



Air Pollution Control Division Technical Services Program

APPENDIX D4

Standard Operating Procedure for Precision & Accuracy Data Processing, Quarterly Data Validation, Verification, and Annual Data Certification

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Quarterly

During the quarter, audits are entered into the QA audit databases after they are performed. During each audit station QC points (all equipment and standards for station QC is independent of auditing equipment and standards) are run and compared with the audit results. In a correctly operating system, one would expect the QC and the QA results to be similar. If this is not the case, then a complete on site analysis to determine the source of the discrepancy is performed. (i.e. – is the auditing equipment or standards malfunctioning? is the station QC equipment or standards malfunctioning? Or is the analyzer being audited malfunctioning? Is there some sort of systemic problem or masking effect?)

At the end of each quarter, AQS strings are generated for each audit performed during the quarter using the QA Audits archive database. Each audit in the database is then reviewed for “reasonableness” to make sure the values obtained make sense. If any values in the database are questioned, a review of the original hand written audit document is performed. Additionally, each QA transaction string is reviewed against the audit stored in the database to make sure all the correct information has been transferred from the database into the string. The set of strings is then compared to the quarterly audit work schedule, to make sure all performance evaluations that were scheduled to take place, did indeed take place, that there is a record for each audit performed in the database and that a string for each audit record has been generated for upload to AQS.

For more information about the QA data coding strings please see the Appendix D5 in this QAPP regarding SOP for formatting these strings.

To generate the strings from the data bases the following steps occur:

For particulate and gaseous QA accuracy data:

- 1) Open the QA Audits Database Archive. (“Enable this content” under “options” if necessary)
- 2) Go to the Database Tools Main Menu
- 3) Click on the “Generate Text Strings” button
- 4) Select the desired parameters
- 5) Enter desired date range Click on the “Submit” button

Access the file under TSP (J:) Drive at "J:/QA Audit Programs/P&A Database\QA Audits Database/aqs_strings.txt"

QC data is generated and loaded to AQS by the Particulate Monitoring (PM) and Gaseous and Meteorology Monitoring (GMM) units respectively. Please see SOPs regarding data handling, and data validation for both the PM flow rate verifications and GMM 1-point QC check validation and verification operations.

Annually

All the QA data is pulled from AQS and run through a series of tests to verify completeness and reasonableness of data reported to AQS. Any questionable values are reevaluated against original paper documentation. Missing QA data is identified. Coding is checked for consistency throughout the year. Incorrect entries and missing QA data is corrected in AQS. A full Data Quality Assessment (DQA) is then performed as per 40CFR Part 58 Appendix A on all the QA data (both QC and QA data is reviewed and analyzed). This DQA is included as part of the Annual Data Report published by TSP and submitted to EPA. The DQA process is also outlined in section 5.4 of the main body of the APCD/TSP QAPP.

After the DQA is performed, any results that fall outside the ranges of the anticipated values expected from the Data Quality Objective (DQO) process are reevaluated to make sure everything has been entered to AQS correctly and/or to determine the root cause of the problem.

There are tools that can help with the DQA process if statistical software is not available. Specifically the Data Assessment Statistical Calculator (DASC) tool can be downloaded from the EPA's AMTIC website.

ANNUAL DATA CERTIFICATION PROCESS:

For the EPA DASC tool and the AQS Power Point Presentations from National Ambient Air Monitoring Conference, go to:

<https://www.epa.gov/amtic>

https://www.epa.gov/sites/default/files/2020-10/dasc_11_3_17.xls

In these Power Point presentations you will be able to see the screen shots of the areas in AQS you will need to utilize to complete the data certification process.

NOTE: All the following steps are run for the APCD PQAO (0240) except the step on subcontracted operators. If 0240 is not selected you will also pull up all the tribal, and federal data that is collected in Colorado, and APCD does not certify that data.

- 1) In AQS run the Monitoring Description Report (AMP390) for criteria pollutants and compare this against the Network Monitoring Plan. Correct any discrepancies. For information on running reports in AQS see Appendix D6.
- 2) In AQS, run an Extract Raw Data Report (AMP504).
- 3) Use the extracted QC and QA data from step 2 to perform the DQA as described in 40CFR Part 58 Appendix A (also presented in section 5.4 of the QAPP). Correct and QA data discrepancies.
- 4) In AQS run the Data Certification Evaluation and Concurrence Report (AMP600). Address any yellow and red flags that can be addressed. Address any "N" recommendations if possible (N means not recommended for EPA certification concurrence).
- 5) In AQS run a Data Quality Indicator Report (AMP256) by quarter and for year (five separate reports) to help identify why yellow flags or "N" recommendations are being made in the AMP600 Report. There is a glitch in AMP256 report, and it only gives annual completeness in some portions where both quarterly and annual completeness criteria need to be met.
- 6) In AQS, run an AMP450 Quick Look Report on criteria pollutants. Look for "000" method codes (000 means multiple codes were used during year to Report data), if you find any, the data codes must be corrected in AQS. Look for any other that could be "suspect", investigate and correct if necessary.
- 7) In AQS, run a Data Completeness Report (AMP430). Look for missing data. Determine if any data is missing, and correct if necessary. Check to make sure the completeness statistics in both the AMP600 and the AMP430 are the same...they should be.
- 8) An AMP360 report can be run if a look at all data qualifiers is needed.
- 9) In AQS, run a Quick Look Report AMP450 for any analyzers that are reported under the APCD PQAO number but operated by a subcontracted entity. (ARS, PQAO code is 0009) These records have to be pulled separately.
- 10) In AQS, run a Quick Look Report (AMP450) for all non-criteria pollutants. Again, look for 000 method codes and any data that does not make sense. Make corrections to AQS data where necessary.
- 11) In AQS, run a Completeness Report (AMP430) for SO₂ hourly (42401) and max 5-minute (42406), and compare to make sure the number of observations. If one of these numbers is very different look for data

entry problems in AQS. If one has slightly more observation points, it should be the max 5-minute values, if not look through data for data errors. Correct data as necessary.

- 12) In AQS, run a Maximum Value Report (AMP350), and look for data that does not make sense, (e.g.- large values where span data may have been mistakenly reported). Correct AQS data if needed.

After all the AQS data submissions have been reviewed, and corrected where necessary, the AGENCY (APCD, PQA0 0240) must go in and apply their recommendation, either “Y” or “N” to each analyzer within the network under the “Monitoring Agency Request” field. Where the agency recommendation is in disagreement with the AMP600 recommendation a comment as to why must be included on the line next to the agency recommendation. To perform this step

- 1) Access the “Certification Form” in AQS
- 2) Go to the “Query Criteria” part.
- 3) Pull up each subset of criteria data by pollutant (method code).
- 4) Use the “shortcut” button to “Initialize the monitoring agency requested values”
- 5) Under “Monitoring Agency Request” put the Agency recommendation to either “Y” certify or to “N” not certify the data from each analyzer.
- 6) Click SAVE.

Prepare the final Data Certification Letter to be submitted the Region VIII EPA (via certified mail). With this letter include a final copy of the AMP600 report (run again after all the monitoring agency recommendations and comments have been completed). Submit a copy of the AMP450 for non-criteria pollutants. Additionally submit an AMP450 report for any data we report under a different operator agency code (e.g. – the four Ozone sites run by ARS)