



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
RESEARCH TRIANGLE PARK, NC 27711
OFFICE OF AIR QUALITY PLANNING AND STANDARDS

Technical Note - Reporting Negative Values for Criteria Pollutant Gaseous Monitors to AQS

10/06/2016

Summary

EPA has received requests to expand the reporting of negative values for some gaseous criteria pollutants. Rather than base an acceptable negative value on Federal Method Detection Limits (Fed-MDLs) posted on AMTIC, AQS will use the following limits until further notice.

- SO₂ -4.0 ppb
- O₃: -4.0 ppb
- NO₂: -5.0 ppb
- CO: -0.4 ppm

Background

For gaseous criteria pollutants, we have traditionally allowed negative values based on the MDL of the monitoring instrument. As an example, if a monitoring organization had an older instrument with a Fed-MDL of 2 ppb, the minimum value allowed in AQS would be -2 ppb. If the same monitoring organization purchased a new instrument with a 0.5 ppb MDL, then the minimum value allowed in AQS would be -0.5 ppb. The Fed-MDL of each approved method is used to set the minimum value. Values below the minimum are rejected by AQS.

OAQPS has been asked to lower some of these minimums for the following reasons:

- Too much data is being reported below the current minimum for the method. AQS rejects this data and it's affecting data completeness.
- The zero drift acceptance criteria that was modified in June 2014 allows for more negative zero drift than some current minimums listed in AQS.

With the process of using the negative MDL as the absolute minimum acceptable value, the data in AQS are only consistent by method but not by pollutant.

Proposed Solution

With continued refinement of NAAQS standards and improvements to monitoring instrumentation, there will be a normal course of changes to methods that will improve MDLs and zero drift. This, in turn, will legitimately move previously acceptable minimum values to values closer to zero. As the FRM/FEM

performance parameters change, so must the minimum acceptable value. With this in mind, OAQPS will be suggesting the use of one minimum value for each criteria pollutant rather than have the minimum values dictated by the method MDL.

Table 1 below shows the Lower Detectable Limit (LDL) and the 12 and 24 hour zero drift in the FRM/FEM performance parameter requirements in Table B1 of 40 CFR Part 53. This is indicated in the table by “B1”. In addition, Table 1 lists the 24 hour and 14 day zero drift QA Handbook guidance as revised based on the June 2014 technical memo in AMTIC¹. This is indicated in the table by “HB”. The last line in the table is the minimum acceptable value that will be set in AQS. It is a compromise between the upper standard for the LDL and zero drift requirements. The only exception to this is the NO₂ range. Other ranges in Table B1 have been changed more recently by ORD but NO₂ has not been revised for some time. OAQPS is aware that the LDL and zero drift have improved on monitoring instruments since these ranges were first promulgated. Therefore, we believe that the -0.005 ppm absolute minimum is reasonable for NO₂.

Table 1. Comparison of FRM/FEM requirements in Table B1 to QA Handbook (HB)

Performance Parameter	Units	SO ₂		O ₃		CO		NO ₂ Std Range
		Upper	Lower	Upper	Lower	Upper	Lower	
B1-LDL	ppm	0.002	0.001	0.005	0.002	0.4	0.2	0.01
B1- Zero drift 12/24 hr.	ppm	0.004	0.002	0.004	0.002	0.5	0.3	0.02
HB Zero 24 hr.	ppm	0.003		0.003		0.4		0.003
HB Zero 14 day	ppm	0.005		0.005		0.6		0.005
Absolute Minimum Negative Acceptable Value	ppm	-0.004		-0.004		-0.4		-0.005

We will be working in the next few months to implement the new minimums in AQS. This will provide for a consistent negative value for all four gaseous criteria pollutants. There are two areas in AQS that relate to minimum (and maximum) values.

At the method level- where each method code has a minimum and maximum value. This minimum value is based on the negative value of the Federal MDL. Any value below the minimum or above the maximum creates an error in AQS and the value is not reported.

At the parameter Level (i.e., 44201 for ozone)- where each parameter has a relative minimum and relative maximum value. Currently, any value below the minimum or above the maximum creates a warning but the value is reported.

AQS will change the parameter level minimum to the values suggested in this technical note and will not allow values below them reported. We expect the change to be coded in AQS by early 2017.

Monitoring organizations can determine their own method level minimum values that are less negative than the parameter level minimums and choose not report values below that to AQS. As FRM/FEM performance criteria change, EPA will review minimums in light of these changes and improvements in technology.

¹ <http://www3.epa.gov/ttn/amtic/files/policy/zerodriftmemo6314.pdf>