U. S. EPA Ambient Air Monitoring Protocol Gas Verification Program

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U. S. EPA Ambient Air Protocol Gas Verification Program
Annual Report for Calendar Year 2012

U.S. Environmental Protection Agency
Office of Air Quality Planning and Standards
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Southern Ute Indian Tribe
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Acronyms and Abbreviations

AA-PGVP	Ambient Air Protocol Gas Verification Program
AQS	Air Quality System
CAMD	Clean Air Markets Division
CFR	Code of Federal Regulations
COC	chain-of-custody
EPA	Environmental Protection Agency
EPRI	Electric Power Research Institute
GMIS	Gas Manufacturer's Internal Standard
ICAC	Institute of Clean Air Companies
NACAA	National Association of Clean Air Agencies
NBS	National Bureau of Standards
NERL	National Exposure Research Laboratory
NIST	National Institute of Standards and Technology
NMi	Netherlands Measurement Institute
NPAP	National Performance Audit Program
NTRM	NIST Traceable Reference Material
OAQPS	Office of Air Quality Planning and Standards
OAP	Office of Atmospheric Programs
ORD	Office of Research and Development
PQAO	Primary Quality Assurance Organization
QA	quality assurance
QAPP	quality assurance project plan
QC	quality control
RAVL	Regional Analytical Verification Laboratory
RO	Reporting Organization (subcomponent of PQAO)
SOP	standard operating procedure
SRM	standard reference material

1.0 Introduction

Background and Program Goals

The basic principles of the U.S. Environmental Protection Agency's (EPA) *Traceability Protocol for the Assay and Certification of Gaseous Calibration Standards* (EPA, 1997)[1] were developed jointly by EPA, the National Bureau of Standards (now National Institute of Standards and Technology [NIST]), and specialty gas producers over 30 years ago. At the time, commercially-prepared calibration gases were perceived as being too inaccurate and too unstable for use in calibrations and audits of continuous source emission monitors and ambient air quality monitors[2]. The protocol was developed to improve their quality by establishing their traceability to NIST Standard Reference Materials (SRMs) and to provide reasonably priced products. This protocol established the gas metrological procedures for measurement and certification of these calibration gases for EPA's Acid Rain Program under 40 Code of Federal Regulations (CFR) Part 75, for the Ambient Air Quality Monitoring Program under 40 CFR Part 58, and for the Source Testing Program under 40 CFR Parts 60, 61, and 68. EPA required monitoring organizations implementing these programs ("the regulated community") to use EPA Protocol Gases as their calibration gases. EPA revised the protocol to establish detailed statistical procedures for estimating the total uncertainty of these gases. EPA's Acid Rain Program developed acceptance criteria for the uncertainty estimate[3].

Specialty gas producers prepare and analyze EPA Protocol Gases without direct governmental oversight. In the 1980s and 1990s, EPA conducted a series of EPA-funded accuracy assessments of EPA Protocol Gases sold by producers. The intent of these audits was to:

- increase the acceptance and use of EPA Protocol Gases as calibration gases;
- provide a quality assurance (QA) check for the producers of these gases; and
- help users identify producers who can consistently provide accurately certified gases.

Either directly or through third parties, EPA procured EPA Protocol Gases from the producers, assessed the accuracy of the gases' certified concentrations through independent analyses, and inspected the accompanying certificates of analysis for completeness and accuracy. The producers were not aware that EPA had procured the gases for these audits.

The accuracy of the EPA Protocol Gases' certified concentrations was assessed using SRMs as the analytical reference standards. If the difference between the audit's measured concentration and the producer's certified concentration was more than +/- 2.0 percent or if the documentation was incomplete or inaccurate, EPA notified the producer to resolve and correct the problem.

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[1] EPA-600/4-77-027b

[2] Decker, C.E. et al., 1981. "Analysis of Commercial Cylinder Gases of Nitric Oxide, Sulfur Dioxide, and Carbon Monoxide at Source Concentrations," *Proceedings of the APCA Specialty Conference on Continuous Emission Monitoring-Design, Operation, and Experience*, APCA Publication No. SP-43.

[3] "Continuous Emission Monitoring," *Code of Federal Regulations*, Title 40, Part 75.

The results of the accuracy assessments were published in peer-reviewed journals and were posted on EPA's Technology Transfer Network website. The accuracy assessments were discontinued in 1998.

In 2009, the Office of the Inspector General (OIG) published the report *EPA Needs an Oversight Program for Protocol Gases*[4]. One of the report's findings suggested that EPA "does not have reasonable assurance that the gases that are used to calibrate emissions monitors for the Acid Rain Program and continuous ambient monitors for the nation's air monitoring network are accurate". OIG recommended that OAR implement oversight programs to assure the quality of the EPA Protocol Gases that are used to calibrate these monitors. It also recommended that EPA's ORD update and maintain the document *Traceability Protocol for Assay and Certification of Gaseous Calibration Standards* to ensure that the monitoring programs' objectives are met.

In order to address the OIG findings for ambient air monitoring, OAQPS, in cooperation with EPA Region 2 and 7 developed an Ambient Air Protocol Gas Verification Program (AA-PGVP). The program establishes gas metrology laboratories in Regions 2 and 7 to verify the certified concentrations of EPA Protocol Gases used to calibrate ambient air quality monitors. The program is expected to ensure that producers selling EPA Protocol Gases participate in the AA-PGVP, and provide end users with information about participating producers and verification results.

The EPA Ambient Air Quality Monitoring Program's QA requirements 40 CFR Part 58, Appendix A require:

> *2.6 Gaseous and Flow Rate Audit Standards. Gaseous pollutant concentration standards (permeation devices or cylinders of compressed gas) used to obtain test concentrations for CO, SO_2, NO, and NO_2 must be traceable to either a National Institute of Standards and Technology (NIST) Traceable Reference Material (NTRM), NIST Standard Reference Materials (SRM) and Netherlands Measurement Institute (NMi) Primary Reference Materials (valid as covered by Joint Declaration of Equivalence) or a NIST-certified Gas Manufacturer's Internal Standard (GMIS), certified in accordance with one of the procedures given in reference 4 of this appendix. Vendors advertising certification with the procedures provided in reference 4 of this appendix and distributing gases as "EPA Protocol Gas" must participate in the EPA Protocol Gas Verification Program or not use "EPA" in any form of advertising.*

This program is considered a verification program because its current level of evaluation does not allow for a large enough sample of EPA Protocol Gases from any one specialty gas producer to yield a statistically rigorous assessment of the accuracy of the producer's gases. It will not provide end users with a scientifically defensible estimate of whether gases of acceptable quality can be purchased from a specific producer. Rather, the results provide information to end users that the specialty gas producer is participating in the program and with information that may be helpful when selecting a producer.

[4] http://www.epa.gov/oig/reports/2009/20090916-09-P-0235.pdf

Purpose of This Document

The purpose of this document is to report the activities that occurred in 2012, and provide the results of the verifications performed.

This document will not explain the implementation of the AA-PGVP, the quality system or the verification procedure. That information has been documented in the Implementation Plan, QAPP and SOPs that can be found on the AA-PGVP Web Page on AMTIC[5].

[5] http://www.epa.gov/ttn/amtic/aapgvp.html

2.0 Implementation Summary

Since program implementation started in 2010, when most of the initial preparation work took place, there were no major "new" implementation activities in 2012. The following provides a brief explanation of the 2012 implementation process.

Producer Information Data Collection-In 2010 EPA sent out an Excel spreadsheet to each monitoring organization in order to obtain information on the gas standard producers being used by the monitoring organization and to determine their interest in participating in the program. In 2011, EPA worked with Research Triangle Institute to develop a web-based survey that one point of contact for each monitoring organization could access. This made recording and evaluation of the survey information much easier for the monitoring organizations and EPA. Based on the information obtained from monitoring organization surveys, EPA developed a list of the specialty gas producers being used by the monitoring organizations. From this list, EPA identified at least one point of contact for each producer. Most of the producers were the same as listed the previous year but a few new producers were added.

AA-PGVP Verification Dates – OAQPS worked with the Region 2 and 7 Regional Analytical Verification Laboratories (RAVLs) to establish verification dates as indicated in Table 1. The dates were posted on the AMTIC website[6]. Monitoring organizations would contact the Regions to schedule cylinder verifications.

Table 1- RAVL Verification Dates.

Quarter	Region 2		Region 7	
	Cylinder Receipt	Analysis	Cylinder Receipt	Analysis
1	Feb 6 – Feb 10	Feb13 – Feb 17	Feb 27- Mar 2	Mar 5 - Mar 9
2	June 4 – June 8	June 11- June 15	May 29 – June 1	June 4- June 15
3	Aug 13 – Aug 17	Aug 20 – Aug 31	Aug 13 – Aug 17	Aug 20 – Aug 31
4	Nov 5 – Nov 9	Nov 12- Nov 16	Oct 29 – Nov 2	Nov 5- Nov 16
Open House	December 5-6		November 27-29	

RAVL Open House - Based on the information gained from monitoring organization surveys, EPA contacted the producers by email to invite them to visit the RAVLs. The Region 2 open house was December 5-6, 2012 and received two specialty producers. The Region 7 open house was November 27-29 and received three specialty gas producers.

Flow of the AA-PGVP

Figure 1 provides a flow of the implementation activities of the AA-PGVP. The major activities in these steps are explained below. More details of these steps are found in the AA-PGVP Implementation Plan, QAPP and SOPs.

[6] http://www.epa.gov/ttn/amtic/aapgvp.html

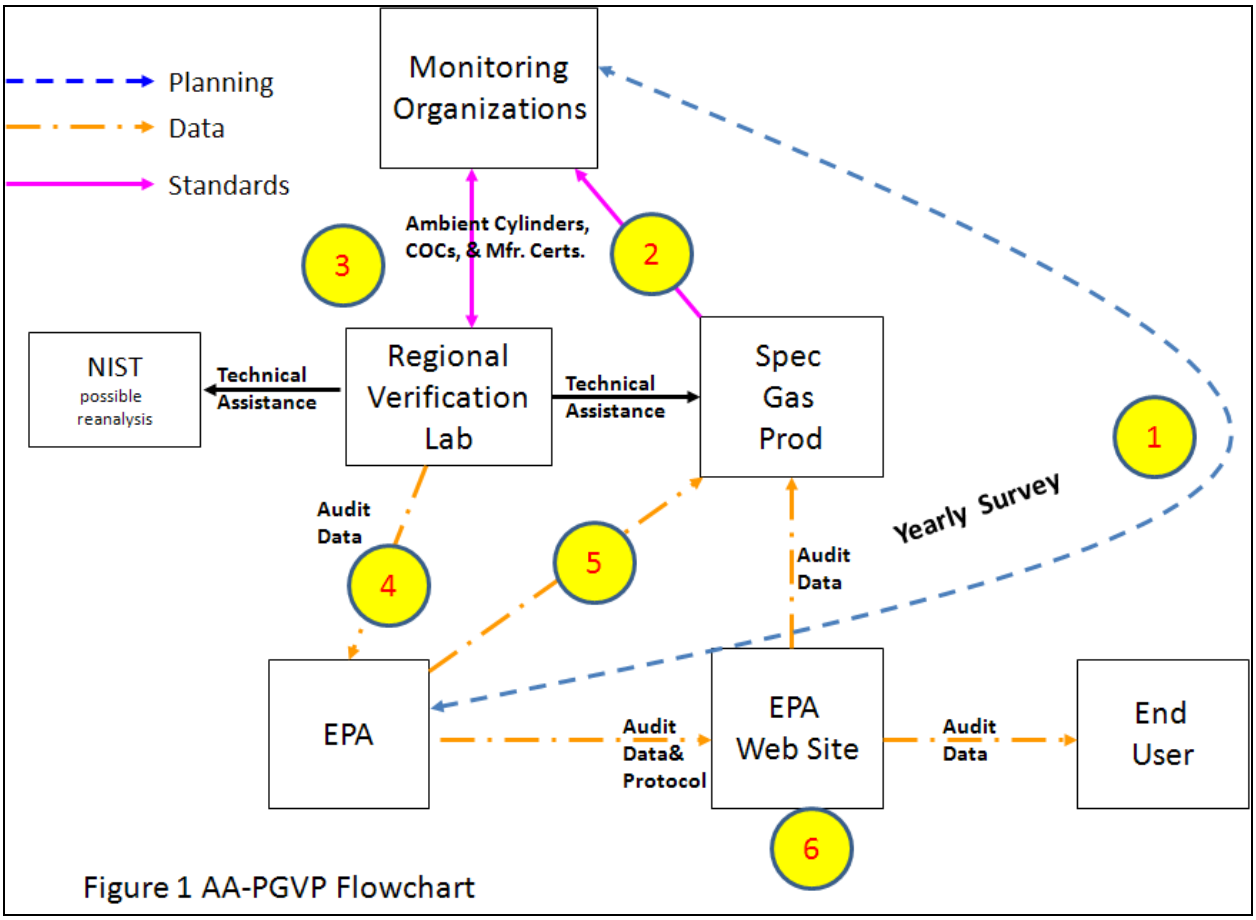

Figure 1 AA-PGVP Flowchart

1. EPA sends emails to the monitoring organization's point of contact to complete the AA-PGVG Survey. EPA compiles information on specialty gas producers and the monitoring organizations that plan to participate. EPA tries to schedule the monitoring organization in an appropriate verification quarter based on delivery of standards from the specialty gas producer.
2. The monitoring organizations order gas standards from specialty gas producers during the normal course of business. If EPA cannot get a cylinder from the monitoring organization, and that producer is being used, EPA will invite the producer to send a cylinder directly to an RAVL.
3. The monitoring organizations send a new/unused standard, specialty gas certification and chain of custody form to the RAVLs.
4. The RAVLS analyze the cylinders and provide the validated results to OAQPS and the monitoring organizations.
5. OAQPS reviews the data and sends verification results to the specialty gas vendors.
6. At the end of the year, OAQPS compiles final results into a report, sends the report out to the specialty gas vendors and posts it on the AA-PGVP AMTIC web page.

3.0 Survey and Verification Results

Monitoring Organization Survey

Based upon the maximum capability of 40 gas cylinders per RAVL per year, the AA-PGVP selection goal, in the following order, is:

1) One gas standard from every specialty gas producer being used by the monitoring community
2) Three standards per specialty gas producer
3) Weight additional standards by producer market share in ambient air monitoring community

In order to determine what specialty gas producers were being used by monitoring organizations, EPA asked each monitoring organization to complete a web-based survey. For the 2012 AA-PGVP, EPA received surveys from 87 of a possible 120 monitoring organizations, which is about a 72% response rate. This was an improvement from 2011; but still slightly lower than the input received from 2010, which was around 75%.

Survey Results

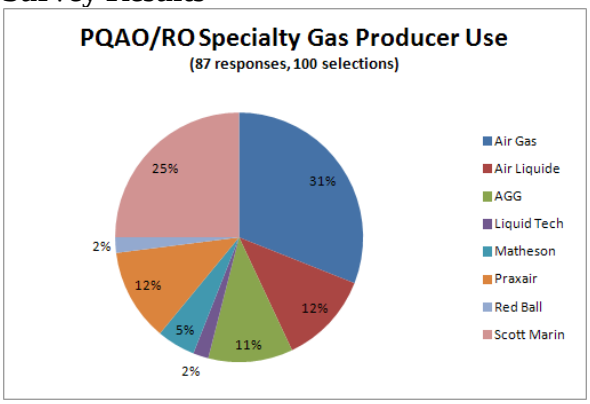

Figure 2. Specialty Gas Producer Use

The 87 monitoring organizations identified 100 specialty gas producers since some monitoring organizations used multiple specialty gas producers. Figure 2 identifies, as a percentage of the total responses, how often the monitoring organizations listed a particular specialty gas producer. As mentioned above, only about 72% of the monitoring organizations responded so this cannot be considered a complete survey.

Eight specialty gas producers were identified in the survey. However, some gas producers have more than one production facility and it is the intent of the AA-PGVP to try and receive one gas cylinder from every production facility being used by monitoring organizations (see Table 3).

Participation in the AA-PGVP is voluntary. The survey asked whether a monitoring organization was receiving new gas standards during the year and, also, whether they would like to participate by sending a cylinder to one of the RAVLs. Of the 87 respondents, 35 either did not want to participate or were not receiving a cylinder during the year. This narrowed the participants down to 52. Of the possible participants, 11 monitoring organizations sent cylinders to EPA. EPA did not have a monitoring organization volunteer submit a cylinder from Matheson, Liquid Technology or Red Ball. EPA invited those participants to send a cylinder to EPA as well as other producers listed in Table 3, with the exception of Tier 5 Labs which was added to the list in late 2012. Table 2 lists the cylinders verified in CY2012. Some of these

cylinders contained multiple pollutants so, although 53 cylinders were sent to the RAVLs, 58 verifications were performed.

Table 2. Gas Standards Sent to RAVLS in CY 2012

Date	Lab	Producer	Facility	Facility Code	Cylinder ID	Participant
2/13/2012	2	AirGas	Riverton, NJ	B52012	LL40871	Rhode Island Office of Air Resources
6/14/2012	2	Praxair	Bethlehem, PA	F12012	FF31529	NJ DEP
8/28/2012	2	Scott-Marrin	Riverside, CA	H12012	JJ712	Southern Ute Indian Tribe
2/9/2012	2	AirGas	Riverton, NJ	B52012	LL40871	Rhode Island Office of Air Resources
8/29/2012	2	American Gas Group	Toledo, OH	F42012	EB0025470	State of North Carolina
8/29/2012	2	Praxair	Bethlehem, PA	F12012	FF18499	State of Delaware
9/6/2012	2	Praxair	Bethlehem, PA	F12012	FF18499	State of Delaware
8/29/2012	2	Scott-Marrin	Riverside, CA	H12012	LL83546	EPA Region 2
2/28/2012	7	Scott-Marrin	Riverside, CA	H12012	FF21133	SCAQMD
8/29/2012	7	Air Liquide	Santa Fe Springs, CA	A52012	AL88288	SCAQMD
8/21/2012	7	Matheson	Twinsburg, OH	D42012	FF52884	MPCA
8/22/2012	7	Praxair	Bethlehem, PA	F12012	CC8818	Linn County Public Health
8/22/2012	7	Air Liquide	Santa Fe Springs, CA	A52012	AL88288	SCAQMD
11/8/2012	7	AGG	Toledo, OH	F42012	EB0023413	Specialty Gases of America
11/8/2012	7	Praxair	Los Angeles, CA	F22012	LL110089	Iowa State Hygienic Lab
2/8/2012	2	Air Liquide	Plainfield, NJ	A62012	CAL12168	NYSDEC
6/13/2012	2	AirGas	Durham, NC	B22012	LL64718	Virginia DEQ
6/13/2012	2	Praxair	Bethlehem, PA	F12012	FF33259	NJ, DEP
8/30/2012	2	Airgas	Durham, NC	B22012	CC354630	EPC of Hillsborough (FL) County
8/30/2012	2	Praxair	Bethlehem, PA	F12012	FF35114	State of Delaware
8/30/2012	2	Scott-Marrin	Riverside, CA	H12012	JJ712	Southern Ute Indian Tribe
2/29/2012	7	Scott-Marrin	Riverside, CA	H12012	FF21133	SCAQMD
8/23/2012	7	Air Liquide	Santa Fe Springs, CA	A52012	AL88288	SCAQMD
11/14/2012	7	AGG	Toledo, OH	F42012	3180	SGA Main Lab
11/14/2012	7	AGG	Toledo, OH	F42012	EA0009186	Montana DEQ
11/14/2012	7	Praxair	Los Angeles, CA	F22012	LL110109	Iowa State Hygienic Lab
11/20/2012	2	AirGas	Royal Oak, MI	B62012	CC415402	Producer shipped
11/20/2012	2	Coastal	Beaumont, TX	O12012	EB0014562	Producer shipped
11/20/2012	2	ILMO	Jacksonville, IL	Q12012	CC13161	Producer shipped
11/20/2012	2	IWS	Belle Chasse, LA	K12012	CC216328	Producer shipped
11/20/2012	2	Linde	Whitby, Ontario	L12012	CC173782	Producer shipped
11/20/2012	2	Linde	Whitby, Ontario	L12012	CC128726	Producer shipped
11/19/2012	2	AirGas	Royal Oak, MI	B62012	CC415757	Producer shipped
11/19/2012	2	ILMO	Jacksonville, IL	Q12012	CC198518	Producer shipped
11/19/2012	2	IWS	Belle Chasse, LA	K12012	EB0032551	Producer shipped
11/19/2012	2	Linde	Whitby, Ontario	L12012	CC173782	Producer shipped
11/19/2012	2	Linde	Whitby, Ontario	L12012	CC128726	Producer shipped
11/6/2012	7	Liquid Technology	Apopka, FL	E12012	EB0041817	Producer shipped
11/6/2012	7	Red Ball	Shreveport, LA	G12012	EB0042161	Producer shipped
11/6/2012	7	Liquid Technology	Apopka, FL	E12012	EB0041817	Producer shipped
11/7/2012	7	Praxair	Los Angeles, CA	F22012	CC324093	Producer shipped
11/7/2012	7	Red Ball	Shreveport, LA	G12012	EB0034432	Producer shipped
11/8/2012	7	Specialty Air	Long Beach, CA	J12012	SG901004	Producer shipped
11/21/2012	2	AirGas	Royal Oak, MI	B62012	CC413647	Producer shipped
11/15/2012	2	Coastal	Beaumont, TX	O12012	EB0024670	Producer shipped
11/15/2012	2	ILMO	Jacksonville, IL	Q12012	CC48435	Producer shipped
11/15/2012	2	IWS	Belle Chasse, LA	K12012	EB0032551	Producer shipped
11/15/2012	2	Linde	Whitby, Ontario	L12012	CC128726	Producer shipped
11/15/2012	2	Linde	Whitby, Ontario	L12012	CC173782	Producer shipped
11/7/2012	7	Liquid Technology	Apopka, FL	E12012	EB0041817	Producer shipped
11/14/2012	7	Praxair	Los Angeles, CA	F22012	CC362280	Producer shipped
11/14/2012	7	Red Ball	Shreveport, LA	G12012	EB0034432	Producer shipped
11/14/2012	7	Specialty Air	Long Beach, CA	J12012	SG901004	Producer shipped

Specialty Gas Producers

EPA contacted all the specialty gas producers in the survey to:

- make them aware that EPA was starting the AA-PGVP,
- describe the details of the program and the website where they could find additional information,
- ask them to identify all of their production facilities so we could determine how to select cylinders from each production facility used, and
- make them aware that EPA would be scheduling an open house toward the end of the year.

Table 3 provides the information gathered in 2010 through 2012 surveys. Since the Emissions Monitoring Protocol Gas Verification Program[7] and the AA-PGVP share the same producer listing and coding scheme, Table 3 identifies the producers on both lists. The producers shaded in green were identified on the AA-PGVP surveys. The facilities shaded in yellow were the facilities that the RAVLs received a cylinder for verification from monitoring organization while those shaded in blue were provided directly from producers. The facilities shaded in red were identified on the monitoring organization surveys but a standard from that facility was not provided in the RAVLs in 2012. For 2012, of the eight producers identified on the Surveys, only Matheson Tri-Gas was not verified. In addition, EPA performed verifications on five producers that were not identified in the surveys as being used in 2012.

Table 3. Production Facilities Verified in 2012

Code	Producer	Facility 1	Facility 2	Facility 3	Facility 4	Facility 5	Facility 6
A	Air Liquide	Plumsteadville, PA	Troy, MI	Laporte, TX	Longmont, CO	Santa Fe Springs, CA	**Plainfield, NJ**
B	Air Gas	Chicago, IL	Durham NC	Los Angeles . CA	Port Allen, LA	Riverton NJ	Royal Oak MI
C	American Gas Group*	Toledo, OH					
D	Matheson Tri-Gas	Joliet, IL Only H_2S	~~Morrow, GA~~ closed	~~Pasadena, TX~~ closed	Twinsburg, OH	~~**Waverly, TN**~~	New Johnsonville, TN
E	Liquid Technology	Apopka, FL					
F	Praxair	Bethlehem, PA	Los Angeles, CA	Morrisville, PA	Toledo, OH (AGG)		
G	Red Ball	Shreveport, LA.					
H	Scott-Marrin	Riverside, CA					
I	Linde	Alpha NJ					
J	Specialty Air Technologies	Long Beach, CA					
K	IWS Gas and Supply	Belle Chasse, LA					
L	Linde Canada Limited	Whitby, Ontario					
M	Applied Gas	Danbury Texas					
N	Global Calibration Gases LLC	~~Palmetto, FL~~	Sarasota, FL				
O	Coastal Specialty Gas	Beaumont, TX					
P	Norco	Boise, ID					
Q	ILMO specialty Gases	Jacksonville IL					
R	Tier 5 labs, LLC	Naperville, IL					

[7] http://www.epa.gov/airmarkets/emissions/

Verification Results

As indicated in 40 CFR Part 75 Appendix A, EPA Protocol Gases must have a certified uncertainty (95 percent confidence interval) that must not be greater than plus or minus (±) 2.0 percent of the certified concentration (tag value) of the gas mixture. This acceptance criterion is for the Acid Rain Program. The AA-PGVP adopted the criteria as its data quality objective and developed a quality system to allow the RAVLs to determine whether or not an individual protocol gas standard concentration was within ± 2% of the certified value. The Ambient Air Program has never identified an acceptance criterion for the protocol gases. Since the AA-PGVP has not been established to provide a statistically rigorous assessment of any specialty gas producer, the RAVLs report all valid results as analyzed but it is suggested that any difference greater than 4-5% is cause for concern. Information related to the analytical reference standards, analytical instruments and methods used, the data reduction procedures and the data assessment procedures are all found in the AA-PGVP QAPP and SOP and are not repeated in this report[8]. Table 4 is the measurement quality objectives table that is included in the AA- PGVP QAPP (Table 7-1 in QAPP). The acceptance criteria in Table 4 were met for each day of verification. In addition, conformance to these requirements can be found in the measurement data worksheets (MDW) that are generated for each comparison run and are available upon request. Appendix A provides a report of the quality control (QC) checks associated with each verification run. Table 5 provides the verification results for CO and SO_2 and Table 6 provides the NO_x results.

Table 4 Measurement Quality Objectives for the AA-PGVP

Requirement	Frequency	Acceptance Criteria	Protocol Gas Doc. Reference	Comments
Completeness	All standards analyzed	95%		Based on an anticipated 40 cylinders per lab per year.
Quarterly Flow Calibration	Quarterly -no more than 1 mo. before verification	Calibration flow accuracy within ± 1%	2.3.7	Using flow primary standard
Calibrator Dilution Check	Quarterly -within 2 weeks of assay	± 1% RD	2.3.5.1	Second SRM. Three or more discrete measurements
Analyzer Calibration	Quarterly - within 2 weeks of assay	± 1% RPD (each point) Slope 0.89 – 1.02	2.1.7.2	5 points between 50-90% of upper range limit of analyzer + zero point
Zero & Span Verifications	Each day of verification	SE mean ≤ 1% and accuracy ± 5% RD	2.1.7.3 , 2.3.5.4	Drift accountability. 3 discrete measurements of zero and span
Precision Test [1]	Day of Verification	± 1% RD standard error of the mean	2.3.5.4	SRM at conc. >80% of analyzer URL
Routine Data Check	Any Standard with Value >2% Tag Value	NA		Sample run three times to verify value.
Lab Comparability	2/year	± 2 % RPD	NA	Sample run three average value used.
Standards Certification				
Primary flow standard	Annually-Certified by NVLAP certified lab	1.0 %	**NA**	Compared to NIST Traceable
NIST SRMs	Expiration date SRM pressure > 150 psig			Will follow NIST recertification requirements

[1] The precision test does not need to accomplished if analyzer calibrated on same day as analysis

[8] http://www.epa.gov/ttn/amtic/aapgvp.html

Table 5. Ambient Air Protocol Gas Verification Program 2012 CO and SO2 Verifications

Highlighted facilities indicate direct shipment of cylinder from producer to Regional Laboratory

Region 2 CO

Date	Lab	Producer	Facility	Facility Code	Cylinder ID	Pollutant	Assay Conc	Producer Conc	% Bias	95% Uncertainty (%)
2/13/2012	2	AirGas	Riverton, NJ	B52012	LL40871	CO	1495.68	1507	-0.75	0.2
2/13/2012	2	Scott-Marrin	Riverside, CA	H12012	LL83546	CO	605.8552	609	-0.52	0.19
6/14/2012	2	Praxair	Bethlehem, PA	F12012	FF31529	CO	39.88527	40.5	-1.52	0.47
6/14/2012	2	Scott-Marrin**	Riverside, CA	H12012	CA08860	CO	5050.08	5064	-0.27	0.45
8/28/2012	2	Scott-Marrin	Riverside, CA	H12012	JJ712	CO	3044.05	3040	0.13	0.31
11/20/2012	2	AirGas	Royal Oak, MI	B62012	CC415402	CO	4754.79	4770	-0.32	0.08
11/20/2012	2	Coastal	Beaumont, TX	O12012	EB0014562	CO	2476.15	2490	-0.56	0.07
11/20/2012	2	ILMO	Jacksonville, IL	Q12012	CC13161	CO	3485.35	3520	-0.98	0.08
11/20/2012	2	IWS	Belle Chasse, LA	K12012	CC216328	CO	2505.83	2510	-0.17	0.07
11/20/2012	2	Linde	Whitby, Ontario	L12012	CC173782	CO	2956.32	2969	-0.43	0.07
11/20/2012	2	Linde	Whitby, Ontario	L12012	CC128726	CO	2715.26	2710	0.19	0.08

Region 2 SO2

2/9/2012	2	AirGas	Riverton, NJ	B52012	LL40871	SO2	11.73	11.81	-0.69	0.44
2/9/2012	2	Scott-Marrin	Riverside, CA	H12012	LL83546	SO2	15.43	15.32	0.75	0.44
6/12/2012	2	Scott-Marrin**	Riverside, CA	H12012	CC32737	SO2	50.14	50.32	-0.35	0.44
8/29/2012	2	American Gas Group	Toledo, OH	F42012	EB0025470	SO2	42.41	42.6	-0.45	0.38
8/29/2012	2	Praxair	Bethlehem, PA	F12012	FF18499	SO2	13.53	14.2	-4.74	0.41
8/29/2012	2	Scott-Marrin	Riverside, CA	H12012	LL83546	SO2	15.42	15.32	0.68	0.37
11/19/2012	2	AirGas	Royal Oak, MI	B62012	CC415757	SO2	42.04	41.81	0.54	0.21
11/19/2012	2	ILMO	Jacksonville, IL	Q12012	CC198518	SO2	72.53	72.3	0.32	0.21
11/19/2012	2	IWS	Belle Chasse, LA	K12012	EB0032551	SO2	50.5	50.05	0.91	0.21
11/19/2012	2	Linde	Whitby, Ontario	L12012	CC173782	SO2	48.84	48.7	0.3	0.21
11/19/2012	2	Linde	Whitby, Ontario	L12012	CC128726	SO2	49.69	50.6	-1.79	0.21

Region 7 CO

2/28/2012	7	Scott-Marrin	Riverside, CA	H12012	FF21133	CO	1868.00	1853	0.84	0.47
6/5/2012	7	Scott-Marrin**	Riverside, CA	H12012	CA08860	CO	5065.00	5064	0.01	0.39
8/29/2012	7	Air Liquide	Santa Fe Springs, CA	A52012	AL88288	CO	451.60	452	-0.1	0.29
11/6/2012	7	Liquid Technology	Apopka, FL	E12012	EB0041817	CO	5001.00	4989	0.25	0.14
11/6/2012	7	Red Ball	Shreveport, LA	G12012	EB0042161	CO	3879.00	3837	1.09	0.14

Region 7 SO2

6/6/2012	7	Scott-Marrin**	Riverside, CA	H12012	CC327237	SO2	50.32	50.32	0	0.3
8/21/2012	7	Matheson	Twinsburg, OH	D42012	FF52884	SO2	29.96	30.7	-2.4	0.21
8/22/2012	7	Praxair	Bethlehem, PA	F12012	CC8818	SO2	7.98	8.2	-2.66	0.4
8/22/2012	7	Air Liquide	Santa Fe Springs, CA	A52012	AL88288	SO2	9.24	9.12	1.3	0.36
11/8/2012	7	AGG	Toledo, OH	F42012	EB0023413	SO2	49.94	50.2	-0.52	0.21
11/6/2012	7	Liquid Technology	Apopka, FL	E12012	EB0041817	SO2	49.21	49.1	0.22	0.19
11/7/2012	7	Praxair	Los Angeles, CA	F22012	CC324093	SO2	50.45	50.5	-0.11	0.19
11/8/2012	7	Praxair	Los Angeles, CA	F22012	LL110089	SO2	29.68	30	-1.06	0.21
11/7/2012	7	Red Ball	Shreveport, LA	G12012	EB0034432	SO2	60.44	62.2	-2.83	0.19
11/8/2012	7	Specialty Air	Long Beach, CA	J12012	SG901004	SO2	50.96	50.38	1.15	0.21

** QC Sample

Table 6. Ambient Air Protocol Gas Verification Program 2012 NOx Verifications

Highlighted facilities indicate direct shipment of cylinder from producer to Regional Laboratory

Region 2 NOx														
Date	Lab	Producer	Facility	Facility Code	Cylinder ID	Producer Ref Standard	Pollutant	NO Assay Conc	NO Producer Conc	% Bias	95% Uncertainty	NOx Assay Conc.	NOx Prod. Conc	% Bias	95% Uncertainty
2/8/2012	2	AirGas	Riverton, NJ	B52012	CC344529	GMIS	NOx	49.7	49.7	-0.01	0.1	49.96	49.7	0.52	0.07
2/8/2012	2	Air Liquide	Plainfield, NJ	A62012	CAL12168	None circl	NOx	44.58	45.1	-1.15	0.19	45.05	45.4	-0.78	0.31
2/8/2012	2	Scott-Marrin	Riverside, CA	H12012	LL83546	GMIS	NOx	30.63	30.2	1.43	0.18	30.6	30.2	1.34	0.3
6/13/2012	2	AirGas	Durham, NC	B22012	LL64718	NTRM	NOx	55.56	55.76	-0.35	0.34	56.1	56.22	-0.21	0.37
6/13/2012	2	Praxair	Bethlehem, PA	F12012	FF33259	GMIS	NOx	51.21	52	-1.53	0.34	51.23	52	-1.47	0.37
6/13/2012	2	Scott-Marrin**	Riverside, CA	H12012	CC327233	NTRM	NOx	50.05	49.84	0.42	0.34	50.04	49.73	0.61	0.37
8/30/2012	2	Airgas	Durham, NC	B22012	CC354630	NTRM	NOx	16.13	16.17	-0.23	0	16.07	16.18	-0.7	0.25
8/30/2012	2	Praxair	Bethlehem, PA	F12012	FF35114	NTRM	NOx	13.02	13.3	-2.1	0.26	13.24	13.3	-0.44	0.29
8/30/2012	2	Scott-Marrin	Riverside, CA	H12012	JJ712	GMIS	NOx	30.15	29.86	0.98	0.23	30.03	29.86	0.58	0.26
8/30/2012	2	Scott-Marrin	Riverside, CA	H12012	LL83546	None circl	NOx	30.39	30.2	0.63	0.29	30.51	30.2	1.04	0.26
11/21/2012	2	AirGas	Royal Oak, MI	B62012	CC413647	NTRM	NOx	48.69	48.95	-0.53	0.09	48.43	48.95	-1.06	0.63
11/15/2012	2	Coastal	Beaumont, TX	O12012	EB0024670	GMIS	NOx	100.43	100.1	0.33	0.12	100.63	100.4	0.23	0.06
11/15/2012	2	ILMO	Jacksonville, IL	Q12012	CC48435	SRM	NOx	72.29	74	-2.31	0.12	74.62	Not provided		0.06
11/15/2012	2	IWS	Belle Chasse, LA	K12012	EB0032551	GMIS	NOx	52.36	50.98	2.7	0.12	52.1	51	2.15	0.06
11/15/2012	2	Linde	Whitby, Ontario	L12012	CC128726	GMIS	NOx	50.74	50.1	1.29	0.12	50.44	50.2	0.49	0.06
11/15/2012	2	Linde	Whitby, Ontario	L12012	CC173782	GMIS	NOx	51.31	51.16	0.29	0.12	51.18	Not provided		0.06
Region 7 NOx															
2/29/2012	7	Scott-Marrin	Riverside, CA	H12012	FF21133	None circl	NOx	91.54	90.1	1.6	0.22	91.57	90.1	1.63	0.24
6/7/2012	7	Scott-Marrin**	Riverside, CA	H12012	CC327233		NOx	49.7	49.94	-0.48	0.21	49.74	49.73	0.02	0.18
8/23/2012	7	Air Liquide	Santa Fe Springs,	A52012	AL88288	NTRM	NOx	36.63	36.5	0.35	0.15	36.61	36.5	0.31	0.13
11/14/2012	7	AGG	Toledo, OH	F42012	3180	GMIS	NOx	50.21	49.8	0.81	0.16	50.76	50	1.52	0.15
11/14/2012	7	AGG	Toledo, OH	F42012	EA0009186	GMIS	NOx	28.44	28	1.58	0.17	28.84	29.2	-1.25	0.15
11/7/2012	7	Liquid Technology	Apopka, FL	E12012	EB0041817	GMIS	NOx	49.88	49.2	1.39	0.16	49.83	49.2	1.27	0.17
11/14/2012	7	Praxair	Los Angeles, CA	F22012	CC362280	GMIS	NOx	49.99	50	-0.03	0.16	50.16	50.1	0.13	0.17
11/14/2012	7	Praxair	Los Angeles, CA	F22012	LL110109	GMIS	NOx	25.2	25.3	-0.41	0.16	25.26	25.5	-0.93	0.15
11/14/2012	7	Red Ball	Shreveport, LA	G12012	EB0034432	SRM	NOx	64.9	64.3	0.93	0.16	64.88	64.6	0.43	0.17
11/14/2012	7	Specialty Air	Long Beach, CA	J12012	SG901004	GMIS	NOx	48.57	48.12	0.94	0.17	48.56	48.5	0.13	0.17
**QC sample															

Table 7 Relative Percent Difference of QC Cylinder

Pollutant	R2	R7	RPD (%)
CO	5050.08	5065	-0.295
SO2	50.14	50.32	-0.358
NO	50.05	49.7	0.702
NOx	50.04	49.74	0.601

Scott-Marrin cylinders CA08860 (CO), CC32737 (SO_2), and CC327233 (NO_x) – all identified with the double-asterisk (**) – were the internal QC cylinders verified by both laboratories. Although shown here, they were not part of the totals in Table 2. The internal QC results for CO, SO_2 and NO_x showed very good agreement, and all were well within the 2% RPD measurement quality objective. As important as the agreement of the QC sample to the certified concentration, equally important is the comparability of the concentrations of the two RAVLs. Table 7 provides the relative percent differences (d_i) of the paired QA sample concentrations, and is defined as:

$$d_i = \frac{X_i - Y_i}{(X_i - Y_i)/2} 100$$

Where X_i = Region 2 RAVL concentration and
Y_i = Region 7 RAVL concentration

Selecting which lab was X_i and Y_i was arbitrary.

Out of the 58 verification results, seven were greater than the ±2% Acid Rain Program criteria and only one value was greater than AA-PGVP 4-5% criteria. The SO_2 cylinder in this range was verified in the third quarter by the Region 2 RAVL on 8/29/2012. The results were

reverified during another cylinder verification run on 9/6/2012 and confirmed the results from the first verification. EPA, per the implementation requirements of the program, notified the producer of all results for that quarter on 9/18/2012 and identified the cylinder above 4% in the email. No additional follow-up with the producer occurred.

Summary and Conclusions

In general, the AA-PGVP 2012 verifications have been successful. The quality system, standard operating procedures, analytical equipment and standards maintained the data quality of the program. Results show that of the 58 verifications, 57 (98%) were within the ± 4-5% AA-PGVP criteria, and 51 (88%) were within the ± 2% Acid Rain Program criteria.

The following lists some areas of the program that need improvement:

Survey Improvement- Some improvements were made in survey completness in 2012 but EPA did not acheive 100% completeness on surveys in 2012. Despite repeated email messages ona two week basis to delinquent monitoring organizations, EPA was not able to get all monitoring organizations to respond. EPA may have to resort to individual phone calls at some point to meet the completeness goals.

Participation Improvement - Since the program is voluntary, EPA can not force participation. Due to the budget/resource issues, many monitoring organization are more resource constrained and, since the AA-PGVP is optional, it is treated as a lower priority. Since the only added expense to monitoring organization is the shipping of cylinders to the RAVL, in 2011 EPA started helping monitoring organizations pay for the shipping cost. EPA continued this in 2012, and plans to improve upon this in 2013 in the hopes of getting more organizations to participate.

Quarterly Interlaboratory QC Checks - The analysis of the same standard by both RAVLs proved to be a useful tool for checking the quality of the AA-PGVP results. In 2011 and 2012, the RAVLS performed one check each. In 2013 the Regions will conduct the check in two quarters along with the routine QC activities associated with each verification run.

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Appendix A

Ambient Air Protocol Gas Verification Program
QA Reports from Measurement Data Worksheets for 2012

During the verification process, the Regional Air Verification Laboratories perform a number of quality control checks that are recorded on the Measurement Data Worksheets. This information is reported and saved along with the verification reports. The following sheets represent the quality control for all verifications that were implemented in 2012.

Region 2 - Quarters 1- 4, pages 15-25
Region 7 - Quarters 1- 4 pages 26-36

All quality control checks passed during verifications

Region 2 QA Data

CO QA Requirements Summary, Region 2 - 1st Quarter of 2012

	QA Requirement	Result	Status
SRM Gas Standards	Primary SRM Cylinder Expiration Date	18-Jan-16	Primary SRM Gas Standard OK
	Primary SRM Cylinder Pressure >150 psi	1610	Primary SRM cylinder pressure is OK
	SRM Dilution Check Cylinder Expiration Date	7-Apr-18	Dilution Check SRM Gas Standard OK
	Dilution Check SRM Cylinder Pressure >150 psi	2200	Dilution check SRM cylinder pressure is OK
Laboratory Flow Standard	High Flow Standard Expiration Date	20-May-12	Standard OK
	Low Flow Standard Expiration Date	20-May-12	Standard OK
	Flow Standard Base Unit Expiration Date	20-May-12	Standard OK
Calibrator (mass flow controllers)	Calibrator Flow Calibration within 2 weeks of assay	6-Feb-12	Calibrator flow calibration within 2 weeks of assay
	Calibrated High Flow MFC Slope Range = 0.99 - 1.01	0.9999948	High MFC OK
	Calibrated Low Flow MFC Slope Range = 0.99 - 1.01	0.9999992	Low MFC OK
Carbon Monoxide Gas Analyzer	Analyzer Calibration within 2 week of assay	7-Feb-12	Analyzer calibration within 2 weeks of assay
	Estimate of Uncetainty < 1% at point #1 (>80% URL)	0.65%	Assay may be conducted at this concentration
	Estimate of Uncetainty < 1% at point #2	0.66%	Assay may be conducted at this concentration
	Estimate of Uncetainty < 1% at point #3	0.67%	Assay may be conducted at this concentration
	Estimate of Uncetainty < 1% at point #4	0.68%	Assay may be conducted at this concentration
	Estimate of Uncetainty < 1% at point #5 (~50% URL)	0.70%	Assay may be conducted at this concentration
	Analyzer slope is within 0.98-1.02	0.9971	Analyzer Slope is acceptable
Dilution Check	Dilution Check Date within 2 weeks of assay	7-Feb-12	Dilution check within 2 weeks of assay
	Dilution Check Relative % Difference < 1%	-0.144%	Dilution Check RSD is OK

CO QA Requirements Summary, Region 2 - 1st Quarter of 2012

	QA Requirement	Result	Status
SRM Gas Standards	Primary SRM Cylinder Expiration Date	18-Jan-16	Primary SRM Gas Standard OK
	Primary SRM Cylinder Pressure >150 psi	1610	Primary SRM cylinder pressure is OK
	SRM Dilution Check Cylinder Expiration Date	7-Apr-18	Dilution Check SRM Gas Standard OK
	Dilution Check SRM Cylinder Pressure >150 psi	2100	Dilution check SRM cylinder pressure is OK
Laboratory Flow Standard	High Flow Standard Expiration Date	20-May-12	Standard OK
	Low Flow Standard Expiration Date	20-May-12	Standard OK
	Flow Standard Base Unit Expiration Date	20-May-12	Standard OK
Calibrator (mass flow controllers)	Calibrator Flow Calibration within 2 weeks of assay	6-Feb-12	Calibrator flow calibration within 2 weeks of assay
	Calibrated High Flow MFC Slope Range = 0.99 - 1.01	0.9999948	High MFC OK
	Calibrated Low Flow MFC Slope Range = 0.99 - 1.01	0.9999992	Low MFC OK
Carbon Monoxide Gas Analyzer	Analyzer Calibration within 2 week of assay	13-Feb-12	Analyzer calibration within 2 weeks of assay
	Estimate of Uncetainty < 1% at point #1 (>80% URL)	0.18%	Assay may be conducted at this concentration
	Estimate of Uncetainty < 1% at point #2	0.19%	Assay may be conducted at this concentration
	Estimate of Uncetainty < 1% at point #3	0.19%	Assay may be conducted at this concentration
	Estimate of Uncetainty < 1% at point #4	0.20%	Assay may be conducted at this concentration
	Estimate of Uncetainty < 1% at point #5 (~50% URL)	0.20%	Assay may be conducted at this concentration
	Analyzer slope is within 0.98-1.02	1.0030	Analyzer Slope is acceptable
Dilution Check	Dilution Check Date within 2 weeks of assay	7-Feb-12	Dilution check within 2 weeks of assay
	Dilution Check Relative % Difference < 1%	-0.695%	Dilution Check RSD is OK
Day of Assay Zero/Span Check	Day of Assay Zero Check - Std. Error < 1%	Std. Error is okay.	Zero Gas Std. Error is OK
	Day of Assay Zero Check - Relative Difference < 5%	RD is okay.	Zero Gas RD is OK
	Day of Assay Span Check - Std. Error < 1%	Std. Error is okay.	Span Gas Std. Error is OK
	Day of Assay Span Check - Relative Difference <5%	RD is okay.	Span Gas RD is OK
Challenge Standard #1 Assay	Challenge Standard #1 Std. Error < 1%	The standard error is okay.	Challenge Standard #1 Std. Error is OK
	Challenge Standard #1 vendor certificate bias	-0.75%	Challenge Std. #1 vendor certificate bias < 2%
Challenge Standard #2 Assay	Challenge Standard #2 Std. Error < 1%	The standard error is okay.	Challenge Standard #2 Std. Error is OK
	Challenge Standard #2 vendor certificate bias	-0.52%	Challenge Std. #2 vendor certificate bias < 2%

SO2 QA Requirements Summary, Region 2 - 1st Quarter of 2012

	QA Requirement	Result	Status
SRM Gas Standards	Primary SRM Cylinder Expiration Date	11-Dec-15	Primary SRM Gas Standard OK
	Primary SRM Cylinder Pressure >150 psi	1425	Primary SRM cylinder pressure is OK
	SRM Dilution Check Cylinder Expiration Date	1-Jun-16	Dilution Check SRM Gas Standard OK
	Dilution Check SRM Cylinder Pressure >150 psi	1570	Dilution check SRM cylinder pressure is OK
Laboratory Flow Standard	High Flow Standard Expiration Date	20-May-12	Standard OK
	Low Flow Standard Expiration Date	20-May-12	Standard OK
	Flow Standard Base Unit Expiration Date	20-May-12	Standard OK
Calibrator (mass flow controllers)	Calibrator Flow Calibration within 2 weeks of assay	6-Feb-12	Calibrator flow calibration within 2 weeks of assay
	Calibrated High Flow MFC Slope Range = 0.99 - 1.01	0.9999948	High MFC OK
	Calibrated Low Flow MFC Slope Range = 0.99 - 1.01	0.9999992	Low MFC OK
Sulfur Dioxide Gas Analyzer	Analyzer Calibration within 2 weeks of assay	9-Feb-12	Analyzer calibration within 2 weeks of assay
	Estimate of Uncetainty < 1% at point #1 (>80% URL)	0.37%	Assay may be conducted at this concentration
	Estimate of Uncetainty < 1% at point #2	0.38%	Assay may be conducted at this concentration
	Estimate of Uncetainty < 1% at point #3	0.42%	Assay may be conducted at this concentration
	Estimate of Uncetainty < 1% at point #4	0.48%	Assay may be conducted at this concentration
	Estimate of Uncetainty < 1% at point #5 (~50% URL)	0.62%	Assay may be conducted at this concentration
	Analyzer slope is within 0.98-1.02	0.9989	Analyzer Slope is acceptable
Dilution Check	Dilution Check Date within 2 weeks of assay	7-Feb-12	Dilution check within 2 weeks of assay
	Dilution Check Relative % Difference < 1%	-0.144%	Dilution Check RSD is OK
Day of Assay Zero/Span Check	Day of Assay Zero Check - Std. Error < 1%	Std. Error is okay.	Zero Gas Std. Error is OK
	Day of Assay Zero Check - Relative Difference < 5%	RD is okay.	Zero Gas RD is OK
	Day of Assay Span Check - Std. Error < 1%	Std. Error is okay.	Span Gas Std. Error is OK
	Day of Assay Span Check - Relative Difference <5%	RD is okay.	Span Gas RD is OK
Challenge Standard #1 Assay	Challenge Standard #1 Std. Error < 1%	The standard error is okay.	Challenge Standard #1 standard error is okay.
	Challenge Standard #1 vendor certificate bias	-0.69%	Challenge Std. #1 vendor certificate bias < 2%
Challenge Standard #2 Assay	Challenge Standard #2 Std. Error < 1%	The standard error is okay.	Challenge Standard #2 standard error is okay.
	Challenge Standard #2 vendor certificate bias	0.75%	Challenge Std. #2 vendor certificate bias < 2%

NOx QA Requirements Summary, Region 2 - 1st Quarter of 2012

	QA Requirement	Result	Status
SRM Gas Standards	Primary SRM Cylinder Expiration Date	1-Jun-16	Primary SRM Gas Standard OK
	Primary SRM Cylinder Pressure >150 psi	2100	Primary SRM cylinder pressure is OK
	SRM Dilution Check Cylinder Expiration Date	1-Jun-16	Dilution Check SRM Gas Standard OK
	Dilution Check SRM Cylinder Pressure >150 psi	1680	Dilution check SRM cylinder pressure is OK
Laboratory Flow Standard	High Flow Standard Expiration Date	20-May-12	Standard OK
	Low Flow Standard Expiration Date	20-May-12	Standard OK
	Flow Standard Base Unit Expiration Date	20-May-12	Standard OK
Calibrator (mass flow controllers)	Calibrator Flow Calibration within 2 weeks of assay	6-Feb-12	Calibrator flow calibration within 2 weeks of assay
	Calibrated High Flow MFC Slope Range = 0.99 - 1.01	0.9999948	High MFC OK
	Calibrated Low Flow MFC Slope Range = 0.99 - 1.01	0.9999992	Low MFC OK
Oxides of Nitrogen Gas Analyzer NO Portion	Analyzer Calibration within 2 weeks of assay	8-Feb-12	Analyzer calibration within 2 weeks of assay
	Estimate of Uncetainty < 1% at point #1 (>80% URL)	0.17%	Assay may be conducted at this concentration
	Estimate of Uncetainty < 1% at point #2	0.18%	Assay may be conducted at this concentration
	Estimate of Uncetainty < 1% at point #3	0.20%	Assay may be conducted at this concentration
	Estimate of Uncetainty < 1% at point #4	0.23%	Assay may be conducted at this concentration
	Estimate of Uncetainty < 1% at point #5 (~50% URL)	0.29%	Assay may be conducted at this concentration
	Analyzer slope is within 0.98-1.02	1.0012	Analyzer Slope is acceptable
Oxides of Nitrogen Gas Analyzer NOx Portion	Analyzer Calibration within 2 week of assay	8-Feb-12	Analyzer calibration within 2 weeks of assay
	Estimate of Uncetainty < 1% at point #1 (>80% URL)	0.29%	Assay may be conducted at this concentration
	Estimate of Uncetainty < 1% at point #2	0.30%	Assay may be conducted at this concentration
	Estimate of Uncetainty < 1% at point #3	0.33%	Assay may be conducted at this concentration
	Estimate of Uncetainty < 1% at point #4	0.39%	Assay may be conducted at this concentration
	Estimate of Uncetainty < 1% at point #5 (~50% URL)	0.49%	Assay may be conducted at this concentration
	Analyzer slope is within 0.98-1.02	0.9994	Analyzer Slope is acceptable
Dilution Check	Dilution Check Date within 2 weeks of assay	7-Feb-12	Dilution check within 2 weeks of assay
	Dilution Check Relative % Difference < 1%	0.000%	Dilution Check RSD is OK
Day of Assay Zero/Span Check NO Portion	Day of Assay Zero Check - Std. Error < 1%	Std. Error is okay.	Zero Gas Std. Error is OK
	Day of Assay Zero Check - Relative Difference < 5%	RD is okay.	Zero Gas RD is OK
	Day of Assay Span Check - Std. Error < 1%	Std. Error is okay.	Span Gas Std. Error is OK
	Day of Assay Span Check - Relative Difference <5%	RD is okay.	Span Gas RD is OK
Day of Assay Zero/Span Check NOx Portion	Day of Assay Zero Check - Std. Error < 1%	Std. Error is okay.	Zero Gas Std. Error is OK
	Day of Assay Zero Check - Relative Difference < 5%	RD is okay.	Zero Gas RD is OK
	Day of Assay Span Check - Std. Error < 1%	Std. Error is okay.	Span Gas Std. Error is OK
	Day of Assay Span Check - Relative Difference <5%	RD is okay.	Span Gas RD is OK
Challenge Standard #1 NO Assay	Challenge Standard #1 Std. Error < 1%	The standard error is okay.	Challenge Standard #1 Std. Error is OK
	Challenge Standard #1 vendor certificate bias	-1.15%	Challenge Std. #1 vendor certificate bias < 2%
Challenge Standard #1 NOx Assay	Challenge Standard #1 Std. Error < 1%	The standard error is okay.	Challenge Standard #1 Std. Error is OK
	Challenge Standard #1 vendor certificate bias	-0.78%	Challenge Std. #1 vendor certificate bias < 2%
Challenge Standard #2 NO Assay	Challenge Standard #2 Std. Error < 1%	The standard error is okay.	Challenge Standard #2 Std. Error is OK
	Challenge Standard #2 vendor certificate bias	2.83%	Challenge Std. #2 vendor certificate bias between 2-4%
Challenge Standard #2 NOx Assay	Challenge Standard #2 Std. Error < 1%	The standard error is okay.	Challenge Standard #2 Std. Error is OK
	Challenge Standard #2 vendor certificate bias	2.82%	Challenge Std. #2 vendor certificate bias between 2-4%
Challenge Standard #3 NO Assay	Challenge Standard #3 Std. Error < 1%	The standard error is okay.	Challenge Standard #3 Std. Error is OK
	Challenge Standard #3 vendor certificate bias	1.43%	Challenge Std. #3 vendor certificate bias < 2%
Challenge Standard #3 NOx Assay	Challenge Standard #3 Std. Error < 1%	The standard error is okay.	Challenge Standard #3 Std. Error is OK
	Challenge Standard #3 vendor certificate bias	1.34%	Challenge Std. #3 vendor certificate bias < 2%
Challenge Standard #4 NO Assay	Challenge Standard #4 Std. Error < 1%	The standard error is okay.	Challenge Standard #4 Std. Error is OK
	Challenge Standard #4 vendor certificate bias	#VALUE!	#VALUE!
Challenge Standard #4 NOx Assay	Challenge Standard #4 Std. Error < 1%	The standard error is okay.	Challenge Standard #4 Std. Error is OK
	Challenge Standard #4 vendor certificate bias	#VALUE!	#VALUE!

CO QA Requirements Summary, Region 2 - 2nd Quarter of 2012

	QA Requirement	Result	Status
SRM Gas Standards	Primary SRM Cylinder Expiration Date	18-Jan-16	Primary SRM Gas Standard OK
	Primary SRM Cylinder Pressure >150 psi	1500	Primary SRM cylinder pressure is OK
	SRM Dilution Check Cylinder Expiration Date	7-Apr-18	Dilution Check SRM Gas Standard OK
	Dilution Check SRM Cylinder Pressure >150 psi	2150	Dilution check SRM cylinder pressure is OK
Laboratory Flow Standard	High Flow Standard Expiration Date	22-May-13	Standard OK
	Low Flow Standard Expiration Date	22-May-13	Standard OK
	Flow Standard Base Unit Expiration Date	22-May-13	Standard OK
Calibrator (mass flow controllers)	Calibrator Flow Calibration within 2 weeks of assay	4-Jun-12	Calibrator flow calibration within 2 weeks of assay
	Calibrated High Flow MFC Slope Range = 0.99 - 1.01	0.9999965	High MFC OK
	Calibrated Low Flow MFC Slope Range = 0.99 - 1.01	0.9999992	Low MFC OK
Carbon Monoxide Gas Analyzer	Analyzer Calibration within 2 week of assay	5-Jun-12	Analyzer calibration within 2 weeks of assay
	Estimate of Uncetainty < 1% at point #1 (>80% URL)	0.72%	Assay may be conducted at this concentration
	Estimate of Uncetainty < 1% at point #2	0.74%	Assay may be conducted at this concentration
	Estimate of Uncetainty < 1% at point #3	0.75%	Assay may be conducted at this concentration
	Estimate of Uncetainty < 1% at point #4	0.76%	Assay may be conducted at this concentration
	Estimate of Uncetainty < 1% at point #5 (~50% URL)	0.78%	Assay may be conducted at this concentration
	Analyzer slope is within 0.98-1.02	0.9985	Analyzer Slope is acceptable
Dilution Check	Dilution Check Date within 2 weeks of assay	5-Jun-12	Dilution check within 2 weeks of assay
	Dilution Check Relative % Difference < 1%	-0.091%	Dilution Check RSD is OK
Day of Assay Zero/Span Check	Day of Assay Zero Check - Std. Error < 1%	Std. Error is okay.	Zero Gas Std. Error is OK
	Day of Assay Zero Check - Relative Difference < 5%	RD is okay.	Zero Gas RD is OK
	Day of Assay Span Check - Std. Error < 1%	Std. Error is okay.	Span Gas Std. Error is OK
	Day of Assay Span Check - Relative Difference <5%	RD is okay.	Span Gas RD is OK
Challenge Standard #1 Assay	Challenge Standard #1 Std. Error < 1%	The standard error is okay.	Challenge Standard #1 Std. Error is OK
	Challenge Standard #1 vendor certificate bias	-0.27%	Challenge Std. #1 vendor certificate bias < 2%
Challenge Standard #2 Assay	Challenge Standard #2 Std. Error < 1%	The standard error is okay.	Challenge Standard #2 Std. Error is OK
	Challenge Standard #2 vendor certificate bias	-1.52%	Challenge Std. #2 vendor certificate bias < 2%

SO2 QA Requirements Summary, Region 2 - 2nd Quarter of 2012

	QA Requirement	Result	Status
SRM Gas Standards	Primary SRM Cylinder Expiration Date	11-Dec-15	Primary SRM Gas Standard OK
	Primary SRM Cylinder Pressure >150 psi	1250	Primary SRM cylinder pressure is OK
	SRM Dilution Check Cylinder Expiration Date	1-Jun-16	Dilution Check SRM Gas Standard OK
	Dilution Check SRM Cylinder Pressure >150 psi	1350	Dilution check SRM cylinder pressure is OK
Laboratory Flow Standard	High Flow Standard Expiration Date	22-May-13	Standard OK
	Low Flow Standard Expiration Date	22-May-13	Standard OK
	Flow Standard Base Unit Expiration Date	22-May-13	Standard OK
Calibrator (mass flow controllers)	Calibrator Flow Calibration within 2 weeks of assay	4-Jun-12	Calibrator flow calibration within 2 weeks of assay
	Calibrated High Flow MFC Slope Range = 0.99 - 1.01	0.9999965	High MFC OK
	Calibrated Low Flow MFC Slope Range = 0.99 - 1.01	0.9999992	Low MFC OK
Sulfur Dioxide Gas Analyzer	Analyzer Calibration within 2 weeks of assay	12-Jun-12	Analyzer calibration within 2 weeks of assay
	Estimate of Uncetainty < 1% at point #1 (>80% URL)	0.43%	Assay may be conducted at this concentration
	Estimate of Uncetainty < 1% at point #2	0.45%	Assay may be conducted at this concentration
	Estimate of Uncetainty < 1% at point #3	0.49%	Assay may be conducted at this concentration
	Estimate of Uncetainty < 1% at point #4	0.57%	Assay may be conducted at this concentration
	Estimate of Uncetainty < 1% at point #5 (~50% URL)	0.73%	Assay may be conducted at this concentration
	Analyzer slope is within 0.98-1.02	1.0053	Analyzer Slope is acceptable
Dilution Check	Dilution Check Date within 2 weeks of assay	5-Jun-12	Dilution check within 2 weeks of assay
	Dilution Check Relative % Difference < 1%	-0.091%	Dilution Check RSD is OK
Day of Assay Zero/Span Check	Day of Assay Zero Check - Std. Error < 1%	Std. Error is okay.	Zero Gas Std. Error is OK
	Day of Assay Zero Check - Relative Difference < 5%	RD is okay.	Zero Gas RD is OK
	Day of Assay Span Check - Std. Error < 1%	Std. Error is okay.	Span Gas Std. Error is OK
	Day of Assay Span Check - Relative Difference <5%	RD is okay.	Span Gas RD is OK
Challenge Standard #1 Assay	Challenge Standard #1 Std. Error < 1%	The standard error is okay.	Challenge Standard #1 standard error is okay.
	Challenge Standard #1 vendor certificate bias	-0.35%	Challenge Std. #1 vendor certificate bias < 2%

NOx QA Requirements Summary, Region 2 - 2nd Quarter of 2012

	QA Requirement	Result	Status
SRM Gas Standards	Primary SRM Cylinder Expiration Date	1-Jun-16	Primary SRM Gas Standard OK
	Primary SRM Cylinder Pressure >150 psi	2100	Primary SRM cylinder pressure is OK
	SRM Dilution Check Cylinder Expiration Date	1-Jun-16	Dilution Check SRM Gas Standard OK
	Dilution Check SRM Cylinder Pressure >150 psi	1600	Dilution check SRM cylinder pressure is OK
Laboratory Flow Standard	High Flow Standard Expiration Date	22-May-13	Standard OK
	Low Flow Standard Expiration Date	22-May-13	Standard OK
	Flow Standard Base Unit Expiration Date	22-May-13	Standard OK
Calibrator (mass flow controllers)	Calibrator Flow Calibration within 2 weeks of assay	4-Jun-12	Calibrator flow calibration within 2 weeks of assay
	Calibrated High Flow MFC Slope Range = 0.99 - 1.01	0.9999965	High MFC OK
	Calibrated Low Flow MFC Slope Range = 0.99 - 1.01	0.9999992	Low MFC OK
Oxides of Nitrogen Gas Analyzer NO Portion	Analyzer Calibration within 2 weeks of assay	13-Jun-12	Analyzer calibration within 2 weeks of assay
	Estimate of Uncetainty < 1% at point #1 (>80% URL)	0.33%	Assay may be conducted at this concentration
	Estimate of Uncetainty < 1% at point #2	0.34%	Assay may be conducted at this concentration
	Estimate of Uncetainty < 1% at point #3	0.37%	Assay may be conducted at this concentration
	Estimate of Uncetainty < 1% at point #4	0.44%	Assay may be conducted at this concentration
	Estimate of Uncetainty < 1% at point #5 (~50% URL)	0.56%	Assay may be conducted at this concentration
	Analyzer slope is within 0.98-1.02	1.0020	Analyzer Slope is acceptable
Oxides of Nitrogen Gas Analyzer NOx Portion	Analyzer Calibration within 2 week of assay	13-Jun-12	Analyzer calibration within 2 weeks of assay
	Estimate of Uncetainty < 1% at point #1 (>80% URL)	0.36%	Assay may be conducted at this concentration
	Estimate of Uncetainty < 1% at point #2	0.37%	Assay may be conducted at this concentration
	Estimate of Uncetainty < 1% at point #3	0.41%	Assay may be conducted at this concentration
	Estimate of Uncetainty < 1% at point #4	0.48%	Assay may be conducted at this concentration
	Estimate of Uncetainty < 1% at point #5 (~50% URL)	0.61%	Assay may be conducted at this concentration
	Analyzer slope is within 0.98-1.02	1.0020	Analyzer Slope is acceptable
Dilution Check	Dilution Check Date within 2 weeks of assay	5-Jun-12	Dilution check within 2 weeks of assay
	Dilution Check Relative % Difference < 1%	0.000%	Dilution Check RSD is OK
Day of Assay Zero/Span Check NO Portion	Day of Assay Zero Check - Std. Error < 1%	Std. Error is okay.	Zero Gas Std. Error is OK
	Day of Assay Zero Check - Relative Difference < 5%	RD is okay.	Zero Gas RD is OK
	Day of Assay Span Check - Std. Error < 1%	Std. Error is okay.	Span Gas Std. Error is OK
	Day of Assay Span Check - Relative Difference <5%	RD is okay.	Span Gas RD is OK
Day of Assay Zero/Span Check NOx Portion	Day of Assay Zero Check - Std. Error < 1%	Std. Error is okay.	Zero Gas Std. Error is OK
	Day of Assay Zero Check - Relative Difference < 5%	RD is okay.	Zero Gas RD is OK
	Day of Assay Span Check - Std. Error < 1%	Std. Error is okay.	Span Gas Std. Error is OK
	Day of Assay Span Check - Relative Difference <5%	RD is okay.	Span Gas RD is OK
Challenge Standard #1 NO Assay	Challenge Standard #1 Std. Error < 1%	The standard error is okay.	Challenge Standard #1 Std. Error is OK
	Challenge Standard #1 vendor certificate bias	-0.35%	Challenge Std. #1 vendor certificate bias < 2%
Challenge Standard #1 NOx Assay	Challenge Standard #1 Std. Error < 1%	The standard error is okay.	Challenge Standard #1 Std. Error is OK
	Challenge Standard #1 vendor certificate bias	-0.21%	Challenge Std. #1 vendor certificate bias < 2%
Challenge Standard #2 NO Assay	Challenge Standard #2 Std. Error < 1%	The standard error is okay.	Challenge Standard #2 Std. Error is OK
	Challenge Standard #2 vendor certificate bias	0.42%	Challenge Std. #2 vendor certificate bias < 2%
Challenge Standard #2 NOx Assay	Challenge Standard #2 Std. Error < 1%	The standard error is okay.	Challenge Standard #2 Std. Error is OK
	Challenge Standard #2 vendor certificate bias	0.61%	Challenge Std. #2 vendor certificate bias < 2%
Challenge Standard #3 NO Assay	Challenge Standard #3 Std. Error < 1%	The standard error is okay.	Challenge Standard #3 Std. Error is OK
	Challenge Standard #3 vendor certificate bias	-1.53%	Challenge Std. #3 vendor certificate bias < 2%
Challenge Standard #3 NOx Assay	Challenge Standard #3 Std. Error < 1%	The standard error is okay.	Challenge Standard #3 Std. Error is OK
	Challenge Standard #3 vendor certificate bias	-1.47%	Challenge Std. #3 vendor certificate bias < 2%

CO QA Requirements Summary, Region 2 - 3rd Quarter of 2012

	QA Requirement	Result	Status
SRM Gas Standards	Primary SRM Cylinder Expiration Date	18-Jan-16	Primary SRM Gas Standard OK
	Primary SRM Cylinder Pressure >150 psi	1500	Primary SRM cylinder pressure is OK
	SRM Dilution Check Cylinder Expiration Date	7-Apr-18	Dilution Check SRM Gas Standard OK
	Dilution Check SRM Cylinder Pressure >150 psi	2100	Dilution check SRM cylinder pressure is OK
Laboratory Flow Standard	High Flow Standard Expiration Date	22-May-13	Standard OK
	Low Flow Standard Expiration Date	22-May-13	Standard OK
	Flow Standard Base Unit Expiration Date	22-May-13	Standard OK
Calibrator (mass flow controllers)	Calibrator Flow Calibration within 2 weeks of assay	26-Aug-12	Calibrator flow calibration within 2 weeks of assay
	Calibrated High Flow MFC Slope Range = 0.99 - 1.01	0.9999894	High MFC OK
	Calibrated Low Flow MFC Slope Range = 0.99 - 1.01	0.9999995	Low MFC OK
Carbon Monoxide Gas Analyzer	Analyzer Calibration within 2 week of assay	26-Aug-12	Analyzer calibration within 2 weeks of assay
	Estimate of Uncetainty < 1% at point #1 (>80% URL)	0.60%	Assay may be conducted at this concentration
	Estimate of Uncetainty < 1% at point #2	0.61%	Assay may be conducted at this concentration
	Estimate of Uncetainty < 1% at point #3	0.62%	Assay may be conducted at this concentration
	Estimate of Uncetainty < 1% at point #4	0.63%	Assay may be conducted at this concentration
	Estimate of Uncetainty < 1% at point #5 (~50% URL)	0.65%	Assay may be conducted at this concentration
	Analyzer slope is within 0.98-1.02	0.9990	Analyzer Slope is acceptable
Dilution Check	Dilution Check Date within 2 weeks of assay	27-Aug-12	Dilution check within 2 weeks of assay
	Dilution Check Relative % Difference < 1%	0.194%	Dilution Check RSD is OK
Day of Assay Zero/Span Check	Day of Assay Zero Check - Std. Error < 1%	Std. Error is okay.	Zero Gas Std. Error is OK
	Day of Assay Zero Check - Relative Difference < 5%	RD is okay.	Zero Gas RD is OK
	Day of Assay Span Check - Std. Error < 1%	Std. Error is okay.	Span Gas Std. Error is OK
	Day of Assay Span Check - Relative Difference <5%	RD is okay.	Span Gas RD is OK
Challenge Standard #1 Assay	Challenge Standard #1 Std. Error < 1%	The standard error is okay.	Challenge Standard #1 Std. Error is OK
	Challenge Standard #1 vendor certificate bias	0.13%	Challenge Std. #1 vendor certificate bias < 2%

SO2 QA Requirements Summary, Region 2 - 3rd Quarter of 2012

	QA Requirement	Result	Status
SRM Gas Standards	Primary SRM Cylinder Expiration Date	11-Dec-15	Primary SRM Gas Standard OK
	Primary SRM Cylinder Pressure >150 psi	1250	Primary SRM cylinder pressure is OK
	SRM Dilution Check Cylinder Expiration Date	1-Jun-16	Dilution Check SRM Gas Standard OK
	Dilution Check SRM Cylinder Pressure >150 psi	1350	Dilution check SRM cylinder pressure is OK
Laboratory Flow Standard	High Flow Standard Expiration Date	22-May-13	Standard OK
	Low Flow Standard Expiration Date	22-May-13	Standard OK
	Flow Standard Base Unit Expiration Date	22-May-13	Standard OK
Calibrator (mass flow controllers)	Calibrator Flow Calibration within 2 weeks of assay	23-Aug-12	Calibrator flow calibration within 2 weeks of assay
	Calibrated High Flow MFC Slope Range = 0.99 - 1.01	0.9999894	High MFC OK
	Calibrated Low Flow MFC Slope Range = 0.99 - 1.01	0.9999995	Low MFC OK
Sulfur Dioxide Gas Analyzer	Analyzer Calibration within 2 weeks of assay	29-Aug-12	Analyzer calibration within 2 weeks of assay
	Estimate of Uncetainty < 1% at point #1 (>80% URL)	0.28%	Assay may be conducted at this concentration
	Estimate of Uncetainty < 1% at point #2	0.29%	Assay may be conducted at this concentration
	Estimate of Uncetainty < 1% at point #3	0.32%	Assay may be conducted at this concentration
	Estimate of Uncetainty < 1% at point #4	0.37%	Assay may be conducted at this concentration
	Estimate of Uncetainty < 1% at point #5 (~50% URL)	0.48%	Assay may be conducted at this concentration
	Analyzer slope is within 0.98-1.02	1.0022	Analyzer Slope is acceptable
Dilution Check	Dilution Check Date within 2 weeks of assay	27-Aug-12	Dilution check within 2 weeks of assay
	Dilution Check Relative % Difference < 1%	0.194%	Dilution Check RSD is OK
Day of Assay Zero/Span Check	Day of Assay Zero Check - Std. Error < 1%	Std. Error is okay.	Zero Gas Std. Error is OK
	Day of Assay Zero Check - Relative Difference < 5%	RD is okay.	Zero Gas RD is OK
	Day of Assay Span Check - Std. Error < 1%	Std. Error is okay.	Span Gas Std. Error is OK
	Day of Assay Span Check - Relative Difference <5%	RD is okay.	Span Gas RD is OK
Challenge Standard #1 Assay	Challenge Standard #1 Std. Error < 1%	The standard error is okay.	Challenge Standard #1 standard error is okay.
	Challenge Standard #1 vendor certificate bias	-4.74%	Challenge Std. #1 vendor certificate bias is 4% or greater
Challenge Standard #2 Assay	Challenge Standard #2 Std. Error < 1%	The standard error is okay.	Challenge Standard #2 standard error is okay.
	Challenge Standard #2 vendor certificate bias	-0.45%	Challenge Std. #2 vendor certificate bias < 2%
Challenge Standard #3 Assay	Challenge Standard #3 Std. Error < 1%	The standard error is okay.	Challenge Standard #3 standard error is okay.
	Challenge Standard #3 vendor certificate bias	0.68%	Challenge Std. #3 vendor certificate bias < 2%

NOx QA Requirements Summary, Region 2 - 3rd Quarter of 2012

	QA Requirement	Result	Status
SRM Gas Standards	Primary SRM Cylinder Expiration Date	1-Jun-16	Primary SRM Gas Standard OK
	Primary SRM Cylinder Pressure >150 psi	2100	Primary SRM cylinder pressure is OK
	SRM Dilution Check Cylinder Expiration Date	1-Jun-16	Dilution Check SRM Gas Standard OK
	Dilution Check SRM Cylinder Pressure >150 psi	1600	Dilution check SRM cylinder pressure is OK
Laboratory Flow Standard	High Flow Standard Expiration Date	22-May-13	Standard OK
	Low Flow Standard Expiration Date	22-May-13	Standard OK
	Flow Standard Base Unit Expiration Date	22-May-13	Standard OK
Calibrator (mass flow controllers)	Calibrator Flow Calibration within 2 weeks of assay	23-Aug-12	Calibrator flow calibration within 2 weeks of assay
	Calibrated High Flow MFC Slope Range = 0.99 - 1.01	0.9999894	High MFC OK
	Calibrated Low Flow MFC Slope Range = 0.99 - 1.01	0.9999995	Low MFC OK
Oxides of Nitrogen Gas Analyzer NO Portion	Analyzer Calibration within 2 weeks of assay	30-Aug-12	Analyzer calibration within 2 weeks of assay
	Estimate of Uncetainty < 1% at point #1 (>80% URL)	0.20%	Assay may be conducted at this concentration
	Estimate of Uncetainty < 1% at point #2	0.21%	Assay may be conducted at this concentration
	Estimate of Uncetainty < 1% at point #3	0.23%	Assay may be conducted at this concentration
	Estimate of Uncetainty < 1% at point #4	0.27%	Assay may be conducted at this concentration
	Estimate of Uncetainty < 1% at point #5 (~50% URL)	0.34%	Assay may be conducted at this concentration
	Analyzer slope is within 0.98-1.02	1.0000	Analyzer Slope is acceptable
Oxides of Nitrogen Gas Analyzer NOx Portion	Analyzer Calibration within 2 week of assay	30-Aug-12	Analyzer calibration within 2 weeks of assay
	Estimate of Uncetainty < 1% at point #1 (>80% URL)	0.26%	Assay may be conducted at this concentration
	Estimate of Uncetainty < 1% at point #2	0.27%	Assay may be conducted at this concentration
	Estimate of Uncetainty < 1% at point #3	0.30%	Assay may be conducted at this concentration
	Estimate of Uncetainty < 1% at point #4	0.35%	Assay may be conducted at this concentration
	Estimate of Uncetainty < 1% at point #5 (~50% URL)	0.44%	Assay may be conducted at this concentration
	Analyzer slope is within 0.98-1.02	0.9975	Analyzer Slope is acceptable
Dilution Check	Dilution Check Date within 2 weeks of assay	27-Aug-12	Dilution check within 2 weeks of assay
	Dilution Check Relative % Difference < 1%	0.000%	Dilution Check RSD is OK
Day of Assay Zero/Span Check NO Portion	Day of Assay Zero Check - Std. Error < 1%	Std. Error is okay.	Zero Gas Std. Error is OK
	Day of Assay Zero Check - Relative Difference < 5%	RD is okay.	Zero Gas RD is OK
	Day of Assay Span Check - Std. Error < 1%	Std. Error is okay.	Span Gas Std. Error is OK
	Day of Assay Span Check - Relative Difference <5%	RD is okay.	Span Gas RD is OK
Day of Assay Zero/Span Check NOx Portion	Day of Assay Zero Check - Std. Error < 1%	Std. Error is okay.	Zero Gas Std. Error is OK
	Day of Assay Zero Check - Relative Difference < 5%	RD is okay.	Zero Gas RD is OK
	Day of Assay Span Check - Std. Error < 1%	Std. Error is okay.	Span Gas Std. Error is OK
	Day of Assay Span Check - Relative Difference <5%	RD is okay.	Span Gas RD is OK
Challenge Standard #1 NO Assay	Challenge Standard #1 Std. Error < 1%	The standard error is okay.	Challenge Standard #1 Std. Error is OK
	Challenge Standard #1 vendor certificate bias	-2.10%	Challenge Std. #1 vendor certificate bias between 2-4%
Challenge Standard #1 NOx Assay	Challenge Standard #1 Std. Error < 1%	The standard error is okay.	Challenge Standard #1 Std. Error is OK
	Challenge Standard #1 vendor certificate bias	-0.44%	Challenge Std. #1 vendor certificate bias < 2%
Challenge Standard #2 NO Assay	Challenge Standard #2 Std. Error < 1%	The standard error is okay.	Challenge Standard #2 Std. Error is OK
	Challenge Standard #2 vendor certificate bias	-0.23%	Challenge Std. #2 vendor certificate bias < 2%
Challenge Standard #2 NOx Assay	Challenge Standard #2 Std. Error < 1%	The standard error is okay.	Challenge Standard #2 Std. Error is OK
	Challenge Standard #2 vendor certificate bias	-0.70%	Challenge Std. #2 vendor certificate bias < 2%
Challenge Standard #3 NO Assay	Challenge Standard #3 Std. Error < 1%	The standard error is okay.	Challenge Standard #3 Std. Error is OK
	Challenge Standard #3 vendor certificate bias	0.98%	Challenge Std. #3 vendor certificate bias < 2%
Challenge Standard #3 NOx Assay	Challenge Standard #3 Std. Error < 1%	The standard error is okay.	Challenge Standard #3 Std. Error is OK
	Challenge Standard #3 vendor certificate bias	0.58%	Challenge Std. #3 vendor certificate bias < 2%
Challenge Standard #4 NO Assay	Challenge Standard #4 Std. Error < 1%	The standard error is okay.	Challenge Standard #4 Std. Error is OK
	Challenge Standard #4 vendor certificate bias	0.63%	Challenge Std. #4 vendor certificate bias < 2%
Challenge Standard #4 NOx Assay	Challenge Standard #4 Std. Error < 1%	The standard error is okay.	Challenge Standard #4 Std. Error is OK
	Challenge Standard #4 vendor certificate bias	1.04%	Challenge Std. #4 vendor certificate bias < 2%

CO QA Requirements Summary, Region 2 - 4th Quarter of 2012, Sheet 1

	QA Requirement	Result	Status
SRM Gas Standards	Primary SRM Cylinder Expiration Date	18-Jan-16	Primary SRM Gas Standard OK
	Primary SRM Cylinder Pressure >150 psi	1500	Primary SRM cylinder pressure is OK
	SRM Dilution Check Cylinder Expiration Date	7-Apr-18	Dilution Check SRM Gas Standard OK
	Dilution Check SRM Cylinder Pressure >150 psi	2100	Dilution check SRM cylinder pressure is OK
Laboratory Flow Standard	High Flow Standard Expiration Date	22-May-13	Standard OK
	Low Flow Standard Expiration Date	22-May-13	Standard OK
	Flow Standard Base Unit Expiration Date	22-May-13	Standard OK
Calibrator (mass flow controllers)	Calibrator Flow Calibration within 2 weeks of assay	13-Nov-12	Calibrator flow calibration within 2 weeks of assay
	Calibrated High Flow MFC Slope Range = 0.99 - 1.01	0.9999956	High MFC OK
	Calibrated Low Flow MFC Slope Range = 0.99 - 1.01	0.9999977	Low MFC OK
Carbon Monoxide Gas Analyzer	Analyzer Calibration within 2 week of assay	14-Nov-12	Analyzer calibration within 2 weeks of assay
	Estimate of Uncetainty < 1% at point #1 (>80% URL)	0.60%	Assay may be conducted at this concentration
	Estimate of Uncetainty < 1% at point #2	0.61%	Assay may be conducted at this concentration
	Estimate of Uncetainty < 1% at point #3	0.62%	Assay may be conducted at this concentration
	Estimate of Uncetainty < 1% at point #4	0.63%	Assay may be conducted at this concentration
	Estimate of Uncetainty < 1% at point #5 (~50% URL)	0.65%	Assay may be conducted at this concentration
	Analyzer slope is within 0.98-1.02	0.9988	Analyzer Slope is acceptable
Dilution Check	Dilution Check Date within 2 weeks of assay	14-Nov-12	Dilution check within 2 weeks of assay
	Dilution Check Relative % Difference < 1%	-0.144%	Dilution Check RSD is OK

CO QA Requirements Summary, Region 2 - 4th Quarter of 2012, Sheet 2

	QA Requirement	Result	Status
SRM Gas Standards	Primary SRM Cylinder Expiration Date	18-Jan-16	Primary SRM Gas Standard OK
	Primary SRM Cylinder Pressure >150 psi	1500	Primary SRM cylinder pressure is OK
	SRM Dilution Check Cylinder Expiration Date	7-Apr-18	Dilution Check SRM Gas Standard OK
	Dilution Check SRM Cylinder Pressure >150 psi	2100	Dilution check SRM cylinder pressure is OK
Laboratory Flow Standard	High Flow Standard Expiration Date	22-May-13	Standard OK
	Low Flow Standard Expiration Date	22-May-13	Standard OK
	Flow Standard Base Unit Expiration Date	22-May-13	Standard OK
Calibrator (mass flow controllers)	Calibrator Flow Calibration within 2 weeks of assay	13-Nov-12	Calibrator flow calibration within 2 weeks of assay
	Calibrated High Flow MFC Slope Range = 0.99 - 1.01	0.9999956	High MFC OK
	Calibrated Low Flow MFC Slope Range = 0.99 - 1.01	0.9999977	Low MFC OK
Carbon Monoxide Gas Analyzer	Analyzer Calibration within 2 week of assay	20-Nov-12	Analyzer calibration within 2 weeks of assay
	Estimate of Uncetainty < 1% at point #1 (>80% URL)	0.72%	Assay may be conducted at this concentration
	Estimate of Uncetainty < 1% at point #2	0.73%	Assay may be conducted at this concentration
	Estimate of Uncetainty < 1% at point #3	0.74%	Assay may be conducted at this concentration
	Estimate of Uncetainty < 1% at point #4	0.76%	Assay may be conducted at this concentration
	Estimate of Uncetainty < 1% at point #5 (~50% URL)	0.78%	Assay may be conducted at this concentration
	Analyzer slope is within 0.98-1.02	0.9995	Analyzer Slope is acceptable
Dilution Check	Dilution Check Date within 2 weeks of assay	14-Nov-12	Dilution check within 2 weeks of assay
	Dilution Check Relative % Difference < 1%	-0.339%	Dilution Check RSD is OK
Day of Assay Zero/Span Check	Day of Assay Zero Check - Std. Error < 1%	Std. Error is okay.	Zero Gas Std. Error is OK
	Day of Assay Zero Check - Relative Difference < 5%	RD is okay.	Zero Gas RD is OK
	Day of Assay Span Check - Std. Error < 1%	Std. Error is okay.	Span Gas Std. Error is OK
	Day of Assay Span Check - Relative Difference <5%	RD is okay.	Span Gas RD is OK
Challenge Standard #1 Assay	Challenge Standard #1 Std. Error < 1%	The standard error is okay.	Challenge Standard #1 Std. Error is OK
	Challenge Standard #1 vendor certificate bias	-0.17%	Challenge Std. #1 vendor certificate bias < 2%
Challenge Standard #2 Assay	Challenge Standard #2 Std. Error < 1%	The standard error is okay.	Challenge Standard #2 Std. Error is OK
	Challenge Standard #2 vendor certificate bias	-0.32%	Challenge Std. #2 vendor certificate bias < 2%
Challenge Standard #3 Assay	Challenge Standard #3 Std. Error < 1%	The standard error is okay.	Challenge Standard #3 Std. Error is OK
	Challenge Standard #3 vendor certificate bias	-0.43%	Challenge Std. #3 vendor certificate bias < 2%
Challenge Standard #4 Assay	Challenge Standard #4 Std. Error < 1%	The standard error is okay.	Challenge Standard #4 Std. Error is OK
	Challenge Standard #4 vendor certificate bias	0.19%	Challenge Std. #4 vendor certificate bias < 2%
Challenge Standard #5 Assay	Challenge Standard #5 Std. Error < 1%	The standard error is okay.	Challenge Standard #5 Std. Error is OK
	Challenge Standard #5 vendor certificate bias	-0.56%	Challenge Std. #5 vendor certificate bias < 2%

SO2 QA Requirements Summary, Region 2 - 4th Quarter of 2012

	QA Requirement	Result	Status
SRM Gas Standards	Primary SRM Cylinder Expiration Date	11-Dec-15	Primary SRM Gas Standard OK
	Primary SRM Cylinder Pressure >150 psi	1250	Primary SRM cylinder pressure is OK
	SRM Dilution Check Cylinder Expiration Date	1-Jun-16	Dilution Check SRM Gas Standard OK
	Dilution Check SRM Cylinder Pressure >150 psi	1350	Dilution check SRM cylinder pressure is OK
Laboratory Flow Standard	High Flow Standard Expiration Date	22-May-13	Standard OK
	Low Flow Standard Expiration Date	22-May-13	Standard OK
	Flow Standard Base Unit Expiration Date	22-May-13	Standard OK
Calibrator (mass flow controllers)	Calibrator Flow Calibration within 2 weeks of assay	13-Nov-12	Calibrator flow calibration within 2 weeks of assay
	Calibrated High Flow MFC Slope Range = 0.99 - 1.01	0.9999956	High MFC OK
	Calibrated Low Flow MFC Slope Range = 0.99 - 1.01	0.9999977	Low MFC OK
Sulfur Dioxide Gas Analyzer	Analyzer Calibration within 2 weeks of assay	19-Nov-12	Analyzer calibration within 2 weeks of assay
	Estimate of Uncetainty < 1% at point #1 (>80% URL)	0.24%	Assay may be conducted at this concentration
	Estimate of Uncetainty < 1% at point #2	0.25%	Assay may be conducted at this concentration
	Estimate of Uncetainty < 1% at point #3	0.27%	Assay may be conducted at this concentration
	Estimate of Uncetainty < 1% at point #4	0.32%	Assay may be conducted at this concentration
	Estimate of Uncetainty < 1% at point #5 (~50% URL)	0.40%	Assay may be conducted at this concentration
	Analyzer slope is within 0.98-1.02	1.0056	Analyzer Slope is acceptable
Dilution Check	Dilution Check Date within 2 weeks of assay	14-Nov-12	Dilution check within 2 weeks of assay
	Dilution Check Relative % Difference < 1%	-0.339%	Dilution Check RSD is OK
Day of Assay Zero/Span Check	Day of Assay Zero Check - Std. Error < 1%	Std. Error is okay.	Zero Gas Std. Error is OK
	Day of Assay Zero Check - Relative Difference < 5%	RD is okay.	Zero Gas RD is OK
	Day of Assay Span Check - Std. Error < 1%	Std. Error is okay.	Span Gas Std. Error is OK
	Day of Assay Span Check - Relative Difference <5%	RD is okay.	Span Gas RD is OK
Challenge Standard #1 Assay	Challenge Standard #1 Std. Error < 1%	The standard error is okay.	Challenge Standard #1 standard error is okay.
	Challenge Standard #1 vendor certificate bias	0.32%	Challenge Std. #1 vendor certificate bias < 2%
Challenge Standard #2 Assay	Challenge Standard #2 Std. Error < 1%	The standard error is okay.	Challenge Standard #2 standard error is okay.
	Challenge Standard #2 vendor certificate bias	0.54%	Challenge Std. #2 vendor certificate bias < 2%
Challenge Standard #3 Assay	Challenge Standard #3 Std. Error < 1%	The standard error is okay.	Challenge Standard #3 standard error is okay.
	Challenge Standard #3 vendor certificate bias	0.30%	Challenge Std. #3 vendor certificate bias < 2%
Challenge Standard #4 Assay	Challenge Standard #4 Std. Error < 1%	The standard error is okay.	Challenge Standard #4 standard error is okay.
	Challenge Standard #4 vendor certificate bias	-1.79%	Challenge Std. #4 vendor certificate bias < 2%
Challenge Standard #5 Assay	Challenge Standard #5 Std. Error < 1%	The standard error is okay.	Challenge Standard #5 standard error is okay.
	Challenge Standard #5 vendor certificate bias	0.91%	Challenge Std. #5 vendor certificate bias < 2%

NOx QA Requirements Summary, Region 2 - 4th Quarter of 2012, Sheet 1

	QA Requirement	Result	Status
SRM Gas Standards	Primary SRM Cylinder Expiration Date	1-Jun-16	Primary SRM Gas Standard OK
	Primary SRM Cylinder Pressure >150 psi	2100	Primary SRM cylinder pressure is OK
	SRM Dilution Check Cylinder Expiration Date	1-Jun-16	Dilution Check SRM Gas Standard OK
	Dilution Check SRM Cylinder Pressure >150 psi	1600	Dilution check SRM cylinder pressure is OK
Laboratory Flow Standard	High Flow Standard Expiration Date	22-May-13	Standard OK
	Low Flow Standard Expiration Date	22-May-13	Standard OK
	Flow Standard Base Unit Expiration Date	22-May-13	Standard OK
Calibrator (mass flow controllers)	Calibrator Flow Calibration within 2 weeks of assay	13-Nov-12	Calibrator flow calibration within 2 weeks of assay
	Calibrated High Flow MFC Slope Range = 0.99 - 1.01	0.9999956	High MFC OK
	Calibrated Low Flow MFC Slope Range = 0.99 - 1.01	0.9999977	Low MFC OK
Oxides of Nitrogen Gas Analyzer NO Portion	Analyzer Calibration within 2 weeks of assay	15-Nov-12	Analyzer calibration within 2 weeks of assay
	Estimate of Uncetainty < 1% at point #1 (>80% URL)	0.11%	Assay may be conducted at this concentration
	Estimate of Uncetainty < 1% at point #2	0.12%	Assay may be conducted at this concentration
	Estimate of Uncetainty < 1% at point #3	0.13%	Assay may be conducted at this concentration
	Estimate of Uncetainty < 1% at point #4	0.15%	Assay may be conducted at this concentration
	Estimate of Uncetainty < 1% at point #5 (~50% URL)	0.19%	Assay may be conducted at this concentration
	Analyzer slope is within 0.98-1.02	1.0085	Analyzer Slope is acceptable
Oxides of Nitrogen Gas Analyzer NOx Portion	Analyzer Calibration within 2 week of assay	15-Nov-12	Analyzer calibration within 2 weeks of assay
	Estimate of Uncetainty < 1% at point #1 (>80% URL)	0.22%	Assay may be conducted at this concentration
	Estimate of Uncetainty < 1% at point #2	0.23%	Assay may be conducted at this concentration
	Estimate of Uncetainty < 1% at point #3	0.25%	Assay may be conducted at this concentration
	Estimate of Uncetainty < 1% at point #4	0.29%	Assay may be conducted at this concentration
	Estimate of Uncetainty < 1% at point #5 (~50% URL)	0.37%	Assay may be conducted at this concentration
	Analyzer slope is within 0.98-1.02	1.0041	Analyzer Slope is acceptable
Dilution Check	Dilution Check Date within 2 weeks of assay	14-Nov-12	Dilution check within 2 weeks of assay
	Dilution Check Relative % Difference < 1%	-0.339%	Dilution Check RSD is OK
Day of Assay Zero/Span Check NO Portion	Day of Assay Zero Check - Std. Error < 1%	Std. Error is okay.	Zero Gas Std. Error is OK
	Day of Assay Zero Check - Relative Difference < 5%	RD is okay.	Zero Gas RD is OK
	Day of Assay Span Check - Std. Error < 1%	Std. Error is okay.	Span Gas Std. Error is OK
	Day of Assay Span Check - Relative Difference <5%	RD is okay.	Span Gas RD is OK
Day of Assay Zero/Span Check NOx Portion	Day of Assay Zero Check - Std. Error < 1%	Std. Error is okay.	Zero Gas Std. Error is OK
	Day of Assay Zero Check - Relative Difference < 5%	RD is okay.	Zero Gas RD is OK
	Day of Assay Span Check - Std. Error < 1%	Std. Error is okay.	Span Gas Std. Error is OK
	Day of Assay Span Check - Relative Difference <5%	RD is okay.	Span Gas RD is OK
Challenge Standard #1 NO Assay	Challenge Standard #1 Std. Error < 1%	The standard error is okay.	Challenge Standard #1 Std. Error is OK
	Challenge Standard #1 vendor certificate bias	-2.31%	Challenge Std. #1 vendor certificate bias between 2-4%
Challenge Standard #1 NOx Assay	Challenge Standard #1 Std. Error < 1%	The standard error is okay.	Challenge Standard #1 Std. Error is OK
	Challenge Standard #1 vendor certificate bias	#VALUE!	#VALUE!
Challenge Standard #2 NO Assay	Challenge Standard #2 Std. Error < 1%	The standard error is okay.	Challenge Standard #2 Std. Error is OK
	Challenge Standard #2 vendor certificate bias	0.33%	Challenge Std. #2 vendor certificate bias < 2%
Challenge Standard #2 NOx Assay	Challenge Standard #2 Std. Error < 1%	The standard error is okay.	Challenge Standard #2 Std. Error is OK
	Challenge Standard #2 vendor certificate bias	0.23%	Challenge Std. #2 vendor certificate bias < 2%
Challenge Standard #3 NO Assay	Challenge Standard #3 Std. Error < 1%	The standard error is okay.	Challenge Standard #3 Std. Error is OK
	Challenge Standard #3 vendor certificate bias	0.29%	Challenge Std. #3 vendor certificate bias < 2%
Challenge Standard #3 NOx Assay	Challenge Standard #3 Std. Error < 1%	The standard error is okay.	Challenge Standard #3 Std. Error is OK
	Challenge Standard #3 vendor certificate bias	#VALUE!	#VALUE!
Challenge Standard #4 NO Assay	Challenge Standard #4 Std. Error < 1%	The standard error is okay.	Challenge Standard #4 Std. Error is OK
	Challenge Standard #4 vendor certificate bias	1.29%	Challenge Std. #4 vendor certificate bias < 2%
Challenge Standard #4 NOx Assay	Challenge Standard #4 Std. Error < 1%	The standard error is okay.	Challenge Standard #4 Std. Error is OK
	Challenge Standard #4 vendor certificate bias	0.49%	Challenge Std. #4 vendor certificate bias < 2%
Challenge Standard #5 NO Assay	Challenge Standard #5 Std. Error < 1%	The standard error is okay.	Challenge Standard #5 Std. Error is OK
	Challenge Standard #5 vendor certificate bias	2.70%	Challenge Std. #5 vendor certificate bias between 2-4%
Challenge Standard #5 NOx Assay	Challenge Standard #5 Std. Error < 1%	The standard error is okay.	Challenge Standard #5 Std. Error is OK
	Challenge Standard #5 vendor certificate bias	2.15%	Challenge Std. #5 vendor certificate bias between 2-4%

NOx QA Requirements Summary, Region 2 - 4th Quarter of 2012, Sheet 2

	QA Requirement	Result	Status
SRM Gas Standards	Primary SRM Cylinder Expiration Date	1-Jun-16	Primary SRM Gas Standard OK
	Primary SRM Cylinder Pressure >150 psi	2100	Primary SRM cylinder pressure is OK
	SRM Dilution Check Cylinder Expiration Date	1-Jun-16	Dilution Check SRM Gas Standard OK
	Dilution Check SRM Cylinder Pressure >150 psi	1600	Dilution check SRM cylinder pressure is OK
Laboratory Flow Standard	High Flow Standard Expiration Date	22-May-13	Standard OK
	Low Flow Standard Expiration Date	22-May-13	Standard OK
	Flow Standard Base Unit Expiration Date	22-May-13	Standard OK
Calibrator (mass flow controllers)	Calibrator Flow Calibration within 2 weeks of assay	13-Nov-12	Calibrator flow calibration within 2 weeks of assay
	Calibrated High Flow MFC Slope Range = 0.99 - 1.01	0.9999956	High MFC OK
	Calibrated Low Flow MFC Slope Range = 0.99 - 1.01	0.9999977	Low MFC OK
Oxides of Nitrogen Gas Analyzer NO Portion	Analyzer Calibration within 2 weeks of assay	15-Nov-12	Analyzer calibration within 2 weeks of assay
	Estimate of Uncetainty < 1% at point #1 (>80% URL)	0.11%	Assay may be conducted at this concentration
	Estimate of Uncetainty < 1% at point #2	0.12%	Assay may be conducted at this concentration
	Estimate of Uncetainty < 1% at point #3	0.13%	Assay may be conducted at this concentration
	Estimate of Uncetainty < 1% at point #4	0.15%	Assay may be conducted at this concentration
	Estimate of Uncetainty < 1% at point #5 (~50% URL)	0.19%	Assay may be conducted at this concentration
	Analyzer slope is within 0.98-1.02	1.0085	Analyzer Slope is acceptable
Oxides of Nitrogen Gas Analyzer NOx Portion	Analyzer Calibration within 2 week of assay	15-Nov-12	Analyzer calibration within 2 weeks of assay
	Estimate of Uncetainty < 1% at point #1 (>80% URL)	0.22%	Assay may be conducted at this concentration
	Estimate of Uncetainty < 1% at point #2	0.23%	Assay may be conducted at this concentration
	Estimate of Uncetainty < 1% at point #3	0.25%	Assay may be conducted at this concentration
	Estimate of Uncetainty < 1% at point #4	0.29%	Assay may be conducted at this concentration
	Estimate of Uncetainty < 1% at point #5 (~50% URL)	0.37%	Assay may be conducted at this concentration
	Analyzer slope is within 0.98-1.02	1.0041	Analyzer Slope is acceptable
Dilution Check	Dilution Check Date within 2 weeks of assay	14-Nov-12	Dilution check within 2 weeks of assay
	Dilution Check Relative % Difference < 1%	-0.339%	Dilution Check RSD is OK
Day of Assay Zero/Span Check NO Portion	Day of Assay Zero Check - Std. Error < 1%	Std. Error is okay.	Zero Gas Std. Error is OK
	Day of Assay Zero Check - Relative Difference < 5%	RD is okay.	Zero Gas RD is OK
	Day of Assay Span Check - Std. Error < 1%	Std. Error is okay.	Span Gas Std. Error is OK
	Day of Assay Span Check - Relative Difference <5%	RD is okay.	Span Gas RD is OK
Day of Assay Zero/Span Check NOx Portion	Day of Assay Zero Check - Std. Error < 1%	Std. Error is okay.	Zero Gas Std. Error is OK
	Day of Assay Zero Check - Relative Difference < 5%	RD is okay.	Zero Gas RD is OK
	Day of Assay Span Check - Std. Error < 1%	Std. Error is okay.	Span Gas Std. Error is OK
	Day of Assay Span Check - Relative Difference <5%	RD is okay.	Span Gas RD is OK
Challenge Standard #1 NO Assay	Challenge Standard #1 Std. Error < 1%	The standard error is okay.	Challenge Standard #1 Std. Error is OK
	Challenge Standard #1 vendor certificate bias	-0.53%	Challenge Std. #1 vendor certificate bias < 2%
Challenge Standard #1 NOx Assay	Challenge Standard #1 Std. Error < 1%	The standard error is okay.	Challenge Standard #1 Std. Error is OK
	Challenge Standard #1 vendor certificate bias	-1.06%	Challenge Std. #1 vendor certificate bias < 2%

Region 7 QA Data

CO QA Requirements Summary, Region 7 - 1st Quarter of 2012

	QA Requirement	Result	Status
SRM Gas Standards	Primary SRM Cylinder Expiration Date	1-Jun-17	Primary SRM Gas Standard OK
	Primary SRM Cylinder Pressure >150 psi	875	Primary SRM cylinder pressure is OK
	SRM Dilution Check Cylinder Expiration Date	9-Nov-15	Dilution Check SRM Gas Standard OK
	Dilution Check SRM Cylinder Pressure >150 psi	1875	Dilution check SRM cylinder pressure is OK
Laboratory Flow Standard	High Flow Standard Expiration Date	11-Nov-12	Standard OK
	Low Flow Standard Expiration Date	11-Nov-12	Standard OK
	Flow Standard Base Unit Expiration Date	N/A	Standard OK
Calibrator (mass flow controllers)	Calibrator Flow Calibration within 2 weeks of assay	27-Feb-12	Calibrator flow calibration within 2 weeks of assay
	Calibrated High Flow MFC Slope Range = 0.99 - 1.01	0.9999980	High MFC OK
	Calibrated Low Flow MFC Slope Range = 0.99 - 1.01	0.9999984	Low MFC OK
Carbon Monoxide Gas Analyzer	Analyzer Calibration within 2 week of assay	27-Feb-12	Analyzer calibration within 2 weeks of assay
	Estimate of Uncetainty < 1% at point #1 (>80% URL)	0.57%	Assay may be conducted at this concentration
	Estimate of Uncetainty < 1% at point #2	0.58%	Assay may be conducted at this concentration
	Estimate of Uncetainty < 1% at point #3	0.64%	Assay may be conducted at this concentration
	Estimate of Uncetainty < 1% at point #4	0.74%	Assay may be conducted at this concentration
	Estimate of Uncetainty < 1% at point #5 (~50% URL)	0.95%	Assay may be conducted at this concentration
	Analyzer slope is within 0.98-1.02	0.9973	Analyzer Slope is acceptable
Dilution Check	Dilution Check Date within 2 weeks of assay	27-Feb-12	Dilution check within 2 weeks of assay
	Dilution Check Relative % Difference < 1%	0.279%	Dilution Check RSD is OK
Day of Assay Zero/Span Check	Day of Assay Zero Check - Std. Error < 1%	Std. Error is okay.	Zero Gas Std. Error is OK
	Day of Assay Zero Check - Relative Difference < 5%	RD is okay.	Zero Gas RD is OK
	Day of Assay Span Check - Std. Error < 1%	Std. Error is okay.	Span Gas Std. Error is OK
	Day of Assay Span Check - Relative Difference <5%	RD is okay.	Span Gas RD is OK
Challenge Standard #1 Assay	Challenge Standard #1 Std. Error < 1%	The standard error is okay.	Challenge Standard #1 Std. Error is OK
	Challenge Standard #1 vendor certificate bias	0.84%	Challenge Std. #1 vendor certificate bias < 2%
Challenge Standard #2 Assay	Challenge Standard #2 Std. Error < 1%	The standard error is okay.	Challenge Standard #2 Std. Error is OK
	Challenge Standard #2 vendor certificate bias	#VALUE!	#VALUE!
Challenge Standard #3 Assay	Challenge Standard #3 Std. Error < 1%	The standard error is okay.	Challenge Standard #3 Std. Error is OK
	Challenge Standard #3 vendor certificate bias	#VALUE!	#VALUE!
Challenge Standard #4 Assay	Challenge Standard #4 Std. Error < 1%	The standard error is okay.	Challenge Standard #4 Std. Error is OK
	Challenge Standard #4 vendor certificate bias	#VALUE!	#VALUE!
Challenge Standard #5 Assay	Challenge Standard #5 Std. Error < 1%	The standard error is okay.	Challenge Standard #5 Std. Error is OK
	Challenge Standard #5 vendor certificate bias	#VALUE!	#VALUE!

NOx QA Requirements Summary, Region 7 - 1st Quarter of 2012

	QA Requirement	Result	Status
SRM Gas Standards	Primary SRM Cylinder Expiration Date	1-Jun-16	Primary SRM Gas Standard OK
	Primary SRM Cylinder Pressure >150 psi	1850	Primary SRM cylinder pressure is OK
	SRM Dilution Check Cylinder Expiration Date	1-Jun-16	Dilution Check SRM Gas Standard OK
	Dilution Check SRM Cylinder Pressure >150 psi	1750	Dilution check SRM cylinder pressure is OK
Laboratory Flow Standard	High Flow Standard Expiration Date	11-Nov-12	Standard OK
	Low Flow Standard Expiration Date	11-Nov-12	Standard OK
	Flow Standard Base Unit Expiration Date	N/A	Standard OK
Calibrator (mass flow controllers)	Calibrator Flow Calibration within 2 weeks of assay	27-Feb-12	Calibrator flow calibration within 2 weeks of assay
	Calibrated High Flow MFC Slope Range = 0.99 - 1.01	0.9999980	High MFC OK
	Calibrated Low Flow MFC Slope Range = 0.99 - 1.01	0.9999984	Low MFC OK
Oxides of Nitrogen Gas Analyzer NO Portion	Analyzer Calibration within 2 weeks of assay	28-Feb-12	Analyzer calibration within 2 weeks of assay
	Estimate of Uncetainty < 1% at point #1 (>80% URL)	0.30%	Assay may be conducted at this concentration
	Estimate of Uncetainty < 1% at point #2	0.31%	Assay may be conducted at this concentration
	Estimate of Uncetainty < 1% at point #3	0.34%	Assay may be conducted at this concentration
	Estimate of Uncetainty < 1% at point #4	0.39%	Assay may be conducted at this concentration
	Estimate of Uncetainty < 1% at point #5 (~50% URL)	0.50%	Assay may be conducted at this concentration
	Analyzer slope is within 0.98-1.02	1.0019	Analyzer Slope is acceptable
Oxides of Nitrogen Gas Analyzer NOx Portion	Analyzer Calibration within 2 week of assay	28-Feb-12	Analyzer calibration within 2 weeks of assay
	Estimate of Uncetainty < 1% at point #1 (>80% URL)	0.25%	Assay may be conducted at this concentration
	Estimate of Uncetainty < 1% at point #2	0.26%	Assay may be conducted at this concentration
	Estimate of Uncetainty < 1% at point #3	0.28%	Assay may be conducted at this concentration
	Estimate of Uncetainty < 1% at point #4	0.33%	Assay may be conducted at this concentration
	Estimate of Uncetainty < 1% at point #5 (~50% URL)	0.43%	Assay may be conducted at this concentration
	Analyzer slope is within 0.98-1.02	1.0011	Analyzer Slope is acceptable
Dilution Check	Dilution Check Date within 2 weeks of assay	27-Feb-12	Dilution check within 2 weeks of assay
	Dilution Check Relative % Difference < 1%	0.279%	Dilution Check RSD is OK
Day of Assay Zero/Span Check NO Portion	Day of Assay Zero Check - Std. Error < 1%	Std. Error is okay.	Zero Gas Std. Error is OK
	Day of Assay Zero Check - Relative Difference < 5%	RD is okay.	Zero Gas RD is OK
	Day of Assay Span Check - Std. Error < 1%	Std. Error is okay.	Span Gas Std. Error is OK
	Day of Assay Span Check - Relative Difference <5%	RD is okay.	Span Gas RD is OK
Day of Assay Zero/Span Check NOx Portion	Day of Assay Zero Check - Std. Error < 1%	Std. Error is okay.	Zero Gas Std. Error is OK
	Day of Assay Zero Check - Relative Difference < 5%	RD is okay.	Zero Gas RD is OK
	Day of Assay Span Check - Std. Error < 1%	Std. Error is okay.	Span Gas Std. Error is OK
	Day of Assay Span Check - Relative Difference <5%	RD is okay.	Span Gas RD is OK
Challenge Standard #1 NO Assay	Challenge Standard #1 Std. Error < 1%	The standard error is okay.	Challenge Standard #1 Std. Error is OK
	Challenge Standard #1 vendor certificate bias	1.60%	Challenge Std. #1 vendor certificate bias < 2%
Challenge Standard #1 NOx Assay	Challenge Standard #1 Std. Error < 1%	The standard error is okay.	Challenge Standard #1 Std. Error is OK
	Challenge Standard #1 vendor certificate bias	1.63%	Challenge Std. #1 vendor certificate bias < 2%
Challenge Standard #2 NO Assay	Challenge Standard #2 Std. Error < 1%	The standard error is okay.	Challenge Standard #2 Std. Error is OK
	Challenge Standard #2 vendor certificate bias	#VALUE!	#VALUE!
Challenge Standard #2 NOx Assay	Challenge Standard #2 Std. Error < 1%	The standard error is okay.	Challenge Standard #2 Std. Error is OK
	Challenge Standard #2 vendor certificate bias	#VALUE!	#VALUE!
Challenge Standard #3 NO Assay	Challenge Standard #3 Std. Error < 1%	The standard error is okay.	Challenge Standard #3 Std. Error is OK
	Challenge Standard #3 vendor certificate bias	#VALUE!	#VALUE!
Challenge Standard #3 NOx Assay	Challenge Standard #3 Std. Error < 1%	The standard error is okay.	Challenge Standard #3 Std. Error is OK
	Challenge Standard #3 vendor certificate bias	#VALUE!	#VALUE!
Challenge Standard #4 NO Assay	Challenge Standard #4 Std. Error < 1%	The standard error is okay.	Challenge Standard #4 Std. Error is OK
	Challenge Standard #4 vendor certificate bias	#VALUE!	#VALUE!
Challenge Standard #4 NOx Assay	Challenge Standard #4 Std. Error < 1%	The standard error is okay.	Challenge Standard #4 Std. Error is OK
	Challenge Standard #4 vendor certificate bias	#VALUE!	#VALUE!
Challenge Standard #5 NO Assay	Challenge Standard #5 Std. Error < 1%	The standard error is okay.	Challenge Standard #5 Std. Error is OK
	Challenge Standard #5 vendor certificate bias	#VALUE!	#VALUE!
Challenge Standard #5 NOx Assay	Challenge Standard #5 Std. Error < 1%	The standard error is okay.	Challenge Standard #5 Std. Error is OK
	Challenge Standard #5 vendor certificate bias	#VALUE!	#VALUE!

CO QA Requirements Summary, Region 7 - 2nd Quarter of 2012

	QA Requirement	Result	Status
SRM Gas Standards	Primary SRM Cylinder Expiration Date	1-Jun-17	Primary SRM Gas Standard OK
	Primary SRM Cylinder Pressure >150 psi	825	Primary SRM cylinder pressure is OK
	SRM Dilution Check Cylinder Expiration Date	9-Nov-15	Dilution Check SRM Gas Standard OK
	Dilution Check SRM Cylinder Pressure >150 psi	1850	Dilution check SRM cylinder pressure is OK
Laboratory Flow Standard	High Flow Standard Expiration Date	11-Nov-12	Standard OK
	Low Flow Standard Expiration Date	11-Nov-12	Standard OK
	Flow Standard Base Unit Expiration Date	N/A	Standard OK
Calibrator (mass flow controllers)	Calibrator Flow Calibration within 2 weeks of assay	4-Jun-12	Calibrator flow calibration within 2 weeks of assay
	Calibrated High Flow MFC Slope Range = 0.99 - 1.01	0.9999794	High MFC OK
	Calibrated Low Flow MFC Slope Range = 0.99 - 1.01	0.9997153	Low MFC OK
Carbon Monoxide Gas Analyzer	Analyzer Calibration within 2 week of assay	4-Jun-12	Analyzer calibration within 2 weeks of assay
	Estimate of Uncetainty < 1% at point #1 (>80% URL)	0.54%	Assay may be conducted at this concentration
	Estimate of Uncetainty < 1% at point #2	0.55%	Assay may be conducted at this concentration
	Estimate of Uncetainty < 1% at point #3	0.57%	Assay may be conducted at this concentration
	Estimate of Uncetainty < 1% at point #4	0.60%	Assay may be conducted at this concentration
	Estimate of Uncetainty < 1% at point #5 (~50% URL)	0.64%	Assay may be conducted at this concentration
	Analyzer slope is within 0.98-1.02	1.0023	Analyzer Slope is acceptable
Dilution Check	Dilution Check Date within 2 weeks of assay	4-Jun-12	Dilution check within 2 weeks of assay
	Dilution Check Relative % Difference < 1%	0.713%	Dilution Check RSD is OK
Day of Assay Zero/Span Check	Day of Assay Zero Check - Std. Error < 1%	Std. Error is okay.	Zero Gas Std. Error is OK
	Day of Assay Zero Check - Relative Difference < 5%	RD is okay.	Zero Gas RD is OK
	Day of Assay Span Check - Std. Error < 1%	Std. Error is okay.	Span Gas Std. Error is OK
	Day of Assay Span Check - Relative Difference <5%	RD is okay.	Span Gas RD is OK
Challenge Standard #1 Assay	Challenge Standard #1 Std. Error < 1%	The standard error is okay.	Challenge Standard #1 Std. Error is OK
	Challenge Standard #1 vendor certificate bias	0.01%	Challenge Std. #1 vendor certificate bias < 2%

SO2 QA Requirements Summary, Region 7 - 2nd Quarter of 2012

	QA Requirement	Result	Status
SRM Gas Standards	Primary SRM Cylinder Expiration Date	1-Jun-16	Primary SRM Gas Standard OK
	Primary SRM Cylinder Pressure >150 psi	1525	Primary SRM cylinder pressure is OK
	SRM Dilution Check Cylinder Expiration Date	11-Dec-15	Dilution Check SRM Gas Standard OK
	Dilution Check SRM Cylinder Pressure >150 psi	1700	Dilution check SRM cylinder pressure is OK
Laboratory Flow Standard	High Flow Standard Expiration Date	11-Nov-12	Standard OK
	Low Flow Standard Expiration Date	11-Nov-12	Standard OK
	Flow Standard Base Unit Expiration Date	N/A	Standard OK
Calibrator (mass flow controllers)	Calibrator Flow Calibration within 2 weeks of assay	4-Jun-12	Calibrator flow calibration within 2 weeks of assay
	Calibrated High Flow MFC Slope Range = 0.99 - 1.01	0.9999794	High MFC OK
	Calibrated Low Flow MFC Slope Range = 0.99 - 1.01	0.9997153	Low MFC OK
Sulfur Dioxide Gas Analyzer	Analyzer Calibration within 2 weeks of assay	5-Jun-12	Analyzer calibration within 2 weeks of assay
	Estimate of Uncetainty < 1% at point #1 (>80% URL)	0.43%	Assay may be conducted at this concentration
	Estimate of Uncetainty < 1% at point #2	0.44%	Assay may be conducted at this concentration
	Estimate of Uncetainty < 1% at point #3	0.45%	Assay may be conducted at this concentration
	Estimate of Uncetainty < 1% at point #4	0.48%	Assay may be conducted at this concentration
	Estimate of Uncetainty < 1% at point #5 (~50% URL)	0.51%	Assay may be conducted at this concentration
	Analyzer slope is within 0.98-1.02	1.0014	Analyzer Slope is acceptable
Dilution Check	Dilution Check Date within 2 weeks of assay	4-Jun-12	Dilution check within 2 weeks of assay
	Dilution Check Relative % Difference < 1%	0.713%	Dilution Check RSD is OK
Day of Assay Zero/Span Check	Day of Assay Zero Check - Std. Error < 1%	Std. Error is okay.	Zero Gas Std. Error is OK
	Day of Assay Zero Check - Relative Difference < 5%	RD is okay.	Zero Gas RD is OK
	Day of Assay Span Check - Std. Error < 1%	Std. Error is okay.	Span Gas Std. Error is OK
	Day of Assay Span Check - Relative Difference <5%	RD is okay.	Span Gas RD is OK
Challenge Standard #1 Assay	Challenge Standard #1 Std. Error < 1%	The standard error is okay.	Challenge Standard #1 Std. Error is OK
	Challenge Standard #1 vendor certificate bias	0.00%	Challenge Std. #1 vendor certificate bias < 2%

NOx QA Requirements Summary, Region 7 - 2nd Quarter of 2012

	QA Requirement	Result	Status
SRM Gas Standards	Primary SRM Cylinder Expiration Date	1-Jun-16	Primary SRM Gas Standard OK
	Primary SRM Cylinder Pressure >150 psi	1750	Primary SRM cylinder pressure is OK
	SRM Dilution Check Cylinder Expiration Date	1-Jun-16	Dilution Check SRM Gas Standard OK
	Dilution Check SRM Cylinder Pressure >150 psi	1925	Dilution check SRM cylinder pressure is OK
Laboratory Flow Standard	High Flow Standard Expiration Date	11-Nov-12	Standard OK
	Low Flow Standard Expiration Date	11-Nov-12	Standard OK
	Flow Standard Base Unit Expiration Date	N/A	Standard OK
Calibrator (mass flow controllers)	Calibrator Flow Calibration within 2 weeks of assay	4-Jun-12	Calibrator flow calibration within 2 weeks of assay
	Calibrated High Flow MFC Slope Range = 0.99 - 1.01	0.9999794	High MFC OK
	Calibrated Low Flow MFC Slope Range = 0.99 - 1.01	0.9997153	Low MFC OK
Oxides of Nitrogen Gas Analyzer NO Portion	Analyzer Calibration within 2 weeks of assay	6-Jun-12	Analyzer calibration within 2 weeks of assay
	Estimate of Uncetainty < 1% at point #1 (>80% URL)	0.20%	Assay may be conducted at this concentration
	Estimate of Uncetainty < 1% at point #2	0.20%	Assay may be conducted at this concentration
	Estimate of Uncetainty < 1% at point #3	0.21%	Assay may be conducted at this concentration
	Estimate of Uncetainty < 1% at point #4	0.22%	Assay may be conducted at this concentration
	Estimate of Uncetainty < 1% at point #5 (~50% URL)	0.24%	Assay may be conducted at this concentration
	Analyzer slope is within 0.98-1.02	0.9996	Analyzer Slope is acceptable
Oxides of Nitrogen Gas Analyzer NOx Portion	Analyzer Calibration within 2 week of assay	6-Jun-12	Analyzer calibration within 2 weeks of assay
	Estimate of Uncetainty < 1% at point #1 (>80% URL)	0.26%	Assay may be conducted at this concentration
	Estimate of Uncetainty < 1% at point #2	0.26%	Assay may be conducted at this concentration
	Estimate of Uncetainty < 1% at point #3	0.27%	Assay may be conducted at this concentration
	Estimate of Uncetainty < 1% at point #4	0.29%	Assay may be conducted at this concentration
	Estimate of Uncetainty < 1% at point #5 (~50% URL)	0.31%	Assay may be conducted at this concentration
	Analyzer slope is within 0.98-1.02	0.9971	Analyzer Slope is acceptable
Dilution Check	Dilution Check Date within 2 weeks of assay	4-Jun-12	Dilution check within 2 weeks of assay
	Dilution Check Relative % Difference < 1%	0.713%	Dilution Check RSD is OK
Day of Assay Zero/Span Check NO Portion	Day of Assay Zero Check - Std. Error < 1%	Std. Error is okay.	Zero Gas Std. Error is OK
	Day of Assay Zero Check - Relative Difference < 5%	RD is okay.	Zero Gas RD is OK
	Day of Assay Span Check - Std. Error < 1%	Std. Error is okay.	Span Gas Std. Error is OK
	Day of Assay Span Check - Relative Difference <5%	RD is okay.	Span Gas RD is OK
Day of Assay Zero/Span Check NOx Portion	Day of Assay Zero Check - Std. Error < 1%	Std. Error is okay.	Zero Gas Std. Error is OK
	Day of Assay Zero Check - Relative Difference < 5%	RD is okay.	Zero Gas RD is OK
	Day of Assay Span Check - Std. Error < 1%	Std. Error is okay.	Span Gas Std. Error is OK
	Day of Assay Span Check - Relative Difference <5%	RD is okay.	Span Gas RD is OK
Challenge Standard #1 NO Assay	Challenge Standard #1 Std. Error < 1%	The standard error is okay.	Challenge Standard #1 Std. Error is OK
	Challenge Standard #1 vendor certificate bias	-0.48%	Challenge Std. #1 vendor certificate bias < 2%
Challenge Standard #1 NOx Assay	Challenge Standard #1 Std. Error < 1%	The standard error is okay.	Challenge Standard #1 Std. Error is OK
	Challenge Standard #1 vendor certificate bias	0.02%	Challenge Std. #1 vendor certificate bias < 2%

CO QA Requirements Summary, Region 7 - 3rd Quarter of 2012

	QA Requirement	Result	Status
SRM Gas Standards	Primary SRM Cylinder Expiration Date	20-Feb-17	Primary SRM Gas Standard OK
	Primary SRM Cylinder Pressure >150 psi	2050	Primary SRM cylinder pressure is OK
	SRM Dilution Check Cylinder Expiration Date	9-Nov-15	Dilution Check SRM Gas Standard OK
	Dilution Check SRM Cylinder Pressure >150 psi	1850	Dilution check SRM cylinder pressure is OK
Laboratory Flow Standard	High Flow Standard Expiration Date	11-Nov-12	Standard OK
	Low Flow Standard Expiration Date	11-Nov-12	Standard OK
	Flow Standard Base Unit Expiration Date	N/A	Standard OK
Calibrator (mass flow controllers)	Calibrator Flow Calibration within 2 weeks of assay	17-Aug-12	Calibrator flow calibration within 2 weeks of assay
	Calibrated High Flow MFC Slope Range = 0.99 - 1.01	0.9999926	High MFC OK
	Calibrated Low Flow MFC Slope Range = 0.99 - 1.01	0.9999995	Low MFC OK
Carbon Monoxide Gas Analyzer	Analyzer Calibration within 2 week of assay	28-Aug-12	Analyzer calibration within 2 weeks of assay
	Estimate of Uncetainty < 1% at point #1 (>80% URL)	0.26%	Assay may be conducted at this concentration
	Estimate of Uncetainty < 1% at point #2	0.26%	Assay may be conducted at this concentration
	Estimate of Uncetainty < 1% at point #3	0.27%	Assay may be conducted at this concentration
	Estimate of Uncetainty < 1% at point #4	0.29%	Assay may be conducted at this concentration
	Estimate of Uncetainty < 1% at point #5 (~50% URL)	0.31%	Assay may be conducted at this concentration
	Analyzer slope is within 0.98-1.02	1.0021	Analyzer Slope is acceptable
Dilution Check	Dilution Check Date within 2 weeks of assay	20-Aug-12	Dilution check within 2 weeks of assay
	Dilution Check Relative % Difference < 1%	0.551%	Dilution Check RSD is OK
Day of Assay Zero/Span Check	Day of Assay Zero Check - Std. Error < 1%	Std. Error is okay.	Zero Gas Std. Error is OK
	Day of Assay Zero Check - Relative Difference < 5%	RD is okay.	Zero Gas RD is OK
	Day of Assay Span Check - Std. Error < 1%	Std. Error is okay.	Span Gas Std. Error is OK
	Day of Assay Span Check - Relative Difference <5%	RD is okay.	Span Gas RD is OK
Challenge Standard #1 Assay	Challenge Standard #1 Std. Error < 1%	The standard error is okay.	Challenge Standard #1 Std. Error is OK
	Challenge Standard #1 vendor certificate bias	-0.10%	Challenge Std. #1 vendor certificate bias < 2%

SO2 QA Requirements Summary, Region 7 - 3rd Quarter of 2012, Sheet 1

	QA Requirement	Result	Status
SRM Gas Standards	Primary SRM Cylinder Expiration Date	1-Jun-16	Primary SRM Gas Standard OK
	Primary SRM Cylinder Pressure >150 psi	1200	Primary SRM cylinder pressure is OK
	SRM Dilution Check Cylinder Expiration Date	11-Dec-15	Dilution Check SRM Gas Standard OK
	Dilution Check SRM Cylinder Pressure >150 psi	1700	Dilution check SRM cylinder pressure is OK
Laboratory Flow Standard	High Flow Standard Expiration Date	11-Nov-12	Standard OK
	Low Flow Standard Expiration Date	11-Nov-12	Standard OK
	Flow Standard Base Unit Expiration Date	N/A	Standard OK
Calibrator (mass flow controllers)	Calibrator Flow Calibration within 2 weeks of assay	17-Aug-12	Calibrator flow calibration within 2 weeks of assay
	Calibrated High Flow MFC Slope Range = 0.99 - 1.01	0.9999926	High MFC OK
	Calibrated Low Flow MFC Slope Range = 0.99 - 1.01	0.9999995	Low MFC OK
Sulfur Dioxide Gas Analyzer	Analyzer Calibration within 2 weeks of assay	20-Aug-12	Analyzer calibration within 2 weeks of assay
	Estimate of Uncetainty < 1% at point #1 (>80% URL)	0.27%	Assay may be conducted at this concentration
	Estimate of Uncetainty < 1% at point #2	0.27%	Assay may be conducted at this concentration
	Estimate of Uncetainty < 1% at point #3	0.28%	Assay may be conducted at this concentration
	Estimate of Uncetainty < 1% at point #4	0.30%	Assay may be conducted at this concentration
	Estimate of Uncetainty < 1% at point #5 (~50% URL)	0.32%	Assay may be conducted at this concentration
	Analyzer slope is within 0.98-1.02	1.0029	Analyzer Slope is acceptable
Dilution Check	Dilution Check Date within 2 weeks of assay	20-Aug-12	Dilution check within 2 weeks of assay
	Dilution Check Relative % Difference < 1%	0.551%	Dilution Check RSD is OK
Day of Assay Zero/Span Check	Day of Assay Zero Check - Std. Error < 1%	Std. Error is okay.	Zero Gas Std. Error is OK
	Day of Assay Zero Check - Relative Difference < 5%	RD is okay.	Zero Gas RD is OK
	Day of Assay Span Check - Std. Error < 1%	Std. Error is okay.	Span Gas Std. Error is OK
	Day of Assay Span Check - Relative Difference <5%	RD is okay.	Span Gas RD is OK
Challenge Standard #1 Assay	Challenge Standard #1 Std. Error < 1%	The standard error is okay.	Challenge Standard #1 Std. Error is OK
	Challenge Standard #1 vendor certificate bias	-2.40%	Challenge Std. #1 vendor certificate bias between 2-4%

SO2 QA Requirements Summary, Region 7 - 3rd Quarter of 2012, Sheet 2

	QA Requirement	Result	Status
SRM Gas Standards	Primary SRM Cylinder Expiration Date	1-Jun-16	Primary SRM Gas Standard OK
	Primary SRM Cylinder Pressure >150 psi	1100	Primary SRM cylinder pressure is OK
	SRM Dilution Check Cylinder Expiration Date	11-Dec-15	Dilution Check SRM Gas Standard OK
	Dilution Check SRM Cylinder Pressure >150 psi	1700	Dilution check SRM cylinder pressure is OK
Laboratory Flow Standard	High Flow Standard Expiration Date	11-Nov-12	Standard OK
	Low Flow Standard Expiration Date	11-Nov-12	Standard OK
	Flow Standard Base Unit Expiration Date	N/A	Standard OK
Calibrator (mass flow controllers)	Calibrator Flow Calibration within 2 weeks of assay	17-Aug-12	Calibrator flow calibration within 2 weeks of assay
	Calibrated High Flow MFC Slope Range = 0.99 - 1.01	0.9999926	High MFC OK
	Calibrated Low Flow MFC Slope Range = 0.99 - 1.01	0.9999663	Low MFC OK
Sulfur Dioxide Gas Analyzer	Analyzer Calibration within 2 weeks of assay	21-Aug-12	Analyzer calibration within 2 weeks of assay
	Estimate of Uncetainty < 1% at point #1 (>80% URL)	0.45%	Assay may be conducted at this concentration
	Estimate of Uncetainty < 1% at point #2	0.47%	Assay may be conducted at this concentration
	Estimate of Uncetainty < 1% at point #3	0.49%	Assay may be conducted at this concentration
	Estimate of Uncetainty < 1% at point #4	0.54%	Assay may be conducted at this concentration
	Estimate of Uncetainty < 1% at point #5 (~50% URL)	0.62%	Assay may be conducted at this concentration
	Analyzer slope is within 0.98-1.02	0.9975	Analyzer Slope is acceptable
Dilution Check	Dilution Check Date within 2 weeks of assay	Date of Dilution Check	#VALUE!
	Dilution Check Relative % Difference < 1%	0.000%	Dilution Check RSD is OK
Day of Assay Zero/Span Check	Day of Assay Zero Check - Std. Error < 1%	Std. Error is okay.	Zero Gas Std. Error is OK
	Day of Assay Zero Check - Relative Difference < 5%	RD is okay.	Zero Gas RD is OK
	Day of Assay Span Check - Std. Error < 1%	Std. Error is okay.	Span Gas Std. Error is OK
	Day of Assay Span Check - Relative Difference <5%	RD is okay.	Span Gas RD is OK
Challenge Standard #1 Assay	Challenge Standard #1 Std. Error < 1%	The standard error is okay.	Challenge Standard #1 Std. Error is OK
	Challenge Standard #1 vendor certificate bias	-2.66%	Challenge Std. #1 vendor certificate bias between 2-4%
Challenge Standard #2 Assay	Challenge Standard #2 Std. Error < 1%	The standard error is okay.	Challenge Standard #2 Std. Error is OK
	Challenge Standard #2 vendor certificate bias	1.30%	Challenge Std. #2 vendor certificate bias < 2%

SO2 QA Requirements Summary, Region 7 - 3rd Quarter of 2012, Sheet 3

	QA Requirement	Result	Status
SRM Gas Standards	Primary SRM Cylinder Expiration Date	1-Jun-16	Primary SRM Gas Standard OK
	Primary SRM Cylinder Pressure >150 psi	1100	Primary SRM cylinder pressure is OK
	SRM Dilution Check Cylinder Expiration Date	11-Dec-15	Dilution Check SRM Gas Standard OK
	Dilution Check SRM Cylinder Pressure >150 psi	1600	Dilution check SRM cylinder pressure is OK
Laboratory Flow Standard	High Flow Standard Expiration Date	11-Nov-12	Standard OK
	Low Flow Standard Expiration Date	11-Nov-12	Standard OK
	Flow Standard Base Unit Expiration Date	N/A	Standard OK
Calibrator (mass flow controllers)	Calibrator Flow Calibration within 2 weeks of assay	4-Sep-12	Calibrator flow calibration within 2 weeks of assay
	Calibrated High Flow MFC Slope Range = 0.99 - 1.01	0.9999987	High MFC OK
	Calibrated Low Flow MFC Slope Range = 0.99 - 1.01	0.9999889	Low MFC OK
Sulfur Dioxide Gas Analyzer	Analyzer Calibration within 2 weeks of assay	5-Sep-12	Analyzer calibration within 2 weeks of assay
	Estimate of Uncetainty < 1% at point #1 (>80% URL)	0.53%	Assay may be conducted at this concentration
	Estimate of Uncetainty < 1% at point #2	0.54%	Assay may be conducted at this concentration
	Estimate of Uncetainty < 1% at point #3	0.58%	Assay may be conducted at this concentration
	Estimate of Uncetainty < 1% at point #4	0.63%	Assay may be conducted at this concentration
	Estimate of Uncetainty < 1% at point #5 (~50% URL)	0.73%	Assay may be conducted at this concentration
	Analyzer slope is within 0.98-1.02	1.0051	Analyzer Slope is acceptable
Dilution Check	Dilution Check Date within 2 weeks of assay	5-Sep-12	Dilution check within 2 weeks of assay
	Dilution Check Relative % Difference < 1%	-0.834%	Dilution Check RSD is OK
Day of Assay Zero/Span Check	Day of Assay Zero Check - Std. Error < 1%	Std. Error is okay.	Zero Gas Std. Error is OK
	Day of Assay Zero Check - Relative Difference < 5%	RD is okay.	Zero Gas RD is OK
	Day of Assay Span Check - Std. Error < 1%	Std. Error is okay.	Span Gas Std. Error is OK
	Day of Assay Span Check - Relative Difference <5%	RD is okay.	Span Gas RD is OK
Challenge Standard #1 Assay	Challenge Standard #1 Std. Error < 1%	The standard error is okay.	Challenge Standard #1 Std. Error is OK
	Challenge Standard #1 vendor certificate bias	-4.90%	Challenge Std. #1 vendor certificate bias is 4% or greater

NOx QA Requirements Summary, Region 7 - 3rd Quarter of 2012

	QA Requirement	Result	Status
SRM Gas Standards	Primary SRM Cylinder Expiration Date	1-Jun-16	Primary SRM Gas Standard OK
	Primary SRM Cylinder Pressure >150 psi	1400	Primary SRM cylinder pressure is OK
	SRM Dilution Check Cylinder Expiration Date	1-Jun-16	Dilution Check SRM Gas Standard OK
	Dilution Check SRM Cylinder Pressure >150 psi	1750	Dilution check SRM cylinder pressure is OK
Laboratory Flow Standard	High Flow Standard Expiration Date	11-Nov-12	Standard OK
	Low Flow Standard Expiration Date	11-Nov-12	Standard OK
	Flow Standard Base Unit Expiration Date	N/A	Standard OK
Calibrator (mass flow controllers)	Calibrator Flow Calibration within 2 weeks of assay	17-Aug-12	Calibrator flow calibration within 2 weeks of assay
	Calibrated High Flow MFC Slope Range = 0.99 - 1.01	0.9999926	High MFC OK
	Calibrated Low Flow MFC Slope Range = 0.99 - 1.01	0.9999995	Low MFC OK
Oxides of Nitrogen Gas Analyzer NO Portion	Analyzer Calibration within 2 weeks of assay	22-Aug-12	Analyzer calibration within 2 weeks of assay
	Estimate of Uncetainty < 1% at point #1 (>80% URL)	0.14%	Assay may be conducted at this concentration
	Estimate of Uncetainty < 1% at point #2	0.15%	Assay may be conducted at this concentration
	Estimate of Uncetainty < 1% at point #3	0.15%	Assay may be conducted at this concentration
	Estimate of Uncetainty < 1% at point #4	0.16%	Assay may be conducted at this concentration
	Estimate of Uncetainty < 1% at point #5 (~50% URL)	0.17%	Assay may be conducted at this concentration
	Analyzer slope is within 0.98-1.02	1.0003	Analyzer Slope is acceptable
Oxides of Nitrogen Gas Analyzer NOx Portion	Analyzer Calibration within 2 week of assay	22-Aug-12	Analyzer calibration within 2 weeks of assay
	Estimate of Uncetainty < 1% at point #1 (>80% URL)	0.10%	Assay may be conducted at this concentration
	Estimate of Uncetainty < 1% at point #2	0.10%	Assay may be conducted at this concentration
	Estimate of Uncetainty < 1% at point #3	0.10%	Assay may be conducted at this concentration
	Estimate of Uncetainty < 1% at point #4	0.11%	Assay may be conducted at this concentration
	Estimate of Uncetainty < 1% at point #5 (~50% URL)	0.11%	Assay may be conducted at this concentration
	Analyzer slope is within 0.98-1.02	1.0008	Analyzer Slope is acceptable
Dilution Check	Dilution Check Date within 2 weeks of assay	Date of Dilution Check	#VALUE!
	Dilution Check Relative % Difference < 1%	0.000%	Dilution Check RSD is OK
Day of Assay Zero/Span Check NO Portion	Day of Assay Zero Check - Std. Error < 1%	Std. Error is okay.	Zero Gas Std. Error is OK
	Day of Assay Zero Check - Relative Difference < 5%	RD is okay.	Zero Gas RD is OK
	Day of Assay Span Check - Std. Error < 1%	Std. Error is okay.	Span Gas Std. Error is OK
	Day of Assay Span Check - Relative Difference <5%	RD is okay.	Span Gas RD is OK
Day of Assay Zero/Span Check NOx Portion	Day of Assay Zero Check - Std. Error < 1%	Std. Error is okay.	Zero Gas Std. Error is OK
	Day of Assay Zero Check - Relative Difference < 5%	RD is okay.	Zero Gas RD is OK
	Day of Assay Span Check - Std. Error < 1%	Std. Error is okay.	Span Gas Std. Error is OK
	Day of Assay Span Check - Relative Difference <5%	RD is okay.	Span Gas RD is OK
Challenge Standard #1 NO Assay	Challenge Standard #1 Std. Error < 1%	The standard error is okay.	Challenge Standard #1 Std. Error is OK
	Challenge Standard #1 vendor certificate bias	0.35%	Challenge Std. #1 vendor certificate bias < 2%
Challenge Standard #1 NOx Assay	Challenge Standard #1 Std. Error < 1%	The standard error is okay.	Challenge Standard #1 Std. Error is OK
	Challenge Standard #1 vendor certificate bias	0.31%	Challenge Std. #1 vendor certificate bias < 2%

CO QA Requirements Summary, Region 7 - 4th Quarter of 2012

	QA Requirement	Result	Status
SRM Gas Standards	Primary SRM Cylinder Expiration Date	1-Jun-17	Primary SRM Gas Standard OK
	Primary SRM Cylinder Pressure >150 psi	700	Primary SRM cylinder pressure is OK
	SRM Dilution Check Cylinder Expiration Date	9-Nov-15	Dilution Check SRM Gas Standard OK
	Dilution Check SRM Cylinder Pressure >150 psi	1850	Dilution check SRM cylinder pressure is OK
Laboratory Flow Standard	High Flow Standard Expiration Date	11-Nov-12	Standard OK
	Low Flow Standard Expiration Date	11-Nov-12	Standard OK
	Flow Standard Base Unit Expiration Date	N/A	Standard OK
Calibrator (mass flow controllers)	Calibrator Flow Calibration within 2 weeks of assay	2-Nov-12	Calibrator flow calibration within 2 weeks of assay
	Calibrated High Flow MFC Slope Range = 0.99 - 1.01	0.9999656	High MFC OK
	Calibrated Low Flow MFC Slope Range = 0.99 - 1.01	0.9999001	Low MFC OK
Carbon Monoxide Gas Analyzer	Analyzer Calibration within 2 week of assay	5-Nov-12	Analyzer calibration within 2 weeks of assay
	Estimate of Uncetainty < 1% at point #1 (>80% URL)	0.18%	Assay may be conducted at this concentration
	Estimate of Uncetainty < 1% at point #2	0.18%	Assay may be conducted at this concentration
	Estimate of Uncetainty < 1% at point #3	0.19%	Assay may be conducted at this concentration
	Estimate of Uncetainty < 1% at point #4	0.20%	Assay may be conducted at this concentration
	Estimate of Uncetainty < 1% at point #5 (~50% URL)	0.21%	Assay may be conducted at this concentration
	Analyzer slope is within 0.98-1.02	1.0001	Analyzer Slope is acceptable
Dilution Check	Dilution Check Date within 2 weeks of assay	5-Nov-12	Dilution check within 2 weeks of assay
	Dilution Check Relative % Difference < 1%	-0.358%	Dilution Check RSD is OK
Day of Assay Zero/Span Check	Day of Assay Zero Check - Std. Error < 1%	Std. Error is okay.	Zero Gas Std. Error is OK
	Day of Assay Zero Check - Relative Difference < 5%	RD is okay.	Zero Gas RD is OK
	Day of Assay Span Check - Std. Error < 1%	Std. Error is okay.	Span Gas Std. Error is OK
	Day of Assay Span Check - Relative Difference <5%	RD is okay.	Span Gas RD is OK
Challenge Standard #1 Assay	Challenge Standard #1 Std. Error < 1%	The standard error is okay.	Challenge Standard #1 Std. Error is OK
	Challenge Standard #1 vendor certificate bias	1.09%	Challenge Std. #1 vendor certificate bias < 2%
Challenge Standard #2 Assay	Challenge Standard #2 Std. Error < 1%	The standard error is okay.	Challenge Standard #2 Std. Error is OK
	Challenge Standard #2 vendor certificate bias	0.25%	Challenge Std. #2 vendor certificate bias < 2%

SO2 QA Requirements Summary, Region 7 - 4th Quarter of 2012, Sheet 1

	QA Requirement	Result	Status
SRM Gas Standards	Primary SRM Cylinder Expiration Date	1-Jun-16	Primary SRM Gas Standard OK
	Primary SRM Cylinder Pressure >150 psi	1050	Primary SRM cylinder pressure is OK
	SRM Dilution Check Cylinder Expiration Date	11-Dec-15	Dilution Check SRM Gas Standard OK
	Dilution Check SRM Cylinder Pressure >150 psi	1625	Dilution check SRM cylinder pressure is OK
Laboratory Flow Standard	High Flow Standard Expiration Date	11-Nov-12	Standard OK
	Low Flow Standard Expiration Date	11-Nov-12	Standard OK
	Flow Standard Base Unit Expiration Date	N/A	Standard OK
Calibrator (mass flow controllers)	Calibrator Flow Calibration within 2 weeks of assay	2-Nov-12	Calibrator flow calibration within 2 weeks of assay
	Calibrated High Flow MFC Slope Range = 0.99 - 1.01	0.9999656	High MFC OK
	Calibrated Low Flow MFC Slope Range = 0.99 - 1.01	0.9999001	Low MFC OK
Sulfur Dioxide Gas Analyzer	Analyzer Calibration within 2 weeks of assay	6-Nov-12	Analyzer calibration within 2 weeks of assay
	Estimate of Uncetainty < 1% at point #1 (>80% URL)	0.19%	Assay may be conducted at this concentration
	Estimate of Uncetainty < 1% at point #2	0.19%	Assay may be conducted at this concentration
	Estimate of Uncetainty < 1% at point #3	0.20%	Assay may be conducted at this concentration
	Estimate of Uncetainty < 1% at point #4	0.21%	Assay may be conducted at this concentration
	Estimate of Uncetainty < 1% at point #5 (~50% URL)	0.22%	Assay may be conducted at this concentration
	Analyzer slope is within 0.98-1.02	1.0012	Analyzer Slope is acceptable
Dilution Check	Dilution Check Date within 2 weeks of assay	5-Nov-12	Dilution check within 2 weeks of assay
	Dilution Check Relative % Difference < 1%	-0.358%	Dilution Check RSD is OK
Day of Assay Zero/Span Check	Day of Assay Zero Check - Std. Error < 1%	Std. Error is okay.	Zero Gas Std. Error is OK
	Day of Assay Zero Check - Relative Difference < 5%	RD is okay.	Zero Gas RD is OK
	Day of Assay Span Check - Std. Error < 1%	Std. Error is okay.	Span Gas Std. Error is OK
	Day of Assay Span Check - Relative Difference <5%	RD is okay.	Span Gas RD is OK
Challenge Standard #1 Assay	Challenge Standard #1 Std. Error < 1%	The standard error is okay.	Challenge Standard #1 Std. Error is OK
	Challenge Standard #1 vendor certificate bias	-2.83%	Challenge Std. #1 vendor certificate bias between 2-4%
Challenge Standard #2 Assay	Challenge Standard #2 Std. Error < 1%	The standard error is okay.	Challenge Standard #2 Std. Error is OK
	Challenge Standard #2 vendor certificate bias	0.22%	Challenge Std. #2 vendor certificate bias < 2%
Challenge Standard #3 Assay	Challenge Standard #3 Std. Error < 1%	The standard error is okay.	Challenge Standard #3 Std. Error is OK
	Challenge Standard #3 vendor certificate bias	-0.11%	Challenge Std. #3 vendor certificate bias < 2%

SO2 QA Requirements Summary, Region 7 - 4th Quarter of 2012, Sheet 2

	QA Requirement	Result	Status
SRM Gas Standards	Primary SRM Cylinder Expiration Date	1-Jun-16	Primary SRM Gas Standard OK
	Primary SRM Cylinder Pressure >150 psi	1050	Primary SRM cylinder pressure is OK
	SRM Dilution Check Cylinder Expiration Date	11-Dec-15	Dilution Check SRM Gas Standard OK
	Dilution Check SRM Cylinder Pressure >150 psi	1625	Dilution check SRM cylinder pressure is OK
Laboratory Flow Standard	High Flow Standard Expiration Date	11-Nov-12	Standard OK
	Low Flow Standard Expiration Date	11-Nov-12	Standard OK
	Flow Standard Base Unit Expiration Date	N/A	Standard OK
Calibrator (mass flow controllers)	Calibrator Flow Calibration within 2 weeks of assay	2-Nov-12	Calibrator flow calibration within 2 weeks of assay
	Calibrated High Flow MFC Slope Range = 0.99 - 1.01	0.9999656	High MFC OK
	Calibrated Low Flow MFC Slope Range = 0.99 - 1.01	0.9999001	Low MFC OK
Sulfur Dioxide Gas Analyzer	Analyzer Calibration within 2 weeks of assay	6-Nov-12	Analyzer calibration within 2 weeks of assay
	Estimate of Uncetainty < 1% at point #1 (>80% URL)	0.19%	Assay may be conducted at this concentration
	Estimate of Uncetainty < 1% at point #2	0.19%	Assay may be conducted at this concentration
	Estimate of Uncetainty < 1% at point #3	0.20%	Assay may be conducted at this concentration
	Estimate of Uncetainty < 1% at point #4	0.21%	Assay may be conducted at this concentration
	Estimate of Uncetainty < 1% at point #5 (~50% URL)	0.22%	Assay may be conducted at this concentration
	Analyzer slope is within 0.98-1.02	1.0012	Analyzer Slope is acceptable
Dilution Check	Dilution Check Date within 2 weeks of assay	5-Nov-12	Dilution check within 2 weeks of assay
	Dilution Check Relative % Difference < 1%	-0.358%	Dilution Check RSD is OK
Day of Assay Zero/Span Check	Day of Assay Zero Check - Std. Error < 1%	Std. Error is okay.	Zero Gas Std. Error is OK
	Day of Assay Zero Check - Relative Difference < 5%	RD is okay.	Zero Gas RD is OK
	Day of Assay Span Check - Std. Error < 1%	Std. Error is okay.	Span Gas Std. Error is OK
	Day of Assay Span Check - Relative Difference <5%	RD is okay.	Span Gas RD is OK
Challenge Standard #1 Assay	Challenge Standard #1 Std. Error < 1%	The standard error is okay.	Challenge Standard #1 Std. Error is OK
	Challenge Standard #1 vendor certificate bias	-0.52%	Challenge Std. #1 vendor certificate bias < 2%
Challenge Standard #2 Assay	Challenge Standard #2 Std. Error < 1%	The standard error is okay.	Challenge Standard #2 Std. Error is OK
	Challenge Standard #2 vendor certificate bias	1.15%	Challenge Std. #2 vendor certificate bias < 2%
Challenge Standard #3 Assay	Challenge Standard #3 Std. Error < 1%	The standard error is okay.	Challenge Standard #3 Std. Error is OK
	Challenge Standard #3 vendor certificate bias	-1.06%	Challenge Std. #3 vendor certificate bias < 2%

NOx QA Requirements Summary, Region 7 - 4th Quarter of 2012, Sheet 1

	QA Requirement	Result	Status
SRM Gas Standards	Primary SRM Cylinder Expiration Date	1-Jun-16	Primary SRM Gas Standard OK
	Primary SRM Cylinder Pressure >150 psi	1300	Primary SRM cylinder pressure is OK
	SRM Dilution Check Cylinder Expiration Date	1-Jun-16	Dilution Check SRM Gas Standard OK
	Dilution Check SRM Cylinder Pressure >150 psi	1750	Dilution check SRM cylinder pressure is OK
Laboratory Flow Standard	High Flow Standard Expiration Date	11-Nov-12	Standard OK
	Low Flow Standard Expiration Date	11-Nov-12	Standard OK
	Flow Standard Base Unit Expiration Date	N/A	Standard OK
Calibrator (mass flow controllers)	Calibrator Flow Calibration within 2 weeks of assay	2-Nov-12	Calibrator flow calibration within 2 weeks of assay
	Calibrated High Flow MFC Slope Range = 0.99 - 1.01	0.9999656	High MFC OK
	Calibrated Low Flow MFC Slope Range = 0.99 - 1.01	0.9999001	Low MFC OK
Oxides of Nitrogen Gas Analyzer NO Portion	Analyzer Calibration within 2 weeks of assay	13-Nov-12	Analyzer calibration within 2 weeks of assay
	Estimate of Uncetainty < 1% at point #1 (>80% URL)	0.23%	Assay may be conducted at this concentration
	Estimate of Uncetainty < 1% at point #2	0.23%	Assay may be conducted at this concentration
	Estimate of Uncetainty < 1% at point #3	0.24%	Assay may be conducted at this concentration
	Estimate of Uncetainty < 1% at point #4	0.25%	Assay may be conducted at this concentration
	Estimate of Uncetainty < 1% at point #5 (~50% URL)	0.27%	Assay may be conducted at this concentration
	Analyzer slope is within 0.98-1.02	1.0002	Analyzer Slope is acceptable
Oxides of Nitrogen Gas Analyzer NOx Portion	Analyzer Calibration within 2 week of assay	13-Nov-12	Analyzer calibration within 2 weeks of assay
	Estimate of Uncetainty < 1% at point #1 (>80% URL)	0.21%	Assay may be conducted at this concentration
	Estimate of Uncetainty < 1% at point #2	0.22%	Assay may be conducted at this concentration
	Estimate of Uncetainty < 1% at point #3	0.22%	Assay may be conducted at this concentration
	Estimate of Uncetainty < 1% at point #4	0.24%	Assay may be conducted at this concentration
	Estimate of Uncetainty < 1% at point #5 (~50% URL)	0.25%	Assay may be conducted at this concentration
	Analyzer slope is within 0.98-1.02	1.0000	Analyzer Slope is acceptable
Dilution Check	Dilution Check Date within 2 weeks of assay	5-Nov-12	Dilution check within 2 weeks of assay
	Dilution Check Relative % Difference < 1%	-0.358%	Dilution Check RSD is OK
Day of Assay Zero/Span Check NO Portion	Day of Assay Zero Check - Std. Error < 1%	Std. Error is okay.	Zero Gas Std. Error is OK
	Day of Assay Zero Check - Relative Difference < 5%	RD is okay.	Zero Gas RD is OK
	Day of Assay Span Check - Std. Error < 1%	Std. Error is okay.	Span Gas Std. Error is OK
	Day of Assay Span Check - Relative Difference <5%	RD is okay.	Span Gas RD is OK
Day of Assay Zero/Span Check NOx Portion	Day of Assay Zero Check - Std. Error < 1%	Std. Error is okay.	Zero Gas Std. Error is OK
	Day of Assay Zero Check - Relative Difference < 5%	RD is okay.	Zero Gas RD is OK
	Day of Assay Span Check - Std. Error < 1%	Std. Error is okay.	Span Gas Std. Error is OK
	Day of Assay Span Check - Relative Difference <5%	RD is okay.	Span Gas RD is OK
Challenge Standard #1 NO Assay	Challenge Standard #1 Std. Error < 1%	The standard error is okay.	Challenge Standard #1 Std. Error is OK
	Challenge Standard #1 vendor certificate bias	0.93%	Challenge Std. #1 vendor certificate bias < 2%
Challenge Standard #1 NOx Assay	Challenge Standard #1 Std. Error < 1%	The standard error is okay.	Challenge Standard #1 Std. Error is OK
	Challenge Standard #1 vendor certificate bias	0.43%	Challenge Std. #1 vendor certificate bias < 2%
Challenge Standard #2 NO Assay	Challenge Standard #2 Std. Error < 1%	The standard error is okay.	Challenge Standard #2 Std. Error is OK
	Challenge Standard #2 vendor certificate bias	1.39%	Challenge Std. #2 vendor certificate bias < 2%
Challenge Standard #2 NOx Assay	Challenge Standard #2 Std. Error < 1%	The standard error is okay.	Challenge Standard #2 Std. Error is OK
	Challenge Standard #2 vendor certificate bias	1.27%	Challenge Std. #2 vendor certificate bias < 2%
Challenge Standard #3 NO Assay	Challenge Standard #3 Std. Error < 1%	The standard error is okay.	Challenge Standard #3 Std. Error is OK
	Challenge Standard #3 vendor certificate bias	0.94%	Challenge Std. #3 vendor certificate bias < 2%
Challenge Standard #3 NOx Assay	Challenge Standard #3 Std. Error < 1%	The standard error is okay.	Challenge Standard #3 Std. Error is OK
	Challenge Standard #3 vendor certificate bias	0.13%	Challenge Std. #3 vendor certificate bias < 2%
Challenge Standard #4 NO Assay	Challenge Standard #4 Std. Error < 1%	The standard error is okay.	Challenge Standard #4 Std. Error is OK
	Challenge Standard #4 vendor certificate bias	-0.03%	Challenge Std. #4 vendor certificate bias < 2%
Challenge Standard #4 NOx Assay	Challenge Standard #4 Std. Error < 1%	The standard error is okay.	Challenge Standard #4 Std. Error is OK
	Challenge Standard #4 vendor certificate bias	0.13%	Challenge Std. #4 vendor certificate bias < 2%
Challenge Standard #5 NO Assay	Challenge Standard #5 Std. Error < 1%	The standard error is okay.	Challenge Standard #5 Std. Error is OK
	Challenge Standard #5 vendor certificate bias	#VALUE!	#VALUE!
Challenge Standard #5 NOx Assay	Challenge Standard #5 Std. Error < 1%	The standard error is okay.	Challenge Standard #5 Std. Error is OK
	Challenge Standard #5 vendor certificate bias	#VALUE!	#VALUE!

NOx QA Requirements Summary, Region 7 - 4th Quarter of 2012, Sheet 2

	QA Requirement	Result	Status
SRM Gas Standards	Primary SRM Cylinder Expiration Date	1-Jun-16	Primary SRM Gas Standard OK
	Primary SRM Cylinder Pressure >150 psi	1300	Primary SRM cylinder pressure is OK
	SRM Dilution Check Cylinder Expiration Date	1-Jun-16	Dilution Check SRM Gas Standard OK
	Dilution Check SRM Cylinder Pressure >150 psi	1750	Dilution check SRM cylinder pressure is OK
Laboratory Flow Standard	High Flow Standard Expiration Date	11-Nov-12	Standard OK
	Low Flow Standard Expiration Date	11-Nov-12	Standard OK
	Flow Standard Base Unit Expiration Date	N/A	Standard OK
Calibrator (mass flow controllers)	Calibrator Flow Calibration within 2 weeks of assay	2-Nov-12	Calibrator flow calibration within 2 weeks of assay
	Calibrated High Flow MFC Slope Range = 0.99 - 1.01	0.9999656	High MFC OK
	Calibrated Low Flow MFC Slope Range = 0.99 - 1.01	0.9999001	Low MFC OK
Oxides of Nitrogen Gas Analyzer NO Portion	Analyzer Calibration within 2 weeks of assay	13-Nov-12	Analyzer calibration within 2 weeks of assay
	Estimate of Uncetainty < 1% at point #1 (>80% URL)	0.23%	Assay may be conducted at this concentration
	Estimate of Uncetainty < 1% at point #2	0.23%	Assay may be conducted at this concentration
	Estimate of Uncetainty < 1% at point #3	0.24%	Assay may be conducted at this concentration
	Estimate of Uncetainty < 1% at point #4	0.25%	Assay may be conducted at this concentration
	Estimate of Uncetainty < 1% at point #5 (~50% URL)	0.27%	Assay may be conducted at this concentration
	Analyzer slope is within 0.98-1.02	1.0002	Analyzer Slope is acceptable
Oxides of Nitrogen Gas Analyzer NOx Portion	Analyzer Calibration within 2 week of assay	13-Nov-12	Analyzer calibration within 2 weeks of assay
	Estimate of Uncetainty < 1% at point #1 (>80% URL)	0.21%	Assay may be conducted at this concentration
	Estimate of Uncetainty < 1% at point #2	0.22%	Assay may be conducted at this concentration
	Estimate of Uncetainty < 1% at point #3	0.22%	Assay may be conducted at this concentration
	Estimate of Uncetainty < 1% at point #4	0.24%	Assay may be conducted at this concentration
	Estimate of Uncetainty < 1% at point #5 (~50% URL)	0.25%	Assay may be conducted at this concentration
	Analyzer slope is within 0.98-1.02	1.0000	Analyzer Slope is acceptable
Dilution Check	Dilution Check Date within 2 weeks of assay	5-Nov-12	Dilution check within 2 weeks of assay
	Dilution Check Relative % Difference < 1%	-0.358%	Dilution Check RSD is OK
Day of Assay Zero/Span Check NO Portion	Day of Assay Zero Check - Std. Error < 1%	Std. Error is okay.	Zero Gas Std. Error is OK
	Day of Assay Zero Check - Relative Difference < 5%	RD is okay.	Zero Gas RD is OK
	Day of Assay Span Check - Std. Error < 1%	Std. Error is okay.	Span Gas Std. Error is OK
	Day of Assay Span Check - Relative Difference <5%	RD is okay.	Span Gas RD is OK
Day of Assay Zero/Span Check NOx Portion	Day of Assay Zero Check - Std. Error < 1%	Std. Error is okay.	Zero Gas Std. Error is OK
	Day of Assay Zero Check - Relative Difference < 5%	RD is okay.	Zero Gas RD is OK
	Day of Assay Span Check - Std. Error < 1%	Std. Error is okay.	Span Gas Std. Error is OK
	Day of Assay Span Check - Relative Difference <5%	RD is okay.	Span Gas RD is OK
Challenge Standard #1 NO Assay	Challenge Standard #1 Std. Error < 1%	The standard error is okay.	Challenge Standard #1 Std. Error is OK
	Challenge Standard #1 vendor certificate bias	0.81%	Challenge Std. #1 vendor certificate bias < 2%
Challenge Standard #1 NOx Assay	Challenge Standard #1 Std. Error < 1%	The standard error is okay.	Challenge Standard #1 Std. Error is OK
	Challenge Standard #1 vendor certificate bias	1.52%	Challenge Std. #1 vendor certificate bias < 2%
Challenge Standard #2 NO Assay	Challenge Standard #2 Std. Error < 1%	The standard error is okay.	Challenge Standard #2 Std. Error is OK
	Challenge Standard #2 vendor certificate bias	1.58%	Challenge Std. #2 vendor certificate bias < 2%
Challenge Standard #2 NOx Assay	Challenge Standard #2 Std. Error < 1%	The standard error is okay.	Challenge Standard #2 Std. Error is OK
	Challenge Standard #2 vendor certificate bias	-1.25%	Challenge Std. #2 vendor certificate bias < 2%
Challenge Standard #3 NO Assay	Challenge Standard #3 Std. Error < 1%	The standard error is okay.	Challenge Standard #3 Std. Error is OK
	Challenge Standard #3 vendor certificate bias	-0.41%	Challenge Std. #3 vendor certificate bias < 2%
Challenge Standard #3 NOx Assay	Challenge Standard #3 Std. Error < 1%	The standard error is okay.	Challenge Standard #3 Std. Error is OK
	Challenge Standard #3 vendor certificate bias	-0.93%	Challenge Std. #3 vendor certificate bias < 2%
Challenge Standard #4 NO Assay	Challenge Standard #4 Std. Error < 1%	The standard error is okay.	Challenge Standard #4 Std. Error is OK
	Challenge Standard #4 vendor certificate bias	#VALUE!	#VALUE!
Challenge Standard #4 NOx Assay	Challenge Standard #4 Std. Error < 1%	The standard error is okay.	Challenge Standard #4 Std. Error is OK
	Challenge Standard #4 vendor certificate bias	#VALUE!	#VALUE!
Challenge Standard #5 NO Assay	Challenge Standard #5 Std. Error < 1%	The standard error is okay.	Challenge Standard #5 Std. Error is OK
	Challenge Standard #5 vendor certificate bias	#VALUE!	#VALUE!
Challenge Standard #5 NOx Assay	Challenge Standard #5 Std. Error < 1%	The standard error is okay.	Challenge Standard #5 Std. Error is OK
	Challenge Standard #5 vendor certificate bias	#VALUE!	#VALUE!

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