

US EPA ARCHIVE DOCUMENT

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

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MEMORANDUM

SUBJECT: Revision to Policy on the Use of PM₁₀ Measurement Data

FROM: Gerald A. Emison, Director
Office of Air Quality Planning and Standards (MD-10)

TO: See Attached List

A joint Office of Air Quality Planning and Standards (OAQPS)/Environmental Monitoring Systems Laboratory (EMSL) committee has evaluated the issue of potential uncertainty in measurement data produced by PM₁₀ samplers. They considered modifications and/or clarifications to existing Environmental Protection Agency (EPA) policy contained in the PM₁₀ SIP Development Guideline (Section 2.3), the supplementary Response to Questions Regarding PM₁₀ State Implementation Plan (SIP) Development (published June 1988), and the data requirements of Appendix K to 40 CFR 50 and Part 58. This committee's issue paper which incorporated comments from Regional staff is attached. This memo follows their recommendations and presents the revised EPA policy regarding the treatment of PM₁₀ data produced by reference and nonreference PM₁₀ samplers. Treatment of data produced by collocated PM₁₀ samplers is also discussed. Deviations to this general policy must receive concurrence of OAQPS.

For this discussion, the term reference sampler shall be used to represent samplers using a reference method based on Appendix J to 40 CFR 50 and designated by EPA in accordance with 40 CFR 53, as well as samplers using an equivalent method designated by EPA in accordance with 40 CFR 53. Nonreference samplers are all other PM₁₀ samplers which have not been formally designated as such.

USE OF REFERENCE AND NONREFERENCE SAMPLER DATA

For purposes of evaluating PM₁₀ air quality status, all data produced by reference samplers shall be interpreted at face value and can be used to make comparisons with the National Ambient Air Quality Standards (NAAQS) for the purposes of determining attainment or nonattainment, in accordance with

Appendix K to 40 CFR 50. Data collected by nonreference samplers may only be used to supplement and to corroborate data collected by reference samplers where such data are insufficient in quantity to make a determination of whether or not the area is attaining or not attaining the standard. Moreover, data collected by some nonreference PM_{10} samplers shall be interpreted using gray zones to indicate the potential uncertainty in these older data, which was the policy used for determination of Group I, II and III areas. These details for using data produced by nonreference samplers in order to interpret status with respect to the 24-hour and annual NAAQS are contained in Attachment A. Three situations are discussed: attainment, nonattainment and indeterminate. The latter situation is one in which sufficient reference and nonreference data are not available to make an unambiguous attainment or nonattainment determination.

Regulations in 40 CFR 58 require that State and Local Air Monitoring Stations (SLAMS) Networks be established by August 1, 1988; therefore, data collected after this date by nonreference samplers shall not be used. If a nonreference sampler without further modification is designated as a reference sampler in the future, then all of its historical data is retroactively defined as data produced by a reference sampler.

A table providing a general overview of this new policy for interpretation of PM_{10} measurement data is included as Attachment B. The treatment of reference and nonreference data is described according to the dates associated with its collection.

COLLOCATED PM_{10} SAMPLERS

In the event that more than one PM_{10} sampler is operating concurrently at a location, data from reference method samplers always takes precedence over data from nonreference samplers. If multiple samplers are collocated for data quality assessment purposes (i.e., precision and accuracy), similar sampler types must be used and one sampler must be designated a priori for data reporting purposes (Appendix A to 40 CFR 58). Furthermore, if more than one type of sampler is used by a reporting organization, collocated precision sites should be established for each sampler type.

In order to sample more frequently than every 6th day, more than one sampler may be operated at a monitoring site. This group of samplers, plus any samplers sited for data quality assessment purposes, shall represent a single monitoring

station. When more than one sampler (or group) is operated independently by one or more monitoring agencies concurrently for attainment assessment purposes, each sampler (or group) shall represent a different monitoring station. The data from each monitoring station shall be used separately to assess attainment or nonattainment with the NAAQS, provided that the data meet all the requirements for SLAMS specified in 40 CFR 58, includes quality assurance and siting, and a quality assurance program that has been approved by the appropriate Regional Office.

Attachments

Addressees:

Director, Air Management Division, Regions I, III, IX
Director, Air and Waste Management Division, Region II
Director, Air, Pesticides and Toxics Management Division,
Region IV
Director, Air and Radiation Division, Region V
Director, Air, Pesticides and Toxics Division, Region VI
Director, Air and Toxics Division, Regions VII, VIII, X
Director, Environmental Services Division, Regions I-VIII, X
Director, Office of Policy and Management, Region IX

cc. G. Foley, AREAL
A. Eckert, OGC

bcc. D. Novello, OGC
J. Bachmann (MD-11)
PM₁₀ Measurement Data Working Group
PM₁₀ Monitoring Contacts
PM₁₀ SIP Contacts

TSD:MRB:DAS:NFRANK:hh:RM637:MUTUAL:X5558:11/8/88:11/9/88

ATTACHMENT A:

USE OF NONREFERENCE PM₁₀ DATA TO SUPPORT AND CORROBORATE REFERENCE PM₁₀ DATA

COMPARISONS WITH THE 24-HR NAAQS

Data produced by nonreference samplers may be interpreted subject to the following conditions: (1) Exceedances measured with certain PM₁₀ dichotomous samplers¹ shall be treated the same as exceedances measured with reference or equivalent method samplers, but only when there also are one or more exceedances subsequently measured with reference samplers at the same location. (2) Data produced with other nonreference samplers shall be interpreted using gray zones (as previously defined in the PM₁₀ SIP Development Guideline and which were used for SIP area grouping) as follows - (a) an exceedance measured with a nonreference sampler outside its gray zone can be treated as an exceedance of the NAAQS, only when there also are one or more exceedances subsequently measured with reference samplers at the same location, and (b) a PM₁₀ value produced by a nonreference sampler which is in its gray zone is not treated as an exceedance of the NAAQS nor is it treated as a nonexceedance of the NAAQS (i.e. it is treated as an uncertain data value for purposes of making comparisons with the NAAQS), but it does count as a measurement used to satisfy data completeness and compute annual averages.

Accordingly, data produced by nonreference method samplers in combination with data produced with reference method samplers may be used to identify the following situations:

24-hr NAAQS - Attainment Situation

If (1) the total number of observed exceedances measured by reference and nonreference samplers results in an estimated number of exceedances to be less than or equal to one (subject to the rounding conventions and adjustments specified in Appendix K), (2) uncertain data values produced by nonreference samplers as defined above do not exist, and (3) the combined data produced by these samplers satisfy the data completeness requirements in Appendix K and are in accordance with the established EPA guidelines, i.e. Guideline on Exceptions to Data Requirements for Determining Attainment of Particulate Matter Standards (EPA-450/4-87-005, April 1987), then the State can

¹Samplers with inlet models SA246B, GMW9200 and WA10.

solicit approval by the appropriate Regional Administrator to demonstrate attainment with the 24-hr NAAQS.

24-hr NAAQS - Nonattainment Situation

If (1) the total number of observed exceedances measured by a reference sampler results in an estimated number of exceedances to be greater than one, or (2) one or more exceedances are observed by a reference sampler and the total number of observed exceedances measured by reference and nonreference samplers results in an estimated number of exceedances to be greater than one (subject to the rounding conventions and adjustments specified in Appendix K), then the State should acknowledge that a nonattainment problem exists and take appropriate action.

24-hr NAAQS - Indeterminate Situation

If the total number of observed exceedances results in an estimated number less than or equal to one, but the available data is insufficient to demonstrate attainment as judged under Appendix K, the State or local monitoring agency must continue PM_{10} sampling until attainment or nonattainment of the NAAQS can be established.

COMPARISONS WITH THE ANNUAL NAAQS

When insufficient reference data are available to estimate the PM_{10} expected annual mean according to Appendix K, then nonreference data can be used to supplement and corroborate data produced by the reference samplers. In order to facilitate this discussion, the following definitions are introduced:

- (1) x_R and x_{NR} represent the annual means computed from data produced by reference and nonreference samplers, respectively.
- (2) x'_{NR} represents the nonreference mean adjusted for the effect of the gray zone, as follows:

$x'_{NR} = 1.2 x_{NR}$, if nonreference data is Wedding²,
 $= 0.8 x_{NR}$, if nonreference data is Sierra
 Anderson³,
 $= x_{NR}$, if nonreference data is produced by certain
 dichotomous samplers specified in footnote 1.

- (3) x and x' represent the range of estimated annual means resulting from a combination of data produced by reference and nonreference samplers and the effects of the gray zones:

$$\begin{aligned}
 x &= p * x_{NR} + (1-p) * x_R, \text{ and} \\
 x' &= p * x'_{NR} + (1-p) * x_R,
 \end{aligned}$$

where p is the relative weight placed on the nonreference data (e.g. $p = 1/3$ when 1 year of nonreference and 2 years of reference data are available).

Annual NAAQS - Attainment Situation

If x_R is less than or equal to 50 ug/m³ and both x and x' are also less than or equal to 50 ug/m³ (subject to the rounding conventions and adjustments specified in Appendix K), then the nonreference data have corroborated that the expected annual mean is less than the level of the NAAQS and the State can solicit approval by the appropriate Regional Administrator to demonstrate attainment with the NAAQS.

Annual NAAQS - Nonattainment Situation

If x_R is greater than 50 ug/m³ and both x and x' are also greater than that concentration level (subject to the rounding conventions and adjustments specified in Appendix K), then the State should acknowledge that a nonattainment problem exists and take appropriate action.

Annual NAAQS - Indeterminate Situation

If (1) x_R is less than or equal to 50 ug/m³, and x or x' is greater than 50 ug/m³, or (2) x_R is greater than 50 ug/m³, and x or x' is less than or equal to 50 ug/m³, then the

²GMW9000 or any comparable Wedding designed high volume PM₁₀ sampler without a cleaning port.

³SA321A

status with respect to the annual standard is indeterminate and the State or local monitoring agency must continue PM_{10} sampling until attainment or nonattainment of the NAAQS can be established.

ATTACHMENT B

REVISED POLICY FOR INTERPRETATION OF PM₁₀ MEASUREMENT DATA

DATA COLLECTION TIME PERIOD

Prior to Aug. 1, 1987 (effective date of promulgation)	Aug 1, 1987 to July 31, 1988	From Aug. 1, 1988
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PM₁₀ Sampler:

Reference Samplers	Face Value	Face Value	Face Value
Unapproved Samplers ¹			
SA & Wedding (older)	Gray Zone ²	Gray Zone	Not to be Used ³
Dichots	Face Value	Face Value	Not to be Used ³

¹ Data produced by unapproved samplers may only be used to support and corroborate data produced by reference samplers.

² A zone of uncertainty within which PM₁₀ data are used with less authority, as discussed in Attachment A; Gray zone limits were defined in the PM₁₀ SIP Development Guideline.

³ For attainment/nonattainment and design values only; Regional Administrator approval for other SIP purposes (40 CFR 58.14(b)).