ENVIRONMENTAL PROTECTION AGENCY

40 CFR Part 58

[EPA–HQ–OAR–2013–0619; FRL–9942–91–OAR]

RIN 2060–AS00

Revisions to Ambient Monitoring Quality Assurance and Other Requirements

AGENCY: Environmental Protection Agency (EPA).

ACTION: Final rule.

SUMMARY: This action promulgates revisions to ambient air monitoring requirements for criteria pollutants. These revisions include adding and harmonizing definitions; clarifying annual monitoring network plan public notice requirements; revising network design requirements; system modifications and operating schedules; clarifying data certification, data submittal and archiving procedures; reorganizing and clarifying quality assurance requirements; and revising certain network design criteria for non-source oriented lead monitoring. These revisions also address other issues in the Ambient Air Quality Surveillance Requirements, to help reduce the compliance burden of monitoring agencies operating ambient monitoring networks.

DATES: This final rule is effective on April 27, 2016.

ADDRESSES: The EPA has established a docket for this action under Docket ID No. EPA–HQ–OAR–2013–0619. All documents in the docket are listed on the *http://www.regulations.gov* Web site. Although listed in the index, some information is not publicly available, *e.g.,* Confidential Business Information (CBI) or other information whose disclosure is restricted by statute. Certain other material, such as copyrighted material, is not placed on the Internet and will be publicly available only in hard copy form. Publicly available docket materials are available either electronically through *http://www.regulations.gov* or in hard copy at Docket ID No. EPA–HQ–OAR–2013–0619, EPA Docket Center, EPA WJC West Building, Room 3334, 1301 Constitution Ave. NW., Washington, DC. The Docket Facility is open from 8:30 a.m. to 4:30 p.m. Monday through Friday, excluding legal holidays. The docket telephone number is (202) 566–1742. The Public Reading Room is open from 8:30 a.m. to 4:30 p.m., Monday through Friday, excluding legal holidays. The telephone number for the Public Reading Room is (202) 566–1744.

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SUPPLEMENTARY INFORMATION:

A. Does this action apply to me?

This action applies to state, territorial, and local air quality management programs that are responsible for ambient air monitoring under 40 CFR part 58. Categories and entities potentially regulated by this action include:

Category	NAICS [a] code
State/territorial/local/tribal government	924110

[a] North American Industry Classification System.

B. Where can I get a copy of this document?

In addition to being available in the docket, an electronic copy of this action will also be available on the Worldwide Web (WWW) through the Technology Transfer Network (TTN). Following signature, a copy of this action will be posted at the TTN's Ambient Monitoring Technology Information Center at the following address: *https://www3.epa.gov/ttnamti1/monregs.html*. The TTN provides information and technology exchange in various areas of air pollution control.

C. Judicial Review

This rule is nationally applicable and, furthermore, the Administrator finds that it is of nationwide scope and effect. Under section 307(b)(1) of the Clean Air Act (CAA), judicial review of this final rule is available by filing a petition for review in the U.S. Court of Appeals for the District of Columbia Circuit by May 27, 2016. Moreover, under section 307(b)(2) of the CAA, the requirements established by this action may not be challenged separately in any civil or criminal proceedings brought by the EPA to enforce these requirements.

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The following topics are discussed in this preamble:

I. Background

On September 11, 2014, the EPA proposed revisions to its ambient air monitoring requirements for criteria pollutants to provide clarifications to existing requirements and to reduce the compliance burden of monitoring agencies operating ambient monitoring networks (79 FR 54356). The proposal focused on ambient monitoring requirements that are found in 40 CFR part 58 and the associated appendices (A, D, and new Appendix B), including issues such as operating schedules, the

development of annual monitoring network plans, data reporting and certification requirements, and the operation of the required quality assurance (QA) program. These revisions were proposed to maintain the robust nature of the ambient monitoring networks while identifying efficiencies and flexibilities that would help ensure the successful operation of the national monitoring system.

The EPA last completed a comprehensive revision of its ambient air monitoring regulations in a final rule published on October 17, 2006 (71 FR 61236). Minor revisions were completed in a direct final rule published on June 12, 2007 (72 FR 32193). Periodic pollutant-specific monitoring updates have occurred in conjunction with revisions to the National Ambient Air Quality Standards (NAAQS). In such cases, the monitoring revisions were typically finalized as part of the NAAQS final rules.[1]

II. Amendments to the Ambient Monitoring Requirements

A. General Information

This section describes revisions to the EPA's ambient air monitoring requirements found in 40 CFR part 58—Ambient Air Quality Surveillance: Subpart A—General Provisions, Subpart B—Monitoring Network, and Appendix D—Network Design Criteria for Ambient Air Quality Monitoring.

The EPA received public comments on its September 2014 proposal from 31 respondents including 15 state agencies, 12 local agencies, two multijurisdictional organizations (MJO), one consulting firm, and one environmental organization whose comments represented two organizations. Due to the relatively large number of individual revisions contained in the proposal, commenters typically focused their attention on particular items of interest while occasionally providing a more general, overarching statement of support for the remaining provisions. In some cases, commenters remained silent on other provisions of the proposal and the level of support for those provisions cannot be ascertained. In the following sections, the specific comments will be noted as they pertain to each particular proposed revision. This preamble will summarize the affected regulation, proposed changes, public comments that were received, the EPA's analysis of those comments where applicable, and EPA's final decision concerning the revisions. A detailed description of changes to Quality Assurance Requirements is contained in section III of the preamble.

B. Definitions

The presence of a definitions section in the regulation ensures a consistent interpretation of technical terminology across the various parts of the CFR that pertain to ambient air monitoring, as well as in supporting guidance documents, databases, and outreach materials that support the monitoring community.

The EPA proposed to add and revise several terms to ensure consistent interpretation within the monitoring regulations and to harmonize usage of terms with the definition of key metadata fields that are important components of the Air Quality System (AQS).[2]

The EPA proposed to add the term ''Certifying Agency'' to the list of definitions. The certifying agency field was added to the AQS in 2013 as part of the development of a revised process for states and the EPA Regions to meet the data certification requirements described in 40 CFR 58.15. The new term specifically describes any monitoring agency that is responsible for meeting data certification requirements for a set of monitors. In practice, a certifying agency is typically a state, local, or tribal agency depending on the particular data reporting arrangements that have been approved by an EPA Regional Office for a given state. A list of certifying agencies by individual monitor is available on the AQS–TTN Web site.[3]

The term ''Chemical Speciation Network,'' or CSN, was proposed for addition to the definition list. The CSN has been functionally defined as being composed of the Speciation Trends Network (STN) sites and the supplemental speciation sites that are collectively operated by monitoring agencies to obtain particulate matter up to 2.5 micrometers ($PM_{2.5}$) chemical species data.

The term ''Implementation Plan'' was proposed for addition to provide more specificity to current definitions that reference the word ''plan'' in their description. The EPA wishes to ensure that references to State Implementation Plans (SIPs) are not confused with references to Annual Monitoring Network Plans that are described in 40 CFR 58.10.

The EPA proposed to revise the term ''Local Agency'' to clarify that such organizations are responsible for implementing portions of Annual Monitoring Network Plans. The current definition refers to the carrying out a plan that is not specifically defined, leading to possible confusion with SIPs.

The EPA proposed to revise the term ''Meteorological Measurements'' to clarify that such measurements refer to required parameters at the National Core Monitoring Program (NCore) and photochemical assessment monitoring stations (PAMS).

The terms ''Monitoring Agency'' and ''Monitoring Organization'' were proposed for clarification to include tribal monitoring agencies and to simplify the definition of monitoring organization to reference the definition of monitoring agency.

The term ''NCore'' was proposed for revision to remove nitrogen dioxide (NO_2) and lead in PM_{10} (Pb-PM_{10}) as a required measurement and to expand the definition of basic meteorology to specifically reference the required measurements: Wind speed, wind direction, temperature, and relative humidity. The EPA clarifies that NO_2 was never a required NCore measurement and that the current definition was erroneous on this issue. Additionally, the requirement to measure Pb-PM_{10} at NCore sites in areas over 500,000 population was proposed for elimination due to the extremely low concentrations being measured at these sites.

The term ''Near-road NO_2 Monitor'' was proposed for revision to ''Near-road Monitor.'' This revision is being made to broaden the definition of near-road monitors to include all monitors operating under the specific requirements described in 40 CFR part 58, appendix D (sections 4.2.1, 4.3.2, 4.7.1(b)(2)) and appendix E (section 6.4(a), Table E–4) for near-road measurement of $PM_{2.5}$ and carbon monoxide (CO) in addition to NO_2.

The term ''Network Plan'' was proposed for addition to clarify that any such references in 40 CFR part 58 refer to the annual monitoring network plan required in 40 CFR 58.10.

The term ''Plan'' was proposed for deletion as its usage has been replaced with more specific references to either the annual monitoring network plan required in 40 CFR 58.10 or the SIP approved or promulgated pursuant to CAA section 110.

The term ''Population-oriented Monitoring (or sites)'' was proposed for

[1] Links to the NAAQS final rules are available at: *https://www3.epa.gov/ttn/naaqs/criteria.html.*

[2] The AQS is the EPA's repository of ambient air quality data. The AQS stores data from over 10,000 monitors, 5,000 of which are currently active. State, local and tribal agencies collect the data and submit it to the AQS on a periodic basis. See *https://www.epa.gov/aqs/aqs-obtaining-aqs-data* for additional information.

[3] *https://aqs.epa.gov/aqsweb/codes/data/CertifyingAgenciesByMonitor.html.*

deletion. This term, along with the related concept of population-oriented monitoring, was deleted from 40 CFR part 58 in the 2013 $PM_{2.5}$ NAAQS final rule (78 FR 3235–3236). This was to ensure consistency with the longstanding definition of ambient air applied to the other NAAQS pollutants.

The term ''Primary Monitor'' was proposed for addition to the definition list. The use of this term has become important in AQS to better define the processes used to calculate NAAQS design values when more than one monitor is being operated by a monitoring agency for a given pollutant at the same site. This term identifies the primary monitor used as the default data source in AQS for creating a combined site record for pollutants that allow site combinations per 40 CFR part 50.

The term ''Primary Quality Assurance Organization'' was proposed for revision to include the use of the acronym, ''PQAO,'' and to note that a PQAO could include a group of monitoring organizations.

The terms ''PSD Monitoring Organization'' and ''PSD Monitoring Network'' were proposed for addition to support the proposed new appendix B that will pertain specifically to QA requirements for prevention of significant deterioration (PSD) networks.

The term ''PSD Reviewing Authority'' was proposed for addition to support the addition of appendix B to the part 58 appendices and to clarify the identification of the lead authority in determining the applicability of QA requirements for PSD monitoring projects.

The term ''Reporting Organization'' was proposed for revision to clarify that the term refers specifically to the reporting of data as defined in AQS. The AQS does allow the distinct designation of agency roles that include analyzing, certifying, collecting, reporting, and PQAO.

The term ''SLAMS'' (state and local air monitoring stations) was proposed for clarification to indicate that the designation of a monitor as SLAMS generally refers to a monitor required under appendix D of part 58 and is needed to meet monitoring objectives. The SLAMS monitors make up networks that include NCore, PAMS, CSN, and other state or local agency sites that have been so designated in annual monitoring network plans.

The terms ''State Agency'' and ''STN'' were proposed for minor wording changes for purposes of clarity only.

The term ''State Speciation Site'' was proposed for deletion given the proposed addition of ''Supplemental Speciation Station'' to better describe the distinct elements of the CSN, which includes the STN stations that are required under section 4.7.4 of appendix D of part 58, and supplemental speciation stations that are operated for specific monitoring agency needs and are not considered to be required monitors under appendix D.

We received relatively few comments on the proposed revisions to definitions. One commenter noted that the clarification of Meteorological Measurements should specify that those parameters are also required at SLAMS sites, which include both the NCore and PAMS sites. They noted the use of the undefined phrase ''combined data record'' in the Primary Monitor definition and recommended that a definition be provided. They also recommended that the EPA include an explanation of the term ''Special Purpose Monitor'' (SPM) in the definitions section of the preamble and not rely solely on the amended regulatory text. A commenter from a state air program noted that the proposed definition for ''Monitoring Organization'' includes the phrase ''or other monitoring organization.'' They believe the phrase is ambiguous and could extend the applicability of requirements such as technical systems audits to universities, contractors, and other government organizations. This commenter was concerned that the phrasing could expand the applicability of regulations, and that the phrase should be either defined or removed from the final definition verbiage.

The EPA has made several revisions to definitions in response to these comments. The Meteorological Measurements definition has been amended to include a clarifying reference that SLAMS stations include sites that comprise the NCore and PAMS networks. Additionally, the words ''or other monitoring organization'' have been removed from the definition for Monitoring Organization to remove any ambiguity that monitoring regulations apply to entities other than state, local, or tribal agencies.[4] The EPA does not believe that the definition for Primary Monitor needs to be amended as the term ''combined data record'' is already defined as part of appendix N to Part 50 (Interpretation of the National Ambient Air Quality Standards for $PM_{2.5}$). The EPA acknowledges that the preamble to the proposal inadvertently failed to discuss a clarification to the Special Purpose Monitor definition included in the proposal. The proposed revision to this definition was the addition of two sentences that merely restated existing requirements already established in 40 CFR 58.10 with regard to annual monitoring network plans and network assessments. The EPA believes that the proposed definition is a useful but minor revision that should be retained as proposed. No other comments were received on the proposed revisions to definitions and they will be finalized as proposed.

[4] The EPA does note that other mechanisms can be used to extend the applicability of monitoring requirements to sites operated by other entities, *e.g.,* industrial monitors. For example, states can develop Memorandum of Understanding (MOU's) with the operators of such sites to ensure that the monitors are operated according to part 58 requirements and that the resulting data are of known quality.

C. Annual Monitoring Network Plan and Periodic Network Assessment

The annual monitoring network plan process provides an important communications and planning pathway between monitoring agencies, EPA Regional Offices, and the general public. The network assessment process, required every 5 years, provides an opportunity to conduct more in-depth planning and analyses of current and future ambient monitoring needs and objectives to help ensure that monitoring programs respond to changing requirements, demographics, air quality trends, and updated technology.

The EPA proposed several changes to the annual monitoring network plan process and related requirements. We received significant comment on these changes. Therefore, each individual proposed revision is discussed below along with relevant comments.

Since the revision of the annual monitoring network plan process in 2006, the EPA has received feedback about confusion concerning the difference between the process of obtaining public inspection versus comment, the responsibility of monitoring agencies to respond to public comment in their submitted annual monitoring network plans, and the responsibility of the EPA Regional Offices to obtain public comment depending on a monitoring agency's prior action, as well as whether the annual monitoring network plan was modified based on discussions with the monitoring agency following plan submission. Accordingly, we proposed that the public inspection aspect of the requirement contained in 40 CFR 58.10(a)(1) be revised to clearly indicate that obtaining public comment is a required part of the process, and that plans that are submitted to the EPA

Regional Offices should address such comments that were received during the public notice period. A related part of the annual monitoring network plan process is described in 40 CFR 58.10(a)(2) with the distinction that this section pertains specifically to plans that propose SLAMS modifications and, thereby, also require specific approval from the EPA Regional Administrator.

Consistent with the proposed change to the comment process described above, the EPA proposed changes to the text in 40 CFR 58.10(a)(1) to reflect the fact that public comments will have been required to be obtained by monitoring agencies prior to submission, and that the role of the EPA Regional Office would be to review the submitted plan together with public comments and any modifications to the plan based on these comments.

A number of state monitoring agencies and two MJOs commented that the proposed requirement to solicit and address comments during the public inspection period would impose additional burden, inflexibility, and delays on the process by requiring that the comments be addressed before the original plan is submitted to the EPA. Some of these commenters estimated that it would take an additional two months compared with the current process to handle comments in this manner, and that they could only support the proposed change if the deadline for submittal was revised as well. They requested that the EPA waive this proposed requirement or make the procedure more flexible by allowing comments to be submitted later, perhaps as an amendment before the plan is approved, or even with the next year's plan. Four state programs supported the proposed revision noting the importance of soliciting public input on the content of the plan and the perspective that states should take the lead in responding to comments versus the EPA. One of these states noted that they attempt to schedule a public comment period for every SLAMS modification. They also noted that flexibility would be needed in emergency situations that demand immediate changes to their network. Another of these states requested that the term ''address'' be clarified and noted that the timeliest way to handle comments and responses would be to include this information in an appendix to the plan when submitted to the EPA. A different perspective was offered by comments received from a joint environmental group submission. They commented that the proposed changes did not go far enough to ensure a meaningful public comment opportunity. They noted that annual monitoring network plans are integral parts of SIPs and that the CAA requires that SIP submittals and revisions be more formally publicly noticed. They suggested that the EPA require states to prominently advertise monitoring plans, allow at least 30 days for public comment, then either hold a public hearing or provide such an opportunity if requested. They also added that a separate notice and comment opportunity must be required on the EPA's proposed action on a submitted plan or a related amendment to an approved plan, and that all of the suggested public comment requirements must also be applicable to the 5-year network assessment.

The EPA recognizes the diversity of comments on this aspect of the proposal. Nearly all commenters recognized that fostering public involvement in the annual monitoring network plan is important and desirable. Those commenters supporting the proposal noted that their existing procedures already address the proposed requirements and that they found it desirable to be able to respond directly to stakeholders. Adverse comment was related to the implied additional burden of obtaining comment versus the current requirement of posting for public inspection, concern about limiting the flexibility to subsequently modify the plan following submission to the EPA, and the perceived impracticality of adequately responding to public comments in a timely manner.

The EPA does not agree with the comments received from the joint environmental group submission on this aspect of the proposal. First, the final rule text requires annual monitoring network plans to be made available for at least 30 days of public inspection and comment and further requires monitoring agencies to address, as appropriate, any significant issues raised in public comment. Requiring at least 30 days of public participation and consideration of significant comments is consistent with the CAA and the Administrative Procedure Act (APA) and, at the same time, affords monitoring agencies with the flexibility and discretion to provide for additional time and public participation procedures.

Second, the EPA disagrees that state action on an annual monitoring network plan triggers the same public participation requirements applicable to SIP adoption and revision. Section 110(a)(2)(B) of the CAA provides that each SIP shall ''provide for establishment and operation of appropriate devices, methods, systems, and procedures necessary to (i) monitor, compile, and analyze data on ambient air quality, and (ii) upon request, make such data available to the Administrator.'' To meet these requirements, our September 2013 *Guidance on Infrastructure State Implementation Plan (SIP) Elements under Clean Air Act Sections 110(a)(1) and 110(a)(2)* states that ''the best practice for an air agency submitting an infrastructure SIP would be to submit, for inclusion into the SIP . . . , the statutory or regulatory provisions that provide the air agency or official *with the authority and responsibility to perform*'' certain actions required under 40 CFR part 58. (*See 2013 iSIP Guidance,* p. 22.) In other words, CAA section 110(a)(2)(B) simply requires that monitoring agencies have the legal authority to implement 40 CFR part 58; it does not treat annual monitoring network plans required under 40 CFR part 58 as ''integral parts'' of a SIP subject to public participation whenever such network plans are established or modified.

Third, the EPA disagrees that EPA action on an annual monitoring network plan requires a separate notice and comment opportunity. The EPA reviews and acts on network plans through informal adjudications in which the EPA determines whether such network plans satisfy the requirements in 40 CFR 58.10. Such adjudications are not rulemakings subject to the public participation requirements of the APA (*see* 5 U.S.C. 553), although they are final agency actions subject to judicial review (*see* 5 U.S.C. 706). The EPA's decision to treat network plan decisions as case-by-case adjudications rather than ''rules'' reflects the fact that the EPA simply compares the information supplied in the network plan with the requirements of 40 CFR part 58 and notifies the relevant monitoring agencies that design and operate the corresponding networks whether their particular networks satisfy Part 58 or need further revision.

Finally, the EPA disagrees that public notice and comment is required ''at both the state and federal levels on the 5-year monitoring network assessments required at 40 CFR 58.10(d).'' To the extent that the EPA takes ''substantive action'' on such assessments, such actions are not rulemakings subject to public participation requirements under the CAA or the APA.

Given the relatively broad support for the concept of soliciting public comment as part of the annual monitoring network plan posting process, as well as the concern for the

implied logistical challenge of both obtaining comment and developing (and getting management approval for) adequate responses, while still meeting the required submission deadline of July 1, the EPA believes that some modification of the proposed language is appropriate. As noted by several commenters, the implied burden to ''reference and address any such received comments'' as described in the proposed regulatory language may be too difficult to achieve. As suggested by one commenter, it may be more practical for monitoring agencies to review and consider the comments, and only to modify the plan when ''appropriate and feasible.'' By modifying the proposed language to provide more flexibility and discretion in addressing comments based on each agency's technical evaluation of received comments and the associated management review chain, the EPA can finalize the generally supported goal of increasing public involvement in the process while lessening the burden on agencies that have not previously included the solicitation of public comment in their process. Accordingly, the EPA is revising the regulatory language in the last sentence of 40 CFR 58.10(a)(1) from ''The annual monitoring network plan must be made available for public inspection and comment for at least 30 days prior to submission to the EPA and the submitted plan shall reference and address any received comments'' to ''The annual monitoring network plan must be made available for public inspection and comment for at least 30 days prior to submission to the EPA and the submitted plan shall include and address, as appropriate, any received comments.'' The EPA believes that this revised language, including the clarification that the plan ''address, as appropriate, any received comments,'' provides sufficient flexibility to monitoring agencies and ensures adequate public participation practices. Under this approach, all agencies will review public comments and make changes to the plan as appropriate in light of public comments, taking into account the requirement for timely submission of network plans. The EPA encourages states to provide responses to significant comments but understands that developing formal responses may potentially delay submission of the plan beyond the July 1 deadline, in light of internal timelines and management review procedures. To avoid such delays, it would also be acceptable for states to submit the proposed plan with comments and any resulting changes, and where the EPA finds it necessary to discuss how the state considered and addressed specific comments, the EPA will follow up as part of our process for reviewing the plan for approval.

Another aspect of the annual monitoring network plan requirements is the listing of required elements and site information in 40 CFR 58.10. The EPA proposed to add two requirements to this list as described below. First, the EPA proposed to require that a PAMS network description be specifically included in the 40 CFR 58.10(a) requirements for any monitoring agencies affected by PAMS requirements. The requirements for such a plan are already referenced in appendix D, sections 5.2 and 5.4 of this part. Second, the EPA proposed that ''long-term'' SPMs, *i.e.,* those SPMs operating for longer than 24 months whose data could be used to calculate design values for NAAQS pollutants in cases where the EPA-approved methods are being employed, should be identified in the 40 CFR 58.10(b) requirements along with a discussion of the rationale for keeping the monitor(s) as SPMs or potentially reclassifying to SLAMS. The EPA did not propose that such monitors must become SLAMS, only that the ongoing operation of such monitors and the rationale for retaining them as SPMs be explicitly discussed to avoid confusion, particularly because the monitoring data could be used to calculate design values regardless of whether the monitors are designated SPMs or SLAMs. Thus, there is potential for unintended complexities in the designations process if any design value SPMs would be discontinued without adequate discussion.

Nine commenters addressed the above issues. Only one commenter specifically addressed the addition of the PAMS network description and that comment was ''Support this action.'' The remainder of comments addressed the issue of requiring an annual monitoring network plan discussion and rationale for whether longer-term SPMs should be retained as SPMs or reclassified to SLAMS. Three of these commenters were supportive of the proposed revision with several noting that they expected that monitoring agencies would still be granted discretion on the issues by the EPA Regional Offices. Two commenters suggested revised language to limit the proposed SPM discussion to only criteria pollutant monitors and also only those monitors utilizing federal reference methods (FRM) or federal equivalent methods (FEM). One commenter only supported the revision if the EPA could provide grant funding. Three commenters did not support the proposed revision, either because they interpreted the provision as meaning that the EPA was proposing that such longer-term SPMs be automatically converted to SLAMS in the absence of a justification, due to the belief that such a rationale would create a burden for monitoring agencies and that such a discussion is misplaced in the annual monitoring network plan, or because of the belief that ongoing discussions between the states and EPA Regional Offices are already sufficient to handle such issues, and that the additional requirement is an unnecessary limit on monitoring network flexibility.

After consideration of these comments, the addition of the PAMS network description to the list of requirements in 40 CFR 58.10(a) will be finalized as proposed due to general support and lack of comment on this revision.

The EPA will not finalize the proposed changes to 40 CFR 58.10(b). The EPA believes that some misunderstanding still exists as to the intent of the proposed addition of a required discussion and rationale concerning longer-term SPM monitors. Although preamble language explicitly stated that the EPA was not intending to propose an automatic conversion process for such SPMs, several commenters interpreted the proposal in that way. One commenter noted, ''Also the mechanism is unclear for how SPMs not granted approval will convert to a SLAMS monitor.'' It was not the EPA's intention to imply any limitations on monitoring agency discretion to employ SPMs as part of their network design strategy, only to raise the awareness among all stakeholders of such situations when they occur, particularly with longer-term SPMs that may have design values approaching or exceeding the NAAQS. Comments regarding the need to limit the proposed requirement to FRMs or FEMs also indicate a misunderstanding of the proposed language as this limitation was already included in the regulatory language in the proposal. Given these apparent areas of confusion and the concern about additional burden that the inclusion of such a rationale would place on plan submitters, the EPA will not finalize this proposed change to 58.10(b). Nevertheless, we continue to believe that an open and robust discussion about such longer-term SPMs is an important part of interactions between monitoring agencies and EPA Regional Offices, particularly in the context of monitors utilizing EPA-approved methods that are measuring concentrations near the level of

applicable NAAQS. While continuing to support the use of SPMs to provide flexible options for investigating air quality problems, we encourage reference to these situations in annual monitoring network plans and thoughtful consideration of the pros and cons of converting such monitors to SLAMS particularly to avoid potential disruption of implementation actions due to discontinuance of important SPMs.

The EPA proposed a minor edit to the annual monitoring network plan requirements to revise terminology referring to $PM_{2.5}$ speciation monitoring. No comments were received on this issue and the change will be finalized as proposed.

The EPA received comments on a general rewording of regulatory language that was included as part of the revisions to 40 CFR 58.10(a). Specifically, we revised the sentence ''The plan shall include a statement of purposes for each monitor and evidence that siting and operation of each monitor meets the requirements of appendices A, C, D, and E of this part, where applicable'' to ''The plan shall include a purpose statement for each monitor along with a statement of whether the operation of each monitor meets the requirements of appendices A, B, C, D, and E of this part, where applicable.'' Additionally, the proposed language added the following sentence: ''The Regional Administrator may require the submission of additional information as needed to evaluate compliance with applicable requirements of Part 58 and its appendices.''

One state monitoring agency noted that there was overlap between the monitoring objective and the purpose of a monitor as referenced in the regulatory language. They suggested that the terms be defined in the definitions section of the rule. They also suggested removing the purpose statement entirely as it appears duplicative with other annual monitoring plan requirements that are already present. Two MJOs referenced the statement concerning the Regional Administrator's discretion to require the submission of additional information to evaluate the compliance of the submitted plan with part 58 and appendices. They commented that the proposed language was ''vague and open-ended'' and that the presence of this requirement would lead to significant differences among the EPA Regions concerning the level of detail needed to evaluate plan submittals. It was suggested that the EPA consider amending the language to more clearly define the circumstances when additional information would be needed.

The EPA believes that some revision of the referenced language is appropriate to achieve the goal of providing monitoring agencies with a more explicit description of the documentation that is required in the plans as well as providing the EPA Regional Offices with a clear basis for review and approval. We agree with the comment that the requirement for a ''purpose statement'' is vaguely worded and duplicative of existing requirements (in 40 CFR 58.10(b)) that pertain to factors such as monitoring objective and spatial scale. We also note the comments concerning the open-ended nature of the statement that the Regional Administrator has discretion to require the submission of additional information to evaluate the compliance of the submitted plan with Part 58 and appendices. The EPA observes that this type of statement is not unusual in the context of various monitoring requirements, particularly in the Network Design Criteria described in appendix D. We do not anticipate frequent requests for additional information in the context of the Annual Monitoring Network Plan requirements, but we would anticipate that additional information would be needed by Regional Offices when the reasons supporting compliance with the applicable requirements of part 58 and its appendices have changed from the previous year's plan, or when a monitor has been added since the previous year's plan was approved.

Accordingly, the EPA is revising the proposed language by deleting the words ''a purpose statement for each monitor along with'' from the second sentence of 40 CFR 58.10(a)(1) and also revising the sentence ''The Regional Administrator may require the submission of additional information as needed to evaluate compliance with applicable requirements of Part 58 and its appendices'' to ''The Regional Administrator may require additional information in support of this statement,'' which is a somewhat narrower framing of the need for Regional Administrator discretion in the context of assuring whether the operation of each monitor meets the requirements of appendices A, B, C, D, and E of this part, as described in the submitted Annual Monitoring Network Plan.

Finally, two public comments were received on preamble language in the proposal pertaining to the EPA's discussion about the ability of Regional Offices to handle partial approvals of annual monitoring network plans in cases where one or more of the required elements is problematic. A joint environmental organization comment noted that the EPA's discussion did not indicate a timeframe for the correction of deficiencies and, hence, the described partial approval process was unlawful and arbitrary. They further suggested that an appropriate time limit for the correction of deficiencies would be 90 days. A MJO comment noted that a partial approval process is not an appropriate strategy for the longer term, although the process as it exists now has been found to be useful in some cases. This commenter supported language in the preamble discussion relating to an approval process while noting technical deficiencies, as long as such deficiencies were related to required elements of the plan.

The EPA notes that the preamble discussion (79 FR 54360) was not tied to any proposed revisions to requirements or regulatory language, but was intended as an articulation of what we believe to be currently available flexibility in the handling of annual monitoring network plan submissions. The EPA agrees that deficiencies should be corrected and intends to work with monitoring agencies to address deficiencies in a timely manner. However, the EPA does not believe that the lack of a regulatory schedule for correcting deficiencies is unlawful or that it would be appropriate to establish one without having solicited comment on the topic in the proposal. Accordingly, no additional action was taken within the context of this rulemaking.

D. Network Technical Requirements

The Network Technical Requirements section provides a place for cross-referencing and clarifying the applicability of the various requirements that are described in the appendices to part 58.

The EPA proposed to revise the language in 40 CFR 58.11(a)(3) to note the proposed revisions to appendix B to the QA requirements that would pertain to PSD monitoring sites. One supportive comment was received on this issue and the revision will be finalized as proposed.

E. Operating Schedules

The operating schedule requirements described in 40 CFR 58.12 pertain to the minimum required frequency of sampling for continuous analyzers (for example, hourly averages) and manual methods for particulate matter (PM) and Pb sampling (typically 24-hour averages for manual methods).

The EPA proposed to revise these requirements by (1) adding flexibility in the minimum required sampling for $PM_{2.5}$ mass sampling and for $PM_{2.5}$ speciation sampling; (2) modifying language pertaining to continuous mass monitoring to reflect revisions in regulatory language that were finalized in the 2013 PM NAAQS final rule; and (3) clarifying the applicability of certain criteria that can lead to an increase in the required sampling frequency, for example, to a daily schedule. Ten commenters responded to these proposed changes. Most of the comments were generally supportive of these changes as they provide additional flexibility and potential burden reductions for monitoring agencies. Some comments noted concern with specific changes to the period of time that a $PM_{2.5}$ sampler would have to utilize an increased sampling frequency if triggered by design values. Additional details on these generally supportive comments are discussed below in the relevant sections. A joint environmental organization comment opposed all the sampling frequency changes; they noted concern for the increased risk of not detecting daily variations in $PM_{2.5}$ by allowing samplers to follow reduced sampling schedules and also noted the lack of a cost analysis documenting the burden of monitoring as well as the fact that the EPA was not requiring additional monitoring to compensate for the reduced sampling frequency.

With regard to the minimum required sampling frequency for manual $PM_{2.5}$ samplers, current requirements state that at least a 1-in-3 day frequency is mandated for required SLAMS monitors without a collocated continuous monitor. The EPA believes that some regulatory flexibility is appropriate in situations where a particular monitor is highly unlikely to record a violation of the $PM_{2.5}$ NAAQS, such as in areas with very low $PM_{2.5}$ concentrations relative to the NAAQS and/or in urban areas with many more monitors than are required by appendix D (when a subset of those monitors is reading lower than other monitors in the area). The EPA specifically proposed that the required sampling frequency could be reduced to 1-in-6 day sampling or another alternate schedule through a case-by-case approval by the EPA Regional Administrator. Such approvals could be based on factors that are already described in 40 CFR 58.12(d)(1)(ii) such as historical $PM_{2.5}$ data assessments, the attainment status of the area, the location of design value sites, and the presence of continuous $PM_{2.5}$ monitors at nearby locations. The EPA noted that the request for such reductions in sampling frequency would occur as part of the annual monitoring network plan process as operating schedules are a required part of the plans as stated in 40 CFR 58.10(b)(4). For sites with a collocated continuous monitor, the EPA also proposed that the current regulatory flexibility to reduce to 1-in-6 day sampling or a seasonal sampling schedule is appropriate based on factors described above and, in certain cases, may also be applicable to lower-reading SLAMS sites without a collocated continuous monitor, for example, to reduce frequency from 1-in-6 day sampling to a seasonal schedule. Such flexibility was proposed through changes in the regulatory language in 40 CFR 58.12(d)(1)(i) and (ii).

With the one exception noted earlier, supportive comments were received on this specific proposed revision. One MJO commented that flexibility is needed in specifying operating schedules, and that it is preferable to retain lower reading sites with a reduced sampling frequency rather than close them completely. Similar comments included ''Support this action'' and the observation that the proposed changes should reduce monitoring burden. Concerning the joint environmental organization comment noting the potential increased risk of not characterizing the risk from $PM_{2.5}$ levels that might be missed when sampling frequency is reduced, the EPA notes that these case-by-case situations would be reviewed by EPA Regional Offices for approval, and that the pertinent approval criteria would include an assessment of prevailing $PM_{2.5}$ concentrations and the availability of other manual or continuous monitors that would provide characterization in the general area. As stated in the proposal, we expect these sampling reduction requests to be made for lower reading sites so the impact on area design values would be negligible. We also note that the requests would be made through the annual monitoring network plan process and, therefore, would be open for public inspection and comment prior to potential approval by the EPA. On an overall basis, the EPA believes that it is important to have operational flexibilities with regard to sampling frequency to permit monitoring agencies to shift resources (*e.g.,* higher sampling frequency samplers) to high priority areas; this flexibility supports the ability of the monitoring network to react to changing air quality trends and problems in a manner most protective of public health. Concerning the observation that the EPA has not provided an analysis of relevant costs, we note the public availability of such financial information in information collection request documents that are regularly updated and submitted for public comment according to Office of Management and Budget regulation.[5]

In consideration of the comments above, the EPA is finalizing the revisions to add flexibility to sampling frequency requirements for $PM_{2.5}$ mass samplers as proposed.

The EPA also proposed added flexibility in sampling frequency for $PM_{2.5}$ CSN sites, specifically the STN sites that are currently operated at approximately 53 locations.[6] The STN stations are currently required to sample on at least a 1-in-3 day frequency with no opportunity for flexibility. Justifications for the proposed additional flexibility include the conservation of resources for reinvestment in other needs within the CSN, rising analytical costs, and the availability of new technologies that provide continuous measurement of $PM_{2.5}$ species. Accordingly, the EPA proposed that a reduction in sampling frequency from 1-in-3 day be permissible for manual $PM_{2.5}$ samplers at STN stations, for example, to a 1-in-6 day frequency. The approval for such changes at STN stations, on a case-by-case basis, would be made by the EPA Administrator as the authority for changes to STN has been retained at the Administrator level per appendix D of this part, section 4.7.4.[7] Factors that would be considered as part of the decision would include an area's design value, the role of the particular site in national health studies, the correlation of the site's species data with nearby sites, and presence of other leveraged measurements.

Few commenters specifically addressed this proposed change as the aforementioned comments pertaining to changes in sampling frequency for $PM_{2.5}$ mass samplers were likely deemed pertinent to the CSN. Where this proposed change was mentioned specifically, monitoring agency comments noted support as a means of increasing flexibility and potentially protecting sites by reducing sampling frequency versus eliminating sites completely. The joint environmental organization comment stated that a

[5] See *http://www.regulations.gov/#!documentDetail;D=EPA-HQ-OAR-2002-0091-0017.*

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

[7] The approval process has been delegated, in practice, to the Director of the Air Quality Assessment Division within the Office of Air Quality Planning and Standards.

reasoned justification for the change was not provided, and noted that speciation data are critical in development of SIP control strategies, health studies, modeling exercises, and investigation of air pollution episodes.

The EPA notes the supportive comments from monitoring agencies and agrees that increasing flexibility with respect to sampling frequency as an alternative to site elimination was a motivation for the revision. With respect to the environmental organization comment noting concern about the additional flexibility and the potential for reduced sampling frequency, the EPA agrees with the observation that $PM_{2.5}$ speciation data are critical to supporting many different monitoring objectives. Because we believe that $PM_{2.5}$ speciation data are critical for the objectives noted above, we recently completed an in-depth assessment of the CSN with the goal of protecting, to the greatest extent possible, the long-term operation of the network.[8] In the face of rising analytical costs and unchanging budgets, the EPA considered factors such as site reductions, changes in sampling frequency, and alterations in operational procedures to support long-term viability of the CSN. The results of the assessment were implemented in late 2014 and early 2015, and the EPA believes the revised CSN continues to provide strong support for key monitoring objectives noted by the commenter and would do so even if sampling frequency were selectively reduced at a small number of STN sites based on substantive and suitable criteria. The EPA notes that a proposal to reduce sampling frequency would need to be accompanied by a technical rationale justifying the request and evaluating the impact on data users and the ability of the site to meet the aforementioned key objectives, for example, by employing new technology such as continuous monitoring of $PM_{2.5}$ species, in lieu of the reduced number of filter samples.

In consideration of the comments and detailed network assessment described above, the EPA is finalizing the revisions to add flexibility to sampling frequency requirements for the $PM_{2.5}$ STN sites as proposed.

The EPA proposed editorial revisions to 40 CFR 58.12(d)(1)(ii) to harmonize the language regarding the use of continuous FEM or approved regional methods (ARM) monitors to support sampling frequency flexibility for manual $PM_{2.5}$ samplers with the current language in 40 CFR 58.12(d)(1)(iii) that was revised as part of 2013 PM NAAQS final rule. Specifically, the phrase ''unless it is identified in the monitoring agency's annual monitoring network plan as not appropriate for comparison to the NAAQS and the EPA Regional Administrator has approved that the data from that monitor may be excluded from comparison to the NAAQS'' was proposed for appending to the current regulatory language to reflect the new process that was finalized in the 2013 PM NAAQS final rule that allows monitoring agencies to request that continuous $PM_{2.5}$ FEM data be excluded from NAAQS comparison based on technical criteria described in 40 CFR 58.11(e). We also proposed the addition of the phrase ''and the EPA Regional Administrator has approved that the data from that monitor may be excluded from comparison to the NAAQS'' to the revisions that were made with the 2013 PM NAAQS. This revision was proposed to clearly indicate that two distinct actions are necessary for the data from a continuous $PM_{2.5}$ FEM to be considered not comparable to the NAAQS; first, the identification of the relevant monitor(s) in an agency's annual monitoring network plan, and, second, the approval by the EPA Regional Administrator of that request to exclude data. The language used by the EPA in the relevant sections of 40 CFR 58.12 related to the initial request by monitoring agencies but did not specifically address the needed approval by the EPA.

No comments specifically addressed these editorial changes in regulatory language and they will be finalized as proposed.

Finally, the EPA proposed to clarify the applicability of statements in 40 CFR 58.12(d)(1)(ii) and (iii) that reference the relationship of sampling frequency to site design values. Specifically, we proposed clarifications and revisions affecting the following statements: (1) ''Required SLAMS stations whose measurements determine the design value for their area and that are within ±10 percent of the NAAQS; and all required sites where one or more 24-hour values have exceeded the NAAQS each year for a consecutive period of at least 3 years are required to maintain at least a 1-in-3 day sampling frequency,'' and (2) ''Required SLAMS stations whose measurements determine the 24-hour design value for their area and whose data are within ±5 percent of the level of the 24-hour $PM_{2.5}$ NAAQS must have a FRM or FEM operate on a daily schedule.'' These revisions were proposed to avoid confusion among monitoring agencies and Regional Offices concerning the applicability of the sampling frequency adjustments since design values are recalculated annually and, in some situations, such revised design values can either fall below the comparative criteria or rise above the criteria. To provide some clarity to this situation as well as to provide a framework where changes in sampling frequency occur on a more consistent and predictable basis, the EPA proposed that design value-driven sampling frequency changes be maintained for a minimum 3-year period once such a change is triggered. Additionally, such changes in sampling frequency would be required to be implemented no later than January 1 of the year that follows the recalculation and certification of a triggering design value.

A number of supportive comments were received on this specific issue from monitoring agencies. These comments ranged from unqualified support to more conditional support based on concerns related to funding levels and the overall burden of analyzing more $PM_{2.5}$ filters when sampling frequency is increased. One agency commented that the proposed change ''makes sense where the concentrations have reached a plateau or fluctuate back and forth from year to year.'' However, concern was noted about waiting for 3 years to decrease sampling frequency when design values are clearly trending downward. Another state agency generally agreed with the proposed approach but requested clarifying language that the same criteria that would require an increase in sampling frequency for a 3-year period due to an increase in design values would also allow a decrease in sampling frequency for a 3-year period if the corresponding site design value decreased below a threshold. Other commenters expressed concern about the associated resource burdens noting that their gravimetric laboratories are already operating at full capacity and that an increase from 1-in-3 day sampling to daily sampling would triple the number of filters to be weighed. Accordingly, these commenters requested that the EPA allow the affected design value sampler to drop back to a reduced sampling frequency as soon as a design value fell out of the specific range and not be required to wait for the proposed 3-year period. One commenter expressed concern that the provision could trigger daily sampling even if the higher values were caused by a rare or exceptional event, and requested that the proposed revision be omitted. Finally, one state monitoring

[8] *https://www.sdas.battelle.org/CSNAssessment/html/Default.html.*

agency expressed concern about the apparent deletion of PM_{10} monitoring requirements from 40 CFR 58.12, and also offered suggested revisions to the current requirements in 40 CFR 58.12(e).

The EPA notes the range of responses on this issue and acknowledges that in cases where the sampling frequency for a $PM_{2.5}$ sampler is increased, for example from 1-in-3 day to daily sampling, the associated burden, which includes field support and gravimetric lab support, would increase for a minimum period of 3 years based on the proposed change. After that 3-year period of increased sampling, the sampling frequency would be eligible to be reduced if the triggering design value was no longer in the specified range (*e.g.,* ±5 percent of the 24-hour $PM_{2.5}$ NAAQS). The EPA agrees that the treatment of sampling frequency in situations where a sampler is no longer in the specific triggering range after a 3-year period of increased sampling, should be analogous to the treatment of sampling frequency in situations where a sampler first enters into the specific triggering range, for purposes of providing predictability to monitoring agencies in terms of anticipating operational burden. In other words, where the sampling frequency is reduced at a sampler after a 3-year period of increased sampling frequency (for example, where the design value falls out of the ±5 percent range), that sampler should not be subject to an increased sampling frequency requirement for at least 3 years. With regard to the concern that an exceptional event could trigger the increased burden of operating a higher sampling frequency sampler, we believe that this is a plausible situation that deserves additional consideration. Rather than trying to account for this situation in this rule, however, we believe it is best dealt with in the context of the ongoing process of developing guidance and proposed revisions to the Exceptional Events rule.[9] Once those actions are finalized, the EPA will work with Regional Offices to clarify how to address this situation. On the related concern of a ''rare'' event triggering increased sampling frequency, the EPA notes that the form of the $PM_{2.5}$ NAAQS is intended to address such year-to-year variations such that design values should not be overly affected by ''rare'' occurrences of $PM_{2.5}$ concentrations in any given year. With regard to the comment indicating an apparent deletion of the PM_{10} sampling frequency requirements in 40 CFR 58.12(e), we note that such changes were not included as part of the proposal and those requirements remain.

The EPA believes that this proposed revision to sampling frequency procedures is a necessary clarification to the regulatory change that was finalized in 2006, and will provide a more predictable and statistically robust process for making design value driven changes in sampling frequency. Based on the unqualified and qualified supportive comments, we are finalizing the regulatory language as proposed. While we are mindful of the potential for added burden in cases where $PM_{2.5}$ samplers must move to a more frequent sampling frequency for a longer period of time based on this revision, we also note that the likelihood of such occurrences affecting monitoring agencies is relatively small. Based on an AQS retrieval conducted in August 2014, fewer than ten $PM_{2.5}$ monitors out of a pool of 980 FRM monitors were required to operate on a daily sampling frequency based on the rule provisions of 40 CFR 58.12(d)(1)(iii).[10] While this analysis is not predictive in nature, we believe the overall risk of increasing burden on monitoring programs is quite small and an acceptable consequence of providing a more specific way of implementing an important aspect of the sampling frequency requirements. Alternatively, as noted in the regulatory text, monitoring agencies have the option of installing a continuous $PM_{2.5}$ FEM monitor to satisfy this requirement and, thereby, avoid the consequence of handling an increased number of filters.

F. System Modification

The System Modification section pertains to the specific requirements that must be followed when monitoring agencies request changes to the SLAMS portion of their networks.

In the 2006 monitoring amendments, the EPA finalized a requirement in 40 CFR 58.14(a) for monitoring agencies to ''develop and implement a plan and schedule to modify the ambient air quality network that complies with the finding of the network assessments required every 5 years by 58.10(e).'' Since 2006, there has been confusion between the EPA and monitoring agencies as to whether a separate plan was required to be submitted by 40 CFR 58.14(a) relative to the annual monitoring network plan, with that separate plan devoted specifically to discussing the results of the 5-year network assessment. As explained in the monitoring proposal, the EPA did not intend for the submission of a distinct plan devoted specifically to the implementation of the 5-year network assessment. Accordingly, the EPA proposed to revise the regulatory language in 40 CFR 58.14(a) to clearly indicate that a separate plan is not needed to account for the findings of the 5-year network assessment, and that the information concerning the implementation of the 5-year assessment, referred to in the proposed regulatory language as a ''network modification plan,'' shall be submitted as part of the annual monitoring network plan that is due no later than the year after the network assessment is due.[11] According to the proposed schedule, the annual monitoring network plans that are due in 2016, 2021, etc., would contain the information referencing the network assessments.

A number of comments were received on this issue. Most of the commenters provided the perspective that the clarification in the regulatory text was useful but that additional clarification was needed to address how the phrase ''implement the findings'' was used in the language. Five of these commenters noted that states should only have to address those changes in the network assessments that are specifically required by regulation, and that the EPA should clarify that monitoring agencies have the flexibility to discuss what findings they intend to implement and which findings they do not intend to implement. Two commenters noted that monitoring agencies should not have to summarize the findings of their network assessment in a network modification plan that is due one year after the assessment, but rather should have the flexibility to address and implement those findings that are appropriate based on available resources and changing priorities over some period of time. Two commenters supported the proposed language without additional elaboration.

The EPA agrees with the comments requesting additional clarification. The intention of the proposed revision was to clarify the process for how and when monitoring agencies should deal with

[9] *http://www2.epa.gov/air-quality-analysis/treatment-data-influenced-exceptional-events#Proposed%20EE%20Rule.*

[10] Hanley, T. (2015). Assessment of $PM_{2.5}$ data to determine the number of sites that would be potentially required to increase their sample frequency to daily. Memorandum to the Docket, EPA–HQ–OAR–2013–0619.

[11] Monitoring agencies, at their discretion, could submit the network modification plan in the year that the assessment is due if sufficient feedback had been received. On balance, the EPA believes that the extra year following the completion of the network assessment would be valuable to assure a productive outcome from the assessment process.

the results from these important network assessments, not to imply that all the results should be implemented or were necessarily required. The network assessment requirements detailed in 40 CFR 58.10(d) reference a mix of required elements (*e.g.,* meeting the monitoring objectives of appendix D) as well as useful but non-required elements such as evaluation of new technologies and the evaluation of the impact on data users of site discontinuance. To the extent that the EPA used the phrase ''implements the findings of the network assessment'' in the proposed regulatory language of 40 CFR 58.14(a), the concern from monitoring agencies about specifying which results from the network assessment are required and not required is understandable. The EPA always intended that the results of the network assessments should be used as a flexible planning tool for informing the next 5 years of monitoring network operations, and the specificity being implied by the monitoring agency comments reflects a misreading of those intentions.[12] The EPA disagrees with the comments suggesting that a network modification plan is unnecessary. Such a requirement has been a part of the monitoring regulations since the inception of the network assessment, and having the network modification plan submitted as part of the annual monitoring network plan insures public involvement in a key process that occurs on a relatively infrequent basis.

To address the concerns noted above, the proposed regulatory language is being revised to replace ''implements'' with ''addresses,'' as follows: ''The state, or where appropriate local, agency shall develop a network modification plan and schedule to modify the ambient air quality monitoring network that addresses the findings of the network assessment required every 5 years by § 58.10(d).'' With this revision, the EPA is indicating that the network modification plan should reference or ''address'' the findings of the network assessment without the unintended implication that some of the findings are required network changes that must be implemented. The correct vehicle for the discussion of required elements that must be implemented is the annual monitoring network plan that is required to be submitted each year, as discussed earlier in section II.C of this preamble.

The EPA also proposed to revise an incorrect cross-reference in the current text of 40 CFR 58.14(a) in which the network assessment requirement is noted as being contained in 40 CFR 58.10(e) when the correct cross-reference is 40 CFR 58.10(d). One supportive comment addressed this issue, and the revision will be finalized as proposed.

G. Annual Air Monitoring Data Certification

The data certification requirement is intended to provide ambient air quality data users with an indication that all required validation and reporting steps have been completed, and that the certified data sets are now considered final and appropriate for all uses including the calculation of design values and the determination of NAAQS attainment status. Current requirements include the certification of data collected at all monitors at SLAMS and monitors at SPMs using FRM, FEM, or ARM methods. In practice, this requirement includes a very wide range of measurements that are not limited to criteria pollutants but also extend to non-criteria pollutant measurements at PAMS stations, meteorological measurements at PAMS and NCore stations, and $PM_{2.5}$ chemical speciation parameters.

The EPA proposed several changes in the data certification requirements to accomplish a streamlining of this important process. First, to support the focus on certification of criteria pollutant measurements, the EPA proposed to revise relevant sections of 40 CFR 58.15 to focus the requirement on FRM, FEM, and ARM monitors at SLAMS and at SPM stations rather than at all SLAMS, which also include PAMS and CSN measurements that may not utilize federally approved methods. Second, the EPA proposed that the required AQS reports be submitted to the Regional Administrator rather than through the Regional Administrator to the Administrator as is currently required. Finally, minor editorial changes were proposed in 40 CFR 58.15 to generalize the title of the official responsible for data certification (senior official versus senior air pollution control officer) and to remove an outdated reference to the former due date for the data certification letter (July 1 versus the current due date of May 1).

Seven commenters specifically addressed the proposed changes to data certification. Three monitoring agencies, one MJO, and one consulting firm were supportive of the changes. One of these commenters also noted that the data certification and QA report hosted on the AQS system, the AMP600 report, should be modified to provide more useful data certification flag recommendations for regions and states. Another of these supportive commenters also stated that the EPA should ensure that QA practices and responsibilities remain in place to validate PAMS and $PM_{2.5}$ chemical speciation data. A joint environmental group comment stated that the EPA had not provided a rational basis for the proposed changes, and that an inconsistency exists between proposing to retain the data certification process for criteria pollutants while stating that existing QA plans and procedures would be sufficient to validate non-criteria pollutant measurements. In this commenter's view, the data certification process, as it exists today, appears to delay the availability of data for use in computing criteria pollutant design values, so perhaps the agency should consider eliminating the process entirely if it is deemed unnecessary. Finally, one commenter asked that the EPA consider moving the data certification deadline from May 1 back to July 1, and also to consider not requiring chemical speciation data to be certified.

With regard to the adverse comment, the EPA notes that the proposed changes were made to protect the viability of the process in the face of a rapidly increasing volume of data subject to certification requirements versus the available resources at the monitoring agency and EPA level needed to meet the requirements and deadline. We continue to believe that the data certification process adds the greatest degree of value when focused on criteria pollutants that support the calculation of design values and the mandatory designations process. The review of design values occurs on an annual basis and there is a long-standing practice of waiting for criteria pollutant data to be certified before such calculations are completed.[13] This process provides a basis for documenting that a state's review of their data is complete and that the data are considered final for key purposes such as comparison to the NAAQS. The same annual pattern of regular data usage and oversight does not exist for non-criteria pollutants such as PAMS, $PM_{2.5}$ chemical species, and air toxics data, and these data are not directly compared to the NAAQS. Therefore, the EPA believes that the applicability and visibility of the data certification process for these measurements is less critical. As stated in the proposal, there are existing standardized procedures and QA documents that provide a framework for assuring the quality of

[12] See *http://www.epa.gov/ttn/amtic/files/2014conference/monnaweinstock.pdf.*

[13] See 40 CFR part 50, appendix N, section 3.0(a) as revised on January 15, 2013 (78 FR 3278).

non-criteria pollutants,[14] and we believe that the resulting quality of such data will not be compromised by their removal from the data certification process. With regard to the comment requesting that the data certification deadline be pushed back to July 1, the EPA notes that this deadline was not proposed for revision and, therefore, is not being considered in this final rulemaking. With regard to the comment about excluding chemical speciation data from the certification process, the EPA notes that this procedural change would occur as a result of the proposed revisions as explained above.

After reviewing the comments, the EPA is finalizing the changes to data certification requirements as proposed. The EPA agrees with commenters that efforts to improve the validation procedures for non-criteria data should continue and the agency has invested in revised tools, such as the recently launched Data Analysis and Reporting Tool (DART) web resource that can assist monitoring agencies with the validation of data including PAMS and air toxics data.[15] Improvements are also being made to the AMP600 report to improve the utility of the program for generating recommended certification flags for consideration by monitoring agencies and EPA Regional Offices during the annual review process.

H. Data Submittal and Archiving Requirements

The requirements described in 40 CFR 58.16 address the specific measurements that must be reported to AQS as well as the relevant schedule for doing so. Required measurements include criteria pollutants in support of NAAQS monitoring objectives and public reporting; specific ozone (O_3) and $PM_{2.5}$ precursor measurements such as those obtained at PAMS, NCore, and CSN stations; selected meteorological measurements at PAMS and NCore stations; and associated QA data that support the assessment of precision and bias. In 1997, an additional set of required supplemental measurements was added to 40 CFR 58.16 in support of the newly promulgated FRM for $PM_{2.5}$, described in 40 CFR part 50, appendix L. In the 2006 monitoring amendments, many of these supplemental measurements were removed from the requirements based on the EPA's confidence that the $PM_{2.5}$ FRM was meeting data quality objectives (see 71 FR 2748). At that time, reporting requirements were retained for average daily ambient temperature and average daily ambient pressure, as well as any applicable sampler flags, in addition to $PM_{2.5}$ mass and field blank mass.

The EPA believes that it is no longer necessary to require agencies to report the average daily temperature and average daily pressure from manual $PM_{2.5}$ samplers, given the long-standing experience with the FRM and the ubiquitous availability of meteorological data, and these specific AQS reporting requirements were proposed for removal in the monitoring proposal. The EPA also proposed to remove similar language referenced elsewhere in 40 CFR 58.16 that pertains to measurements at Pb sites as well as to other average temperature and average pressure measurements recorded by samplers or from nearby airports. For the reasons noted above, the EPA believes that meteorological data are more than adequately available from a number of sources, and that the removal of specific requirements for such data to be reported to AQS represents an opportunity for burden reduction. The EPA notes that the requirement to report specific meteorological data for NCore and PAMS stations remains unchanged given the importance of having on-site meteorological data to correlate with $PM_{2.5}$ and O_3 precursor measurements. The EPA also proposed a change to the data reporting schedule described in 40 CFR 58.16(b) and (d) to provide additional flexibility for reporting $PM_{2.5}$ chemical speciation data measured at CSN stations. Specifically, we proposed that such data be required to be reported to AQS within 6 months following the end of each quarterly reporting period, as is presently required for certain PAMS measurements such as volatile organic compounds. This change would provide an additional 90 days for $PM_{2.5}$ chemical speciation data to be reported compared with the current requirement of reporting 90 days after the end of each quarterly reporting period. This change was proposed to provide both the EPA and monitoring agencies with potential data reporting flexibility as technological and procedural revisions are considered for the national analytical frameworks that support the CSN network.

Seven commenters specifically addressed the proposed changes to data submittal and archiving requirements. One state monitoring agency, one MJO, and one consulting firm were supportive of all of the proposed changes in this rule section, with the consulting firm comment also noting that average temperature and pressure information should still be archived within monitoring programs for data validation purposes. Two state monitoring agencies expressed concerns about the proposed change in the reporting deadline for $PM_{2.5}$ chemical speciation data by noting the impacts on their usage of the data, one agency noting that efforts to submit timely exceptional event demonstrations would be impacted by the longer period allowed for reporting data, and the other state agency noting that their use of the speciation data to validate $PM_{2.5}$ FRM and ion (*e.g.,* sulfate, nitrate) data would be impacted.

With specific regard to the impact on state submissions of exceptional event data exclusion determinations, the EPA understands the impact of the additional 90-day delay in gaining access to $PM_{2.5}$ chemical speciation data, but also notes that the relatively long timelines that currently exist within the exceptional events rule framework can typically accommodate an additional delay of 90 days without significant impact on the submitting agency. Accordingly, we do not believe that the additional 90 days being proposed for reporting $PM_{2.5}$ chemical speciation data should materially impact the ability of submitters to develop exceptional event data exclusion determinations within allowable timeframes.[16] Concerning the comment relating to the availability of $PM_{2.5}$ chemical speciation data to QA practices for $PM_{2.5}$ FRM data, the EPA acknowledges the comparative value of such data but believes that the existing availability of $PM_{2.5}$ sampler diagnostic records, collocated FRM data, as well as the potential availability of continuous monitoring data from collocated monitors and/or nearby sites, should be more than sufficient to validate $PM_{2.5}$ FRM data in the absence of more timely reported speciation data.

In consideration of the comments noted above, the EPA is finalizing the changes to data submittal and archiving requirements as proposed.

I. Network Design Criteria (Appendix D)

Appendix D to part 58 contains important information about ambient monitoring objectives, site types, spatial scales, as well as other general and specific minimum requirements

[14] See *http://www.epa.gov/ttn/amtic/specguid.html* and *http://www.epa.gov/ttn/amtic/airtoxqa.html*.

[15] See *http://www.epa.gov/ttn/amtic/files/2014conference/mondatdewinter.pdf* or access DART at *http://www.airnowtech.org/dart/dartwelcome.cfm* (username and password required).

[16] The EPA expects chemical speciation data to be reported within 30 days of $PM_{2.5}$ mass data based on the revised analytical framework that took effect in late 2015.

concerning network size and design criteria.

The EPA proposed two changes that affect the required suite of measurements in the NCore network. This multi-pollutant network became operational on January 1, 2011, and includes approximately 80 stations that are located in both urban and rural areas.[17]

The EPA proposed a minor change to section 3 of appendix D to part 58, the design criteria for NCore sites, specifically, the deletion of the requirement to measure speciated $PM_{10-2.5}$ from the list of measurements in section 3(b). An identical revision was finalized in the text of 40 CFR 58.16(a) in the 2013 p.m. NAAQS final rule (see 78 FR 3244). During this process, the EPA inadvertently failed to complete a similar change that was required in the language of section 3 of appendix D. Accordingly we proposed this change to align the NCore monitoring requirements between the two sections noted above.

The EPA also proposed to delete the requirement to measure Pb at urban NCore sites, either as Pb in Total Suspended Particles (Pb-TSP) or as Pb-PM_{10}. This requirement was finalized as part of the reconsideration of Pb monitoring requirements that occurred in 2010 (see 75 FR 81126). Since that time, non-source oriented Pb data has been measured at 50 urban NCore sites, with the majority of sites having already collected at least 2 years of data. In all cases, valid ambient Pb readings have been low, with maximum 3-month rolling averages typically reading around 0.01 micrograms per cubic meter as compared to the NAAQS level of 0.15 micrograms per cubic meter.[18] This is an expected result given the elimination of Pb from gasoline and the refocusing of the ambient network to characterize emissions at sites that have been placed in relative close proximity to the remaining industrial sources around a given threshold. We expect the vast majority of non-source sites to have the 3 years of data necessary to calculate a design value following the completion of monitoring in 2015. Given the uniformly low readings being measured at these NCore sites, we believe it is appropriate to consider eliminating this requirement. As noted in the associated docket memo, non-source oriented Pb data will continue to be measured (as Pb-PM_{10}) at the 27 National Air Toxics Trends Sites (NATTS) and at hundreds of $PM_{2.5}$ speciation stations that comprise the CSN and IMPROVE networks.

Accordingly, the EPA proposed to delete the requirement to monitor for non-source oriented Pb at NCore sites from appendix D of 40 CFR part 58.[19] Given the requirement to collect a minimum of 3 years of Pb data in order to support the calculation of design values, the EPA proposed that monitoring agencies would be able to request permission to discontinue non-source oriented monitoring following the collection of at least 3 years of data at each urban NCore site.[20]

Eight commenters specifically addressed the proposed changes to network design criteria. Five state or local monitoring agencies, one MJO, and one consulting firm were supportive of all of the proposed changes in this appendix, with several of the monitoring agencies characterizing their measurements of Pb at urban NCore sites as either ''extremely low'' or between 3 percent or 5 to 7 percent of the Pb NAAQS. One joint environmental group comment disagreed with the proposed change to Pb monitoring, noting the perspective that there is no safe level of Pb and that data even well below the level of the NAAQS could assist communities with finding ways of reducing Pb exposure and that such data would also assist researchers investigating the risks of Pb exposure for children. This commenter also noted that the EPA might propose to lower the Pb NAAQS in an upcoming rulemaking that was pending at the time when the comment was submitted.

With regard to the adverse comment, the EPA notes in the referenced docket memo that well over 300 monitoring sites for Pb would remain in operation following the proposed termination of monitoring at urban NCore sites. These remaining sites would provide characterization of Pb in TSP, PM_{10}, and $PM_{2.5}$ in a variety of urban and rural locations including source oriented sites, neighborhood/community locations, and background areas. We also note that the EPA retains the authority to require additional Pb monitoring as determined by Regional Administrators per the rule language in appendix D, section 4.5(c). With regard to the reference to the EPA's upcoming decision on the Pb NAAQS, we note that on December 19, 2014, based on a review of the full body of evidence, the EPA proposed to retain, without revision, the current NAAQS of 0.15 micrograms per cubic meter (as a 3-month average in TSP) as requisite to protect public health and welfare.[21]

In consideration of the supportive comments noted above, the EPA is finalizing the changes to network design criteria as proposed. With specific regard to Pb monitoring at urban NCore sites, monitoring agencies should request permission from the EPA Regional Administrator to discontinue non-source oriented monitoring following the collection of at least 3 years of complete data at each affected site. Monitoring agencies should work closely with their respective EPA Regional Offices to ensure review and coordination of these changes to the network and inclusion of such changes in annual monitoring network plans.

III. Amendments to Quality Assurance Requirements

A. Quality Assurance Requirements for Monitors Used in Evaluations for National Ambient Air Quality Standards—Appendix A

1. General Information

The following changes to monitoring requirements relate to appendix A to part 58. Changes that affect the overall appendix are discussed in this section of the preamble while changes specific to the various sections of the appendix will be addressed in subsequent sections of the preamble. The EPA notes that the entire regulatory text section for appendix A will be reprinted since this section is being reorganized for clarity as well as being selectively revised as described in detail below. Additionally, although the EPA proposed a new appendix B to apply to PSD monitors, much of the proposed content of appendix B was taken directly from the existing requirements for these monitors set forth in appendix A. It should be noted that a number of provisions from appendix A were reprinted in the regulatory text for appendix B solely for clarity, to assist the public in understanding the changes being proposed. The EPA did not solicit comment on those provisions and did not make any changes to those provisions in this rulemaking.

[17] See *https://www3.epa.gov/ttn/amtic/ncore.html* for more information.

[18] See supporting information for reconsideration of existing requirements to monitor for lead at urban NCore site, Kevin Cavender, Docket number EPA–HQ–OAR–2013–0619, *http://www.regulations.gov/#!documentDetail;D=EPA–HQ–OAR–2013–0619–0002*.

[19] Specific revisions are proposed in 40 CFR part 58, appendix D, section 3(b) and sections 4.5(b) and 4.5(c).

[20] The EPA will review requests for shutdown under the provisions of 40 CFR 58.14. Although the EPA anticipates that these non-source oriented monitors will have design values well below the NAAQS and will be eligible to be discontinued after 3 years of data have been collected, in the event that a monitor records levels approaching the NAAQS, it may not qualify to be discontinued.

[21] *http://www.epa.gov/airquality/lead/actions.html#dec2014*.

The QA requirements in appendix A have been developed for measuring the criteria pollutants of O_3, NO_2, sulfur dioxide (SO_2), CO, Pb and PM (PM_{10} and $PM_{2.5}$), and are minimum requirements for monitoring these ambient air pollutants for use in NAAQS attainment demonstrations. To emphasize the objective of this appendix, the EPA proposed to change the title of appendix A to ''Quality Assurance Requirements for Monitors used in Evaluations of National Ambient Air Quality Standards,'' and remove the terms SLAMS and SPMs from the title. We do, however, in the applicability paragraph, indicate that any monitor identified as SLAMS must meet the appendix A criteria in order to avoid any confusion about SLAMS monitors measuring criteria pollutants. Special purpose monitors may in fact be monitoring for a criteria pollutant for other objectives besides making comparisons to the NAAQS. Therefore, appendix A clarifies in the title and the applicability section that the QA requirements specified in this appendix are for criteria pollutant monitors that are designated, through the Part 58 ambient air regulations and monitoring organization annual monitoring network plans, as eligible to be used for NAAQS evaluation purposes. The applicability section also provides a reporting mechanism in AQS to identify any criteria pollutant monitors that are not used for NAAQS evaluations. The criteria pollutants identified for NAAQS exclusion will require review and approval by the EPA Regional Offices and will increase transparency and efficiencies in the NAAQS designation, data quality evaluation and data certification processes. There were no adverse comments to the change in the title and, therefore, the title will be changed as proposed.

The previous appendix A regulation had separate sections for automated (continuous) and manual method types. The EPA proposed to reformat the document by pollutant rather than by method type. The four gaseous pollutants (CO, NO_2, SO_2 and O_3) will be contained in one section since the quality control (QC) requirements are very similar, and separate sections will be provided for PM_{10}, $PM_{2.5}$, and Pb.

The EPA received one supportive comment from a consulting firm made on the proposed reformatting and no adverse comments. Therefore, appendix A and appendix B will be reformatted as proposed.

In the 2006 monitoring rule revisions, the PSD QA requirements, which were previously in appendix B, were added to appendix A and appendix B was reserved. The PSD requirements, in most cases, mimicked appendix A in structure but because PSD monitoring is often operated only for a period of 1 year, some of the frequencies of implementation of the PSD requirements are higher than the appendix A requirements. In addition, the agencies governing the implementation, assessment and approval of the QA requirements are different for PSD and ambient air monitoring for NAAQS decisions (*i.e.,* the EPA Regions for appendix A versus PSD reviewing authorities for PSD). The combined regulations have caused confusion among monitoring organizations and those implementing PSD requirements, so the EPA proposed that the PSD requirements be moved back to a separate appendix B. This change would also provide more flexibility for revision if changes in either appendix are needed.

The EPA received one supportive comment to adopt this change and received no adverse comments. Therefore, PSD QA requirements will be placed into appendix B as proposed.

Finally, the EPA proposed that appendix A emphasize the use of PQAO and moved the definition and explanation to the beginning of the regulation in order to ensure that the application and use of PQAO in appendix A is clearly understood. The definition for PQAO was not proposed for change. Since the PQAO can be a consolidation of a number of local monitoring organizations, the EPA proposed to add a sentence clarifying that the agency identified as the PQAO (usually the state agency) will be responsible for overseeing that the appendix A requirements are being met by all local agencies within the PQAO. Current appendix A regulation requires PQAOs to be approved by the EPA Regions during network reviews or audits. The EPA believes this approval can occur at any time and proposed to eliminate wording that suggests that PQAO approvals can only occur during events like network reviews or audits.

The EPA received one comment supporting the clarifying language suggesting it will reduce unnecessary work on the part of the monitoring agencies by combining and consolidating QA/QC activities and also fostering a unified approach to air monitoring across an entire state's PQAO. The EPA received no adverse comments. Therefore, the EPA is finalizing the language as proposed.

2. Quality System Requirements

The EPA proposed to remove the QA requirements for $PM_{10-2.5}$ (see current sections 3.2.6, 3.2.8, 3.3.6, 3.3.8, 4.3). Appendix A has traditionally been used to describe the QA requirements of the criteria pollutants used in making NAAQS attainment decisions. While the part 58 Ambient Air Monitoring regulation requires monitoring for the CSN, PAMS, and total oxides of nitrogen (NO_y) for NCore, the QA requirements for these networks are found in technical assistance documents and not in appendix A. In 2006, the EPA proposed a $PM_{10-2.5}$ NAAQS along with requisite QA requirements in appendix A. While the $PM_{10-2.5}$ NAAQS was not promulgated, $PM_{10-2.5}$ monitoring was required to be performed at NCore sites and the EPA proposed requisite QA requirements in appendix A. Some of the PM requirements, like collocation for precision and the performance evaluation programs for bias, are accomplished on a percentage of monitoring sites within a PQAO. For example, collocated sampling for $PM_{2.5}$ and PM_{10} is required at approximately 15 percent of the monitoring sites within a PQAO. Since virtually every NCore site is the responsibility of a different PQAO, the appendix A requirements for $PM_{10-2.5}$, if implemented at the PQAO level, would have been required to be implemented at almost every NCore site, which would have been expensive and an unintended burden. Therefore, the EPA required the implementation of the $PM_{10-2.5}$ QC requirements at a national level and worked with the EPA Regions and monitoring organizations to identify the sites that would implement the requirements. The implementation of the $PM_{10-2.5}$ QC requirements at NCore sites fundamentally changed how QC is implemented in appendix A and has been a cause of confusion. Since $PM_{10-2.5}$ is not a NAAQS pollutant and the QC requirements cannot be cost-effectively implemented at a PQAO level, the EPA proposed to eliminate the $PM_{10-2.5}$ requirements including flow rate verifications, semi-annual flow rate audits, collocated sampling procedures, and the $PM_{10-2.5}$ Performance Evaluation Program (PEP). Similar to the technical assistance documents associated for the CSN [22] and PAMS [23] networks, the EPA will develop QA guidance for the $PM_{10-2.5}$ network which will afford more flexibility for implementation and revision of QC activities for $PM_{10-2.5}$.

The EPA received comments from a state and a consulting firm in support of

[22] See *http://www.epa.gov/ttn/amtic/specguid.html* for CSN quality assurance project plan.

[23] See *http://www.epa.gov/ttn/amtic/pamsguidance.html* for PAMS technical assistance document.

the removal of these requirements and no adverse comments. Therefore, the EPA will remove the $PM_{10-2.5}$ QA requirements as proposed.

The EPA proposed that the QA Pb requirements of collocated sampling (see current section 3.3.4.3) and Pb performance evaluation procedures (see current section 3.3.4.4) for non-source oriented NCore sites be eliminated. The 2010 Pb rule in 40 CFR part 58, appendix D, section 4.5(b), added a requirement to conduct non-source oriented Pb monitoring at each NCore site in a core based statistical area (CBSA) with a population of 500,000 or more. This requirement had some monitoring organizations implementing Pb monitoring at only their NCore sites. Since the appendix A requirements are focused on PQAOs, the QC requirements would increase at PQAOs who were required to implement Pb monitoring at their NCore site. Similar to the $PM_{10-2.5}$ QA requirements, the requirement for Pb at NCore sites forced the EPA away from a focus on PQAOs to working with the EPA Regions and monitoring organizations for implementation of the Pb-PEP at NCore sites at national levels. Therefore, the EPA proposed to eliminate the collocation requirement and the Pb-PEP requirements at NCore sites while retaining the requirements for flow rate verifications and flow rate audits, which do not require additional monitors or independent sampling and analysis. Similar to the CSN and PAMS programs, the EPA will develop QA guidance for Pb monitoring in the NCore network, which will afford more flexibility for change/revision to accommodate Pb monitoring at non-source oriented NCore sites. Additionally, the EPA proposed to delete the requirement to measure Pb at these specific NCore sites, either as Pb-TSP or as Pb-PM_{10} (see section II.I). Such a revision would eliminate the need for any associated QA requirements including collocation, Pb-PEP or any QC requirements for these monitors.

The EPA received two state comments and one MJO comment in support of the removal of this requirement and no adverse comments. Therefore, the EPA will remove the Pb QA requirements at non-source oriented NCore sites as proposed. As noted earlier in section II.I, the EPA is also finalizing the proposed deletion of Pb monitoring requirements at NCore sites from appendix D.

The EPA proposed that quality management plan (QMP) (current section 2.1.1) and quality assurance project plan (QAPP) (current section 2.1.2) submission and approval dates be reported by monitoring organizations and the EPA. This will allow for timely and accurate reporting of this information. From 2007 to 2011, the EPA tracked the submission and approval of QMPs and QAPPs by polling the EPA Regions each year and updating a spreadsheet that was posted on the Ambient Monitoring Technical Information Center (AMTIC) Web site. The development of the annual spreadsheet was time-consuming on the part of monitoring organizations and the EPA and, due to polling delays, took a significant amount of time to assemble a final version for posting. It is expected that simplified reporting by monitoring organizations and EPA to AQS will reduce entry errors and the burden of incorporating this information into annual spreadsheets, and increase transparency of this important quality system documentation. In order to reduce the initial burden of this data entry activity, the EPA populated AQS with the last set of updated QMP and QAPP data from the 2011 listing. Monitoring organizations will need to update AQS only when submitting new or revised versions of QAPP or QMPs (one or two fields) and the EPA can then add approval dates.

The EPA received one state comment in support of this proposal, and two states, a consulting firm and one MJO commented expressing concern. One state commenter mentioned that the preamble indicates that the monitoring organizations would be responsible for submitting the dates associated with QMP and QAPP submittals and approvals and, if this was the intent of the proposed rule, AQS must be modified to allow monitoring organizations the ability to enter this data. The commenter also mentioned that the EPA's AQS web application only allows monitoring organizations to view QAPP and QMP dates, but the functionality to enter or revise those dates is unavailable. The commenter mentioned other issues related to the current functionality of the system but not a disagreement with the proposed requirement to report the data.

The MJO commenter mentioned that reporting to AQS was an unnecessary burden on state air monitoring agencies because the EPA Regional Offices receive these reports and the information is available to the public on the EPA AMTIC Web site. The consulting firm did not understand how shifting this burden to ''monitoring organizations'' would relieve the reporting burden on any organization other than the EPA.

As mentioned in the proposal, the approach of reporting QAPP and QMP information to AMTIC was not only time-consuming for monitoring organizations but also for EPA who would work for 2 to 3 months to pull together this annual report. By reporting the information directly to AQS, the monitoring organization's requirements are also reduced since they do not need to be polled every year to gather this information, review it for accuracy and completeness, and transmit it to the EPA Regional Office. The monitoring organizations will only need to report updates to AQS when they occur and will not be burdened with this request/review process every year.

In regard to the comment related to the current functionality of AQS, which did not allow agency reporting of the QMP/QAPP information, the EPA notes that AQS is now available for monitoring organizations, and EPA Regional Offices, to report this information that has currently been reported and revised by the EPA. Therefore, rather than posting a static table on AMTIC each year (which could change through-out the time period between updates), AMTIC can host a link to the most up-to-date information in AQS, which is a much more efficient method than the cumbersome annual collection and reporting method described above. Therefore, the EPA is finalizing the requirement as proposed.

The EPA proposed that if a PQAO or monitoring organization has been delegated authority to review and approve their QAPP, an electronic copy must be submitted to the EPA Regional Office at the time it is submitted to the PQAO/monitoring organization's QAPP approving authority. Submission of an electronic version to the EPA at the time of completion is not considered an added burden on the monitoring organization because such submission is already a standard practice as part of the review process for technical systems audits (TSA).

The EPA did not receive any supporting or adverse comments to this proposal, but did receive a state comment suggesting that a copy of all approved QAPP's be submitted annually rather than at the time when a QAPP is submitted or approved. The EPA notes that during recent systems audits, EPA auditors have found language in approved QAPPs that do not meet ambient air regulatory requirements. Non-conformance with a regulatory requirement can lead to data invalidation. In an effort to identify any non-conformance with regulatory requirements as early as possible, especially with monitoring organizations that have been delegated responsibility to approve their own

QAPPs, the EPA believes it is important to have the opportunity to review these documents as early as possible to eliminate potential data invalidation issues. Therefore, the EPA is finalizing this language as proposed.

In the QAPP requirement language, the EPA proposed to clarify that the QAPP include a list of sites and monitors associated with the QAPP.

The EPA received a state comment that considered it a burden to update the QAPP every time a site or monitor is changed or is added. The commenter suggested adding that this information can be referenced in other publicly available documents. Since this section allows standard operating procedures to be referenced in the QAPP, the EPA will also allow the referencing of monitors and sites.

The requirement to identify the sites/monitors in a QAPP is a standard QAPP requirement and is why it is included in the regulation. However, the QAPP can refer to an official table that is updated annually that may be on a Web site or other official documentation (*e.g.,* annual network plan). In addition, if the QAPP does contain this information, an addendum to the QAPP modifying this information (with reference to the QAPP) can be accomplished without having to physically edit the document each time a monitoring site is added because the addition of the site does not affect how the quality system is implemented.

The EPA is finalizing the requirement as proposed, but is also clarifying that sites and monitors may be allowed to be referenced from other up-to-date sources.

The EPA proposed to add some clarifying language to the section describing the National Performance Evaluation Program (NPEP) (current section 2.4) explaining self-implementation of the performance evaluation by the monitoring organization. The clarification also adds the definition of ''independent assessment'' which is included in the $PM_{2.5}$-PEP, Pb-PEP and National Performance Audit Program (NPAP) QAPPs, and is included in the self-implementation memo sent to the monitoring organizations on an annual basis and posted on the AMTIC Web site.[24] The clarification codifies in regulation what was in guidance, and provides a better reference for this information in addition to the annual memo sent to the monitoring organizations.

[24] See *http://www.epa.gov/ttn/amtic/npepqa.html.*

The EPA received one state comment in support of the addition of the independent assessment definition and one state comment noting concern.

The state comment of concern included a reference to the NPAP revisions that are proposed below (section 3.1.3) and does not appear to be related to the actual definition that was proposed in this section. Further, we note that the state that made the comment qualifies as eligible to conduct an ''independent assessment'' under the current definition that was proposed and has been defined in this way in annual self-implementation decision memorandums that have been sent to monitoring organizations since 2008. This definition has not changed and was expected to be achieved by monitoring organizations in order to self-implement the various performance evaluations defined in this section. Therefore, the EPA is finalizing the requirement as proposed.

The EPA proposed to add clarifying language to the TSA section (current section 2.4). As described in more detail below, the current TSA requirements are clearly intended to be performed at the monitoring organization level.

The EPA proposed a TSA frequency of 3 years for each PQAO, but included language that if a PQAO is made up of a number of monitoring organizations, all monitoring organizations within the PQAO should be audited within 6 years. This proposed language maintains the 3 year TSA requirement as it applies to PQAOs but provided additional flexibility for the EPA Regions to audit every monitoring organization within the PQAO every 6 years. This revision was made to address logistical concerns at the EPA Regions, particularly for those Regions with very large PQAOs composed of many monitoring organizations. In the EPA's view, the proposed revision did not materially affect the burden on monitoring organizations.

The EPA received one state comment supporting the proposed revision as written, one comment by a joint environmental organization suggesting that we maintain the current requirement to audit each monitoring organization on a 3-year basis, and two state comments that suggested that the proposed revision was a burden to monitoring organizations.

The comment from the joint environmental organization expressed concern with the potential for reduced frequency of the TSAs for monitoring organizations in consolidated PQAOs (proposed 6-year frequency versus current 3-year frequency). The commenter believed such a change could seriously jeopardize implementation of the Act and threaten public health by delaying NAAQS decisions. The commenter cited examples of recent invalidation of $PM_{2.5}$ data that were based on findings from TSAs. In their view, delaying audit frequencies to once every 6 years (for a monitoring organization) raises the risk of even greater delay and disruption of nonattainment designations in areas that are violating NAAQS and have data quality issues at the pertinent monitoring organizations.

Two commenters from state agencies felt that the proposed language would treat these monitoring organizations (within a PQAO) as individual entities, causing an increase in the number of TSAs and difficulty in ensuring consistency among monitoring organizations within the PQAO, and would disrupt monitoring organizations with the scheduling of these audits. The PQAO staff would be required to oversee the changes throughout the monitoring organizations, participate in each of the TSAs, track all corrective actions, verify implementation, and ensure consistency of implementation across all monitoring organizations.

Commenters who were concerned with the proposed language to audit individual monitoring organizations within a PQAO may have been interpreting the current and earlier appendix A requirements somewhat differently than the original intent of the EPA. Since 1996, the TSA language in appendix A has been associated with auditing monitoring agencies or monitoring organizations, not PQAOs (note—the PQAO term was promulgated in 2006). For additional context, the following rule excerpts provide a chronological history of the TSA language in appendix A.

Prior to 1998: ''*Agencies operating SLAMS network stations shall be subject to annual EPA systems audits of their ambient air monitoring program and are required to participate in EPA's National Performance Audit Program.''*

1998: ''*Systems audits of the ambient air monitoring programs of agencies operating SLAMS shall be conducted at least every 3 years by the appropriate EPA Regional Office.''*

2005: ''*Systems audits of the ambient air monitoring programs of agencies operating SLAMS shall be conducted at least every 3 years by the appropriate Regional Office.''*

2006–2014 (prior to this proposed change): ''*Technical systems audits of each ambient air monitoring organization shall be conducted at least every 3 years by the appropriate EPA*

Regional Office and reported to the AQS.''

The EPA notes that the current definition (40 CFR 58.1) for a monitoring agency (prior to this proposal) was defined as ''a state or local agency responsible for meeting the requirements of this part.'' Monitoring organization was defined as a ''state, local, or other monitoring organization responsible for operating a monitoring site for which the quality assurance regulations apply.'' Neither definition described any consolidation of agencies into a PQAO; therefore, individual monitoring agencies or organizations were to receive a TSA by the EPA Region annually prior to 1998 and every 3 years after 1998.

As indicated by one of the commenters who suggested that the proposed language would treat monitoring organizations as individual entities, the TSA language was, in fact, defined to treat the monitoring agencies as individual entities. The value of this approach has been reaffirmed by recent TSAs where Regional Office auditors have found that monitoring organizations within consolidated PQAOs, in some cases, did not operate consistent quality systems.

A commenter expressing concern about the proposed revision made the point that all monitoring organizations covered under the umbrella of the PQAO's quality system would have to make changes in their operation each time a TSA at any of the monitoring organizations indicates an issue with that monitoring organization's quality system. This comment reflects a concern (and a tacit acknowledgement) that monitoring organizations within a PQAO do not necessarily implement a consistent quality system and need to be audited at some frequency. The commenter is correct and the EPA agrees that an issue identified by a TSA at one monitoring organization within the PQAO should be reviewed by the PQAO to determine if corrective action should be instituted for all monitoring organizations operating in the PQAO. That is the specific concern that has driven the EPA's regulations to consistently require TSAs at the monitoring organization level. The proposed TSA language provides for this review of the PQAO every 3 years and of all monitoring organizations within the PQAO within 6 years.

A state agency commenter was also concerned that TSAs could affect the data certification process. The commenter was concerned that EPA concurrence with a PQAO's data certification could be prohibited due to the lack of a TSA within the appropriate time frame. The EPA notes that TSA completeness requirements are reported on certification reports but do not affect the concurrence process itself and, therefore, do not penalize the PQAO if the TSA is not performed at the required frequency.

In response to the comment from the joint environmental organization and based on the recent findings in the TSAs,[25] the EPA Regions are providing more scrutiny on the PQAO requirements to ensure that monitoring organizations consolidated in PQAOs develop and document consistent quality practices. The EPA Headquarters and Regions are working together to develop a more consistent TSA process based on ''lessons learned'' from the $PM_{2.5}$ TSAs findings identified in the joint environmental organization comment. In addition, Regions are scrutinizing PQAO quality systems to ensure a level of QA consistency of monitoring organizations within a PQAO and, where there are issues, either taking corrective actions or suggesting that monitoring organizations within a PQAO disaggregate. The EPA has also seen PQAOs developing better documents and training for monitoring organizations within PQAOs to improve quality system consistency. Based on the information presented above, the EPA believes that the proposal to allow monitoring organizations within a PQAO to be audited within a 6-year period is reasonable and is finalizing the requirement as proposed.

In summary, the revised regulation specifies that EPA Regional Offices conduct TSAs of every PQAO at a 3-year frequency and that they should also perform a TSA on all monitoring organizations within the PQAO within 6 years. Where resources permit, the EPA encourages the adoption of the practice of some PQAOs to perform their own agency-specific TSAs and monitoring site visits on member monitoring agencies in the intervening years between required EPA Regional Office TSAs. Such visits can help to proactively identify potential QA deficiencies before situations involving long-term data loss occur and can also serve to assure uniformity in procedures across PQAOs through periods of changing personnel, equipment, or EPA requirements.

The EPA proposed to require monitoring organizations to complete an annual survey for the Ambient Air Protocol Gas Verification Program (AA–PGVP) (current section 2.6.1). Since 2009, the EPA has had a separate information collection request [26] requiring monitoring organizations to complete an annual survey of the producers that supply their gas standards (for calibrations and QC) in order to be able to select standards from these producers for verification. The survey generally takes less than 10 minutes to complete. The EPA proposed to add the requirement to complete the survey to appendix A.

The EPA received one consulting firm comment suggesting that entry of data in the annual survey was a modest burden and another state comment of support without additional comment. There were no adverse comments on completing the annual survey. Therefore, the EPA is finalizing the language as proposed.

In addition, the EPA proposed to add language that monitoring organizations participate, at the request of the EPA, in the AA–PGVP by sending a gas standard to one of the verification laboratories no more frequently than every 5 years. Since many monitoring organizations already volunteer to send in cylinders, this proposed new requirement is not expected to materially affect most agencies and will not affect those agencies that do not run gaseous ambient air monitors and, therefore, do not use gas standards.

The EPA received three state comments supporting and one MJO and two state comments expressing concern about this aspect of the AA–PGVP requirement. The supportive responses included one organization already participating in the program and another that mentioned that the independent verification of cylinder contents has value for monitoring groups especially with respect to the lower target gas concentrations now employed in QA procedures. A third response supported the action with no additional comments. Comments expressing concern about the proposal were related to the extra cost associated with shipping a cylinder to the verification laboratory and the Department of Transportation (DOT) training required for shipping the cylinder. One commenter mentioned that the organizations are already required to use traceable or certified gases and another suggested that the EPA could also consider working with the standard gas vendors directly, potentially through a federally funded gas certification and verification program. A commenter suggested the

[25] McCabe, Janet G. (2014). Particle Pollution Quality Assurance. Memorandum to the Docket, EPA–HQ–OAR–2013.

[26] See *http://www.reginfo.gov/public/Forward?SearchTarget=PRA&textfield=ambient+air+protocol+gas.*

requirement is resource intensive because additional standard gases will need to be maintained for use while the audited cylinder is not in use.

By way of background relating to the genesis of the AA–PGVP, the EPA notes that the Office of Research and Development (ORD) operated a protocol gas audit program that was discontinued in 1997. In the mid-2000 timeframe, the EPA received a number of comments from monitoring organizations that the program was needed and the current program (implemented in 2010) was created based on those comments. The monitoring organizations were concerned that they were receiving cylinders that were not meeting the protocol gas specifications even though the producers, as one commenter mentioned, are required to use traceable or certified gases. Information from a 2009 Office of Inspector General report indicated some failures to meet protocol gas requirements by some protocol gas producers.[27] Gas producers were also sharing concerns with the EPA that some producers were selling cylinders that were not properly verified. Although the EPA initially tried to develop a program that would be funded by the gas vendors, many of whom agreed to fund it, one producer lodged a protest and the EPA could not implement the program in this manner.

In addition, the AA–PGVP is intended to be a blind verification of the producers, meaning it would be most advantageous for the producer not to know a cylinder is being sent to a verification lab and, therefore, the EPA tries not to request cylinders directly from gas producers. Although one commenter suggested that the EPA receive cylinders directly from the producer, this would defeat the purpose of the blind verification and the producers would have the opportunity to send a cylinder that may have had additional testing against its certified value. The AA–PGVP has been implemented since 2010 and the EPA is starting to see a drop in monitoring organization participation, yet we also received positive comments that the program is valuable in keeping the producers aware of the need for the quality of their gas standards.

In response to the comment expressing concern about the cost of participating in the program and the logistical difficulty of properly being certified to ship cylinders, the EPA clarifies that with the current program, the EPA covers the cost of shipping the cylinders to and from the regional AA–PGVP verification laboratory. Online DOT training is offered to monitoring organizations and is valid for 3 years. So although there is an expense to the monitoring organization on the time to train, there is limited burden related to the rest of the program. The EPA is aware that additional standard gases will need to be maintained for use while the new cylinder is being sent for verification. Most monitoring organizations order new cylinders prior to expiration of older cylinders or before they run out of gas supply. There is normally a transition period where new cylinders are on hand and checked against the current cylinder before retiring the older cylinder. The AA–PGVP Implementation Plan[28] describes that during this change-out process, if the new cylinder is ordered with enough lead time (AA–PGVP estimates 30–45 days from shipping through verification and cylinder return), it could be sent to the AA–PGVP verification laboratory and verified prior to use by monitoring organizations before it needed to be exchanged with an older cylinder.

Based on the comments received and the EPA's clarifications of the need for the current program, the EPA will codify the ICR requiring monitoring organizations to report the gas standard producers it uses on an annual basis and also finalize the proposed language allowing the agency to request cylinders from monitoring organizations no more frequently than every 5 years.

3. Measurement Quality Checks for Gases

The EPA proposed to lower the audit concentrations (current section 3.2.1) of the one-point QC checks to between 0.005 and 0.08 parts per million (ppm) for SO_2, NO_2, and O_3 (currently 0.01 to 0.1 ppm), and to between 0.5 and 5 ppm for CO monitors (currently 1 and 10 ppm). With the development of more sensitive monitoring instruments with lower detection limits, technical improvements in calibrators, and lower ambient air concentrations in general, the EPA felt this revision would better reflect the precision and bias of the ambient air data being measured at the site. Since the QC check concentrations are selected using the mean or median concentration of typical ambient air concentrations (guidance on this is provided in the QA Handbook[29]), the EPA proposed to add some clarification to the current language by requiring monitoring organizations to select either the highest or lowest concentration in the ranges identified if their mean or median concentrations are above or below the prescribed range.

The majority of the comments (19 of 26 responding to the quality assurance proposal) received on appendix A were related to this proposed change. One state and one consulting firm commenter expressed support for the change but the majority of commenters expressed concern (16 state commenters and one MJO). Most of the commenters expressed similar technical concerns that:

- The SLAMS network is in place mainly for decisions related to the NAAQS, so QC checks should be at the levels approximating the NAAQS values.
- Some of the FRM or FEM that are still in use may operate acceptably at concentrations around the NAAQS, but the older versions of the approved monitors are not as sensitive at lower concentrations (*i.e.,* mean or median concentrations), so QC checks at these lower levels are beyond the operational limits of the instrumentation.
- The instrumentation necessary to challenge the monitors at the lower concentrations (calibrators with additional mass flow controllers or gas cylinders of lower concentrations) would be required to comply and, therefore, represent an added expense and burden.
- The lower concentrations affect the percent difference statistic so there is more chance that the QC check will fail the acceptance requirements and, therefore, invalidate data that the monitoring organization feels is of acceptable quality.

The EPA acknowledges these comments and has performed some evaluations on 2013 hourly gaseous data that are summarized in a memo placed in the docket.[30] As summarized in the memo, the EPA generally believes that challenging ambient air analyzers with a one-point QC check at the level of the NAAQS provides an incomplete and potentially inaccurate representation of the precision and bias of the data actually reported to the AQS since, in most cases, the precision and bias estimates are performed at levels that are above 99 percent of the actual SLAMS data reported to AQS. The

[27] U.S. Environmental Protection Agency. ''EPA Needs an Oversight Program for Protocol Gases,'' Office of Inspector General Report No. 09–P–0235, 2009.

[28] *http://www.epa.gov/ttnamti1/files/ambient/qaqc/aapgvpimpplan.pdf.*

[29] QA Handbook for Air Pollution Measurement Vol. II Ambient Air Quality Monitoring Program at: *http://www.epa.gov/ttn/amtic/qalist.html.*

[30] Papp, M. (2015). Assessments of One-Point QC Data in Response to Comments on Revisions to the Ambient Air Quality Assurance Regulation contained in 40 CFR part 58, appendix A. Memorandum to the Docket, EPA–HQ–OAR–2013–0619.

EPA's analysis of QC check data shows that many monitoring agencies are successfully meeting measurement quality objectives at lower concentrations that are closer to the routine ambient data being reported to AQS. We recognize that some of these QC checks may be reported by monitoring organizations that have invested in the technology (*i.e.,* analyzers, calibration devices and standards at NCore sites) necessary to adequately calibrate and estimate precision and bias at the concentrations measured at ambient levels. This analysis demonstrates that the technology is available to measure and report precision and bias at mean/median ambient air concentration levels.

At the same time, the EPA is aware that there are monitoring agencies that have not yet invested in some of these newer technologies and/or may not believe that the operation of more sensitive instrumentation and associated calibration equipment outside of the NCore framework is necessary to meet their monitoring objectives. In light of the comments received on this issue, the EPA will modify the proposed changes to QC check requirements. Specifically, we are finalizing the lower concentration ranges as proposed: 0.005 to 0.08 ppm for SO_2, NO_2, and O_3, and between the prescribed range of 0.5 and 5 ppm for CO monitors. Additionally, rather than requiring that the range selected be at the mean or median concentration range at the site or the agencies network of sites, the current flexibility to select the QC check gas concentration within the prescribed range will remain unchanged. Specifically, monitoring agencies should relate the concentration of the QC check to the monitoring objective of the site; with SLAMS monitors primarily intended for NAAQS compliance utilizing concentrations at or near the level of the NAAQS (higher end of the required range), and trace gas monitors operating at NCore, background or trends sites related to the mean or median of the ambient air concentrations normally measured at those sites in order to appropriately reflect the precision and bias at these routine concentration ranges. The EPA also clarifies that if the mean or median concentrations at trace gas sites are below the method detection limits (MDL) of the instrument, or if concentrations are above the prescribed range, the agency can select the lowest or highest concentration in the range that can be practically achieved. In addition, the EPA will keep language suggesting that an additional QC check point is encouraged for those organizations that may have occasional high values or would like to confirm monitor linearity at the higher end of the operational range. It will also encourage monitoring organizations that are operating NAAQS compliance sites to include additional QC checks around the mean or median values.

The EPA believes that providing monitoring organizations some flexibility in determining the QC check concentration range based on site monitoring objective and the sensitivity of its monitors should address the concerns that were noted in the comments on this aspect of the proposed requirement. However, the EPA reiterates that our analysis of reported data has shown that monitoring agencies can test and achieve acceptable precision and bias results at these lower concentration levels. Providing data users with estimates of precision and bias where the majority of our ambient air data are measured is an EPA programmatic goal and monitoring organizations should be working with the EPA Regional Offices to develop the budgets necessary for purchasing the updated equipment and revising related procedures. The EPA will continue to endorse this approach to make the QC checks more meaningful and we will consider future revisions to appendix A to either require QC checks at two concentration levels (*i.e.,* one around the mean concentrations and one related to the NAAQS) or require the span check [31] to be reported to AQS. In addition, to alleviate concerns about failing the acceptance criteria at lower QC concentrations, the EPA will evaluate suggestions by monitoring organizations to raise acceptance criteria or look at alternative acceptance criteria (*e.g.,* difference instead of percent difference). Since acceptance criteria are included in guidance, the EPA will have the opportunity to perform the evaluations without affecting the regulation. In 2011, the EPA developed similar guidance for lower concentration levels of the annual performance evaluation audits.[32]

The EPA proposed to remove reference to zero and span adjustments (current section 3.2.1.1) and revise the one-point QC language to simply require that the QC check be conducted before any calibration or adjustment to the monitor. Recent revisions of the QA Handbook discourage the implementation of frequent span adjustments so the proposed language helps to clarify that no adjustment be made prior to implementation of the one-point QC check.

There were no comments made on this proposed revision so the EPA is finalizing this revision as proposed.

The EPA proposed to remove the requirement (current section 3.2.2) to implement an annual performance evaluation for one monitor in each calendar quarter when monitoring organizations have fewer than four monitoring instruments. The minimum requirement for the annual performance evaluation for the primary monitor at a site is one per year. The current regulation requires evaluation of 25 percent of the monitors per quarter so that the performance evaluations are performed in all four quarters. There are cases where some monitoring organizations have fewer than four primary monitors for a gaseous pollutant, and the current language suggests that a monitor already receiving a performance evaluation be re-audited to provide for performance evaluations in all four quarters. This proposed removal of the requirement for evaluation in every quarter reduces the burden for monitoring agencies operating smaller networks and does not change the requirement of an annual performance evaluation for each primary monitor.

The EPA received one state comment in support of this revision and no adverse comments. Therefore, the EPA is finalizing this revision as proposed.

The current annual performance evaluation language (current section 3.2.2.1) requires that the audits be conducted by selecting three consecutive audit levels (currently five audit levels are provided in appendix A). Due to the implementation of the NCore network, the inception of trace gas monitors, and generally lower ambient air concentrations being measured, there is a need for audit levels at lower concentrations to more accurately represent the uncertainties present in much of the ambient data. The EPA proposed to expand the audit levels from five to ten and remove the requirement to audit three consecutive levels. The previous regulation suggested that the three audit levels bracket 80 percent of the ambient air concentrations measured by the analyzer, and monitoring organizations have requested the use of an audit point to establish monitor accuracy around the NAAQS levels. Therefore, the EPA proposed to revise the language so that two of the audit levels selected

[31] A check similar to the QC check but implemented at a concentration closer to the higher end of the calibration range of the monitor.

[32] *http://www.epa.gov/ttnamti1/files/ambient/pm25/datamang/20110217lowlevelstatmemo.pdf.*

represent 10–80 percent of routinely-collected ambient concentrations either measured by the monitor or in the PQAOs network of monitors. The proposed revision allowed the third point to be selected at the NAAQS level (*e.g.,* 75 ppb for SO_2) or above the highest 3-year routine hourly concentration, whichever was greater.

One state commenter and a consulting firm supported this proposal while six state commenters voiced concern. The comments expressing concern were similar to comments made on the one-point QC check proposal described earlier, including:

- The SLAMS network is in place mainly for decisions related to the NAAQS, so QC checks should be at the levels approximating the NAAQS values.
- Some of the FRM or FEM that are still in use may operate acceptably at concentrations around the NAAQS, but these older methods are not as sensitive at lower concentrations (*i.e.,* mean or median concentrations), so QC checks at these lower levels are beyond the limits of the instrumentation.
- The instrumentation necessary to challenge the monitors at the lower concentrations (calibrators with additional mass flow controllers or gas cylinders of lower concentrations) would be required to comply and, therefore, represent an added expense and burden.
- The lower concentrations affect the percent difference statistic so there is more chance that the QC check will fail the acceptance requirements and, therefore, invalidate data that the monitoring organization feels is of acceptable quality.

The EPA believes that there are some distinctions between the annual performance evaluations and the one-point QC checks, and although the comments on the proposed revisions are similar, a different response to the comments is appropriate as explained below.

Where monitoring organizations typically utilize standards and equipment at each site to run one-point QC checks, the annual performance evaluations require less equipment since, in many cases, one set (or a few sets) of independent equipment is/are used to audit all sites in a network. Accordingly, the EPA believes that it is practical for monitoring agencies to procure and utilize audit equipment, including calibrators and gas standards that are capable of generating the lower concentrations that are typically measured at most sites in the U.S. Indeed, all monitoring agencies that operate NCore multi-pollutant stations should already own and be proficient in the operation of such equipment as the objectives of the NCore stations and the technology used (*i.e.,* trace level gas monitors) are oriented to characterizing typical ambient concentrations.

In order to make the requirements easier to comprehend and allow for more flexibility in audit point selection, the EPA will revise the proposed language to require three points to be selected: One point around two to three times the method detection limit of the instruments within the PQAO network, a second point less than or equal to the 99 percentile of the data at the site or the network of sites within a PQAO or the next highest audit concentration level, and the third point around the primary NAAQS or the highest 3-year concentration at the site or the network of sites in the PQAO. This framework provides two audit points that reflect 99 percent of the monitoring data and a third point at the highest 3-year concentration or the level of the NAAQS, whichever concentration the monitoring organization chooses. Since performance evaluation audits are only performed once a year at each site, the burden to perform these audits at suitable concentrations is reduced relative to the QC checks. Therefore, the revised audit approach should provide the flexibility requested by the commenters. Also, in 2011, the EPA adopted a more flexible acceptance criteria for the two lower concentration audit levels (option to use difference instead of percent difference) [33] that is not influenced by concentration, which should alleviate commenter's concerns about acceptance criteria at the lower audit levels. Accordingly, the EPA is finalizing the changes to performance audit requirements as described above.

The EPA proposed to revise the language (current section 3.2.2.2(a)) addressing the limits on excess nitric oxide (NO) that must be followed during gas phase titration (GPT) procedures involving NO_2 audits. The previous NO limit (maintaining at least 0.08 ppm NO) was restrictive and required auditors to make numerous mid-audit adjustments during a GPT that resulted in making the NO_2 audit a time-consuming procedure. Accordingly, we proposed a more general statement regarding GPT that acknowledges the ongoing usage of monitoring agency procedures and guidance documents that have successfully supported NO_2 calibration activities.

The EPA received one state comment in support of the proposed revision to the language on excess NO and no adverse comments. Therefore, the EPA is finalizing this revision as proposed.

The EPA proposed to remove language (current section 3.2.2.2(b)) in the annual performance evaluation section that required Regional approval for audit gases for any monitors operating at ranges higher that 1.0 ppm for O_3, SO_2 and NO_2 and greater than 50 ppm for CO. The EPA does not need to approve a monitoring organization's use of audit gases to audit above proposed concentration levels. Since data reported to AQS above the highest level may be flagged or rejected, the EPA proposed that PQAOs notify the EPA Regional Office of sites being audited at concentrations above level 10 so that reporting accommodations can be made.

The EPA did not receive any comments on this proposed change. Therefore, the EPA is finalizing this revision as proposed.

The EPA proposed to provide additional explanatory language in appendix A to describe the NPAP. The NPAP has been a long-standing program for the ambient air monitoring community. Since 2007, the EPA has distributed an annual decision memorandum to all monitoring organizations in order to determine whether the monitoring organization plans to self-implement the NPAP program or utilize the federally implemented program. In order to make this decision, the NPAP adequacy and independence requirements are described in this annual decision memorandum. The EPA proposed to include these same requirements in appendix A in a separate section for NPAP. In addition, the annual decision memorandum stated that 20 percent of the sites would be audited each year so that all sites would be audited in a 5-year period. Since there is a possibility that monitoring organizations may want certain higher priority sites audited more frequently, the EPA proposed to revise the language to require all sites to be audited within a 6-year period to provide more flexibility and discretion for monitoring agencies. This revision does not change the number of sites audited in any given year, but allows for increased frequency in auditing sites deemed as high priority.

The EPA received one state comment and one consulting firm comment supporting this action and two state comments expressing concern. One commenter supported it without any additional comment while another made the point that the clarification simply added the definition of an ''independent assessment,'' which has been widely circulated and understood

[33] *http://www.epa.gov/ttnamti1/files/ambient/pm25/datamang/20110217lowlevelstatmemo.pdf.*

by state, local and tribal monitoring organizations for several years and is neutral with respect to burden. One state commenter mentioned that the proposed additions have changed the requirements for demonstrating independence and adequacy that were originally outlined in the memorandum, ''*National Performance Audit Program/ $PM_{2.5}$ Performance Evaluation Program Implementation Decision Memorandum for Calendar Year 2008,*'' by implementing training requirements, requiring separate audit equipment, and adding a requirement to perform a whole system check tested against an independent and qualified lab. The commenter suggested that the proposed changes impact the costs for the PQAO to implement the NPAP.

A state commenter suggested that the description for NPAP was ''inconsistent with what had been conveyed in the past and is more pertinent for the performance audit.'' The commenter also suggested that proposed sections 3.1.3.4(a)–(f) be removed and retained in guidance (annual memorandum). However, the 2008 version of the QA Handbook, as well as the current 2013 version, provides the same definition of a Performance Evaluation as 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, and has included NPAP in this definition in both versions of the QA Handbook. Another state commenter also raised questions as to the objective of the program and suggested that the NPAP objective is already being accomplished with the annual performance evaluation.

In response to changes in the NPAP requirement from the 2008 NPAP memo, each year the EPA requests that monitoring organizations make a decision with regard to self-implementation of the NPAP program based on the current year's decision memorandum, or allow for federal implementation of the program. The proposed regulatory language has been included in the decision memorandums for the past number of years that the EPA expected monitoring organizations to follow in order to self-implement.

The EPA disagrees that the NPAP objectives have changed since the inception of the program. Early versions of NPAP included cylinders of unknown concentration being sent to monitoring organizations (mailed audits) who would challenge the analyzers with these standards and send the results back to the EPA for evaluation. This process was ''blind,'' meaning that the monitoring organization did not know the concentration of the standard they were auditing. It was completely independent of monitoring organization implementation and also established independence of the concentration being audited. At the same time the NPAP mailed audits were conducted, monitoring organizations continued to implement their annual performance evaluations. So, both NPAP and the annual performance programs have been implemented at the same time and NPAP, having a different objective, allowed for a level of independent auditing by the EPA. Due to complaints lodged on the length of time required to get results back from the NPAP ''mailable'' program, the EPA instituted the current NPAP through the probe program while continuing its primary objective: providing independent, quantitative evaluations of data quality. Since the majority of monitoring organizations allow for federal implementation, which is reliably independent of monitoring organization implementation (only two monitoring organizations in the country self-implement NPAP), the EPA identified the requirements necessary for self-implementing monitoring organizations to maintain as close a level of independence and data quality consistency to federal implementation. Therefore, while one commenter suggested that the training requirements be revised to ensure that auditors have been trained in the procedures that PQAOs actually employ to satisfy this requirement, the EPA believes that the training be required to reflect consistency with the federal program in order to establish consistency in data quality across the NPAP program. The EPA provides the opportunity for monitoring organizations to make the self-implementation decision each year based on the requirements in the decision memorandum, which ensures the NPAP program is equitably and consistently implemented across all monitoring organizations. Therefore, the EPA is finalizing this revision as proposed, but is also providing some flexibility as requested in a state comment by inserting the following language into the relevant section of appendix A:

OAQPS, in consultation with the relevant EPA Regional Office, may approve the PQAO's plan to self-implement NPAP if the OAQPS determines that the PQAO's self-implementation plan is equivalent to the federal programs and adequate to meet the objectives of national consistency and data quality.

4. Measurement Quality Checks for Particulate Monitors

The EPA proposed to require that flow rate verifications (current section 3.2.3) be reported to AQS. Particulate matter concentrations (*e.g.,* $PM_{2.5}$, PM_{10}, Pb) are reported in mass per unit of volume ($\mu g/m^3$). Flow rate verifications are implemented at required frequencies in order to ensure that the PM sampler is providing an accurate and repeatable measure of volume that is critical for the determination of concentration. If a given flow rate verification does not meet acceptance criteria, the EPA guidance suggests that data may be invalidated back to the most recent acceptable verification, which is why these checks are performed at higher frequencies. Implementation of the flow rate verification is currently a requirement, but reporting to AQS has only been a requirement for PM_{10} continuous instruments. This is the only QC requirement in appendix A that was not fully required for reporting for all PM pollutants and has been a cause of confusion. When performing TSAs, the EPA Regional Offices review the flow rate verification information. There are cases where it is difficult to find the flow rate verification information to ascertain completeness, data quality, and whether corrective actions have been implemented in the case of flow rate verification failures. In addition, the EPA Regions have mentioned that some of the monitoring organizations have been voluntarily reporting these data to AQS in an effort to increase transparency and reliability in data quality. In a recent review of 2012 data, out of the 1,110 SLAMS $PM_{2.5}$ samplers providing flow rate audit data (which are required to be reported), flow rate verification data were also reported for 543 samplers or about 49 percent for the samplers with flow rate audit data. With the development of a new QA transaction in AQS, we believe that the reporting of flow rate verification data would improve the evaluation of data quality for data certification and at national levels, provide consistent interpretation in the regulation for all PM pollutants without being overly burdensome (approximately 12 data points per sampler per year).

The EPA received one state comment in support of this revision and no adverse comments. Therefore, the EPA is finalizing this revision as proposed.

In addition, the flow rate verification requirements for all the particulate monitors suggest randomization of the implementation of flow rate verifications with respect to time of day, day of the week and routine service and

adjustments. Since this is a suggestion, the EPA proposed to remove this language from the regulation and instead include it in QA guidance.

The EPA noted that one consulting firm voiced concern about removing the suggestion for randomizing flow rate verifications. They stated that the ''randomization of QC procedures is a critical aspect of QA currently unacknowledged by the EPA, and that single point (precision) checks of gaseous monitors and flow rate verification checks on PM samplers are crucial to characterizing the precision, bias and accuracy of the data arising from those instruments. Diurnal and weekly rhythms exist in solar radiation, temperature, humidity, electrical power and traffic patterns. As standards decrease and monitoring instrumentation becomes more sensitive, the likelihood increases that interferences will occur in those instruments. One means of detecting such biases involves randomized QC checks since they occur out-of-sync with daily/weekly rhythms.''

The EPA agrees with the technical rationale for randomization provided by the commenter, but also received comments that the regulation should provide requirements and that suggested practices should be referenced in guidance documents. Therefore, the EPA is finalizing this revision as proposed and will include the randomization suggestion in the next revision of the QA Handbook and in the $PM_{2.5}$ method.

The EPA proposed to add clarifying language to the $PM_{2.5}$ collocation requirements (current section 3.2.5) that a site can only count for the collocation of the method designation of the primary monitor at that site. Precision is estimated at the PQAO level and required at 15 percent of the primary monitor sites for each method designation. When developing the collocation requirements, the EPA intended to have the collocated monitors distributed to as many sites as possible in order to capture as much of the temporal and spatial variability in the PQAO given that only 15 percent of the primary monitors within a method designation are collocated. Therefore, since there can be only one primary monitor at a site for any given time period, it was originally intended that the primary monitor and the QA collocated monitor (for the primary) at a monitoring site count as one collocation. This revision does not change the current regulation and does not increase or decrease burden, but is intended to provide clarity on how the PQAO identifies the number and types of monitors needed to achieve the collocation requirements.

The EPA received one state and one consulting firm comment supporting this clarification and two state comments expressing concern.

One commenter expressing concern did not support specifically forbidding collocation of multiple particulate monitors at a single site and made the following points. As the NCore sites were designed to provide a large suite of monitoring, the commenter felt it was an ideal location to deploy a range of instruments. The commenter mentioned, ''where the array of $PM_{10-2.5}$ monitors at a monitoring site include a $PM_{2.5}$ FRM as the primary monitor, the operation of the continuous $PM_{2.5}$ FEM is advantageous for collocation across the network. For the EPA not to allow this collocation directly contradicts the goal of the proposed rule by placing additional compliance and operating burdens on monitoring organizations and network operators.'' A second commenter mentioned that the proposed ''new requirement could result with the discontinuing a sampler at one location and creating more upkeep and maintenance for the samplers at different locations.''

The EPA notes that the proposed language does not represent a new requirement, is not a revision to the current requirement, and merely represents a needed clarification of the current language because some monitoring organizations were misinterpreting the original language by allowing one site to provide multiple collocations. Since the original language identified that collocation for appendix A purposes requires the QA collocated monitor to be compared against the primary monitor at a site, and since there can only be one primary monitor at a site at any particular time, the EPA believes that the original language and intent were clear. Based on data assessments of collocated data in AQS, most monitoring organizations follow this requirement. Since the current requirement states that 15 percent of the primary monitors in each method designation must be collocated, and there can only be one primary monitor at a site, the current regulation (without the clarifying language) allows only one collocation to count for a given site. When the EPA became aware of potential confusion on this issue in 2010, we provided guidance to both the EPA Regions and monitoring community through the QA EYE newsletter (Issue 9, page 3).[34] The article and the table, which was based on the number of sites in a monitoring organization, were developed to articulate the intent of the regulation.

The EPA supports the use of multiple monitors at sites like NCore, as one commenter suggested, for testing and evaluation purposes but not for conforming to the appendix A original requirements. However, as articulated in the current appendix A regulation, a collocated monitor can be used to achieve collocation requirements for more than one pollutant. For example, collocated manual $PM_{10-2.5}$ monitors could be used to satisfy $PM_{2.5}$ collocation, PM_{10} collocation, as well as PM_{10}–Pb collocation. Therefore, the EPA is adding the clarification as proposed to ensure that the current requirement is not misinterpreted.

The EPA proposed to provide more flexibility to monitoring organizations when selecting sites for collocation. Appendix A (current section 3.2.5.3) had required that 80 percent of the collocated monitors be deployed at sites within ±20 percent of the NAAQS and if the monitoring organization did not have sites within that range, then 60 percent of the sites were to be deployed among the highest 25 percent of all sites within the network. Monitoring organizations found this difficult to achieve. Some monitoring organizations did not have many sites and, at times, due to permission, access, and limited space issues, the requirement was not always achievable.

Realizing that the collocated monitors provide precision estimates for the PQAO (since only 15 percent of the sites for each method designation are collocated), while also acknowledging that sites that measure concentrations close to the NAAQS are important, the EPA proposed to require that 50 percent (down from 80 percent) of the collocated monitors be deployed at sites within ±20 percent of the NAAQS and, if the PQAO did not have sites within that range, then 50 percent of the sites are to be deployed among the highest sites within the network. Although this requirement does not change the number of sites requiring collocation, it does provide the PQAO additional flexibility in its choice of collocated sites.

The EPA received three state comments and one consulting firm comment in general support of this proposal and no comments expressing concern.

As with the previous requirement, the EPA has a cut-off value of 3 $\mu g/m^3$ for data used in evaluations of precision and bias, meaning that only data equal to or greater than 3 $\mu g/m^3$ are used in estimates of precision and bias. This did

[34] *http://www.epa.gov/ttnamti1/qanews.html.*

not change in the proposed regulation. Our expectation is that monitoring organizations will site collocated monitors in such a manner that they will likely collect collocated samples from sites that have values equal to or greater than 3 μg/m3. One commenter was concerned about ''clean'' days that are below the 3 μg/m3 threshold since the employment of this threshold would affect data completeness by excluding pairs on cleaner days. The EPA notes, however, that completeness is not calculated solely on data pairs with concentrations equal to or greater than 3 μg/m3, but on all valid collocated pairs (valid pairs below 3 μg/m3 are expected to be reported to AQS). Therefore, as long as the monitoring agency collects and reports all collocated data at the required frequency, data completeness is not an issue.

Another state commenter, in support of the proposal, suggested that the highest concentration site be selected for the first collocation and, if a second site is needed, then the second highest site be selected, and so on. While this is an alternative approach, the initial rationale for the revision was to provide more flexibility in site selection in cases where some sites (for example the highest concentration site) had access problems or some other issue that did not make it a good candidate for collocation. The wording in the proposed regulation is meant to ensure that some of the sites selected for collocation represent the locations with the highest concentrations in the respective monitoring agencies network while providing the flexibility to choose among those sites.

Since there was general support for the proposal with no adverse comments, the EPA is finalizing this revision as proposed.

5. Calculations for Data Quality Assessment

In order to provide reasonable estimates of data quality, the EPA uses data above an established threshold concentration usually related to the detection limits of the measurement. Measurement pairs are selected for use in the precision and bias calculations only when both measurements are greater than or equal to a threshold concentration.

For many years, the threshold concentration for Pb precision and bias data was 0.02 μg/m3. The EPA promulgated a new Pb FRM (78 FR 40000) utilizing the Inductively Coupled Plasma Mass Spectrometry (ICP–MS) analysis technique in 2013 as a revision to appendix G of 40 CFR part 50.[35] This new FRM demonstrated MDLs[36] below 0.0002 μg/m3, which is well below the EPA requirement of 5 percent of the current Pb NAAQS level of 0.15 μg/m3, or 0.0075 μg/m3. As a result of the increased sensitivity inherent in this new FRM, the EPA proposed to lower the acceptable Pb concentration (current section 4) from the current value of 0.02 μg/m3 to 0.002 μg/m3 for measurements obtained using the new Pb FRM and other more recently approved equivalent methods that have the requisite increased sensitivity.[37] The current 0.02 μg/m3 value will be retained for the previous Pb FRM that has subsequently been re-designated as FEM EQLA–0813–803, as well as older equivalent methods that were approved prior to the more recent work on developing more sensitive methods. Since ambient Pb concentrations are lower and methods more sensitive, lowering the threshold concentration will allow more collocated data to be evaluated, which will provide more representative estimates of precision and bias at current ambient Pb levels.

The EPA received one state comment and one consulting firm comment in support of the proposal and one state comment expressing concern.

The comment expressing concern related to a perception that data would be lost due to the increased possibility that data quality objectives (DQO) would not be met with the decreased threshold concentration. The commenter believed the change would increase the likelihood that collocated data would not meet the 20 percent coefficient of variation (CV) limit for precision as specified in appendix A, section 2.3.1.3. This would in turn decrease data completeness and, if data loss is great enough, could potentially render the data from an entire monitoring location useless for NAAQS compliance determinations.

The EPA notes that invalidation of routine data based solely on the variability of collocated monitoring data is not required or recommended. The data validation guidance in the QA Handbook, which many monitoring organizations use to develop validation criteria, allows for these data to be reviewed in the context of other QC samples before decisions to invalidate data are made. Since the collocated data are only collected at approximately 15 percent of the monitoring sites, the data set is meant to reflect the precision of the PQAO monitoring network and not to evaluate the validity of data from individual sites. Site data can be used to troubleshoot causes of variability and to take corrective actions, but is not intended to invalidate routine monitoring data unless a significant systemic issue is discovered.

Based on the comment noted above, the EPA performed an evaluation of collocated Pb data collected in calendar years 2011–2013 to evaluate the amount of collocation information available when using the two reporting thresholds. In that time period, 7,063 collocated measurements were taken. Within this data set, there were 2,521 data pairs where both values were equal to or greater than 0.02 μg/m3 (*i.e.,* only about 35 percent of the information collected could be used to estimate precision). In the most pertinent examples, there were cases where monitoring organizations collected valid ambient data and no collocated data could be used due to the current higher threshold. For example, one monitoring organization collected 173 collocated measurements and no value was equal to or greater than 0.02 μg/m3 and, therefore, there was no estimate of precision reported for this monitoring organization for a 3-year period. There were eight monitoring organizations that could not use any collocated results for 2011–2013 and 22 monitoring organizations (about 50 percent of the monitoring organizations) that had less than 25 percent of their data used. In contrast, if the same data set is used, but the threshold is reduced to the proposed value of greater than or equal to 0.002 μg/m3, then 6,418 measurements are available, which increases precision data availability from 35 percent to 91 percent. As an example, the monitoring organization that had no collocated values (173 measurements) equal to or greater than 0.02 μg/m3 had the number of available pairs increased to 172 with the lower 0.002 μg/m3 threshold and had a precision estimate CV of 16.43, which is within the 3-year DQO goal of 20 percent.

The EPA acknowledges that using a lower threshold concentration will increase the estimate of precision since the required CV statistic is a derivation of the percent difference. When EPA evaluated the Pb data quality objectives to determine acceptable precision and bias for the new standard, we evaluated all collocated data in AQS including the

[35] See 78 FR 40000, July 3, 2013.

[36] MDL is described as the minimum concentration of a substance that can be measured and reported with 99 percent confidence that the analyte concentration is greater than zero.

[37] FEMS approved on or after March 4, 2010, have the required sensitivity to utilize the 0.002 μg/m3 reporting limit with the exception of manual equivalent method EQLA–0813–803, the previous FRM based on flame atomic absorption spectroscopy.

lower concentration data.[38] Since the collocated data are actual samples, they include measurement uncertainty for all phases of the measurement system including variability in EPA-provided filters, sampling handling, sampler flow differences, plumes from sources, laboratory contamination, as well as other types of measurement uncertainty mentioned by one commenter. In fact, the goal of the collocation is to provide an estimate of overall measurement imprecision between two sampling systems that are, in theory, sampling the same air. So although the commenter identifies this as a concern, providing a measure of the overall precision of the measurement system is what the collocated data are intended to evaluate. The commenter mentioned that changing the threshold based solely on the estimated FRM detection limit may not translate to other FEMs that may have different detection limits. At a minimum, all approved Pb methods are required to meet the method detection limit to be approved as equivalent. Therefore, the 0.002 μg/m^3 threshold should be applicable to the newer methods and is the reason for the dual thresholds.

Based on our review and evaluations, the EPA set the precision goal of a 90 percent confidence limit for the CV of 20 percent as mentioned by the commenter. This CV estimate is determined by aggregating 3 years of collocated data. In the evaluation of the 2011–2013 data, the EPA evaluated data down to the lower threshold with the new methods capable of more sensitivity. The average 3-year precision estimate (2011–2013) for all monitoring organizations using the approved FRM and FEM methods and a threshold of 0.002 μg/m^3 was 16.31. The average 3-year CV for a threshold of 0.02 μg/m^3 was 11.09. This is an increase of imprecision on average of 5 percent, but a significant increase in data availability from 35 percent to 90 percent.

The commenter also suggested that the current threshold should remain in effect until a limit of quantitation (LOQ) test can be performed. Although there are a number of definitions for LOQ, some have defined it to be three times (3x) to ten times (10x) the MDL. The new Pb FRM by ICP–MS promulgated in 2013 in 40 CFR part 50, appendix G, showed that the MDLs were below 0.0002 μg/m^3. Therefore, the EPA took the 10x definition of LOQ and calculated 0.002 μg/m^3 as the level of the new threshold.

[38] *http://www.epa.gov/ttnamti1/files/ambient/pb/QAQA.pdf.*

Two commenters made similar points that, due to the fact that the CV is based on individual sample pair percent differences, the CV tends to increase at lower concentrations for a constant absolute difference. The EPA acknowledges this fact. On a related issue, when developing the 10 audit levels for annual performance evaluation checks, the EPA provided guidance on the two lower audit levels allowing for an absolute difference criteria as well as a percent difference criteria. Rather than eliminate close to 55 percent of the collocated data, which is what is occurring now with the higher threshold, the EPA is finalizing the two thresholds as proposed and will also evaluate the use of an absolute difference acceptance criteria at lower concentration levels.

The EPA proposed to remove the TSP threshold concentration for precision and bias since TSP is no longer a NAAQS-required pollutant and the EPA no longer has QC requirements for it.

The EPA received one comment in support of this proposal and no adverse comments and is finalizing this revision as proposed.

The EPA proposed to remove the statistical check currently described in section 4.1.5 of appendix A. The check was developed to perform a comparison of the one-point QC checks and the annual performance evaluation data performed by the same PQAO on gaseous instruments. The section suggests that 95 percent of all the bias estimates from the annual performance evaluation (reported as a percent difference) should fall within the 95 percent probability interval developed using the one-point QC checks. The problem with this specific statistical check is that PQAOs with very good repeatability on the one-point QC check data had a hard time meeting this requirement since the probability interval became very tight, making it more difficult for better performing PQAOs to meet the requirement when comparing the one-point QC checks and performance evaluation data. Separate statistics to evaluate the one-point QC checks and the performance evaluations are already promulgated, so the removal of this check does not affect data quality assessments.

The EPA received one comment in support of this proposal and no adverse comments and is finalizing this revision as proposed.

Similar to the statistical comparison of performance evaluations data, the EPA proposed to remove the statistical check (current section 4.2.4) to compare the flow rate audit data and flow rate verification data for PM monitors. The existing language suggests that 95 percent of all the flow rate audit data results (reported as percent difference) should fall within the 95 percent probability interval developed from the flow rate verification data for the PQAO. The problem, as with the one-point QC check comparison requirement for gaseous monitors, was that monitoring organizations with very good repeatability on the flow rate verifications had a hard time meeting this requirement since the probability interval became very tight, making it difficult for better performing PQAOs to meet the requirement. Separate statistics to evaluate the flow rate verifications and flow rate audits are already promulgated, so the removal of this check does not affect data quality assessments.

The EPA received one comment in support of this proposal and no adverse comments and is finalizing this revision as proposed.

B. Quality Assurance Requirements for Monitors Used in Evaluations of Prevention of Significant Deterioration Projects—Appendix B

The EPA proposed to create appendix B to specify the minimum quality assurance requirements for the control and assessment of the quality of the ambient air monitoring data submitted to a PSD reviewing authority or the EPA by an organization operating an air monitoring station, or network of stations, operated in order to comply with Part 51 New Source Review—Prevention of Significant Deterioration (PSD). These proposed revisions to the quality assurance requirements applicable to PSD are, in the majority of cases, identical to the revisions proposed in appendix A. The majority of comments received for this rule focused on the appendix A requirements and were discussed in the previous section. Due to the similarity of the proposed changes for appendix A and appendix B, the EPA assumes that comments submitted in response to proposed appendix A revisions also reflect the sentiment of commenters concerning the proposed language in appendix B. Therefore, the preamble discussions that include responses to comments for appendix A should, in most cases, also apply to appendix B. Accordingly, the EPA will not duplicate those discussions in the following sections pertaining to appendix B, and we refer the reader back to the relevant appendix A discussions in section III.A. of the preamble, above. In the few cases where comments were made specifically for appendix B sections, those

comments are discussed in the appropriate sections below.

1. General Information

The following changes to monitoring requirements impact Part 58—Ambient Air Quality Surveillance; Appendix B—Quality Assurance Requirements for Prevention of Significant Deterioration (PSD) Air Monitoring. Changes that affect the overall appendix are discussed in this section of the preamble while changes specific to the various sections of the appendix will be addressed in subsequent sections of the preamble. Since the PSD QA requirements have been included in appendix A since 2006, section headings refer to the current appendix A sections.

The QA requirements in appendix B have been developed for measuring the criteria pollutants of O_3, NO_2, SO_2, CO, $PM_{2.5}$, PM_{10} and Pb and are minimum QA requirements for the control and assessment of the quality of the PSD ambient air monitoring data submitted to the PSD reviewing authority [39] or the EPA by an organization operating a network of PSD stations.

In the 2006 monitoring rule revisions, the PSD QA requirements, which were previously in appendix B, were consolidated with appendix A and appendix B was reserved. The PSD requirements, in most cases, parallel appendix A in structure and content but because PSD monitoring is only required for a period of 1 year or less, some of the frequencies of implementation of the QC requirements for PSD are higher than the corresponding appendix A requirements. In addition, the agencies governing the implementation, assessment and approval of the QA requirements can be different: The PSD reviewing authorities for PSD monitoring and the EPA Regions for ambient air monitoring for NAAQS decisions. Since 2006, the combined regulations have caused confusion or misinterpretations of the regulations among the public and monitoring organizations implementing NAAQS or PSD requirements, and have resulted in failure, in some cases, to perform the necessary QC requirements. Accordingly, the EPA proposed that the PSD QA requirements be removed from appendix A and returned to appendix B. Separating the two sets of QA requirements would clearly distinguish the PSD QA requirements and allow more flexibility for future revisions to either monitoring program.

With this final rule, the EPA would not change most of the QA requirements for PSD. Therefore, the discussion that follows will cover those sections of the PSD requirements that the EPA proposed to change from the current appendix A requirements.

Commenters supported moving the PSD QA requirements to a distinct section with no adverse comments received, so the EPA is finalizing as proposed.

The applicability section of appendix B clarifies that the PSD QA requirements are not assumed to be minimum requirements for data use in NAAQS attainment decisions. One reason for this distinction is in the flexibility allowed in PSD monitoring for the NPEP (current appendix A, section 2.4). The proposed PSD requirements allow the PSD reviewing authority to decide whether implementation of the NPEP will be performed. The NPEP, which is described in appendix A, includes the NPAP, the $PM_{2.5}$ Performance Evaluation Program ($PM_{2.5}$–PEP), and the Pb–PEP. Accordingly, under the proposed revision, if a PSD reviewing authority intended to use PSD data for any official comparison to the NAAQS beyond the permitting application, such as for attainment/nonattainment designations or clean data determinations, then all requirements in appendix B including implementation of the NPEP would apply. In this case, monitoring would more closely conform to the appendix A requirements. The EPA proposed this flexibility for PSD because the NPEP requires either federal implementation or implementation by a qualified individual, group or organization that is not part of the organization directly performing and accountable for the work being assessed. The NPEP may require specialized equipment, certified auditors and a number of activities which are enumerated in the sections associated with these programs. Arranging this type of support service may be more difficult for the operator of a single or small number of PSD monitoring stations operating for only a year or less.

The EPA cannot accept funding from private contractors or industry, and federal implementation of the NPEP for PSD would face several funding and logistical hurdles. This creates an inequity in the NPEP implementation options available to the PSD monitoring organizations compared to the state/local/tribal monitoring organizations for NAAQS compliance. The EPA has had success in training and certifying private contractors in various categories of performance evaluations conducted under NPEP, but many have not made the necessary investments in capital equipment to implement all categories of the performance evaluations. Since the monitoring objectives for the collection of data for PSD are not necessarily the same as the appendix A monitoring objectives, the EPA proposed to allow the PSD reviewing authority to determine whether a PSD monitoring project must implement the NPEP.

The EPA only received comments in support of this proposed change, and is finalizing the change as proposed.

The EPA proposed to clarify the definition of PSD PQAO. The PQAO was first defined in appendix A in 2006 (current appendix A, section 3.1.1), when the PSD requirements were combined with appendix A. The definition is not substantially changed for PSD, but the EPA proposed to clarify that a PSD PQAO can only be associated with one PSD reviewing authority. Distinguishing among the PSD PQAOs that coordinate with a PSD reviewing authority would be consistent with discrete jurisdictions for PSD permitting, and it would simplify oversight of the QA requirements for each PSD network.

Given that companies may apply for PSD permits throughout the U.S., it is expected that some PSD monitoring organizations will work with multiple reviewing authorities. The PSD PQAO code that may appear in the AQS data base and other records defines the PSD monitoring organization or a coordinated aggregation of such organizations that is responsible for a set of stations within one PSD reviewing authority that monitors the same pollutant and for which data quality assessments will be pooled. The PSD monitoring organizations that work with multiple PSD reviewing authorities would have individual PSD PQAO codes for each PSD reviewing authority. This approach will allow flexibility to develop appropriate quality systems for each PSD reviewing authority.

The EPA did not receive any comment on this process and is finalizing the requirement as proposed.

The EPA proposed to add definitions of ''PSD monitoring organization'' and ''PSD monitoring network'' to 40 CFR 58.1. The definitions have been developed to improve understanding of the appendix B regulations.

Because the EPA uses the term ''monitoring organization'' frequently in the NAAQS-associated ambient air regulations, the EPA wanted to provide a better definition of the term in the PSD

[39] Permitting authority and reviewing authority are often used synonymously in PSD permitting. Since reviewing authority has been defined in 40 CFR 51.166(b), it is used throughout appendix B.

QA requirements. Therefore, the EPA proposed the term ''PSD monitoring organization'' to identify ''a source owner/operator, a government agency, or a contractor of the source or agency that operates an ambient air pollution monitoring network for PSD purposes.''

The EPA also proposed to define ''PSD monitoring network'' in order to distinguish ''a set of stations that provide concentration information for a specific PSD permit.'' The EPA will place both definitions in 40 CFR 58.1. The EPA did not receive any comment on these changes and is finalizing them as proposed.

2. Quality System Requirements

The EPA proposed to remove the $PM_{10-2.5}$ requirements for flow rate verifications, semi-annual flow rate audits, collocated sampling procedures and $PM_{10-2.5}$ PEP from appendix B (current appendix A, sections 3.2.6, 3.2.8, 3.3.6, 3.3.8, 4.3). In 2006, the EPA proposed a $PM_{10-2.5}$ NAAQS along with requisite QA requirements in appendix A. While the $PM_{10-2.5}$ NAAQS was not promulgated, $PM_{10-2.5}$ monitoring was required to be performed at NCore sites and the EPA proposed requisite QA requirements in appendix A. Since PSD monitoring is distinct from monitoring at NCore sites and $PM_{10-2.5}$ is not a criteria pollutant, it will be removed from the PSD QA requirements. The EPA did not receive any comment on this proposed revision and is finalizing the requirement as proposed.

The EPA proposed that the Pb QA requirements of collocated sampling (current appendix A, section 3.3.4.3) and Pb performance evaluation procedures (current appendix A, section 3.3.4.4) for non-source oriented NCore sites be eliminated for PSD. The 2010 Pb rule in 40 CFR part 58, appendix D, section 4.5(b) added a requirement to conduct non-source oriented Pb monitoring at each NCore site in a CBSA with a population of 500,000 or more. Since PSD does not implement NCore sites, the EPA proposed to eliminate the Pb QA language specific to non-source oriented NCore sites from PSD while retaining the PSD QA requirements for routine Pb monitoring.

The EPA received three supportive comments for the removal of this requirement and no adverse comments. Therefore, the EPA is finalizing the requirement as proposed.

The EPA proposed that elements of QMPs and QAPPs which are separate documents described in appendix A, sections 2.1.1 and 2.1.2, can be combined into a single document for PSD monitoring networks. The QMP provides a ''blueprint'' of a PSD monitoring organization's quality system. It includes quality policies and describes how the organization as a whole manages and implements its quality system regardless of what monitoring is being performed. The QAPP includes details for implementing a specific PSD monitoring activity. For PSD monitoring, the EPA believes the project-specific QAPP takes priority, but there are important aspects of the QMP that could be incorporated into the QAPP. The current appendix A requirements allow smaller organizations or organizations that do infrequent work with EPA to combine the QMP with the QAPP based on negotiations with the funding agency and provided guidance [40] on a graded approach to developing these documents. In the case of PSD QMPs and QAPPs, the EPA proposed that the PSD reviewing authority, which has the approval authority for these documents, also have the flexibility for allowing the PSD PQAO to combine pertinent elements of the QMP into the QAPP rather than requiring the submission of both QMP and QAPP documents separately. The EPA did not receive any comment on this and is finalizing the requirement as proposed.

The EPA proposed to add language to the appendix B version of the DQO section (current appendix A, section 2.3.1) which allows flexibility for the PSD reviewing authority and the PSD monitoring organization to determine if adherence to the DQOs specified in appendix A, which are the DQO goals for NAAQS decisions, are appropriate or whether project-specific goals are necessary. Allowing the PSD reviewing authority and the PSD monitoring organization flexibility to change the DQOs does not change the implementation requirements for the types and frequency of the QC checks in appendix B, but does give some flexibility in the acceptance of data for use in specific projects for which the PSD data are collected. As an example, the goal for acceptable measurement uncertainty for the collection of O_3 data for NAAQS determinations is defined for precision as an upper 90 percent confidence limit for CV of 7 percent and for bias as an upper 95 percent confidence limit for the absolute bias of 7 percent. The precision and bias estimates are made with 3 years of one-point QC check data. A single or a few one-point QC checks over 7 percent would not have a significant effect on meeting the DQO goal. The PSD monitoring DQO, depending on the objectives of the PSD monitoring network, may require a stricter DQO goal or one less restrictive. Since PSD monitoring covers a period of 1 year or less, one-point QC checks over 7 percent will increase the likelihood of failing to meet the DQO goal since there would be fewer QC checks available in the monitoring period to estimate precision and bias. With fewer checks, any individual check will statistically have more influence over the precision or bias estimate. Realizing that PSD monitoring may have different monitoring objectives, the EPA proposed to add language that would allow decisions on DQOs to be determined through consultation between the appropriate PSD reviewing authority and PSD monitoring organization. The EPA did not receive any comment on this and is finalizing the requirement as proposed.

The EPA proposed to add some clarifying language to the section describing the NPEP (current appendix A, section 2.4) to explain self-implementation of the performance evaluation by the PSD monitoring organization. Self-implementation of NPEP has always been an option for monitoring organizations but the requirements for self-implementation were described in the technical implementation documents (*i.e.,* implementation plans and QAPPs) for the program and in an annual self-implementation decision memo that is distributed to monitoring organizations.[41] These major requirements for self-implementation are proposed to be included in the appendix B sections pertaining to the NPEP program (NPAP, $PM_{2.5}$–PEP and Pb–PEP).

The NPEP clarification also adds a definition of ''independent assessment.'' The proposed definition is derived from the NPEP (NPAP, $PM_{2.5}$–PEP, and Pb–PEP) QAPPs and guidance; it also appears in the annual self-implementation memo described above. The clarification is not a new requirement but consolidates this information.

Refer to comments related to NPEP in appendix A in III.A. As there were no comments specifically related to PSD, the EPA is finalizing the requirement as proposed.

The EPA proposed to require PSD PQAOs to provide information to the PSD reviewing authority on the vendors of gas standards that they use (or will use) for the duration of the PSD monitoring project. A QAPP or monitoring plan may incorporate this

[40] Graded approach to Tribal QAPP and QMPs *http://www.epa.gov/ttn/amtic/cpreldoc.html.*

[41] *http://www.epa.gov/ttn/amtic/npepqa.html.*

information. However, that document must then be updated if there is a change in the vendor used. The current regulation (current appendix A, section 2.6.1) requires any gas vendor advertising and distributing ''EPA Protocol Gas'' to participate in the AA–PGVP. The EPA posts a list of these vendors on the AMTIC Web site.[42] This is not expected to be a burden since information of this type is normally included in a QAPP or standard operating procedure for a monitoring activity.

There were no adverse comments in appendix A or appendix B related to identifying vendors used to supply monitoring organization with gas standards. Therefore, the EPA is finalizing the requirement as proposed.

3. Measurement Quality Checks for Gases

The EPA proposed to lower the audit concentrations (current appendix A, section 3.2.1) of the one-point QC checks to 0.005 and 0.08 ppm for SO_2, NO_2, and O_3 (currently 0.01 to 0.1 ppm), and to between 0.5 and 5 ppm for CO monitors (currently 1 and 10 ppm). With the development of more sensitive monitoring instruments with lower detection limits, technical improvements in calibrators, and lower ambient air concentrations in general, the EPA believes this revision will better reflect the precision and bias of the routinely-collected ambient air data. Because the audit concentrations are selected using the mean or median concentration of typical ambient air data (guidance on this is provided in the QA Handbook [43]), the EPA proposed to add some clarification to the current language by requiring PSD monitoring organizations to select either the highest or lowest concentration in the ranges identified if the mean or median values of the routinely-collected concentrations are above or below the prescribed range.

The EPA received a number of comments on this proposed requirement. Please refer to the appendix A comments in III.A. In light of the comments received, the EPA will maintain the concentration ranges as proposed: 0.005 to 0.08 ppm for SO_2, NO_2, and O_3, and between the prescribed range of 0.5 and 5 ppm for CO monitors. However, rather than requiring that the range selected be at the mean or median concentration range at the site or the agencies network of sites, the QC check gas concentration selected within the prescribed range can be related to the monitoring objective of the site, with those monitors primarily intended for NAAQS compliance utilizing concentrations at or near the level of the NAAQS (higher end of the required range), and trace gas monitors operating at background or trends sites related to the mean or median of the ambient air concentrations normally measured at those sites in order to appropriately reflect the precision and bias at these routine concentration ranges. If the mean or median concentrations at trace gas sites are below the MDL of the instrument or above the prescribed range, the agency can select the lowest or highest concentration in the range that can be practically achieved. In the case of PSD monitoring, the EPA will add language requiring the PSD monitoring organization to consult with the PSD reviewing authority on the most appropriate one-point QC concentration based on the objectives of the monitoring activity. In addition, the EPA will keep language suggesting that an additional QC check point is encouraged for those organizations that may have occasional high values or would like to confirm the monitors' linearity at the higher end of the operational range.

In addition, to alleviate concerns about failing the acceptance criteria at lower QC concentrations, the EPA will evaluate suggestions by monitoring organizations to raise acceptance criteria or look at alternative acceptance criteria (*e.g.,* difference instead of percent difference). Since acceptance criteria is included in guidance, the EPA will have the opportunity to perform the evaluations without effecting the regulation.

The EPA proposed to remove the existing reference to zero and span adjustments (current appendix A, section 3.2.1.1) and to revise the one-point QC language to simply require that the QC check be conducted before making any calibration or adjustment to the monitor. Recent revisions of the QA Handbook discourage the practice of making frequent span adjustments, so the proposed language helps to clarify that no adjustment be made prior to implementation of the one-point QC check. There were no comments made on this proposed revision, so the EPA is finalizing this revision as proposed.

The current annual performance evaluation language (current appendix A, section 3.2.2.1) requires that the audits be conducted by selecting three consecutive audit levels (currently, appendix A recognizes five audit levels). Due to the implementation of the NCore network, the inception of trace gas monitors, and lower ambient air concentrations being measured under typical circumstances, there is a need for audit levels at lower concentrations to more accurately represent the uncertainties present in the ambient air data. The EPA proposed to expand the audit levels from five to ten and remove the requirement to audit three consecutive levels. The current regulation also requires that the three audit levels should bracket 80 percent of the ambient air concentrations measured by the analyzer. This current ''bracketing language'' has caused some confusion, and monitoring organizations have requested the use of an audit point to establish monitor accuracy around the NAAQS levels. Therefore, the EPA proposed to revise the language so that two of the audit levels selected represent 10 to 80 percent of routinely-collected ambient concentrations either measured by the monitor or in the PSD PQAOs network of monitors. The proposed revision allows the third point to be selected at a concentration that is consistent with PSD-specific DQOs (*e.g.,* the 75 ppb NAAQS level for SO_2).

The EPA received a number of comments on this proposal. Please refer to the appendix A comments in III.A.

In addition to comments related to appendix A, the EPA received comments specific to PSD on this section. A commenter mentioned that for PSD, the performance evaluation (PE) is performed quarterly since PSD monitoring may occur for only 1 year. The current language required the audit to occur each calendar quarter and since PSD monitoring does not necessarily follow calendar quarters, it was suggested to revise the term ''calendar quarter'' to ''quarterly.'' The EPA will revise the PSD language to reflect implementing the quarterly PE on a quarter or 90-day frequency. A commenter felt that the requirement that PE personnel will be required to meet PE training and certification requirements was in error because the requirement for certification applies only to NPEP audits, not to quarterly performance evaluation audits, and there is no further regulatory discussion to support such an assertion. Because the EPA has provided more flexibility on implementing NPEP at PSD sites, we believed there needed to be an additional requirement that the personnel implementing these audits be trained and certified. However, as the commenter mentioned, there is no additional instruction on this, nor is there any mention of the organization required to do this training and certification. It is expected that any

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

[43] QA Handbook for Air Pollution Measurement Vol. II Ambient Air Quality Monitoring Program at: *http://www.epa.gov/ttn/amtic/qalist.html.*

entity performing this activity would be trained and capable of performing these audits. Therefore, the EPA will remove the last sentence requiring training and certification.

The EPA received a comment that suggested the PE language was not consistent with an earlier section (2.7) that only required the use of reference and equivalent method monitors as opposed to trace gas analyzers regardless of the concentrations measured. The commenter's contention was that based upon the proposed language related to the selection of PE concentration, the PSD monitoring agency would be required to acquire trace gas instruments due to their sensitivity and the fact that their ambient air concentrations were low. They used examples of annual mean NO_2 values around 1.9 ppb and SO_2 concentrations of 1.0 ppb. However, the proposed PE language is consistent with the reference and equivalent language described in section 2.7 since trace gas analyzers are in fact reference and equivalent instruments and, therefore, are included in that description. Regardless of the proposed PE concentration range, it would seem that PSD monitoring organizations that are required to monitor at the low concentration ranges would want to select FRM or FEM instruments more capable of reliably measuring these concentrations.

Based on the comments received related to appendices A and B, the EPA will revise the proposed language to require three points to be selected: One point around two to three times the method detection limit of the instruments within the PQAO network, a second point less than the 99 percentile of the data at the site or the network of sites within a PQAO or the next highest audit concentration level, and the third point around the primary NAAQS or the highest 3-year concentration at the site or the network of sites in the PQAO. This provides two audit points that reflect 99 percent of the monitoring data and a third point at the highest 3-year concentration or the NAAQS, whichever concentration the PSD monitoring organization chooses.

The EPA proposed to revise the language (current appendix A, section 3.2.2.2(a)) addressing the limits on excess NO that must be followed during GPT procedures involving NO_2 audits. The current NO limit (maintaining at least 0.08 ppm) is very restrictive and requires auditors to make numerous mid-audit adjustments during a GPT that result in making the NO_2 audit a very time-consuming procedure. Monitoring agency staff have advised us that the observance of such excess NO limits has no apparent effect on NO_2 calibrations being conducted with modern-day GPT-capable calibration equipment and, therefore, the requirements in the context of performing audits is unnecessary.[44] We also note the increasing availability of the EPA-approved direct NO_2 methods that do not utilize converters, rendering the use of GPT techniques that require the output of NO and NO_X to be a potentially diminishingly used procedure in the future. Accordingly, we have proposed a more general statement regarding GPT that acknowledges the ongoing usage of monitoring agency procedures and guidance documents that have successfully supported NO_2 calibration activities. The EPA believes that if such procedures have been successfully used during calibrations when instrument adjustments are potentially being made, then such procedures are appropriate for audit use when instruments are not subject to adjustment.

The EPA received only supportive comments endorsing the proposed revision to the language on excess NO. Therefore, the EPA is finalizing this revision as proposed.

The EPA proposed to remove language (current appendix A, section 3.2.2.2(b)) in the annual performance evaluation section that requires Regional approval for audit gases for any monitors operating at ranges higher that 1.0 ppm for O_3, SO_2 and NO_2 and greater than 50 ppm for CO. The EPA does not need to approve a monitoring organization's use of audit gases to audit above proposed concentration levels since the EPA has identified the requirements for all audit gases used in the program in current appendix A, section 2.6.1. There should be very few cases where a PE needs to be performed above level 10, but there may be some legitimate instances (*e.g.,* an SO_2 audit in areas impacted by volcanic emissions). Since data reported to AQS above the highest level may be rejected (if PSD PE data are reported to AQS), the EPA proposes that PQAOs notify the PSD reviewing authority of sites auditing at concentrations above level 10 so that reporting accommodations can be made. There were no comments made on this proposed revision, so the EPA is finalizing this revision as proposed.

The EPA proposed to describe the NPAP (current appendix A, section 2.4) in more detail. The NPAP is a long-standing program for the ambient air monitoring community. The NPAP is a performance evaluation, which is a type of audit where quantitative data are collected independently in order to evaluate the proficiency of an analyst, monitoring instrument or laboratory. This program has been briefly mentioned in section 2.4 of the current appendix A requirements. In appendix A, the EPA proposed to add language consistent with an annual decision memorandum[45] distributed to all state and local monitoring organizations in order to determine whether the monitoring organization plans to self-implement the NPAP program or utilize the federally implemented program. In order to make this decision, the NPAP adequacy and independence requirements are described in the decision memorandum. The EPA proposed to include these same requirements in appendix B in a separate section for NPAP. As described in the applicability section, the implementation of NPAP is at the discretion of the PSD reviewing authority but must be implemented if data are used in any NAAQS determinations. Since PSD monitoring is implemented at shorter intervals (usually a year) and with fewer monitors, if NPAP is performed, it is required to be performed annually on each monitor operated in the PSD network.

See appendix A for comments and discussions related to this section. The EPA is finalizing this revision as proposed.

4. Measurement Quality Checks for Particulate Monitors

The EPA proposed to have one flow rate verification frequency requirement for all PM PSD monitors. The current regulations (current appendix A, table A–2) provide for monthly flow rate verifications for most samplers used to monitor $PM_{2.5}$, PM_{10} and Pb and quarterly flow rate verifications for high-volume PM_{10} or TSP samplers (for Pb). With longer duration NAAQS monitoring, the quarterly verification frequencies are adequate for these high-volume PM_{10} or TSP samplers. However, with the short duration of PSD monitoring, the EPA believes that monthly flow rate verifications are more appropriate to ensure that any sampler flow rate problems are identified more quickly and to reduce the potential for a significant amount of data invalidation that could extend monitoring activities.

The EPA received one comment in support of this revision and no adverse

[44] See supporting information in Excess NO Issue paper, Mike Papp and Lewis Weinstock, Docket number EPA–HQ–OAR–2013–0619.

[45] *http://www3.epa.gov/ttn/amtic/npepqa.html.*

comments. Therefore, the EPA is finalizing this revision as proposed.

The EPA proposed to grant more flexibility to PSD monitoring organizations when selecting $PM_{2.5}$ method designations for sites that require collocation. Appendix A (current section 3.2.5.2(b)) requires that if a primary monitor is a FEM, then the first QC collocated monitor must be a FRM monitor. Most of the FEM monitors are continuous monitors while the FRM monitors are filter-based. Continuous monitors (which are all FEMs) may be advantageous for use at the more remote PSD monitoring locations, since the site operator would not need to visit a site as often to retrieve filters (current FRMs are filter-based). The current collocation requirements for FEMs require a filter-based FRM for collocation, which would mean a visit to retrieve the FRM filters at least 1 week after the QC collocated monitor operated. Therefore, the EPA proposed that the FRM be selected as the QC collocated monitor unless the PSD PQAO submits a waiver request to the PSD reviewing authority to allow for collocation with a FEM. If the request for a waiver is approved, then the QC monitor must be the same method designation as the primary FEM monitor. The EPA did not receive any comments on this proposal and is finalizing this revision as proposed.

The EPA proposed to allow the PSD reviewing authority to waive the $PM_{2.5}$ 3 $\mu g/m^3$ concentration validity threshold for implementation of the $PM_{2.5}$–PEP in the last quarter of PSD monitoring. The $PM_{2.5}$–PEP (current appendix A, section 3.2.7) requires five valid $PM_{2.5}$–PEP audits per year for $PM_{2.5}$ monitoring networks with less than or equal to five sites and eight valid $PM_{2.5}$–PEP audits per year with $PM_{2.5}$ monitoring networks greater than five sites. Any PEP samples collected with a concentration less than 3 $\mu g/m^3$ are not considered valid, since they cannot be used for bias estimates, and re-sampling is required at a later date. With NAAQS-related monitoring, which aggregates the $PM_{2.5}$–PEP data over a 3-year period, re-sampling is easily accomplished. Due to the relatively short-term nature of most PSD monitoring, the likelihood of measuring low concentrations in many areas attaining the $PM_{2.5}$ standard and the time required to weigh filters collected in performance evaluations, a PSD monitoring organization's QAPP may contain a provision to waive the 3 $\mu g/m^3$ threshold for validity of performance evaluations conducted in the last quarter of monitoring, subject to approval by the PSD reviewing authority. The EPA did not receive any comments on this proposed waiver and is finalizing this revision as proposed.

5. Calculations for Data Quality Assessment

In order to allow reasonable estimates of data quality, the EPA uses data above an established threshold concentration usually related to the detection limits of the measurement method. Measurement pairs are selected for use in the precision and bias calculations only when both measurements are above a threshold concentration.

For many years, the threshold concentration for Pb precision and bias data has been 0.02 $\mu g/m^3$. The EPA promulgated a new Pb FRM utilizing the ICP–MS analysis technique in 2013 as a revision to appendix G of 40 CFR part 50.[46] This new FRM demonstrated MDLs[47] below 0.0002 $\mu g/m^3$, which is well below the EPA requirement of five percent of the current Pb NAAQS level of 0.15 $\mu g/m^3$, or 0.0075 $\mu g/m^3$. As a result of the increased sensitivity inherent in this new FRM, the EPA proposed to lower the acceptable Pb concentration (current section 4) from the current value of 0.02 $\mu g/m^3$ to 0.002 $\mu g/m^3$ for measurements obtained using the new Pb FRM and other more recently approved equivalent methods that have the requisite increased sensitivity.[48] The current 0.02 $\mu g/m^3$ value will be retained for the previous Pb FRM that has subsequently been re-designated as FEM EQLA–0813–803 as well as older equivalent methods that were approved prior to the more recent work on developing more sensitive methods. Since ambient Pb concentrations are lower and methods more sensitive, lowering the threshold concentration will allow much more collocated information to be evaluated, which will provide more representative estimates of precision and bias.

See comments related to this proposal in the appendix A section. The EPA will establish two thresholds as proposed and will evaluate the use of an absolute difference acceptance criteria at lower concentration levels.

The EPA also proposed to remove the TSP threshold concentration since TSP is no longer a NAAQS-required pollutant and the EPA no longer has QC requirements for it. The EPA received one comment in support of this proposed change and no adverse comments and is finalizing this revision as proposed.

The EPA proposed to remove the statistical check currently described in section 4.1.5 of appendix A. The check was developed to perform a comparison of the one-point QC checks and the annual performance evaluation data performed by the same PQAO. The section suggests that 95 percent of all the bias estimates of the annual performance evaluations (reported as a percent difference) should fall within the 95 percent probability interval developed using the one-point QC checks. The problem with this check is that PQAOs with very good repeatability on the one-point QC check data had a hard time meeting this requirement since the probability interval became very tight, making it more difficult for better performing PQAOs to meet the requirement. Separate statistics to evaluate the one-point QC checks and the performance evaluations are already promulgated, so the removal of this check does not affect data quality assessments. The EPA received one comment in support of this proposal and no adverse comments and is finalizing this revision as proposed.

Similar to the statistical comparison of performance evaluation data, the EPA proposed to remove the statistical check (current appendix A, section 4.2.4) to compare the flow rate audit data and flow rate verification data. The existing language suggests that 95 percent of all the flow rate audit data (reported as percent difference) should fall within the 95 percent probability interval developed from the flow rate verification data for the PQAO. The problem, as with the one-point QC check, was that monitoring organizations with very good repeatability on the flow rate verifications had a hard time meeting this requirement since the probability interval became very tight, making it difficult for better performing PQAOs to meet the requirement. Separate statistics to evaluate the flow rate verifications and flow rate audits are already promulgated, so the removal of this check does not affect data quality assessments. The EPA received one comment in support of this proposal and no adverse comments and is finalizing this revision as proposed.

The EPA proposed to remove the reporting requirements that are currently in section 5 of appendix A because they do not pertain to PSD monitoring (current sections 5.1, 5.1.1 and 5.1.2.1). Since PSD organizations

[46] See 78 FR 40000, July 3, 2013.

[47] MDL is described as the minimum concentration of a substance that can be measured and reported with 99 percent confidence that the analyte concentration is greater than zero.

[48] FEMs approved on or after March 4, 2010, have the required sensitivity to utilize the 0.002 $\mu g/m^3$ reporting limit with the exception of manual equivalent method EQLA–0813–803, the previous FRM based on flame atomic absorption spectroscopy.

are not required to certify their data to the EPA nor report to AQS, the EPA will remove language related to these requirements and language that required the EPA to calculate and report the measurement uncertainty for the entire calendar year. The EPA will retain the quarterly PSD reporting requirements (current section 5.2 in appendix A) and require that those requirements be consistent with 40 CFR 58.16 as it pertains to PSD ambient air quality data and QC data, as described in appendix B. The EPA did not receive any comment on this revision and is finalizing this revision as proposed.

IV. Statutory and Executive Order Reviews

A. Executive Order 12866: Regulatory Planning and Review and Executive Order 13563: Improving Regulation and Regulatory Review

This action is not a significant regulatory action and was, therefore, not submitted to the Office of Management and Budget (OMB) for review.

B. Paperwork Reduction Act (PRA)

This action does not impose any new information collection burden under the PRA. OMB has previously approved the information collection activities contained in the existing regulations and has assigned OMB control number 2060–0084. While the EPA believes that the net effect of the requirement changes is a decrease in overall burden, the current information collection request calculation tools examine key air monitoring tasks on somewhat of a macro level and are therefore not sufficiently detailed to show a material change in burden compared with the existing requirements.

C. Regulatory Flexibility Act (RFA)

I certify that this action will not have a significant economic impact on a substantial number of small entities under the RFA. This action will not impose any requirements on small entities. This action finalizes minor changes and clarifications to existing monitoring requirements and definitions.

D. Unfunded Mandates Reform Act

This action does not contain an unfunded federal mandate of $100 million or more as described in UMRA, 2 U.S.C. 1531–1538, and does not significantly or uniquely affect small governments. The revisions to the monitoring requirements impose no enforceable duty on any state, local, or tribal governments or the private sector beyond those duties already established in the CAA.

E. Executive Order 13132: Federalism

This action does not have federalism implications. It will not have substantial direct effects on the states, on the relationship between the national government and the states, or on the distribution of power and responsibilities among the various levels of government.

F. Executive Order 13175: Consultation and Coordination With Indian Tribal Governments

This action does not have tribal implications, as specified in Executive Order 13175 (65 FR 67249, November 9, 2000). Tribes have the opportunity to seek treatment in a manner similar to a state for the purpose of installing and operating a monitoring network consisting of one or more monitors and to then install and operate such a network, but are not required to do so. With regard to any tribes that may currently be operating a monitoring network, as well as any tribes that may operate a monitoring network in the future, this action finalizes minor changes and clarifications to existing monitoring requirements and will not materially impact the time required to operate monitoring networks. Thus, consultation under the Executive Order 13175 is not required for this action. The EPA will work through tribal resources such as the Tribal Air Monitoring Support Center to ensure a complete understanding of these revisions.

G. Executive Order 13045: Protection of Children From Environmental Health and Safety Risks

The EPA interprets Executive Order 13045 as applying only to those regulatory actions that concern environmental health or safety risks that the EPA has reason to believe may disproportionately affect children, per the definition of ''covered regulatory action'' in section 2–202 of the Executive Order. This action is not subject to Executive Order 13045 because it does not concern an environmental health risk or safety risk.

H. Executive Order 13211: Actions Concerning Regulations That Significantly Affect Energy Supply, Distribution, or Use

This action is not subject to Executive Order 13211, because it is not a significant regulatory action under Executive Order 12866.

I. National Technology Transfer and Advancement Act

This action does not involve technical standards.

J. Executive Order 12898: Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations

The EPA believes the human health or environmental risk addressed by this action will not have potential disproportionately high and adverse human health or environmental effects on minority, low-income or indigenous populations. This action finalizes minor changes and clarifications to existing monitoring requirements and definitions.

K. Congressional Review Act

This action is subject to the CRA, and the EPA will submit a rule report to each House of the Congress and to the Comptroller General of the United States. This action is not a ''major rule'' as defined by 5 U.S.C. 804(2).

List of Subjects in 40 CFR Part 58

Environmental protection, Administrative practice and procedure, Air pollution control, Intergovernmental relations.

Dated: March 10, 2016.

Gina McCarthy,

Administrator.

Part 58, chapter I, title 40 of the Code of Federal Regulations is amended as follows:

PART 58—AMBIENT AIR QUALITY SURVEILLANCE

■ 1. The authority citation for part 58 continues to read as follows:

Authority: 42 U.S.C. 7403, 7405, 7410, 7414, 7601, 7611, 7614, and 7619.

■ 2. Revise § 58.1 to read as follows:

§ 58.1 Definitions.

As used in this part, all terms not defined herein have the meaning given them in the Clean Air Act.

AADT means the annual average daily traffic.

Act means the Clean Air Act as amended (42 U.S.C. 7401, *et seq.*)

Additive and multiplicative bias means the linear regression intercept and slope of a linear plot fitted to corresponding candidate and reference method mean measurement data pairs.

Administrator means the Administrator of the Environmental Protection Agency (EPA) or his or her authorized representative.

Air quality system (AQS) means the EPA's computerized system for storing and reporting of information relating to ambient air quality data.

Approved regional method (ARM) means a continuous $PM_{2.5}$ method that has been approved specifically within a

state or local air monitoring network for purposes of comparison to the NAAQS and to meet other monitoring objectives.

AQCR means air quality control region.

Area-wide means all monitors sited at neighborhood, urban, and regional scales, as well as those monitors sited at either micro- or middle-scale that are representative of many such locations in the same CBSA.

Certifying agency means a state, local, or tribal agency responsible for meeting the data certification requirements in accordance with § 58.15 for a unique set of monitors.

Chemical Speciation Network (CSN) includes Speciation Trends Network stations (STN) as specified in paragraph 4.7.4 of appendix D of this part and supplemental speciation stations that provide chemical species data of fine particulate.

CO means carbon monoxide.

Combined statistical area (CSA) is defined by the U.S. Office of Management and Budget as a geographical area consisting of two or more adjacent Core Based Statistical Areas (CBSA) with employment interchange of at least 15 percent. Combination is automatic if the employment interchange is 25 percent and determined by local opinion if more than 15 but less than 25 percent.

Core-based statistical area (CBSA) is defined by the U.S. Office of Management and Budget, as a statistical geographic entity consisting of the county or counties associated with at least one urbanized area/urban cluster of at least 10,000 population, plus adjacent counties having a high degree of social and economic integration. Metropolitan Statistical Areas (MSAs) and micropolitan statistical areas are the two categories of CBSA (metropolitan areas have populations greater than 50,000; and micropolitan areas have populations between 10,000 and 50,000). In the case of very large cities where two or more CBSAs are combined, these larger areas are referred to as combined statistical areas (CSAs)

Corrected concentration pertains to the result of an accuracy or precision assessment test of an open path analyzer in which a high-concentration test or audit standard gas contained in a short test cell is inserted into the optical measurement beam of the instrument. When the pollutant concentration measured by the analyzer in such a test includes both the pollutant concentration in the test cell and the concentration in the atmosphere, the atmospheric pollutant concentration must be subtracted from the test measurement to obtain the corrected concentration test result. The corrected concentration is equal to the measured concentration minus the average of the atmospheric pollutant concentrations measured (without the test cell) immediately before and immediately after the test.

Design value means the calculated concentration according to the applicable appendix of part 50 of this chapter for the highest site in an attainment or nonattainment area.

EDO means environmental data operations.

Effective concentration pertains to testing an open path analyzer with a high-concentration calibration or audit standard gas contained in a short test cell inserted into the optical measurement beam of the instrument. Effective concentration is the equivalent ambient-level concentration that would produce the same spectral absorbance over the actual atmospheric monitoring path length as produced by the high-concentration gas in the short test cell. Quantitatively, effective concentration is equal to the actual concentration of the gas standard in the test cell multiplied by the ratio of the path length of the test cell to the actual atmospheric monitoring path length.

Federal equivalent method (FEM) means a method for measuring the concentration of an air pollutant in the ambient air that has been designated as an equivalent method in accordance with part 53 of this chapter; it does not include a method for which an equivalent method designation has been canceled in accordance with § 53.11 or § 53.16.

Federal reference method (FRM) means a method of sampling and analyzing the ambient air for an air pollutant that is specified as a reference method in an appendix to part 50 of this chapter, or a method that has been designated as a reference method in accordance with this part; it does not include a method for which a reference method designation has been canceled in accordance with § 53.11 or § 53.16 of this chapter.

HNO_3 means nitric acid.

Implementation plan means an implementation plan approved or promulgated by the EPA pursuant to section 110 of the Act.

Local agency means any local government agency, other than the state agency, which is charged by a state with the responsibility for carrying out a portion of the annual monitoring network plan required by § 58.10.

Meteorological measurements means measurements of wind speed, wind direction, barometric pressure, temperature, relative humidity, solar radiation, ultraviolet radiation, and/or precipitation that occur at SLAMS stations including the NCore and PAMS networks.

Metropolitan Statistical Area (MSA) means a CBSA associated with at least one urbanized area of 50,000 population or greater. The central-county, plus adjacent counties with a high degree of integration, comprise the area.

Monitor means an instrument, sampler, analyzer, or other device that measures or assists in the measurement of atmospheric air pollutants and which is acceptable for use in ambient air surveillance under the applicable provisions of appendix C to this part.

Monitoring agency means a state, local or tribal agency responsible for meeting the requirements of this part.

Monitoring organization means a monitoring agency responsible for operating a monitoring site for which the quality assurance regulations apply.

Monitoring path for an open path analyzer means the actual path in space between two geographical locations over which the pollutant concentration is measured and averaged.

Monitoring path length of an open path analyzer means the length of the monitoring path in the atmosphere over which the average pollutant concentration measurement (path-averaged concentration) is determined. See also, *optical measurement path length.*

Monitoring planning area (MPA) means a contiguous geographic area with established, well-defined boundaries, such as a CBSA, county or state, having a common area that is used for planning monitoring locations for $PM_{2.5}$. A MPA may cross state boundaries, such as the Philadelphia PA–NJ MSA, and be further subdivided into community monitoring zones. The MPAs are generally oriented toward CBSAs or CSAs with populations greater than 200,000, but for convenience, those portions of a state that are not associated with CBSAs can be considered as a single MPA.

NATTS means the national air toxics trends stations. This network provides hazardous air pollution ambient data.

NCore means the National Core multipollutant monitoring stations. Monitors at these sites are required to measure particles ($PM_{2.5}$ speciated $PM_{2.5}$, $PM_{10–2.5}$), O_3, SO_2, CO, nitrogen oxides (NO/NO_y), and meteorology (wind speed, wind direction, temperature, relative humidity).

Near-road monitor means any approved monitor meeting the applicable specifications described in 40 CFR part 58, appendix D (sections 4.2.1, 4.3.2, 4.7.1(b)(2)) and appendix E

(section 6.4(a), Table E–4) for near-road measurement of $PM_{2.5}$, CO, or NO_2.

Network means all stations of a given type or types.

Network Plan means the Annual Monitoring Network Plan described in § 58.10.

NH_3 means ammonia.

NO_2 means nitrogen dioxide.

NO means nitrogen oxide.

NO_X means the sum of the concentrations of NO_2 and NO.

NO_y means the sum of all total reactive nitrogen oxides, including NO, NO_2, and other nitrogen oxides referred to as NO_Z.

O_3 means ozone.

Open path analyzer means an automated analytical method that measures the average atmospheric pollutant concentration in situ along one or more monitoring paths having a monitoring path length of 5 meters or more and that has been designated as a reference or equivalent method under the provisions of part 53 of this chapter.

Optical measurement path length means the actual length of the optical beam over which measurement of the pollutant is determined. The path-integrated pollutant concentration measured by the analyzer is divided by the optical measurement path length to determine the path-averaged concentration. Generally, the optical measurement path length is:

(1) Equal to the monitoring path length for a (bistatic) system having a transmitter and a receiver at opposite ends of the monitoring path;

(2) Equal to twice the monitoring path length for a (monostatic) system having a transmitter and receiver at one end of the monitoring path and a mirror or retroreflector at the other end; or

(3) Equal to some multiple of the monitoring path length for more complex systems having multiple passes of the measurement beam through the monitoring path.

PAMS means photochemical assessment monitoring stations.

Pb means lead.

PM means particulate matter, including but not limited to PM_{10}, PM_{10C}, $PM_{2.5}$, and $PM_{10-2.5}$.

$PM_{2.5}$ means particulate matter with an aerodynamic diameter less than or equal to a nominal 2.5 micrometers as measured by a reference method based on appendix L of part 50 and designated in accordance with part 53 of this chapter, by an equivalent method designated in accordance with part 53, or by an approved regional method designated in accordance with appendix C to this part.

PM_{10} means particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers as measured by a reference method based on appendix J of part 50 of this chapter and designated in accordance with part 53 of this chapter or by an equivalent method designated in accordance with part 53.

PM_{10C} means particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers as measured by a reference method based on appendix O of part 50 of this chapter and designated in accordance with part 53 of this chapter or by an equivalent method designated in accordance with part 53.

$PM_{10-2.5}$ means particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers and greater than a nominal 2.5 micrometers as measured by a reference method based on appendix O to part 50 of this chapter and designated in accordance with part 53 of this chapter or by an equivalent method designated in accordance with part 53.

Point analyzer means an automated analytical method that measures pollutant concentration in an ambient air sample extracted from the atmosphere at a specific inlet probe point, and that has been designated as a reference or equivalent method in accordance with part 53 of this chapter.

Primary monitor means the monitor identified by the monitoring organization that provides concentration data used for comparison to the NAAQS. For any specific site, only one monitor for each pollutant can be designated in AQS as primary monitor for a given period of time. The primary monitor identifies the default data source for creating a combined site record for purposes of NAAQS comparisons.

Primary quality assurance organization (PQAO) means a monitoring organization, a group of monitoring organizations or other organization that is responsible for a set of stations that monitor the same pollutant and for which data quality assessments can be pooled. Each criteria pollutant sampler/monitor at a monitoring station must be associated with only one PQAO.

Probe means the actual inlet where an air sample is extracted from the atmosphere for delivery to a sampler or point analyzer for pollutant analysis.

PSD monitoring network means a set of stations that provide concentration information for a specific PSD permit.

PSD monitoring organization means a source owner/operator, a government agency, or a contractor of the source or agency that operates an ambient air pollution monitoring network for PSD purposes.

PSD reviewing authority means the state air pollution control agency, local agency, other state agency, tribe, or other agency authorized by the Administrator to carry out a permit program under §§ 51.165 and 51.166 of this chapter, or the Administrator in the case of EPA-implemented permit programs under § 52.21 of this chapter.

PSD station means any station operated for the purpose of establishing the effect on air quality of the emissions from a proposed source for purposes of prevention of significant deterioration as required by § 51.24(n) of this chapter.

Regional Administrator means the Administrator of one of the ten EPA Regional Offices or his or her authorized representative.

Reporting organization means an entity, such as a state, local, or tribal monitoring agency, that reports air quality data to the EPA.

Site means a geographic location. One or more stations may be at the same site.

SLAMS means state or local air monitoring stations. The SLAMS include the ambient air quality monitoring sites and monitors that are required by appendix D of this part and are needed for the monitoring objectives of appendix D, including NAAQS comparisons, but may serve other data purposes. The SLAMS includes NCore, PAMS, CSN, and all other state or locally operated criteria pollutant monitors, operated in accordance to this part, that have not been designated and approved by the Regional Administrator as SPM stations in an annual monitoring network plan.

SO_2 means sulfur dioxide.

Special purpose monitor (SPM) station means a monitor included in an agency's monitoring network that the agency has designated as a special purpose monitor station in its annual monitoring network plan and in the AQS, and which the agency does not count when showing compliance with the minimum requirements of this subpart for the number and siting of monitors of various types. Any SPM operated by an air monitoring agency must be included in the periodic assessments and annual monitoring network plan required by § 58.10 and approved by the Regional Administrator.

State agency means the air pollution control agency primarily responsible for development and implementation of a State Implementation Plan under the Act.

Station means a single monitor, or a group of monitors, located at a particular site.

STN station means a $PM_{2.5}$ chemical speciation station designated to be part of the speciation trends network. This network provides chemical species data of fine particulate.

Supplemental speciation station means a $PM_{2.5}$ chemical speciation station that is operated for monitoring agency needs and not part of the STN.

Traceable means that a local standard has been compared and certified, either directly or via not more than one intermediate standard, to a National Institute of Standards and Technology (NIST)-certified primary standard such as a NIST-traceable Reference Material (NTRM) or a NIST-certified Gas Manufacturer's Internal Standard (GMIS).

TSP (total suspended particulates) means particulate matter as measured by the method described in appendix B of Part 50.

Urbanized area means an area with a minimum residential population of at least 50,000 people and which generally includes core census block groups or blocks that have a population density of at least 1,000 people per square mile and surrounding census blocks that have an overall density of at least 500 people per square mile. The Census Bureau notes that under certain conditions, less densely settled territory may be part of each Urbanized Area.

VOCs means volatile organic compounds.

■ 3. In § 58.10:

■ a. Revise paragraphs (a)(1) and (a)(2).

■ b. Add paragraph (a)(12).

The revisions and addition read as follows:

§ 58.10 Annual monitoring network plan and periodic network assessment.

(a)(1) Beginning July 1, 2007, the state, or where applicable local, agency shall submit to the Regional Administrator an annual monitoring network plan which shall provide for the documentation of the establishment and maintenance of an air quality surveillance system that consists of a network of SLAMS monitoring stations that can include FRM, FEM, and ARM monitors that are part of SLAMS, NCore, CSN, PAMS, and SPM stations. The plan shall include a statement of whether the operation of each monitor meets the requirements of appendices A, B, C, D, and E of this part, where applicable. The Regional Administrator may require additional information in support of this statement. The annual monitoring network plan must be made available for public inspection and comment for at least 30 days prior to submission to the EPA and the submitted plan shall include and address, as appropriate, any received comments.

(2) Any annual monitoring network plan that proposes network modifications (including new or discontinued monitoring sites, new determinations that data are not of sufficient quality to be compared to the NAAQS, and changes in identification of monitors as suitable or not suitable for comparison against the annual $PM_{2.5}$ NAAQS) to SLAMS networks is subject to the approval of the EPA Regional Administrator, who shall approve or disapprove the plan within 120 days of submission of a complete plan to the EPA.

* * * * *

(12) A detailed description of the PAMS network being operated in accordance with the requirements of appendix D to this part shall be submitted as part of the annual monitoring network plan for review by the EPA Administrator. The PAMS Network Description described in section 5 of appendix D may be used to meet this requirement.

* * * * *

■ 4. In § 58.11, revise paragraph (a)(3) to read as follows:

§ 58.11 Network technical requirements.

(a) * * *

(3) The owner or operator of an existing or a proposed source shall follow the quality assurance criteria in appendix B to this part that apply to PSD monitoring when operating a PSD site.

* * * * *

■ 5. In § 58.12:

■ a. Revise paragraph (d)(1).

■ b. Revise paragraph (d)(3).

The revisions read as follows:

§ 58.12 Operating schedules.

* * * * *

(d) * * *

(1)(i) Manual $PM_{2.5}$ samplers at required SLAMS stations without a collocated continuously operating $PM_{2.5}$ monitor must operate on at least a 1-in-3 day schedule unless a waiver for an alternative schedule has been approved per paragraph (d)(1)(ii) of this section.

(ii) For SLAMS $PM_{2.5}$ sites with both manual and continuous $PM_{2.5}$ monitors operating, the monitoring agency may request approval for a reduction to 1-in-6 day $PM_{2.5}$ sampling or for seasonal sampling from the EPA Regional Administrator. Other requests for a reduction to 1-in-6 day $PM_{2.5}$ sampling or for seasonal sampling may be approved on a case-by-case basis. The EPA Regional Administrator may grant sampling frequency reductions after consideration of factors (including but not limited to the historical $PM_{2.5}$ data quality assessments, the location of current $PM_{2.5}$ design value sites, and their regulatory data needs) if the Regional Administrator determines that the reduction in sampling frequency will not compromise data needed for implementation of the NAAQS. Required SLAMS stations whose measurements determine the design value for their area and that are within ±10 percent of the annual NAAQS, and all required sites where one or more 24-hour values have exceeded the 24-hour NAAQS each year for a consecutive period of at least 3 years are required to maintain at least a 1-in-3 day sampling frequency until the design value no longer meets these criteria for 3 consecutive years. A continuously operating FEM or ARM $PM_{2.5}$ monitor satisfies this requirement unless it is identified in the monitoring agency's annual monitoring network plan as not appropriate for comparison to the NAAQS and the EPA Regional Administrator has approved that the data from that monitor may be excluded from comparison to the NAAQS.

(iii) Required SLAMS stations whose measurements determine the 24-hour design value for their area and whose data are within ±5 percent of the level of the 24-hour $PM_{2.5}$ NAAQS must have an FRM or FEM operate on a daily schedule if that area's design value for the annual NAAQS is less than the level of the annual $PM_{2.5}$ standard. A continuously operating FEM or ARM $PM_{2.5}$ monitor satisfies this requirement unless it is identified in the monitoring agency's annual monitoring network plan as not appropriate for comparison to the NAAQS and the EPA Regional Administrator has approved that the data from that monitor may be excluded from comparison to the NAAQS. The daily schedule must be maintained until the referenced design value no longer meets these criteria for 3 consecutive years.

(iv) Changes in sampling frequency attributable to changes in design values shall be implemented no later than January 1 of the calendar year following the certification of such data as described in § 58.15.

* * * * *

(3) Manual $PM_{2.5}$ speciation samplers at STN stations must operate on at least a 1-in-3 day sampling frequency unless a reduction in sampling frequency has been approved by the EPA Administrator based on factors such as area's design value, the role of the particular site in national health studies, the correlation of the site's species data

with nearby sites, and presence of other leveraged measurements.

* * * * *

■ 6. In § 58.14, revise paragraph (a) to read as follows:

§ 58.14 System modification.

(a) The state, or where appropriate local, agency shall develop a network modification plan and schedule to modify the ambient air quality monitoring network that addresses the findings of the network assessment required every 5 years by § 58.10(d). The network modification plan shall be submitted as part of the Annual Monitoring Network Plan that is due no later than the year after submittal of the network assessment.

* * * * *

■ 7. Revise § 58.15 to read as follows:

§ 58.15 Annual air monitoring data certification.

(a) The state, or where appropriate local, agency shall submit to the EPA Regional Administrator an annual air monitoring data certification letter to certify data collected by FRM, FEM, and ARM monitors at SLAMS and SPM sites that meet criteria in appendix A to this part from January 1 to December 31 of the previous year. The head official in each monitoring agency, or his or her designee, shall certify that the previous year of ambient concentration and quality assurance data are completely submitted to AQS and that the ambient concentration data are accurate to the best of her or his knowledge, taking into consideration the quality assurance findings. The annual data certification letter is due by May 1 of each year.

(b) Along with each certification letter, the state shall submit to the Regional Administrator an annual summary report of all the ambient air quality data collected by FRM, FEM, and ARM monitors at SLAMS and SPM sites. The annual report(s) shall be submitted for data collected from January 1 to December 31 of the previous year. The annual summary serves as the record of the specific data that is the object of the certification letter.

(c) Along with each certification letter, the state shall submit to the Regional Administrator a summary of the precision and accuracy data for all ambient air quality data collected by FRM, FEM, and ARM monitors at SLAMS and SPM sites. The summary of precision and accuracy shall be submitted for data collected from January 1 to December 31 of the previous year.

■ 8. In § 58.16, revise paragraphs (a), (c), and (d) to read as follows:

§ 58.16 Data submittal and archiving requirements.

(a) The state, or where appropriate, local agency, shall report to the Administrator, via AQS all ambient air quality data and associated quality assurance data for SO_2; CO; O_3; NO_2; NO; NO_y; NO_X; Pb–TSP mass concentration; Pb–PM_{10} mass concentration; PM_{10} mass concentration; $PM_{2.5}$ mass concentration; for filter-based $PM_{2.5}$ FRM/FEM, the field blank mass; chemically speciated $PM_{2.5}$ mass concentration data; $PM_{10-2.5}$ mass concentration; meteorological data from NCore and PAMS sites; and metadata records and information specified by the AQS Data Coding Manual (*https://www.epa.gov/sites/production/files/2015-09/documents/aqs_data_coding_manual_0.pdf*). Air quality data and information must be submitted directly to the AQS via electronic transmission on the specified schedule described in paragraphs (b) and (d) of this section.

* * * * *

(c) Air quality data submitted for each reporting period must be edited, validated, and entered into the AQS (within the time limits specified in paragraphs (b) and (d) of this section) pursuant to appropriate AQS procedures. The procedures for editing and validating data are described in the AQS Data Coding Manual and in each monitoring agency's quality assurance project plan.

(d) The state shall report VOC and if collected, carbonyl, NH_3, and HNO_3 data from PAMS sites, and chemically speciated $PM_{2.5}$ mass concentration data to AQS within 6 months following the end of each quarterly reporting period listed in paragraph (b) of this section.

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■ 9. Revise Appendix A to part 58 to read as follows:

Appendix A to Part 58—Quality Assurance Requirements for Monitors used in Evaluations of National Ambient Air Quality Standards

1. General Information

1.1 *Applicability.* (a) This appendix specifies the minimum quality system requirements applicable to SLAMS and other monitor types whose data are intended to be used to determine compliance with the NAAQS (*e.g.,* SPMs, tribal, CASTNET, NCore, industrial, etc.), unless the EPA Regional Administrator has reviewed and approved the monitor for exclusion from NAAQS use and these quality assurance requirements.

(b) Primary quality assurance organizations are encouraged to develop and maintain quality systems more extensive than the required minimums. Additional guidance for the requirements reflected in this appendix can be found in the ''Quality Assurance Handbook for Air Pollution Measurement Systems,'' Volume II (see reference 10 of this appendix) and at a national level in references 1, 2, and 3 of this appendix.

1.2 *Primary Quality Assurance Organization (PQAO).* A PQAO is defined as a monitoring organization or a group of monitoring organizations or other organization that is responsible for a set of stations that monitors the same pollutant and for which data quality assessments will be pooled. Each criteria pollutant sampler/monitor must be associated with only one PQAO. In some cases, data quality is assessed at the PQAO level.

1.2.1 Each PQAO 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 in defining PQAOs 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;

(c) Common calibration facilities and standards;

(d) Oversight by a common quality assurance organization; and

(e) Support by a common management organization (*i.e.,* state agency) or laboratory.

Since data quality assessments are made and data certified at the PQAO level, the monitoring organization identified as the PQAO will be responsible for the oversight of the quality of data of all monitoring organizations within the PQAO.

1.2.2 Monitoring organizations having difficulty describing its PQAO or in assigning specific monitors to primary quality assurance organizations should consult with the appropriate EPA Regional Office. Any consolidation of monitoring organizations to PQAOs shall be subject to final approval by the appropriate EPA Regional Office.

1.2.3 Each PQAO is required to implement a quality system that provides sufficient information to assess the quality of the monitoring data. The quality system must, at a minimum, include the specific requirements described in this appendix. Failure to conduct or pass a required check or procedure, or a series of required checks or procedures, does not by itself invalidate data for regulatory decision making. Rather, PQAOs and the EPA shall use the checks and procedures required in this appendix in combination with other data quality information, reports, and similar documentation that demonstrate overall compliance with Part 58. Accordingly, the EPA and PQAOs shall use a ''weight of evidence'' approach when determining the suitability of data for regulatory decisions.

The EPA reserves the authority to use or not use monitoring data submitted by a monitoring organization when making regulatory decisions based on the EPA's assessment of the quality of the data. Consensus built validation templates or validation criteria already approved in QAPPs should be used as the basis for the weight of evidence approach.

1.3 *Definitions.*

(a) *Measurement Uncertainty.* A term used to describe deviations from a true concentration or estimate that are related to the measurement process and not to spatial or temporal population attributes of the air being measured.

(b) *Precision.* A measurement of mutual agreement among individual measurements of the same property usually under prescribed similar conditions, expressed generally in terms of the standard deviation.

(c) *Bias.* The systematic or persistent distortion of a measurement process which causes errors in one direction.

(d) *Accuracy.* The degree of agreement between an observed value and an accepted reference value. Accuracy includes a combination of random error (imprecision) and systematic error (bias) components which are due to sampling and analytical operations.

(e) *Completeness.* A measure of the amount of valid data obtained from a measurement system compared to the amount that was expected to be obtained under correct, normal conditions.

(f) *Detection Limit.* The lowest concentration or amount of target analyte that can be determined to be different from zero by a single measurement at a stated level of probability.

1.4 *Measurement Quality Checks.* The measurement quality checks described in section 3 of this appendix shall be reported to AQS and are included in the data required for certification.

1.5 *Assessments and Reports.* Periodic assessments and documentation of data quality are required to be reported to the EPA. To provide national uniformity in this assessment and reporting of data quality for all networks, specific assessment and reporting procedures are prescribed in detail in sections 3, 4, and 5 of this appendix. On the other hand, the selection and extent of the quality assurance and quality control activities used by a monitoring organization depend on a number of local factors such as field and laboratory conditions, the objectives for monitoring, the level of data quality needed, the expertise of assigned personnel, the cost of control procedures, pollutant concentration levels, etc. Therefore, quality system requirements in section 2 of this appendix are specified in general terms to allow each monitoring organization to develop a quality system that is most efficient and effective for its own circumstances while achieving the data quality objectives described in this appendix.

2. Quality System Requirements

A quality system (reference 1 of this appendix) is the means by which an organization manages the quality of the monitoring information it produces in a systematic, organized manner. It provides a framework for planning, implementing, assessing and reporting work performed by an organization and for carrying out required quality assurance and quality control activities.

2.1 *Quality Management Plans and Quality Assurance Project Plans.* All PQAOs must develop a quality system that is described and approved in quality management plans (QMP) and QAPPs to ensure that the monitoring results:

(a) Meet a well-defined need, use, or purpose (reference 5 of this appendix);

(b) Provide data of adequate quality for the intended monitoring objectives;

(c) Satisfy stakeholder expectations;

(d) Comply with applicable standards specifications;

(e) Comply with statutory (and other legal) requirements; and

(f) Reflect consideration of cost and economics.

2.1.1 The QMP describes the quality system in terms of the organizational structure, functional responsibilities of management and staff, lines of authority, and required interfaces for those planning, implementing, assessing and reporting activities involving environmental data operations (EDO). The QMP must be suitably documented in accordance with EPA requirements (reference 2 of this appendix), and approved by the appropriate Regional Administrator, or his or her representative. The quality system described in the QMP will be reviewed during the systems audits described in section 2.5 of this appendix. Organizations that implement long-term monitoring programs with EPA funds should have a separate QMP document. Smaller organizations, organizations that do infrequent work with the EPA or have monitoring programs of limited size or scope may combine the QMP with the QAPP if approved by, and subject to any conditions of the EPA. Additional guidance on this process can be found in reference 10 of this appendix. Approval of the recipient's QMP by the appropriate Regional Administrator or his or her representative may allow delegation of authority to the PQAOs independent quality assurance function to review and approve environmental data collection activities adequately described and covered under the scope of the QMP and documented in appropriate planning documents (QAPP). Where a PQAO or monitoring organization has been delegated authority to review and approve their QAPP, an electronic copy must be submitted to the EPA region at the time it is submitted to the PQAO/monitoring organization's QAPP approving authority. The QAPP will be reviewed by the EPA during systems audits or circumstances related to data quality. The QMP submission and approval dates for PQAOs/monitoring organizations must be reported to AQS either by the monitoring organization or the EPA Region.

2.1.2 The QAPP is a formal document describing, in sufficient detail, the quality system that must be implemented to ensure that the results of work performed will satisfy the stated objectives. PQAOs must develop QAPPs that describe how the organization intends to control measurement uncertainty to an appropriate level in order to achieve the data quality objectives for the EDO. The quality assurance policy of the EPA requires every EDO to have a written and approved QAPP prior to the start of the EDO. It is the responsibility of the PQAO/monitoring organization to adhere to this policy. The QAPP must be suitably documented in accordance with EPA requirements (reference 3 of this appendix) and include standard operating procedures for all EDOs either within the document or by appropriate reference. The QAPP must identify each PQAO operating monitors under the QAPP as well as generally identify the sites and monitors to which it is applicable either within the document or by appropriate reference. The QAPP submission and approval dates must be reported to AQS either by the monitoring organization or the EPA Region.

2.1.3 The PQAO/monitoring organization's quality system must have adequate resources both in personnel and funding to plan, implement, assess and report on the achievement of the requirements of this appendix and it's approved QAPP.

2.2 *Independence of Quality Assurance.* The PQAO 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 PQAO's QMP. Quality management includes strategic planning, allocation of resources and other systematic planning activities (*e.g.,* planning, implementation, assessing and reporting) pertaining to the quality system. 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.

2.3. *Data Quality Performance Requirements.*

2.3.1 *Data Quality Objectives.* The DQOs, or the results of other systematic planning processes, are statements that define the appropriate type of data to collect and specify the tolerable levels of potential decision errors that will be used as a basis for establishing the quality and quantity of data needed to support the monitoring objectives (reference 5 of this appendix). The DQOs will be developed by the EPA to support the primary regulatory objectives for each criteria pollutant. As they are developed, they will be added to the regulation. The quality of the conclusions derived from data interpretation can be affected by population uncertainty (spatial or temporal uncertainty) and measurement uncertainty (uncertainty associated with collecting, analyzing, reducing and reporting concentration data). This appendix focuses on assessing and controlling measurement uncertainty.

2.3.1.1 *Measurement Uncertainty for Automated and Manual $PM_{2.5}$ Methods.* The goal for acceptable measurement uncertainty is defined for precision as an upper 90

percent confidence limit for the coefficient of variation (CV) of 10 percent and ±10 percent for total bias.

2.3.1.2 *Measurement Uncertainty for Automated O_3 Methods.* The goal for acceptable measurement uncertainty is defined for precision as an upper 90 percent confidence limit for the CV of 7 percent and for bias as an upper 95 percent confidence limit for the absolute bias of 7 percent.

2.3.1.3 *Measurement Uncertainty for Pb Methods.* The goal for acceptable measurement uncertainty is defined for precision as an upper 90 percent confidence limit for the CV of 20 percent and for bias as an upper 95 percent confidence limit for the absolute bias of 15 percent.

2.3.1.4 *Measurement Uncertainty for NO_2.* The goal for acceptable measurement uncertainty is defined for precision as an upper 90 percent confidence limit for the CV of 15 percent and for bias as an upper 95 percent confidence limit for the absolute bias of 15 percent.

2.3.1.5 *Measurement Uncertainty for SO_2.* The goal for acceptable measurement uncertainty for precision is defined as an upper 90 percent confidence limit for the CV of 10 percent and for bias as an upper 95 percent confidence limit for the absolute bias of 10 percent.

2.4 *National Performance Evaluation Programs.* The PQAO shall provide for the implementation of a program of independent and adequate audits of all monitors providing data for NAAQS compliance purposes including the provision of adequate resources for such audit programs. A monitoring plan (or QAPP) which provides for PQAO participation in the EPA's National Performance Audit Program (NPAP), the $PM_{2.5}$ Performance Evaluation Program ($PM_{2.5}$-PEP) program and the Pb Performance Evaluation Program (Pb-PEP) and indicates the consent of the PQAO for the EPA to apply an appropriate portion of the grant funds, which the EPA would otherwise award to the PQAO for these QA activities, will be deemed by the EPA to meet this requirement. For clarification and to participate, PQAOs should contact either the appropriate EPA regional quality assurance (QA) coordinator at the appropriate EPA Regional Office location, or the NPAP coordinator at the EPA Air Quality Assessment Division, Office of Air Quality Planning and Standards, in Research Triangle Park, North Carolina. The PQAOs that plan to implement these programs (self-implement) rather than use the federal programs must meet the adequacy requirements found in the appropriate sections that follow, as well as meet the definition of independent assessment that follows.

2.4.1 *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 ambient air monitoring data. An organization can conduct the performance evaluation (PE) 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. In addition, the sample analysis of audit filters must be performed by a laboratory facility and laboratory equipment separate from the facilities used for routine sample analysis. Field and laboratory personnel will be required to meet PE field and laboratory training and certification requirements to establish comparability to federally implemented programs.

2.5 *Technical Systems Audit Program.* Technical systems audits of each PQAO shall be conducted at least every 3 years by the appropriate EPA Regional Office and reported to the AQS. If a PQAO is made up of more than one monitoring organization, all monitoring organizations in the PQAO should be audited within 6 years (two TSA cycles of the PQAO). As an example, if a state has five local monitoring organizations that are consolidated under one PQAO, all five local monitoring organizations should receive a technical systems audit within a 6-year period. Systems audit programs are described in reference 10 of this appendix.

2.6 *Gaseous and Flow Rate Audit Standards.*

2.6.1 Gaseous pollutant concentration standards (permeation devices or cylinders of compressed gas) used to obtain test concentrations for CO, SO_2, NO, and NO_2 must be traceable to either a National Institute of Standards and Technology (NIST) Traceable Reference Material (NTRM) or a NIST-certified Gas Manufacturer's Internal Standard (GMIS), certified in accordance with one of the procedures given in reference 4 of this appendix. Vendors advertising certification with the procedures provided in reference 4 of this appendix and distributing gases as ''EPA Protocol Gas'' for ambient air monitoring purposes must participate in the EPA Ambient Air Protocol Gas Verification Program or not use ''EPA'' in any form of advertising. Monitoring organizations must provide information to the EPA on the gas producers they use on an annual basis and those PQAOs purchasing standards will be obligated, at the request of the EPA, to participate in the program at least once every 5 years by sending a new unused standard to a designated verification laboratory.

2.6.2 Test concentrations for O_3 must be obtained in accordance with the ultraviolet photometric calibration procedure specified in appendix D to Part 50 of this chapter and by means of a certified NIST-traceable O_3 transfer standard. Consult references 7 and 8 of this appendix for guidance on transfer standards for O_3.

2.6.3 Flow rate measurements must be made by a flow measuring instrument that is NIST-traceable to an authoritative volume or other applicable standard. Guidance for certifying some types of flowmeters is provided in reference 10 of this appendix.

2.7 *Primary Requirements and Guidance.* Requirements and guidance documents for developing the quality system are contained in references 1 through 11 of this appendix, which also contain many suggested procedures, checks, and control specifications. Reference 10 describes specific guidance for the development of a quality system for data collected for comparison to the NAAQS. Many specific quality control checks and specifications for methods are included in the respective reference methods described in Part 50 of this chapter or in the respective equivalent method descriptions available from the EPA (reference 6 of this appendix). Similarly, quality control procedures related to specifically designated reference and equivalent method monitors are contained in the respective operation or instruction manuals associated with those monitors.

3. Measurement Quality Check Requirements

This section provides the requirements for PQAOs to perform the measurement quality checks that can be used to assess data quality. Data from these checks are required to be submitted to the AQS within the same time frame as routinely-collected ambient concentration data as described in 40 CFR 58.16. Table A–1 of this appendix provides a summary of the types and frequency of the measurement quality checks that will be described in this section.

3.1. *Gaseous Monitors of SO_2, NO_2, O_3, and CO.*

3.1.1 *One-Point Quality Control (QC) Check for SO_2, NO_2, O_3, and CO.* (a) A one-point QC check must be performed at least once every 2 weeks on each automated monitor used to measure SO_2, NO_2, O_3 and CO. With the advent of automated calibration systems, more frequent checking is strongly encouraged. See Reference 10 of this appendix for guidance on the review procedure. The QC check is made by challenging the monitor with a QC check gas of known concentration (effective concentration for open path monitors) between the prescribed range of 0.005 and 0.08 parts per million (ppm) for SO_2, NO_2, and O_3, and between the prescribed range of 0.5 and 5 ppm for CO monitors. The QC check gas concentration selected within the prescribed range should be related to the monitoring objectives for the monitor. If monitoring at an NCore site or for trace level monitoring, the QC check concentration should be selected to represent the mean or median concentrations at the site. If the mean or median concentrations at trace gas sites are below the MDL of the instrument the agency can select the lowest concentration in the prescribed range that can be practically achieved. If the mean or median concentrations at trace gas sites are above the prescribed range the agency can select the highest concentration in the prescribed range. An additional QC check point is encouraged for those organizations that may have occasional high values or would like to confirm the monitors' linearity at the higher end of the operational range or around NAAQS concentrations. If monitoring for NAAQS decisions, the QC concentration can be selected at a higher concentration within the prescribed range but should also consider precision points around mean or median monitor concentrations.

(b) Point analyzers must operate in their normal sampling mode during the QC check and the test atmosphere must pass through all filters, scrubbers, conditioners and other components used during normal ambient sampling and as much of the ambient air inlet system as is practicable. The QC check

must be conducted before any calibration or adjustment to the monitor.

(c) Open path monitors are tested by inserting a test cell containing a QC check gas concentration into the optical measurement beam of the instrument. If possible, the normally used transmitter, receiver, and as appropriate, reflecting devices should be used during the test, and the normal monitoring configuration of the instrument should be altered as little as possible to accommodate the test cell for the test. However, if permitted by the associated operation or instruction manual, an alternate local light source or an alternate optical path that does not include the normal atmospheric monitoring path may be used. The actual concentration of the QC check gas in the test cell must be selected to produce an effective concentration in the range specified earlier in this section. Generally, the QC test concentration measurement will be the sum of the atmospheric pollutant concentration and the QC test concentration. As such, the result must be corrected to remove the atmospheric concentration contribution. The corrected concentration is obtained by subtracting the average of the atmospheric concentrations measured by the open path instrument under test immediately before and immediately after the QC test from the QC check gas concentration measurement. If the difference between these before and after measurements is greater than 20 percent of the effective concentration of the test gas, discard the test result and repeat the test. If possible, open path monitors should be tested during periods when the atmospheric pollutant concentrations are relatively low and steady.

(d) Report the audit concentration of the QC gas and the corresponding measured concentration indicated by the monitor to AQS. The percent differences between these concentrations are used to assess the precision and bias of the monitoring data as described in sections 4.1.2 (precision) and 4.1.3 (bias) of this appendix.

3.1.2 *Annual performance evaluation for SO_2, NO_2, O_3, or CO.* A performance evaluation must be conducted on each primary monitor once a year. This can be accomplished by evaluating 25 percent of the primary monitors each quarter. The evaluation should be conducted by a trained experienced technician other than the routine site operator.

3.1.2.1 The evaluation is made by challenging the monitor with audit gas standards of known concentration from at least three audit levels. One point must be within two to three times the method detection limit of the instruments within the PQAOs network, the second point will be less than or equal to the 99th percentile of the data at the site or the network of sites in the PQAO or the next highest audit concentration level. The third point can be around the primary NAAQS or the highest 3-year concentration at the site or the network of sites in the PQAO. An additional 4th level is encouraged for those agencies that would like to confirm the monitors' linearity at the higher end of the operational range. In rare circumstances, there may be sites measuring concentrations above audit level 10. Notify the appropriate EPA region and the AQS program in order to make accommodations for auditing at levels above level 10.

Audit level	Concentration Range, ppm			
	O_3	SO_2	NO_2	CO
1	0.004–0.0059	0.0003–0.0029	0.0003–0.0029	0.020–0.059
2	0.006–0.019	0.0030–0.0049	0.0030–0.0049	0.060–0.199
3	0.020–0.039	0.0050–0.0079	0.0050–0.0079	0.200–0.899
4	0.040–0.069	0.0080–0.0199	0.0080–0.0199	0.900–2.999
5	0.070–0.089	0.0200–0.0499	0.0200–0.0499	3.000–7.999
6	0.090–0.119	0.0500–0.0999	0.0500–0.0999	8.000–15.999
7	0.120–0.139	0.1000–0.1499	0.1000–0.2999	16.000–30.999
8	0.140–0.169	0.1500–0.2599	0.3000–0.4999	31.000–39.999
9	0.170–0.189	0.2600–0.7999	0.5000–0.7999	40.000–49.999
10	0.190–0.259	0.8000–1.000	0.8000–1.000	50.000–60.000

3.1.2.2 The NO_2 audit techniques may vary depending on the ambient monitoring method. For chemiluminescence-type NO_2 analyzers, gas phase titration (GPT) techniques should be based on EPA guidance documents and monitoring agency experience. The NO_2 gas standards may be more appropriate than GPT for direct NO_2 methods that do not employ converters. Care should be taken to ensure the stability of such gas standards prior to use.

3.1.2.3 The standards from which audit gas test concentrations are obtained must meet the specifications of section 2.6.1 of this appendix. The gas standards and equipment used for the performance evaluation must not be the same as the standards and equipment used for one-point QC, calibrations, span evaluations or NPAP.

3.1.2.4 For point analyzers, the evaluation shall be carried out by allowing the monitor to analyze the audit gas test atmosphere in its normal sampling mode such that the test atmosphere passes through all filters, scrubbers, conditioners, and other sample inlet components used during normal ambient sampling and as much of the ambient air inlet system as is practicable.

3.1.2.5 Open-path monitors are evaluated by inserting a test cell containing the various audit gas concentrations into the optical measurement beam of the instrument. If possible, the normally used transmitter, receiver, and, as appropriate, reflecting devices should be used during the evaluation, and the normal monitoring configuration of the instrument should be modified as little as possible to accommodate the test cell for the evaluation. However, if permitted by the associated operation or instruction manual, an alternate local light source or an alternate optical path that does not include the normal atmospheric monitoring path may be used. The actual concentrations of the audit gas in the test cell must be selected to produce effective concentrations in the evaluation level ranges specified in this section of this appendix. Generally, each evaluation concentration measurement result will be the sum of the atmospheric pollutant concentration and the evaluation test concentration. As such, the result must be corrected to remove the atmospheric concentration contribution. The corrected concentration is obtained by subtracting the average of the atmospheric concentrations measured by the open path instrument under test immediately before and immediately after the evaluation test (or preferably before and after each evaluation concentration level) from the evaluation concentration measurement. If the difference between the before and after measurements is greater than 20 percent of the effective concentration of the test gas standard, discard the test result for that concentration level and repeat the test for that level. If possible, open path monitors should be evaluated during periods when the atmospheric pollutant concentrations are relatively low and steady. Also, if the open-path instrument is not installed in a permanent manner, the monitoring path length must be reverified to be within ±3 percent to validate the evaluation since the monitoring path length is critical to the determination of the effective concentration.

3.1.2.6 Report both the evaluation concentrations (effective concentrations for open-path monitors) of the audit gases and the corresponding measured concentration (corrected concentrations, if applicable, for open path monitors) indicated or produced by the monitor being tested to AQS. The percent differences between these concentrations are used to assess the quality of the monitoring data as described in section 4.1.1 of this appendix.

3.1.3 *National Performance Audit Program (NPAP).*

The NPAP is a performance evaluation which is a type of audit where quantitative data are collected independently in order to evaluate the proficiency of an analyst, monitoring instrument or laboratory. Due to the implementation approach used in the

program, NPAP provides a national independent assessment of performance while maintaining a consistent level of data quality. Details of the program can be found in reference 11 of this appendix. The program requirements include:

3.1.3.1 Performing audits of the primary monitors at 20 percent of monitoring sites per year, and 100 percent of the sites every 6 years. High-priority sites may be audited more frequently. Since not all gaseous criteria pollutants are monitored at every site within a PQAO, it is not required that 20 percent of the primary monitors for each pollutant receive an NPAP audit each year only that 20 percent of the PQAOs monitoring sites receive an NPAP audit. It is expected that over the 6-year period all primary monitors for all gaseous pollutants will receive an NPAP audit.

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

3.1.3.3 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.

3.1.3.4 As described in section 2.4 of this appendix, the PQAO may elect, on an annual basis, to utilize the federally implemented NPAP program. If the PQAO plans to self-implement NPAP, the EPA will establish training and other technical requirements for PQAOs to establish comparability to federally implemented programs. In addition to meeting the requirements in sections 3.1.3.1 through 3.1.3.3 of this appendix, the PQAO must:

(a) Utilize an audit system equivalent to the federally implemented NPAP audit system and is separate from equipment used in annual performance evaluations.

(b) Perform a whole system check by having the NPAP system tested against an independent and qualified EPA lab, or equivalent.

(c) 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).

(d) Incorporate the NPAP in the PQAO's quality assurance project plan.

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

(f) Participate in initial and update training/certification sessions.

3.1.3.5 OAQPS, in consultation with the relevant EPA Regional Office, may approve the PQAO's plan to self-implement NPAP if the OAQPS determines that the PQAO's self-implementation plan is equivalent to the federal programs and adequate to meet the objectives of national consistency and data quality.

3.2 $PM_{2.5}$.

3.2.1 *Flow Rate Verification for $PM_{2.5}$.* A one-point flow rate verification check must be performed at least once every month (each verification minimally separated by 14 days) on each monitor used to measure $PM_{2.5}$. The verification is made by checking the operational flow rate of the monitor. If the verification is made in conjunction with a flow rate adjustment, it must be made prior to such flow rate adjustment. For the standard procedure, use a flow rate transfer standard certified in accordance with section 2.6 of this appendix to check the monitor's normal flow rate. Care should be used in selecting and using the flow rate measurement device such that it does not alter the normal operating flow rate of the monitor. Report the flow rate of the transfer standard and the corresponding flow rate measured by the monitor to AQS. The percent differences between the audit and measured flow rates are used to assess the bias of the monitoring data as described in section 4.2.2 of this appendix (using flow rates in lieu of concentrations).

3.2.2 *Semi-Annual Flow Rate Audit for $PM_{2.5}$.* Audit the flow rate of the particulate monitor twice a year. The two audits should ideally be spaced between 5 and 7 months apart. The EPA strongly encourages more frequent auditing. The audit should (preferably) be conducted by a trained experienced technician other than the routine site operator. The audit is made by measuring the monitor's normal operating flow rate(s) using a flow rate transfer standard certified in accordance with section 2.6 of this appendix. The flow rate standard used for auditing must not be the same flow rate standard used for verifications or to calibrate the monitor. However, both the calibration standard and the audit standard may be referenced to the same primary flow rate or volume standard. Care must be taken in auditing the flow rate to be certain that the flow measurement device does not alter the normal operating flow rate of the monitor. Report the audit flow rate of the transfer standard and the corresponding flow rate measured by the monitor to AQS. The percent differences between these flow rates are used to evaluate monitor performance.

3.2.3 *Collocated Quality Control Sampling Procedures for $PM_{2.5}$.* For each pair of collocated monitors, designate one sampler as the primary monitor whose concentrations will be used to report air quality for the site, and designate the other as the quality control monitor. There can be only one primary monitor at a monitoring site for a given time period.

3.2.3.1 For each distinct monitoring method designation (FRM or FEM) that a PQAO is using for a primary monitor, the PQAO must have 15 percent of the primary monitors of each method designation collocated (values of 0.5 and greater round up); and have at least one collocated quality control monitor (if the total number of monitors is less than three). The first collocated monitor must be a designated FRM monitor.

3.2.3.2 In addition, monitors selected for collocation must also meet the following requirements:

(a) A primary monitor designated as an EPA FRM shall be collocated with a quality control monitor having the same EPA FRM method designation.

(b) For each primary monitor designated as an EPA FEM used by the PQAO, 50 percent of the monitors designated for collocation, or the first if only one collocation is necessary, shall be collocated with a FRM quality control monitor and 50 percent of the monitors shall be collocated with a monitor having the same method designation as the FEM primary monitor. If an odd number of collocated monitors is required, the additional monitor shall be a FRM quality control monitor. An example of the distribution of collocated monitors for each unique FEM is provided below. Table A–2 of this appendix demonstrates the collocation procedure with a PQAO having one type of primary FRM and multiple primary FEMs.

#Primary FEMS of a unique method designation	#Collocated	#Collocated with an FRM	#Collocated with same method designation
1–9	1	1	0
10–16	2	1	1
17–23	3	2	1
24–29	4	2	2
30–36	5	3	2
37–43	6	3	3

3.2.3.3 Since the collocation requirements are used to assess precision of the primary monitors and there can only be one primary monitor at a monitoring site, a site can only count for the collocation of the method designation of the primary monitor at that site.

3.2.3.4 The collocated monitors should be deployed according to the following protocol:

(a) Fifty percent of the collocated quality control monitors should be deployed at sites with annual average or daily concentrations estimated to be within plus or minus 20 percent of either the annual or 24-hour NAAQS and the remainder at the PQAOs discretion;

(b) If an organization has no sites with annual average or daily concentrations within ±20 percent of the annual NAAQS or 24-hour NAAQS, 50 percent of the collocated quality control monitors should be deployed at those sites with the annual mean concentrations or 24-hour concentrations among the highest for all sites in the network and the remainder at the PQAOs discretion.

(c) The two collocated monitors must be within 4 meters (inlet to inlet) of each other and at least 2 meters apart for flow rates greater than 200 liters/min or at least 1 meter apart for samplers having flow rates less than 200 liters/min to preclude airflow interference. A waiver allowing up to 10 meters horizontal distance and up to 3 meters vertical distance (inlet to inlet) between a primary and collocated sampler may be approved by the Regional Administrator for sites at a neighborhood or larger scale of representation during the annual network plan approval process. Sampling and analytical methodologies must be the consistently implemented for both primary and collocated quality control samplers and for all other samplers in the network.

(d) Sample the collocated quality control monitor on a 1-in-12 day schedule. Report the measurements from both primary and collocated quality control monitors at each collocated sampling site to AQS. The calculations for evaluating precision between the two collocated monitors are described in section 4.2.1 of this appendix.

3.2.4 *$PM_{2.5}$ Performance Evaluation Program (PEP) Procedures.* The PEP is an independent assessment used to estimate total measurement system bias. These evaluations will be performed under the NPEP as described in section 2.4 of this appendix or a comparable program. Performance evaluations will be performed annually within each PQAO. For PQAOs with less than or equal to five monitoring sites, five valid performance evaluation audits must be collected and reported each year. For PQAOs with greater than five monitoring sites, eight valid performance evaluation audits must be collected and reported each year. A valid performance evaluation audit means that both the primary monitor and PEP audit concentrations are valid and above 3 $\mu g/m^3$. Siting of the PEP monitor must be consistent with section 3.2.3.4(c). However, any horizontal distance greater than 4 meters and any vertical distance greater than one meter must be reported to the EPA regional PEP coordinator. Additionally for every monitor designated as a primary monitor, a primary quality assurance organization must:

3.2.4.1 Have each method designation evaluated each year; and,

3.2.4.2 Have all FRM, FEM or ARM samplers subject to a PEP audit at least once every 6 years, which equates to approximately 15 percent of the monitoring sites audited each year.

3.2.4.3. Additional information concerning the PEP is contained in reference 10 of this appendix. The calculations for evaluating bias between the primary monitor and the performance evaluation monitor for $PM_{2.5}$ are described in section 4.2.5 of this appendix.

3.3 *PM_{10}.*

3.3.1 *Flow Rate Verification for PM_{10} Low Volume Samplers (less than 200 liter/minute).* A one-point flow rate verification check must be performed at least once every month (each verification minimally separated by 14 days) on each monitor used to measure PM_{10}. The verification is made by checking the operational flow rate of the monitor. If the verification is made in conjunction with a flow rate adjustment, it must be made prior to such flow rate adjustment. For the standard procedure, use a flow rate transfer standard certified in accordance with section 2.6 of this appendix to check the monitor's normal flow rate. Care should be taken in selecting and using the flow rate measurement device such that it does not alter the normal operating flow rate of the monitor. The percent differences between the audit and measured flow rates are reported to AQS and used to assess the bias of the monitoring data as described in section 4.2.2 of this appendix (using flow rates in lieu of concentrations).

3.3.2 *Flow Rate Verification for PM_{10} High Volume Samplers (greater than 200 liters/minute).* For PM_{10} high volume samplers, the verification frequency is one verification every 90 days (quarter) with 4 in a year. Other than verification frequency, follow the same technical procedure as described in section 3.3.1 of this appendix.

3.3.3 *Semi-Annual Flow Rate Audit for PM_{10}.* Audit the flow rate of the particulate monitor twice a year. The two audits should ideally be spaced between 5 and 7 months apart. The EPA strongly encourages more frequent auditing. The audit should (preferably) be conducted by a trained experienced technician other than the routine site operator. The audit is made by measuring the monitor's normal operating flow rate using a flow rate transfer standard certified in accordance with section 2.6 of this appendix. The flow rate standard used for auditing must not be the same flow rate standard used for verifications or to calibrate the monitor. However, both the calibration standard and the audit standard may be referenced to the same primary flow rate or volume standard. Care must be taken in auditing the flow rate to be certain that the flow measurement device does not alter the normal operating flow rate of the monitor. Report the audit flow rate of the transfer standard and the corresponding flow rate measured by the monitor to AQS. The percent differences between these flow rates are used to evaluate monitor performance.

3.3.4 *Collocated Quality Control Sampling Procedures for Manual PM_{10}.* Collocated sampling for PM_{10} is only required for manual samplers. For each pair of collocated monitors, designate one sampler as the primary monitor whose concentrations will be used to report air quality for the site and designate the other as the quality control monitor.

3.3.4.1 For manual PM_{10} samplers, a PQAO must:

(a) Have 15 percent of the primary monitors collocated (values of 0.5 and greater round up); and

(b) Have at least one collocated quality control monitor (if the total number of monitors is less than three).

3.3.4.2 The collocated quality control monitors should be deployed according to the following protocol:

(a) Fifty percent of the collocated quality control monitors should be deployed at sites with daily concentrations estimated to be within plus or minus 20 percent of the applicable NAAQS and the remainder at the PQAOs discretion;

(b) If an organization has no sites with daily concentrations within plus or minus 20 percent of the NAAQS, 50 percent of the collocated quality control monitors should be deployed at those sites with the daily mean concentrations among the highest for all sites in the network and the remainder at the PQAOs discretion.

(c) The two collocated monitors must be within 4 meters (inlet to inlet) of each other and at least 2 meters apart for flow rates greater than 200 liters/min or at least 1 meter apart for samplers having flow rates less than 200 liters/min to preclude airflow interference. A waiver allowing up to 10 meters horizontal distance and up to 3 meters vertical distance (inlet to inlet) between a primary and collocated sampler may be approved by the Regional Administrator for sites at a neighborhood or larger scale of representation. This waiver may be approved during the annual network plan approval process. Sampling and analytical methodologies must be the consistently implemented for both collocated samplers and for all other samplers in the network.

(d) Sample the collocated quality control monitor on a 1-in-12 day schedule. Report the measurements from both primary and collocated quality control monitors at each collocated sampling site to AQS. The calculations for evaluating precision between the two collocated monitors are described in section 4.2.1 of this appendix.

(e) In determining the number of collocated quality control sites required for PM_{10}, monitoring networks for lead (Pb–PM_{10}) should be treated independently from networks for particulate matter (PM), even though the separate networks may share one or more common samplers. However, a single quality control monitor that meets the collocation requirements for Pb-PM_{10} and PM_{10} may serve as a collocated quality control monitor for both networks. Extreme care must be taken when using the filter from a quality control monitor for both PM_{10} and Pb analysis. A PM_{10} filter weighing should occur prior to any Pb analysis.

3.4 *Pb.*

3.4.1 *Flow Rate Verification for Pb–PM_{10} Low Volume Samplers (less than 200 liter/minute).* A one-point flow rate verification check must be performed at least once every month (each verification minimally separated by 14 days) on each monitor used to measure Pb. The verification is made by checking the operational flow rate of the monitor. If the verification is made in conjunction with a flow rate adjustment, it must be made prior to such flow rate adjustment. For the standard procedure, use a flow rate transfer standard certified in accordance with section 2.6 of this appendix to check the monitor's normal flow rate. Care should be taken in selecting and using the flow rate measurement device such that it does not

alter the normal operating flow rate of the monitor. The percent differences between the audit and measured flow rates are reported to AQS and used to assess the bias of the monitoring data as described in section 4.2.2 of this appendix (using flow rates in lieu of concentrations).

3.4.2 *Flow Rate Verification for Pb High Volume Samplers (greater than 200 liters/minute).* For high volume samplers, the verification frequency is one verification every 90 days (quarter) with four in a year. Other than verification frequency, follow the same technical procedure as described in section 3.4.1 of this appendix.

3.4.3 *Semi-Annual Flow Rate Audit for Pb.* Audit the flow rate of the particulate monitor twice a year. The two audits should ideally be spaced between 5 and 7 months apart. The EPA strongly encourages more frequent auditing. The audit should (preferably) be conducted by a trained experienced technician other than the routine site operator. The audit is made by measuring the monitor's normal operating flow rate using a flow rate transfer standard certified in accordance with section 2.6 of this appendix. The flow rate standard used for auditing must not be the same flow rate standard used for verifications or to calibrate the monitor. However, both the calibration standard and the audit standard may be referenced to the same primary flow rate or volume standard. Care must be taken in auditing the flow rate to be certain that the flow measurement device does not alter the normal operating flow rate of the monitor. Report the audit flow rate of the transfer standard and the corresponding flow rate measured by the monitor to AQS. The percent differences between these flow rates are used to evaluate monitor performance.

3.4.4 Collocated Quality Control Sampling for TSP Pb for monitoring sites other than non-source oriented NCore. For each pair of collocated monitors for manual TSP Pb samplers, designate one sampler as the primary monitor whose concentrations will be used to report air quality for the site, and designate the other as the quality control monitor.

3.4.4.1 A PQAO must:

(a) Have 15 percent of the primary monitors (not counting non-source oriented NCore sites in PQAO) collocated. Values of 0.5 and greater round up; and

(b) Have at least one collocated quality control monitor (if the total number of monitors is less than three).

3.4.4.2 The collocated quality control monitors should be deployed according to the following protocol:

(a) The first collocated Pb site selected must be the site measuring the highest Pb concentrations in the network. If the site is impractical, alternative sites, approved by the EPA Regional Administrator, may be selected. If additional collocated sites are necessary, collocated sites may be chosen that reflect average ambient air Pb concentrations in the network.

(b) The two collocated monitors must be within 4 meters (inlet to inlet) of each other and at least 2 meters apart for flow rates greater than 200 liters/min or at least 1 meter apart for samplers having flow rates less than 200 liters/min to preclude airflow interference.

(c) Sample the collocated quality control monitor on a 1-in-12 day schedule. Report the measurements from both primary and collocated quality control monitors at each collocated sampling site to AQS. The calculations for evaluating precision between the two collocated monitors are described in section 4.2.1 of this appendix.

3.4.5 Collocated Quality Control Sampling for Pb–PM_{10} at monitoring sites other than non-source oriented NCore. If a PQAO is monitoring for Pb–PM_{10} at sites other than at a non-source oriented NCore site then the PQAO must:

3.4.5.1 Have 15 percent of the primary monitors (not counting non-source oriented NCore sites in PQAO) collocated. Values of 0.5 and greater round up; and

3.4.5.2 Have at least one collocated quality control monitor (if the total number of monitors is less than three).

3.4.5.3 The collocated monitors should be deployed according to the following protocol:

(a) Fifty percent of the collocated quality control monitors should be deployed at sites with the highest 3-month average concentrations and the remainder at the PQAOs discretion.

(b) The two collocated monitors must be within 4 meters (inlet to inlet) of each other and at least 2 meters apart for flow rates greater than 200 liters/min or at least 1 meter apart for samplers having flow rates less than 200 liters/min to preclude airflow interference. A waiver allowing up to 10 meters horizontal distance and up to 3 meters vertical distance (inlet to inlet) between a primary and collocated sampler may be approved by the Regional Administrator for sites at a neighborhood or larger scale of representation. This waiver may be approved during the annual network plan approval process. Sampling and analytical methodologies must be the consistently implemented for both collocated samplers and for all other samplers in the network.

(c) Sample the collocated quality control monitor on a 1-in-12 day schedule. Report the measurements from both primary and collocated quality control monitors at each collocated sampling site to AQS. The calculations for evaluating precision between the two collocated monitors are described in section 4.2.1 of this appendix.

(d) In determining the number of collocated quality control sites required for Pb–PM_{10}, monitoring networks for PM_{10} should be treated independently from networks for Pb–PM_{10}, even though the separate networks may share one or more common samplers. However, a single quality control monitor that meets the collocation requirements for Pb–PM_{10} and PM_{10} may serve as a collocated quality control monitor for both networks. Extreme care must be taken when using a using the filter from a quality control monitor for both PM_{10} and Pb analysis. A PM_{10} filter weighing should occur prior to any Pb analysis.

3.4.6 *Pb Analysis Audits.* Each calendar quarter, audit the Pb reference or equivalent method analytical procedure using filters containing a known quantity of Pb. These audit filters are prepared by depositing a Pb standard on unexposed filters and allowing them to dry thoroughly. The audit samples must be prepared using batches of reagents different from those used to calibrate the Pb analytical equipment being audited. Prepare audit samples in the following concentration ranges:

Range	Equivalent ambient Pb concentration, $\mu g/m^3$
1	30–100% of Pb NAAQS.
2	200–300% of Pb NAAQS.

(a) Extract the audit samples using the same extraction procedure used for exposed filters.

(b) Analyze three audit samples in each of the two ranges each quarter samples are analyzed. The audit sample analyses shall be distributed as much as possible over the entire calendar quarter.

(c) Report the audit concentrations (in µg Pb/filter or strip) and the corresponding measured concentrations (in µg Pb/filter or strip) to AQS using AQS unit code 077. The percent differences between the concentrations are used to calculate analytical accuracy as described in section 4.2.6 of this appendix.

3.4.7 Pb PEP Procedures for monitoring sites other than non-source oriented NCore. The PEP is an independent assessment used to estimate total measurement system bias. These evaluations will be performed under the NPEP described in section 2.4 of this appendix or a comparable program. Each year, one performance evaluation audit must be performed at one Pb site in each primary quality assurance organization that has less than or equal to five sites and two audits at PQAOs with greater than five sites. Non-source oriented NCore sites are not counted. Siting of the PEP monitor must be consistent with section 3.4.5.3(b). However, any horizontal distance greater than 4 meters and any vertical distance greater than 1 meter must be reported to the EPA regional PEP coordinator. In addition, each year, four collocated samples from PQAOs with less than or equal to five sites and six collocated samples at PQAOs with greater than five sites must be sent to an independent laboratory, the same laboratory as the performance evaluation audit, for analysis. The calculations for evaluating bias between the primary monitor and the performance evaluation monitor for Pb are described in section 4.2.4 of this appendix.

4. Calculations for Data Quality Assessments

(a) Calculations of measurement uncertainty are carried out by the EPA according to the following procedures. The PQAOs must report the data to AQS for all measurement quality checks as specified in this appendix even though they may elect to perform some or all of the calculations in this section on their own.

(b) The EPA will provide annual assessments of data quality aggregated by site and PQAO for SO_2, NO_2, O_3 and CO and by PQAO for PM_{10}, $PM_{2.5}$, and Pb.

(c) At low concentrations, agreement between the measurements of collocated quality control samplers, expressed as

relative percent difference or percent difference, may be relatively poor. For this reason, collocated measurement pairs are selected for use in the precision and bias calculations only when both measurements are equal to or above the following limits:

(1) Pb: 0.002 µg/m³ (Methods approved after 3/04/2010, with exception of manual equivalent method EQLA–0813–803).

(2) Pb: 0.02 µg/m³ (Methods approved before 3/04/2010, and manual equivalent method EQLA–0813–803).

(3) PM_{10} (Hi-Vol): 15 µg/m³.

(4) PM_{10} (Lo-Vol): 3 µg/m³.

(5) $PM_{2.5}$: 3 µg/m³.

4.1 *Statistics for the Assessment of QC Checks for* SO_2, NO_2, O_3 and CO.

4.1.1 *Percent Difference.* Many of the measurement quality checks start with a comparison of an audit concentration or value (flow rate) to the concentration/value measured by the monitor and use percent difference as the comparison statistic as described in equation 1 of this section. For each single point check, calculate the percent difference, d_i, as follows:

Equation 1

$$d_i = \frac{meas - audit}{audit} \cdot 100$$

where *meas* is the concentration indicated by the PQAO's instrument and *audit* is the audit concentration of the standard used in the QC check being measured.

4.1.2 *Precision Estimate.* The precision estimate is used to assess the one-point QC checks for SO_2, NO_2, O_3, or CO described in section 3.1.1 of this appendix. The precision estimator is the coefficient of variation upper bound and is calculated using equation 2 of this section:

Equation 2

$$CV = \sqrt{\frac{n \cdot \sum_{i=1}^{n} d_i^2 - \left(\sum_{i=1}^{n} d_i\right)^2}{n(n-1)}} \cdot \sqrt{\frac{n-1}{\chi^2_{0.1,n-1}}}$$

where n is the number of single point checks being aggregated; $X^2_{0.1,n-1}$ is the 10th percentile of a chi-squared distribution with n–1 degrees of freedom.

4.1.3 *Bias Estimate.* The bias estimate is calculated using the one-point QC checks for SO_2, NO_2, O_3, or CO described in section 3.1.1 of this appendix. The bias estimator is an upper bound on the mean absolute value of the percent differences as described in equation 3 of this section:

Equation 3

$$|bias| = AB + t_{0.95,n-1} \cdot \frac{AS}{\sqrt{n}}$$

where n is the number of single point checks being aggregated; $t_{0.95,n-1}$ is the 95th quantile of a t-distribution with n–1 degrees of freedom; the quantity *AB* is the mean of the absolute values of the $d_{i's}$ and is calculated using equation 4 of this section:

Equation 4

$$AB = \frac{1}{n} \cdot \sum_{i=1}^{n} |d_i|$$

and the quantity *AS* is the standard deviation of the absolute value of the $d_{i's}$ and is calculated using equation 5 of this section:

Equation 5

$$AS = \sqrt{\frac{n \cdot \sum_{i=1}^{n} |d_i|^2 - \left(\sum_{i=1}^{n} |d_i|\right)^2}{n(n-1)}}$$

4.1.3.1 *Assigning a sign (positive/negative) to the bias estimate.* Since the bias statistic as calculated in equation 3 of this appendix uses absolute values, it does not have a tendency (negative or positive bias) associated with it. A sign will be designated by rank ordering the percent differences of the QC check samples from a given site for a particular assessment interval.

4.1.3.2 Calculate the 25th and 75th percentiles of the percent differences for each site. The absolute bias upper bound should be flagged as positive if both percentiles are positive and negative if both percentiles are negative. The absolute bias upper bound would not be flagged if the 25th and 75th percentiles are of different signs.

4.2 *Statistics for the Assessment of* PM_{10}, $PM_{2.5}$, and Pb.

4.2.1 *Collocated Quality Control Sampler Precision Estimate for* PM_{10}, $PM_{2.5}$ *and Pb.* Precision is estimated via duplicate measurements from collocated samplers. It is recommended that the precision be aggregated at the PQAO level quarterly, annually, and at the 3-year level. The data pair would only be considered valid if both concentrations are greater than or equal to the minimum values specified in section 4(c) of this appendix. For each collocated data pair, calculate the relative percent difference, d_i, using equation 6 of this appendix:

Equation 6

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

where X_i is the concentration from the primary sampler and Y_i is the concentration value from the audit sampler. The coefficient of variation upper bound is calculated using equation 7 of this appendix:

Equation 7

$$CV = \sqrt{\frac{n \cdot \sum_{i=1}^{n} d_i^2 - \left(\sum_{i=1}^{n} d_i\right)^2}{2n(n-1)}} \cdot \sqrt{\frac{n-1}{X^2_{0.1,n-1}}}$$

where *n* is the number of valid data pairs being aggregated, and $X^2_{0.1,n-1}$ is the 10th percentile of a chi-squared distribution with n–1 degrees of freedom. The factor of 2 in the denominator adjusts for the fact that each d_i is calculated from two values with error.

4.2.2 *One-Point Flow Rate Verification Bias Estimate for PM_{10}, $PM_{2.5}$ and Pb.* For each one-point flow rate verification, calculate the percent difference in volume using equation 1 of this appendix where *meas* is the value indicated by the sampler's volume measurement and *audit* is the actual volume indicated by the auditing flow meter. The absolute volume bias upper bound is then calculated using equation 3, where *n* is the number of flow rate audits being aggregated; $t_{0.95,n-1}$ is the 95th quantile of a t-distribution with n-1 degrees of freedom, the quantity *AB* is the mean of the absolute values of the $d_{i's}$ and is calculated using equation 4 of this appendix, and the quantity *AS* in equation 3 of this appendix is the standard deviation of the absolute values if the $d_{i's}$ and is calculated using equation 5 of this appendix.

4.2.3 *Semi-Annual Flow Rate Audit Bias Estimate for PM_{10}, $PM_{2.5}$ and Pb.* Use the same procedure described in section 4.2.2 for the evaluation of flow rate audits.

4.2.4 *Performance Evaluation Programs Bias Estimate for Pb.* The Pb bias estimate is calculated using the paired routine and the PEP monitor as described in section 3.4.7. Use the same procedures as described in section 4.1.3 of this appendix.

4.2.5 *Performance Evaluation Programs Bias Estimate for $PM_{2.5}$.* The bias estimate is calculated using the PEP audits described in section 4.1.3 of this appendix. The bias estimator is based on the mean percent differences (Equation 1). The mean percent difference, *D,* is calculated by Equation 8 below.

Equation 8

$$D = \frac{1}{n_j} \cdot \sum_{i=1}^{n_j} d_i$$

where n_j is the number of pairs and $d_1, d_2, \ldots d_{nj}$ are the biases for each pair to be averaged.

4.2.6 *Pb Analysis Audit Bias Estimate.* The bias estimate is calculated using the analysis audit data described in section 3.4.6. Use the same bias estimate procedure as described in section 4.1.3 of this appendix.

5. Reporting Requirements

5.1 *Reporting Requirements.* For each pollutant, prepare a list of all monitoring sites and their AQS site identification codes in each PQAO and submit the list to the appropriate EPA Regional Office, with a copy to AQS. Whenever there is a change in this list of monitoring sites in a PQAO, report this change to the EPA Regional Office and to AQS.

5.1.1 *Quarterly Reports.* For each quarter, each PQAO shall report to AQS directly (or via the appropriate EPA Regional Office for organizations not direct users of AQS) the results of all valid measurement quality checks it has carried out during the quarter. The quarterly reports must be submitted consistent with the data reporting requirements specified for air quality data as set forth in 40 CFR 58.16. The EPA strongly encourages early submission of the quality assurance data in order to assist the PQAOs ability to control and evaluate the quality of the ambient air data.

5.1.2 *Annual Reports.*

5.1.2.1 When the PQAO has certified relevant data for the calendar year, the EPA will calculate and report the measurement uncertainty for the entire calendar year.

6. References

(1) American National Standard—Specifications and Guidelines for Quality Systems for Environmental Data Collection and Environmental Technology Programs. ANSI/ASQC E4–2014. February 2014. Available from American Society for Quality Control, 611 East Wisconsin Avenue, Milwaukee, WI 53202.

(2) EPA Requirements for Quality Management Plans. EPA QA/R–2. EPA/240/B–01/002. March 2001, Reissue May 2006. Office of Environmental Information, Washington DC 20460. *http://www.epa.gov/quality/agency-wide-quality-system-documents.*

(3) EPA Requirements for Quality Assurance Project Plans for Environmental Data Operations. EPA QA/R–5. EPA/240/B–01/003. March 2001, Reissue May 2006. Office of Environmental Information, Washington DC 20460. *http://www.epa.gov/quality/agency-wide-quality-system-documents.*

(4) EPA Traceability Protocol for Assay and Certification of Gaseous Calibration Standards. EPA–600/R–12/531. May, 2012. Available from U.S. Environmental Protection Agency, National Risk Management Research Laboratory, Research Triangle Park NC 27711. *http://cfpub.epa.gov/si/si_public_record_report.cfm?dirEntryId=245292.*

(5) Guidance for the Data Quality Objectives Process. EPA QA/G–4. EPA/240/B–06/001. February, 2006. Office of Environmental Information, Washington DC 20460. *http://www.epa.gov/quality/agency-wide-quality-system-documents.*

(6) List of Designated Reference and Equivalent Methods. Available from U.S. Environmental Protection Agency, National Exposure Research Laboratory, Human Exposure and Atmospheric Sciences Division, MD–D205–03, Research Triangle Park, NC 27711. *http://www3.epa.gov/ttn/amtic/criteria.html.*

(7) Transfer Standards for the Calibration of Ambient Air Monitoring Analyzers for Ozone. EPA–454/B–13–004 U.S. Environmental Protection Agency, Research Triangle Park, NC 27711, October, 2013. *http://www3.epa.gov/ttn/amtic/qapollutant.html.*

(8) Paur, R.J. and F.F. McElroy. Technical Assistance Document for the Calibration of Ambient Ozone Monitors. EPA–600/4–79–057. U.S. Environmental Protection Agency, Research Triangle Park, NC 27711, September, 1979. *http://www.epa.gov/ttn/amtic/cpreldoc.html.*

(9) Quality Assurance Handbook for Air Pollution Measurement Systems, Volume 1—A Field Guide to Environmental Quality Assurance. EPA–600/R–94/038a. April 1994. Available from U.S. Environmental Protection Agency, ORD Publications Office, Center for Environmental Research Information (CERI), 26 W. Martin Luther King Drive, Cincinnati, OH 45268. *http://www3.epa.gov/ttn/amtic/qalist.html.*

(10) Quality Assurance Handbook for Air Pollution Measurement Systems, Volume II: Ambient Air Quality Monitoring Program Quality System Development. EPA–454/B–13–003. *http://www3.epa.gov/ttn/amtic/qalist.html.*

(11) National Performance Evaluation Program Standard Operating Procedures. *http://www3.epa.gov/ttn/amtic/npapsop.html.*

TABLE A–1 OF APPENDIX A TO PART 58—MINIMUM DATA ASSESSMENT REQUIREMENTS FOR NAAQS RELATED CRITERIA POLLUTANT MONITORS

Method	Assessment method	Coverage	Minimum frequency	Parameters reported	AQS assessment type
Gaseous Methods (CO, NO_2, SO_2, O_3)					
One-Point QC for SO_2, NO_2, O3, CO.	Response check at concentration 0.005–0.08 ppm SO_2, NO_2, O3, and. 0.5 and 5 ppm CO	Each analyzer	Once per 2 weeks	Audit concentration [1] and measured concentration. [2]	One-Point QC.
Annual performance evaluation for SO_2, NO_2, O3, CO.	See section 3.1.2 of this appendix.	Each analyzer	Once per year	Audit concentration [1] and measured concentration [2] for each level.	Annual PE.
NPAP for SO_2, NO_2, O3, CO.	Independent Audit	20% of sites each year.	Once per year	Audit concentration [1] and measured concentration [2] for each level.	NPAP.
Particulate Methods					
Continuous [4] method—collocated quality control sampling $PM_{2.5}$.	Collocated samplers	15%	1-in-12 days	Primary sampler concentration and duplicate sampler concentration. [3]	No Transaction reported as raw data.
Manual method—collocated quality control sampling PM_{10}, $PM_{2.5}$, Pb–TSP, Pb–PM_{10}.	Collocated samplers	15%	1-in-12 days	Primary sampler concentration and duplicate sampler concentration. [3]	No Transaction reported as raw data.
Flow rate verification PM_{10} (low Vol) $PM_{2.5}$, Pb–PM_{10}.	Check of sampler flow rate.	Each sampler	Once every month	Audit flow rate and measured flow rate indicated by the sampler.	Flow Rate Verification.
Flow rate verification PM_{10} (High-Vol), Pb–TSP.	Check of sampler flow rate.	Each sampler	Once every quarter ...	Audit flow rate and measured flow rate indicated by the sampler.	Flow Rate Verification.
Semi-annual flow rate audit PM_{10}, TSP, PM_{10}–2.5, $PM_{2.5}$, Pb–TSP, Pb–PM_{10}.	Check of sampler flow rate using independent standard.	Each sampler, ...	Once every 6 months	Audit flow rate and measured flow rate indicated by the sampler.	Semi Annual Flow Rate Audit.
Pb analysis audits Pb–TSP, Pb–PM_{10}.	Check of analytical system with Pb audit strips/filters.	Analytical	Once each quarter	Measured value and audit value (ug Pb/filter) using AQS unit code 077.	Pb Analysis Audits.
Performance Evaluation Program $PM_{2.5}$.	Collocated samplers	(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.	Distributed over all 4 quarters.	Primary sampler concentration and performance evaluation sampler concentration.	PEP.
Performance Evaluation Program Pb–TSP, Pb–PM_{10}.	Collocated samplers	(1) 1 valid audit and 4 collocated samples for primary QA orgs, with <=5 sites.. (2) 2 valid audits and 6 collocated samples for primary QA orgs with >5 sites.	Distributed over all 4 quarters.	Primary sampler concentration and performance evaluation sampler concentration. Primary sampler concentration and duplicate sampler concentration.	PEP.

[1] Effective concentration for open path analyzers.
[2] Corrected concentration, if applicable for open path analyzers.
[3] Both primary and collocated sampler values are reported as raw data.
[4] $PM_{2.5}$ is the only particulate criteria pollutant requiring collocation of continuous and manual primary monitors.

TABLE A–2 OF APPENDIX A TO PART 58—SUMMARY OF $PM_{2.5}$ NUMBER AND TYPE OF COLLOCATION (15% COLLOCATION REQUIREMENT) REQUIRED USING AN EXAMPLE OF A PQAO THAT HAS 54 PRIMARY MONITORS (54 SITES) WITH ONE FEDERAL REFERENCE METHOD TYPE AND THREE TYPES OF APPROVED FEDERAL EQUIVALENT METHODS

Primary sampler method designation	Total No. of monitors	Total No. of collocated	No. of collocated with FRM	No. of collocated with same method designation as primary
FRM	20	3	3	3
FEM (A)	20	3	2	1
FEM (B)	2	1	1	0
FEM (C)	12	2	1	1

■ 10. Add Appendix B to part 58 to read as follows:

Appendix B to Part 58—Quality Assurance Requirements for Prevention of Significant Deterioration (PSD) Air Monitoring

1. General Information
2. Quality System Requirements
3. Measurement Quality Check Requirements
4. Calculations for Data Quality Assessments
5. Reporting Requirements
6. References

1. General Information

1.1 *Applicability.*

(a) This appendix specifies the minimum quality assurance requirements for the control and assessment of the quality of the ambient air monitoring data submitted to a PSD reviewing authority or the EPA by an organization operating an air monitoring station, or network of stations, operated in order to comply with Part 51 New Source Review—Prevention of Significant Deterioration (PSD). Such organizations are encouraged to develop and maintain quality assurance programs more extensive than the required minimum. Additional guidance for the requirements reflected in this appendix can be found in the ''Quality Assurance Handbook for Air Pollution Measurement Systems,'' Volume II (Ambient Air) and ''Quality Assurance Handbook for Air Pollution Measurement Systems,'' Volume IV (Meteorological Measurements) and at a national level in references 1, 2, and 3 of this appendix.

(b) It is not assumed that data generated for PSD under this appendix will be used in making NAAQS decisions. However, if all the requirements in this appendix are followed (including the NPEP programs) and reported to AQS, with review and concurrence from the EPA region, data may be used for NAAQS decisions. With the exception of the NPEP programs (NPAP, $PM_{2.5}$ PEP, Pb–PEP), for which implementation is at the discretion of the PSD reviewing authority, all other quality assurance and quality control requirements found in the appendix must be met.

1.2 *PSD Primary Quality Assurance Organization (PQAO).* A PSD PQAO is defined as a monitoring organization or a coordinated aggregation of such organizations that is responsible for a set of stations within one PSD reviewing authority that monitors the same pollutant and for which data quality assessments will be pooled. Each criteria pollutant sampler/monitor must be associated with only one PSD PQAO.

1.2.1 Each PSD PQAO 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. A PSD PQAO must be associated with only one PSD reviewing authority. Common factors that should be considered in defining PSD PQAOs include:

(a) Operation by a common team of field operators according to a common set of procedures;

(b) Use of a common QAPP and/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 organization or laboratory.

1.2.2 PSD monitoring organizations having difficulty describing its PQAO or in assigning specific monitors to a PSD PQAO should consult with the PSD reviewing authority. Any consolidation of PSD PQAOs shall be subject to final approval by the PSD reviewing authority.

1.2.3 Each PSD PQAO is required to implement a quality system that provides sufficient information to assess the quality of the monitoring data. The quality system must, at a minimum, include the specific requirements described in this appendix. Failure to conduct or pass a required check or procedure, or a series of required checks or procedures, does not by itself invalidate data for regulatory decision making. Rather, PSD PQAOs and the PSD reviewing authority shall use the checks and procedures required in this appendix in combination with other data quality information, reports, and similar documentation that demonstrate overall compliance with parts 51, 52 and 58 of this chapter. Accordingly, the PSD reviewing authority shall use a ''weight of evidence'' approach when determining the suitability of data for regulatory decisions. The PSD reviewing authority reserves the authority to use or not use monitoring data submitted by a PSD monitoring organization when making regulatory decisions based on the PSD reviewing authority's assessment of the quality of the data. Generally, consensus built validation templates or validation criteria already approved in quality assurance project plans (QAPPs) should be used as the basis for the weight of evidence approach.

1.3 *Definitions.*

(a) *Measurement Uncertainty.* A term used to describe deviations from a true concentration or estimate that are related to the measurement process and not to spatial or temporal population attributes of the air being measured.

(b) *Precision.* A measurement of mutual agreement among individual measurements of the same property usually under prescribed similar conditions, expressed generally in terms of the standard deviation.

(c) *Bias.* The systematic or persistent distortion of a measurement process which causes errors in one direction.

(d) *Accuracy.* The degree of agreement between an observed value and an accepted reference value. Accuracy includes a combination of random error (imprecision) and systematic error (bias) components which are due to sampling and analytical operations.

(e) *Completeness.* A measure of the amount of valid data obtained from a measurement system compared to the amount that was expected to be obtained under correct, normal conditions.

(f) *Detectability.* The low critical range value of a characteristic that a method specific procedure can reliably discern.

1.4 *Measurement Quality Check Reporting.* The measurement quality checks described in section 3 of this appendix, are required to be submitted to the PSD reviewing authority within the same time frame as routinely-collected ambient concentration data as described in 40 CFR 58.16. The PSD reviewing authority may as well require that the measurement quality check data be reported to AQS.

1.5 *Assessments and Reports.* Periodic assessments and documentation of data quality are required to be reported to the PSD reviewing authority. To provide national uniformity in this assessment and reporting of data quality for all networks, specific assessment and reporting procedures are prescribed in detail in sections 3, 4, and 5 of this appendix.

2. Quality System Requirements

A quality system (reference 1 of this appendix) is the means by which an organization manages the quality of the monitoring information it produces in a

systematic, organized manner. It provides a framework for planning, implementing, assessing and reporting work performed by an organization and for carrying out required quality assurance and quality control activities.

2.1 *Quality Assurance Project Plans.* All PSD PQAOs must develop a quality system that is described and approved in quality assurance project plans (QAPP) to ensure that the monitoring results:

(a) Meet a well-defined need, use, or purpose (reference 5 of this appendix);

(b) Provide data of adequate quality for the intended monitoring objectives;

(c) Satisfy stakeholder expectations;

(d) Comply with applicable standards specifications;

(e) Comply with statutory (and other legal) requirements; and

(f) Assure quality assurance and quality control adequacy and independence.

2.1.1 The QAPP is a formal document that describes these activities in sufficient detail and is supported by standard operating procedures. The QAPP must describe how the organization intends to control measurement uncertainty to an appropriate level in order to achieve the objectives for which the data are collected. The QAPP must be documented in accordance with EPA requirements (reference 3 of this appendix).

2.1.2 The PSD PQAO's quality system must have adequate resources both in personnel and funding to plan, implement, assess and report on the achievement of the requirements of this appendix and it's approved QAPP.

2.1.3 Incorporation of quality management plan (QMP) elements into the QAPP. The QMP describes the quality system in terms of the organizational structure, functional responsibilities of management and staff, lines of authority, and required interfaces for those planning, implementing, assessing and reporting activities involving environmental data operations (EDO). The PSD PQAOs may combine pertinent elements of the QMP into the QAPP rather than requiring the submission of both QMP and QAPP documents separately, with prior approval of the PSD reviewing authority. Additional guidance on QMPs can be found in reference 2 of this appendix.

2.2 Independence of Quality Assurance Management. The PSD PQAO must provide for a quality assurance management function for its PSD data collection operation, that aspect of the overall management system of the organization that determines and implements the quality policy defined in a PSD PQAO's QAPP. Quality management includes strategic planning, allocation of resources and other systematic planning activities (*e.g.,* planning, implementation, assessing and reporting) pertaining to the quality system. 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.

2.3 *Data Quality Performance Requirements.*

2.3.1 *Data Quality Objectives (DQOs).* The DQOs, or the results of other systematic planning processes, are statements that define the appropriate type of data to collect and specify the tolerable levels of potential decision errors that will be used as a basis for establishing the quality and quantity of data needed to support air monitoring objectives (reference 5 of the appendix). The DQOs have been developed by the EPA to support attainment decisions for comparison to national ambient air quality standards (NAAQS). The PSD reviewing authority and the PSD monitoring organization will be jointly responsible for determining whether adherence to the EPA developed NAAQS DQOs specified in appendix A of this part are appropriate or if DQOs from a project-specific systematic planning process are necessary.

2.3.1.1 *Measurement Uncertainty for Automated and Manual $PM_{2.5}$ Methods.* The goal for acceptable measurement uncertainty for precision is defined as an upper 90 percent confidence limit for the coefficient of variation (CV) of 10 percent and plus or minus 10 percent for total bias.

2.3.1.2 *Measurement Uncertainty for Automated Ozone Methods.* The goal for acceptable measurement uncertainty is defined for precision as an upper 90 percent confidence limit for the CV of 7 percent and for bias as an upper 95 percent confidence limit for the absolute bias of 7 percent.

2.3.1.3 *Measurement Uncertainty for Pb Methods.* The goal for acceptable measurement uncertainty is defined for precision as an upper 90 percent confidence limit for the CV of 20 percent and for bias as an upper 95 percent confidence limit for the absolute bias of 15 percent.

2.3.1.4 *Measurement Uncertainty for NO_2.* The goal for acceptable measurement uncertainty is defined for precision as an upper 90 percent confidence limit for the CV of 15 percent and for bias as an upper 95 percent confidence limit for the absolute bias of 15 percent.

2.3.1.5 *Measurement Uncertainty for SO_2.* The goal for acceptable measurement uncertainty for precision is defined as an upper 90 percent confidence limit for the CV of 10 percent and for bias as an upper 95 percent confidence limit for the absolute bias of 10 percent.

2.4 *National Performance Evaluation Program.* Organizations operating PSD monitoring networks are required to implement the EPA's national performance evaluation program (NPEP) if the data will be used for NAAQS decisions and at the discretion of the PSD reviewing authority if PSD data are not used for NAAQS decisions. The NPEP includes the National Performance Audit Program (NPAP), the $PM_{2.5}$ Performance Evaluation Program ($PM_{2.5}$-PEP) and the Pb Performance Evaluation Program (Pb-PEP). The PSD QAPP shall provide for the implementation of NPEP including the provision of adequate resources for such NPEP if the data will be used for NAAQS decisions or if required by the PSD reviewing authority. Contact the PSD reviewing authority to determine the best procedure for implementing the audits which may include an audit by the PSD reviewing authority, a contractor certified for the activity, or through self-implementation which is described in sections below. A determination of which entity will be performing this audit program should be made as early as possible and during the QAPP development process. The PSD PQAOs, including contractors that plan to implement these programs on behalf of PSD PQAOs, that plan to implement these programs (self-implement) rather than use the federal programs, must meet the adequacy requirements found in the appropriate sections that follow, as well as meet the definition of independent assessment that follows.

2.4.1 *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 routinely-collected ambient air monitoring data. An organization can conduct the performance evaluation (PE) 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. In addition, the sample analysis of audit filters must be performed by a laboratory facility and laboratory equipment separate from the facilities used for routine sample analysis. Field and laboratory personnel will be required to meet the performance evaluation field and laboratory training and certification requirements. The PSD PQAO will be required to participate in the centralized field and laboratory standards certification and comparison processes to establish comparability to federally implemented programs.

2.5 *Technical Systems Audit Program.* The PSD reviewing authority or the EPA may conduct system audits of the ambient air monitoring programs or organizations operating PSD networks. The PSD monitoring organizations shall consult with the PSD reviewing authority to verify the schedule of any such technical systems audit. Systems audit programs are described in reference 10 of this appendix.

2.6 *Gaseous and Flow Rate Audit Standards.*

2.6.1 Gaseous pollutant concentration standards (permeation devices or cylinders of compressed gas) used to obtain test concentrations for carbon monoxide (CO), sulfur dioxide (SO_2), nitrogen oxide (NO), and nitrogen dioxide (NO_2) must be traceable to either a National Institute of Standards and Technology (NIST) Traceable Reference Material (NTRM) or a NIST-certified Gas Manufacturer's Internal Standard (GMIS), certified in accordance with one of the procedures given in reference 4 of this appendix. Vendors advertising certification with the procedures provided in reference 4 of this appendix and distributing gases as ''EPA Protocol Gas'' must participate in the EPA Protocol Gas Verification Program or not use ''EPA'' in any form of advertising. The PSD PQAOs must provide information to the PSD reviewing authority on the gas vendors they use (or will use) for the duration of the PSD monitoring project. This information can

be provided in the QAPP or monitoring plan, but must be updated if there is a change in the producer used.

2.6.2 Test concentrations for ozone (O_3) must be obtained in accordance with the ultraviolet photometric calibration procedure specified in appendix D to Part 50, and by means of a certified NIST-traceable O_3 transfer standard. Consult references 7 and 8 of this appendix for guidance on transfer standards for O_3.

2.6.3 Flow rate measurements must be made by a flow measuring instrument that is NIST-traceable to an authoritative volume or other applicable standard. Guidance for certifying some types of flow-meters is provided in reference 10 of this appendix.

2.7 Primary Requirements and Guidance. Requirements and guidance documents for developing the quality system are contained in references 1 through 11 of this appendix, which also contain many suggested procedures, checks, and control specifications. Reference 10 describes specific guidance for the development of a quality system for data collected for comparison to the NAAQS. Many specific quality control checks and specifications for methods are included in the respective reference methods described in Part 50 or in the respective equivalent method descriptions available from the EPA (reference 6 of this appendix). Similarly, quality control procedures related to specifically designated reference and equivalent method monitors are contained in the respective operation or instruction manuals associated with those monitors. For PSD monitoring, the use of reference and equivalent method monitors are required.

3. Measurement Quality Check Requirements

This section provides the requirements for PSD PQAOs to perform the measurement quality checks that can be used to assess data quality. Data from these checks are required to be submitted to the PSD reviewing authority within the same time frame as routinely-collected ambient concentration data as described in 40 CFR 58.16. Table B–1 of this appendix provides a summary of the types and frequency of the measurement quality checks that are described in this section. Reporting these results to AQS may be required by the PSD reviewing authority.

3.1 *Gaseous monitors of SO_2, NO_2, O_3, and CO.*

3.1.1 *One-Point Quality Control (QC) Check for SO_2, NO_2, O_3, and CO.* (a) A one-point QC check must be performed at least once every 2 weeks on each automated monitor used to measure SO_2, NO_2, O_3 and CO. With the advent of automated calibration systems, more frequent checking is strongly encouraged and may be required by the PSD reviewing authority. See Reference 10 of this appendix for guidance on the review procedure. The QC check is made by challenging the monitor with a QC check gas of known concentration (effective concentration for open path monitors) between the prescribed range of 0.005 and 0.08 parts per million (ppm) for SO_2, NO_2, and O_3, and between the prescribed range of 0.5 and 5 ppm for CO monitors. The QC check gas concentration selected within the prescribed range should be related to monitoring objectives for the monitor. If monitoring for trace level monitoring, the QC check concentration should be selected to represent the mean or median concentrations at the site. If the mean or median concentrations at trace gas sites are below the MDL of the instrument the agency can select the lowest concentration in the prescribed range that can be practically achieved. If the mean or median concentrations at trace gas sites are above the prescribed range the agency can select the highest concentration in the prescribed range. The PSD monitoring organization will consult with the PSD reviewing authority on the most appropriate one-point QC concentration based on the objectives of the monitoring activity. An additional QC check point is encouraged for those organizations that may have occasional high values or would like to confirm the monitors' linearity at the higher end of the operational range or around NAAQS concentrations. If monitoring for NAAQS decisions the QC concentration can be selected at a higher concentration within the prescribed range but should also consider precision points around mean or median concentrations.

(b) Point analyzers must operate in their normal sampling mode during the QC check and the test atmosphere must pass through all filters, scrubbers, conditioners and other components used during normal ambient sampling and as much of the ambient air inlet system as is practicable. The QC check must be conducted before any calibration or adjustment to the monitor.

(c) Open-path monitors are tested by inserting a test cell containing a QC check gas concentration into the optical measurement beam of the instrument. If possible, the normally used transmitter, receiver, and as appropriate, reflecting devices should be used during the test and the normal monitoring configuration of the instrument should be altered as little as possible to accommodate the test cell for the test. However, if permitted by the associated operation or instruction manual, an alternate local light source or an alternate optical path that does not include the normal atmospheric monitoring path may be used. The actual concentration of the QC check gas in the test cell must be selected to produce an effective concentration in the range specified earlier in this section. Generally, the QC test concentration measurement will be the sum of the atmospheric pollutant concentration and the QC test concentration. As such, the result must be corrected to remove the atmospheric concentration contribution. The corrected concentration is obtained by subtracting the average of the atmospheric concentrations measured by the open path instrument under test immediately before and immediately after the QC test from the QC check gas concentration measurement. If the difference between these before and after measurements is greater than 20 percent of the effective concentration of the test gas, discard the test result and repeat the test. If possible, open path monitors should be tested during periods when the atmospheric pollutant concentrations are relatively low and steady.

(d) Report the audit concentration of the QC gas and the corresponding measured concentration indicated by the monitor. The percent differences between these concentrations are used to assess the precision and bias of the monitoring data as described in sections 4.1.2 (precision) and 4.1.3 (bias) of this appendix.

3.1.2 *Quarterly performance evaluation for SO_2, NO_2, O_3, or CO.* Evaluate each primary monitor each monitoring quarter (or 90 day frequency) during which monitors are operated or a least once (if operated for less than one quarter). The quarterly performance evaluation (quarterly PE) must be performed by a qualified individual, group, or organization that is not part of the organization directly performing and accountable for the work being assessed. The person or entity performing the quarterly PE must not be involved with the generation of the routinely-collected ambient air monitoring data. A PSD monitoring organization can conduct the quarterly PE itself 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. The quarterly PE also requires a set of equipment and standards independent from those used for routine calibrations or zero, span or precision checks.

3.1.2.1 The evaluation is made by challenging the monitor with audit gas standards of known concentration from at least three audit levels. One point must be within two to three times the method detection limit of the instruments within the PQAOs network, the second point will be less than or equal to the 99th percentile of the data at the site or the network of sites in the PQAO or the next highest audit concentration level. The third point can be around the primary NAAQS or the highest 3-year concentration at the site or the network of sites in the PQAO. An additional 4th level is encouraged for those PSD organizations that would like to confirm the monitor's linearity at the higher end of the operational range. In rare circumstances, there may be sites measuring concentrations above audit level 10. These sites should be identified to the PSD reviewing authority.

Audit level	Concentration range, ppm			
	O_3	SO_2	NO_2	CO
1	0.004–0.0059	0.0003–0.0029	0.0003–0.0029	0.020–0.059
2	0.006–0.019	0.0030–0.0049	0.0030–0.0049	0.060–0.199

Audit level	Concentration range, ppm			
	O_3	SO_2	NO_2	CO
3	0.020–0.039	0.0050–0.0079	0.0050–0.0079	0.200–0.899
4	0.040–0.069	0.0080–0.0199	0.0080–0.0199	0.900–2.999
5	0.070–0.089	0.0200–0.0499	0.0200–0.0499	3.000–7.999
6	0.090–0.119	0.0500–0.0999	0.0500–0.0999	8.000–15.999
7	0.120–0.139	0.1000–0.1499	0.1000–0.2999	16.000–30.999
8	0.140–0.169	0.1500–0.2599	0.3000–0.4999	31.000–39.999
9	0.170–0.189	0.2600–0.7999	0.5000–0.7999	40.000–49.999
10	0.190–0.259	0.8000–1.000	0.8000–1.000	50.000–60.000

3.1.2.2 The NO_2 audit techniques may vary depending on the ambient monitoring method. For chemiluminescence-type NO_2 analyzers, gas phase titration (GPT) techniques should be based on the EPA guidance documents and monitoring agency experience. The NO_2 gas standards may be more appropriate than GPT for direct NO_2 methods that do not employ converters. Care should be taken to ensure the stability of such gas standards prior to use.

3.1.2.3 The standards from which audit gas test concentrations are obtained must meet the specifications of section 2.6.1 of this appendix.

3.1.2.4 For point analyzers, the evaluation shall be carried out by allowing the monitor to analyze the audit gas test atmosphere in its normal sampling mode such that the test atmosphere passes through all filters, scrubbers, conditioners, and other sample inlet components used during normal ambient sampling and as much of the ambient air inlet system as is practicable.

3.1.2.5 Open-path monitors are evaluated by inserting a test cell containing the various audit gas concentrations into the optical measurement beam of the instrument. If possible, the normally used transmitter, receiver, and, as appropriate, reflecting devices should be used during the evaluation, and the normal monitoring configuration of the instrument should be modified as little as possible to accommodate the test cell for the evaluation. However, if permitted by the associated operation or instruction manual, an alternate local light source or an alternate optical path that does not include the normal atmospheric monitoring path may be used. The actual concentrations of the audit gas in the test cell must be selected to produce effective concentrations in the evaluation level ranges specified in this section of this appendix. Generally, each evaluation concentration measurement result will be the sum of the atmospheric pollutant concentration and the evaluation test concentration. As such, the result must be corrected to remove the atmospheric concentration contribution. The corrected concentration is obtained by subtracting the average of the atmospheric concentrations measured by the open-path instrument under test immediately before and immediately after the evaluation test (or preferably before and after each evaluation concentration level) from the evaluation concentration measurement. If the difference between the before and after measurements is greater than 20 percent of the effective concentration of the test gas standard, discard the test result for that concentration level and repeat the test for that level. If possible, open-path monitors should be evaluated during periods when the atmospheric pollutant concentrations are relatively low and steady. Also, if the open-path instrument is not installed in a permanent manner, the monitoring path length must be reverified to be within ±3 percent to validate the evaluation, since the monitoring path length is critical to the determination of the effective concentration.

3.1.2.6 Report both the evaluation concentrations (effective concentrations for open-path monitors) of the audit gases and the corresponding measured concentration (corrected concentrations, if applicable, for open-path monitors) indicated or produced by the monitor being tested. The percent differences between these concentrations are used to assess the quality of the monitoring data as described in section 4.1.1 of this appendix.

3.1.3 *National Performance Audit Program (NPAP).* As stated in sections 1.1 and 2.4, PSD monitoring networks may be subject to the NPEP, which includes the NPAP. The NPAP is a performance evaluation which is a type of audit where quantitative data are collected independently in order to evaluate the proficiency of an analyst, monitoring instrument and laboratory. Due to the implementation approach used in this program, NPAP provides for a national independent assessment of performance with a consistent level of data quality. The NPAP should not be confused with the quarterly PE program described in section 3.1.2. The PSD organizations shall consult with the PSD reviewing authority or the EPA regarding whether the implementation of NPAP is required and the implementation options available. Details of the EPA NPAP can be found in reference 11 of this appendix. The program requirements include:

3.1.3.1 Performing audits on 100 percent of monitors and sites each year including monitors and sites that may be operated for less than 1 year. The PSD reviewing authority has the authority to require more frequent audits at sites they consider to be high priority.

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

3.1.3.3 Using audit gases that are verified against the National Institute for Standards and Technology (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.

3.1.3.4 The PSD PQAO may elect to self-implement NPAP. In these cases, the PSD reviewing authority will work with those PSD PQAOs to establish training and other technical requirements to establish comparability to federally implemented programs. In addition to meeting the requirements in sections 3.1.1.3 through 3.1.3.3, the PSD PQAO must:

(a) Ensure that the PSD audit system is equivalent to the EPA NPAP audit system and is an entirely separate set of equipment and standards from the equipment used for quarterly performance evaluations. If this system does not generate and analyze the audit concentrations, as the EPA NPAP system does, its equivalence to the EPA NPAP system must be proven to be as accurate under a full range of appropriate and varying conditions as described in section 3.1.3.6.

(b) Perform a whole system check by having the PSD audit system tested at an independent and qualified EPA lab, or equivalent.

(c) Evaluate the system with the EPA NPAP program through collocated auditing at an acceptable number of sites each year (at least one for a PSD network of five or less sites; at least two for a network with more than five sites).

(d) Incorporate the NPAP into the PSD PQAO's QAPP.

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

(f) Participate in initial and update training/certification sessions.

3.2 *$PM_{2.5}$.*

3.2.1 *Flow Rate Verification for $PM_{2.5}$.* A one-point flow rate verification check must be performed at least once every month (each verification minimally separated by 14 days) on each monitor used to measure $PM_{2.5}$. The verification is made by checking the operational flow rate of the monitor. If the verification is made in conjunction with a flow rate adjustment, it must be made prior to such flow rate adjustment. For the standard procedure, use a flow rate transfer standard certified in accordance with section 2.6 of this appendix to check the monitor's normal flow rate. Care should be used in selecting and using the flow rate measurement device such that it does not alter the normal operating flow rate of the monitor. Flow rate verification results are to be reported to the PSD reviewing authority quarterly as described in section 5.1. Reporting these results to AQS is encouraged. The percent differences between the audit

and measured flow rates are used to assess the bias of the monitoring data as described in section 4.2.2 of this appendix (using flow rates in lieu of concentrations).

3.2.2 *Semi-Annual Flow Rate Audit for $PM_{2.5}$.* Every 6 months, audit the flow rate of the $PM_{2.5}$ particulate monitors. For short-term monitoring operations (those less than 1 year), the flow rate audits must occur at start up, at the midpoint, and near the completion of the monitoring project. The audit must be conducted by a trained technician other than the routine site operator. The audit is made by measuring the monitor's normal operating flow rate using a flow rate transfer standard certified in accordance with section 2.6 of this appendix. The flow rate standard used for auditing must not be the same flow rate standard used for verifications or to calibrate the monitor. However, both the calibration standard and the audit standard may be referenced to the same primary flow rate or volume standard. Care must be taken in auditing the flow rate to be certain that the flow measurement device does not alter the normal operating flow rate of the monitor. Report the audit flow rate of the transfer standard and the corresponding flow rate measured by the monitor. The percent differences between these flow rates are used to evaluate monitor performance.

3.2.3 *Collocated Sampling Procedures for $PM_{2.5}$.* A PSD PQAO must have at least one collocated monitor for each PSD monitoring network.

3.2.3.1 For each pair of collocated monitors, designate one sampler as the primary monitor whose concentrations will be used to report air quality for the site, and designate the other as the QC monitor. There can be only one primary monitor at a monitoring site for a given time period.

(a) If the primary monitor is a FRM, then the quality control monitor must be a FRM of the same method designation.

(b) If the primary monitor is a FEM, then the quality control monitor must be a FRM unless the PSD PQAO submits a waiver for this requirement, provides a specific reason why a FRM cannot be implemented, and the waiver is approved by the PSD reviewing authority. If the waiver is approved, then the quality control monitor must be the same method designation as the primary FEM monitor.

3.2.3.2 In addition, the collocated monitors should be deployed according to the following protocol:

(a) The collocated quality control monitor(s) should be deployed at sites with the highest predicted daily $PM_{2.5}$ concentrations in the network. If the highest $PM_{2.5}$ concentration site is impractical for collocation purposes, alternative sites approved by the PSD reviewing authority may be selected. If additional collocated sites are necessary, the PSD PQAO and the PSD reviewing authority should determine the appropriate location(s) based on data needs.

(b) The two collocated monitors must be within 4 meters of each other and at least 2 meters apart for flow rates greater than 200 liters/min or at least 1 meter apart for samplers having flow rates less than 200 liters/min to preclude airflow interference. A waiver allowing up to 10 meters horizontal distance and up to 3 meters vertical distance (inlet to inlet) between a primary and collocated quality control monitor may be approved by the PSD reviewing authority for sites at a neighborhood or larger scale of representation. This waiver may be approved during the QAPP review and approval process. Sampling and analytical methodologies must be the consistently implemented for both collocated samplers and for all other samplers in the network.

(c) Sample the collocated quality control monitor on a 6-day schedule for sites not requiring daily monitoring and on a 3-day schedule for any site requiring daily monitoring. Report the measurements from both primary and collocated quality control monitors at each collocated sampling site. The calculations for evaluating precision between the two collocated monitors are described in section 4.2.1 of this appendix.

3.2.4 *$PM_{2.5}$ Performance Evaluation Program (PEP) Procedures.* As stated in sections 1.1 and 2.4 of this appendix, PSD monitoring networks may be subject to the NPEP, which includes the $PM_{2.5}$ PEP. The PSD monitoring organizations shall consult with the PSD reviewing authority or the EPA regarding whether the implementation of $PM_{2.5}$ PEP is required and the implementation options available for the $PM_{2.5}$ PEP. For PSD PQAOs with less than or equal to five monitoring sites, five valid performance evaluation audits must be collected and reported each year. For PSD PQAOs with greater than five monitoring sites, eight valid performance evaluation audits must be collected and reported each year. Additionally, within the five or eight required audits, each type of method designation (FRM/FEM designation) used as a primary monitor in the PSD network shall be audited. For a PE to be valid, both the primary monitor and PEP audit measurements must meet quality control requirements and be above 3 $\mu g/m^3$ or a predefined lower concentration level determined by a systematic planning process and approved by the PSD reviewing authority. Due to the relatively short-term nature of most PSD monitoring, the likelihood of measuring low concentrations in many areas attaining the $PM_{2.5}$ standard and the time required to weigh filters collected in PEs, a PSD monitoring organization's QAPP may contain a provision to waive the 3 $\mu g/m^3$ threshold for validity of PEs conducted in the last quarter of monitoring, subject to approval by the PSD reviewing authority.

3.3 *PM_{10}.*

3.3.1 *Flow Rate Verification for PM_{10}.* A one-point flow rate verification check must be performed at least once every month (each verification minimally separated by 14 days) on each monitor used to measure PM_{10}. The verification is made by checking the operational flow rate of the monitor. If the verification is made in conjunction with a flow rate adjustment, it must be made prior to such flow rate adjustment. For the standard procedure, use a flow rate transfer standard certified in accordance with section 2.6 of this appendix to check the monitor's normal flow rate. Care should be taken in selecting and using the flow rate measurement device such that it does not alter the normal operating flow rate of the monitor. The percent differences between the audit and measured flow rates are used to assess the bias of the monitoring data as described in section 4.2.2 of this appendix (using flow rates in lieu of concentrations).

3.3.2 *Semi-Annual Flow Rate Audit for PM_{10}.* Every 6 months, audit the flow rate of the PM_{10} particulate monitors. For short-term monitoring operations (those less than 1 year), the flow rate audits must occur at start up, at the midpoint, and near the completion of the monitoring project. Where possible, the EPA strongly encourages more frequent auditing. The audit must be conducted by a trained technician other than the routine site operator. The audit is made by measuring the monitor's normal operating flow rate using a flow rate transfer standard certified in accordance with section 2.6 of this appendix. The flow rate standard used for auditing must not be the same flow rate standard used for verifications or to calibrate the monitor. However, both the calibration standard and the audit standard may be referenced to the same primary flow rate or volume standard. Care must be taken in auditing the flow rate to be certain that the flow measurement device does not alter the normal operating flow rate of the monitor. Report the audit flow rate of the transfer standard and the corresponding flow rate measured by the monitor. The percent differences between these flow rates are used to evaluate monitor performance

3.3.3 *Collocated Sampling Procedures for Manual PM_{10}.* A PSD PQAO must have at least one collocated monitor for each PSD monitoring network.

3.3.3.1 For each pair of collocated monitors, designate one sampler as the primary monitor whose concentrations will be used to report air quality for the site, and designate the other as the quality control monitor.

3.3.3.2 In addition, the collocated monitors should be deployed according to the following protocol:

(a) The collocated quality control monitor(s) should be deployed at sites with the highest predicted daily PM_{10} concentrations in the network. If the highest PM_{10} concentration site is impractical for collocation purposes, alternative sites approved by the PSD reviewing authority may be selected.

(b) The two collocated monitors must be within 4 meters of each other and at least 2 meters apart for flow rates greater than 200 liters/min or at least 1 meter apart for samplers having flow rates less than 200 liters/min to preclude airflow interference. A waiver allowing up to 10 meters horizontal distance and up to 3 meters vertical distance (inlet to inlet) between a primary and collocated sampler may be approved by the PSD reviewing authority for sites at a neighborhood or larger scale of representation. This waiver may be approved during the QAPP review and approval process. Sampling and analytical methodologies must be the consistently implemented for both collocated samplers and for all other samplers in the network.

(c) Sample the collocated quality control monitor on a 6-day schedule or 3-day schedule for any site requiring daily monitoring. Report the measurements from both primary and collocated quality control monitors at each collocated sampling site. The calculations for evaluating precision between the two collocated monitors are described in section 4.2.1 of this appendix.

(d) In determining the number of collocated sites required for PM_{10}, PSD monitoring networks for Pb-PM_{10} should be treated independently from networks for particulate matter (PM), even though the separate networks may share one or more common samplers. However, a single quality control monitor that meets the collocation requirements for Pb-PM_{10} and PM_{10} may serve as a collocated quality control monitor for both networks. Extreme care must be taken if using the filter from a quality control monitor for both PM_{10} and Pb analysis. PM_{10} filter weighing should occur prior to any Pb analysis.

3.4 *Pb.*

3.4.1 *Flow Rate Verification for Pb.* A one-point flow rate verification check must be performed at least once every month (each verification minimally separated by 14 days) on each monitor used to measure Pb. The verification is made by checking the operational flow rate of the monitor. If the verification is made in conjunction with a flow rate adjustment, it must be made prior to such flow rate adjustment. Use a flow rate transfer standard certified in accordance with section 2.6 of this appendix to check the monitor's normal flow rate. Care should be taken in selecting and using the flow rate measurement device such that it does not alter the normal operating flow rate of the monitor. The percent differences between the audit and measured flow rates are used to assess the bias of the monitoring data as described in section 4.2.2 of this appendix (using flow rates in lieu of concentrations).

3.4.2 *Semi-Annual Flow Rate Audit for Pb.* Every 6 months, audit the flow rate of the Pb particulate monitors. For short-term monitoring operations (those less than 1 year), the flow rate audits must occur at start up, at the midpoint, and near the completion of the monitoring project. Where possible, the EPA strongly encourages more frequent auditing. The audit must be conducted by a trained technician other than the routine site operator. The audit is made by measuring the monitor's normal operating flow rate using a flow rate transfer standard certified in accordance with section 2.6 of this appendix. The flow rate standard used for auditing must not be the same flow rate standard used to in verifications or to calibrate the monitor. However, both the calibration standard and the audit standard may be referenced to the same primary flow rate or volume standard. Great care must be taken in auditing the flow rate to be certain that the flow measurement device does not alter the normal operating flow rate of the monitor. Report the audit flow rate of the transfer standard and the corresponding flow rate measured by the monitor. The percent differences between these flow rates are used to evaluate monitor performance.

3.4.3 *Collocated Sampling for Pb.* A PSD PQAO must have at least one collocated monitor for each PSD monitoring network.

3.4.3.1 For each pair of collocated monitors, designate one sampler as the primary monitor whose concentrations will be used to report air quality for the site, and designate the other as the quality control monitor.

3.4.3.2 In addition, the collocated monitors should be deployed according to the following protocol:

(a) The collocated quality control monitor(s) should be deployed at sites with the highest predicted daily Pb concentrations in the network. If the highest Pb concentration site is impractical for collocation purposes, alternative sites approved by the PSD reviewing authority may be selected.

(b) The two collocated monitors must be within 4 meters of each other and at least 2 meters apart for flow rates greater than 200 liters/min or at least 1 meter apart for samplers having flow rates less than 200 liters/min to preclude airflow interference. A waiver allowing up to 10 meters horizontal distance and up to 3 meters vertical distance (inlet to inlet) between a primary and collocated sampler may be approved by the PSD reviewing authority for sites at a neighborhood or larger scale of representation. This waiver may be approved during the QAPP review and approval process. Sampling and analytical methodologies must be the consistently implemented for both collocated samplers and all other samplers in the network.

(c) Sample the collocated quality control monitor on a 6-day schedule if daily monitoring is not required or 3-day schedule for any site requiring daily monitoring. Report the measurements from both primary and collocated quality control monitors at each collocated sampling site. The calculations for evaluating precision between the two collocated monitors are described in section 4.2.1 of this appendix.

(d) In determining the number of collocated sites required for Pb-PM_{10}, PSD monitoring networks for PM_{10} should be treated independently from networks for Pb-PM_{10}, even though the separate networks may share one or more common samplers. However, a single quality control monitor that meets the collocation requirements for Pb-PM_{10} and PM_{10} may serve as a collocated quality control monitor for both networks. Extreme care must be taken if using a using the filter from a quality control monitor for both PM_{10} and Pb analysis. The PM_{10} filter weighing should occur prior to any Pb analysis.

3.4.4 *Pb Analysis Audits.* Each calendar quarter, audit the Pb reference or equivalent method analytical procedure using filters containing a known quantity of Pb. These audit filters are prepared by depositing a Pb standard on unexposed filters and allowing them to dry thoroughly. The audit samples must be prepared using batches of reagents different from those used to calibrate the Pb analytical equipment being audited. Prepare audit samples in the following concentration ranges:

Range	Equivalent ambient Pb concentration, µg/m³
1	30–100% of Pb NAAQS.
2	200–300% of Pb NAAQS.

(a) Audit samples must be extracted using the same extraction procedure used for exposed filters.

(b) Analyze three audit samples in each of the two ranges each quarter samples are analyzed. The audit sample analyses shall be distributed as much as possible over the entire calendar quarter.

(c) Report the audit concentrations (in µg Pb/filter or strip) and the corresponding measured concentrations (in µg Pb/filter or strip) using AQS unit code 077 (if reporting to AQS). The percent differences between the concentrations are used to calculate analytical accuracy as described in section 4.2.5 of this appendix.

3.4.5 *Pb Performance Evaluation Program (PEP) Procedures.* As stated in sections 1.1 and 2.4, PSD monitoring networks may be subject to the NPEP, which includes the Pb PEP. The PSD monitoring organizations shall consult with the PSD reviewing authority or the EPA regarding whether the implementation of Pb-PEP is required and the implementation options available for the Pb-PEP. The PEP is an independent assessment used to estimate total measurement system bias. Each year, one PE audit must be performed at one Pb site in each PSD PQAO network that has less than or equal to five sites and two audits for PSD PQAO networks with greater than five sites. In addition, each year, four collocated samples from PSD PQAO networks with less than or equal to five sites and six collocated samples from PSD PQAO networks with greater than five sites must be sent to an independent laboratory for analysis. The calculations for evaluating bias between the primary monitor and the PE monitor for Pb are described in section 4.2.4 of this appendix.

4. Calculations for Data Quality Assessments

(a) Calculations of measurement uncertainty are carried out by PSD PQAO according to the following procedures. The PSD PQAOs should report the data for all appropriate measurement quality checks as specified in this appendix even though they may elect to perform some or all of the calculations in this section on their own.

(b) At low concentrations, agreement between the measurements of collocated samplers, expressed as relative percent difference or percent difference, may be relatively poor. For this reason, collocated measurement pairs will be selected for use in the precision and bias calculations only when both measurements are equal to or above the following limits:

(1) Pb: 0.002 µg/m³ (Methods approved after 3/04/2010, with exception of manual equivalent method EQLA–0813–803).

(2) Pb: 0.02 µg/m³ (Methods approved before 3/04/2010, and manual equivalent method EQLA–0813–803).

(3) PM_{10} (Hi-Vol): 15 µg/m³.

(4) PM_{10} (Lo-Vol): 3 µg/m³.

(5) $PM_{2.5}$: 3 µg/m³.

(c) The $PM_{2.5}$ 3 μg/m³ limit for the $PM_{2.5}$ − PEP may be superseded by mutual agreement between the PSD PQAO and the PSD reviewing authority as specified in section 3.2.4 of the appendix and detailed in the approved QAPP.

4.1 *Statistics for the Assessment of QC Checks for SO_2, NO_2, O_3 and CO.*

4.1.1 *Percent Difference.* Many of the measurement quality checks start with a comparison of an audit concentration or value (flow-rate) to the concentration/value measured by the monitor and use percent difference as the comparison statistic as described in equation 1 of this section. For each single point check, calculate the percent difference, d_i, as follows:

Equation 1

$$d_i = \frac{meas - audit}{audit} \cdot 100$$

where *meas* is the concentration indicated by the PQAO's instrument and *audit* is the audit concentration of the standard used in the QC check being measured.

4.1.2 *Precision Estimate.* The precision estimate is used to assess the one-point QC checks for SO_2, NO_2, O_3, or CO described in section 3.1.1 of this appendix. The precision estimator is the coefficient of variation upper bound and is calculated using equation 2 of this section:

Equation 2

$$CV = \sqrt{\frac{n \cdot \sum_{i=1}^{n} d_i^2 - \left(\sum_{i=1}^{n} d_i\right)^2}{n(n-1)}} \cdot \sqrt{\frac{n-1}{\chi^2_{0.1,n-1}}}$$

where n is the number of single point checks being aggregated; $X^2_{0.1,n-1}$ is the 10th percentile of a chi-squared distribution with n−1 degrees of freedom.

4.1.3 *Bias Estimate.* The bias estimate is calculated using the one-point QC checks for SO_2, NO_2, O_3, or CO described in section 3.1.1 of this appendix. The bias estimator is an upper bound on the mean absolute value of the percent differences as described in equation 3 of this section:

Equation 3

$$|bias| = AB + t_{0.95,n-1} \cdot \frac{AS}{\sqrt{n}}$$

where n is the number of single point checks being aggregated; $t_{0.95,n-1}$ is the 95th quantile of a t-distribution with n−1 degrees of freedom; the quantity *AB* is the mean of the absolute values of the d_i's and is calculated using equation 4 of this section:

Equation 4

$$AB = \frac{1}{n} \cdot \sum_{i=1}^{n} |d_i|$$

and the quantity *AS* is the standard deviation of the absolute value of the d_i's and is calculated using equation 5 of this section:

Equation 5

$$AS = \sqrt{\frac{n \cdot \sum_{i=1}^{n} |d_i|^2 - \left(\sum_{i=1}^{n} |d_i|\right)^2}{n(n-1)}}$$

4.1.3.1 *Assigning a sign (positive/negative) to the bias estimate.* Since the bias statistic as calculated in equation 3 of this appendix uses absolute values, it does not have a tendency (negative or positive bias) associated with it. A sign will be designated by rank ordering the percent differences of the QC check samples from a given site for a particular assessment interval.

4.1.3.2 Calculate the 25th and 75th percentiles of the percent differences for each site. The absolute bias upper bound should be flagged as positive if both percentiles are positive and negative if both percentiles are negative. The absolute bias upper bound would not be flagged if the 25th and 75th percentiles are of different signs.

4.2 *Statistics for the Assessment of PM_{10}, $PM_{2.5}$, and Pb.*

4.2.1 *Collocated Quality Control Sampler Precision Estimate for PM_{10}, $PM_{2.5}$ and Pb.* Precision is estimated via duplicate measurements from collocated samplers. It is recommended that the precision be aggregated at the PQAO level quarterly, annually, and at the 3-year level. The data pair would only be considered valid if both concentrations are greater than or equal to the minimum values specified in section 4(c) of this appendix. For each collocated data pair, calculate the relative percent difference, d_i, using equation 6 of this appendix:

Equation 6

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

where X_i is the concentration from the primary sampler and Y_i is the concentration value from the audit sampler. The coefficient of variation upper bound is calculated using equation 7 of this appendix:

Equation 7

$$CV = \sqrt{\frac{n \cdot \sum_{i=1}^{n} d_i^2 - \left(\sum_{i=1}^{n} d_i\right)^2}{2n(n-1)}} \cdot \sqrt{\frac{n-1}{X^2_{0.1,n-1}}}$$

where n is the number of valid data pairs being aggregated, and $X^2_{0.1,n-1}$ is the 10th percentile of a chi-squared distribution with n–1 degrees of freedom. The factor of 2 in the denominator adjusts for the fact that each d_i is calculated from two values with error.

4.2.2 *One-Point Flow Rate Verification Bias Estimate for PM_{10}, $PM_{2.5}$ and Pb.* For each one-point flow rate verification, calculate the percent difference in volume using equation 1 of this appendix where *meas* is the value indicated by the sampler's volume measurement and *audit* is the actual volume indicated by the auditing flow meter. The absolute volume bias upper bound is then calculated using equation 3, where n is the number of flow rate audits being aggregated; $t_{0.95,n-1}$ is the 95th quantile of a t-distribution with n–1 degrees of freedom, the quantity *AB* is the mean of the absolute values of the d_i's and is calculated using equation 4 of this appendix, and the quantity *AS* in equation 3 of this appendix is the standard deviation of the absolute values if the d_i's and is calculated using equation 5 of this appendix.

4.2.3 *Semi-Annual Flow Rate Audit Bias Estimate for PM_{10}, $PM_{2.5}$ and Pb.* Use the same procedure described in section 4.2.2 for the evaluation of flow rate audits.

4.2.4 *Performance Evaluation Programs Bias Estimate for Pb.* The Pb bias estimate is calculated using the paired routine and the PEP monitor as described in section 3.4.5. Use the same procedures as described in section 4.1.3 of this appendix.

4.2.5 *Performance Evaluation Programs Bias Estimate for $PM_{2.5}$.* The bias estimate is calculated using the PEP audits described in section 4.1.3 of this appendix. The bias estimator is based on the mean percent differences (Equation 1). The mean percent difference, *D*, is calculated by Equation 8 below.

Equation 8

$$D = \frac{1}{n_j} \cdot \sum_{i=1}^{n_j} d_i$$

where n_j is the number of pairs and $d_1, d_2, \ldots d_{nj}$ are the biases for each pair to be averaged.

4.2.6 *Pb Analysis Audit Bias Estimate.* The bias estimate is calculated using the analysis audit data described in section 3.4.4. Use the same bias estimate procedure as described in section 4.1.3 of this appendix.

5. Reporting Requirements

5.1. *Quarterly Reports.* For each quarter, each PSD PQAO shall report to the PSD reviewing authority (and AQS if required by the PSD reviewing authority) the results of all valid measurement quality checks it has carried out during the quarter. The quarterly reports must be submitted consistent with the data reporting requirements specified for air quality data as set forth in 40 CFR 58.16 and pertain to PSD monitoring.

6. References

(1) American National Standard—Specifications and Guidelines for Quality Systems for Environmental Data Collection and Environmental Technology Programs. ANSI/ASQC E4–2014. February 2014. Available from American Society for Quality Control, 611 East Wisconsin Avenue, Milwaukee, WI 53202.

(2) EPA Requirements for Quality Management Plans. EPA QA/R–2. EPA/240/B–01/002. March 2001, Reissue May 2006. Office of Environmental Information, Washington, DC 20460. *http://www.epa.gov/quality/agency-wide-quality-system-documents.*

(3) EPA Requirements for Quality Assurance Project Plans for Environmental Data Operations. EPA QA/R–5. EPA/240/B–01/003. March 2001, Reissue May 2006. Office of Environmental Information, Washington, DC 20460. *http://www.epa.gov/quality/agency-wide-quality-system-documents.*

(4) EPA Traceability Protocol for Assay and Certification of Gaseous Calibration Standards. EPA–600/R–12/531. May, 2012. Available from U.S. Environmental Protection Agency, National Risk Management Research Laboratory, Research Triangle Park, NC 27711. *http://cfpub.epa.gov/si/si_public_record_report.cfm?dirEntryId=245292.*

(5) Guidance for the Data Quality Objectives Process. EPA QA/G–4. EPA/240/B–06/001. February, 2006. Office of Environmental Information, Washington, DC 20460. *http://www.epa.gov/quality/agency-wide-quality-system-documents.*

(6) List of Designated Reference and Equivalent Methods. Available from U.S. Environmental Protection Agency, National Exposure Research Laboratory, Human Exposure and Atmospheric Sciences Division, MD–D205–03, Research Triangle

Park, NC 27711. *http://www3.epa.gov/ttn/amtic/criteria.html.*

(7) Transfer Standards for the Calibration of Ambient Air Monitoring Analyzers for Ozone. EPA–454/B–13–004 U.S. Environmental Protection Agency, Research Triangle Park, NC 27711, October, 2013. *http://www3.epa.gov/ttn/amtic/qapollutant.html.*

(8) Paur, R.J. and F.F. McElroy. Technical Assistance Document for the Calibration of Ambient Ozone Monitors. EPA–600/4–79–057. U.S. Environmental Protection Agency, Research Triangle Park, NC 27711, September, 1979. *http://www.epa.gov/ttn/amtic/cpreldoc.html.*

(9) Quality Assurance Handbook for Air Pollution Measurement Systems, Volume 1—A Field Guide to Environmental Quality Assurance. EPA–600/R–94/038a. April 1994. Available from U.S. Environmental Protection Agency, ORD Publications Office, Center for Environmental Research Information (CERI), 26 W. Martin Luther King Drive, Cincinnati, OH 45268. *http://www3.epa.gov/ttn/amtic/qalist.html.*

(10) Quality Assurance Handbook for Air Pollution Measurement Systems, Volume II: Ambient Air Quality Monitoring Program Quality System Development. EPA–454/B–13–003. *http://www3.epa.gov/ttn/amtic/qalist.html.*

(11) National Performance Evaluation Program Standard Operating Procedures. *http://www3.epa.gov/ttn/amtic/npapsop.html.*

TABLE B–1—MINIMUM DATA ASSESSMENT REQUIREMENTS FOR NAAQS RELATED CRITERIA POLLUTANT PSD MONITORS

Method	Assessment method	Coverage	Minimum frequency	Parameters reported	AQS Assessment type
Gaseous Methods (CO, NO_2, SO_2, O_3)					
One-Point QC for SO_2, NO_2, O_3, CO.	Response check at concentration 0.005–0.08 ppm SO_2, NO_2, O_3, & 0.5 and 5 ppm CO.	Each analyzer	Once per 2 weeks	Audit concentration [1] and measured concentration [2].	One-Point QC.
Quarterly performance evaluation for SO_2, NO_2, O_3, CO.	See section 3.1.2 of this appendix.	Each analyzer	Once per quarter	Audit concentration [1] and measured concentration [2] for each level.	Annual PE.
NPAP for SO_2, NO_2, O_3, CO [3].	Independent Audit	Each primary monitor	Once per year	Audit concentration [1] and measured concentration [2] for each level.	NPAP.
Particulate Methods					
Collocated sampling PM_{10}, $PM_{2.5}$, Pb.	Collocated samplers	1 per PSD Network per pollutant.	Every 6 days or every 3 days if daily monitoring required.	Primary sampler concentration and duplicate sampler concentration [4].	No Transaction reported as raw data.
Flow rate verification PM_{10}, $PM_{2.5}$, Pb.	Check of sampler flow rate	Each sampler	Once every month	Audit flow rate and measured flow rate indicated by the sampler.	Flow Rate Verification.
Semi-annual flow rate audit PM_{10}, $PM_{2.5}$, Pb.	Check of sampler flow rate using independent standard.	Each sampler	Once every 6 months or beginning, middle and end of monitoring.	Audit flow rate and measured flow rate indicated by the sampler.	Semi Annual Flow Rate Audit.
Pb analysis audits Pb-TSP, Pb-PM_{10}.	Check of analytical system with Pb audit strips/filters.	Analytical	Each quarter	Measured value and audit value (ug Pb/filter) using AQS unit code 077 for parameters: 14129—Pb (TSP) LC FRM/FEM 85129—Pb (TSP) LC Non-FRM/FEM.	Pb Analysis Audits.
Performance Evaluation Program $PM_{2.5}$ [3].	Collocated samplers	(1) 5 valid audits for PQAOs with <= 5 sites.. (2) 8 valid audits for PQAOs with > 5 sites. (3) All samplers in 6 years	Over all 4 quarters	Primary sampler concentration and performance evaluation sampler concentration.	PEP.
Performance Evaluation Program Pb [3].	Collocated samplers	(1) 1 valid audit and 4 collocated samples for PQAOs, with <=5 sites. (2) 2 valid audits and 6 collocated samples for PQAOs with >5 sites.	Over all 4 quarters	Primary sampler concentration and performance evaluation sampler concentration. Primary sampler concentration and duplicate sampler concentration.	PEP.

[1] Effective concentration for open path analyzers.
[2] Corrected concentration, if applicable for open path analyzers.
[3] NPAP, $PM_{2.5}$ PEP and Pb-PEP must be implemented if data is used for NAAQS decisions otherwise implementation is at PSD reviewing authority discretion.
[4] Both primary and collocated sampler values are reported as raw data.

■ 11. In Appendix D to part 58, revise paragraph 3(b), remove and reserve paragraph 4.5(b), and revise paragraph 4.5(c) to read as follows:

Appendix D to Part 58—Network Design Criteria for Ambient Air Quality Monitoring

* * * * *

3. * * *

(b) The NCore sites must measure, at a minimum, $PM_{2.5}$ particle mass using continuous and integrated/filter-based samplers, speciated $PM_{2.5}$, $PM_{10-2.5}$ particle mass, O_3, SO_2, CO, NO/NO_Y, wind speed, wind direction, relative humidity, and ambient temperature.

(1) Although the measurement of NO_y is required in support of a number of monitoring objectives, available commercial instruments may indicate little difference in their measurement of NO_y compared to the conventional measurement of NO_X, particularly in areas with relatively fresh sources of nitrogen emissions. Therefore, in areas with negligible expected difference between NO_y and NO_X measured concentrations, the Administrator may allow for waivers that permit NO_X monitoring to be substituted for the required NO_y monitoring at applicable NCore sites.

(2) The EPA recognizes that, in some cases, the physical location of the NCore site may not be suitable for representative meteorological measurements due to the site's physical surroundings. It is also possible that nearby meteorological measurements may be able to fulfill this data need. In these cases, the requirement for

meteorological monitoring can be waived by the Administrator.

* * * * *

4.5 * * *

(b) [Reserved]

(c) The EPA Regional Administrator may require additional monitoring beyond the minimum monitoring requirements contained in paragraph 4.5(a) of this appendix where the likelihood of Pb air quality violations is significant or where the emissions density, topography, or population locations are complex and varied. The EPA Regional Administrators may require additional monitoring at locations including, but not limited to, those near existing additional industrial sources of Pb, recently closed industrial sources of Pb, airports where piston-engine aircraft emit Pb, and other sources of re-entrained Pb dust.

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