UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
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OFFICE OF AIR QUALITY PLANNING AND STANDARDS

Technical Note- Clarification on Use of Automatic Zero Adjustments

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SUMMARY

The February 6, 2017 Office of Inspector General (OIG) management alert[1] identified a number of issue related to monitoring organization non-conformance with QA Handbook Volume II[2]. In particular, a number of monitoring organizations visited by OIG were not implementing automatic zero adjustments as described in the Handbook. Subsequently, the QA Handbook was revised in Jan 2017 to provide additional guidance clarifying how zero adjustments should be implemented. The majority of the monitoring organizations (about 90%) do not zero adjust and we revised the QA Handbook language to further discourage the practice. However, if it is used, please follow the guidance in this memo and the QA Handbook.

BACKGROUND

Some ambient air monitors may be capable of making automatic zero and span adjustments. EPA Guidance has always discouraged span adjustments and while not encouraging zero adjustment, allowed it to be implemented under certain conditions. In the Jan 2017 QA Handbook Vol II, we have revised the language to the following:

> ***EPA discourages the use of either adjustment*** *but considers automatic zero adjustments reasonable when: 1) the automatic zero standards pass through the sample inlet and sample conditioning system, 2) the zero point/adjustment is performed daily,* ***and applied to the following 24-hour period[3], 3) the zero reading is within the 24-hour acceptance criterion,*** *and 4) both the adjusted and unadjusted zero response readings can be obtained from the data recording device.* ***Zero adjustments cannot be used to correct data prior to zero test.***

The 2017 Handbook language on zero adjustment is not significantly different than the 2013 document. Information in bold font was added to the 2017 QA Handbook. EPA included language that use of both adjustments are discouraged since they may mask issues in the

[1] See website: https://www.epa.gov/office-inspector-general/report-certain-state-local-and-tribal-data-processing-practices-could

[2] Quality Assurance Handbook for Air Pollution Measurement Systems Volume II (EPA-454/B-13-003)

[3] Acceptable techniques include an automated adjustment made by the data system or a manually actuated adjustment handled as part of a systematic data reduction procedure.

monitoring or calibration systems that should be evaluated and corrected rather than "adjusted away". We also added some language in step two and the last sentence to make it clear the adjustment is applied to data collected after the zero test not the data collected before the zero test. The 2017 document also added step three to ensure that the zero test is within the 24-hour acceptance critical criteria in the gaseous validation templates in the QA Handbook.

In some cases, the OIG did not observe the zero test being run through the sample inlet (through the probe). In addition, we became aware that one of the data logging systems has a software capability called the "EPA Two Step Zero Adjustment". In talking to the software vendor, this adjustment may very well be something another EPA (from another country) asked to be developed. It has not been developed for or endorsed for use by the US EPA and should not be used. This command takes the difference between a previous zero test value and the next zero test values (approximately 24 hours apart) and then does a prorated post adjustment of the 24-hour data between the two zero values to adjust the routine data between the two tests. This process is inconsistent with Step 2 in the guidance above that requires the zero test and the correction to be applied only to the data following the test[3].

Our review of 2012-2015 data showed that out of 137 primary quality assurance organizations (PQAO) collecting gaseous ambient air data, only 15 PQAOs were performing zero adjustments. Some monitoring organizations have discontinued using the adjustment since the OIG alert was released. If organizations decide to continue such practices, we ask that they follow the guidance listed and ensure that QAPP's and SOP's reflect the exact practices in use. Regional monitoring contacts should be consulted if questions remain about the acceptable approaches described above.