SOP to Collect, Review & Submit Data from
Continuous Instruments Connected to the DR DAS Network

Data from the DR DAS network is used to report air quality conditions and preliminary air monitoring data to the public in near real-time. The DR DAS Network is also used for backup data collection from continuous monitors connected to this network and for diagnostic monitoring of those monitors. The methods described in this SOP apply to the following continuous instruments: Met One- BAM 1020; Met One meteorological instruments (BX-592_Temp, BX-596_Temp/BP, 014A_wind speed, 024A_wind direction, 083D_Temp/RH); Thermo Electron Scientific- TEOM & TEOM FDMS, Thermo Electron Scientific- 48C & 48i CO analyzers, Teledyne API- 400E & 703E O3 analyzers.

The Municipality of Anchorage (MOA) and State of Alaska (SOA) preferably collect data from Met One BAMs directly from the BAM internal data storage. Although the DR DAS network acquires all hourly data records including error status codes, only the direct download provides monitor data and status codes together in a single tabular format for convenient data review. The DR DAS network can be used to facilitate download of the internal BAM data record via a server serial connection accessible over the internet.

The DR DAS network is the primary means for collecting data from analog meteorological instruments and gaseous analyzers at monitoring sites in Anchorage, Palmer, Wasilla and Juneau that are connected to the network. PC-data loggers (site servers) collect data from each instrument via a serial connection, or for instruments without a serial interface, via an ADAMS 5000, analog-to-digital converter. Data for each parameter is interrogated and stored via software known as Envidas for Windows (EFW) which resides on the PC-logger at each networked site. EFW polls serial data every 20 seconds and stores 1-minute and 60-minute averages of data collected via serial interface. Analog data is polled every 2-seconds and is also stored as 1 and 60-minute averages.

Data from each networked site is collected and stored in the main database on the DR DAS, central server located in Lacey, WA. Data from each site is polled via a program called Comm Center which resided on the central server. Comm Center interrogates each site PC-logger and stores that data in the main SQL database on the central server. Data in the SQL database can be reviewed, edited, reported and submitted to AQS using an application called Envista ARM. The Envista ARM application resides on the central server and my also reside on local workstations. Access to the central server and the SQL database on that server, requires a secure virtual private network (VPN) connection to the Washington, Department of Ecology (WA-DOE) which maintains central server for Alaska's DR DAS network.

Alert rules are preset screening criteria that my be set to notify a site operator of aberrant conditions, and may be used to automatically flag, edit or modify data. Alert rules are maintained within a program call Envista ARM Setup, which resides on the central server. Presently alert rules are used pre-screen data that is reported to the public in near-real time via the internet with the Envista Web application.

Edits, invalidations, QC-flags and other data annotations, whether done by automated or manual means, are stored in a validated data set in the SQL database, independent of the raw data; thereby creating an auditable record of all data modifications.

Data from the DR DAS network can be obtained and reviewed in three ways.

1. Data can be reported and reviewed directly on the site logger via the Envidas Reporter subprogram within EFW. Reports for desired time periods and data intervals can be reported for any parameters desired, and can be exported in comma-delimited format to the directory: C:\Program Files\EnvidasFW\Export. These export files can then be transferred over the internet to any networked computer via use of the file transfer program within Ultra VNC. Ultra VNC is remote control software which is used to access the site servers directly over the internet.

2. Reports of data from the validated data set may also be obtained without a secure connection through the following website which allows the public to access data from the Alaska monitoring network: https://test-fortress.wa.gov/ecy/aaqm/Default.htm

   Visitors to this website may generate Group or Station reports. Station reports return selected data from a single monitoring site. Group reports return like pollutants types or other measurements from multiple monitoring sites. When reported in tabular format, data reports my then be exported to the viewer in any of several common formats including: Excel, Word, CSV, HTML, PDF, XLM or space-separated text.

3. Data in the SQL database can be reviewed and reported via the Envista ARM application on the central server (or run on a local computer). Either way, access to the database requires establishing a secure VPN connection to the WA-DOE network using a changing numeric key (RSA key) and a personal identification number. The Envista ARM application may be used to generate many types of data reports including: tabular, linear time series, histograms, WindRose and AQI reports. Manual data edits and flags are applied using the data editing features within the Envista ARM Application. Such edits generate records in the validated data set in the SQL database. Envista ARM may be used to create AQS formatted data files and these files can be submitted to AQS directly from with Envista ARM application.

QC Documentation:

The EFW application on the site servers has an electronic logbook feature. At present MOA and SOA maintain hardcopy log books for each instrument, and use the electronic log to record actions or conditions with impact to data and affecting just the site logger. We have found this practice to be most efficient and effective for our needs as electronic entries can be cumbersome enough to discourage diligent capture of instrument upkeep notes. Instrument log books are retrieved and review during the data review process.

Data Review and Submittal:

MOA and SOA review all data for compliance with monitoring standards and reference methods as established in 40 CFR Part 50. Data are also reviewed for compliance with QAPP criteria and any aberrant conditions which would jeopardize the accuracy or validity of the data. Instrument logs, site logs and server logs are reviewed at least quarterly for any conditions that require data qualification or invalidation. During the data validation process, data are coded in AQS format. AQS coding may be performed using either the Envista ARM application or through Excel templates developed to assist in error checking and AQS data coding.

Presently MOA and SOA both manually upload files to AQS using EPA's Central Data Exchange (CDX). This manually upload process allows for greater scrutiny and control of the AQS formatted data file prior to submittal to AQS and facilitates editing should any changes be required once that data has made it into the AQS Staging Area.