

Environment Agency Mobile Monitoring Facility No.6

The Environment Agency Ambient Air Monitoring Team carries out ambient air monitoring using Mobile Monitoring Facilities (MMF). These facilities allow us to carry out flexible, short-term studies examining the impact of specific pollution sources on local communities. The facilities contain a number of analysers designed to sample the atmosphere for a selection of pollutants commonly associated with industrial emissions. The equipment is strategically sited at temporary locations with the intention of quantifying pollution loadings and determining sources.

The Environment Agency's Ambient Air Monitoring Team are currently carrying out a study of ambient air quality on behalf of Environment Agency Wales at the Taibach Margam Air Quality Management Area in Port Talbot. We have deployed a mobile monitoring facility (MMF6) to Prince Street in Port Talbot (NGR SS 7769 8824). The MMF6, located on Prince Street Port Talbot, measures the following pollutants:

- particulate (PM₁₀ & PM_{2.5})
- sulphur dioxide
- carbon monoxide

Meteorological Instruments

MMF6 also contains equipment that can measure meteorological conditions. This provides the opportunity to consider measured pollutant levels relative to the prevailing meteorological situation. This can supply important information allowing a more detailed understanding of the pollutants' dispersion in the atmosphere and consequently a more accurate assessment of their origins. The meteorological parameters that can be measured are:

- wind direction,
- wind speed,

All meteorological measurements are taken at an elevation of 8m above the ground and from positions where the wind approach was unobstructed. The temporal resolution of all logged meteorological data is 5 minutes.

Wind direction is an important consideration as it provides direct information about the orientation of any source relative to the monitoring site. It must be noted, however, that pollutants will be carried along a wind's trajectory that may, over distances of several kilometres, be curved so that in these cases the wind direction will not simply 'point' to the source's direction. Wind speed and temperature both have a significant influence on the amount of mixing within the atmosphere, having profound effects on the vertical distribution of pollutants through the atmospheric boundary layer. Relative humidity is important because the level of moisture within the air affects the rates of reaction and removal of some air pollutants.

Information regarding past deployments of MMF units can be found on the Environment Agency website.

<http://www.environment-agency.gov.uk/research/library/publications/33815.aspx>

Data Verification and Ratification for the Prince Street Mobile Monitoring Facility

Due to the high level of public interest, the Environment Agency have taken the decision to upload the ratified monitoring results directly to the Wales Air Quality Forum website. The data will be marked as ratified, and will be uploaded on a quarterly basis.

Data Verification is carried out on an ongoing basis and is nominally a process to "clean-up" the initial provisional data. The process includes:

- A manual review of the data to exclude any data from instrument malfunctions or faulty calibrations.
- Incorporation of any data which were initially missing due to communications failure with a monitoring station.

- Updates to data scaling following application of the most recent calibration factors.

Data Ratification is a detailed manual check of the data set carried out on a quarterly basis for the Prince Street MMF, prior to the data being uploaded to the website. Data ratification reviews all calibration data, information from analyser services and repairs and any other information available for the particular site or analyser over the whole ratification period. In addition, data ratification also requires the judgement of experienced Environment Agency air quality scientists who will have to consider the validity of data in the light of many things including:

- Relationships between pollutants.
- The impact of air pollution episodes.
- The context of the results in the overall UK pollution climate.
- National and regional pollutant patterns.
- Long-term trends.

Once all the ratification checks and corrections have been made then the data are loaded to the Welsh Air Quality Database with a status flag of "Ratified". It should however be noted that there are occasionally circumstances where data which have been flagged as "Ratified" could be subject to further revision. This may be for example where:

- An audit has detected a problem which affects data back into an earlier ratification period.
- Long-term analysis has detected an anomaly between expected and measured trends which requires further investigation and possible data correction.

The verification and ratification process ensures the best possible accuracy of air quality data for public information, and for scientific research purposes. It also underpins the success of the Local Air Quality Management Process, as well as helping Welsh Government to fulfil its statutory requirements under EU Directives.