UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
RESEARCH TRIANGLE PARK, NC 27711

OFFICE OF
AIR QUALITY PLANNING
AND STANDARDS

August 7, 2020

MEMORANDUM

SUBJECT: National Performance Audit Program, $PM_{2.5}$, $PM_{10-2.5}$, and Lead Performance Evaluation Program Implementation Decision Memorandum for Calendar Year 2021

FROM: Richard A. Wayland, Divison Director
Air Quality Assessment Division

TO: Air Division Directors

This is notification to the Air Division Directors concerning the implementation of the $PM_{2.5}$ Performance Evaluation Program ($PM_{2.5}$-PEP), the $PM_{10-2.5}$ Performance Evaluation Program ($PM_{10-2.5}$-PEP, the Lead Performance Evaluation Program (Pb-PEP) and the National Performance Audit Program (NPAP). This memorandum is our annual follow-up to provide monitoring organizations time to make an informed decision whether to implement these performance evaluations or to approve a redirection of a State and Tribal Assistance Grant (STAG) to the U.S. Environmental Protection Agency (EPA). If redirection is chosen, the EPA will implement these audit activities as associated program support.

There are two options for satisfying this requirement: self-implementation of adequate and independent audits or EPA implementation of $PM_{2.5}$-PEP, $PM_{10-2.5}$-PEP, Pb-PEP and/or NPAP using STAG grant funds. We request that each monitoring organization under your jurisdiction decide by September 18, 2020, for the following calendar year (CY) 2021 implementation:

- whether they will implement the $PM_{2.5}$-PEP themselves,
- whether they will implement the Pb-PEP themselves, and
- whether they will implement the NPAP themselves.

A "no" to any answer will indicate that the monitoring organization, for CY 2021, approves the redirection of fiscal year (FY) 2021 STAG funds to the EPA for federal implementation for the program marked "no."

Details of the independence and adequacy requirements for these programs are found in guidance documents on the Ambient Monitoring Technical Information Center (AMTIC)[1]. An agency will need to demonstrate compliance with these requirements in order to be approved for self-implementation. Attachment 1 provides the highlights of this guidance and estimates of annual costs broken down by Region and Program. Note the NPAP is comprised of the NPAP audit and an annual performance evaluation, which are two distinct programs in the ambient air quality assurance regulations (40 CFR Part 58 Appendix A). One type of audit cannot be substituted for the other.

[1] See specific links for $PM_{2.5}$-PEP, $PM_{10-2.5}$-PEP, Pb-PEP and NPAP at https://www.epa.gov/ttn/amtic/npepqa.html

Although the quality assurance (QA) requirements for $PM_{10-2.5}$ were removed from Appendix A in 2016, EPA believes a limited number of $PM_{10-2.5}$-PEP sampling events at NCore sites each year will be useful for future assessments of data uncertainty. Consequently, each EPA region will be tasked to perform one $PM_{10-2.5}$ PEP sampling event per year, at one of the NCore sites in their Region that are visited for a $PM_{2.5}$ PEP audit. Since the $PM_{10-2.5}$-PEP audit can also count for a $PM_{2.5}$-PEP audit, many of the implementation expenses can be shared; therefore, the cost of the $PM_{10-2.5}$-PEP audit is reduced (see Table 1). Each monitoring organization that chooses to self-implement their $PM_{2.5}$ PEP, and coincidently has a NCore site in their Primary Quality Assurance Organization, shall follow the same convention, which means they should perform one $PM_{10-2.5}$-PEP audit within a calendar year.

Attachment 2 provides the information we would like to obtain from each monitoring organization.

- PQAOs in your Region that confirm their site and sampler counts will not change in CY 2021 need not complete Attachment 2, but please include a list of the those static PQAO networks in your responding email.
- PQAOs in your Region that have experienced or expect a long-term change (irrespective of the pandemic) should fill out Attachment 2 and return to your regional monitoring staff.

This year, I am asking that Regions quality assure, by September 30, 2020, the data that state/local/tribal (SLT) organizations submit in Attachment 2. We will continue to utilize these responses to enable the PEP and NPAP to plan and implement audits and expedite resulting QA data for the annual data certification process.

NOTE: As part of the grant allocation process, the Office of Air Quality Planning and Standards (OAQPS) will propose that 2021 STAG funds be redirected to OAQPS for all monitoring organizations that did not self-implement the PEP or NPAP programs in CY 2020. This includes those organizations who, by September 18, 2020, declare their intent to perform the work in CY 2021. If those monitoring organizations demonstrate their capability to implement the $PM_{2.5}$-PEP, Pb-PEP and NPAP to the EPA Region by October 1, 2020, the redirected funds will be distributed back to the monitoring organization. This process will ensure that the PEP and NPAP programs will be federally implemented for those organizations planning on implementing the PEP and NPAP but, for some reason, have encountered implementation delays.

If you have any questions on the PEP or NPAP programs, please contact Dennis Crumpler, PM-PEP and Pb-PEP coordinator (919) 541-0871, or Greg Noah, NPAP coordinator (919) 541-2771.

Attachments (2)

Attachment 1

Background

The $PM_{2.5}$-PEP, Pb-PEP and NPAP are performance evaluations, which are a type of audit where quantitative data are collected independently in order to evaluate the proficiency of an analyst, monitoring instrument or laboratory. The programs:

- Allow one to determine data comparability and usability across sites, networks, 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;
- Verify the precision and bias estimates reported by the monitoring organizations;
- Assure the public of non-biased assessments of data quality;
- Provide a quantitative mechanism for the EPA to defend the quality of data; and
- 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.

$PM_{2.5}$-PEP Definitions of Adequate and Independent

$PM_{2.5}$-PEP definitions of adequate and independent, and the consequential implementation requirements, have been previously provided in a memorandum sent to the Regional Air Program Managers for Ambient Monitoring and Air Monitoring Quality Assurance Contacts. The attachment provided detailed guidance for determining the independence and adequacy of monitoring organization programs proposing to assume their $PM_{2.5}$-PEP responsibilities and can be found on AMTIC at http://www.epa.gov/ttn/amtic/pmpep.html (posted 7/25/08). The following major elements are summarized below.

Adequate - Adequate for the $PM_{2.5}$-PEP is described in 40 CFR Part 58 Appendix A Section 2.4.

Primary quality assurance organizations (PQAO) with 5 or less $PM_{2.5}$ monitoring sites are required to have 5 valid audits per year distributed across the 4 quarters; PQAOs with more than 5 sites would be required to have 8 valid audits per year distributed across the 4 quarters. The EPA requires:

- One hundred (100) percent completeness (meaning whatever it takes to get 5 or 8 valid samples). See discussion on "Valid Samples" below.
- All samplers subject to an audit within 6 years.

Independent - The following definition comes directly from the 1998 PEP Implementation Plan found on AMTIC at http://www.epa.gov/ttn/amtic/pmpep.html.

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 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. In addition, the pre- and post-sample weighing of audit filters must be performed by a 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 participating auditing organizations are also required to participate in the centralized field and laboratory standards certification process to ensure comparability to federally implemented programs and ease of data entry into AQS.*

Comparable - 40 CFR Part 58 Appendix A Section 3.2.4 states that the monitoring organizations are responsible for performing the evaluations *"...under the PEP or a comparable program."* We interpret this to mean that any PEP program that is assumed by a state, local or tribal (STL) monitoring organization will be run similarly to the federal PEP, as set out in the attachment, and will periodically be subject to performance evaluations with the federal PEP conducted within its respective EPA Region.

PM $_{10-2.5}$-PEP Definitions of Adequate and Independent

Adequate a Monitoring agency that self-implements the $PM_{2.5}$-PEP will also perform one valid–$PM_{10-2.5}$-PEP sampling event each year at a NCore site within its PQAO. The $PM_{10-2.5}$-PEP sampling event will also provide a $PM_{2.5}$ measurement, which can supply one of the values for the PQAO's $PM_{2.5}$ PEP requirement.

Independent - The following definition comes directly from the 1998 PEP Implementation Plan, found on AMTIC at http://www.epa.gov/ttn/amtic/pmpep.html.

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 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. In addition, the pre- and post-sample weighing of audit filters must be performed by a 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 participating auditing organizations are also required to participate in the centralized field and laboratory standards certification process to ensure comparability to federally implemented programs and ease of data entry into AQS.*

Comparable - 40 CFR Part 58 Appendix A Section 3.2.4 states that the monitoring organizations are responsible for performing the evaluations *"...under the NPEP... or a comparable program."* We interpret this to mean that any PEP program that is assumed by a state, local or tribal monitoring organization will be run similarly to the federal PEP, as set

out in the attachment, and will periodically be subject to performance evaluations with the federal PEP conducted within its respective EPA Region.

Valid Audits

The improvement in air quality over the last 8 years has increased the incidence of daily measured concentrations of $PM_{10-2.5}$ and $PM_{2.5}$ that are equal to or less than the minimums to be considered valid for the purpose of bias assessments. Monitoring agencies may assume that they will not have to acquire more than 1 make up sample for the $PM_{2.5}$ -PEP and one for each part of the Pb -PEP (independent and collocated). Make-up of $PM_{10-2.5}$-PEP events per se will not be necessary however the $PM_{2.5}$ measurement will be subject to the one make-up event criteria. EPA is developing a policy and procedure which may completely obviate the need for make-up of measurements that are not valid solely because of the concentration cut-off. Self-implementing agencies will be informed if the policy is adopted prior to the 2020 calendar year.

Pb-PEP Definitions of Adequate and Independent

Pb-PEP definitions of adequate and independent are very similar to the $PM_{2.5}$-PEP. The following major elements have not changed and are summarized below.

Adequate - Each year, one performance evaluation audit, as described in Section 3.4.7 of this appendix, must be performed at one Total Suspended Particulate (TSP) Pb or PM_{10} Pb site in each PQAO that has less than or equal to five sites, and two audits at PQAO with greater than five sites. In addition, each year, PQAO with less than or equal to five sites shall provide four samples from its collocated (precision) site(s) and PQAO with greater than five sites shall provide six samples from its collocated sites, all of which must be sent to the same laboratory for analysis as the (independent) performance evaluation audit. Low volume PM_{10} Pb-PEP was developed based on Pb-monitoring at non-source NCore sites. In 2016, the requirement for Pb monitoring at non-source NCore sites was removed and therefore low volume PM_{10} Pb-PEP will no longer be implemented on a national level. However, any state, local or tribal organization that sets-up a low volume PM_{10} Pb site (apart from NCore) from which an ambient Pb design value may be determined, must include that site into the 6-year rotation with high volume TSP Pb sites. The EPA requires:

- One hundred (100) percent completeness (meaning whatever it takes to get 5 or 8 valid samples). Again, see the discussion on "Valid Samples" below.
- All samplers subject to an audit within 6 years.

More details on the criteria are found in the Pb-PEP Implementation Plan[2] and in the latest version of the Independence Criteria and Adequacy Guidance (August 2020).[3]

Independent - The following definition comes directly from the 2009 Pb-PEP Implementation Plan, found on AMTIC.

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[2] http://www.epa.gov/ttn/amtic/pbpep.html
[3] http://www.epa.gov/ttn/amtic/npepqa.html

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 Pb-PEP if it can meet this 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 below. In addition, the sample analysis of audit filters must be performed by a separate laboratory facility using separate laboratory equipment. Field and laboratory personnel would be required to meet the Pb-PEP audit field and laboratory training and certification requirements. The monitoring organizations will be required to participate in the centralized field and laboratory standards certification and comparison processes to ensure comparability to federally implemented programs and ease of data entry into AQS.*

Comparable - 40 CFR Part 58 Appendix A Section 3.4.7 states that the monitoring organizations are responsible for performing the evaluations *"...under the NPEP... or a comparable program."* We interpret this to mean that any Pb-PEP program that is assumed by a state, local or tribal monitoring organization will be run similarly to the federal Pb-PEP, as set out in the attachment, and will periodically be subject to performance evaluations with the federal Pb-PEP conducted within its respective EPA Region.

NPAP Definitions of Adequate and Independent

Adequate - The following is a definition of adequate for NPAP program implementation as promulgated in 40 CFR part 58 Appendix A Section 3.1.3 and as detailed in this and other posted NPAP implementation guidance documents:

- Performing audits of the primary monitors at 20 percent of monitoring sites per year, and 100 percent of the sites every 6 years.

- Conducting the NPAP audits at a different time from the Annual Performance Evaluations (APE); preferably at least one week apart. The national NPAP program has little control over the scheduling of the APEs; however, PQAOs are encouraged not to schedule APEs within a week of the NPAP audits so quality assurance activities can be distributed across the year.

- Developing a delivery system that will allow for the audit concentration gases to be introduced to the probe inlet where logistically feasible.

- Using audit gases that are verified against the NIST standard reference methods or special review procedures and validated annually for CO, SO_2 and NO_2, and at the beginning of each quarter of audits for O_3.

- Utilize an audit system equivalent to the federally implemented NPAP audit system and is separate from equipment used in annual performance evaluations. If this system

does not generate and analyze the audit concentrations, as the national system does, its equivalence to the national system must be proven to be as accurate as the national system under a full range of appropriate and varying conditions (see validation/certification).

- Perform a whole system check by having the NPAP system tested against an independent and qualified EPA lab, or equivalent. The national systems are checked this way by Regions 2 and 7 and Research Triangle Park (RTP) at least once every 2 years.

- Evaluate the system with the EPA NPAP program through collocated auditing at an acceptable number of sites each year (at least one for an agency network of five or less sites; at least two for a network with more than five sites). The comparison tests results would have to be no greater than 5 percent different, per point, for O_3 and 7 percent different, per point, for NO_2, SO_2 and CO from the EPA NPAP results.

- Incorporate the NPAP in the PQAO's quality assurance project plan.

- Be subject to review by independent, EPA-trained personnel.

- Participate in initial and update training/certification sessions documented in uniform, EPA developed checklists and written exams, and certified by EPA-NPAP trained execution-experienced EPA personnel, who have themselves been certified by participating in the latest annual training.

Independence - Independence is proposed in guidance using the PEP 1998 definition with minor wording revisions for NPAP as written below:

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 NPAP if it can meet the 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. Independent for NPAP audits also requires a second, independent set of equipment and standards. A self-implementing agency may not use the same system they use for their annual audits. The auditor must not be the same auditor who audited the site for the annual audit. The same audit must not be reported for both the annual and NPAP (national) audit for a site.*

Comparable - 40 CFR Part 58 Appendix A Section 2.4 states that the monitoring organizations are responsible for performing the NPAP and must meet the adequacy requirements found in the appropriate Appendix A sections (section 3.1.3). We interpret this statement to mean that any NPAP program that is assumed by a state, local or tribal monitoring organization will be run similarly to the federal NPAP and will periodically be

subject to performance evaluations with the federal NPAP conducted within its respective EPA Region.

To ensure comparability of the audits, NPAP training requirements have been developed are referenced in the NPAP QAPP in Section A8. Initial training and certification are described in detail for EPA staff, contractors and self-implementing PQAOs in the QAPP.

NPAP requires that 20 percent of the monitoring sites in a PQAO are audited each year. All monitoring sites across the PQAO must be audited over the course of 6 years; however, if auditing at the 20 percent rate, an entire PQAO could be audited in only 5 years. The 6-year time frame was chosen to allow time for the NPAP coordinators to target specific sites that should be audited on a more frequent basis. For example, a design value site or a site close to a design value may be audited on a more frequent basis to provide more data quality information without incurring an additional burden, in both cost and time, on the audit group.

The Code of Federal Regulations (CFR) has two separate performance evaluation assessment requirements, not just one. They are in 40 CFR Part 58 Appendix A Section 3.1.2, the Annual Performance Evaluation and the NPAP program, 40 CFR Part 58 Appendix A Section 3.1.3 and should not be construed as the same program.

Program Costs

OAQPS has consulted with each EPA Regional PEP/NPAP Program Lead to evaluate program costs. In the past, the EPA used national estimates developed in the implementation plans to derive per site costs. Due to differences in labor rates and travel requirements in each Region, these cost estimates were not always equitable. After 20 years of operation OAQPS can now estimate reasonably well the annual cost for technical documentation and data management support provided by the QA contractor, recertification of NIST-traceable calibration standards, and the shipping and analytical (gravimetric and Pb ICPMS) services. These costs have grown over the last five years to be approximately $350,000 for PM2.5-PEP and $140,000 for Pb-PEP.

For several years OAQPS has included depreciation of equipment needed for running the PEP samplers in the Annual Regional PEP estimates. Each year, a value of $1000 per active fleet sampler is held back by OAQPS and funds are distributed on an as needed basis; repairs costs for Pb-PEP have averaged $1,000 per region since the inception of the program. Four regions no longer have SLTs that run Pb-NAAQS monitoring sites, therefore, the projected and withheld fixed cost will be $6000.

For NPAP, the Through-the-Probe depreciation costs will be $6,000 and the OAQPS fixed costs will be $2,000. Table 1 represents the estimated per-audit costs associated with each program.

Table 1 Regional Per-Audit Cost Estimates

Region	NPAP	$PM_{2.5}$ PEP	$PM_{10-2.5}$ PEP	Pb PEP	Comments
1*	400	2300	1100	**	Fed Imp of NPAP
2*	400	2200	1100	**	Fed Imp of NPAP
3	2400	2100	1100	2400	
4	1860	2200	1100	2200	
5	2500	2600	1300	2600	
6	2805	3000	1300	2600	
7	2500	2600	1300	2600	
8	3000	3000	1500	**	
9	3000	3000	1500	3000	
10	2500	3100	1500	**	

*NPAP costs for Regions 1 and 2 appear lower than other Regions because they are implemented by the EPA staff.
** These Regions no longer have SLTs for which they are responsible to conduct Pb-PEP audits.

Attachment 2

Performance Evaluation Program (PEP) and National Performance Audit Program (NPAP) Reporting Organization Implementation Decision Form for Calendar Year 2021

EPA Region	State #	State Abbreviation	PQAO

PQAO Responsible Official	

Number of $PM_{2.5}$ SLAMS/PAMS/SPM Sites		Number of Gaseous SLAMS/PAMS/SPM Sites; Please ID NCore Sites	
Number of Pb SLAMS/PAMS/SPM Sites		Number of $PM_{10-2.5}$ SLAMS/PAMS/SPM Sites; Please ID Non-NCore Sites	
Number of PM_{10}-Pb SLAMS/PAMS/SPM Sites Please ID Non-NCore Sites			

$PM_{2.5}$ PEP Question	(Yes or No)[3]	NPAP Question	(Yes or No)[3]
Do you plan to implement[1] an adequate/independent $PM_{2.5}$ PEP in 2021?[2]		Do you plan to implement[1] an adequate/independent NPAP in 2021?[2]	

Pb-PEP Question	(Yes or No)[3]
Do you plan to implement[1] an adequate/independent Pb-PEP in 2021?[2]	

1. This means the monitoring organization could implement their own adequate/independent program or participate in some other state, local or consortium-run adequate/independent program.

2. Regions must approve capability by October 1, 2020.

3. A "no" will indicate that the monitoring organization, for CY 2021, approves redirection of FY 2021 STAG funds to the EPA for federal implementation.