



TECHNICAL SERVICES DIVISION
QUALITY ASSURANCE PROJECT PLAN

DATA MGT SOP 609
METEOROLOGICAL DATA MANAGEMENT

REVISION 609.1.00 8/29/2007

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STANDARD OPERATING PROCEDURE
BAAQMD Technical Services Division

Meteorological Data Management

August 29, 2007

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Purpose

The purpose of this Data Management Standard Operating Procedure (SOP) is to document data validation procedures for Meteorological sensors used by BAAQMD to measure continuous hourly values of wind speed, wind direction, temperature, relative humidity, solar radiation, rainfall, and atmospheric pressure. The goal is to define the staff persons responsible for the review, a review timeline, and the specific steps and objectives of the review process.

Background

The District has installed and operates many meteorological stations within the Bay Area to measure continuous ambient meteorological parameters. All meteorological sensors meet the performance and accuracy requirements of the Environmental Protection Agency (EPA) for regulatory modeling applications and are regularly challenged with a rigorous calibration and Quality Assurance schedule of performance evaluations. Ambient hourly levels collected from the data loggers undergo automated checks before real-time posting to the District’s web page for the general public. Further data validation procedures outlined in this document are completed before submission of regulatory “final data” to the EPA Air Quality System database (AQS). These procedures follow guidelines established in the reference documents listed in the last section of this document.

Data Validation Procedure Summary

Data review begins with the Meteorological and Quality Assurance Section (MQA) staff that installs and maintains the meteorological sensors. MQA staff is responsible for following approved instrument SOPs and is the final authority in determining whether the instruments are operating correctly and providing valid data.

The second data review is conducted by the Research and Modeling Section of the Planning Division (RM). In general, R&M is responsible for all data review not specifically related to sensor operation. As part of the Quality Assurance function, R&M may recommend changes concerning MQA data handling and validation procedures.

MQA Data Review

The meteorological data reviewer in the MQA Section is the Meteorological Air Quality Instrument Specialist (AQIS). That person has the authority to edit data values and modify data validation codes.

Meteorological AQIS

The Meteorological AQIS shall:

- Review the network error report daily to confirm that sensors are working correctly, and to respond to database notifications when sensors exceed check limits.
- Invalidate all data recorded during periods of equipment malfunction, maintenance, or interference from other activities at the station in accordance with MQA SOPs.
- Discuss any problems with either the Principal Air and Meteorological Monitoring Specialist (PAMMS) or the MQA Manager before making equipment or associated datalogger/telemetry changes or adjustments.
- Complete the meteorological data review no later than 15 days after the end of the month.
- After review by R&M, post the hourly meteorological data to AQS no later than 60 days after the end of the month.

Principal Air and Meteorological Monitoring Specialist

The PAMMS shall:

- Check the data for irregularities and suspicious values and refer problems back to the Meteorological AQIS.
- Review all data modifications and validation code changes made by the Meteorological AQIS.
- Complete all meteorological data review no later than 30 days after the end of the month.

R&M Data Review

A meteorologist in the Research and Modeling staff conducts the final review of the District meteorological data. The R&M reviewer shall:

- Check for data irregularities and suspicious values and refer problems back to the Meteorological AQIS.

- Examine meteorological values spatially across the District network to determine if the values appear reasonable for the conditions. Investigate any sites that appear to be abnormally high or low compared to the rest of the network.
- Investigate anomalies such as repeating values or patterns, and high rates of change.
- Check diurnal patterns at each site to confirm that values are appropriate for the time of day.
- R&M review should be completed no later than 45 days after the end of the month.

Authors, Revisions, and Approvals

August 2007 (original version)

Author: Dick Duker, Manager of Meteorology and Quality Assurance

Approved:

Approved:

References

EPA QA Handbook Vol. IV, [Quality Assurance Handbook for Air Pollution Measurement Systems](#): Meteorological Measurements.

[Meteorological Monitoring Guidance for Regulatory Modeling Applications](#), EPA-454/R-99-005, US EPA, February 2000.

[Meteorological Monitoring Guidance for Manual of Procedures, Volume VI: Air Monitoring Procedures](#), March 2006, Bay Area Air Quality Management District.