EPA OFICE OF AIR QUALITY PLANNING AND STANDARDS

The QA EYE

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National Air Quality Conference Well Attended

SPECIAL POINTS OF INTEREST:

- National Air Quality Conference Presentations on AMTIC

INSIDE THIS ISSUE:

When all was said and done, over 500 people attended the Ambient Air Quality Conference the week of May 14 in Denver Colorado. The meeting packed in one day of training and two and one half days of plenary and concurrent technical sessions. Forty five vendors attended the conference and overall the attendees seemed happy with the venue and the sessions. Those attending received a follow-up email requesting additional feedback on the conference. We received 114 responses to the survey and the information will help us plan for future meetings.

QA Activities at the Conference

On Monday, a half day training course was provided on the 40 CFR Part 58 Appendix A QA Regulations. The session co-chaired by Donovan Rafferty, WA Dept of Ecology and Mike Papp, OAQPS. The session had trainers representing the States (Donovan Rafferty), Tribes (Melinda Ronca-Battista, Tribal Air Monitoring Support Center), the EPA Regions (Mathew Plate, R9 and Greg Noah, R4) and OAQPS (Dennis Crumpler, Mark Shanis, and Mike Papp). There was a lot of material covered in the 4 hours and although 80 people signed up for the session the 150 seat room was standing room only at the end of the day. Training slides are posted at the conference site on AMTIC. Survey responses on the training session were positive.

On Wednesday morning there was a breakout session on monitoring regulation changes. The session was more of a "let it all hang out" session where ideas were brought to the table to spur conversations and get initial impressions. Mike Papp, OAQPS talked about potential changes to the 40 CFR Part 58 Appendix A regulations. Prior to the conference, Mike asked for feedback from the monitoring community, via the QA Strategy Workgroup, on areas they thought needed changing in Appendix A. Mike is maintaining a table of these changes and is accepting any additional comments.

Wednesday also included a half-day QA technical session co-chaired by Yousaf Hameed, Clark County and Dennis Crumpler and Mark Shanis, OAQPS. There were many interesting papers at the session which was well attended. Presentations are posted at the conference site on AMTIC. http://www.epa.gov/ttn/amtic/naamc.html

Much of this Newsletter will be devoted to issues or discussions that came up during the conference.

Pb Analysis Audits- Questions about Concentration Ranges and Reporting.

Many people refer to the Pb analysis audits as the Pb audit strips. However, with the advent of Pb-PM_{10}, analysis audits need to be available for teflon filters with analysis either by XRF or by approved FEM methods. The following information is provided to help explain the concentration ranges that are considered acceptable.

Level	Current Regulation		
	Pb Conc (µg/strip)	Ambient Air Conc (µg/m³)	Conc Percentage of NAAQS
1	9 30	0.04 0.15	30 100%
2	60 - 90	0.30 - 0.45	200-300%

Pb Strips

These strips can either be developed by EPA (ordering on a annual basis), by a third party, or by the analytical laboratory performing the analysis. Standard operating procedures for the development of the strips are on AMTIC http://www.epa.gov/ttn/amtic/pb-monitoring.html. QA EYE Newsletters 8 and 9 have additional information about these strips. The current requirement in Appendix A for the concentrations for the Pb analysis audits are 30-100% of the NAQQS for level one and 200-300% of the NAAQS for level two. The reporting units for the data are in ug/strip (AQS units code 077) and are not converted to concentration (ug/m³).

NAAQS-0.15 ug/m3	Sampler Flow 1.7 m³/min			
	Level 1		Level 2	
	30%	100%	200%	300%
ug/m3	0.045	0.15	0.3	0.45
ug/strip (3/4" strips)	9.18	30.6	61.2	91.8
ug/strip 1" strips	12.24	40.8	81.6	122.4

	Sampler Flow 1.1 m³/min			
	Level 1		Level 2	
	30%	100%	200%	300%
ug/m3	0.045	0.15	0.3	0.45
ug/strip (3/4" strips)	5.94	19.8	39.6	59.4
ug/strip 1" strips	7.92	26.4	52.8	79.2

	Pb-TSP by extraction			
For AMP255	Level 1		Level 2	
	Min	Max	Min	Max
	5.9	40	45	125

	PM10 Teflon by extraction			
	Level 1		Level 2	
	30%	100%	200%	300%
ug/m3	0.045	0.15	0.3	0.45
ug/filter	1.08	3.60	7.20	10.80

	PM10 Teflon by XRF			
	Level 1		Level 2	
	30%	100%	200%	300%
ug/m3	0.045	0.15	0.3	0.45
ug/filter	1.08	3.60	7.20	10.80
ug/cm2	0.09	0.30	0.61	0.91

The equivalent ambient Pb concentration in ug/m³ is based on sampling at a 1.7 m³/min flow rate for 24 hours on a 20.3 cmX25.4 cm (8X10 inch) glass fiber filter where one twelfth of the filter (3/4 inch strip) is used. EPA has received comments that monitoring organizations are using different filter strip sizes and different flow rates in the samplers so when they calculate the concentrations they need for the filter strip, it is outside the limits provided in the "Pb Conc" column of the table above and AQS identifies the concentration as not meeting the acceptance criteria. In some cases AQS did not allow the data to be reported.

Since the acceptable flow volumes for the TSP monitors are 1.1 to 1.7 m³/min and the Pb strips are made at ¾ to 1 inch widths, the calculations to the left were performed. The data illustrate that based upon what size strip and volume is used, the concentration limits can extend from 6- 40 ug/strip for audit level 1 and 40- 123 ug/strip for audit level 2. Although EPA would prefer that monitoring organization develop the Pb analysis audits within the 9-30 and 60-90 ug/strip range, in 2012 AQS will accept values at 4- 40 ug/strip for level 1 and 45- 170 ug/strip for level 2. **In 2013 we will be revising the ranges to 4-40 ug/strip for level 1 and 45-125 ug/strip for level 2.**

Pb-PM10 (Teflon)

For the Pb-PM_{10} Teflon filters it is more straight forward since the filter size and the flow rates do not vary. The table to the left provides the appropriate ranges for the Teflon in units of ug/filter of 1.0 - 4.0 ug for Level 1 and 7.0 to 11.0 ug for level 2. The ranges are calculated by dividing the concentration (ug/filter) by the 24 hour sample volume which is 24 m³. Since some XRF analysis is reported in ug/cm², a conversion using the area of the filter of 11.86 cm² (as defined in 40 CFR part 50 App Q sect 2.1) is used. Since EPA has had some difficulty preparing/acquiring audits at the appropriate ranges, AQS is currently accepting 1.0 - 4.0 ug for Level 1 and 5.0 to 11.0 ug for level 2.

Reporting the Pb Analysis Audit Data– Replicate Analysis Results

Since some monitoring organizations are using contractors to analyze their filters, there has been some issues concerning what Pb analysis audit data to report. At a minimum, 6 analysis audit values (three low concentration and three high concentration) should be reported each quarter. Some contractors may run the audits within the quarter on different days, and some may run the audits all on the same day. It's preferred that they run on different days but it's not a requirement. However, the laboratories may also be providing the monitoring organizations with replicate analysis. For TSP strips this means that they are analyzing the extract a number of times and providing the results of this multiple analysis to the monitoring organization. In the case of XRF analysis, the laboratory may be running XRF on different portions of the same filter and providing the results of this analysis to the monitoring organizations. For purposes of AQS reporting, EPA requires only the mean of the replicates reported. Some laboratories may be running the XRF audit filters more often then required. These additional results provide more information about the quality of the laboratories results and can be reported to AQS.

Annual PEs and Bracketing 80% of Ambient Air Concentrations... How's it calculated

For the annual performance evaluation requirements for the gaseous pollutants, EPA has received a fair number of questions on how to handle the suggestion that: "*The audit levels selected should represent or bracket 80 percent of ambient concentrations measured by the analyzer being evaluated*".

This intent of this suggestion is to implement audits at concentrations normally measured by the routine monitor so the assessment represents an estimate of uncertainty around routine concentration levels. Monitoring organizations trying to perform these assessments have asked EPA for the best method to represent or bracket their data. EPA did not get specific on this criteria in order to provide the monitoring organizations some flexibility in this approach. However, due to the popularity of this question some suggestions follow.

One could perform the 80% bracketing on a site level or on an aggregation of all sites within the monitoring organization.

All sites combined-

1) Take 3 years of hourly data from all sites, find the 80th percentile and use that as a starting point to find appropriate audit levels. Each year add a new year to create a rolling 3-year average. You could then use the same audit concentration levels for each site in the network.

2) Take the most current valid year of hourly data from all sites, find the 80th percentile and use that as a starting point to find appropriate audit levels. Each year use the most current year to provide an estimate. You could then use the same audit concentration levels for each site in the network.

Single Sites-

Perform the same estimate in #1 or #2 using individual sites for the development of site specific audit levels.

Protecting the NAAQS.

A comment that we've heard from monitoring organizations is that they like to audit in a manner that ensures the monitor is accurate at the NAAQS level. If this is the case, there are two acceptable solutions: 1) audit a fourth point around the level of the NAAQS or 2) use one of the three required audit points for this audit level. Since the audit levels do not need to be consecutive, either approach is acceptable.

Any of the techniques discussed above will provide audit levels that more closely match the routine concentrations at the site. There are probably other approaches that would be deemed acceptable by EPA, so check with your Region. Your QAPP should define how your organization will implement the requirement.

National Toxics Trends Site Network Assessment Presented at National Air Monitoring Conference

The NATTS Network collects ambient air monitoring data on air toxics as part of the Urban Air Toxic Strategy, which addresses air toxics in urban areas. Air toxics include hazardous air pollutants or HAPs, which are pollutants that are known or suspected to cause cancer or other serious health effects, such as reproductive effects or birth defects, or adverse environmental effects. Data generated by each NATTS site are quality assured and submitted to the national Air Quality System (AQS), EPA's repository of ambient air data. These quality-assured data can then be used for purposes such as:

- Identifying trends in ambient air toxic concentrations to facilitate tracking progress toward emission and risk reduction goals.
- Directly evaluating public exposure and environmental impacts in the vicinity of monitoring sites.
- Assessing the effects of specific emission reduction activities both locally and nationally.
- Providing quality assured air toxics data for risk characterization.
- Evaluating and subsequently improving air toxics emission inventories and model performance.
- Identifying additional monitoring needs (e.g., new sites or additional methods).

EPA conducted its NATTS Network Assessment as part of the Air Toxics Component of its overall National Monitoring Strategy, which requires that the NATTS Network be evaluated and modified every 6 years. EPA's assessment can be divided into two portions: quantitative and qualitative. The quantitative portion examined the pollutant datasets collected by the monitoring stations and evaluates the quality of those datasets in terms of suitability for assessing trends. EPA used the suitable datasets to identify trends of air toxic concentrations over the 6-year period 2005 - 2010, as well as to identify national trends of air toxics at individual sites. The qualitative portion examined issues such as whether the network design is appropriate to achieve the network's goals and objectives and whether changes to the sites, pollutants, or means of measurement are needed to refine the network. OAQPS staff presented the summary of the NATTS Network Assessment at the National Air Monitoring Conference in May 2012. A copy of the draft NATTS Network Assessment is available upon request. Please contact David Shelow @ shelow.david@epa.gov or Dennis Mikel at mikel.dennisk@epa.gov to request a copy.

PM2.5 Bias Estimates Continue to Puzzle

At the 2009 Ambient Air Conference in Nashville, Dennis Crumpler reported seeing a downward trend in the bias estimates based on the $PM_{2.5}$ Performance Evaluation Program (PEP). In developing the 2008-2010 $PM_{2.5}$ QA Report, EPA was continuing to see this trend and is trying to evaluate this data in a number of ways to determine a cause. EPA, working with Sonoma Technology Inc. (STI), started evaluating 12 years of the $PM_{2.5}$ data by asking:

- What are current levels of bias?
- Has bias been changing over time?
- When did bias start trending down?
- Does bias vary by type of separator, WINS versus Very Sharp Cut Cyclone (VSCC)?
- Does bias vary by season?
- Does bias vary by $PM_{2.5}$ concentration?
- Does bias vary by region of the country?

Current Levels of Bias.

Table 1 presents the 2008-2010 bias estimates of the major methods used in the $PM_{2.5}$ network. Although we have some continuous federal equivalent methods in the network, we do not have enough PEP data to make any definitive statements of bias. Table 1 illustrates that all bias estimates are negative, meaning concentrations from samplers operated by primary quality assurance organizations (PQAO) are lower than concentrations from PEP samplers, on average

Table 1. 2008-2010 bias estimates by method

Method Number	Maker	Single / Sequential	WINS / VSCC	Bias (%)	90% Confidence
116	BGI	Single	WINS	-7.8 %	+/- 3 %
117	R&P	Single	WINS	-12.4 %	+/- 3 %
118	R&P	Sequential	WINS	-11.8 %	+/- 1 %
119	Andersen	Single	WINS	-10.7 %	+/- 7 %
120	Andersen	Sequential	WINS	-8.0 %	+/- 1 %
142	BGI	Single	VSCC	-2.0 %	+/- 3 %
143	R&P	Single	VSCC	-6.0 %	+/- 4 %
145	R&P	Sequential	VSCC	-5.9 %	+/- 1 %
153	Thermo	Single	VSCC	-6.1 %	+/- 2 %
155	Thermo	Sequential	VSCC	-3.7 %	+/- 7 %

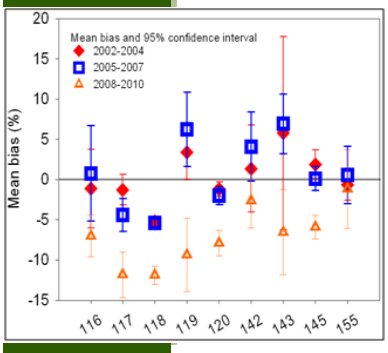

Fig 1. Bias over three, three-year periods

Has bias been changing over time?

Yes, as illustrated in Figure 1. In the 2002-2004 and 2005-2007 time periods the bias was fairly close and between methods there was no consistency which three year period was higher or lower. However, for the 2008-2010 time period, all methods are reading more negative than the other two 3-year periods.

When did bias start trending down?

It appears that the downward trend in bias, as illustrated in Figure 2 started somewhere around 2007. At this point EPA is unsure what might have been the cause for this trend. Only methods 118, 120 and 145 are shown because these three methods are used most often by the monitoring organizations. One can see that in 2011 the downward trend may have stopped but the data used in the assessment is preliminary and data validation is not complete.

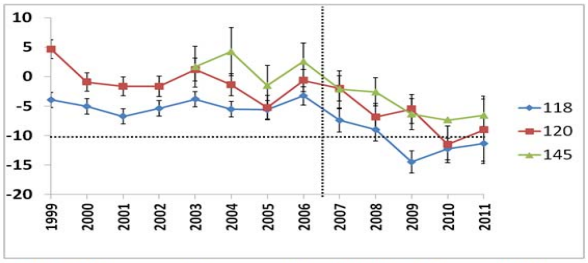

Fig 2. Bias trend for methods 118, 120, and 145

Does bias vary by type of separator, WINS versus very sharp cut cyclone (VSCC)?

Yes. In general it appears that with enough information present for both method designations (WINS and VSCC) that the WINS has a more negative bias than the VSCC when operated by the monitoring organizations. Figure 3 illustrates this for the R&P sequential, and Table 2 provides the information for the other major method designations.

Fig 3. R&P Bias for WINS and VSCC

Table 2 Difference in Seperator by Major Method Sampler Type for SLT Samplers

Sampler Type	Method Numbers	Difference in WINS and VSCC Median Biases	Statistical Test of WINS Bias to VSCC Bias for SLT
BGI Single	116 vs 142	-7.4 %	WINS Bias < VSCC Bias
R&P Single	117 vs 143	-9.2 %	WINS Bias < VSCC Bias
R&P Sequential	118 vs 145	-4.5 %	WINS Bias < VSCC Bias
Andersen Single	119 vs 153	-0.3 %	Not significantly different.
Andersen Sequential	120 vs 155	-6.8 %	Not significantly different. Too few observations for 155.

STI also ran a similar assessment of the PEP monitors since the PEP also uses a combination of WINS and VSCC. However, the analysis did not find a significant difference between the two separators for the PEP samplers (the majority of the PEP uses the BGI audit sampler).

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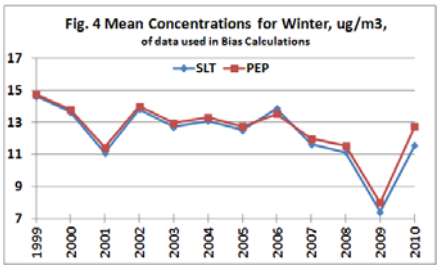
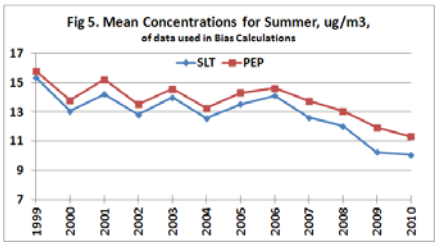
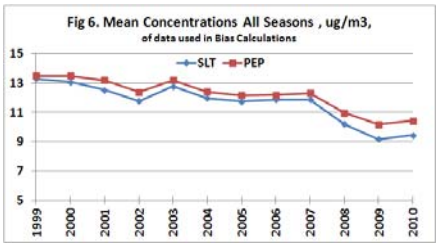
PM2.5 Bias *Continued from page 4*

Does bias vary by season?





Maybe. The trend is still downward for all seasons but in some cases it appears that the summer produces a more negative bias than other seasons. Figures 4 and 5 represent the annual mean concentrations for the PEP and State/Local/Tribal (SLT) samples for the winter and summer months respectively. There is more of a difference between the PEP and SLT concentrations during the summer which would lead to a more negative bias estimate during those periods.



Does Bias Vary by Concentration

Probably not. After looking at the season graphs and noticing the decrease in average concentrations which is better depicted in Figure 6 (representing all seasons), there was a concern whether the lower concentrations had an affect on the bias statistic since an absolute difference (i.e., 2 ug/m^3) at a lower concentration would produce a larger percent difference estimate. After some additional evaluation, we concluded lower concentrations have a limited role, if any, on the bias trend we are seeing. As illustrated in Table 3 we looked at median bias estimates over 5 different concentration ranges in the 2008 through 2010 data and did not see any significant differences although median bias estimates at concentrations > 12 ug/m^3 did show a less negative bias.

Table 3. 2008-2010 median percent Bias at concentration ranges

PEP Conc ug/m3	Median Percent Bias
0-3	-10.2
3-6	-12.6
6-9	-10.7
9-12	-11.5
>12	-6.4

Does Bias Vary by Region of the Country?

Not in any pattern. Bias estimates were generally trending down across the nation without a clear regional pattern.

So What's the Answer

We are not sure. We can't answer the question about why we see a trend but we do know that there appears to be more bias, in general, in the summer and the WINS appears to produce more negative results compared to the VSCC when the monitoring organization operates instruments with both types of separators. Some things come to mind that were also brought up at the conference.

1) Filter removal -The PEP program generally removes the filter the next morning while the routine sample can remain in the instrument for a maximum of 177 hours. The longer retrieval time allows for greater volatilization which is suggested by greater differences in summer months. However, it is not clear how this protocol could cause the downward trend in bias.
2) WINS cleaning - Since the VSCC requires less maintenance, there is a possibility that monitoring organizations are following the VSCC cleaning schedule which might mean the WINS are not cleaned as frequently (every 5 events). Some suggest that a dirty WINS might have an effect.
3) Cleaning of down tubes. Some have recently suggested that maybe there is an accumulation of particles on the down tube that is resulting in a loss of particles over time getting to the filters.
4) Aging of instruments and cassettes. A commenter at the conference wondered whether we are seeing the aging of the instruments. He also commented that there is a possibility we are getting leaks around the cassettes which may cause a change in concentration (since volume is a big part of the estimate)

Next Steps

There are a number of questions we may try and answer. They include:

- Do ambient temperatures play a role? As temperature increases, does bias becomes more negative?
- Do changes in speciation of PM2.5 play a role? As PM2.5 concentrations come down, is the volatile fraction of PM2.5 increasing?
- Do filters retrieved within 10 hours of the end of sampling have smaller bias than those retrieved after filters experience the heat of day?
- What is impact on bias based on length of time between last WINS cleaning and sample collection? Do longer times mean lower concentrations (compared to the PEP)?

Answers to some of these questions may require more in depth studies of data from monitoring organizations since some of this information is not reported to the Air Quality System (AQS).

When Routine Data is Invalid Some QC Data Should Go

Not all App A checks fit nicely into the paradigm.

QAPPs should include wording that addresses when to retain and when to exclude QA and QC data from AQS .

The intent of the QC data that are reported to the AQS is to provide an estimate of precision and bias of the routine data collected during a particular time period. For example the 1-point QC check is performed minimally every two weeks for the gaseous pollutants and so the data from the check represents that the monitor was within acceptance specifications for that time period. Upon failure of the QC checks and subsequent invalidation of the data (should that occur) it is expected that null value codes would replace the routine data and the QC check would not be reported to AQS. Since the routine data would not be available it would not be appropriate to provide a QC value that would be used in an overall estimates of precision and bias of that site. The estimate of precision and bias for that site should represent the valid routine data being reported for the site.

It is suggested that only those QC checks that are performed on each monitor/sampler are subject to removal and only for the checks within the same time period that the routine data were invalidated. As an example if the Annual PE for ozone was performed in April, 2012 and the ozone data for Dec, 2012 were invalidated, the April 2012 PE could remain in AQS and only the 1-point QC checks for Dec. would be removed. Not all App A checks fit nicely into the paradigm. For example:

Collocated data- since they represent a PQAO and not an individual site it becomes more of a dilemma. However if routine data from a collocated site were invalidated due to a finding based on imprecision of the collocated data then one would not want to have these data represent the other sites in the PQAO.

NPAP and PEP data. Similar to the collocated data, this data represents the PQAO and is not often used to invalidate data. However, there are cases where NPAP data have been used to invalidate routine data and in that case it would not be appropriate to report the NPAP results to AQS.

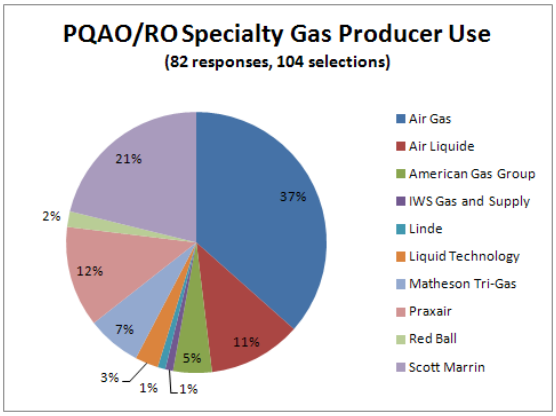
Other concerns might arise in connection with the Annual PEs, or audits, mentioned above. Consistent with many agencies' Quality Assurance Project Plans (QAPPs), data will not be invalidated on the basis of an audit alone. Many agencies will verify, such as by independent tests, the results of a "failed" audit. It might not be practical in all cases to verify an audit result, immediately recalibrate the "failed" channel and schedule a second audit following the recalibration. Accordingly, excluding the audit result that discovered a problem in the first place could cause the responsible agency either to incur additional audit costs or, alternatively, be "penalized" for appearing to fail to meet the required number of audits. Many agencies would be concerned about having a less than complete audit count appear in the AMP255 at the time of annual data certification.

As suggested above, monitoring agencies should keep in mind the objective of reporting the results of QA and QC checks to AQS: The results of the reported QA/QC checks should represent the precision and bias of the reported raw data. The analysts who report these data should be mindful that precision and bias calculations can apply at the monitor level or at the PQAO level. Often, a result that falls outside criteria indicates an out-of-control situation that is subsequently corrected such as by invalidating data and recalibrating. Under other circumstances, after-the-fact review of QC checks with poor, but "passing," results might reveal a trend consistent with a problem that was only discovered by some other means.

Because of concerns such as these, it is important to consider these recommendations in the context of corrective action. It is recommended that QAPPs include wording that addresses when to retain and when to exclude QA and QC data from AQS and when to conduct replacement QA/QC checks. However, it is impossible to foresee every circumstance that might lead to a poor QA/QC result and, in some cases, it might not be obvious whether to report or exclude a result. In these cases decisions may fall to the responsible QA officers or managers. Discussions between the EPA Region and monitoring organizations might also need to occur to determine the best course of action.

Ambient Air Protocol Gas Verification Program-2nd Report Published

A second full year of implementation of the Ambient Air Protocol Gas Verification program wrapped up December 2011. EPA provided the specialty gas producers an opportunity to review the last quarter of verification data, take any corrective action needed, and review the report prior to publication which was posted on AMTIC April, 2012.



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 2011 AA-PGVP, EPA received surveys from 82 of a possible 122 monitoring organizations, which is about a 67% response rate. This was lower than the input received from 2010 which was around 75%. The table above illustrates producer use based upon the responses received.

Of the 82 respondents, 33 either did not want to participate or were not receiving a cylinder during the year. This narrowed the participants down to 49. Of the possible participants, 15 monitoring organizations sent cylinders to EPA. EPA did not have a monitoring organization volunteer submit a cylinder from Linde, IWS, Red Ball, or Liquid Technology. EPA invited those producers to send a cylinder directly to EPA. In addition, although the monitoring organization surveys did not list, Global, Coastal or ILMO as a producer currently being used, they inquired about the program and submitted cylinders for verification. Some of these cylinders contained multiple pollutants so although 37 cylinders were sent to the RAVLs, 65 verifications were performed.

The Results

As required 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.

In general, the AA-PGVP 2011 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 65 verifications, 64 were within the ± 4-5% AA-PGVP criteria, and 58 (89%) were within the ± 2% Acid Rain Program criteria.

Survey Improvement-

In 2010, EPA had difficulties with monitoring organizations naming production facilities. Sometimes names were mispelled or locations misrepresented. For example, a number of distribution facilities were identified that were not actually producing standards. In 2011, EPA implemented a web-based survey that allowed monitoring organizations to select (based on final 2010 data) the producers they were purchasing standards from. If the suvey list did not have a producer, the monitoring organization could supply a new name and location. The contractor who maintains the survey would provide the new producer information to EPA and if it was determined that it was a legitimate producer, the contractor would update the software so that the new producer would be included on the selection list. The new system has reduced entry errors considerably.

Program Issues– Participation
EPA Needs Your Help!

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 organizations is the shipping cylinders to the RAVL, in 2011 EPA started helping monitoring organizations pay for the shipping cost. The first 2 quarters of 2012 show very light monitoring organization participation which may force EPA to invite the specialty gas producers to send cylinders directly from their facility which defeats the objective of a blind verification. Twenty five percent of last year's cylinders came directly from producers.

We are grateful to the following organizations that participated in last years survey and we hope that more will consider participating in 2012.

- **Arizona DEQ**
- **City of Philadelphia**
- **Mecklenburg County NC**
- **Maricopa County Air Quality Dept**
- **Minnesota Pollution Control Agency**
- **New Jersey DEP**
- **North Carolina DNR**
- **Ohio EPA (Portsmouth)**
- **Southern Ute Indian Tribe**
- **State of Delaware**
- **State of Florida**
- **Texas Commission of Environmental Quality**
- **University of Iowa State Hygienic Lab**
- **Virginia DEQ**
- **West Virginia DEP**

Trace Gas NPAP Issues and Notes from the National Meeting

Mark Shanis has been working on a number of issues associated with NPAP activities at NCore sites. The following are some brief updates and helpful hints from his presentations at the National Ambient Air Meeting in Denver.

Zero Air Generator (ZAG) Agreement Issues

The API-701H seems to do a better job than API-701, but there is a need to control heat from the convertor, especially if you use a case-based audit system, or monitor with tightly packed instrument racks. If you are auditing or monitoring trace level CO and have an hydrocarbon (HC) convertor in your ZAG, especially if it is a 701 or 701H, you may need to have a CO convertor after the HC convertor. The HC converter will convert some, but not all, HC that goes through it into CO. If you have to add the CO convertor that API offers, it may mean more heat output from your ZAG. You may wish to check your ZAG against a good Ultra Pure Air cylinder, as the NPAP program does, to be able to independently check the performance of your ZAG.

Trace Level (TL) Calibrators

Generate the TL lower audit levels either with :

1. a lower ratio of CO/NO/SO2 in your blended gas (audit for generation) cylinder; or
2. adding 3rd lower flow rate pollutant mass flow controller (MFC) to your 100cc/min such as a 20 or 10cc/min MFC; or by increasing your dilution MFC from 10 lpm to 20 lpm, or from 20 lpm to 30 lpm (but you can only do that if you have a ZAG that is designed to and can safely go that high;

Some combination of 1 and 2 may also work. The NPAP audit trailer at RTP has a 20cc/min, 100cc/min, and 30 lpm MFC combination. We use approximately 675ppm CO, 60ppm NO, and 30ppm SO2, and we have a 2nd blend for lower levels of ppm CO/NO/SO2.

Region 2 has a 10cc/min, 100cc/min, and 20 lpm MFC combination, and have just proposed using 450ppm CO, 30ppm NO and 15ppm SO2 blend for generating audit levels.

TL calibrator's ozone generators have been observed in the past 2 years to have problems generating the lowest 1 or 2 ozone levels for GPT for NOy (or TL NO2), due to software and/or hardware design features of the generator; and/or to the ability of the auditor (or station manager) to keep a stable, correct range temperature, especially in the summer. However, newer or serviced models of at least API and Environics calibrator's ozone generators have been shown to provide 1-10ppb O3, with stability for an audit of NOy or GPT.

CO analyzer issues

Zero and 3-4 hour drift characteristics may not be as good as specified by the manufacturer. One factor causing the observed problem has been temperature variability due to limitations in AC control of the station, or the audit vehicle/container (trailer, truck, or case-based systems).

SO2 and NO analyzers seem less affected by temperature effects. Temperature control is a more important investment for trace level monitoring, and auditing. A zero of +/-15ppb for a 0-5 ppm full scale TL CO analyzer is probably as good as you may get.

NOy analyzer issues

The audit gas will have to be delivered to the sampling stations NOy convertor inlet, on top of a 10 meter tower. However, if you carry an audit NOy, the convertor does not have to be on a 10 meter tower for a representative audit. However, some NOy analyzer convertors' components may have a wiring problem, resulting in a convertor temperature lower than is required to do the NOy to NO conversion correctly, so be sure to see the API notice about this issue.

Since convertor efficiency is an issue for a device based on conversion of non-NO species to NO, and since the NOy technology is still relatively new, the convertor efficiency (CE) must be checked periodically, and audited. To do this, NO2 is not really sufficient, and NPN or IPN is available and must be used. NO2 only tests conversion efficiency of NO2, not NOy. Most of what will be measured will be NO2, not NOY, but if you don't check, how will you know which is present and in what proportions?

Regular range NO2 audits of NO-NOx analyzers have been shown to be accurate and reliable when based on measurement of the diluted CO from a cylinder of a gas blend of CO, SO2, and NO, followed by reaction of the diluted blend with ozone from the diluting calibration device. That is, we measure the diluted CO on our audit CO analyzer, which we calibrate at the site just before the audit, and assume the concentration of the diluted NO, based on reliance on the blend ratio (CO & NO). We use the audit station's NO-NOx response to test and calculate the sampling station's NO-NOx convertor efficiency for NO2. We call this an NO2 audit based on CO & GPT. The SOP for this procedure is in the NPAP TTP Draft Operators field SOP (7/28/2011) on AMTIC: http://www.epa.gov/ttn/amtic/npapsop.html

Reliance on this procedure for trace level NOy analyzers depends on the performance of the CO analyzer, and control of temperature and pressure. While we see that this SOP variation works, questions have been raised about the challenging the lowest audit levels.

At RTP we have developed an alternate NOy calibration and audit method, based on joint calibration of the CO & NOy analyzers with a set of NPN or IPN spans, and if needed, reliance on the NPN calibrated NOy analyzer for an audit. Initial tests appear promising. Confirmation tests are underway at RTP. If successful, the new and/or older method will be tried out in Region 4. Due to the added time for doing NOy audits by GPT, an alternate shortcut method has been proposed, will be tested around the Regions, and discussed for future use.

PM_{10} Filters Serving Dual Purposes and a Reprieve for Filter Archiving

"the agency feels this is an appropriate use for the filters and therefore a legitimate reason for not archiving filters that fall into this category of use."

We have received questions on the use of low volume PM_{10} filters that can provide multiple measurements of $PM_{10;}$ specifically the PM_{10} half of the $PM_{10\text{-}2.5}$ measurement, and subsequently used in the analysis of PM_{10}-Pb.

Using the same filters for both PM_{10} and Pb analysis reduces the number of samplers required at the monitoring sites and creates other efficiencies. EPA has encouraged this practice with guidance to perform PM_{10} mass measurements prior to performing Pb analysis on the same filter (QA EYE Issue 12). Now that there is an approved FEM Pb ICP -MS technique which will destroy the PM_{10} Teflon filter during sample extraction (the XRF FRM technique is non-destructive and therefore the filter can still be archived), monitoring organizations have asked whether using the PM_{10} filter for multiple uses with a destructive ICP-MS Pb FEM method is in conflict with the following 40 CFR Part 58.16 requirement that:

"The State, or where applicable, local agency shall archive all $PM_{2.5}$, PM_{10}, and $PM_{10-2.5}$ filters from manual low-volume samplers (samplers having flow rates less than 200 liters/minute) from all SLAMS sites for a minimum period of 1 year after collection."

The requirement goes on to state that the archived filters would be made available to EPA or other federal agencies, during the 1-year archive period, for supplemental analysis. Therefore, the archive requirement is to ensure that the filters are available, in a viable condition, for beneficial supplemental uses. Since the approved Pb FEM technique is available for use and EPA has encouraged multiple use of filters in order to reduce capital and resource costs, the agency feels this is an appropriate use for the filters and therefore a legitimate reason for not archiving filters that fall into this category of use.

EPA Making Progress on New QA Transactions

The Ambient Air Monitoring Group and the National Air Data Group (the keepers of the AQS system) have formed a Workgroup with a number of EPA Regional and monitoring organization volunteers to review the reporting requirements for the required as well and non-required QA data that is reported to AQS. For many years we have tried to "fit" all our QA data into a precision (RP) or accuracy (RA) transaction that although functional, was not always a great fit. With the possibility of building more automated assessments and the need for additional QA data reported to AQS, this Workgroup has met three times to review the transactions and address issues arising from the review. The process was discussed during the QA Session at the May National Ambient Air Meeting in Denver and will be a topic at the August AQS Meeting.

The Workgroup has one or two meetings remaining which should get us to a stage for external review to a larger audience and programming.

Authors Contributing to the QA EYE— Have You Got Anything to Say?

We appreciate all those authors contributing to this issue. They include:

Bill Frietsche for his work on the Pb Analysis Audit (page 2)

Dennis Mikel who authored the National Toxics Summary on page 3

Shelly Eberly (Geometric Tools) and **Mike McCarthy** (STI) who provided the evaluations for the PM2.5 Bias estimate piece on pages 4 and 5

Joe Delwiche (R8) and **Chris Hall** for contributions to the data validation article on page 6, and,

Mark Shanis who authored the Trace Gas NPAP article on Page 8.

We are always looking for interesting articles for the QA EYE. Please take a few moments out of a day to write up something you feel would help the QA community .

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The Office of Air Quality Planning and Standards is dedicated to developing a quality system to ensure that the Nation's ambient air data is of appropriate quality for informed decision making. We realize that it is only through the efforts of our EPA partners and the monitoring organizations that this data quality goal will be met. This newsletter is intended to provide up-to-date communications on changes or improvements to our quality system. Please pass a copy of this along to your peers and e–mail us with any issues you'd like discussed.

Mike Papp

Important People and Websites

Since 1998, the OAQPS QA Team has been working with the Office of Radiation and Indoor Air in Montgomery and Las Vegas and ORD in order to accomplish it's QA mission. The following personnel are listed by the major programs they implement. Since all are EPA employees, their e-mail address is: last name.first name@ epa.gov.

The **EPA Regions** are the primary contacts for the monitoring organizations and should always be informed of QA issues.

Program	Person		Affiliation
STN/IMPROVE Lab Performance Evaluations	Eric	Bozwell	ORIA- Montgomery
Tribal Air Monitoring	Emilio	Braganza	ORIA-LV
Statistics, DQOs, DQA, precision and bias	Rhonda	Thompson	OAQPS
Speciation Trends Network QA Lead	Dennis	Crumpler	OAQPS
OAQPS QA Manager	Joe	Elkins	OAQPS
Standard Reference Photometer Lead	Scott	Moore	ORD-APPCD
Speciation Trends Network/IMPROVE Field Audits	Jeff	Lantz	ORIA -LV
National Air Toxics Trend Sites QA Lead	Dennis	Mikel	OAQPS
Criteria Pollutant QA Lead	Mike	Papp	OAQPS
NPAP Lead	Mark	Shanis	OAQPS
PM2.5 and Pb PEP Lead	Dennis	Crumpler	OAQPS
STN/IMPROVE Lab PE/TSA/Special Studies	Jewell	Smiley	ORIA-Montgomery
STN/IMPROVE Lab PE/TSA/Special Studies	Steve	Taylor	ORIA-Montgomery

Websites

Website	URL	Description
EPA Quality Staff	EPA Quality System	Overall EPA QA policy and guidance
AMTIC	http://www.epa.gov/ttn/amtic/	Ambient air monitoring and QA
AMTIC QA Page	http://www.epa.gov/ttn/amtic/quality.html	Direct access to QA programs