.88
3	4.91	5.01

*Calculated according to equation 7E-5.

HR-1 Preheater Stack (EPN 35-HR-5)
Calibration Summary
Oxides of Nitrogen

	NO_x Calibration			NO_x Zero			Actual	Actual
Run Number	Initial Drift Check (ppm)	Final Drift Check (ppm)	Average (ppm)	Initial Drift Check (ppm)	Final Drift Check (ppm)	Average (ppm)	NO_x Calibration Value (ppm)	NO_x Zero Value (ppm)
1	44.80	45.60	45.20	0.10	0.00	0.05	45.10	0.00
2	45.60	44.90	45.25	0.00	0.00	0.00	45.10	0.00
3	44.90	44.30	44.60	0.00	0.00	0.00	45.10	0.00

METCO ENVIRONMENTAL

HR-1 Preheater Stack (EPN 35-HR-5)
Calibration Summary
Carbon Monoxide

Run Number	CO Calibration Initial Drift Check (ppm)	CO Calibration Final Drift Check (ppm)	CO Calibration Average (ppm)	CO Zero Initial Drift Check (ppm)	CO Zero Final Drift Check (ppm)	CO Zero Average (ppm)	Actual CO Calibration Value (ppm)	Actual CO Zero Value (ppm)
1	42.90	42.40	42.65	0.00	0.00	0.00	43.70	0.00
2	42.40	43.40	42.90	0.00	0.00	0.00	43.70	0.00
3	43.40	43.60	43.50	0.00	0.00	0.00	43.70	0.00

HR-1 Preheater Stack (EPN 35-HR-5)
Calibration Summary
Oxygen

Run Number	O_2 Calibration Initial Drift Check (%)	O_2 Calibration Final Drift Check (%)	O_2 Calibration Average (%)	O_2 Zero Initial Drift Check (%)	O_2 Zero Final Drift Check (%)	O_2 Zero Average (%)	Actual O_2 Calibration Value (%)	Actual O_2 Zero Value (%)
1	12.00	12.00	12.00	0.10	0.10	0.10	12.00	0.00
2	12.00	11.80	11.90	0.10	0.00	0.05	12.00	0.00
3	11.80	11.70	11.75	0.00	0.00	0.00	12.00	0.00

HR-1 Preheater Stack (EPN 35-HR-5)
System Calibration Bias and Drift Data
Oxides of Nitrogen
Calibration Span = 94.00 ppm

Run Number	NO_x Calibration Initial Response (ppm)	NO_x Calibration Initial Bias (%*)	NO_x Calibration Final Response (ppm)	NO_x Calibration Final Bias (%*)	NO_x Calibration Drift (%*)	NO_x Zero Initial Response (ppm)	NO_x Zero Initial Bias (%*)	NO_x Zero Final Response (ppm)	NO_x Zero Final Bias (%*)	NO_x Zero Drift (%*)	Actual NO_x Calibration Value (ppm)	Actual NO_x Zero Value (ppm)
1	44.80	0.74	45.60	0.11	0.85	0.10	0.11	0.00	0.00	0.11	45.50	0.00
2	45.60	0.11	44.90	0.64	0.74	0.00	0.00	0.00	0.00	0.00	45.50	0.00
3	44.90	0.64	44.30	1.28	0.64	0.00	0.00	0.00	0.00	0.00	45.50	0.00

* Percent of Calibration Span

HR-1 Preheater Stack (EPN 35-HR-5)
System Calibration Bias and Drift Data
Carbon Monoxide
Calibration Span = 82.90 ppm

Run Number	CO Calibration Initial Response (ppm)	CO Calibration Initial Bias (%*)	CO Calibration Final Response (ppm)	CO Calibration Final Bias (%*)	CO Calibration Drift (%*)	CO Zero Initial Response (ppm)	CO Zero Initial Bias (%*)	CO Zero Final Response (ppm)	CO Zero Final Bias (%*)	CO Zero Drift (%*)	Actual CO Calibration Value (ppm)	Actual CO Zero Value (ppm)
1	42.90	0.24	42.40	0.84	0.60	0.00	0.00	0.00	0.00	0.00	43.10	0.00
2	42.40	0.84	43.40	0.36	1.21	0.00	0.00	0.00	0.00	0.00	43.10	0.00
3	43.40	0.36	43.60	0.00	0.24	0.00	0.00	0.00	0.00	0.00	43.10	0.00

* Percent of Calibration Span

HR-1 Preheater Stack (EPN 35-HR-5)
System Calibration Bias and Drift Data
Oxygen
Calibration Span = 20.80 percent

Run Number	O_2 Calibration Initial Response (%)	Initial Bias (%*)	Final Response (%)	Final Bias (%*)	Drift (%*)	O_2 Zero Initial Response (%)	Initial Bias (%*)	Final Response (%)	Final Bias (%*)	Drift (%*)	Actual O_2 Calibration Value (%)	Actual O_2 Zero Value (%)
1	12.00	0.48	12.00	0.48	0.00	0.10	0.48	0.10	0.48	0.00	12.10	0.00
2	12.00	0.48	11.80	1.44	0.96	0.10	0.48	0.00	0.00	0.48	12.10	0.00
3	11.80	1.44	11.70	1.91	0.48	0.00	0.00	0.00	0.00	0.00	12.10	0.00

* Percent of Calibration Span

HR-1 Preheater Stack (EPN 35-HR-5)
Analyzer Calibration Data
Oxides of Nitrogen

Date 03/09/07
Runs 1 - 3
Calibration Span = 94.00 ppm

Gas Range	Actual Calibration Value (ppm)	Analyzer Calibration Response (ppm)	Absolute Difference (ppm)	Difference (%*)
Low	0.00	0.00	0.00	0.00
Mid	45.10	45.50	0.40	0.43
High	94.00	94.60	0.60	0.64

* Percent of Calibration Span

HR-1 Preheater Stack (EPN 35-HR-5)
Analyzer Calibration Data
Carbon Monoxide

Date 03/09/07
Runs 1 - 3
Calibration Span = 82.90 ppm

Gas Range	Actual Calibration Value (ppm)	Analyzer Calibration Response (ppm)	Absolute Difference (ppm)	Difference (%*)
Low	0.00	0.00	0.00	0.00
Mid	43.70	43.10	0.60	0.72
High	82.90	83.20	0.30	0.36

* Percent of Calibration Span

HR-1 Preheater Stack (EPN 35-HR-5)
Analyzer Calibration Data
Oxygen

Date 03/09/07
Runs 1 - 3
Calibration Span = 20.90 %

Gas Range	Actual Calibration Value (%)	Analyzer Calibration Response (%)	Absolute Difference (%)	Difference (%*)
Low	0.00	0.00	0.00	0.00
Mid	12.00	12.10	0.10	0.48
High	20.90	20.90	0.00	0.00

* Percent of Calibration Span

Auxiliary Average Report

DCNID : 07 Site Name : 07120 Aux Interval : 1 Date : 3/ 9/ 7

ARI Prebake Stack

Time	O2 %	CO PPM	NOX PPM	
07:32	0.1000C	0.0000C	0.0000C	
07:33	0.1000C	0.0000C	0.0000C	N2 ALM017977
07:34	0.1000C	0.1000C	0.0000C	
07:35	0.1000C	0.1000C	96.8000C	
07:36	0.1000C	0.0000C	95.3000C	
07:37	0.1000C	0.0000C	94.9000C	
07:38	0.1000C	0.0000C	95.0000C	
07:39	0.1000C	0.0000C	95.4000C	
07:40	0.1000C	0.0000C	95.1000C	
07:41	0.1000C	0.0000C	94.5000C	
07:42	0.1000C	0.0000C	94.6000C	94.6 ppm NOx BLM 1763
07:43	0.1000C	0.0000C	65.3000C	
07:44	0.1000C	0.0000C	0.2000C	
07:45	0.1000C	0.1000C	44.6000C	
07:46	0.0000C	0.0000C	45.5000C	
07:47	0.0000C	0.0000C	45.5000C	45.1 ppm NOx ALM042345
07:48	3.5000C	0.0000C	9.9000C	
07:49	18.9000C	0.3000C	1.6000C	
07:50	6.1000C	16.2000C	2.9000C	
MAX :	18.9000	16.2000	96.8000	
MIN :	0.0000	0.0000	0.0000	
:	1.5737	0.8842	51.4263	
SCANS:	19	19	19	

O2 #10
Teledyne
S/N 146228
0-25%

CO #12
TECO 48
S/N 4833-527-245
~~0-1000ppm~~
0-829 ppm

~~CO~~ NOx # 54
TECO 10S
S/N 1054942-282
0-94.6 ppm

Leak check good
[signature] 1/9/1

Auxiliary Average Report

DCNID : 07 Site Name : 07120 Aux Interval : 1 Date : 3/ 9/ 7

HCl Pickle Stack

Time	O2 %	CO PPM	NOX PPM	
07:51	0.1000C	76.1000C	17.4000C	Noxconverter ✓
07:52	0.1000C	84.7000C	17.4000C	
07:53	0.1000C	84.6000C	17.4000C	
07:54	0.1000C	84.0000C	17.4000C	
07:55	0.1000C	83.7000C	17.4000C	
07:56	0.1000C	83.7000C	17.4000C	
07:57	0.0000C	83.3000C	17.4000C	
07:58	0.0000C	83.3000C	17.4000C	
07:59	0.0000C	83.2000C	17.4000C	
08:00	0.0000C	83.0000C	17.4000C	N2
08:01	0.0000C	83.2000C	17.4000C	
08:02	0.0000C	83.2000C	17.4000C	82.9 ppm CO LL6768
08:03	14.7000C	58.7000C	17.4000C	
08:04	20.9000C	4.0000C	17.4000C	
08:05	20.9000C	0.1000C	17.4000C	20.9% O2 Air ALM026836
08:06	13.4000C	2.7000C	17.4000C	
08:07	0.3000C	31.9000C	17.4000C	
08:08	0.1000C	43.1000C	17.4000C	
08:09	0.1000C	43.1000C	17.4000C	43.7 ppm CO ALM054226
08:10	0.1000C	43.1000C	17.3000C	
08:11	8.9000C	31.8000C	17.3000C	
12	12.0000C	2.6000C	17.3000C	
08:13	12.1000C	0.0000C	17.3000C	
08:14	12.1000C	0.0000C	17.3000C	12.0% O2 ALM047619
08:15	13.1000C	0.0000C	17.3000C	
08:16	20.5000C	0.0000C	17.3000C	
08:17	20.8000C	0.2000C	17.3000C	
08:18	20.8000C	0.2000C	17.3000C	
08:19	20.7000C	0.2000C	17.3000C	
08:20	20.7000C	0.3000C	17.3000C	
08:21	-999	-999	-999	
MAX :	20.9000	84.7000	17.4000	
MIN :	0.0000	0.0000	17.3000	
AVG :	7.7600	41.9333	17.3633	
SCANS:	30	30	30	

07 120
ROHM & HAAS
DEER PARK TX
HR 1 PREHEATER STACK
Page : 1

Start ✓

		O2 %	CO PPM	NOX PPM	
03/09/07	08:44	4.9	0.0-	14.6	pt 1
03/09/07	08:45	4.9	0.0-	14.7	
03/09/07	08:46	4.9	0.0-	14.5	
03/09/07	08:47	4.9	0.0-	14.5	pt 2
03/09/07	08:48	4.9	0.0-	14.6	
03/09/07	08:49	4.9	0.0-	14.7	
03/09/07	08:50	4.9	0.0-	14.8	pt 3
03/09/07	08:51	4.9	0.0-	14.8	
03/09/07	08:52	4.9	0.0-	14.7	
03/09/07	08:53	4.9	0.0-	14.6	
03/09/07	08:54	4.9	0.0-	14.7	
AVERAGES :		4.9	0.0	14.7	

07 120
ROHM & HAAS
DEER PARK TX
HR 1 PREHEATER STACK
Page : 1

Run 1 F.2.1 Brs

		O2 %	CO PPM	NOX PPM
03/09/07	08:23	12.0C	0.0C	0.1C
03/09/07	08:24	12.0C	0.0C	0.1C
03/09/07	08:25	11.4C	0.0C	0.1C
03/09/07	08:26	2.9C	0.0C	0.1C
03/09/07	08:27	0.5C	0.0C	6.1C
03/09/07	08:28	2.3C	0.1C	42.8C
03/09/07	08:29	0.8C	0.2C	43.9C
03/09/07	08:30	0.2C	0.2C	44.2C
03/09/07	08:31	0.2C	0.2C	44.8C
03/09/07	08:32	0.2C	0.2C	44.8C
03/09/07	08:33	0.2C	0.2C	44.8C
03/09/07	08:34	0.1C	2.0C	24.5C
03/09/07	08:35	0.1C	26.7C	1.1C
03/09/07	08:36	0.1C	42.2C	0.2C
03/09/07	08:37	0.1C	43.0C	0.1C
03/09/07	08:38	0.1C	42.9C	0.1C
03/09/07	08:39	0.1C	42.9C	0.1C
03/09/07	08:40	1.4C	41.2C	5.9C
03/09/07	08:41	4.6C	16.8C	14.1C
AVERAGES :		2.6	13.6	16.7

Auxiliary Average Report

DCNID : 07 Site Name : 07120 Aux Interval : 1 Date : 3/ 9/ 7

HRA Preheater Stack

Run 1

T e	O2 %	CO PPM	NOX PPM
08:55	4.9000	0.0000-	14.8000
08:56	4.9000	0.0000-	14.7000
08:57	4.9000	0.0000-	14.6000
08:58	4.9000	0.0000-	14.5000
08:59	4.9000	0.0000-	14.5000
09:00	4.9000	0.0000-	14.6000
09:01	4.9000	0.0000-	14.6000
09:02	4.9000	0.0000-	14.6000
09:03	4.9000	0.0000-	14.7000
09:04	4.9000	0.0000-	14.6000
09:05	4.9000	0.0000-	14.6000
09:06	4.8000	0.0000-	14.7000
09:07	4.8000	0.0000-	15.0000
09:08	4.8000	0.0000-	14.9000
09:09	4.8000	0.0000-	14.8000
09:10	4.8000	0.0000-	14.7000
09:11	4.8000	0.0000-	14.7000
09:12	4.8000	0.0000-	14.7000
09:13	4.8000	0.0000-	14.8000
09:14	4.8000	0.0000-	14.7000
09:15	4.8000	0.0000-	14.7000
09:16	4.8000	0.0000-	14.7000
17	4.8000	0.0000-	14.9000
09:18	4.8000	0.0000-	14.8000
09:19	4.8000	0.0000-	14.8000
09:20	4.8000	0.0000-	14.5000
09:21	4.9000	0.0000-	14.6000
09:22	4.8000	0.0000-	14.7000
09:23	4.8000	0.0000-	14.8000
09:24	4.8000	0.0000-	14.7000
MAX :	4.9000	0.0000	15.0000
IN :	4.8000	0.0000	14.5000
VG :	4.8400	0.0000	14.7000
SCANS:	30	30	30

Auxiliary Average Report

DCNID : 07 Site Name : 07120 Aux Interval : 1 Date : 3/ 9/ 7

HR 1 Preheater Stack

Final cond.

Time	O2 %	CO PPM	NOX PPM
09:25	4.8000	0.0000-	14.7000
09:26	4.8000	0.0000-	14.7000
09:27	4.8000	0.0000-	14.7000
09:28	4.8000	0.0000-	14.7000
09:29	4.8000	0.0000-	14.7000
09:30	4.8000	0.0000-	14.6000
09:31	4.8000	0.0000-	14.6000
09:32	4.8000	0.0000-	14.6000
09:33	4.8000	0.0000-	14.8000
09:34	4.8000	0.0000-	14.6000
09:35	4.8000	0.0000-	14.7000
09:36	4.8000	0.0000-	14.8000
09:37	4.8000	0.0000-	14.7000
09:38	4.8000	0.0000-	14.8000
09:39	4.9000	0.0000-	14.4000
09:40	4.9000	0.0000-	14.4000
09:41	4.9000	0.0000-	14.5000
09:42	4.9000	0.0000-	14.5000
09:43	4.9000	0.0000-	14.4000
09:44	4.9000	0.0000-	14.6000
09:45	4.9000	0.0000-	14.5000
46	4.9000	0.0000-	14.7000
09:47	4.8000	0.0000-	14.6000
09:48	4.9000	0.0000-	14.6000
09:49	4.9000	0.0000-	14.4000
09:50	4.8000	0.0000-	14.6000
09:51	4.9000	0.0000-	14.6000
09:52	4.9000	0.0000-	14.6000
09:53	4.9000	0.0000-	14.6000
09:54	4.8000	0.0000-	14.7000
MAX :	4.9000	0.0000	14.8000
MIN :	4.8000	0.0000	14.4000
AVG :	4.8433	0.0000	14.6133
SCANS:	30	30	30

2-min Avg 4.84 ✓ 0.00 ✓ 14.66 ✓

07 120
ROHM & HAAS
DEER PARK TX
HR 1 PREHEATER STACK
ge : 1

Run 1 Fuel
Run 2 Fuel

		O2 %	CO PPM	NOX PPM
03/09/07	10:29	0.0C	42.4C	0.3C
03/09/07	10:30	9.0C	39.2C	0.1C
03/09/07	10:31	11.9C	22.7C	0.0C
03/09/07	10:32	12.0C	8.6C	0.0C
03/09/07	10:33	12.0C	2.2C	0.0C
03/09/07	10:34	5.1C	0.2C	39.0C
03/09/07	10:35	0.1C	0.0C	45.6C
03/09/07	10:36	0.1C	0.0C	45.6C
AVERAGES :		6.3	14.4	16.3

Auxiliary Average Report

DCNID : 07 Site Name : 07120 Aux Interval : 1 Date : 3/ 9/ 7

AR-1 Preheater

Run 2 cont.

Time	O2 %	CO PPM	NOX PPM
11:13	4.9000	0.1000	13.2000
11:14	4.9000	0.1000	13.3000
11:15	4.9000	0.1000	13.3000
11:16	4.9000	0.1000	13.2000
11:17	4.9000	0.1000	13.1000
11:18	4.9000	0.1000	13.1000
11:19	4.9000	0.1000	13.0000
11:20	4.9000	0.1000	13.0000
11:21	4.9000	0.1000	13.0000
11:22	4.9000	0.1000	13.1000
11:23	4.9000	0.1000	13.1000
11:24	4.9000	0.1000	13.1000
11:25	4.9000	0.1000	13.2000
11:26	4.9000	0.1000	13.1000
11:27	4.9000	0.1000	13.0000
11:28	4.9000	0.1000	13.0000
11:29	4.9000	0.0000	12.9000
11:30	4.9000	0.1000	12.9000
11:31	4.9000	0.1000	12.9000
11:32	4.9000	0.1000	12.9000
11:33	4.9000	0.1000	13.0000
34	4.9000	0.1000	13.1000
11:35	4.8000	0.1000	13.2000
11:36	4.8000	0.1000	13.2000
11:37	4.9000	0.0000	13.3000
11:38	4.9000	0.1000	13.3000
11:39	4.8000	0.1000	13.4000
11:40	4.8000	0.1000	13.3000
11:41	4.9000	0.1000	13.2000
11:42	4.9000	0.0000	13.2000
MAX :	4.9000	0.1000	13.4000
MIN :	4.8000	0.0000	12.9000
AVG :	4.8867	0.0900	13.1200
SCANS:	30	30	30
60 min Avg	4.87 ✓	0.10 ✓	13.53 ✓

07 120
ROHM & HAAS
DEER PARK TX
HR 1 PREHEATER STACK
Page : 1

		O2 %	CO PPM	NOX PPM
03/09/07	11:48	0.6C	0.0C	43.8C
03/09/07	11:49	0.1C	0.1C	44.7C
03/09/07	11:50	0.1C	0.1C	44.8C
03/09/07	11:51	0.1C	0.1C	44.8C
03/09/07	11:52	0.0C	0.1C	44.9C
03/09/07	11:53	7.0C	0.1C	5.3C
03/09/07	11:54	11.7C	0.0C	0.0C
03/09/07	11:55	11.8C	0.0C	0.0C
03/09/07	11:56	11.8C	0.0C	0.0C
03/09/07	11:57	8.7C	0.0C	0.2C
03/09/07	11:58	0.3C	5.1C	0.0C
03/09/07	11:59	0.1C	17.0C	0.0C
03/09/07	12:00	0.1C	27.1C	0.0C
03/09/07	12:01	0.1C	34.0C	0.0C
03/09/07	12:02	0.1C	38.4C	0.0C
03/09/07	12:03	0.1C	41.2C	0.0C
03/09/07	12:04	0.0C	42.7C	0.0C
03/09/07	12:05	0.0C	43.4C	0.0C
03/09/07	12:06	0.0C	43.4C	0.0C
AVERAGES :		2.8	15.4	12.0

Run 2 Final.
Run 3 Initial

Auxiliary Average Report

DCNID : 07 Site Name : 07120 Aux Interval : 1 Date : 3/ 9/ 7

Run 3 p>1

ime	O2 %	CO PPM	NOX PPM
12:10	4.9000	0.0000-	14.2000
12:11	4.9000	0.0000-	14.2000
12:12	4.9000	0.0000-	14.2000
12:13	4.9000	0.0000-	14.2000
12:14	4.9000	0.0000-	14.3000
12:15	4.9000	0.0000-	14.4000
12:16	4.9000	0.0000-	14.2000
12:17	4.9000	0.0000-	14.3000
12:18	4.9000	0.0000-	14.2000
12:19	4.9000	0.0000-	14.1000
12:20	4.9000	0.0000-	14.2000
12:21	4.9000	0.0000-	14.3000
12:22	4.9000	0.0000-	14.2000
12:23	4.9000	0.0000-	14.2000
12:24	5.0000	0.0000-	14.2000
12:25	4.9000	0.0000-	14.1000
12:26	5.0000	0.0000-	14.0000
12:27	5.0000	0.0000-	14.1000
12:28	4.9000	0.0000-	14.0000
12:29	4.9000	0.0000-	14.1000
12:30	4.9000	0.0000-	14.0000
31	5.0000	0.0000-	14.1000
12:32	4.9000	0.0000-	14.2000
12:33	4.9000	0.0000-	14.2000
12:34	4.9000	0.0000-	14.2000
12:35	4.9000	0.0000-	14.2000
12:36	4.9000	0.0000-	14.2000
12:37	4.9000	0.0000-	14.0000
12:38	5.0000	0.0000-	14.1000
12:39	4.9000	0.0000-	14.2000
AX :	5.0000	0.0000	14.4000
IN :	4.9000	0.0000	14.0000
AVG :	4.9167	0.0000	14.1700
CANS:	30	30	30

Auxiliary Average Report

DCNID : 07 Site Name : 07120 Aux Interval : 1 Date : 3/ 9/ 7

Time	O2 %	CO PPM	NOX PPM
12:40	4.9000	0.0000-	14.1000
12:41	4.9000	0.0000-	14.1000
12:42	4.9000	0.0000-	14.3000
12:43	4.9000	0.0000-	14.2000
12:44	4.9000	0.0000-	14.3000
12:45	4.9000	0.0000-	14.2000
12:46	4.9000	0.0000-	14.1000
12:47	4.9000	0.0000-	14.2000
12:48	4.9000	0.0000-	14.2000
12:49	4.9000	0.0000-	14.1000
12:50	4.9000	0.0000-	14.2000
12:51	4.9000	0.0000-	14.3000
12:52	4.9000	0.0000-	14.3000
12:53	4.9000	0.0000-	14.2000
12:54	4.9000	0.0000-	14.2000
12:55	4.9000	0.0000-	14.2000
12:56	4.9000	0.0000-	14.2000
12:57	4.9000	0.0000-	14.2000
12:58	4.9000	0.0000-	14.2000
12:59	4.9000	0.0000-	14.1000
:	4.9000	0.0000	14.3000
IN :	4.9000	0.0000	14.1000
AVG :	4.9000	0.0000	14.1950
CANS:	20	20	20

Auxiliary Average Report

DCNID : 07 Site Name : 007120 Aux Interval : 1 Date : 3/ 9/ 7

Run 3 Cont. PS 3

Time	O2 %	CO PPM	NOX PPM	
14:10	4.9000	0.9000	13.6000	Delay due to data logger problem
14:11	4.9000	0.0000-	13.7000	w/ human field on test
14:12	4.9000	0.0000-	13.8000	
14:13	4.9000	0.0000-	13.7000	
14:14	4.9000	0.0000-	13.7000	
14:15	5.0000	0.0000-	13.5000	
14:16	4.9000	0.0000-	13.5000	
14:17	4.9000	0.0000-	13.5000	
14:18	4.9000	0.0000-	13.7000	
14:19	4.9000	0.0000-	13.6000	
MAX :	5.0000	0.9000	13.8000	
MIN :	4.9000	0.0000	13.5000	
AVG :	4.9100	0.0900	13.6300	
SCANS:	10	10	10	

4.91 ✓ 0.02 ✓ 14.09 ✓

07 120
ROHM & HAAS
DEER PARK TX
HR 1 PREHEATER STACK
Page : 1

Run 3 Final

		O2 %	CO PPM	NOX PPM
03/09/07	14:29	0.0C	43.6C	0.0C
03/09/07	14:30	0.0C	43.6C	0.0C
03/09/07	14:31	0.0C	39.1C	31.0C
03/09/07	14:32	0.0C	7.8C	44.2C
03/09/07	14:33	0.0C	0.4C	44.3C
03/09/07	14:34	0.0C	0.4C	44.3C
03/09/07	14:35	5.9C	0.3C	8.7C
03/09/07	14:36	11.6C	0.0C	0.0C
03/09/07	14:37	11.7C	0.0C	0.0C
AVERAGES :		3.2	15.0	19.2

APPENDIX E

Plant Operational Data

HR1 Metco NOx Compliance Testing

HR1 Run1	3/9/07 8:55	3/9/07 9:55
HR1 Run2	3/9/07 10:43	3/9/07 11:43
HR1 Run3	3/9/07 12:11	3/9/07 13:11

	Process Air Flow MSCFM	Natural Gas Flow SCFM	Natural Gas Heating Value MMBtu/scfh	Natural Gas Heat Input MMBtu/hr	Alternative Gas Flow SCFM	Preheater Exit Temp DEGC
HR1 Run1	58	1150	1023	71	N/A	632
HR1 Run2	58	1150	1023	71	N/A	632
HR1 Run3	58	1150	1023	71	N/A	632
Average	**58**	**1150**	**1023**	**71**	**N/A**	**632**

ROHM AND HAAS ENGINEERING DIVISION

629

VORTEX FLOW METER

PROCESS	HR1
PO NO.	
JOB NO.	14504
CONTRACTOR JOB NO.	

REV	DATE	DESCRIPTION	BY	CHK	APP
B	06/2004	IFC 14504/6253	WT	WT	CLO
2	6/02/02	LINE NO. CHANGE	GJC	GJC	GJC
A	8/7/03	As-Built	MAC	MAC	MAC

GENERAL	1	Tag No.	FE-0035-147-002					
	2	Service	NATURAL GAS FLOW					
	3	Line No. / Equip. No.	6"-027-040005					
	4	P & ID No.	120-00-0035-000-001					
ELECTRICAL/ SAFETY	5	Area Classification: Class | Division | Group	GENERAL PURPOSE					
	6	Enclosure Class (Expl. proof, NEMA...)	NEMA 4X					
	7	Non-Incendive	YES					
	8	Intrinsically Safe Installation	NO					
PROCESS DATA	9	Fluid	NATURAL GAS					
	10	Fluid State	GAS					
	11	Flow: Min | Norm | Max | Units	100	1400	2200	SCFM		
	12	Pressure: Min | Norm | Max | Units	30	40	60	PSIG		
	13	Temperature: Min | Norm | Max | Units	10	20	27	C		
	14	Oper. Spec. Grev. | Spec. Grav. @ Base P,T	0.0448 LB/FT^3		0.0448 LB/FT^3			
	15	Operating Viscosity, Units	1092x10^7			POISE		
	16	Vacuum Possibility (Y/N)	N					
	17	Vapor Pressure @ Oper. Temp. (Liquids Only)	N/A			N/A		
	18	Base Pressure, Units	40			PSIG		
	19	Base Temperature, Units	68			F		
	20							
	21							
	22							
METER/ SENSOR	23	Flow Meter Type	VORTEX					
	24	Meter Size | Connection	3"		RF ANSI 150#			
	25	Pressure Rating | Temperature Rating	REF. ANSI B16.5		-40 F TO +250 C			
	26	Meter Material | Extension Material	316 SS		N/A			
	27	Sensor Gasket Material	GRAFOIL					
	28	Sensor Housing Material	316 SS					
	29	Bluff Body Material	316 SS					
	30	Vane Material	316 SS					
	31	Sensor Type | Sensor Material	DIFF. SWITCHED CPACITANCE		316 SS			
TRANSMITTER	32	Calibrated Range: Min | Max | Units	0	2200		SCFM		
	33	Adjustable Range: Min | Max | Units	55.9	627		SCFM AIR		
	34	Location | Mounting	FIELD		TOP OF SENSOR			
	35	Housing Material	POWDER COATED ALUMINUM					
	36	Signal Cable Length	MFG. STD.					
	37	Digital Output | Isolated (Y/N)	PULSE		Y			
	38	Analog Output | Isolated (Y/N)	4-20 mA		Y			
	39	Power Requirement, Units	12 VDC					
	40	Blind or Indicating	INDICATING					
	41	Display Scale	FLOW AND % SCALE					
	42							
VENDOR DATA	43	Manufacturer	ENDRESS+HAUSER					
	44	Model - Transmitter	72F-80SK0AA1AAB4AA					
	45	Model - Element	72F-80SK0AA1AAB4AA					
	46	No. of Manuals | No. of Reproducible Dwgs.	1		0			
	47	Calibration (Y/N) | Calibration Data Sheet (Y/N)	Y		Y			
OPTIONS	48							
	49							
	50							

Notes:

Each piece of equipment is to be metal or plastic tagged with Rohm and Haas Company AR Number, Purchase Order Number, and Item Number.

APPENDIX F

Resumes of Test Personnel

ROBERT M. PATTERSON; President

Education	B. S. 1983, Central Michigan University; Mt. Pleasant, Michigan, in Geology and Earth Science-Meteorology.
Professional Training Courses	Attended a two-day short course, "Performing and Observing Source Sampling" in Dallas, Texas. Attended a one-day short course on basic supervision. Attended a four-week management course presented by the American Management Association, 1991-1992.
Certification	Certified Visible Emissions Evaluator Certified Cabot Full-Face Respirator Fit Tester
Professional Memberships	Source Evaluation Society American Management Association
Technical Experience	Participated in the sampling of over 1,000 sources, including several of which were sampled simultaneously using more than one sampling train. Thoroughly trained in all EPA testing procedures, 1986-present. Over nineteen years experience with EPA and Texas Air Control Board methods of sampling - both stationary sources and ambient air. CFR, Title 40, Chapter I, Part 60, EPA Methods 1 through 25, and 101 through 110. Performance Specifications 1 through 5. CFR, Title 40, Chapter I, Part 50, Appendix A through F. "Sampling Procedures Manual, Texas Air Control Board, January 1983." Parts 1-1 through 14-6, Appendix B through Appendix M. Experienced with sampling Method 0010, Modified Method 5 Sampling Train; Method 0030, Volatile Organic Sampling Train; and various EPA and "Site Specific" multiple metal and acid gas sampling trains.

(continued)

PATTERSON, Rob (cont'd)

Technical Experience (cont'd)

Over twenty one years experience with EPA and Texas Air Control Board methods of analysis of both stationary and ambient air samples. Particulate matter, SO_3, SO_2, H_2SO_4, NO_x, CO, CO_2, O_2, H_2S, F, TRS, HCl, Cl_2, NH_3, VOC, C_1-C_7, and other organics. Both laboratory and on-site analyses were performed.

Experienced in the sampling and analysis of commercial calibration gas cylinders for sulfur dioxide, oxides of nitrogen, carbon dioxide, oxygen, carbon monoxide, and C_1-C_7 hydrocarbons.

Thoroughly trained in the operation and routine maintenance of the following:

- MSA LIRA Model 202S Infrared Analyzer
- Analytical Instrument Development, Inc. Model 340A Calibration System
- Shimadzu GC-Mini 2 Gas Chromatograph
- Thermo Environmental Model 10AR Oxides of Nitrogen Analyzer
- Thermo Oxygen Analyzer
- Teledyne Model 326 Oxygen Analyzer
- Thermo Environmental Model 48 Carbon Monoxide Analyzer
- Thermo Environmental Model 40 Sulfur Dioxide Analyzer
- Ratfisch Model RS 100 Total Hydrocarbon Analyzer
- Western Research Model 721AT Sulfur Dioxide Analyzer
- Horiba Model PIR 2000 Carbon Dioxide Analyzer
- Ratfisch Model RS 55 Total Hydrocarbon Analyzer
- J.U.M. Model VE-7 Total Hydrocarbon Analyzer

METCO ENVIRONMENTAL

JAMES R. MONFRIES; Senior Quality Assurance Manager

Education	B. S. 1975, University of Texas at Arlington; Arlington, Texas, in Biology with a minor in Chemistry. Graduate work at the University of Texas at Dallas in the Environmental Science Department.
Professional Training Courses	Attended a two-day short course, "Performing and Observing Source Sampling" in Dallas, Texas, July 1976.
Certification	Certified Visible Emissions Evaluator
Professional Memberships	Air and Waste Management Association Source Evaluation Society - Past President
Technical Experience	Participated in the sampling of over 700 sources, serving in the supervisory capacity on over 500 sources. Many of the sources were sampled simultaneously using more than one sampling train at several points in the flue gas stream, 1976-present. Has also supervised several ambient air monitoring studies, including a permanent five-station high volume air sampling network in South Texas, a permanent four-station high volume air sampling network in Pennsylvania, and a permanent seven-station sulfur dioxide sampling network in East Texas. Was Quality Assurance Manager for several ambient air monitoring studies; including a four-station high volume air sampling network for TSP and PM10 in Midlothian, Texas; a single-station high volume air sampling network for PM10 in South Texas; a two-station high volume air sampling network for TSP in Wichita Falls, Texas; and a four-station continuous air sampling network for TSP and PM10 in Jewett, Texas using Thermo Andersen FH 62 C14 Beta Gauge Dust Monitors.

(continued)

MONFRIES, James (cont'd)

Twenty years experience with EPA and Texas Commission on Environmental Quality methods of analysis of both source and ambient air samples for particulates, SO_2, SO_3, H_2SO_4, H_2S, HCl, Cl_2, NO_x, Hydrocarbons, and TRS.

Experienced in the analysis of commercial calibration gas cylinders for sulfur dioxide and oxides of nitrogen.

Experienced with VOST and Modified Method 5 Sampling Procedures.

Thoroughly trained in the operation and routine maintenance of the following:

- Lear Siegler, Inc. SM800 Stack Gas Monitor
- Du Pont Model 460/1 Photometric Analyzer System
- Lear Siegler, Inc. SM1000 Ambient SO_2 Monitor
- Calibrated Instruments Ultragas SO_2 Monitor
- Meloy 285E SO_2 Analyzer
- Meloy SA-700 Fluorescent SO_2 Analyzer
- MSA LIRA Model 202S Infrared Analyzer
- Analytical Instrument Development, Inc. Model 340A Calibration System
- Shimadzu GC-Mini 2 Gas Chromatograph
- Thermo Environmental Model 10S NO_x Analyzer
- Thermo Oxygen Analyzer
- Teledyne Model 326 Oxygen Analyzer
- Thermo Environmental Model 48 Carbon Monoxide Analyzer
- Thermo Environmental Model 40 Sulfur Dioxide Analyzer
- Ratfisch Model RS 103 Total Hydrocarbon Analyzer
- Western Research Model 721AT Sulfur Dioxide Analyzer
- Horiba Model PIR 2000 Carbon Dioxide Analyzer
- Ratfisch Model RS 55 Total Hydrocarbon Analyzer
- J.U.M. Model VE-7 Total Hydrocarbon Analyzer
- Thermo Andersen Model FH 62 C14 Dust Monitor

JERVEY C. CHEVEALLIER; Manager, Baton Rouge Operations

Education	B. S. in Wildlife and Fisheries, 1994; Louisiana State University; Baton Rouge, Louisiana.
Professional Training Courses	Attended 40-hour Occupational and Environmental training program on Hazardous Materials (CFR 1910.120) in Baton Rouge, Louisiana, March of 1999. Attended an 8-hour refresher course for CFR 1910.120 (given annually).
Certifications	Certified Visible Emissions Evaluator Certified in First Aid/CPR HAZMAT certified
Technical Experience	Participated in the sampling of over 500 sources (50 of which were trial burns). Serving in the supervisory capacity of over 300 sources, including several of which were sampled simultaneously using more than one sampling train. Thoroughly trained in all EPA testing procedures, 1996-present. Testing experience in various industries such as: • Power generation, • Cement, • Glass, • Food, • Oil and gas, • Pulp and paper, • Chemical, and • Incineration Supervised projects for Owens Brockway in Atlanta, Georgia; First Chemical in Pascagoula, Mississippi; U. S. Alliance in Coosa Pines, Alabama; and Pepperidge Farms in Richmond, Utah.

(continued)

CHEVEALLIER, Jervey (cont'd)

Technical Experience (cont'd)

Over three years experience with EPA and Texas Air Control Board (TACB) methods of sampling stationary sources.

Thoroughly trained in the following EPA Methods: CFR Title 40, Chapter 1, Part 60, EPA Methods 1 through 17, 20, 23, 25A, 26A, and 29.

Experience with sampling EPA Methods 0010, 23A, 0030, 0060, and 0061.

Experience with particle-size sampling with the Andersen impactor method.

Has performed on-site analysis for gravimetric particulate, sulfur trioxide and sulfur dioxide.

Experienced in the sampling of commercial calibration gas cylinders for sulfur dioxide, oxides of nitrogen, carbon dioxide, oxygen, and carbon monoxide.

Thoroughly trained in the operation and routine maintenance of the following:

- Thermo Environmental Model 10S Oxides of Nitrogen Analyzer
- Thermo Environmental Model 48 Carbon Monoxide Analyzer
- Teledyne Model 326 Oxygen Analyzer
- Western Research Model 721M Sulfur Dioxide Analyzer

(continued)

CHEVEALLIER, Jervey (cont'd)

Technical Experience (cont'd)

- Horiba Model PIR 2000 Carbon Dioxide Analyzer
- J.U.M. Model VE-7 Total Hydrocarbon Analyzer
- ESC Data Acquisition System
- Thoroughly trained in the calibration techniques for all field testing equipment.

DANIEL MOORE; Environmental Scientist III

Education	Process Technician, October 2000; Louisiana Technical College, River Parishes Campus.
Certifications	Certified Visible Emissions Evaluator HAZMAT certified Adult CPR certified Standard First Aid certified
Technical Experience	Participated in the sampling of over 100 sources, including several of which were sampled simultaneously using more than one sampling train. Thoroughly trained in all EPA testing procedures, 2001-present.