This is a Scottish Government Guidance Note in relation to the measurement of ambient Particulate Matter (PM) and the LAQM reporting of measured concentrations – May 2023

Particulate Matter (PM_{10} and $PM_{2.5}$) is measured at 83 sites across Scotland for LAQM purposes. In addition, 13 local authorities have declared AQMAs for Particulate Matter (PM_{10})[1] with several considering the potential for revocation where concentrations have been consistently below the annual mean objective.

The accurate measurement of ambient PM represents a significant challenge, particularly under conditions where concentrations can generally be considered to be low (e.g. close to the WHO Guideline Values). Numerous technologies and methodologies have been developed to quantify concentrations of PM in near-real time to provide insight of prevailing concentrations to policy makers, health and environmental specialists and the public. Whilst relatively new MCERT equivalent instruments, such as those included in the Scottish Air Quality Monitoring Network, have generally brought improvements in measurement capability, achieving accurate and reproducible measurements of the low concentrations remains a significant challenge. As such, ambient concentrations of PM_{10} and $PM_{2.5}$ reported by different MCERT equivalent instruments in the same environments can vary by several micrograms (as an annual mean). Such differences represent a particular problem when considering compliance with air quality standards, especially in situations where a change in instrumentation results in a step-change reduction in reported concentrations. Such a step change was identified when the SAQD network predominately moved to a new measurement technique so as to meet the Scottish Government requirements to measure $PM_{2.5}$. This prompted Scottish Government to investigate.

The aim of the Scottish Government Pilot Research Study to investigate Particulate Matter Monitoring Techniques in Scotland[2] was to help identify whether measurements techniques used in Scotland were providing accurate measurements that government could rely on when making policy decisions. The study was extended[3] between July 2021 and June 2022 to focus on the assessment of the main method used for monitoring PM – the Fidas 200[4].

Consequently, Scottish Government have issued the following guidance for local authorities on the reporting and use of PM data from Fidas 200 instruments within the SAQD network:

- As this study does not supersede the formal UK equivalence results, the corrections for gravimetric equivalence currently applied and reported on the Scottish Air Quality Database and website[5] will remain unchanged.
- Corrections stated should be applied when reporting data within the LAQM reporting regime (includes APRs and revocation applications).
- Fidas 200 PM_{10} data collected within the SAQD should be corrected by **dividing** ratified data (provided by the Air Quality in Scotland website) by **0.909**.
- Fidas 200 $PM_{2.5}$ data collected within the SAQD should be corrected by **multiplying** ratified data (provided by the Air Quality in Scotland website) **by 1.06**.
- For completeness, it is recommended that authorities report both the corrected and uncorrected ratified data statistics.
    - Ratified PM_{10} as downloaded from the SAQD
    - Ratified PM_{10} as downloaded from the SAQD **divided by 0.909**
    - Ratified $PM_{2.5}$ as downloaded from the SAQD
    - Ratified $PM_{2.5}$ as downloaded from the SAQD **multiplied by 1.06**
- **To reduce any additional work that this may cause Local authorities, Ricardo have updated the Annual Statistics Reports so that they provide the corrected and uncorrected statistics for 2022 as well as corrected data for previous years. The Annual Statistic Reports can be found here https://www.scottishairquality.scot/laqm/statistics**

[1] PM_{10} - Particulate matter with an aerodynamic diameter of less than 10 micrometres (µm).
[2] https://www.scottishairquality.scot/technical-reports/pilot-research-study-investigate-particulate-matter-monitoring-techniques
[3] https://www.scottishairquality.scot/technical-reports/equivalence-study-investigate-particulate-matter-monitoring-scotland-using-fidas
[4] https://www.palas.de/en/product/fidas200
[5] https://www.scottishairquality.scot/

- Local authorities that are applying revocation of AQMAs should use both corrected and uncorrected data when applying for revocation.