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Technical Note- Guidance on the Use of Parameter Occurrence Codes (POCs) When Using Multiple Instruments at Monitoring Sites

SUMMARY

Each individual physical monitor or sampler should be stored as a separate POC when submitting data to the AQS, even if multiple samplers/monitors¹ are intended to routinely be combined with the “primary” monitor for a given site. The AQS will be properly configured to construct a site-level record in accordance with the CFR as well as monitor level reports which may be desired by some data users. The focus for this effort is PM_{2.5}, lead (Pb), and PM₁₀ as these are the criteria pollutants where multiple samplers are often intended to be operated to provide a combined site level concentration. By storing each individual physical monitor as a separate POC, data users will be able to properly assess the quality of the data from a specific sampler while also ensuring that the primary record for a site provides the appropriate sample completeness calculation.

BACKGROUND

The regulatory language for particulate matter (PM) and lead (Pb) monitoring allows for the combining of data when the primary monitor at the site does not sample on a particular day either due to it not being a scheduled sampling day or the instrument did not collect a valid sample. However, we are aware of cases where data from more than one monitor is being routinely reported using the same parameter occurrence code (POC) which virtually makes multiple monitors the primary monitor at a site. Earlier guidance dating from the 1990’s allowed substituted data to be entered into a single POC but the guidance was developed for infrequent substitution of a malfunctioning primary monitor. Cases occurring more recently involve second and third monitors being intentionally set up for combining data with the primary monitor. EPA has discouraged this practice and continues to suggest that POCs be used to identify each individual physical monitor at a site and that one and only one physical monitor be designated as primary for a given time period at a site.

EPA understands that monitoring organizations are working with limited resources. To reduce costs, some monitoring organizations are setting up multiple samplers at a site to cover the required sampling frequencies needed while being able to visit the site less often. Some monitoring organizations, instead of purchasing sequential samplers for every day or one-in-three

¹ Samplers are monitors are used synonymously.

day sampling frequencies are using single channel samplers and “rotating” them in to cover the required sampling frequency needs.

Allowing for data to be combined has been considered acceptable since it does reduce temporal uncertainties. Some monitoring organizations are reporting the data from multiple monitors into the primary monitor POC because the current AQS reports will consider each monitors data (from separate POCs) incomplete. However, use of multiple samplers to provide NAAQS estimates does create additional measurement uncertainty since each monitor can have different precision and bias that can affect the confidence one has in the concentration estimate. This becomes more difficult to evaluate when the data is reported to one POC as compared to reporting each sampler as a separate POC. Because of this, pollutant-specific AQS enhancements have been made and are being planned.

DATA CALCULATIONS AND AQS:

PM_{2.5} (AQS Parameter Code 88101): 40 CFR Part 50 Appendix N specifically states, “Data for the primary monitor shall be augmented as much as possible with data from collocated FRM/FEM/ARM monitors. If a valid 24-hour measurement is not produced from the primary monitor for a particular day (scheduled or otherwise), but a valid sample is generated by a collocated FRM/FEM/ARM instrument (and recorded in AQS), then that collocated value shall be considered part of the site data record (i.e., that site's daily value). If more than one valid collocated FRM/FEM/ARM value is available, the average of those valid collocated values shall be used as the daily value.” In 2008 AQS was enhanced to automatically combine values from collocated monitors at a site on days when the primary monitor did not collect a valid sample. This removed the need for monitoring agencies to manually combine the data for PM_{2.5} from multiple POCs prior to submission to AQS.

Lead (AQS Parameter Codes 14129 and 85129): 40 CFR Part 50 Appendix R also specifies that data from the primary monitor at a site shall be augmented with data from collocated FRM/FEM monitors in a manner identical to that for PM_{2.5}. This capability was implemented in AQS in 2010. This removed the need for monitoring agencies to manually combine the data for Lead from multiple POCs prior to submission to AQS

PM₁₀ (AQS Parameter Code 81102): 40 CFR Part 50 Appendix K is not explicit about the issue of combining data from a primary monitor at a site with data from collocated FRM/FEM monitors. However, the guidance document, “Use of Collocated PM₁₀ Data”, dated July 24, 1989, (available at <http://www.epa.gov/ttn/amtic/files/ambient/criteria/collocpm.pdf>) allowed substitution of values from collocated FRM/FEM monitors, with the same method code as the primary monitor, on days when the primary monitor did not collect a valid sample. AQS can be configured to combine data from multiple samplers for PM₁₀ if the samplers combined are the same method designation as the primary monitor (sampler). So, for example:

- Continuous instruments can be combined with the continuous instrument of the same method designation as the primary but not with other continuous instruments of unlike method designation or manual samplers at the site.
- Manual samplers can be combined with the manual sampler of the same method

designation as the primary but not with other manual samplers of unlike method designation or continuous instruments at the site.

The data from each individual sampler should be entered in a separate POC. By 2014, AQS will be configured to combine this data from monitors with the same method code for attainment decisions and also present completeness statistics for the acceptable combined site/monitor(s) as well as for each individual monitor at the site.

In the instance of collocation for QA purposes, the collocated sampler can serve dual purposes:

- as the required QA collocated monitor (CFR does not require that the collocated monitor for PM₁₀ be the same method designation as the primary) and,
- as a sampler that can be combined with the primary if the collocated QA sampler is the **same** method designation as the primary.

The AQS design value report will be enhanced in 2013 to use these site-method daily values to compute the “expected exceedances” for NAAQS compliance determination. This removes the need for monitoring agencies to manually combine the data for PM₁₀ from multiple POCs with the same method code prior to submission to AQS.

Data Completeness: For PM_{2.5} and Lead, the site-level completeness shall be evaluated to determine monitoring completeness for NAAQS compliance purposes. For PM₁₀, the site-method-level completeness shall be evaluated to determine monitoring completeness for NAAQS compliance purposes. This means that if collocated monitors are configured in AQS to use a higher Required Collection Frequency (RCF) than the actual sampling frequency (e.g. RCF set to 3 with actual sampling occurring every 6 day, in order to generate a site-level 1-in-3 day collection frequency), the monitor-level completeness of the collocated monitors shall not be considered for compliance purposes. The EPA plans to enhance the AQS “Data Completeness Report” to reflect this strategy. In addition, other AQS reports will provide completeness statistics for each monitor for users requiring this information.

CONCLUSION:

In summary, each monitoring organization should strive to implement primary monitors that are the most appropriate for the sampling frequencies required in order to reduce the need for using multiple monitors for NAAQS determinations. However, the revision to AQS described above will allow combining data where needed and provide site level evaluations of completeness.