Options Available for Tribes to Meet Independent Performance Evaluation Requirements for the Ambient Air Monitoring Programs Collecting Data for Comparison to the NAAQS

Introduction

One monitoring goal, as described in the 1990 Amendments to the Clean Air Act, is to:

> "(2) *Establishment of a national network to monitor, collect, and compile data* ***with quantification of uncertainty*** *in the status and trends of air emissions, deposition, air quality, surface water quality, forest condition, and visibility impairment and* ***to ensure the comparability of air quality data collected in different states and obtained from different nations."*** (excerpt from Section 103)

The Ambient Air Quality Monitoring Network, as well as other ambient air related networks (i.e., IMPROVE, Castnet, NADP) have been developed to collect this vital air data. It is very important to people and organizations concerned with human health and the welfare of our communities and ecosystems that the ambient air data collected from monitoring organizations are of acceptable and comparable quality. It can be very frustrating to review data and see pollutant concentrations change by 10 or 15% at the border, or from one monitoring organization to another. It can also be very frustrating to data users when the precision or bias of the data is not known. Many scientists feel that data are unusable if it is of unknown quality. The QA regulations, set forth in 40 CFR Part 58 Appendix A (hereafter referred to as Appendix A) has been developed to ensure that monitoring programs are well planned so that it is known what data quality is needed, that checks are included to assess data quality, and corrective actions are in place to improve quality systems when needed.

Most of the QA requirements in Appendix A are performed by the monitoring organization. These checks are very important and should be submitted to AQS along with routine data since it allows people using the information to asses the quality of the monitoring data. Attachment 1 provides a review of these checks in more detail. Other requirements, like the National Performance Audit Program (NPAP) and the $PM_{2.5}$ Performance Evaluation Program (PEP), are the responsibility of the monitoring organizations, but in most cases, are being performed through federally implemented programs using State and Tribal Assistance Grant (STAG) funds.

The Appendix A QA requirements are specific to data that are collected for comparison to the National Ambient Air Quality Standards (NAAQS). Tribes monitoring for NAAQS comparison purposes must follow these requirements, including participation in the NPAP and PEP programs. Tribes monitoring for other purpose are strongly encouraged to participate in these two programs, but it is not a requirement. Some of the options discussed in the following sections may make the implementation of these audits attractive to the tribes, even if the intent of data collection is other than NAAQS comparison.

Many tribal monitoring organizations are interested in participating in these independent performance evaluations. However, due to the manner in which the requirements have been promulgated, the STAG funding necessary for implementation, and some of the logistical constraints associated with implementation, many tribes have not participated in these programs.

The intent of this document is to provide some background on the EPA's various independent QA programs and provide some options to increase tribal monitoring organization participation in these important programs.

Performance Evaluations- What are they?

Performance evaluations (PEs) are a type of audit in which the quantitative data generated in a measurement system are obtained independently and compared with routinely obtained data to evaluate the proficiency of an analyst, or a laboratory[1]. The National Performance Evaluation Programs:

- Allow one to determine data comparability and usability across sites, monitoring networks (tribes, states, and geographic regions), instruments and laboratories.
- Provide a level of confidence that monitoring systems are operating within an acceptable level of data quality so data users can make decisions with acceptable levels of certainty.
- Help verify the precision and bias estimates performed by monitoring organizations.
- Identify where improvements (technology/training) are needed.
- Assure the public of non-biased assessments of data quality.
- Provide a quantitative mechanism to defend the quality of data.
- Provide information to monitoring organizations on how they compare with the rest of the nation, in relation to the acceptance limits and to assist in corrective actions and/or data improvements.

NPAP through the probe audit

PEP Audit

Some type of national PE program is implemented for all of the ambient air monitoring activities. Table 1 provides more information on these activities. These nationally implemented performance evaluations provide for assessments of comparability that are typically not being performed by any other entity within the ambient air monitoring community. In addition, it's important that these performance evaluations be independent in order to ensure they are non-biased and objective. With the passage of the Data Quality Act[2], there is potential for EPA to receive challenges to the quality of the ambient air data. Independent audits help provide another piece of objective evidence on the quality of a monitoring agencies data and can help EPA defend the quality of the data.

Although Table 1 lists seven performance evaluation programs operating at the federal level, the two of prime importance for this document are the NPAP and PEP Programs. Additional information on both programs can be found on the AMTIC Website[3]. The October 17, 2006 monitoring rule identifies the monitoring organizations as

[1] American National Standard-Quality Systems for Environmental Data and Technology Programs-Requirements with Guidance for Use (ANSI/ASQC E4-2004)
[2] see www.eenews.net/Greenwire/Backissues/081604/08160403.htm
[3] http://www.epa.gov/ttn/amtic/npepqa.html

responsible for ensuring the implementation of these audits[4]. Monitoring organizations can either implement the program itself or continue to participate in the federally implemented program. Over the years, a number of tribes have participated in both the NPAP and PEP Programs. The tribes have found the data useful since it provides an independent check on the quality of their programs and also allows for trouble shooting and program improvement when an audit is found to be outside acceptance ranges.

Table 1 National Performance Evaluation Activities Performed by EPA

Program/ Lead Agency	Explanation
NPAP OAQPS	National Performance Audit Program provides audit standards for the gaseous pollutants either as devices that the site operator connects to the back of the instrument or through the probe in which case the audits are conducted by presenting audit gases through the probe inlet of ambient air monitoring stations. Flow audit devices and lead strips are also provided through NPAP. NPAP audits are required at 20% of a primary quality assurance organizations sites each year with a goal of auditing all sites in 5-7 years.
$PM_{2.5}$ PEP OAQPS	$PM_{2.5}$ Performance Evaluation Program. The strategy is to collocate a portable FRM $PM_{2.5}$ air sampling audit instrument with an established primary sampler at a routine air monitoring site, operate both samplers in the same manner, and then compare the results. Each year five PEP audits are required for primary quality assurance organizations (PQAOs) with less than or equal to 5 monitoring sites or eight audits are required for PQAOs with greater than five sites. These audits are not required for PM_{10}
NATTS PT OAQPS	A National Air Toxics Trend Sites (NATTS) proficiency test (PT) is a type of assessment in which a sample, the composition of which is unknown to the analyst, is provided to test whether the analyst/laboratory can produce analytical results within the specified acceptance criteria. PTs for volatile organic carbons (VOCs), carbonyls and metals are performed quarterly for the ~22 NATTS laboratories
SRP ORIA-LV	The Standard Reference Photometer (SRP) Program provides a mechanism to establish traceability among the ozone standards used by monitoring organizations with the National Institute of Standards and Technology (NIST). Every year NIST certifies an EPA SRP. Upon certification, this SRP is shipped to the EPA Regions who use this SRP to certify the SRP that remains stationary in the Regional Lab. These stationary SRPs are then used to certify the ozone transfer standards that are used by the state, local and Tribal monitoring organizations who bring their transfer standards to the Regional SRP for certification.
PAMS Cylinder Certs ORIA LV	EPA developed a system to certify the standards used by the monitoring agencies to calibrate their PAMS analytical systems. The standards are sent to the EPA Office of Radiation and Indoor Air (ORIA-LV) who perform an independent analysis/certification of the cylinders. This analysis is compared to the vendor concentrations to determine if they are within the contractually required acceptance tolerance.
STN/IMPROVE Round Robins PTs and Audits ORIA-AL	$PM_{2.5}$ Speciation Trends Network (STN) and IMPROVE Round Robins are a type of performance evaluation where the audit samples are developed in ambient air; therefore, the true concentration is unknown. The Office of Indoor Air and Radiation (ORIA) in Montgomery, AL) implement these audits for the STN/IMPROVE programs and for the PEP weighing laboratories. The audit is performed by collecting samples over multiple days and from multiple samplers. These representative samples are then characterized by the ORIA lab and sent to the routine sample laboratories for analysis. Since the true concentrations are unknown, the reported concentrations are reviewed to determine general agreement among the laboratories. In addition ORIA implements technical systems audits of IMPROVE and STN laboratories
Protocol Gas OAQPS	EPA Protocol Gases are used in quality control activities (i.e., calibrations, audits etc.) to ensure the quality of data derived from ambient air monitors used by every state in the country. EPA developed the Protocol Gas Program to allow standards sold by specialty gas producers to be considered traceable to NIST standards. This program was discontinued in 1998. In 2002, there was interest by the gas vendors and EPA to reestablish this program. The program is presently undergoing re-structuring with NIST performing the audit analysis function. A limited program started back up in C2006. An implementation plan has been developed to define the operations of the program and is currently under internal review.

[4] http://www.epa.gov/ttn/amtic/40cfr53.html-Final - Revisions to Ambient Air Monitoring Regulations.

Tribal Monitoring Organization Decisions

There are a number of decisions that the tribal monitoring organizations will need to make in regards to the implementation of the PEP and NPAP Programs including:

1. Can we implement the program ourselves and what is considered "self implementation"
2. If we opt for federal implementation, can we afford it?
3. If we can not afford it are there some options?

Can we implement the program ourselves*?*

If a tribal monitoring organization plans on implementing the PEP or NPAP, the programs must meet some minimal levels of independence and adequacy to ensure that a monitoring organization's program is comparable to the federal PEP and NPAP programs.

Independence –

Remember, one major attribute of a performance evaluation program is that the "quantitative data generated in a measurement system are obtained **independently** and compared with routinely obtained data". Therefore, maintaining the nature of independence is very important. Independence for both the PEP and NPAP are defined the same way, as described below and illustrated in Figure 1.

Independent assessment - an assessment performed by a qualified individual, group, or organization that is not part of the organization directly performing and accountable for the work being assessed. This auditing organization must not be involved with the generation of the routine ambient air monitoring data. An organization can conduct the PEP/NPAP if it can meet the above definition and has a management structure that, at a minimum, will allow for the separation of its routine sampling personnel from its auditing personnel by two levels of management, as illustrated in Figure 1. In addition, the pre and post sample weighing of PEP audit filters must be performed by separate laboratory facility (from the routine sampling filter weighing) using separate laboratory equipment. Field and laboratory personnel would be required to meet the PEP field and laboratory training and certification requirements. The auditing organizations are also asked to consider participating in the centralized field and laboratory standards certification process.

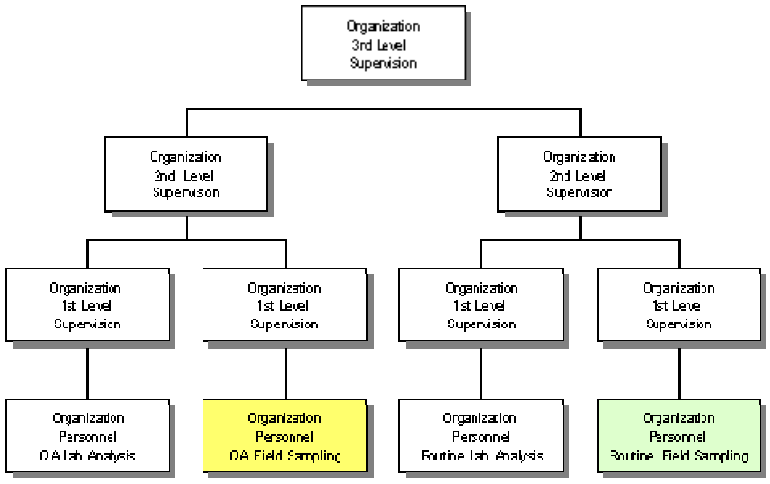

Figure 1. Illustration of independence

Figure 1 illustrates that the QA activities (in yellow) are separated from the monitoring activities (in green) by two levels of management. As mentioned above, for PEP audits, the laboratory preparing the routine $PM_{2.5}$ filters (pre and post-weighing) can not prepare the PEP filters. However, the current national PEP laboratory in EPA Region 4 is capable of functioning as the independent laboratory for the tribe. The TAMS laboratory in Las Vegas can also provide this function as long as the tribe does not send its routine filters to the TAMS laboratory.

Adequacy--

The adequacy requirements for the NPAP and PEP Program have been published to ensure that these programs, if implemented by the tribes, achieve the optimum levels of accuracy, precision and bias in the required measurements. The specific, more detailed requirements are found in Attachments 2 and 3. However, they can be summarized as follows:

PEP Adequacy --

- Primary quality assurance organizations with 5 or less $PM_{2.5}$ monitoring sites would be required to have 5 valid audits per year distributed across the 4 quarters; primary quality assurance organizations with greater than 5 sites would be required to have 8 valid audits per year distributed across the 4 quarters.
- 100 percent completeness (meaning whatever it takes to get 5 or 8 valid samples).
- All samplers subject to an audit within 6 years.
- Data submission to AQS.
- Trained/certified by EPA to perform audit.
- Conforming to the important aspects of the federally implemented PEP Field and Laboratory SOPs and quality assurance project plan requirements.
- Incorporation of PEP in the monitoring organization's quality assurance project plan.

NPAP Adequacy --

- Performing audits at 20 percent of monitoring sites within a primary quality assurance organization each year with a goal of all sites audited in a 5-7 year period.
- Data submission to AQS.
- Development of a delivery system that will allow for the audit concentration gas to be introduced to the probe inlet where logistically feasible.
- Use of audit gas (CO, SO_2 and NO_2) that is NIST certified and validated once a year and an ozone generator that is verified quarterly.
- For national comparability, validation/certification with the EPA NPAP program through collocated auditing, at an acceptable number of sites each year. The comparison tests would have to be no greater than 5 percent different from the EPA NPAP results.
- Incorporation of NPAP in the monitoring organization's quality assurance project plan.

In many (but not all) cases the tribe would have to acquire the necessary capital equipment to implement the performance evaluation. EPA may be able to work with the tribes for loans of NPAP or PEP equipment but arrangements would need to be made at local levels such as the EPA Regions or the TAMS Center.

On May 17, 2006 a memo[5] was drafted by EPA, OAQPS asking the EPA Regions to poll their state and local monitoring organizations to determine which organizations planned on implementing their own PEP or NPAP and which wanted continued federal implementation. Only one state opted to implement the PEP and three decided to implement NPAP. The overwhelming majority continue to use the federally implemented program. Similarly, starting in 2007, the tribal monitoring organizations implementing monitoring for comparisons to the NAAQS will have to decide whether they will implement the PEP or NPAP programs or allow for federal implementation of the programs. Tribes implementing monitoring for other objectives but want to participate in these programs will need to communicate this to the EPA Regions. EPA will develop a communication schedule with the tribal monitoring organizations and the EPA Regions that will allow these decisions to be made in time to schedule audits (if the tribes are requesting federal implementation) for the following calendar year.

What is considered "Self-Implementation"?

The requirement for self-implementation is meeting the adequacy and independence requirements. Self-implementation can be met by:

- Tribal monitoring organization performing the audits themselves (meeting all independent and adequacy requirements).
- One tribal monitoring organization auditing another.
- Cooperation among states and tribes for auditing.
- Tribes working together and hiring internally or externally for audits.
- Other mechanisms like working with various organizations (TAMS, others) for the implementation of audits. This might include borrowing federal equipment as mentioned earlier.

Any of these methods can provide effective implementation of the programs and potentially at costs that might be less then the federally implemented program. Some of these methods would allow the tribes to build technical capabilities.

If we opt for Federal implementation, can we afford it?

As described in the May 17th memo, most EPA Regions use the Environmental Service Assistance Team (ESAT) Contract run by the Office of Superfund Remediation and Technology Innovation (OSRTI) to implement both the NPAP and PEP. This contract supports each EPA Region so the personnel that implement the NPAP and PEP are stationed close to the Regional Offices.

Figure 2 provides the key planning aspects of the federally implemented program that must be completed within the specified time frames in order to ensure that funding will continue at an adequate level. Since the federally implemented program is funded with STAG funds, the timeline is dictated by the grant process. Each year OAQPS will need to determine which tribes will plan on implementing NPAP or PEP, and which will opt to utilize the federally implemented

[5] http://www.epa.gov/ttn/amtic/npepqa.html; May 17, 2006 Memo to Monitoring Organizations Determination to Implement the National Performance Audit or $PM_{2.5}$ Performance Evaluation Program

program. These decisions need to be made one year in advance of implementation. Figure 2 provides an example timetable of the key decisions that would be made in CY07 for a CY08 implementation. Information related to each task in Figure 2 is described in Table 2.

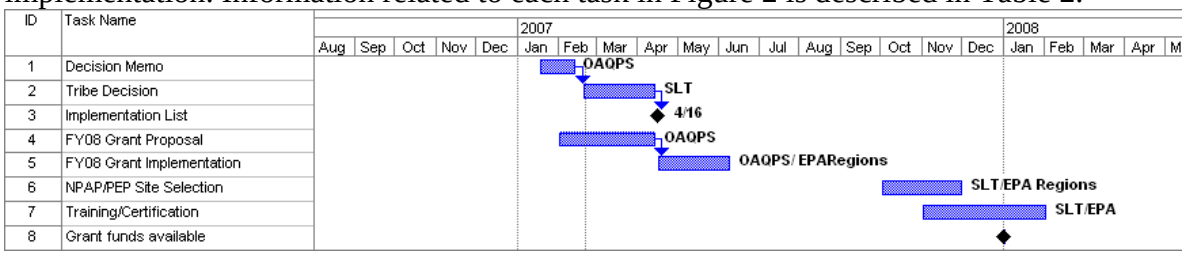

Figure 2 Example Planning Timeline in CY07 for CY08 Implementation

Table 2. Planning Timeline for Federal Implementation.

Task 1	Decision Memo January	This memo, sent by the EPA Regions, will alert the tribes about making a decision to implement NPAP/PEP or to redirect funds to EPA for implementation.
Task 2	Tribal Decision Jan-April	Tribes will make an implementation decision and inform the appropriate EPA Regional contact. The Regions would need to know how many gaseous monitoring sites and how many PM2.5 sites are in the tribes (based on primary quality assurance organizations) monitoring network. This would determine the number of required NPAP and PEP audits.
Task 3	Implementation List April	OAQPS will create a list of all primary quality assurance organizations implementing NPAP or PEP itself or utilizing the Federal program and will be posted on AMTIC.
Task 4	Grant Proposal Jan-April	EPA, in coordination with the EPA Regions and the tribes will develop the grant package. EPA will include a redirection of STAG funds for those organizations who have requested federal implementation.
Task 5	Grant Implementation April-June	OAQPS will develop the grant guidance document which provides for the funding of the federally implemented program for the coming year.
Task 6	Site Selection October-November	In order to develop appropriate contract costs for the calendar year, sites for both the $PM_{2.5}$ PEP and the NPAP are selected by the tribe and EPA in this time period.
Task 7	Training/Certification	Each year the federally implemented program will train new audit personnel or certify current field auditors. Tribal monitoring organizations will be invited to participate in this training.

Based on years of implementing both the NPAP and PEP programs, a PEP audit will cost about $2,000 per site and an NPAP audit will cost $2,200 per site. These costs are all inclusive, meaning they include all costs associated with implementation, travel, training, capital equipment, consumables, maintenance, repair and data reporting. Once the decision is made for federal implementation, and the tribes have decided on the sites for auditing, the Regions will inform OAQPS of the number of sites and therefore the audit costs for the tribe.

Typically, for the federally implemented program at the state and local monitoring organizations sites, the STAG funds for the audits are redirected to OAQPS prior to distribution to the EPA Regions. OAQPS then determines the number of audits to be accomplished by all monitoring organizations in a particular Region and provides a purchase request to the ESAT audit support contractor in that Region to perform the NPAP and PEP audits. For implementation of these programs for the tribes, with agreement from the EPA Senior Indian Program Manager, EPA anticipates a similar process will be implemented, with annual STAG funds being redirected to OAQPS for those tribes requesting federal implementation.

If we can not do it ourselves and we can't afford it, are there any other options?

Due to the small number of monitors usually operated by tribal organizations, the percentage of required PEP and NPAP audits are substantially higher (compared to the number of routine monitors) than would be required for most state and local monitoring organizations. However, in

order to perform statistically relevant assessments of data quality, EPA can not reduce the number of audits below the current requirement. However, the tribes may be able to meet the requirements and achieve some cost efficiencies by consolidating to a smaller number of primary quality assurance organizations.

Option 1- Consolidation of Tribes to Smaller Number of Primary Quality Assurance Organizations.

Prior to the signing of the Ambient Air Monitoring Regulation by the Administrator on October 17, 2006, the Appendix A requirements aggregated much of the data quality information by "reporting organizations". Due to some confusion by monitoring organizations on its use, the term "reporting organization" was replaced with the term "primary quality assurance organization (PQAO)"[6].

The term PQAO has very important implications to quality assurance activities. For example, it is used to determine how many collocated particulate monitors need to be implemented, how many PEP and NPAP audits need to be implemented, and is also used to aggregate data for assessments of completeness, precision and bias. The definition of PQAO as written in Appendix A is provided below.

> 3.1.1 Each primary quality assurance organization shall be defined such that measurement uncertainty among all stations in the organization can be expected to be reasonably homogeneous, as a result of common factors. Common factors that should be considered by monitoring organizations in defining primary quality assurance organizations include:
>
> (a) Operation by a common team of field operators according to a common set of procedures;
> (b) Use of a common QAPP or standard operating procedures;
> (c) Common calibration facilities and standards;
> (d) Oversight by a common quality assurance organization; and
> (e) Support by a common management, laboratory or headquarters.

EPA believes that the 5 common factors listed are the key criteria to be used when an agency decides the sites to be considered for aggregation to a PQAO. The requirement does not intend that all 5 factors have to be fulfilled but that these factors are considered. However, common procedures and a common QAPP should be strongly considered as key to making decisions to consolidate sites into a PQAO.

Most tribes implementing ambient air monitoring, even within a state, are unique entities and have there own PQAO. However, many state monitoring sites are currently aggregated into one PQAO. There are a few states that have many small local reporting organizations that appear to meet the common factors that describe a PQAO. These reporting organizations could potentially be aggregated into a single PQAO and save the monitoring organization resources by reducing the number of collocated PM monitoring, the number of PEP audits and to some extent, the number NPAP audits. Many of these local organizations have recently informed EPA that they plan to consolidate to a smaller number of PQAOs.

tribes might consider consolidating to a fewer number of PQAOs. Below is an example of the savings that could occur, based upon the current requirements. In this scenario, there are 4 tribal

[6] 40 CFR Part 58 Appendix A Section 3.1.

monitoring organizations (tribes A-D) operating both gaseous monitoring sites and $PM_{2.5}$ monitoring sites. Most tribal monitoring organizations do not have extensive networks so the number of sites within each network is realistic. It is assumed that the tribes meet a number of the factors defining a PQAO and could consolidate to one PQAO. Table 3 provides the number and costs of the NPAP audits, the numbers of collocated $PM_{2.5}$ sites needed and the number and costs of the $PM_{2.5}$ PEP audits for each individual monitoring organization as well as for a consolidated PQAO. As the table illustrates, the number of audits and costs of the NPAP decrease by 50% if the tribes consolidate to one PQAO; as does the collocation requirement. In contrast, there is a significant savings in the PEP program. Where it would cost a total of $46,000 to perform 23 audits at the 4 separate tribal PQAOs, it would cost $16,000 for 8 audits under the scenario of the 4 tribes consolidating to one PQAO (PQAO A-D).

Table 3. Example Scenario of Number of Audits and Associated costs for Separate and Consolidated PQAOs

Tribe PQAO	Number of Gaseous Sites	NPAP Audits Required	NPAP Cost ($)	Number of PM2.5 Sites	Number of Collocation Required	Number of PEP Required	PEP Cost ($)
A	2	1	$2,200.00	3	1	5	$10,000.00
B	3	1	$2,200.00	2	1	5	$10,000.00
C	1	1	$2,200.00	1	1	5	$10,000.00
D	5	1	$2,200.00	6	1	8	$16,000.00
Totals Separate	**11**	**4**	**$8,800.00**	**12**	**4**	**23**	**$46,000.00**
PQAO A-D	**11**	**2**	**$4,400.00**	**12**	**2**	**8**	**$16,000.00**
Savings		**2**	**$4,400.00**		**2**	**15**	**$30,000.00**

Therefore, there is a significant advantage to tribes consolidating to fewer PQAOs. The consolidation may also help in the development of QA project plans (QAPPs) and standard operating procedure (SOPs) since one QAPP and set of SOPs could serve multiple tribes.

In addition to tribes consolidating with other tribes, the tribes may also consider forming a PQAO with a state monitoring organization. This not only has the advantages mentioned above but since the state organizations are usually larger and have more resources at their disposal, they will have developed many of the QA materials such as the QAPP and standard operating procedures that can then be followed and used by the tribes. So in summary, the following (in order of simplicity) are a few options for PQAO consolidation:

- Consolidation of tribes within a state
- Consolidation of tribes across states within an EPA Region
- Consolidation of tribes with state PQAO
- Consolidation of tribes across EPA Regions

Attachment 4 contains a form that can be distributed to tribes by the EPA Regions in order to gather information on whether a tribe will be considering any of these consolidation techniques and its interest in participating in the NPAP and or the PEP.

NOTE: It must be noted that PQAO consolidation is for QA purposes only and does not have any other political or technical implications. The tribal agency codes and the reporting organization codes in AQS will remain unique to each tribe so the tribe will remain as sovereign entities no matter which consolidation technique is used.

Option 2 -TAMS Center Assistance

In 2007, it is anticipated that the TAMS Center in Las Vegas will receive a trailer that will be outfitted to serve as a NPAP through-the-probe mobile laboratory. This trailer will be used to train and certify auditors to perform NPAP and can be used to perform NPAP audits. In addition, the TAMS Center also has PEP equipment available for loan. The tribes could take advantage of this equipment and possibly combine resources to train an auditor who could service a number of tribes and therefore meet both the independence and adequacy requirements.

In addition to equipment loans, the TAMS Center technical staff may be able to perform a limited number of audits for tribes on a first-come-first-serve basis. The details of this process will be developed in 2007.

Option 3-EPA Regional Assistance

Similar to the TAMS Center (option 2), the NPAP trailers or vehicles in the EPA Regions may be available for loans to the tribes on a first-come-first-serve basis. There are a number of stipulations for the use of the NPAP laboratories that are discussed in Attachment 2. The loan of the equipment would alleviate capital expenditure costs. The PEP equipment may be available for loan but this would need to be negotiated at the EPA Regional level.

Summary

With the new monitoring regulation promulgated on October 17, 2006, EPA wants to ensure that the tribal monitoring organizations are aware of their grant obligations for ambient air monitoring to implement the QA requirements described in 40 CFR Part 58 Appendix A and to report this data to AQS. Although these requirements are specific to sites that will be used for comparison to the NAAQS, they provide for a reasonable assessment of data quality that should be implemented at sites that may be developed for objectives other than NAAQS comparisons. Appendix A requires monitoring organizations to participate in two independent performance evaluation programs; NPAP and PEP. The tribes can either implement these programs itself or utilize the federally implemented programs which will require a redirection of STAG funds to EPA. In order to reduce the costs of these programs, the tribes might consider the following options:

- Consolidation to smaller primary quality assurance organizations (PQAO). This would not only save on PEP and NPAP costs but also on the costs of PM collocations. Federal implementation at these “consolidated” PQAOs would cost each individual tribe less. The tribe might also consider forming a PQAO with a state monitoring organization.
- Tribes consolidating funds for purchasing equipment and training tribal auditors to service a number of tribes. EPA would provide personnel training/certification and would also certify the NPAP and PEP equipment.
- Loans of capital equipment from either the TAMS Center or the EPA Regions on a first-come-first-serve basis.
- Utilizing trained and certified personnel at the TAMS Center to implement audits within to the extent that this is possible or feasible.

Attachment 1

Criteria Pollutant Quality Control Checks Described in 40 CFR Part 58 Appendix A

Criteria Pollutant Quality Control Checks Described in 40 CFR Part 58 Appendix A

The EPA's Ambient Air Quality Monitoring Program is implemented under the authority of the Clean Air Act to provide air quality data for one or more of the three following objectives:

- Provide air pollution data to the general public in a timely manner.
- Support compliance with air quality standards and emissions strategy development.
- Support air pollution research studies.

In order to support the objectives the monitoring networks are designed with a variety of monitoring sites that generally fall into the following categories which are used to:

1. determine the highest concentrations expected to occur in the area covered by the network;
2. determine typical concentrations in areas of high population density;
3. determine the impact on ambient pollution levels of significant sources or source categories;
4. determine the general background concentration levels;
5. determine the extent of regional pollutant transport among populated areas, and in support of secondary standards; and
6. measure air pollution impacts on visibility, vegetation damage, or other welfare- based impacts.

These different objectives can potentially require information of varying quality. EPA recognized the importance of collecting data of acceptable and consistent quality and developed 40 CFR Part 58 Appendix A that established the development of a quality assurance program to be implemented at the primary quality assurance organization level of aggregation. The appendices identify quality control, audits and performance evaluation techniques that are implemented internally as well as by external organizations like the EPA Regions, ORD and OAQPS, and established the statistical techniques to evaluate the data quality indicators. The primary data quality indicators (DQI) for the ambient air program are precision, bias completeness, comparability and detectability.

Quality Control (QC) is the overall system of technical activities that measures the performance of a process against defined standards to verify that they meet the stated acceptance requirements. Quality control includes establishing specifications or acceptance criteria for each quality characteristic of the monitoring/analytical process, assessing procedures used in the monitoring/analytical process to determine conformance to these specifications and taking any necessary corrective actions to bring them into conformance. So QC is both proactive and corrective. It establishes techniques to determine if field and lab procedures are producing acceptable data and identifies actions to correct unacceptable performance.

Within any data collection process errors can occur that result in data of unacceptable quality. For example:

- Samples and filters can be mislabeled
- Data can be transcribed or reported incorrectly or information management systems can be programmed incorrectly
- Calibration or check standards can be contaminated or certified incorrectly resulting in faulty calibrations
- Instruments can be set up improperly or over time fail to operate within specifications
- Procedures may not be followed

The goal of quality control is to provide a reasonable level of checking at various stages of the measurement process to ensure that data quality is maintained and if it is found that the quality has not been maintained one does not lose or invalidate a significant amount of data. So, in developing a quality control strategy, one must weigh the costs associated with quality control against the risks of data loss. With the objective to minimize data loss, quality control data is most beneficial when it is used as real time as possible. Therefore, information management systems can play a very important role in reviewing QC data to flag or identify various data for further review. These information management procedures can help the technical staff review these QC checks coming from a number of monitoring sites in a consistent manner and in a time efficient way. However, it must be realized that information management systems are only as good as their programs and so must also be checked to ensure they are performing as expected.

For each DQI one must identify a level of uncertainty or error that is acceptable. Measurement quality objective (MQOs) are designed to evaluate and control various phases (sampling, preparation, analysis) of the measurement process to ensure that data quality is acceptable. This finally gets us to the various quality control checks, like the one point quality control check for the gaseous pollutants or the particulate matter collocated instruments. These checks help quantify a data quality indicator and their acceptance criteria are the MQOs. EPA has not changed the types of samples it uses to assess precision and bias. Although the October 18, 2006 rule has changed some of the names and some of their sampling frequencies, the basic checks are the same.

Table 1 provides a complete listing of the required measurement quality checks and the MQOs as they are currently defined in Appendix A. Although the QA criteria highlighted in blue are the responsibility of the monitoring organization, they represent federally implemented programs that are available for the Tribes if they so which to participate.

Table 1. Ambient Air Monitoring Measurement Quality Samples (Table A-2 in 40 CFR Appendix A)				
Method	**CFR Reference**	**Coverage (annual)**	**Minimum frequency**	**MQOs***
Automated Methods				
One-Point QC: for SO_2, NO_2, O_3, CO	Section 3.2.1	Each analyzer	Once every 2 weeks	**O_3** Precision 7%, Bias ± 7%. **SO_2, NO_2, CO** Precision 10% , Bias ± 10%
NPAP for SO_2, NO_2, O_3, CO	Section 2.4	20%	Once/year	10% difference each concentration
Annual performance evaluation for SO_2, NO_2, O_3, CO	Section 3.2.2	Each analyzer	Once per year	≤ 15 % for each audit concentration
Flow rate verification PM_{10},$PM_{2.5}$, $PM_{10-2.5}$	Section 3.2.3	Each sampler	Once every month	≤ 4% of standard and 5% of design value
Semi-annual flow rate audit PM_{10}, $PM_{2.5}$, $PM_{10-2.5}$	Section 3.2.4	Each sampler	Once every 6 months	≤ 4% of standard and 5% of design value
Collocated sampling $PM_{2.5}$, $PM_{10-2.5}$	Section 3.2.5	15%	Every twelve days	$PM_{2.5}$, - 10% precision $PM_{10-2.5-}$ - 15% precision
PM Performance evaluation program $PM_{2.5}$,$PM_{10-2.5}$	Section 3.2.7	1. 5 valid audits for primary QA orgs, with ≤ 5 sites 2. 8 valid audits for primary QA orgs, with > 5 sites 3. All samplers in 6 years	over all 4 quarters	$PM_{2.5}$, - ± 10% bias $PM_{10-2.5-}$ - ±15% bias
Manual Methods				
Collocated sampling PM_{10}, TSP, $PM_{10-2.5,}$ $PM_{2.5}$	3.3.1 and 3.3.5	15%	Every 12 days PSD -every 6 days	PM_{10}, TSP, $PM_{2.5}$, - 10% precision $PM_{10-2.5-}$ - 15% precision
Flow rate verification PM_{10} (low Vol),$PM_{10-2.5}$, $PM_{2.5}$	3.3.2	Each sampler	Once every month	≤ 4% of standard and 5% of design value
Flow rate verification PM_{10} (High-Vol), TSP	3.3.2	Each sampler	Once every quarter	≤ 10% of standard and 10% of design value
Semi-annual flow rate audit PM_{10} (low-Vol), TSP , $PM_{10-2.5}$, $PM_{2.5}$	3.3.3	Each sampler, all locations	Once every 6 months	≤ 4% of standard and 5% of design value
Semi-annual flow rate audit PM_{10} (High-Vol), TSP	3.3.3	Each sampler	Once every 6 months	≤ 10% of standard and 10% of design value
Manual Methods Lead	3.3.4	1. Each sampler 2. Analytical (lead strips)	1. Include with TSP 2. Each quarter	1. Same as for TSP. 2. - ± 10% bias
Performance evaluation program $PM_{2.5,}$ $PM_{10-2.5}$	3.3.7 and 3.3.8	1. 5 valid audits for primary QA orgs, with ≤ 5 sites 2. 8 valid audits for primary QA orgs, with ≥ 5 sites 3. All samplers in 6 years	Over all 4 quarters	$PM_{2.5}$, ± 10% bias $PM_{10-2.5-,}$ ±15% bias

* Some of the MQOs are found in CFR and others in the QA Handbook Vol II (Appendix 15) which is under revision during the development of this guidance document

Attachment 2

NPAP Program Adequacy/Independence Criteria

Adequacy Criteria for Annual Regional Assessment of Monitoring Organization Ability to Implement NPAP TTP

Overall Implementation

1) Audits at 20% of primary quality assurance organization's (PQAOs) sites per year with a goal to audit all sites within 5-7 years. All quarters of a PQAO's monitoring season should be equally represented.
2) 100% completeness meaning whatever it takes to get valid audits at 20% of the sites.
3) Meet definition of independence for both field and lab implementation.
4) PQAO's TTP SOPs and QAPP available, reviewed, and approved by the Region prior to implementation; then subsequently available upon request .
5) Performance of external comparability checks by (between) the EPA National NPAP TTP program and the state or local organization implementing TTP itself as the annual process to demonstrate an organization's ability to provide TTP performance audits to it own sites. The external comparability check will include:
    a) One or more sites chosen by EPA . The number of checks will be dependent on the size of the organization's network, but should be at least 1 per year for a small organization, and 2 per year for a large state organization (20 sites or more).
    b) All the gaseous pollutants that the organization proposes to audit by TTP
    c) The TTP lab audit system and auditor(s) which the monitoring organization proposes to use for audits (if an organization has more than one system and/or auditor, EPA will choose which will be audited).
    d) Acceptance criteria of a 5 percent difference per point for the gaseous pollutants Ozone, CO, and SO2 and NO2.
6) Adequate number/type of TTP generation, analytical, and support equipment and materials, including back-ups.
7) Use of the EPA NPAP Access data base and EPA TTP spreadsheets, or data collection software that provides comparable data fields and reporting units to provide the minimum number of parameters in AQS transactions that need to be entered into AQS.
8) EPA access to all of the PQAO's TTP audit data in a time frame allowing relevant and adequate audit review and analysis.
9) Ability of EPA to audit TTP activities with appropriate notification.
10) If using Federal NPAP equipment, must agree to loan stipulations described in NPAP Implementation Plan.

The NPAP TTP Field Critical Activities and Acceptance Criteria for Mobile Lab Equipment, Standards and Personnel

1. Initial personnel training through NPAP TTP sanctioned course prior to any TTP implementation
2. Annual personnel recertification, either by:
    a. Attending an annual NPAP TTP certification course,
    b. Attending a Regionally implemented certification course implemented by an EPA regional or OAQPS certified trainer,
    c. Oversight during a Regional Office technical systems audit;
3. Equipment and Standards Certification: Performing and recording annual, quarterly, and audit day QC and QA acceptance checks, and system performance assessment procedures and evaluations. These include:
    a. Acceptable quarterly checks: TTP ozone analyzer (and calibrator, in Region 2) certification against Regional SRP, ozone line loss test, visual system cleanliness, leak, and manifold excess flow range check,
    b. On-site, pre-audit checks: zero air (ultrapure cylinder vs continuous generator) check, all system component and flow path pressure and flow setting checks, ozone warm-up and acceptable performance parameter check, successful end-of-hose connection to station inlet of approved 50 or 150ft FEP Teflon hose including check for evidence of kinks, pinholes, etc,
    c. On-site audit checks: pre-audit two-point upscale CO calibration check and post-audit one-point upscale point for all blended gas audits. Analysis of complete stabilization of TTP ozone and CO generation output at every ozone and blended gas audit.
4. Independence of Audit Equipment and Standards: Use of performance audit generation, analysis, and support reference standard equipment and materials that are not used to set-up/calibrate, or check monthly performance parameters of the FRM sampler being audited. NPAP TTP analytical equipment "calibration" must also be performed with a second set of reference standards that are independent from the standards used in routine monitoring and NPAP TTP audits. This means the SLT must have at least two sets of Primary Standards.
5. NIST Traceability: Annual certification of all standards as NIST traceable using the EPA Protocol Gas certification procedures and spreadsheets- G1 or G2, as appropriate. Documentation sent to OAQPS.
6. Maintenance Contamination Control: Quarterly monitor inspection and cleaning. NPAP TTP equipment must be clean. Flow path system disconnection should be avoided, but whenever necessary, very clean caps of the correct size and EPA acceptable material must be available and used on all potential openings carefully, ensuring that the seal is complete, and air tight.
7. Annual multi-point audit instrument verification and /or calibration at the independent certification laboratory**.**
9. Archive paper and/or electronic media copies of TTP lab certification comparisons, audit results and supporting documentation for as long as it takes all sites in the monitoring network to be audited, during which time they may be audited, and then disposed of as EPA decides.
10. Adopts AQS format for reporting NPAP-like QA data to appropriate fields
11. Monitoring Organization or National Program (OAQPS) loads data into AQS within AQS's schedule.
12. Monitoring Organization or National Program submits annual report of results to EPA in EPA specified format specified.

Critical Acceptance Criteria and Activities for Independent Certification Laboratories

A certification laboratory is required to ensure that the TTP mobile laboratory delivery system and standards produce audits of adequate quality. The laboratory's function is to test or check the TTP delivery systems and standards at a minimum annually.

1. Initial and subsequent training of certification lab personnel through Federal NPAP-TTP sanctioned course prior to certification lab implementation
2. Certification lab, certification lab personnel, and standards independent of laboratory performing routine monitoring support.
3. Certification lab meets CFR-required temperature conditions for ambient air monitoring operation comparison activities.
4. Certification lab flow path interior surfaces and components in general, must comply with 40 CFR requirements for materials used that come in contact with reactive gases, including ozone, NO, NO2, and SO2.
5. Certification Lab must meet NPAP TTP Lab QC and QA acceptance activities and criteria as described in NPAP TTP SOPs and, for each comparison, include:
    a. Successful visual inspection of the entire flow path of the TTP generation and verification system, including the manifold delivery system;
    b. The certification labs analyzers and standards must meet the acceptance criteria in the TTP SOPs
    c. The pre-certification zero air response of the certification laboratory's CO analyzer should be no greater than ± 0.1 ppm.
    d. Excess manifold flow of 0.3-0.4 LPM (on rotameter or equivalent)
    e. Output of delivery hose above but near ambient pressure; attach to outside /external inlet; upon connection to certification lab inlet, vent line end pressure should not be negative, but at least slightly positive.
    f. If using a TECO 49C-PS, determine, for initial analyzer performance check, the absolute value of both channels, not just the ratio. The difference of the absolute photon count of the 2 channels should not be much greater than 200.
    g. For blended gas certification comparisons configuration control must include the use of 316 stainless steel, preferably 1/8"OD, and not FEP Teflon.
    h. TTP blended gas certification comparisons for NO2 must provide for a converter efficiency check. This enables determination of compliance with the CFR's requirement for minimum acceptable CE (>95%).
6. Quarterly quality control/assurance activities and acceptance criteria for ozone standard analyzers
    a. Primary ozone standard analyzer should be certified against the/a Regional NIST Standard Reference Photometer in any quarter of the year in which TTP ozone (and/or NO2) audits are planned. Acceptable results are a difference in slope of < 3%, and in the intercept of < 3 ppb.
    b. Standard certification data, is added by the TTP certification comparison operator into the EPA TTP Gaseous Audit EXCEL workbook (or equivalent certification comparison documentation system).
7. Annual Quality Control /Assurance TTP System Standard Certification Laboratory Requirement
    a. NIST Traceability: Annual certification of all standards as NIST traceable, using the EPA Protocol Gas certification procedures and spreadsheets- G1 or G2, as appropriate . Documentation sent to OAQPS.

Note: Related attachment from NPAP TTP Implementation Plan,

Monitoring Organization Use of National NPAP Equipment (Excerpt from NPAP Implementation Plan)

6.1.2.4 Monitoring Organization Use of Equipment -

There are many individual circumstances associated with the TTP in each Region. These circumstances are based on many different factors and variables that are specific to the particular Region, state, or local agency. As a result, specifics of a loan arrangement will have to be worked out between each Region and state or local monitoring agency. EPA in RTP will not be able to identify one loan requirement procedure that will accommodate each agency's needs and priorities for doing NPAP TTP audits. However because the logistics and timing are critical for the federally implemented program, as well as any other potential users, it is important that formal agreements on the use of the equipment are in place that will cover the majority of issues that may arise with the loaning of equipment.

The main considerations for lending one of the current 6 Regional mobile NPAP TTP laboratories to a state or local ambient air monitoring organization are:

1) The arrangement must allow the federally implemented NPAP schedule to take priority
2) The equipment must be returned in the same condition in which it was received
3) To minimize damage during transport, avoid taking equipment out of the mobile labs. If equipment must be taken out of a mobile lab, which EPA should pre-approve, do not use ground or air commercial freight shipping; arrange safe and equipment protective transport between Regional and state or local transport vehicles and personnel; for case-based versions, use the cases.
4) If a borrowing organization damages a part or all of the mobile lab, they must replace the lab or damaged item, and notify the Region and the next state or local agency in line to use the mobile lab immediately.
5) If a borrowing organization uses a critical material, such as zero air scrubbing ingredients or one of the required compressed gas standard cylinder, to a point at or below the level EPA considers necessary for use by the next organization, the borrowing organization must contribute to the replacement of the item. The borrowing organization must notify the Region and the next state or local agency in line to use the mobile lab. EPA will be responsible for the review and acceptance of audit gas standards prior to transfer to the next user organization. Negotiations for the sharing of the costs for consumables can take place at the beginning of the grant season so that equitable cost contributions among lenders can occur. Note: There should be no use in the field below 400 psig, to allow for post-audit checking of the remainder, for all of the criteria pollutant gases contained. To use in the field, the cylinder needs to contain 400 psig, plus an excess over 400 of the amount estimated by EPA to be needed by the next using organization
6) Sufficient resources must be available to the monitoring organization to provide any replacements that become necessary; a documented statement must be provided to that effect from the agency before a loan is allowed.
7) The personnel provided by the organization to operate the lab must be trained and certified through the EPA training course described in Section 9 of the TTP Implementation Plan.
8) To use an EPA trailer, before being provided with the trailer,. The proposing organization

must demonstrate that they have the proper tow vehicle, hitch, anti–sway apparatus, and personnel with the necessary tow vehicle–trailer training and experience. These details are addressed in a document already on AMTIC at the NPAP website.

9) Procedures for identifying responsibility should be developed and implemented. For example, before receiving and before returning of a TTP mobile lab trailer, the borrower and receiver, respectively, should arrange to pull the trailer, and operate the TTP equipment inside, before turning over to the next organization. As soon as one pulls the trailer, obvious problems can be perceived. So the test that will show problems should be completed before turnover of responsibility, for the benefit of giver and receiver. A form should be developed and provided, similar to the form used for car rentals, documenting the acceptance of the transferred inventory and responsibility of the receiving organization personnel, and specifically addressing the issue of self insurance, and acceptance of responsibility for the costs of damage or destruction.

Attachment 3

PEP Program Adequacy and Independence Criteria: Monitoring Rule Requirements and Supplemental Guidance

PEP Program Adequacy and Independence Criteria: Monitoring Rule Requirements and Supplemental Guidance

Glossary (taken from the Current Field and Laboratory Operating Procedures)

AQS	Air Quality System (EPA data base for ambient monitoring data)
COC	Chain of Custody form
COR	For EPA, the Contracting Officer's Representative on a given contract; he or she could be a Work Assignment Manager (WAM), Task Order Delivery Officer (TOPO), or Delivery Order Project Officer (DOPO)
ESAT	Environmental Services Assistance Team
FS	A field scientist is a person certified by the U.S. Environmental Protection Agency (EPA) as completing a required training program as being capable and responsible for conducting FRM PEs. That person would have a 2-or 4- year college degree in a physical or life science or scientific instrumentation or have equivalent training or work experience.
FRM	Federal Reference Method
NIST	National Institute of Standards and Technology
OAQPS	Office of Air Quality Planning and Standards
PEP	PM2.5 Federal Reference Method *Performance Evaluation Program*
PQAO	Primary Quality Assurance Organization
QAPP	Quality Assurance Project Plan
SOP	Standard Operating Procedures
SLT	State, local or Tribal (refers to environmental agencies and in particular those that conduct ambient air monitoring and related quality assurance activities

Overview of Monitoring Rule Requirements

- Monitoring plans or the QAPP shall provide for the implementation of a program of independent and adequate audits of all monitors providing data for SLAMS and PSD including provisions of adequate resources for such audit programs. (40 CFR 58 Appendix A section 2.4). Starting January 1, 2009, this requirement also applies to SPM monitors using FRM, FEM, or ARM methods which also meet the requirements of Appendix E of 40 CFR 58, unless alternative QA procedures are approved by the Regional Administrator. (Appendix A, section 1; 40 CFR 58.20; and 40 CFR 58.11(a)(2)) EPA interprets this requirement to apply only to SLAMS, PSD, and SPM monitors that measure NAAQS pollutants.)
- Primary quality assurance organizations with 5 or fewer $PM_{2.5}$ monitoring sites are required to have 5 valid independent audits per year; primary quality assurance organizations with greater than 5 sites are required to have 8 valid audits per year. Each method designations must be evaluated each year, within the required 5 or 8 audits. (40 CFR part 58 Appendix A section 3.2.7)
- The regulation requires100 percent completeness (meaning whatever it takes to get 5 or 8 valid samples).
- All FRM samplers at within each SLAMS network will be subject to a PEP audit within 6 years.

Guidance – General

- The general requirement for a program of independent and adequate audits means that any SLT implementing a PEP program must provide for independence and adequacy for both field and lab implementation elements of the $PM_{2.5}$ PEP program.
- QAPP and SOPs for implementation will be reviewed and approved by Region.
- SLT PEPs should have an adequate number of audit samplers, including back-ups.
- If equipment is borrowed from the Regional PEP program there must be some formal agreement that the SLT agency will repair or replace damaged equipment in a timely manner.
- While the old and revised monitoring rules are silent on the scheduling of the required audits, the 1998 PEP Implementing Guidance, the1999 PEP QAPP and the "Redbook" both refer to quarterly audits, which we still believe is the achievable best practice. When there were many more audits to complete, the schedules sometimes were strained and audits may have fallen a week or two into following quarters. With the number of audits shrinking and the number of organizations, upon which PEP numbers are determined, the new PQAOs, are shrinking, the scheduling should be more manageable.
- The implementation of the PEP program by SLTs necessarily requires a new QA function by EPA. The EPA, via contractor support, will compile a nationwide PEP QA summary report annually for three years. The frequency will be re-evaluated at that time.

Guidance on Independence of the SLT PEP Program

40 CRF part 58 Appendix Section 2.2 states "The monitoring organization must provide for a quality assurance management function -- that aspect of the overall management system of the organization that determines and implements the quality policy defined in a monitoring organization's QMP…The quality assurance management function must have sufficient technical expertise and management authority to conduct independent oversight and assure the implementation of the organization's quality system relative to the ambient air quality monitoring program and should be organizationally independent of environmental data generation activities." (EPA has a good example of a QMP for OAQPS http://www.epa.gov/oar/oaqps/qa/qmp.pdf. In the preamble to the October 17, 2006 Federal Register that promulgated the recent revisions of the aforementioned monitoring regulations, EPA explained that "An independent organization could be another unit of the same agency that is sufficiently separated in terms of organizational reporting and which can provide for independent filter weighing and performance evaluation auditing." In the PEP QAPP and implementing guidance EPA elaborates "An organization can conduct the Performance Evaluation Program (PEP) if it can meet the above definition and has a management/supervision structure that, at a minimum, will allow for the separation of its routine sampling personnel from its auditing personnel by two levels of management. In addition, the pre and post sample weighing of audit filters must be performed by separate laboratory facility using separate laboratory equipment. Field and laboratory personnel would be required to meet the PEP field and laboratory training and certification requirements. The State and local organizations are also asked to consider participating in the centralized field and laboratory standards certification process.

Guidance on Adequacy of the SLT PEP Program

PEP Field Operations -- Critical Steps and Activities

The current PEP Field SOP September 2006, contains all the following requirements, except for new regulatory frequency specifications for PEP audits and activities associated with collocation and alternate recertification requirements for SLT PEP Field Scientists specified in Element 17 below. The recertification and collocation exceptions, to the extent that they are applicable to the federally implemented PEP, will be implemented in 2007 by Quality Assurance Bulletin. The SOP will be revised accordingly during its standard revision process in 2007.

1. Initial training and certification of audit personnel through EPA's federally-implemented PEP Field scientist course prior to implementation.

   The PEP is the "Gold Standard" for network bias (and relative accuracy on a local basis); therefore, uniform and consistent implementation remains a primary objective. Operator and sampler performance are held to high standards. Comprehensive record keeping, the quality control of the filter exposure and handling, and careful data validation are critical activities. EPA will provide the initial training in a timely manner for every State that needs to get certified to take their program. We will tailor the course to the specific roles that the States are assuming—field operations, gravimetric lab operations, or both. The course may be as much a forum for a given agency to fine tune their PEP QAPPs as it is for training. SLT Field Lab Scientist may also attend EPA national training and recertification courses.

2. Annual recertification of audit personnel either by
   a. Attending an annual PEP certification or recertification course,
   b. Attending a Regionally implemented recertification course conducted by a certified, EPA regional or OAQPS trainer,
   c. Local Recertification conducted by an independent organizations certified by OAQPS; see alternative during collocation events—element 17 below.
3. Existence of a back-up sampler, for the circumstance of having a sampler failure near the end of a quarter or year; which would otherwise jeopardize completeness (5 or 8 valid audits with at least one in each quarter). These may be made available from the federally run PEP program.
4. Performance leak check, pressure, temperature, time and flow rate check at every audit. Data recorded and available upon request.
5. Generation of 1 field blank every event.
6. Generation of trip blanks for at least one-half of the Field Blanks, i.e., 3 for the SLTs that conduct five PEP events and 4 for those that conduct 8 PEP events. The trip blank would be valid only if it is associated with a valid PEP audit.
7. PEP sampler should be positioned horizontally within 1-4 meters (2-4 m from any high volume samplers) and 1 meter vertically, of primary sampler's (monitor's) inlet.

8. Use of pre-weighed filters within 30 days of stable pre-PEP-event tare weight.
9. 48-hour sample retrieval from sampling end date/time. See Current SOP for exceptions.
10. Use of filter caps and antistatic bags.
11. Sample placed on cold packs (ice substitute) upon retrieval and maintained at 4^{o}C.

    The October 17, 2006 regulatory changes Part 50 Appendix L section 8.36 actually states routine FRM filter samples are to be shipped at temperatures no greater than experienced during sampling and weighed within 10 days except that 30 days for post sampling conditioning and weighing be allowed if the routine sample should is shipped on cold packs.. That is the only way a sample can remain below the ambient monitoring temperature it must be cold-packed. Again since the PEP is the "Gold Standard' we should retain the more stringent quality control measures.
12. The sample should be transported/shipped to the gravimetric service lab at 4^{o}C with an accompanying max/min thermometer.

    EPA will provide "max-min" thermometers if the SLT agencies do not have them. If they use our Federal Lab it will be automatic.
13. The exposed filter shipment and delivery goal is to recover it within 8 hours of the end of the sampling event, get it cold-packed and shipped the same day via Fedex or other service, delivery to gravimetric service laboratory with next day "morning" delivery, unless the sample is collected on Friday, which requires refrigerated storage over the week-end at 4^{o}C and shipment with 24 hour delivery on the following Monday. A more rapid delivery is always acceptable. .
14. SLT-operated PEPs will implement a chain of custody protocol and require completed field data sheets for each PEP event. Chain of Custody Forms (COCs) and Field Data Sheets (FDSs) and all QA/QC data should be filed and made available upon request. As a general rules PEP files should be held for 4 years plus the current calendar year in order to address any FRM data-driven decision appeals. EPA will furnish COCs and FDSs to those agencies that utilize the Federal PEP lab service. Electronic files will be available upon request and are encouraged for the sake of consistency in reporting.
15. Audit samplers must be inspected and cleaned on a quarterly basis or more frequently if necessary—PEP equipment must be pristine.
16. If the PEP sampler is something other than a BGI PQ200, a multi-point verification and /or calibration for all parameters (pressure, temperature, flow) using a NIST traceable standard that is independent from the routine operational verification standard, is required annually**,**. The PQ200 requires multipoint only for temperature.
17. In 2007 the EPA-implemented PEP will consolidate several QA activities called for in the original PEP Implementation Plan and QAPP: Periodic Sampling events using collocated PEP Samplers; Technical Systems Audits of PEP field scientists; and to accommodate SLT PEP programs which may be limited by travel budgets or policies of their agencies, an annual, on-site recertification for SLT Field Scientists during a collocation event.

    A. Quarterly collocations which are required to identify issues among the PEP samplers will be reduced to semi-annual collocation of all audit instruments at one site. The past seven years of PEP collocation data indicates that semi-annual collocations along with routine verification of operating parameters should adequately identify calibration drift and sampler malfunctions. (Federally run PEPs will be called upon to run a collocation in the

first calendar quarter to compare the new BGI "very sharp cut cyclone" with the WINS impactor as a $PM_{2.5}$ separator.)

B. The QAPP will be revised to require one technical systems audit of the field scientist and a recertification through a training course or real-time review of field operating procedures.

Two times per year, one of which would presumably be in December, SLT PEP programs will bring their instruments to a location at which the EPA Regional ESAT contractor is collocating and inspecting their PEP audit samplers. Details would be worked out through the EPA Regional Office, but the two events would accomplish the following:

- In one event an EPA Regional representative, presumably an ESAT COR or QA official will conduct a review of the ESAT Contractor's field operations procedures concurrent with the collocation. This will satisfy the Second required audit in the federally implemented PEP QAPP.
- The Regional ESAT Contractor, if holding a current PEP field scientist certification, is qualified to coordinate the collocation sampling event and also conduct a review of the SLT PEP Field procedures and sample handling. If the Regional PEP COR or QA official is present, the review would qualify as a recertification of the SLT field scientist(s). The EPA Regional PEP COR or QA official will be present for at least one of these collocation events, and observe the operational procedures, as part of the Region's responsibility, according to the QAPP to audit PEP activities in the Region.
- The EPA Regional ESAT PEP field scientists and SLT PEP field scientists (if operating in that Region) will conduct a multi-day collocated sampling event. If the SLT employees cannot stay for the entire collocation event, the ESAT contractors could complete the sampling event (with the SLT's written concurrence) and ship the SLT samplers back home, using SLT shipping accounts.
- Either prior to or in conjunction with **one** of the semiannual collocations, the EPA Regional COR will specify that paperwork for at least one quarter of PEP activity, be submitted by both the PEP contractor and the SLT PEP programs, for a TSA review. Review of this material along with observing the field operations associated with the collocation will satisfy the annual TSA requirement for either the ESAT-run or SLT PEP program.
- The TSA and evaluation forms will be reported to OAQPS for compiling in a national oversight record. OAQPS will compile an annual summary and include the summaries in a detailed Triennial PEP QA Report. These forms are already in the QAPP.

PEP Laboratory (Lab) -- Critical Steps and Activities

1. The PEP Lab's QAPP and SOPs should be available, reviewed and approved prior to implementation; then subsequently available upon request.
2. Initial training through Federal PEP sanctioned course prior to implementation.
    a. Substantial differences in the theoretically could exist between FRM gravimetric lab procedures and the Federally run PEP, due to the QA/QC requirements in the

PEP LAB SOP, the data validation procedures, and posting to AQS. EPA will require PEP labs to retain the same levels of QA/QC.

3. The PEP Lab must be independent of the SLT's laboratory performing routine FRM sample weighing for the sampler(s) being audited.
4. The PEP Lab and analyst will be audited annually by the EPA Region or OAQPS; recertification of lab technicians is part of the process.
5. The PEP Lab must meet the Temperature/Humidity control conditions for a 24-hr period in order to allow weighing of samples.
6. All PEP Labs must meet QC requirements as described in PEP lab SOPs and include
   a. Lab Blanks 10% or 1 per weighing session
   b. Duplicate Filter weighing 1 per weighing session
   c. Balance check beginning and end of weighing session
   d. Previous session's duplicate at end of each weigh session. +/- 15 ug
7. Every balance used for PEP gravimetric analyses must internally audited annually against an NIST certified set of standards that are independent from the routine operating standards. An annual recalibration will satisfy this requirement if it is conducted by an independent party and the results before and after recertification are documented.
8. Reference Standards will be checked or certified as follows:
   a. Working mass standard check against primary on a quarterly and monthly basis
   b. Primary standards and working standards certified annually as NIST traceable. Documentation sent to OAQPS
   c. Lab temp and humidity standards certified annually as NIST traceable. Documentation sent to OAQPS
9. The PEP Field and Lab SOPs discuss the time requirements for weighing exposed filters. Generally, weighing is expected within 10 days from filter exposure end date/time, see the discussion in the September 2006 field SOP which will be incorporated into the Lab SOP revisions in 2007.
10. Filters must be equilibrated minimum of 24 hours for pre **and** post weighing
11. The PEP Lab will employ filter equilibration blanks
    a. Lot blanks used to determine general equilibration time
    b. Lot exposure blanks – used to establish equilibrium of a specific batch of filters.
12. The PEP Lab will initiate and complete chain of custody (COC) procedures. COCs and Field Data Sheets should be recorded and stored and made available upon request according to the schedule laid out in the Field and Lab SOPs,
13. The PEP lab will archive filters for current year plus last calendar year in cold storage and 3 preceding years at ambient.
14. The PEP Lab will follow AQS format for reporting QA data to appropriate fields in AQS
15. The PEP Lab will load data into AQS within AQS's schedule—every 90 days, which is no later than deadline for SLT/PQAO submission of the PM2.5 FRM data obtained in the same quarter as the audit.

16. The PEP Lab will participate in an annual gravimetric round-robin performance evaluation administered by EPA's Office of Radiation and Indoor Air-National Air and Radiation Environmental Laboratory, in Montgomery, Alabama.
17. The PEP Lab (or in the case of an SLT PEP program it might be the client PQAO) submits annual report of results to EPA in format specified by EPA.

Attachment 4

PM2.5 Performance Evaluation Program (PEP) & National Performance Audit Program (NPAP) Primary Quality Assurance Organization Implementation Decision Form for Tribal Monitoring Organizations -Calendar Year 2008

PM2.5 Performance Evaluation Program (PEP) & National Performance Audit Program (NPAP) Primary Quality Assurance Organization Implementation Decision Form for Tribal Monitoring Organizations -Calendar Year 2008

The goal of this form is to provide EPA information on those Tribes that wish or are required to participate in the National Performance Audit Program (NPAP) or the $PM_{2.5}$ Performance Evaluation Program (PEP) and how the Tribe plans on implementing the programs.

The 40 CFR Part 58 Appendix A QA requirements are specific to data that are collected for comparison to the National Ambient Air Quality Standards (NAAQS). Tribes monitoring for NAAQS comparison purposes must follow these requirements, including participation in the NPAP and PEP programs. Tribes monitoring for other purpose are strongly encouraged to participate in these two programs but it is not a requirement. The following form will be used to determine:

1. Whether it plans on consolidating or forming a primary quality assurance organization (PQAO) with another entity (Tribe, State or Local monitoring organization),
2. Whether it would like to participate in the National Performance Audit Program (NPAP) and /or the Performance Evaluation Program (PEP), and
3. If it plans on participating in the PEP or NPAP, does it plan on requesting federal implementation or does the Tribe plan to implement these programs itself?

As described in the document titled: *Options Available for Tribes to Meet Independent Performance Evaluation Requirements for the Ambient Air Monitoring Programs Collecting Data for Comparison to the NAAQS*, the Tribes could potentially be aggregated to a smaller number of PQAOs and save the monitoring organization resources by reducing the number of collocated PM monitoring, the number of PEP audits and to some extent, the number NPAP audits. The definition of PQAO as written in 40 CFR Part 58 Appendix A is provided below.

> 3.1.1 Each primary quality assurance organization shall be defined such that measurement uncertainty among all stations in the organization can be expected to be reasonably homogeneous, as a result of common factors. Common factors that should be considered by monitoring organizations in defining primary quality assurance organizations include:
>
> (a) Operation by a common team of field operators according to a common set of procedures;
> (b) Use of a common quality assurance project plan (QAPP) or standard operating procedures (SOPs);
> (c) Common calibration facilities and standards;
> (d) Oversight by a common quality assurance organization; and
> (e) Support by a common management, laboratory or headquarters.

The requirement does not intend that all 5 factors have to be fulfilled but that these factors are considered. However, common procedures and a common QAPP and SOPs should be strongly considered as key to making decisions to consolidate. Therefore, if Tribes plan to consolidate, the form will ask whether the consolidated entities will be using the same or similar QAPP and SOPs. It must be noted that this consolidation is for QA purpose only and would not have any other political or technical implications. The tribal agency codes and the reporting organization codes in AQS would remain unique to each Tribe so the Tribe would remain as sovereign entities no matter which consolidation technique was used.

The form will then ask specific questions that will determine whether the Tribe will attempt to implement the NPAP or PEP program itself or request federal implementation of these programs which would require a redirection of State and Tribal Assistance Grant (STAG) funds to EPA for implementation.

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Tribal Organization:	

Primary Quality Assurance Organization #	TT or State #	Tribal Code or State Abbreviation	EPA Region

Tribes Primary Quality Assurance Organization Responsible Official:	

Do you currently have an approved quality management plan (QMP)?	(Y or N)
Do you currently have an approved quality assurance project plan QAPP?	(Y or N)

Do you plan on consolidating with another PQAO ?	(Y or N)

If the answer is yes to the question above answer the questions below in gray. If the answer is no, the questions in gray can be skipped.

List the other organizations that will consolidate to one PQAO.	
PQAO Name:	PQAO #
PQAO Name:	PQAO #

If consolidating PQAOs will you be using the same or similar QAPPs?	(Y or N)
If consolidating PQAOs will you be using the same or similar SOPs?	(Y or N)

Number of $PM_{2.5}$ SLAMS Sites		Number of Gaseous SLAMS Sites	

PEP Question	(Y or N)	NPAP Question	(Y or N)
Are you interested in PEP Audits		Are you interested in NPAP Audits	
Do you plan to implement[1] an adequate/independent the PM2.5 PEP in 2008? [2]		Do you plan to implement[1] an adequate/independent NPAP in 2008?[2]	
Are you requesting Federal Implementation of PEP?		Are you requesting Federal implementation of NPAP?	

[1] This means the reporting organization could implement their own adequate/independent program or participate in some other State or Local or consortium run adequate/independent program.

[2] Regions must approve capability by Dec, 2007