

**ENVIRONMENTAL PROTECTION AGENCY****40 CFR Part 58****[AD-FRL 2742-5]****Ambient Air Quality Surveillance****AGENCY:** Environmental Protection Agency.**ACTION:** Proposed revision.

**SUMMARY:** EPA proposes to amend provisions of Part 58 of Chapter 1 of Title 40 of the Code of Federal Regulations to take into account the suggestions offered by State and local air pollution control agencies through the Standing Air Monitoring Work Group (SAMWG) mechanism and the operating experience of State and local agencies, EPA Regional Offices and EPA Headquarters personnel over the last 5 years. Salient changes proposed include: provisions to use most current census population figures to estimate air monitoring network size, allowing 120 days instead of 90 days to submit National Air Monitoring Stations (NAMS) Quarterly data to the National Air Data Bank, to require reporting organizations to submit the results of each individual precision and accuracy test, and to modify network design and siting requirements.

**DATE:** Comments must be submitted on or before May 7, 1985.

**ADDRESS:** Submit comments (duplicate copies are preferred) to: Central Docket Section, U.S. Environmental Protection Agency, Attn: Docket No. A-84-28, 401 M Street, SW., Washington, D.C. 20460. Docket No. A-84-28 is located in the Central Docket Section of the Environmental Protection Agency, West Tower Lobby Gallery I, 401 M St., SW., Washington, D.C. The docket may be inspected between 8:00 a.m. and 4:00 p.m. on week days and a reasonable fee may be charged for copying.

**FOR FURTHER INFORMATION CONTACT:** Neil Berg or Stanley Sleva, Monitoring and Data Analysis Division (MD-14), Office of Air Quality Planning and Standards, Environmental Protection Agency, Research Triangle Park, N.C. 27711, phone: 919-541-5651 or (FTS) 629-5651.

**SUPPLEMENTARY INFORMATION:****Background**

Section 110(a)(2)(C) of the Clean Air Act requires ambient air quality monitoring for purposes of the State Implementation Plans (SIP's) and for reporting air quality data to EPA. Criteria to be followed when measuring air quality and provisions for daily air

pollution index reporting are required by Section 319 of the Act. To satisfy these requirements, on May 10, 1979 (44 FR 27558), EPA established 40 CFR Part 58 which provided detailed requirements for air quality monitoring, data reporting, and surveillance for all of the pollutants for which ambient air quality standards have been established (criteria pollutants) except lead. On September 3, 1981 (44 FR 27558), similar rules were promulgated for lead. On March 20, 1984, similar rules were proposed for  $PM_{10}$  and for TSP as a secondary standard.

The regulations in this notice deal with changes to the ambient air quality monitoring, data reporting, and surveillance requirements of 40 CFR 58 based on the experience of State and local agencies, EPA Regional Offices, and EPA Headquarters personnel during the past 5 years.

**Proposed Revisions to Part 58—Ambient Air Quality Surveillance***Section 58.1 Definitions.*

The revisions proposed today would change the definition of urban area population from the 1970 census to that of the most current decennial census figures. The most current decennial census figures are in the "1980 Census of Population" U.S. Department of Commerce, Bureau of the Census PC 80-1-A1, U.S. Government Printing Office, Washington, D.C., April 1982. There has been an increase of 91 in the number of urbanized areas greater than 50,000 since the 1970 census. The greatest increase (64 urban areas) occurred in the 50,000 to 100,000 population category. The 1970 census showed 275 urban areas and the 1980 census shows 366.

*Section 58.35 NAMS data submittal.*

The current monitoring regulations specify that all NAMS data be submitted in quarterly reports to the National Air Data Bank within 90 days of the end of each reporting period. This requirement would be changed to 120 days to allow States and Regional Offices more time to thoroughly validate the data prior to submitting to the National Air Data Bank.

Analysis of the past three years indicate that 64% of the States report NAMS data within the 90 day period while 95% of the States report within the 120 days period.

*Section 58.40 Index reporting.*

The revisions proposed today would make the population of urban areas for purposes of Air Quality Index Reporting compatible with the definition of urban area population found in Section 58.1

Definitions. This would increase the number of urban areas required to report a PSI from 105 to 115.

**Revisions to Appendix A**

Appendix A prescribes minimum quality assurance and specific quality assessment requirements applicable to SLAMS air monitoring data submitted to EPA. Some changes are being proposed to these requirements, primarily in the requirements for reporting the assessment data to EPA. These changes should have a minor, if any, economic impact on monitoring agencies. A more significant change under consideration by EPA to increase the auditing frequency for automated analyzers and particulate matter samplers is not being proposed at this time because of concern about the substantial impact it would have on some agencies. Comments are solicited on any of these issues, which are discussed more fully below.

Air quality data collected from National Air Monitoring Stations (NAMS) and State and Local Air Monitor Stations (SLAMS) are used for a variety of purposes by a number of public agencies, including State and local air pollution control agencies, the Environmental Protection Agency (EPA), the Council of Environmental Quality (CEQ), other Federal agencies, and the Congress, as well as organizations in the private sector. State and local agencies use the data principally for determining compliance with air quality standards, developing State implementation plans, achieving and maintaining air quality, maintenance planning, and reviewing new sources. On the national level, these data are used for regulatory development, re-evaluating the national air quality standards, evaluating State implementation plans, studying air quality trends, estimating health risks, and developing health risk models.

Assessments of the quality of the NAMS and SLAMS data provide these data users with estimates of the accuracy (degree of bias) and precision (variability) of the monitoring data. Such information is essential to the application of the monitoring data to the various objectives. Subsequent to the original establishment of the assessment requirements in 1979, the uses of the data quality information have been re-evaluated, and the specific needs for such information have been refined. The changes in the data assessment requirements being proposed today are intended to improve and expand the usefulness and value of the data quality estimates associated with the NAMS and SLAMS monitoring data.

The most significant change proposed is a change in the reporting requirements for data quality assessments. Under the existing Appendix A requirements, data quality (precision and accuracy) measurements are combined and reported on an integrated "reporting organization" basis. These reporting organizations are State-level agencies or subordinate organizations within a State for which pooled precision and accuracy assessments serve to inform a data user of the overall data quality being achieved by the reporting organization as a whole. The present reporting system does not now provide available data quality indicators for specific individual monitors or monitoring sites.

It is proposed, instead, to require reporting organizations to submit to EPA the results from each individual precision and accuracy test. EPA would then calculate and report the same type of integrated precision and accuracy assessments representative of each reporting organization as are now calculated and reported by the States. More importantly, precision and accuracy information would then be available for each individual monitoring site.

Access to these individual precision and accuracy test results would allow EPA to analyze data quality at specific sites, in specific areas, for specific methods or analyzers, under specific conditions, etc. This additional information will greatly improve the description of the quality of specific blocks of monitoring data, an important benefit for the data user in many instances. For example, more detailed accuracy data directly associated with the pollutant measurements would be very useful in developing and issuing air quality criteria that are to reflect the latest scientific information concerning air pollutants and their effects on public health or welfare. Similarly, other data uses, such as trends analysis, development of national policies, and research studies, would benefit significantly when site-specific accuracy and precision of the measurement data are known.

This change in reporting should have only a minor impact on monitoring agencies, which would no longer have to carry out the calculations of integrated precision and accuracy estimates for each reporting organization according to the procedures currently specified in Section 4 of Appendix A. The agencies would simply forward the individual results of the precision and accuracy tests directly to EPA. The calculation procedures would still be retained (in Section 5 of the proposed revised

Appendix A) to indicate how EPA will calculate the integrated precision and accuracy estimates. Reporting organizations could also continue to calculate the integrated precision and accuracy estimates for use in their own quality assurance programs, even though these estimates would not be reported to EPA.

New forms and data formats are proposed for reporting the individual precision and accuracy test data to EPA. Figures A-1 and A-2 are generalized reporting forms, while Figures A-3 and A-4 are site and method specific reporting forms. Specific comments are solicited as to whether both types of forms are necessary, and if not, which type is preferable or what changes might be beneficial. The new reporting requirements are proposed as Section 4 in the revised Appendix A and include instructions for using the proposed reporting forms.

Another change concerns the procedure in Section 3 for auditing automated analyzers for NO<sub>2</sub>. It is proposed to require that NO<sub>2</sub> audit gases for chemiluminescence-type NO<sub>2</sub> analyzers also contain  $0.1 \pm .02$  ppm of NO. This requirement is intended to provide a more realistic test of the NO<sub>2</sub> analyzer under conditions that simulate a typical ambient air mix on NO and NO<sub>2</sub>, and it is consistent with current NO<sub>2</sub> audit recommendations to be incorporated into Volume II of the Quality Assurance Handbook (Reference 3 of Appendix A).

Some minor changes are proposed in the number of collocated monitoring sites required for assessing the precision of manual monitoring methods. As proposed, the number of collocated sites required for each manual method used would depend on the number of sites in the network and would be 1, 2, or 3 sites for 1-5, 6-20, or over 20 network sites, respectively. It is further proposed that these collocated-sampler precision assessment requirements also apply to lead measurements, replacing the current requirement for analysis of duplicate filter strips for lead. Although many agencies may have to add one or two additional samplers (mostly for lead), the overall impact of these changes should be small because of the small number of collocated sites required for each monitoring network.

Another minor change is proposed in the computation of precision from collocated measurements (Section 5.3 of the revised Appendix A). The calculation of percent difference would be referenced to the average of the two collocated measurements (equation 10) rather than to the measurement from the

primary sampler. The reason for this change is that even though only the primary sampler is used for routine measurements, the two collocated measurements are obtained with identical samplers under identical conditions. The average of the two measurements provides the best estimate of the true value. It is therefore statistically more correct to use the average of the two measurements rather than only one of them as the reference for determining the percent difference.

Some very minor changes are also proposed to the general quality assurance requirements in Sections 1 and 2. The language of Sections 1 and 2 would be revised slightly, and a few additional items (training, selection and control of calibration standards, and data quality assessment) are proposed to be added to the list of activities required for quality assurance plans in Section 2. These changes are to augment and clarify the provisions and descriptions of these sections. It is not intended that all quality assurance plans approved under the current language of Section 2 would have to be amended immediately to address the new items. Rather, plans that do not already include procedures for the new activities may be updated as part of the agency's normal, ongoing program to review and modify its quality assurance procedures or in conjunction with an annual EPA systems audit as identified in Section 2.4. A minor related change proposed in Section 3 would clarify that all definitions of reporting organizations must be approved by the appropriate EPA Regional Office.

Numerous other wording changes and revisions in the language have also been made throughout the proposed revised text of Appendix A to improve, clarify or update various provisions, and a new table (Table A-1) is added to summarize the minimum quality assessment requirements of Appendix A.

It should be noted that other changes or revisions to Appendix A (as well as Appendix B) were previously proposed on March 20, 1984 (49 FR 10442) to incorporate provisions applicable to methods for monitoring PM<sub>10</sub>. Those amendments are still pending. In general, provisions proposed in March for PM<sub>10</sub> methods are similar or identical to current provisions for TSP or other manual methods. The changes proposed to the current provisions are intended to apply also to PM<sub>10</sub> methods when the PM<sub>10</sub> amendments are promulgated. Where possible, the PM<sub>10</sub> provisions are proposed to be consolidated with provisions for TSP and other similar methods, and applicability to PM<sub>10</sub>

methods would be affected by use of generic terms such as "particulate matter method" or "particulate matter sampler," which are intended to apply to both TSP and PM<sub>10</sub> methods. Specific references to PM<sub>10</sub> are enclosed in brackets [ ] to indicate that the provision would be included only upon promulgation of the PM<sub>10</sub> amendments package.

As noted in the first paragraph, EPA is considering a future requirement for the more frequent auditing of automated analyzers and particulate matter samplers. From evaluation of the applications and utility of the SLAMS data quality assessment information, EPA is very concerned that the currently required one-per-year audit of these analyzers and samplers is not sufficient to adequately characterize the true quality of the ambient data in all cases. EPA believes that auditing each of these devices every calendar quarter would provide more representative assessments of the data quality. Quarterly audits, together with the presently proposed change to report individual audit results, would make available more detailed and useful information concerning specific sites or specific blocks of ambient monitoring data. Also, quarterly audits would provide sufficient information to assess the precision of automated analyzers, thereby obviating the need for continued reporting of the results from the biweekly precision checks.

Many State and local pollution control agencies have submitted advance comments on this issue. These advance comments from affected agencies indicate sharply polar positions on this matter. Ten State or local agencies reported that they are already auditing all of their analyzers every quarter, and six additional agencies reported that implementation of a quarterly audit program would not be a problem. These agencies support a quarterly audit requirement—some very strongly, corroborating EPA's belief that quarterly audits are necessary to adequately assess data quality and indicating that such a requirement is overdue. Seven other agencies indicated general agreement with the need for more frequent audits but expressed concern about obtaining additional resources necessary to implement quarterly audits.

At the opposite pole, approximately 20 agencies opposed a quarterly audit requirement—some very strongly and profusely—indicating that a substantial amount of additional resources would be needed and suggesting that in the presence of an effective quality assurance program, more frequent

auditing of analyzers was not necessary and may even be detrimental if it diverts resources from other quality assurance efforts.

In view of the considerable adverse impact that would be caused on some agencies and the current general unavailability of additional resources, EPA has decided not to propose an increase in the audit frequency at this time. But EPA seeks additional comments on this issue for further study, and proposal of a more frequent audit requirement will be reconsidered in the future. All comments previously received from State and local monitoring agencies will be retained and reconsidered together with the additional comments received in connection with this proposal. Therefore, those agencies need not resubmit the same comments. New comments, of course, are welcome.

#### Amendments to Appendix B

Appendix B prescribes minimum quality assurance and quality assessment requirements applicable to air monitoring data submitted to EPA in connection with the regulations for Prevention of Significant Deterioration (PSD). Sections 1 and 2 are proposed to be revised, corresponding to revisions to Sections 1 and 2 of Appendix A, to incorporate editorial changes to the language and additional items to be addressed in the required quality assurance plans. Because of the number of minor changes, the entire texts of Section 1 and Sections 2.1 and 2.2 are being repropounded. Also, minor corrections or wording changes are proposed to Section 2.3, and a new introductory paragraph is proposed to be added to Section 3.

A proposed change in Section 3.2 would require that NO<sub>2</sub> audit gases for auditing chemiluminescence-type NO<sub>2</sub> analyzers also contain approximately 0.1 ppm of NO. Another proposed change, in the Section 5 procedure for calculating precision from collocated measurements, provides that the percent difference would be referenced to the average of the two measurements rather than to the measurement from the primary sampler. A new equation (1a) is added for this purpose. Finally, the References section is revised to incorporate corrections and updated information, and a new table summarizing the minimum quality assessment requirements in Appendix B is proposed to be added. These changes are all similar to corresponding changes proposed for Appendix A and are based on the same rationale discussed in connection with Appendix A.

#### Revisions to Appendix C

Appendix C stipulates the types of monitoring methods that may be used in State air quality monitoring networks. Sections 2.4 and 2.5 are proposed to be revoked and reserved because these sections are obsolete and unnecessary. Also, Section 2.6.1 is proposed to be revoked and reserved because it has expired and is not longer pertinent. The title of Section 2.6 would be changed to reflect the revocation of Section 2.6.1. These changes would have no impact on monitoring agencies.

#### Revisions to Appendix D

The revisions to Appendix D proposed today would revise Section 2.5 to address the possible scavenging effect of trees on ozone at middle scale sites and to change the requirements for ozone monitoring to correspond with the ozone season as determined on a State by State basis and designated in the Storage and Retrieval of Aerometric Data (SAROAD) files.

In Section 3.2, dealing with SO<sub>2</sub> NAMS network design criteria, Table 3 is changed to make it compatible with the criteria proposed for PM<sub>10</sub> and for the TSP secondary standard. The minimum urban area size requiring NAMS has been raised from 50,000 to 100,000, and a 4th population category of those urban areas greater than 1,000,000 has been added. Also, the range of required monitors has been broadened, especially in large areas of high concentration. This will better meet the national data needs of the Agency.

In Sections 3.3, and 3.5, dealing with design criteria for NAMS for CO, and NO<sub>2</sub> respectively, the criteria would be revised to allow a middle scale site for NAMS. This change would make the design criteria compatible with the existing criteria for Pb and the proposed criteria for PM<sub>10</sub> and TSP. Also, this change would be consistent with using the objective of the monitoring to determine the location of the site rather than letting the required scale of representativeness dictate site location. This change should allow the site to be identified in terms of the most appropriate scale of representativeness. Middle scale sites would be allowed to fulfill category (a) requirements for TSP, PM<sub>10</sub>, Pb, SO<sub>2</sub>, and NO<sub>2</sub>. Middle scale sites would be allowed to fulfill category (b) requirements for CO. Table 5, Summary of Spatial Scales for SLAMS and NAMS would be revised to accommodate all of these revisions to the allowable scales.

## Revisions to Appendix E

The revisions to Appendix E proposed today would add a specific section entitled "Spacing from Trees and Other Considerations" to each of the 7 criteria pollutant sections, including the section on PM<sub>10</sub> which was proposed on March 20, 1984. Although the new sections deal with trees as reacting surfaces, adsorbing surfaces, obstructions to wind flow, and in some cases emitters of particulate matter (pollen), the only change proposed at this time is the addition of "from the dripline" to the statement "should be set back 20 meters from trees" and the requirement that the probe must be 10 meters from the dripline when trees act as an obstruction or produce pollen in significant quantities. EPA solicits input from State and local agencies and other organizations concerning their monitoring experiences with situations where trees may or may not unduly bias the air quality data. EPA welcomes pollutant specific information or monitoring data which could indicate whether or not trees are a cause for concern in selecting monitoring locations. Based on the comments and/or data received during the comment period, the final rules resulting from today's proposal may include additional or fewer restrictions concerning trees.

## Revisions to Appendix G

The revisions to Appendix G proposed today would leave to the discretion of the reporting agency the requirement to measure and report the Pollutant Standard Index (PSI) in those cases where the PSI as calculated by the critical pollutant has not exceeded a value of 50 during the previous calendar year.

## Impact on Small Entities

The Regulatory Flexibility Act requires that all federal agencies consider the impacts of final regulations on small entities, which are defined to be small businesses, small organizations, and small governmental jurisdictions (5 U.S.C. 601 et seq.). EPA's consideration pursuant to this Act indicates that no small entity group would be significantly affected in an adverse way by the proposal. Therefore, pursuant to 5 U.S.C. 605(b), the Administrator certifies that this regulation will not have a significant economic impact on a substantial number of small entities.

## Other Reviews

Since this revision is classified as minor, no additional reviews are required.

The proposed revisions to Part 58 were submitted to the Office of Management and Budget (OMB) for review (under Executive Order 12291). This is not a "major" rule under E.O. 12291 because it does not meet any of the criteria defined in the Executive Order.

The information collection requirements in this proposed rule have been submitted for approval to the Office of Management and Budget (OMB) under the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 et seq. Submit comments on these requirements to the Office of Information and Regulatory Affairs; OMB; 726 Jackson Place, NW.; Washington, D.C. 20503 marked "Attention: Desk Officer for EPA." The final rule will respond to any OMB or public comments on the information collection requirements.

## List of Subjects in 40 CFR Part 58

Air Pollution Control, Intergovernmental relations, Reporting and recordkeeping requirements, Quality assurance requirements, Pollutant standard index, Ambient air quality monitoring network.

(Secs. 110, 301(a) and 319, Clean Air Act, 42 U.S.C. 7410, 7801(a), 7819)

Dated: February 20, 1985.

Lee M. Thomas,  
Administrator.

## PART 58—AMBIENT AIR QUALITY SURVEILLANCE

For the reasons set forth in the Preamble, Part 58 of Chapter I of Title 40 of the *Code of Federal Regulations* is proposed to be amended as follows:

1. Section 58.1 is amended by revising paragraph (s) to read as follows:

### § 58.1 Definitions.

(s) "Urban area population" means the population defined in the most recent decennial U.S. Census of Population Report.

2. Paragraph (c) of Section 58.35 is revised to read as follows:

### § 58.35 NAMS data submittal.

\* \* \* \* \*

(c) \* \* \*

(1) Be received by the National Air Data Bank, after being submitted by the States to the Regional Offices for review, within 120 days of the end of each reporting period, and

3. Section 58.40 is amended by revising paragraph (c) to read as follows:

### § 58.40 Index reporting.

\* \* \* \* \*

(c) The population of urban areas for purposes of index reporting are the most recent U.S. census population figures as defined in § 58.1 paragraph (s).

4. Appendix A is revised to read as follows:

## Appendix A—Quality Assurance Requirements for State and Local Air Monitoring Stations (SLAMS)

### 1. General Information

This Appendix specifies the minimum quality assurance requirements applicable to SLAMS air monitoring data submitted to EPA. States are encouraged to develop and maintain quality assurance programs more extensive than the minimum required.

Quality assurance of air monitoring systems includes two distinct and important interrelated functions. One function is the control of the measurement process through the implementation of policies, procedures, and corrective actions. The other function is the assessment of the quality of the monitoring data (the product of the measurement process). For a given monitoring system, the greater the effort and the effectiveness of the control, the better the resulting quality of the monitoring data will be. The results of data quality assessments indicate whether the control efforts need to be increased.

Documentation of the quality assessments of the monitoring data is important to data users, who can then consider the impact of the data quality in specific applications (see Reference 1). Accordingly, assessments of SLAMS data quality are required to be reported to EPA periodically. To provide national uniformity in this assessment and reporting of data quality for all SLAMS networks, specific assessment and reporting procedures are prescribed in detail in Sections 3, 4, and 5 of this Appendix.

In contrast, the control function encompasses a variety of policies, procedures, specification, standards, and corrective measures which affect the quality of the resulting data. The selection and extent of the quality control activities—as well as additional quality assessment activities—used by a monitoring agency depend on a number of local factors such as the field and laboratory conditions, the objectives of the monitoring, the level of the data quality needed, the expertise of assigned personnel, the cost of control procedures, pollutant concentration levels, etc. Therefore, the quality assurance requirements, in Section 2 of this Appendix, are specified in general terms to allow each State to develop a quality assurance system that is most efficient and effective for its own circumstances.

### 2. Quality Assurance Requirements

2.1 Each State must develop and implement a quality assurance program consisting of policies, procedures, specifications, standards and documentation necessary to:

- (1) Provide data of adequate quality to meet monitoring objectives, and
- (2) Minimize loss of air quality data due to malfunctions or out-of-control conditions.

This quality assurance program must be described in detail, suitably documented, and approved by the Regional Administrator, or his designee. The Quality Assurance Program will be reviewed during the annual system audit described in Section 2.4.

2.2 Primary guidance for developing the quality assurance program is contained in References 2 and 3, which also contain many suggested procedures, checks, and control specifications. Section 2.0.9 of Reference 3 describes specific guidance for the development of a Quality Assurance Program for SLAMS automated analyzers. Many specific quality control checks and specifications for manual methods are included in the respective reference methods described in Part 50 of this chapter or in the respective equivalent method descriptions available from EPA (see Reference 4). Similarly, quality control procedures related to specifically designated reference and equivalent analyzers are contained in the respective operation and instruction manuals associated with those analyzers. This guidance, and any other pertinent information from appropriate sources, should be used by the States in developing their quality assurance programs.

As a minimum, each quality assurance program must include operational procedures for each of the following activities:

- (1) Selection of methods, analyzers, or samplers;
- (2) Training;
- (3) Installation of equipment;
- (4) Selection and control of calibration standards;
- (5) Calibration;
- (6) Zero/span checks and adjustments of automated analyzers;
- (7) Control checks and their frequency;
- (8) Control limits for zero, span and other control checks, and respective corrective actions when such limits are surpassed;
- (9) Calibration and zero/span checks for multiple range analyzers (see Section 2.6 of Appendix C of this part);
- (10) Preventive and remedial maintenance;
- (11) Quality control procedures for air pollution episode monitoring;
- (12) Recording and validating data;
- (13) Data quality assessment (precision and accuracy);
- (14) Documentation of quality control information.

### 2.3 Pollutant Concentration and Flow Rate Standards.

2.3.1 Gaseous pollutant concentration standards (permeation devices or cylinders of compressed gas) use to obtain test concentrations for CO, SO<sub>2</sub>, and NO<sub>2</sub> must be traceable to either a National Bureau of Standards (NBS) Standard Reference Material (SRM) or an NBS/EPA-approved commercially available Certified Reference Material (CRM). CRM's are described in Reference 5, and a list of CRM sources is available from the Quality Assurance Division (MD-77), Environmental Monitoring Systems Laboratory, U.S. Environmental Protection Agency, Research Triangle Park, NC 27711.

General guidance and recommended techniques for certifying gaseous working standards against an SRM or CRM are

provided in Section 2.0.7 of Reference 3. Direct use of a CRM as a working standard is acceptable, but direct use of an NBS SRM as a working standard is discouraged because of the limited supply and expense of SRM's.

2.3.2 Test concentrations for ozone must be obtained in accordance with the UV photometric calibration procedure specified in Appendix D of Part 50 of this chapter, or by means of a certified ozone transfer standard. Consult References 6 and 7 for guidance on primary and transfer standards for ozone.

2.3.3. Flow rate measurements must be made by a flow measuring instrument that is traceable to an authoritative volume or other standard. Guidance for certifying some types of flowmeters is provided in Reference 2.

### 2.4 National Performance and System Audit Programs.

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. These audits are described in Section 1.4.16 of Reference 2 and Section 2.0.11 of Reference 3. For instructions, agencies should contact either the appropriate EPA Regional Quality Assurance Coordinator or the Quality Assurance Division (MD-77), Environmental Monitoring Systems Laboratory, U.S. Environmental Protection Agency, Research Triangle Park, North Carolina 27711.

### 3. Data Quality Assessment Requirements

All ambient monitoring methods or analyzers used in SLAMS shall be tested periodically, as described in this Section 3, to quantitatively assess the quality of the SLAMS data being routinely produced. Measurement accuracy and precision are estimated for both automated and manual methods. The individual results of these tests for each method or analyzer shall be reported to EPA as specified in Section 4. EPA will then calculate quarterly integrated estimates of precision and accuracy applicable to the SLAMS data as described in Section 5. Data assessment results should be reported to EPA only for methods and analyzers approved for use in SLAMS monitoring under Appendix C of this part.

The integrated data quality assessment estimates will be calculated on the basis of "reporting organizations." A reporting organization is defined as a State, subordinate organization within a State, or other organization that is responsible for a set of stations that monitor the same pollutant and for which precision or accuracy assessments can be pooled. States must define one or more reporting organizations for each pollutant such that each monitoring station in the State SLAMS network is included in one, and only one, reporting organization.

Each reporting organization shall be defined such that precision or accuracy among all stations in the organization can be expected to be reasonably homogeneous, as a result of common factors. Common factors that should be considered by States in defining reporting organizations include: (1) Operation by a common team of field

operators, (2) common calibration facilities, and (3) support by a common laboratory or headquarters. Where there is uncertainty in defining the reporting organizations or in assigning specific sites to reporting organizations, States shall consult with the appropriate EPA Regional Office for guidance. All definitions of reporting organizations shall be subject to final approval by the appropriate EPA Regional Office.

Assessment results shall be reported on forms or in a format similar to Figures A-1 and A-2 (general forms) or Figures A-3 and A-4 (site- and method-specific forms). Concentration and flow standards must be as specified in Section 2.3 or 3.4. In addition, working standards and equipment used for accuracy audits must not be the same standards and equipment used for routine calibration. Concentration measurements reported from analyzers or analytical systems must be derived by means of the same calibration curve and data processing system used to obtain the routine air monitoring data. Table A-1 provides a summary of the minimum data quality assessment requirements, which are described in more detail in the following sections.

#### 3.1 Precision of Automated Methods.

A one-point precision check must be carried out at least once every two weeks on each automated analyzer used to measure SO<sub>2</sub>, NO<sub>2</sub>, O<sub>3</sub> and CO. The precision check is made by challenging the analyzer with a precision check gas of known concentration between 0.08 and 0.10 ppm for SO<sub>2</sub>, NO<sub>2</sub>, and O<sub>3</sub> analyzers, and between 8 and 10 ppm for CO analyzers. To check the precision of SLAMS analyzers operating on ranges higher than 0 to 1.0 ppm for SO<sub>2</sub>, NO<sub>2</sub>, and O<sub>3</sub>, or 0 to 100 ppm for CO, use precision check gases of appropriately higher concentration as approved by the Regional Administrator or his designee. However, the results of precision checks at concentration levels other than those shown above need not be reported to EPA. The standards from which precision check test concentrations are obtained must meet the specifications of section 2.3.

Except for certain CO analyzers described below, analyzers must operate in their normal sampling mode during the precision 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. If permitted by the associated operation or instruction manual, a CO analyzer may be temporarily modified during the precision check to reduce vent or purge flows, or the test atmosphere may enter the analyzer at a point other than the normal sample inlet, *provided that* the analyzer's response is not likely to be altered by these deviations from the normal operational mode. If a precision check is made in conjunction with a zero or span adjustment, it must be made prior to such zero or span adjustments.

The differences between the actual concentration of the precision check gas and the concentration indicated by the analyzer is used to assess the precision of the monitoring data as described in section 5.1.

### 3.2 Accuracy of Automated Methods.

Each calendar quarter, audit at least 25 percent of the SLAMS analyzers that monitor for SO<sub>2</sub>, NO<sub>2</sub>, O<sub>3</sub>, or CO such that each analyzer is audited at least once per year. If there are fewer than four analyzers for pollutant within a reporting organization, randomly reaudit one or more analyzers so that at least one analyzer for that pollutant is audited each calendar quarter. Where possible, EPA strongly encourages more frequent auditing, to an audit frequency of up to once per quarter for each SLAMS analyzer.

The audit is made by challenging the analyzer with at least one audit gas of known concentration from each of the following ranges which fall within the measurement range of the analyzer being audited:

Audit level	Concentration range, ppm		
	SO <sub>2</sub> , O <sub>3</sub>	NO <sub>2</sub>	CO
1	0.03-0.08	0.03-0.08	3-8
2	0.15-0.20	0.15-0.20	15-20
3	0.35-0.45	0.35-0.45	35-45
4	0.80-0.90		80-90

NO<sub>2</sub> audit gas for chemiluminescence-type NO<sub>2</sub> analyzers must also contain 0.10±.02 ppm NO to approximate a typical ambient mix of NO and NO<sub>2</sub>.

To audit SLAMS analyzers operating on ranges higher than 0 to 1.0 ppm for SO<sub>2</sub>, NO<sub>2</sub>, and O<sub>3</sub> or 0 to 100 ppm for CO, use audit gases of appropriately higher concentration as approved by the Regional Administrator or his designee. The results of audits at concentration levels other than those shown in the above table need not be reported to EPA.

The standards from which audit gas test concentrations are obtained must meet the specifications of Section 2.3. Working or transfer standards and equipment used for auditing must not be the same as the standards and equipment used for calibration and spanning, but may be referenced to the same NBS SRM, CRM, or primary UV photometer. The auditor should not be the operator/analyst who conducts the routine monitoring, calibration, and analysis.

The audit shall be carried out by allowing the analyzer to analyze the audit 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. The exception given in section 3.1 for certain CO analyzers does not apply for audits.

Report both the test concentrations and the concentration measurements produced by the analyzer being tested. The differences between these concentrations are used to assess the accuracy of the monitoring data as described in Section 5.2.

### 3.3 Precision of Manual Methods.

For networks of manual methods, select one or more monitoring sites within the reporting organization for duplicate sampling as follows: for 1 to 5 sites, select 1 site; for 6 to 20 sites, select 2 sites; and for over 20 sites, select 3 sites. Where possible, additional collocated sampling is encouraged. Sites with the highest expected annual arithmetic mean

concentration must be selected or, if such sites are impractical, alternate sites approved by the Regional Administrator may be selected. The two collocated samplers must be within 4 meters of each other, and high-volume particulate matter [or PM<sub>10</sub>] samplers must be at least 2 meters apart to preclude airflow interference. Calibration, sampling and analysis must be the same for other collocated samplers and the same as for all other samplers in the network.

For each pair of collocated samplers, designate one sampler as the primary sampler whose samples will be used to report air quality for the site, and designate the other as the duplicate sampler. Each duplicate sampler must be operated concurrently with its associated routine sampler at least once per week. The operation schedule should be selected so that the sampling days are distributed evenly over the year and over the seven days of the week. Report the measurements from both samplers at each collocated sampling site, including measurements falling below the limits specified in 5.3(a). The differences in measured concentration (μg/m<sup>3</sup>) between the two collocated samplers are used to calculate precision as described in Section 5.3.

### 3.4 Accuracy of Manual Methods.

The accuracy of manual sampling methods is assessed by auditing a portion of the measurement process. For particulate matter methods, the flow rate during sample collection is audited. For Pb methods, the flow rate and analytical measurement are audited. The flow rate audit should be scheduled so as to avoid interference with a scheduled sampling period. For SO<sub>2</sub> and NO<sub>2</sub> methods, the analytical measurement is audited.

(a) *Particulate matter methods.* Each calendar quarter, audit the flow rate of at least 25 percent of the samplers such that each sampler is audited at least once per year. If there are fewer than four high-volume samplers within a reporting organization, randomly reaudit one or more samplers so that one sampler is audited each calendar quarter. Audit each sampler at its normal operating flow rate, using a flow rate transfer standard as described in Section 2.3.3. The flow rate standard used for auditing must not be the same flow rate standard used to calibrate the sampler. However, both the calibration standard and the audit standard may be referenced to the same primary flow rate standard. The flow audit should be scheduled so as to avoid interference with a scheduled sampling period. The differences between the audit flow rate and the flow rate indicated by the sampler's normally used flow indicator are used to calculate accuracy as described in Section 5.4.

Great care must be used in auditing high-volume particulate matter samplers having flow regulators because the introduction of resistance plates in the audit flow standard device can cause abnormal flow patterns at the point of flow sensing. For this reason, the flow audit standard should be used with a normal filter in place and without resistance plates in auditing flow-regulated high-volume samplers, or other steps should be taken to assure that flow patterns are not perturbed at the point of flow sensing.

(b) *SO<sub>2</sub> Methods.* Prepare audit solutions from a working sulfite-TCM solution as described in section 10.2 of the SO<sub>2</sub> Reference Method (Appendix A of Part 50 of this chapter). These audit samples must be prepared independently from the standardized sulfite solutions used in the routine calibration procedure. Sulfite-TCM audit samples must be stored between 0 and 5 °C and expire 30 days after preparation.

Prepare audit samples in each of the concentration ranges of 0.2-0.3, 0.5-0.6, and 0.8-0.9 μg SO<sub>2</sub>/ml. Analyze an audit sample in each of the three ranges at least once each day that samples are analyzed and at least twice per calendar quarter. The differences between the audit concentrations (in μg SO<sub>2</sub>/ml) and the indicated concentrations (in μg SO<sub>2</sub>/ml) are used to calculate accuracy as described in section 5.4.2.

(c) *NO<sub>2</sub> Methods.* Prepare audit solutions from a working sodium nitrite solution as described in the appropriate equivalent method (see reference 4). These audit samples must be prepared independently from the standardized nitrite solution used in the routine calibration procedure. Sodium nitrite audit samples expire 3 months after preparation. Prepare audit samples in each of the concentration ranges of 0.2-0.3, 0.5-0.6, and 0.8-0.9 μg NO<sub>2</sub>/ml. Analyze an audit sample in each of the three ranges at least once each day that samples are analyzed and at least twice per calendar quarter. The differences between the audit concentrations (in μg NO<sub>2</sub>/ml) and the indicated concentrations (in μg NO<sub>2</sub>/ml) are used to calculate accuracy as described in section 5.4.2.

(d) *Pb Methods.* For the Pb reference method (Appendix G of Part 50 of this chapter), the flow rates of the high-volume Pb samplers shall be audited as part of the TSP network using the same procedures described in Section 3.4(a). For agencies operating both TSP and Pb networks, 25 percent of the total number of high-volume samplers are to be audited each quarter.

Each calendar quarter, audit the Pb reference method analyses using glass fiber filter strips containing a known quantity of Pb. These audit sample strips are prepared by depositing a lead solution on 1.9 cm by 20.3 cm (¾ inch by 8 inch) unexposed glass fiber filter strips and allowing them to dry thoroughly. The audit samples must be prepared using batches of reagents different from those used to calibrate the lead analytical equipment being audited. Prepare audit samples in the following concentration ranges:

Range	Pb concentration, μg/strip	Equivalent ambient Pb concentration, <sup>1</sup> μg/m <sup>3</sup>
1	100- 300	0.5-1.5
2	600-1000	3.0-5.0

<sup>1</sup>Equivalent ambient Pb concentration in μg/m<sup>3</sup> is based on sampling at 1.7 m<sup>3</sup>/min for 24 hours on 20.3 cm × 25.4 cm (8 inch × 10 inch) glass fiber filter.

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



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. The percent difference between the audit concentration (in  $\mu\text{g Pb}/\text{strip}$ ) and the analyst's measured concentration (in  $\mu\text{g Pb}/\text{strip}$ ) is used to calculate analysis accuracy as described in Section 5.4.2.

The accuracy of an equivalent method is assessed in the same manner as for the reference method. The flow auditing device and Pb analysis audit samples must be compatible with the specific requirements of the equivalent method.

#### 4. Reporting Requirements

For each pollutant, prepare a list of all monitoring sites and their SAROAD site identification codes in each reporting organization and submit the list to the EPA Regional Office, with a copy to the Environmental Monitoring Systems Laboratory (MD-75), U.S. Environmental Protection Agency, Research Triangle Park, North Carolina 27711 (EMSL/RTP). Whenever there is a change in this list of monitoring sites in a reporting organization, report this change to the Regional Office and to EMSL/RTP.

##### 4.1 Quarterly Reports.

Within 120 calendar days after the end of each quarter, each reporting organization shall report to EMSL/RTP through the appropriate EPA Regional Office the results of all valid precision and accuracy assessments it has carried out during the quarter. This information should be reported in a format similar to that of the forms illustrated in Figures A-1 and A-2 or A-3 and A-4, or in an alternate format (including machine-readable or electronic transfer formats) acceptable to the appropriate Regional Office. Instructions for using the forms are provided in Section 4.3 below. Do not report results from invalid tests, from tests carried out during a time period for which ambient data immediately prior or subsequent to the tests were invalidated for appropriate reasons, or from tests of methods or analyzers not approved for use in SLAMS monitoring networks under Appendix C of this Part.

Within 120 days after the data quality assessment information is submitted, EPA will calculate integrated precision and accuracy estimates for each reporting organization as specified in Section 5 and return reports of the respective estimates to each reporting organization.

##### 4.2 Annual Reports.

When precision and accuracy estimates for a reporting organization have been calculated for all four quarters of the calendar year, EPA will calculate the average probability limits for precision and accuracy for the year and will associate them with the data submitted in the annual SLAMS report required by § 58.26.

Each reporting organization shall submit, along with its annual SLAMS report, a listing by pollutant of all monitoring sites in the reporting organization.

##### 4.3 Instructions for Data Assessment Reporting Forms.

Optional forms for reporting data quality assessment information are provided in Figures A-1 through A-4. The forms in Figures A-3 and A-4 are site- and method-specific forms for reporting assessment data from individual analyzers or samplers, whereas the forms in Figures A-1 and A-2 are general forms for reporting data from several sites and methods on the same form. The instructions for both sets of forms are identical:

##### Common Information (all forms):

Block No.	Description
1-2.....	State: The two digit SAROAD State code.
3-5.....	Reporting Organization: A unique 3-digit code assigned by each State to each of its respective reporting organizations.
6-7.....	Year: Last two digits of the calendar year corresponding to the quarter specified in block 8.
8.....	Quarter: Enter 1, 2, 3, or 4 to refer to the calendar quarter during which the data quality assessments were obtained.
9.....	Enter "1" for original assessment data, "2" to revise assessment data previously submitted, or "3" to delete previously submitted assessment data.

Also enter the name of the reporting organization and the date the form is submitted.

##### Accuracy data (Figs. A-1 and A-3):

Block No.	Description
10-18.....	Site: Enter the SAROAD site identification code (first 9 digits only).
21-23.....	Method Code: Enter the measurement method code from the back of the form. Also enter the pollutant symbol (e.g., $\text{SO}_2$ , CO, TSP, $\text{PM}_{10}$ , etc.) on the blank to the left of block No. 21.
24.....	Precoded with an "A".
25-28.....	Date: Enter month and day of audit.
29.....	T: Enter "1" if the audit standards were traced to NBS by the reporting organization; enter "2" if the standards were traced to NBS by some other organization.
30.....	S: Enter the code letter of the source of the local primary standard used, from the list on the form.
31-32.....	Unit code: Enter the unit code number from the unit code list on the form (use only the codes listed). Also write in the unit on the blank to the left of block 31.
33.....	Precoded with a "0" or a "1."
34-40.....	Level 1 Actual: Enter the actual concentration determined from the audit standard in appropriate blocks with respect to the precoded decimal point.
41-47.....	Level 1 Indicated: Enter the concentration indicated by the analyzer or sampler being audited in appropriate blocks with respect to the precoded decimal point.
48-61.....	Level 2: Enter the actual and indicated concentrations for audit level 2, if applicable.
34-61.....	Levels 3 and 4 (if applicable): On the second line, enter the actual and indicated concentrations for audit level 3 and, if used, audit level 4.

##### Precision data (Figs. A-2 and A-4):

Block No.	Description
10-18.....	Site: Enter the SAROAD site identification code (first 9 digits only).
21-23.....	Method Code: Enter the measurement method code from the back of the form. Also enter the pollutant symbol (e.g., $\text{NO}_2$ , Pb, TSP, $\text{PM}_{10}$ , etc.) on the blank to the left of block No. 21.
24.....	Precoded with a "P".
25-28.....	Date: Enter month and day of test.

Block No.	Description
31-32.....	Unit Code: Enter the unit code number from the unit code list on the form (use only the codes listed). Also write in the unit on the blank to the left of block 31.
34-40.....	Actual or Primary: Enter the value of the known test concentration or the concentration measurement associated with the sampler designated as the primary sampler.
41-47.....	Indicated or Duplicate: Enter the value of the concentration measurement from the analyzer or the duplicate collocated sampler.

#### 5. Calculations for Data Quality Assessment

Calculation of estimates of integrated precision and accuracy are carried out by EPA according to the following procedures. Reporting organizations should report the results of individual precisions and accuracy tests as specified in Sections 3 and 4 even though they may elect to carry out some or all of the calculations in this section on their own.

##### 5.1 Precision of Automated Methods.

Estimates of the precision of automated methods are calculated from the results of biweekly precision checks as specified in Section 3.1. At the end of each calendar quarter, an integrated precision probability interval for all SLAMS analyzers in the reporting organization is calculated for each pollutant.

(a) *Single Analyzer Precision.* The percentage difference ( $d_i$ ) for each precision check is calculated using equation 1, where  $Y_i$  is the concentration indicated by the analyzer for the  $i$ -th precision check and  $X_i$  is the known concentration for the  $i$ -th precision check.

$$d_i = \frac{Y_i - X_i}{X_i} \times 100 \quad (1)$$

For each analyzer, the quarterly average ( $d_j$ ) is calculated with equation 2, and the standard deviation ( $S_j$ ) with equation 3, where  $n$  is the number of precision checks on the instrument made during the calendar quarter. For example,  $n$  should be 6 or 7 if precision checks are made bi-weekly during a quarter.

$$d_j = \frac{1}{n} \sum_{i=1}^n d_i \quad (2)$$

$$S_j = \sqrt{\frac{1}{n-1} \left[ \sum_{i=1}^n d_i^2 - \frac{1}{n} \left( \sum_{i=1}^n d_i \right)^2 \right]} \quad (3)$$

(b) *Precision for Reporting Organization.* For each pollutant, the average of averages ( $D$ ) and the pooled standard deviation ( $S_a$ ) are calculated for all analyzers monitoring the pollutant, using either equations 4 and 5 or 4a and 5a, where  $k$  is the number of analyzers within the reporting organization for a single pollutant.

$$D = \frac{1}{k} \sum_{j=1}^k d_j \quad (4)$$

$$D = \frac{n_1 d_1 + n_2 d_2 + \dots + n_j d_j + \dots + n_k d_k}{n_1 + n_2 + \dots + n_j + \dots + n_k} \quad (4a)$$

$$S_a = \sqrt{\frac{1}{k} \sum_{j=1}^k S_j^2} \quad (5)$$

$$S_a = \sqrt{\frac{(n_1 - 1)S_1^2 + (n_2 - 1)S_2^2 + \dots + (n_j - 1)S_j^2 + \dots + (n_k - 1)S_k^2}{n_1 + n_2 + \dots + n_j + \dots + n_k - k}} \quad (5a)$$

Equations 4 and 5 are used when the same number of precision checks are made for each analyzer. Equations 4a and 5a are used to obtain a weighted average and a weighted standard deviation when different numbers of precision checks are made for the analyzers.

For each pollutant, the 95 Percent Probability Limits for the precision of a reporting organization are calculated using equations 6 and 7.

Upper 95 Percent Probability Limit =  $D + 1.96 S_a$  (6)

Lower 95 Percent Probability Limit =  $D - 1.96 S_a$  (7)

### 5.2 Accuracy of Automated Methods.

Estimates of the accuracy of automated methods are calculated from the results of independent audits as described in Section 3.2. At the end of each calendar quarter, an integrated accuracy probability interval for all SLAMS analyzers in the reporting organization is calculated for each pollutant. Separate probability limits are calculated for each audit concentration level listed in Section 3.2.

(a) *Single Analyzer Accuracy.* The percentage difference ( $d_i$ ) for each audit concentration is calculated using equation 1, where  $Y_i$  is the analyzer's concentration measurement from the  $i$ -th audit check and  $X_i$  is the actual concentration of the audit gas used for the  $i$ -th audit check.

(b) *Accuracy for Reporting Organization.* For each audit concentration level, the average ( $D$ ) of the individual percentage differences ( $d_i$ ) for all  $n$  analyzers measuring a given pollutant audited during the quarter is calculated using equation 8.

$$D = \frac{1}{n} \sum_{i=1}^n d_i \quad (8)$$

For each concentration level, the standard deviation ( $S_a$ ) of all the individual percentage differences for all analyzers audited during the quarter is calculated, for each pollutant, using equation 9.

$$S_a = \sqrt{\frac{1}{n-1} \left[ \sum_{i=1}^n d_i^2 - \frac{1}{n} \left( \sum_{i=1}^n d_i \right)^2 \right]} \quad (9)$$

For reporting organizations having four or fewer analyzers for a particular pollutant, only one audit is required each quarter and the average and standard deviation cannot be calculated. For such reporting organizations, the audit results of two consecutive quarters are required to calculate an average and a standard deviation, using equations 8 and 9. Therefore, the reporting of probability limits is on a semi-annual (instead of a quarterly) basis.

For each pollutant, the 95 Percent Probability Limits for the accuracy of a reporting organization are calculated at each audit concentration level using equations 6 and 7.

### 5.3 Precision of Manual Methods.

Estimates of precision of manual methods are calculated from the results obtained from collocated samplers as described in Section 3.3. At the end of each calendar quarter, an integrated precision probability interval for all collocated samplers operating in the

reporting organization is calculated for each manual method network.

(a) *Single Sampler Precision.* At low concentrations, agreement between the measurements of collocated samplers, expressed as percent age differences, may be relatively poor. For this reason, collocated measurement pairs are selected for use in the precision calculations only when both measurements are above the following limits:

TSP: 20  $\mu\text{g}/\text{m}^3$ ,  
 SO<sub>2</sub>: 45  $\mu\text{g}/\text{m}^3$ ,  
 NO<sub>2</sub>: 30  $\mu\text{g}/\text{m}^3$ ,  
 Pb: 0.25  $\mu\text{g}/\text{m}^3$ , and  
 [PM<sub>10</sub>: 20  $\mu\text{g}/\text{m}^3$ ].

For each selected measurement pair, the percentage difference ( $d_i$ ) is calculated, using equation 10,

$$d_i = \frac{Y_i - X_i}{(Y_i + X_i)/2} \times 100 \quad (10)$$

Where  $Y_i$  is the pollutant concentration measurement obtained from the duplicate sampler and  $X_i$  is the concentration measurement obtained from the primary sampler designated for reporting air quality for the site. For each site, the quarterly average percentage difference ( $d_i$ ) is calculated from equation 2 and the standard deviation ( $S_j$ ) is calculated from equation 3, where  $n$  = the number of selected measurement pairs at the site.



(b) *Precision for Reporting Organization.* For each pollutant, the average percentage difference (D) and the pooled standard deviation ( $S_p$ ) are calculated, using equations 4 and 5, or using equations 4a and 5a if different numbers of paired measurements are obtained at the collocated sites. For these calculations, the k of equations 4, 4a, 5 and 5a is the number of collocated sites.

The 95 Percent Probability Limits for the integrated precision for a reporting organization are calculated using equations 11 and 12.

Upper 95 Percent Probability Limit =  $D + 1.96 S_p / \sqrt{2}$  (11)

Lower 95 Percent Probability Limit =  $D - 1.96 S_p / \sqrt{2}$  (12)

#### 5.4 Accuracy for Manual Methods.

Estimates of the accuracy of manual methods are calculated from the results of independent audits as described in Section 3.4. At the end of each calendar quarter, an integrated accuracy probability interval is calculated for each manual method network operated by the reporting organization.

#### 5.4.1 Particulate Matter Samplers (including reference method Pb samplers).

(a) *Single Sampler Accuracy.* For the flow rate audit described in Section 3.4(a), the percentage difference ( $d_i$ ) for each audit is calculated using equation 1, where  $X_i$  represents the known flow rate and  $Y_i$  represents the flow rate indicated by the sampler.

(b) *Accuracy for Reporting Organization.* For each type of particulate matter measured (i.e., TSP/Pb and  $PM_{10}$ ), the average (D) of the individual percentage differences for all similar particulate matter samplers audited during the calendar quarter is calculated using equation 8. The standard deviation ( $S_p$ ) of the percentage differences for all of the

similar particulate matter samplers audited during the calendar quarter is calculated using equation 9. The 95 percent probability limits for the integrated accuracy for the reporting organization are calculated using equations 6 and 7. For reporting organizations having four or fewer particulate matter samplers, only one audit is required each quarter and the audit results of two consecutive quarters are required to calculate an average and a standard deviation. In that case, probability limits will be reported semi-annually rather than quarterly.

#### 5.4.2 Analytical Methods for $SO_2$ , $NO_2$ , and Pb.

(a) *Single Analysis-Day Accuracy.* For each of the audits of the analytical methods for  $SO_2$ ,  $NO_2$ , and Pb described in Section 3.4 (b), (c), and (d), the percentage difference ( $d_i$ ) at each concentration level is calculated using equation 1, where  $X_i$  represents the known value of the audit sample and  $Y_i$  represents the value of  $SO_2$ ,  $NO_2$ , and Pb indicated by the analytical method.

(b) *Accuracy for Reporting Organization.* For each analytical method, the average (D) of the individual percentage differences at each concentration level for all audits during the calendar quarter is calculated using equation 8. The standard deviation ( $S_p$ ) of the percentage differences at each concentration level for all audits during the calendar quarter is calculated using equation 9. The 95 percent probability limits for the accuracy for the reporting organization are calculated using equations 6 and 7.

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TABLE A-1.—MINIMUM DATA ASSESSMENT REQUIREMENTS

Method	Assessment method	Coverage	Frequency	Parameters reported
<b>Precision</b>				
Automated methods for $SO_2$ , $NO_2$ , $O_3$ , and CO.	Response check at concentration between .08 and .10 ppm (8 & 10 ppm for CO).	Each analyzer.....	Once per 2 weeks.....	Actual concentration and measured concentration.
Manual methods including lead.	Collocated samplers.....	1 site for 1-5 sites, 2 sites for 6-20 sites, 3 sites for >20 sites (sites with highest conc.).	Once per week.....	Two concentration measurements.
<b>Accuracy</b>				
Automated methods for $SO_2$ , $NO_2$ , $O_3$ , CO.	Response check at .03-.08 ppm*, .15-.20 ppm*, .35-.45 ppm*, .60-.90 ppm* (if applicable).	1. Each analyzer.....	1. Once per year.....	Actual concentration and measured concentration for each level.
Manual methods for $SO_2$ and $NO_2$ .	Check of analytical procedure with audit standard solutions.	2. 25% of analyzers (at least 1). Analytical system.....	2. Each calendar quarter.....	Actual concentration and measured concentration for each audit solution.
TSP, $PM_{10}$ .	Check of sampler flow rate.....	1. Each sampler.....	1. Once per year.....	Actual flow rate and flow rate indicated by the sampler.
Lead.....	1. Check sample flow rate as for TSP. 2. Check analytical system with Pb audit strips.	2. 25% of samplers (at least 1). 1. Each sampler..... 2. Analytical system.....	2. Each calendar quarter..... 1. Include with TSP..... 2. Each quarter.....	1. Same as for TSP. 2. Actual concentration and measured concentration of audit samples ( $\mu g$ Pb/strip)

\*Conc. times 100 for CO.

BILLING CODE 6560-50-M

# DATA QUALITY ASSESSMENT FORM ACCURACY

REPORTING  
STATE ORGANIZATION

1 2 3 4 5

QUARTER

0 1

YEAR

0 1

SEND COMPLETED FORM  
TO REGIONAL OFFICE

1=ORIGINAL  
2=REVISION  
3=DELETION

0 9

NAME OF REPORTING ORGANIZATION \_\_\_\_\_

DATE SUBMITTED \_\_\_\_\_

MO./DAY/YR

SAROAD  
SITE CODE

10-18

POLLU-METHOD  
TANT CODE

21-23

DATE  
MON. DAY

25-28

UNIT  
MON. DAY T<sup>1</sup> S<sup>2</sup> UNIT CODE

31-32

ACTUAL

34-37

LEVEL 1

38-40

ACTUAL

40-51

LEVEL 2

52-54

INDICATED

55-58

59-61

LEVEL 4

LEVEL 3

LEVEL 1

LEVEL 3

LEVEL 1

LEVEL 3

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## HeinOnline -- 50 Fed. Reg. 9548 1985

# DATA QUALITY ASSESSMENT FORM

## ACCURACY

REPORTING  
STATE ORGANIZATION
     

YEAR

 

QUARTER

SEND COMPLETED FORM  
TO REGIONAL OFFICE
☐ 1=ORIGINAL  
☐ 2=REVISION  
☐ 3=DELETION

NAME OF REPORTING ORGANIZATION \_\_\_\_\_

DATE SUBMITTED \_\_\_\_\_

MO./DAY/YR

SAROAD  
SITE CODE
       

10-18

POLLU- METHOD  
TANT CODE
  

21-23

24

DATE  
MON. DAY T<sup>1</sup> S<sup>2</sup> UNIT  
CODE
       


ACTUAL

INDICATED

ACTUAL

INDICATED

LEVEL 1

LEVEL 2

LEVEL 3

LEVEL 4

LEVEL 1

LEVEL 2

LEVEL 3

LEVEL 4

LEVEL 1

LEVEL 2

LEVEL 3

LEVEL 4

LEVEL 1

LEVEL 2

LEVEL 3

LEVEL 4

LEVEL 1

LEVEL 2

LEVEL 3

LEVEL 4

<sup>1</sup> Traceability: Audit gasses were traced to NBS by

1 Reporting organization

2 Other than reporting organization

<sup>2</sup> Source of local primary standard

- A NBS SRM  
 B EMSL reference gas  
 C Commercial CRM  
 D Photometer  
 E Other; specify \_\_\_\_\_

UNIT CODES

ppm 07  
 ug/m<sup>3</sup> 14  
 CFM 72  
 L/min 73  
 m<sup>3</sup>/min 83

Figure A-3

# DATA QUALITY ASSESSMENT FORM PRECISION

REPORTING  
STATE ORGANIZATION

1	2	3	4	5
---	---	---	---	---

YEAR

6	7
---	---

QUARTER

8
---

SEND COMPLETED FORM  
TO REGIONAL OFFICE

NAME OF REPORTING ORGANIZATION \_\_\_\_\_

DATE SUBMITTED \_\_\_\_\_

MO./DAY/YR

1=ORIGINAL  
2=REVISION  
3=DELETION  
9

SAROAD  
SITE CODE  
10-18

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POLLU-  
TANT METHOD  
CODE  
21-23

--	--	--

24

P
---

## UNIT CODES

ppm	07
ug/m <sup>3</sup>	14
CFM	72
L/min	73
m <sup>3</sup> /min	83

DATE		UNIT	UNIT CODE 31-32	ACTUAL OR PRIMARY		INDICATED OR DUPLICATE																																																																													
MON. 25-26	DAY 27-28			34-37	38-40	41-44	45-47																																																																												
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Figure A-4

METHOD	DESIGNATION NUMBER	METHOD CODE	METHOD	DESIGNATION NUMBER	METHOD CODE
<u>SO<sub>2</sub> Manual Methods</u>					
Ref. method (pararosaniline)	EQS-0775-001	801	<u>NO<sub>2</sub> Manual Methods</u>	EQN-1277-026	026
Technicon I (pararosaniline)	EQS-0775-002	001	Sodium arsenite	EQN-1277-027	027
Technicon II (Pararosaniline)		002	Sodium arsenite/Technicon II	EQN-1277-028	028
			TGS-ANSA		
<u>SO<sub>2</sub> Analyzers</u>					
Asarco 500	EQSA-0877-024	024	<u>NO<sub>2</sub> Analyzers</u>		
Beckman 953	EQSA-0678-029	029	Beckman 952A	RPNA-0179-034	034
Bendix 8303	EQSA-1078-030	030	Bendix 8101-B	RPNA-0479-038	038
Lear Siegler AM2020	EQSA-1280-049	049	Bendix 8101-C	RPNA-0777-022	022
Lear Siegler SM1000	EQSA-1275-005	005	CSI 1600	RPNA-0977-025	025
Meloy SA185-2A	EQSA-1275-006	006	Meloy NA330R	RPNA-1078-031	031
Meloy SA285E	EQSA-1078-032	032	Monitor Labs 8440E	RPNA-0677-021	021
Meloy SA700	EQSA-0580-046	046	Monitor Labs 8840	RPNA-0280-042	042
Monitor Labs 8450	EQSA-0876-013	013	Philips PW9762/02	RPNA-0879-040	040
Monitor Labs 8850	EQSA-0779-039	039	Thermo Electron 14B/E	RPNA-0179-035	035
Philips PW9700	EQSA-0876-011	011	Thermo Electron 14D/E	RPNA-0279-037	037
Philips PW9755	EQSA-0676-010	010			
Thermo Electron 43	EQSA-0276-009	009			
<u>O<sub>3</sub> Analyzers</u>					
Beckman 950A	RFOA-0577-020	020	<u>TSP Manual Method</u>		
Bendix 8002	RFOA-0176-007	007	Reference method (high-volume)	--	802
CSI 2000	RFOA-0279-036	036			
Dasibi 1003-AH, -PC, -RS	EQOA-0577-019	019	<u>Pb Manual Methods</u>		
Dasibi 1008-AH	EQOA-0383-056	056	Ref. method (hi-vol/AA spect.)		803
McMillan 1100-1	RFOA-1076-014	014	Hi-vol/AA spect. (alt. extr.)	EQL-0380-043	043
McMillan 1100-2	RFOA-1076-015	015	Hi-vol/Flameless AA (EMSL/EPA)	EQL-0380-044	044
McMillan 1100-3	RFOA-1076-016	016	Hi-vol/ICAP spect. (EMSL/EPA)	EQL-0380-045	045
Meloy OA325-2R	RFOA-1075-003	003	Hi-vol/Wavelength diap. XRF	EQL-0581-052	052
Meloy OA350-2R	RFOA-1075-004	004	Hi-vol/ICAP spect. (Montana)	EQL-0483-057	057
Monitor Labs 8410E	RFOA-1176-017	017	Hi-vol/Energy-diap. XRF	EQL-0783-058	058
Monitor Labs 8810	EQOA-0881-053	053			
PCI Ozone Corp. LC-12	EQOA-0382-055	055			
Philips PW9771	EQOA-0777-023	023	<u>CO Analyzers</u>		
Thermo Electron 49	EQOA-0880-047	047	Beckman 866	RPFA-0876-012	012
			Bendix 8501-5CA	RPFA-0276-008	008
			Dasibi 3003	RPFA-0381-051	051
			Horiba AQM-10, -11, -12	RPFA-1278-033	033
			Horiba 300E/300SE	RPFA-1180-048	048
			MASS - CO 1 (Massachusetts)	RPFA-1280-050	050
			Monitor Labs 8310	RPFA-0979-041	041
			MSA 202S	RPFA-0177-018	018
			Thermo Electron 48	RPFA-0981-054	054

[ INFORMATION FOR BACK OF DATA FORMS ]

BILLING CODE 8500-50-C

[ INFORMATION FOR BACK OF DATA FORMS ]

BILLING CODE 6560-50-C



**Appendix B—[Amended]****5. Appendix B is amended as follows:****a. Section 1 is revised to read as follows:****1. General Information**

This Appendix specifies the minimum quality assurance requirements for the control and assessment of the quality of the PSD ambient air monitoring data submitted to EPA by an organization operating a network of PSD stations. Such organizations are encouraged to develop and maintain quality assurance programs more extensive than the required minimum.

Quality assurance of air monitoring systems includes two distinct and important interrelated functions. One function is the control of the measurement process through the implementation of policies, procedures, and corrective actions. The other function is the assessment of the quality of the monitoring data (the product of the measurement process). In general, the greater the effort and effectiveness of the control of a given monitoring system, the better will be the resulting quality of the monitoring data. The results of data quality assessments indicate whether the control efforts need to be increased.

Documentation of the quality assessments of the monitoring data is important to data users, who can then consider the impact of the data quality in specific applications (see Reference 1). Accordingly, assessments of PSD monitoring data quality are required to be made and reported periodically by the monitoring organization.

To provide national uniformity in the assessment and reporting of data quality among all PSD networks, specific assessment and reporting procedures are prescribed in detail in Sections 3, 4, 5, and 6 of this Appendix.

In contrast, the control function encompasses a variety of policies, procedures, specifications, standards, and corrective measures which affect the quality of the resulting data. The selection and extent of the quality control activities—as well as additional quality assessment activities—used by a monitoring organization depend on a number of local factors such as the field and laboratory conditions, the objectives of the monitoring, the level of the data quality needed, the expertise of assigned personnel, the cost of control procedures, pollutant concentration levels, etc. Therefore, the quality assurance requirements, in Section 2 of this Appendix, are specified in general terms to allow each organization to develop a quality control system that is most efficient and effective for its own circumstances.

For purposes of this Appendix, "organization" is defined as a source owner/operator, a government agency, or their contractor that operates an ambient air pollution monitoring network for PSD purposes.

b. Sections 2.1 and 2.2 are revised to read as follows:

**2. Quality Assurance Requirements**

2.1 Each organization must develop and implement a quality assurance program

consisting of policies, procedures, specifications, standards and documentation necessary to:

(1) Provide data of adequate quality to meet monitoring objectives and quality assurance requirements of the permit-granting authority, and

(2) Minimize loss of air quality data due to malfunctions or out-of-control conditions.

This quality assurance program must be described in detail, suitably documented, and approved by the permit-granting authority. The Quality Assurance Program will be reviewed during the system audits described in Section 2.4.

2.2 Primary guidance for developing the Quality Assurance Program is contained in References 2 and 3, which also contain many suggested procedures, checks, and control specifications. Section 2.0.9 of Reference 3 describes specific guidance for the development of a Quality Assurance Program for automated analyzers. Many specific quality control checks and specifications for manual methods are included in the respective reference methods described in Part 50 of this chapter or in the respective equivalent method descriptions available from EPA (see Reference 4). Similarly, quality control procedures related to specifically designated reference and equivalent analyzers are contained in their respective operation and instruction manuals. This guidance, and any other pertinent information from appropriate sources, should be used by the organization in developing its quality assurance program.

As a minimum, each quality assurance program must include operational procedures for each of the following activities:

- (1) Selection of methods, analyzers, or samplers;
- (2) Training;
- (3) Installation of equipment;
- (4) Selection and control of calibration standards;
- (5) Calibration;
- (6) Zero/span checks and adjustments of automated analyzers;
- (7) Control checks and their frequency;
- (8) Control limits for zero, span and other control checks, and respective corrective actions when such limits are surpassed;
- (9) Calibration and zero/span checks for multiple range analyzers (see Section 2.6 of Appendix C of this part);
- (10) Preventive and remedial maintenance;
- (11) Recording and validating data;
- (12) Data quality assessment (precision and accuracy);
- (13) Documentation of quality control information.

(c) In Section 2.3.1, the phrase "in Reference 7" is changed to "in Reference 5" (two places) and the phrase "References 2 and 3" is changed to "Section 2.0.7 of Reference 3." Also, the phrase "the address shown in Reference 7." is changed to "Quality Assurance Division (MD-77), Environmental Monitoring Systems Laboratory, U.S. Environmental Protection Agency, Research Triangle Park, NC 27711."

d. Sections 2.3.2 and 2.3.3 are revised to read as follows:

2.3.2 Test concentrations for ozone must be obtained in accordance with the UV photometric calibration procedure specified in Appendix D of Part 50 of this chapter, or by means of a certified ozone transfer standard. Consult References 6 and 7 for guidance on primary and transfer standards for ozone.

2.3.3 Flow measurement must be made by a flow measuring instrument that is traceable to an authoritative volume or other standard. Guidance for certifying various types of flowmeters is provided in Reference 3.

e. In Section 2.4, the phrase "Section 1.4.16 of reference 1 and reference 6" is changed to "Section 1.4.16 of reference 2 and Section 2.0.11 of reference 3."

f. In Section 3, an introductory paragraph is added to read as follows:

**3. Data Quality Assessment Requirements**

All ambient monitoring methods or analyzers used in PSD monitoring shall be tested periodically, as described in this Section 3, to quantitatively assess the quality of the data being routinely collected. The results of these tests shall be reported as specified in Section 6. Concentration standards used for the tests must be as specified in Section 2.3. Concentration measurements reported from analyzers or analytical systems must be derived by means of the same calibration curve and data processing system used to obtain the routine air monitoring data. Table B-1 provides a summary of the minimum data quality assessment requirements, which are described in more detail in the following section.

\* \* \* \* \*

g. The first paragraph of Section 3.2 is revised to read as follows:

3.2 *Accuracy of Automated Methods.* Each sampling quarter audit each analyzer that monitors for SO<sub>2</sub>, NO<sub>2</sub>, O<sub>3</sub>, or CO at least once. The audit is made by challenging the analyzer with at least one audit gas of known concentration from each of the following ranges which fall within the measurement range of the analyzer being audited:

Audit level	Concentration range, ppm		
	SO <sub>2</sub> , O <sub>3</sub>	NO <sub>2</sub>	CO
1.....	0.03-0.08	0.03-0.08	3-8
2.....	0.15-0.20	0.15-0.20	15-20
3.....	0.35-0.45	0.35-0.45	35-45
4.....	0.80-0.90		80-90

NO<sub>2</sub> audit gas for chemiluminescence-type NO<sub>2</sub> analyzers must also contain 0.10±.02 ppm NO to approximate a typical ambient mix of NO and NO<sub>2</sub>.

\* \* \* \* \*

h. In the second paragraph of section 5.1, the phrase "equation 1" is changed to "equation 1a," and equation 1a is added to read as follows:

$$d_i = \frac{Y_i - X_i}{(Y_i + X_i)/2} \times 100 \quad (1a)$$

i. The section entitled "References" is revised to read as follows:

#### References

1. Rhodes, R.C. Guideline on the Meaning and Use of Precision and Accuracy Data Required by 40 CFR Part 58, Appendices A and B. EPA-600/4-83-023. U.S. Environmental Protection Agency, Research Triangle Park, NC 27711, June, 1983.
2. "Quality Assurance Handbook for Air Pollution Measurement Systems, Volume I—Principles." EPA-600/9-78-005. March 1978. Available from U.S. Environmental Protection

Agency, Environmental Monitoring Systems Laboratory (MD-77), Research Triangle Park, NC 27711.

3. "Quality Assurance Handbook for Air Pollution Measurement Systems, Volume II—Ambient Air Specific Methods." EPA-600/4-77-027a. May 1979. Available from U.S. Environmental Protection Agency, Environmental Monitoring Systems Laboratory (MD-77), Research Triangle Park, NC 27711.

4. "List of Designated Reference and Equivalent Methods." Available from U.S. Environmental Protection Agency, Department E (MD-77), Research Triangle Park, NC 27711.

5. Hughes, E.E. and J. Mandel. A Procedure for Establishing Traceability of Gas Mixtures to Certain National Bureau of Standards SRM's. EPA-600/7-81-010. U.S.

Environmental Protection Agency, Research Triangle Park, NC 27711, May, 1981. (Joint NBS/EPA Publication)

6. 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, Environmental Monitoring Systems Laboratory (MD-77), Research Triangle Park, NC 27711, September, 1979.

7. McElroy, F.F. Transfer Standards for the Calibration of Ambient Air Monitoring Analyzers for Ozone. EPA-600/4-79-056. U.S. Environmental Protection Agency, Environmental Monitoring Systems Laboratory (MD-77), Research Triangle Park, NC 27711, September, 1979.

j. Table B-1 is added to read as follows:

TABLE B-1.—MINIMUM PSD DATA ASSESSMENT REQUIREMENTS

Method	Assessment method	Coverage	Frequency	Parameters reported
<b>Precision</b>				
Automated methods for SO <sub>2</sub> , NO <sub>x</sub> , O <sub>3</sub> , CO.	Response check at concentrations between .08 and .10 ppm (8 and 10 ppm for CO).	Each analyzer.....	Once per 2 weeks.....	Actual concentration and measured concentration.
TSP, (PM <sub>10</sub> ), Lead.....	Collocated samplers.....	Highest concentration site in monitoring network.	Once per week or every 3rd day for continuous sampling.	Two concentration measurements.
<b>Accuracy</b>				
Automated methods for SO <sub>2</sub> , NO <sub>x</sub> , O <sub>3</sub> , CO.	Response check at .03-.08 ppm*, .15-.20 ppm*, .35-.45 ppm*, .80-.90 ppm* (if applicable).	Each analyzer.....	Once per sampling quarter.....	Actual concentration and measured concentration for each level.
TSP, (PM <sub>10</sub> ),.....	Sampler flow check.....	Each sampler.....	Once per sampling quarter.....	Actual flow rate and flow rate indicated by the sampler.
Lead.....	1. Sample flow rate check..... 2. Check of analytical systems with Pb audit strips.	1. Each sampler..... 2. Analytical system.....	1. Once/quarter..... 2. Each quarter Pb sampler are analyzed.	1. Same as for TSP. 2. Actual concentration and measured concentration of audit samples (µg Pb/strip).

\*Concentration shown times 100 for CO.

#### Appendix C—[Amended]

6. Appendix C is amended as follows:

a. Section 2.2 is revised to read as proposed in 49 FR 10445 in connection with proposed amendments for PM<sub>10</sub> (49 FR 10435).

b. Sections 2.4 and 2.5 are removed and reserved.

c. In Section 2.6, subsection 2.6.1 is removed and reserved, and the heading of Section 2.6 is revised to read as follows:

2.6 Use of methods with higher, nonconforming ranges in certain geographical areas.

#### Appendix D—[Amended]

7. Appendix D is amended as follows:

a. In Section 2.5, the following sentence is inserted after the first sentence in the middle scale discussion which appears after the third paragraph. "Trees also may have a strong scavenging effect on O<sub>3</sub> and may tend to suppress O<sub>3</sub> concentrations in their immediate vicinity." The first sentence in the last paragraph of Section 2.5 is replaced by the following. "Since ozone levels decrease significantly in the

colder parts of the year in many areas, ozone is required to be monitored only during the "ozone season" as designated in the SAROAD files on a State by State basis and described below:

OZONE MONITORING SEASON BY STATE

State	Begin month	End month
Alabama.....	March.....	November.....
Alaska.....	April.....	October.....
Arizona.....	January.....	December.....
Arkansas.....	March.....	November.....
California.....	January.....	December.....
Colorado.....	March.....	September.....
Connecticut.....	April.....	October.....
Delaware.....	.....do.....	Do.....
District of Columbia.....	.....do.....	Do.....
Florida.....	January.....	December.....
Georgia.....	March.....	November.....
Hawaii.....	January.....	December.....
Idaho.....	April.....	October.....
Illinois.....	.....do.....	Do.....
Indiana.....	.....do.....	Do.....
Iowa.....	.....do.....	Do.....
Kansas.....	.....do.....	Do.....
Kentucky.....	.....do.....	Do.....
Louisiana.....	January.....	December.....
Maine.....	April.....	October.....
Maryland.....	.....do.....	Do.....
Massachusetts.....	.....do.....	Do.....
Michigan.....	.....do.....	Do.....
Minnesota.....	.....do.....	Do.....
Mississippi.....	March.....	November.....
Missouri.....	April.....	October.....
Montana.....	June.....	September.....
Nebraska.....	April.....	October.....

OZONE MONITORING SEASON BY STATE—Continued

State	Begin month	End month
Nevada.....	January.....	December.....
New Hampshire.....	April.....	October.....
New Jersey.....	.....do.....	Do.....
New Mexico.....	January.....	December.....
New York.....	April.....	October.....
North Carolina.....	.....do.....	Do.....
North Dakota.....	May.....	September.....
Ohio.....	April.....	October.....
Oklahoma.....	March.....	November.....
Oregon.....	April.....	October.....
Pennsylvania.....	.....do.....	Do.....
Puerto Rico.....	January.....	December.....
Rhode Island.....	April.....	October.....
South Carolina.....	.....do.....	Do.....
South Dakota.....	June.....	September.....
Tennessee.....	April.....	October.....
Texas.....	January.....	December.....
Utah.....	May.....	September.....
Vermont.....	April.....	October.....
Virginia.....	.....do.....	Do.....
Washington.....	.....do.....	Do.....
West Virginia.....	.....do.....	Do.....
Wisconsin.....	.....do.....	Do.....
Wyoming.....	.....do.....	Do.....
American Samoa.....	January.....	December.....
Guam.....	.....do.....	Do.....
Virgin Islands.....	.....do.....	Do.....

b. In Section 3.2, Table 3 is revised as follows:

TABLE 3.—SO<sub>2</sub> National Air Monitoring Station Criteria

[Approximate number of stations per area] \*

Population category	High concentration <sup>b</sup>	Medium concentration <sup>c</sup>	Low concentration <sup>d</sup>
>1,000,000.....	6-10	4-8	2-4
500,000 to 1,000,000.....	4-8	2-4	1-2
250,000 to 500,000.....	3-4	1-2	0-1
100,000 to 250,000.....	1-2	0-1	0

\* Selection of urban areas and actual number of stations per area will be jointly determined by EPA and the State agency.

<sup>b</sup> High concentration—exceeding level of the primary NAAQS.

<sup>c</sup> Medium concentration—exceeding 80 percent of the level of the primary or 100 percent of the secondary NAAQS.

<sup>d</sup> Low concentration—less than 80 percent of the level of the primary or 100 percent of the secondary NAAQS.

c. In Section 3.3, the parenthetical expression "(neighborhood scale)" at the end of the last sentence in the 2nd paragraph is amended to read "(middle

scale, neighborhood scale)". In the first sentence of the 4th paragraph the first use of the word "neighborhood" is removed and replaced by "category (b)" and the parenthetical expression "(neighborhood scale)" is replaced by "(middle scale or neighborhood scale)." In the 3rd sentence of the 4th paragraph the term "under the influence" is replaced by "unduly influenced by".

d. In Section 3.5 the first parenthetical expression in the second paragraph "(category (a) neighborhood scale)" is amended to read "(category (a), middle scale or neighborhood scale)." e. Table 5 in Section 3.7, as proposed on March 20, 1984 (49 FR 10447), is revised as follows:

Table 5.—Summary of Spatial Scales for SLAMS and NAMS

Spatial Scale	Scales applicable for SLAMS							Scales applicable for NAMS						
	TSP	SO <sub>2</sub>	CO	O <sub>3</sub>	NO <sub>2</sub>	Pb	PM <sub>10</sub>	TSP	SO <sub>2</sub>	CO	O <sub>3</sub>	NO <sub>2</sub>	Pb	PM <sub>10</sub>
Micro.....	///	///	///	///	///	///	///	///	///	///	///	///	///	///
Middle.....	///	///	///	///	///	///	///	///	///	///	///	///	///	///
Neighborhood.....	///	///	///	///	///	///	///	///	///	///	///	///	///	///
Urban.....	///	///	///	///	///	///	///	///	///	///	///	///	///	///
Regional.....	///	///	///	///	///	///	///	///	///	///	///	///	///	///

## Appendix E—[Amended]

### 8. Appendix E is amended as follows:

a. In the table of contents, Section 2.4 is revised and Sections 3.3, 4.4, 5.4, 6.4, 7.4 and 8.4 are inserted in the appropriate places as follows:

2.4 Spacing from trees and other considerations.

3.3 Spacing from trees and other considerations.

4.4 Spacing from trees and other considerations.

5.4 Spacing from trees and other considerations.

6.4 Spacing from trees and other considerations.

7.4 Spacing from trees and other considerations.

8.4 Spacing from trees and other considerations.

b. In Section 2.2, the last two sentences in the second paragraph are removed.

c. In Section 2, a new Section 2.4 replaces the existing Section 2.4.

### 2. Total Suspended Particulates (TSP).

#### 2.4 Spacing from trees and other considerations.

Trees can provide surfaces for particulate deposition or adsorption, act as a source of particulate in some cases (pollen), and obstruct normal wind flow pattern. To minimize the possible effects of trees on the measured TSP levels, the sampler should be placed at least 20 meters from the drip line of trees. However, in situations where trees could be classified as an obstruction, i.e., the distance between the trees and the sampler is less than twice the height that the tree protrudes above the sampler, the sampler must be placed at least 10 meters from the drip line of the obstructing tree(s).

In order to minimize the impact of wind blown dusts, stations should not be located on barren ground. Additional information on TSP probe siting may be found in reference 10."

d. In Section 3.2 the words "should be placed more than 20 meters from trees and" are removed from the first sentence of the second paragraph.

e. In Section 3, a new Section 3.3 is added.

### 3. Sulfur Dioxide (SO<sub>2</sub>).

#### 3.3 Spacing from trees and other considerations.

Trees can provide surfaces for SO<sub>2</sub> adsorption and act as an obstruction to normal wind flow patterns. To minimize the possible effects of trees on the measured SO<sub>2</sub>

levels, the sampler should be placed at least 20 meters from the drip line of trees. However, in situations where trees could be classified as an obstruction, i.e., the distance between the tree(s) and the sampler is less than twice the height that the tree(s) protrudes above the sampler, the sampler must be placed at least 10 meters from the drip line of the obstructing tree(s).

f. In Section 4.3, the next to last sentence in paragraph 3 is removed.

g. In Section 4, a new Section 4.4 is added.

### 4. Carbon Monoxide (CO)

#### 4.4 Spacing from trees and other considerations.

Since CO is relatively non-reactive, the major factor concerning trees is as obstructions to normal wind flow patterns. For middle and neighborhood scale stations, trees should not be located between the major sources of CO, usually vehicles on a heavily traveled road, and the sampler. The sampler must be at least 10 meters from the drip line of a tree which is between the sampler and the road and extends at least 5 meters above the sampler. For microscale stations, no trees or shrubs should be located between the sampling inlet probe and the road.

h. In Section 5.2, the second and third sentences in the first paragraph are removed.

i. In Section 5.3, the 6th and 7th sentences in the first paragraph are removed.

j. In Section 5, a new section 5.4 is added.

### 5. Ozone (O<sub>3</sub>)

#### 5.4 Spacing from trees and other considerations.

Trees can provide surfaces for O<sub>3</sub> adsorption and/or reactions and obstruct normal wind flow patterns. To minimize the possible effect of trees on measured O<sub>3</sub> levels, the probe should be placed at least 20 meters from the drip line of trees. Since the scavenging effect of trees is greater for ozone than for the other criteria pollutants, strong consideration of this effect must be given in locating the O<sub>3</sub> inlet probe to avoid this problem. Therefore, the sampler must be at least 10 meters from the drip line of trees that are located between the urban city core area and the sampler along the predominant summer day-time wind direction.

k. In Section 6.2, the word "trees" is removed from the 1st sentence. The sixth sentence is also removed.

l. In Section 6.3, the next to last sentence is removed.

### 6. Nitrogen Dioxide (NO<sub>2</sub>)

#### 6.4 Spacing from trees and other considerations.

Trees can provide surfaces for NO<sub>2</sub> adsorption and/or reactions and obstruct

normal wind patterns. To minimize the possible scavenging effect of trees on the measured levels of NO<sub>2</sub>, the probe should be placed at least 20 meters from the drip line. For trees that protrude above the height of the probe by 5 meters or more, the sampler must be at least 10 meters from the drip line of trees.

n. In Section 7.2, the first sentence is removed.

o. In Section 7, a new Section 7.4 is added.

#### 7. Lead (Pb)

##### 7.4 Spacing from trees and other considerations.

Trees can provide surfaces for deposition or adsorption of lead particles and obstruct normal wind flow patterns. For microscale and middle scale category (a) roadway sites there must not be any tree(s) between the source of the lead, i.e., the vehicles on the roadway, and the sampler. For neighborhood scale, category (b) sites, the sampler should be at least 20 meters from the drip line of trees. The sampler must, however, be placed at least 10 meters from the drip line of trees which could be classified as an obstruction, i.e., the distance between the tree(s) and the

sampler is less than twice the height that the tree protrudes above the sampler.

p. In Section 8.2, as proposed on March 20, 1984 (49 FR 10448), the last sentence in the second paragraph is removed.

q. In Section 8, as proposed to be amended on March 20, 1984 (49 FR 10448), a new section 8.4 replaces the existing Section 8.4.

#### 8. Particulate Matter (PM<sub>10</sub>)

\* \* \* \* \*

##### 8.4 Spacing from trees and other considerations.

Trees can provide surface for particulate deposition or adsorption, act as a source of particulate in some cases (pollen), and obstruct normal wind flow patterns. To minimize the possible effects of trees on the measured PM<sub>10</sub> levels, the sampler should be placed at least 20 meters from the drip line of trees. The sampler must, however, be placed at least 10 meters from the drip line of trees which also could be classified as an obstruction, i.e., the distance between the trees and the sampler is less than twice the height that the tree protrudes above the sampler.

Regarding other considerations, for those areas that are primarily influenced by stationary source emissions as opposed to roadway emissions, guidance in locating these areas may be found in the guideline document "Optimum Network Design and Site Exposure Criteria for Particulate Matter."<sup>29</sup>

Stations should not be located in an unpaved area unless there is vegetative ground cover year round, so that the impact of wind blown dusts will be kept to a minimum.

#### Appendix G—[Amended]

9. Appendix G is amended as follows:

a. In Section 8, the following is added to the end of the first paragraph "Also, in situations where the PSI value has not exceeded 50, as calculated by the critical pollutant, for the previous calendar year, the requirement to measure and report the PSI will be left up to the discretion of the reporting agency."

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**Friday  
March 8, 1985**

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**Part III**

**Department of Labor**

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**Employment Standards Administration,  
Wage and Hour Division**

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**Minimum Wages for Federal and  
Federally Assisted Construction; General  
Wage Determination Decisions, Notice**