MONTROSE
AIR QUALITY SERVICES

August 2, 2017
R1415252

Mr. Greg Studer
Desert View Power
62-300 Gene Welmas Drive
Mecca, CA 92254-0758

Subject: Quarterly CGA Units 1 and 2

Dear Greg:

This letter presents the results of the Continuous Emission Monitoring System (CEMS) quarterly test audit conducted by Dave Wonderly of Delta Air Quality Services (Delta), an affiliate of Montrose Air Quality Services, LLC (MAQS), on August 1, 2017 Delta was contracted by Desert View Power to perform this audit. The program consists of a Cylinder Gas Audit (CGA) for unit 1 and 2 on the NO_x, CO, SO_2, and O_2 monitors in accordance with 40 CFR Part 60 Appendix F Section 5.1.2.

The CGA comprised of challenging the entire unit CEMS, as close to the tip of the probe as possible, with NBS traceable gases of known concentration. The gases were injected at the probe through previously installed audit ports.

Two audit gases per monitor range were selected according to the requirements of Appendix F. Each monitor was challenged by each of its two gases three separate times. The accuracy was calculated two ways. By the percent difference between the actual known gas concentration and the average value read by the monitor, and the difference in ppm from actual known gas concentration and the average value read by the monitor. Results are shown in the attached tables (Tables 1 and 2).

The results of the CGA demonstrate that the CEMS was operating within the EPA quality assurance specification of either 15% accuracy or 5 ppm difference for all parameters. All data, including gas bottle certifications and monitor response data sheets, are provided as an attachment. If you have any questions or comments, please do not hesitate to call me at 714-279-6777.

Sincerely,

Dave Wonderly
Program Manager

DW/rcr
Attachments

1631 E. St. Andrew Pl. • Santa Ana, California 92705 • www.montrose-env.com
Phone (714) 242-8240 • Fax (714) 242) 9081

TABLE 1
CYLINDER GAS AUDIT RESULTS
UNIT 1
DESERT VIEW POWER
August 1, 2017

Parameter	Accuracy, % of Gas Value	Accuracy Acceptance Criteria	Difference From Gas Value, ppm	Difference Acceptance Criteria	Status*
SO_2 Low Range (mid span)	-3.8%	15%	-1.06	5 ppm	Pass
SO_2 Low range (low span)	-2.3%	15%	-0.29	5 ppm	Pass
NO_x Low range (mid span)	-2.4%	15%	-1.34	5 ppm	Pass
NO_x Low range(low span)	1.2%	15%	0.30	5 ppm	Pass
CO Low Range (mid span)	5.1%	15%	2.81	5 ppm	Pass
CO Low Range (low span)	12.0%	15%	3.00	5 ppm	Pass
O_2 (mid span)	-0.4%	15%	N/A	N/A	Pass
O_2 (low span)	-0.1%	15%	N/A	N/A	Pass
SO_2 High Range (mid span)	-1.1%	15%	-2.97	5 ppm	Pass
SO_2 High Range (low span)	1.8%	15%	2.26	5 ppm	Pass
NO_x High Range (mid span)	0.5%	15%	1.49	5 ppm	Pass
NO_x High Range (low span)	0.3%	15%	0.34	5 ppm	Pass
CO High Range (mid span)	4.4%	15%	11.99	5 ppm	Pass
CO High Range (low span)	9.1%	15%	11.81	5 ppm	Pass

*** Pass if accuracy less than 15% or within 5 ppm and O_2 accuracy is less than 15%**

TABLE 2
CYLINDER GAS AUDIT RESULTS
UNIT 2
DESERT VIEW POWER
August 1, 2017

Parameter	Accuracy, % of Gas Value	Accuracy Acceptance Criteria	Difference From Gas Value, ppm	Difference Acceptance Criteria	Status*
SO_2 Low Range (mid span)	-6.4%	15%	-1.78	5 ppm	Pass
SO_2 Low range (low span)	-2.7%	15%	-0.32	5 ppm	Pass
NO_x Low range (mid span)	-1.7%	15%	-0.94	5 ppm	Pass
NO_x Low range(low span)	3.7%	15%	0.95	5 ppm	Pass
CO Low Range (mid span)	0.6%	15%	0.36	5 ppm	Pass
CO Low Range (low span)	3.9%	15%	0.98	5 ppm	Pass
O_2 (mid span)	-0.5%	15%	NA	NA	Pass
O_2 (low span)	0.1%	15%	NA	NA	Pass
SO_2 High Range (mid span)	-1.2%	15%	-3.19	5 ppm	Pass
SO_2 High Range (low span)	-0.5%	15%	-0.61	5 ppm	Pass
NO_x High Range (mid span)	1.1%	15%	2.91	5 ppm	Pass
NO_x High Range (low span)	2.2%	15%	2.73	5 ppm	Pass
CO High Range (mid span)	2.3%	15%	6.33	5 ppm	Pass
CO High Range (low span)	4.9%	15%	6.43	5 ppm	Pass

* Pass if accuracy less than 15% or within 5 ppm and O_2 accuracy is less than 15%

CYLINDER GAS AUDIT
WORK SHEET

NORMAL RANGE

	NOx ppm		CO ppm		SO2 ppm		O2 %	
Reference Gas	Point 1	Point 2	Point 1	Point 2	Point 1	Point 2	Point 1	Point 2
Concentration	25.3	56.9	25.1	55.3	12.2	27.8	5.05	10.16
Replicate								
1	25.84	55.80	26.30	55.97	11.04	25.84	5.05	10.11
2	26.23	56.03	26.16	55.64	12.19	26.05	5.06	10.11
3	26.67	56.04	25.78	55.36	12.40	26.17	5.06	10.12
Average	26.25	55.96	26.08	55.66	11.88	26.02	5.06	10.11
Difference, ppm	0.95	-0.94	0.98	0.36	-0.32	-1.78	n/a	n/a
Accuracy	3.7%	-1.7%	3.9%	0.6%	-2.7%	-6.4%	0.1%	-0.5%

Client: Colmac
Location: Mecca
Date: 8/1/2017

Unit No: 2
Data By: DW

HIGH RANGE

	NOx ppm		CO ppm		SO2 ppm	
Reference Gas	Point 1	Point 2	Point 1	Point 2	Point 1	Point 2
Concentration	124	274	130	274	124	274.0
Replicate						
1	126.09	276.68	135.62	279.87	115.62	270.20
2	126.96	276.76	136.62	280.30	126.74	270.66
3	127.13	277.28	137.05	280.82	127.82	271.58
Average	126.73	276.91	136.43	280.33	123.39	270.81
Difference, ppm	2.73	2.91	6.43	6.33	-0.61	-3.19
Accuracy	2.2%	1.1%	4.9%	2.3%	-0.5%	-1.2%

Client: **DESERT VIEW POWER**
Location: **Mecca**
Date: 8/1/2017

Unit No: **Boiler 1&2**
Data By: **Dave Wonderly**

Instrument	NOx ppm Low Range		SO2 ppm Low Range		O2 %		CO ppm Low Range	
Range	100		50		25		100	
Gas Specification	Point 1	Point 2	Point 1	Point 2	Point 1	Point 2	Point 1	Point 2
Min	20	50	20	50	4	8	20	50
Max	30	60	30	60	6	12	30	60
Units	% FS	% FS	% FS	% FS	% O2	% O3	% FS	% FS
Gas Requirement	ppm NOx	ppm NOx	ppm SO2	ppm SO2	% O2	% O2	ppm CO	ppm CO
Min	**20**	**50**	**10**	**25**	**4**	**8**	**20**	**50**
Max	**30**	**60**	**15**	**30**	**6**	**12**	**30**	**60**
Gas Used	25.3	56.9	12.2	27.8	5.05	10.16	25.1	55.3
% of Range	25%	57%	24%	56%	20%	41%	25%	55%
Status	OK	OK	OK	OK	OK	OK	OK	OK
Cylinder No.	CC358132	SA6514	CC31695	CC99793	CC16105	SA9922	CC16105	SA9922
Ending Pressure								
Exp Date								

Instrument	NOx ppm High Range		SO2 ppm High Range		CO ppm High Range	
Range	500		500		500	
Gas Specification	Point 1	Point 2	Point 1	Point 2	Point 1	Point 2
Min	20	50	20	50	20	50
Max	30	60	30	60	30	60
Units	% FS	% FS	% FS	% FS	% FS	% FS
Gas Requirement	ppm NOx	ppm NOx	ppm SO2	ppm SO2	ppm CO	ppm CO
Min	**100**	**250**	**100**	**250**	**100**	**250**
Max	**150**	**300**	**150**	**300**	**150**	**300**
Gas Used	124	274	124	274	130	274
% of Range	25%	55%	25%	55%	26%	55%
Status	OK	OK	OK	OK	OK	OK
Cylinder No.	CC318251	CC121194	CC318251	CC121194	CC318251	CC121194
Ending Pressure	1500	empty	1500	500	1500	500
Exp Date	6/29/2021	6/13/2021	6/29/2021	6/13/2021	6/29/2021	6/13/2021

CYLINDER GAS AUDIT
WORK SHEET

CeDAR 1-Minute Data
Data for 8/1/2017 8:43 AM thru 8/1/2017 9:35 AM

Timestamp	(Boiler 1) NOx ppm 1-Min	(Boiler 1) SO2 ppm 1-Min	(Boiler 1) CO ppm 1-Min	(Boiler 1) O2% 1-Min	(Boiler 2) NOx ppm 1-Min	(Boiler 2) SO2 ppm 1-Min	(Boiler 2) CO ppm 1-Min	(Boiler 2) O2% 1-Min
8/1/2017 8:43	33.69	5.97	13.67	7.32	41.2	17.39	22.01	6.42
8/1/2017 8:44	0.26	1.14	28.4	5.05	1.58	3.63	26.22	5.05
8/1/2017 8:45	0	0.6	28.34	5.04	1.09	2.47	26.3	5.05
8/1/2017 8:46	0	0.33	38.9	7.89	1.15	1.86	37.25	8.11
8/1/2017 8:47	0	0.24	58.42	10.12	0.83	1.6	55.97	10.11
8/1/2017 8:48	0.16	0.13	47.1	7.18	0.97	1.14	43.86	6.87
8/1/2017 8:49	0	0.13	28.16	5.05	0.6	0.98	26.16	5.06
8/1/2017 8:50	0.04	0.05	41.81	8.48	0.88	0.73	40.27	8.73
8/1/2017 8:51	0	0.11	58.14	10.12	1.18	0.59	55.64	10.11
8/1/2017 8:52	0	0.06	44.33	6.76	1.12	0.41	40.99	6.45
8/1/2017 8:53	0	0.11	27.8	5.05	0.92	0.47	25.78	5.06
8/1/2017 8:54	0	0.03	40.64	8.27	1.05	0.28	39.08	8.56
8/1/2017 8:55	0	0.06	57.78	10.13	0.81	0.25	55.36	10.12
8/1/2017 8:56	0	3.56	34.73	3.82	1	5.45	30.94	3.24
8/1/2017 8:57	0	10.53	2.84	0	0.95	11.04	0.26	0.02
8/1/2017 8:58	0.22	17.64	2.9	0	1.11	18.63	0.37	0.03
8/1/2017 8:59	0.02	26.36	2.81	0	1.09	25.84	0.2	0.01
8/1/2017 9:00	0.01	20.51	2.84	0	1.13	18.94	0.16	0.01
8/1/2017 9:01	0.21	12.4	2.89	0	1.04	12.19	0.12	0.01
8/1/2017 9:02	0.19	18.56	2.97	0	1.34	19.27	0.11	0
8/1/2017 9:03	0.22	26.83	2.93	0	1.41	26.05	0.13	0
8/1/2017 9:04	0.15	20.82	3.09	0	1.29	18.88	0.18	0
8/1/2017 9:05	0.12	12.81	3.14	0	0.93	12.4	0.06	0.01
8/1/2017 9:06	0.12	18.86	3.29	0	1.31	19.6	0.09	0
8/1/2017 9:07	0.24	27.03	3.29	0	1.28	26.17	0.12	0
8/1/2017 9:08	8.8	16.73	3.38	0	12.16	13.41	0.17	0
8/1/2017 9:09	25.51	2.14	3.54	0	25.84	1.42	0.33	0
8/1/2017 9:10	35.54	1.07	3.74	0	38.73	0.68	0.36	0
8/1/2017 9:11	55.42	0.68	3.83	0	55.8	0.31	0.45	0
8/1/2017 9:12	45.19	0.4	3.94	0	42.33	0.11	0.34	0
8/1/2017 9:13	25.69	0.52	4.07	0	26.23	0.09	0.31	0
8/1/2017 9:14	36.64	0.33	4.14	0	39.87	0	0.42	0
8/1/2017 9:15	55.78	0.28	4.38	0	56.03	0	0.54	0
8/1/2017 9:16	45.3	0.25	4.48	0	42.57	0	0.7	0
8/1/2017 9:17	25.6	0.3	4.64	0	26.67	0	0.54	0
8/1/2017 9:18	35.85	0.28	4.77	0	39.35	0	0.76	0
8/1/2017 9:19	55.48	0.26	4.9	0	56.04	0	0.81	0
8/1/2017 9:20	79.09	56.66	63.27	0	129.16	68.5	62.27	0
8/1/2017 9:21	123.64	119.11	140.7	0	126.09	115.62	135.62	0
8/1/2017 9:22	175.2	191.73	201.73	0	191.21	196.26	198.4	0
8/1/2017 9:23	275.42	267.53	284.95	0	276.33	266.7	279.69	0
8/1/2017 9:24	275.69	270.94	285.29	0	276.68	270.2	279.87	0
8/1/2017 9:25	221.55	199.55	221.87	0	206.95	190.89	213.06	0
8/1/2017 9:26	124.59	129.52	142.01	0	126.96	126.74	136.62	0
8/1/2017 9:27	180.21	201.86	207.1	0	196.6	206.42	203.57	0

CYLINDER GAS AUDIT
WORK SHEET

8/1/2017 9:28	275.76	270.59	285.92	0	276.76	270.66	280.3	0
8/1/2017 9:29	223.84	201.82	224.51	0	209.44	193.7	215.54	0
8/1/2017 9:30	124.8	130.14	142.71	0	127.13	127.82	137.05	0
8/1/2017 9:31	180.95	203.5	208.21	0	197.48	208.43	204.84	0
8/1/2017 9:32	275.03	271.56	286.76	0	277.28	271.58	280.82	0
8/1/2017 9:33	275.81	273.83	287.04	0	277.25	273.65	281.18	0

CYLINDER GAS AUDIT
WORK SHEET

Client: DESERT VIEW POWER
Location: Mecca

Unit No: 1
Data By: DW

Date: 8/1/2017

NORMAL RANGE

	NOx ppm		CO ppm		SO2 ppm		O2 %	
Reference Gas	Point 1	Point 2	Point 1	Point 2	Point 1	Point 2	Point 1	Point 2
Concentration	25.3	56.9	25.1	55.3	12.2	27.8	5.05	10.16
Replicate								
1	25.51	55.42	28.34	58.42	10.53	26.36	5.04	10.12
2	25.69	55.78	28.16	58.14	12.40	26.83	5.05	10.12
3	25.60	55.48	27.80	57.78	12.81	27.03	5.05	10.13
Average	25.60	55.56	28.10	58.11	11.91	26.74	5.05	10.12
Difference, ppm	0.30	-1.34	3.00	2.81	-0.29	-1.06	n/a	n/a
Accuracy	1.2%	-2.4%	12.0%	5.1%	-2.3%	-3.8%	-0.1%	-0.4%

Client: Colmac
Location: Mecca
Date: 8/1/2017

Unit No: 1
Data By: DW

HIGH RANGE

	NOx ppm		CO ppm		SO2 ppm	
Reference Gas	Point 1	Point 2	Point 1	Point 2	Point 1	Point 2
Concentration	124	274	130	274	124	274.0
Replicate						
1	123.64	275.69	140.70	285.29	119.11	270.94
2	124.59	275.76	142.01	285.92	129.52	270.59
3	124.80	275.03	142.71	286.76	130.14	271.56
Average	124.34	275.49	141.81	285.99	126.26	271.03
Difference, ppm	0.34	1.49	11.81	11.99	2.26	-2.97
Accuracy	0.3%	0.5%	9.1%	4.4%	1.8%	-1.1%

Client: Colmac
Location: Mecca
Date: 8/1/2017

Unit No: 2
Data By: DW

PRAXAIR

Praxair
5700 South Alameda Street
Los Angeles, CA 90058
Tel: (323) 585-2154 Fax:(714) 542-6689
PGVPID: F22015

DocNumber: 000080292

CERTIFICATE OF ANALYSIS / EPA PROTOCOL GAS

Customer & Order Information:

PRAXAIR WHSE INDIO CA
84481 CABAZON RD
INDIO CA 922010

Praxair Order Number: 31160350
Customer P. O. Number: 05518359
Customer Reference Number:

Fill Date: 5/15/2015
Part Number: EV NICOOXE55-AS
Lot Number: 106513509
Cylinder Style & Outlet: AS CGA 350
Cylinder Pressure & Volume: 2000 psig 140 cu. ft.

Certified Concentration:

Expiration Date: 5/22/2023
Cylinder Number: CC16105

			NIST Traceable Analytical Uncertainty:
25.1	ppm	CARBON MONOXIDE	± 0.5 %
5.05	%	OXYGEN	± 0.4 %
	Balance	NITROGEN	

Certification Information: Certification Date: 5/22/2015 Term: 96 Months Expiration Date: 5/22/2023

This cylinder was certified according to the 2012 EPA Traceability Protocol, Document #EPA-600/R-12/531, using Procedure G1. Do Not Use this Standard if Pressure is less than 100 PSIG.

Analytical Data: (R=Reference Standard, Z=Zero Gas, C=Gas Candidate)

1. Component: CARBON MONOXIDE

Requested Concentration: 25 ppm
Certified Concentration: 25.1 ppm
Instrument Used: Horiba VIA-510 S/N 576876015
Analytical Method: NDIR
Last Multipoint Calibration: 4/23/2015

Reference Standard Type: GMIS
Ref. Std. Cylinder # : CC123291
Ref. Std. Conc: 25.0 ppm
Ref. Std. Traceable to SRM # : 2635a
SRM Sample # : 58-E-34
SRM Cylinder # : FF10666

First Analysis Data: Date: 5/22/2015

Z:	0	R:	25	C:	25.2	Conc:	25.2
R:	25	Z:	0	C:	25	Conc:	25
Z:	0	C:	25.1	R:	25	Conc:	25.1

UOM: ppm Mean Test Assay: 25.1 ppm

Second Analysis Data: Date:

Z:	0	R:	0	C:	0	Conc:	0
R:	0	Z:	0	C:	0	Conc:	0
Z:	0	C:	0	R:	0	Conc:	0

UOM: ppm Mean Test Assay: 0 ppm

2. Component: OXYGEN

Requested Concentration: 5 %
Certified Concentration: 5.05 %
Instrument Used: OXYMAT 5E
Analytical Method: PARAMAGNETIC
Last Multipoint Calibration: 4/30/2015

Reference Standard Type: GMIS
Ref. Std. Cylinder # : CC240877
Ref. Std. Conc: 5.00%
Ref. Std. Traceable to SRM # : 2658a
SRM Sample # : 72-D-28
SRM Cylinder # : CAL016862

First Analysis Data: Date: 5/22/2015

Z:	0	R:	5	C:	5.05	Conc:	5.05
R:	5	Z:	0	C:	5.06	Conc:	5.06
Z:	0	C:	5.05	R:	5	Conc:	5.05

UOM: % Mean Test Assay: 5.053 %

Second Analysis Data: Date:

Z:	0	R:	0	C:	0	Conc:	0
R:	0	Z:	0	C:	0	Conc:	0
Z:	0	C:	0	R:	0	Conc:	0

UOM: % Mean Test Assay: 0 %

Analyzed by: Matthew Angerer
Matthew Angerer

Certified by: Ying Fu

Information contained herein has been prepared at your request by qualified experts within Praxair Distribution, Inc. While we believe that the information is accurate within the limits of the analytical methods employed and is complete to the extent of the specific analyses performed, we make no warranty or representation as to the suitability of the use of the information for any purpose. The information is offered with the understanding that any use of the information is at the sole discretion and risk of the user. In no event shall the liability of Praxair Distribution, Inc., arising out of the use of the information contained herein exceed the fee established for providing such information.

PRAXAIR

Praxair
5700 South Alameda Street
Los Angeles, CA 90058
Tel: (323) 585-2154 Fax:(714) 542-6689
PGVPID: F22015

DocNumber: 000080290

CERTIFICATE OF ANALYSIS / EPA PROTOCOL GAS

Customer & Order Information:

PRAXAIR WHSE INDIO CA
84481 CABAZON RD
INDIO CA 922010

Praxair Order Number: 31180468
Customer P. O. Number: 05518367
Customer Reference Number:

Fill Date: 5/18/2015
Part Number: EV NICOOXE54-A8
Lot Number: 109513908
Cylinder Style & Outlet: A8 CGA 590
Cylinder Pressure & Volume: 2000 psig 140 cu. ft.

Certified Concentration:

Expiration Date: 5/22/2023
Cylinder Number: SA9922

			NIST Traceable Analytical Uncertainty:
55.3	ppm	CARBON MONOXIDE	± 0.4 %
10.16	%	OXYGEN	± 0.4 %
	Balance	NITROGEN	

Certifcation Information: Certification Date: 5/22/2015 Term: 96 Months Expiration Date: 5/22/2023

This cylinder was certified according to the 2012 EPA Traceabillty Protocol, Document #EPA-600/R-12/531, using Procedure G1. Do Not Use this Standard if Pressure is less than 100 PSIG.

Analytical Data: (R=Reference Standard, Z=Zero Gas, C=Gas Candidate)

1. Component: CARBON MONOXIDE

Requested Concentration: 55 ppm
Certified Concentration: 55.3 ppm
Instrument Used: Horiba VIA-510 S/N 576876015
Analytical Method: NDIR
Last Multipoint Calibration: 4/23/2015

Reference Standard Type: GMIS
Ref. Std. Cylinder # : CC243411
Ref. Std. Conc: 50.0 ppm
Ref. Std. Traceable to SRM # : 1678c
SRM Sample # : 04-L-41
SRM Cylinder # : FF18402

First Analysis Data: Date: 5/22/2015

Z:	0	R:	50	C:	55.5	Conc:	55.5
R:	50	Z:	0	C:	55.2	Conc:	55.2
Z:	0	C:	55.2	R:	50	Conc:	55.2

UOM: ppm Mean Test Assay: 55.3 ppm

Second Analysis Data: Date:

Z:	0	R:	0	C:	0	Conc:	0
R:	0	Z:	0	C:	0	Conc:	0
Z:	0	C:	0	R:	0	Conc:	0

UOM: ppm Mean Test Assay: 0 ppm

2. Component: OXYGEN

Requested Concentration: 10 %
Certified Concentration: 10.16 %
Instrument Used: OXYMAT 5E
Analytical Method: PARAMAGNETIC
Last Multipoint Calibration: 4/30/2015

Reference Standard Type: GMIS
Ref. Std. Cylinder # : CC240893
Ref. Std. Conc: 10.00%
Ref. Std. Traceable to SRM # : 2658a
SRM Sample # : 72-D-28
SRM Cylinder # : CAL016862

First Analysis Data: Date: 5/22/2015

Z:	0	R:	10	C:	10.16	Conc:	10.16
R:	10	Z:	0	C:	10.16	Conc:	10.16
Z:	0	C:	10.16	R:	10	Conc:	10.16

UOM: % Mean Test Assay: 10.16 %

Second Analysis Data: Date:

Z:	0	R:	0	C:	0	Conc:	0
R:	0	Z:	0	C:	0	Conc:	0
Z:	0	C:	0	R:	0	Conc:	0

UOM: % Mean Test Assay: 0 %

Analyzed by: Nassim Haddad

Certified by: Ying Yu

Information contained herein has been prepared at your request by qualified experts within Praxair Distribution, Inc. While we believe that the information is accurate within the limits of the analytical methods employed and is complete to the extent of the specific analyses performed, we make no warranty or representation as to the suitability of the use of the information for any purpose. The information is offered with the understanding that any use of the information is at the sole discretion and risk of the user. In no event shall the liability of Praxair Distribution, Inc., arising out of the

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Praxair
5700 South Alameda Street
Los Angeles, CA 90058
Tel: (323) 585-2154 Fax:(714) 542-6689
PGVPID: F22015

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CERTIFICATE OF ANALYSIS / EPA PROTOCOL GAS

Customer & Order Information:

PRAXAIR WHSE INDIO CA
84481 CABAZON RD
INDIO CA 922010

Praxair Order Number: 31160285
Customer P. O. Number: 05518343
Customer Reference Number:

Fill Date: 5/4/2015
Part Number: EV NISD12ME-AS
Lot Number: 109512403
Cylinder Style & Outlet: AS CGA 660
Cylinder Pressure & Volume: 2000 psig 140 cu. ft.

Certified Concentration:

Expiration Date:	5/19/2019		NIST Traceable Analytical Uncertainty:
Cylinder Number:	CC31695		
12.2	ppm	SULFUR DIOXIDE	± 1.1 %
	Balance	NITROGEN	

Certifcation Information: *Certification Date:* 5/19/2015 *Term:* 48 Months *Expiration Date:* 5/19/2019

This cylinder was certified according to the 2012 EPA Traceability Protocol, Document #EPA-600/R-12/531, using Procedure G1. Do Not Use this Standard if Pressure is less than 100 PSIG.

Analytical Data: (R=Reference Standard Z=Zero Gas, C=Gas Candidate)

1. Component: SULFUR DIOXIDE

Requested Concentration: 12 ppm
Certified Concentration: 12.2 ppm
Instrument Used: Ametek 921CE S/N AW-921-S321
Analytical Method: Ultraviolet Absorption
Last Multipoint Calibration: 4/27/2015

Reference Standard Type: GMIS
Ref. Std. Cylinder #: CC362421
Ref. Std. Conc: 10.02 ppm
Ref. Std. Traceable to SRM #: 1689
SRM Sample #: 98-A-26
SRM Cylinder #: FF40552

First Analysis Data: Date: 5/12/2015

Z:	0	R:	99	C:	121.3	Conc:	12.261
R:	99.2	Z:	0	C:	121.1	Conc:	12.24
Z:	0	C:	121	R:	99.2	Conc:	12.23

UOM: ppm Mean Test Assay: 12.244 ppm

Second Analysis Data: Date: 5/19/2015

Z:	0	R:	100.3	C:	120.3	Conc:	12.038
R:	100	Z:	0	C:	121	Conc:	12.108
Z:	0	C:	120.8	R:	100.1	Conc:	12.088

UOM: ppm Mean Test Assay: 12.078 ppm

Analyzed by: Nelson M. Nelson Ma

Certified by: N. Haddad Nassim Haddad

Information contained herein has been prepared at your request by qualified experts within Praxair Distribution, Inc. While we believe that the information is accurate within the limits of the analytical methods employed and is complete to the extent of the specific analyses performed, we make no warranty or representation as to the suitability of the use of the information for any purpose. The information is offered with the understanding that any use of the information is at the sole discretion and risk of the user. In no event shall the liability of Praxair Distribution, Inc., arising out of the use of the information contained herein exceed the fee established for providing such information.

PRAXAIR

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5700 South Alameda Street
Los Angeles, CA 90058
Tel: (323) 585-2154 Fax:(714) 542-6689
PGVPID: F22015

DocNumber: 000081865

CERTIFICATE OF ANALYSIS / EPA PROTOCOL GAS

Customer & Order Information:

PRAXAIR WHSE INDIO CA
84481 CABAZON RD
INDIO CA 922010

Praxair Order Number: 31735123
Customer P. O. Number: 05611934
Customer Reference Number:

Fill Date: 7/10/2015
Part Number: NI SD27.5ME-AS
Lot Number: 109519108
Cylinder Style & Outlet: AS CGA 660
Cylinder Pressure & Volume: 2000 psig 140 cu. ft.

Certified Concentration:

Expiration Date:	7/24/2019		NIST Traceable
Cylinder Number:	CC99793		Analytical Uncertainty:
27.8	ppm	SULFUR DIOXIDE	± 1 %
	Balance	NITROGEN	

Certifcation Information: *Certification Date:* 7/24/2015 *Term:* 48 Months *Expiration Date:* 7/24/2019
This cylinder was certified according to the 2012 EPA Traceability Protocol Document #EPA-600/R-12/531, using Procedure G1. Do Not Use this Standard if Pressure is less than 100 PSIG.

Analytical Data: *(R=Reference Standard, Z=Zero Gas, C=Gas Candidate)*

1. Component: SULFUR DIOXIDE

Requested Concentration: 27.5 ppm
Certified Concentration: 27.8 ppm
Instrument Used: Ametek 921CE S/N AW-921-S321
Analytical Method: Ultraviolet Absorption
Last Multipoint Calibration: 5/25/2015

Reference Standard Type: NTRM
Ref. Std. Cylinder #: CC72909
Ref. Std. Conc: 48.58 ppm
Ref. Std. Traceable to SRM #: N/A
SRM Sample #: 120701
SRM Cylinder #: N/A

First Analysis Data: Date: 7/17/2015

Z:	0	R:	489.7	C:	280.9	Conc:	27.851
R:	490.2	Z:	0	C:	280.6	Conc:	27.821
Z:	0	C:	281.1	R:	490	Conc:	27.871

UOM: ppm Mean Test Assay: 27.848 ppm

Second Analysis Data: Date: 7/24/2015

Z:	0	R:	490	C:	279.6	Conc:	27.877
R:	491.3	Z:	0	C:	281.9	Conc:	27.905
Z:	0	C:	281.3	R:	491	Conc:	27.845

UOM: ppm Mean Test Assay: 27.809 ppm

Analyzed by: Nassim Haddad

Certified by: Nelson Ma

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Praxair
3700 South Alameda Street
Los Angeles, CA 90058
Tel: (323) 585-2154 Fax:(714) 542-6619
PGVPID: F22015

DocNumber: 000079735

CERTIFICATE OF ANALYSIS / EPA PROTOCOL GAS

Customer & Order Information:

PRAXAIR WHSE INDIO CA
84481 CABAZON RD
INDIO CA 922010

Praxair Order Number: 31160553
Customer P. O. Number: 05518383
Customer Reference Number:

Fill Date: 5/4/2015
Part Number: NI NO55ME-AS
Lot Number: 109512404
Cylinder Style & Outlet: AS CGA 660
Cylinder Pressure & Volume: 2000 psig 140 cu. ft.

Certified Concentration:

Expiration Date:	5/15/2023		NIST Traceable
Cylinder Number:	SA6514		Analytical Uncertainty:
56.2	ppm	NITRIC OXIDE	± 0.7 %
	Balance	NITROGEN	

NOx = 56.9 ppm

NOx for Reference Only

Certifcation Information: *Certification Date:* 5/15/2015 *Term:* 96 Months *Expiration Date:* 5/15/2023

This cylinder was certified according to the 2012 EPA Traceability Protocol, Document #EPA-600/R-12/531, using Procedure G1. Do Not Use this Standard if Pressure is less than 100 PSIG.

Analytical Data: *(R=Reference Standard, Z=Zero Gas, C=Gas Candidate)*

1. **Component:** NITRIC OXIDE

Requested Concentration: 55 ppm
Certified Concentration: 56.2 ppm
Instrument Used: Thermo Electron 42i S/N 072602432C
Analytical Method: Chemiluminescence
Last Multipoint Calibration: 5/4/2015

First Analysis Data:						Date:	5/8/2015
Z:	0	R:	100.2	C:	55.9	Conc:	55.9
R:	100.2	Z:	0	C:	56.3	Conc:	56.3
Z:	0	C:	56.3	R:	100.2	Conc:	56.3
UOM:	ppm			Mean Test Assay:			56.167 ppm

Analyzed by: Jacquelyne Fiero

Reference Standard Type: GMIS
Ref. Std. Cylinder #: CC207152
Ref. Std. Conc: 100.2 PPM
Ref. Std. Traceable to SRM #: 1684b
SRM Sample #: 44-T-20
SRM Cylinder #: FF6010

Second Analysis Data:						Date:	5/15/2015
Z:	0	R:	100.2	C:	56.3	Conc:	56.3
R:	100.2	Z:	0	C:	56.2	Conc:	56.2
Z:	0	C:	55.9	R:	100.2	Conc:	55.9
UOM:	ppm			Mean Test Assay:			56.133 ppm

Certified by: Matthew Angerer

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5700 South Alameda Street
Los Angeles, CA 90058
Tel: (323) 585-2154 Fax:(714) 542-6689
PGVPID: F22015

DocNumber: 000079837

CERTIFICATE OF ANALYSIS / EPA PROTOCOL GAS

Customer & Order Information:

PRAXAIR WHSE INDIO CA
84481 CABAZON RD
INDIO CA 922010

Praxair Order Number: 31160500
Customer P. O. Number: 05518378
Customer Reference Number:

Fill Date: 5/4/2015
Part Number: NI NO25ME-AS
Lot Number: 109512412
Cylinder Style & Outlet: AS CGA 660
Cylinder Pressure & Volume: 2000 psig 140 cu. ft.

Certified Concentration:

Expiration Date:	5/18/2018		NIST Traceable
Cylinder Number:	CC358132		Analytical Uncertainty:
25.1	ppm	NITRIC OXIDE	± 1 %
Balance		NITROGEN	

NOx = 25.3 ppm

NOx for Reference Only

Certification Information: *Certification Date:* 5/18/2015 *Term:* 36 Months *Expiration Date:* 5/18/2018

This cylinder was certified according to the 2012 EPA Traceability Protocol, Document #EPA-600/R-12/531, using Procedure G1. Do Not Use this Standard if Pressure is less than 100 PSIG.

Analytical Data: *(R=Reference Standard, Z=Zero Gas, C=Gas Candidate)*

1. Component: NITRIC OXIDE

Requested Concentration	25 ppm
Certified Concentration	25.1 ppm
Instrument Used:	Thermo Electron 42i-LS-S/N 1030645077
Analytical Method:	Chemiluminescence
Last Multipoint Calibration:	4/27/2015

First Analysis Data:							Date:	5/11/2015
Z:	0	R:	20.2	C:	25.2	Conc:	25.2	
R:	20.2	Z:	0	C:	25.2	Conc:	25.2	
Z:	0	C:	25.2	R:	20.2	Conc:	25.2	
UOM:	ppm			Mean Test Assay:			25.2 ppm	

Reference Standard Type:	GMIS
Ref. Std. Cylinder # :	CC457637
Ref. Std. Conc:	20.2 ppm
Ref. Std. Traceable to SRM # :	2629e
SRM Sample # :	50-G-17
SRM Cylinder # :	FF31891

Second Analysis Data:							Date:	5/18/2015
Z:	0	R:	20.2	C:	25.1	Conc:	25.1	
R:	20.2	Z:	0	C:	25.1	Conc:	25.1	
Z:	0	C:	25.1	R:	20.2	Conc:	25.1	
UOM:	ppm			Mean Test Assay:			25.1 ppm	

Analyzed by: Nelson Ma

Certified by: Nassim Haddad

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PRAXAIR

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5700 South Alameda Street
Los Angeles, CA 90058
Tel: (323) 585-2154 Fax:(714) 542-6689
PGVPID: F22014

DocNumber: 000071788

CERTIFICATE OF ANALYSIS / EPA PROTOCOL GAS

Customer & Order Information:

PRAXAIR WHSE INDIO CA
84481 CABAZON RD
INDIO CA 922010

Praxair Order Number: 28623632
Customer P. O. Number: 05125090
Customer Reference Number:

Fill Date: 9/18/2014
Part Number: EV NIX4E268-AS
Lot Number: 109426105
Cylinder Style & Outlet: AS CGA 660
Cylinder Pressure & Volume: 2000 psig 140 cu. ft.

Certified Concentration:

Expiration Date:	9/30/2022		NIST Traceable Analytical Uncertainty:
Cylinder Number:	CC318251		
130	ppm	CARBON MONOXIDE	± 0.6 %
124	ppm	NITRIC OXIDE	± 0.5 %
124	ppm	SULFUR DIOXIDE	± 0.6 %
	Balance	NITROGEN	

NOx = 124 ppm

NOx for Reference Only

Certifcation Information: *Certification Date:* 9/30/2014 *Term:* 96 Months *Expiration Date:* 9/30/2022

This cylinder was certified according to the 2012 EPA Traceability Protocol, Document #EPA-600/R-12/531, using Procedure G1. Do Not Use this Standard if Pressure is less than 100 PSIG.

Analytical Data: *(R=Reference Standard, Z=Zero Gas, C=Gas Candidate)*

1. Component: CARBON MONOXIDE

Requested Concentration: 125 ppm
Certified Concentration: 130 ppm
Instrument Used: HORIBA VIA-510 576 876 015
Analytical Method: NDIR
Last Multipoint Calibration: 9/12/2014

First Analysis Data: Date: 9/23/2014

Z:	0	R:	148.8	C:	130	Conc:	130
R:	148.8	Z:	0	C:	130	Conc:	130
Z:	0	C:	130	R:	148.8	Conc:	130

UOM: ppm Mean Test Assay: 130 ppm

Reference Standard Type: GMIS
Ref. Std. Cylinder #: CC181210
Ref. Std. Conc: 148.8 ppm
Ref. Std. Traceable to SRM #: 1679c
SRM Sample #: 3-J-30
SRM Cylinder #: CAL017865

Second Analysis Data: Date:

Z:	0	R:	0	C:	0	Conc:	0
R:	0	Z:	0	C:	0	Conc:	0
Z:	0	C:	0	R:	0	Conc:	0

UOM: ppm Mean Test Assay: 0 ppm

2. Component: NITRIC OXIDE

Requested Concentration: 125 ppm
Certified Concentration: 124 ppm
Instrument Used: Thermo Electron 42i S/N 072602432C
Analytical Method: Chemiluminescence
Last Multipoint Calibration: 9/7/2014

First Analysis Data: Date: 9/23/2014

Z:	0	R:	104.8	C:	124.6	Conc:	124.6
R:	104.8	Z:	0	C:	124.8	Conc:	124.8
Z:	0	C:	124.6	R:	104.8	Conc:	124.6

UOM: ppm Mean Test Assay: 124.67 ppm

Reference Standard Type: GMIS
Ref. Std. Cylinder #: SA20275
Ref. Std. Conc: 104.8 ppm
Ref. Std. Traceable to SRM #: 1684b
SRM Sample #: 44-T-20
SRM Cylinder #: FF6010

Second Analysis Data: Date: 9/30/2014

Z:	0	R:	104.8	C:	124.5	Conc:	124.5
R:	104.8	Z:	0	C:	124	Conc:	124
Z:	0	C:	124.2	R:	104.8	Conc:	124.2

UOM: ppm Mean Test Assay: 124.23 ppm

3. Component: SULFUR DIOXIDE

Requested Concentration: 125 ppm
Certified Concentration: 124 ppm
Instrument Used: HORIBA, VIA-510, 56946604
Analytical Method: NDIR11
Last Multipoint Calibration: 9/5/2014

First Analysis Data: Date: 9/23/2014

Z:	0	R:	251	C:	124	Conc:	124
R:	251	Z:	0	C:	124	Conc:	124
Z:	0	C:	124	R:	251	Conc:	124

UOM: ppm Mean Test Assay: 124 ppm

Reference Standard Type: GMIS
Ref. Std. Cylinder #: CC140671
Ref. Std. Conc: 251 ppm
Ref. Std. Traceable to SRM #: 1661a
SRM Sample #: 94-I-18
SRM Cylinder #: FF22307

Second Analysis Data: Date: 9/30/2014

Z:	0	R:	251	C:	124	Conc:	124
R:	251	Z:	0	C:	124	Conc:	124
Z:	0	C:	125	R:	251	Conc:	125

UOM: ppm Mean Test Assay: 124.33 ppm

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Praxair
5700 South Alameda Street
Los Angeles, CA 90058
Tel: (323) 585-2154 Fax:(714) 542-6689
PGVPID: F22013

DocNumber: 000055551

CERTIFICATE OF ANALYSIS / EPA PROTOCOL GAS

Customer & Order Information:

PRAXAIR WHSE INDIO CA
84481 CABAZON RD
INDIO CA 922010

Praxair Order Number: 24065203
Customer P. O. Number: 04456403
Customer Reference Number:

Fill Date: 5/16/2011
Part Number: EV NDX4E269-AS
Lot Number: 109113609
Cylinder Style & Outlet: AS CGA 660
Cylinder Pressure & Volume. 1800 psig 126 cu. ft.

Certified Concentration:

Expiration Date: 6/29/2021
Cylinder Number: CC121194

			NIST Traceable Analytical Uncertainty:
274	ppm	CARBON MONOXIDE	± 1 %
274	ppm	NITRIC OXIDE	± 0.5 %
274	ppm	SULFUR DIOXIDE	± 0.9 %
	Balance	NITROGEN	

NOx = 274 ppm

NOx for Reference Only

Certifcation Information: *Certification Date:* 6/29/2013 *Term:* 96 Months *Expiration Date:* 6/29/2021

This cylinder was certified according to the 2012 EPA Traceability Protocol Document #EPA-600/R-12/531, using Procedure G1. Do Not Use this Standard if Pressure is less than 100 PSIG.

Last certified concentration was [CO] = 274 ppm, [NO] = 274 ppm, [SO2] = 274 ppm and [NOx] = 274 ppm on 06/07/2011

Analytical Data: *(R=Reference Standard, Z=Zero Gas, C=Gas Candidate)*

1. **Component: CARBON MONOXIDE**

Requested Concentration: 275 ppm
Certified Concentration: 274 ppm
Instrument Used: Horiba VIA-510, S/N 577172043
Analytical Method: NDIR
Last Multipoint Calibration: 6/5/2013

First Analysis Data:						Date:	6/29/2013
Z:	0	R:	247.2	C:	274	Conc:	274
R:	247.2	Z:	0	C:	274	Conc:	274
Z:	0	C:	274	R:	247.2	Conc:	274
UOM:	ppm			Mean Test Assay:			274 ppm

Reference Standard Type: GMIS
Ref. Std. Cylinder # : CC118115
Ref. Std. Conc: 247.2 ppm
Ref. Std. Traceable to SRM # : 2636a
SRM Sample # : 57-9-C
SRM Cylinder # : CLM-004482

Second Analysis Data:						Date:	
Z:	0	R:	0	C:	0	Conc:	0
R:	0	Z:	0	C:	0	Conc:	0
Z:	0	C:	0	R:	0	Conc:	0
UOM:	ppm			Mean Test Assay:			0 ppm

2. **Component: NITRIC OXIDE**

Requested Concentration: 275 ppm
Certified Concentration: 274 ppm
Instrument Used: Themo Electron 42i S/N 072602432C
Analytical Method: Chemiluminescence
Last Multipoint Calibration: 6/5/2013

First Analysis Data:						Date:	6/29/2013
Z:	0	R:	253	C:	273	Conc:	273
R:	253	Z:	0	C:	273	Conc:	273
Z:	0	C:	273	R:	253	Conc:	273
UOM:	ppm			Mean Test Assay:			273 ppm

Reference Standard Type: GMIS
Ref. Std. Cylinder # : CC121758
Ref. Std. Conc: 253.0 ppm
Ref. Std. Traceable to SRM # : vs. 1685b
SRM Sample # : 43-L-11
SRM Cylinder # : CAL017304

Second Analysis Data:						Date:	
Z:	0	R:	0	C:	0	Conc:	0
R:	0	Z:	0	C:	0	Conc:	0
Z:	0	C:	0	R:	0	Conc:	0
UOM:	ppm			Mean Test Assay:			0 ppm

3. **Component: SULFUR DIOXIDE**

Requested Concentration: 275 ppm
Certified Concentration: 274 ppm
Instrument Used: HORIBA, VIA-510, 56946604
Analytical Method: NDIR
Last Multipoint Calibration: 6/5/2013

First Analysis Data:						Date:	6/29/2013
Z:	0	R:	250	C:	274	Conc:	274
R:	250	Z:	0	C:	274	Conc:	274
Z:	0	C:	274	R:	250	Conc:	274
UOM:	ppm			Mean Test Assay:			274 ppm

Reference Standard Type: GMIS
Ref. Std. Cylinder # : CC107926
Ref. Std. Conc: 250 ppm
Ref. Std. Traceable to SRM # : vs. 1661a
SRM Sample # : 94-H-05
SRM Cylinder # : FF28146

Second Analysis Data:						Date:	
Z:	0	R:	0	C:	0	Conc:	0
R:	0	Z:	0	C:	0	Conc:	0
Z:	0	C:	0	R:	0	Conc:	0
UOM:	ppm			Mean Test Assay:			0 ppm

Analyzed by: Nelson Ma

Certified by: Diego Mestanza

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