

## ANNEX IV

## Data quality objectives and requirements for air quality models

## I. Data quality objectives

The following data quality objectives are provided as a guide to quality assurance.

	[ <sup>F1</sup> Benzo(a)pyrene]	Arsenic, cadmium and nickel	Polycyclic aromatic hydrocarbons other than benzo(a)pyrene, total gaseous mercury	Total deposition
—Uncertainty				
Fixed and indicative measurements	50 %	40 %	50 %	70 %
Modelling	60 %	60 %	60 %	60 %
—Minimum data capture	90 %	90 %	90 %	90 %
—Minimum time coverage				
Fixed measurements <sup>a</sup>	33 %	50 %		
Indicative measurements <sup>ab</sup>	14 %	14 %	14 %	33 %

**a** Distributed over the year to be representative of various conditions for climate and anthropogenic activities

**b** Indicative measurement being measurements which are performed at reduced regularity but fulfil the other data quality objectives]

#### Textual Amendments

- F1** Substituted by [Commission Directive \(EU\) 2015/1480 of 28 August 2015 amending several annexes to Directives 2004/107/EC and 2008/50/EC of the European Parliament and of the Council laying down the rules concerning reference methods, data validation and location of sampling points for the assessment of ambient air quality \(Text with EEA relevance\).](#)

The uncertainty (expressed at a 95 % confidence level) of the methods used for the assessment of ambient air concentrations will be evaluated in accordance with the principles of the CEN Guide to the expression of uncertainty in measurement (ENV 13005-1999), the methodology of ISO 5725:1994, and the guidance provided in the CEN Report, ‘Air quality — Approach to uncertainty estimation for ambient air reference measurement methods’ (CR 14377:2002E). The percentages for uncertainty are given for individual measurements, which are averaged over typical sampling times, for a 95 % confidence interval. The uncertainty of the measurements should be interpreted as being applicable in the region of the appropriate target value. Fixed and indicative measurements must be evenly distributed over the year in order to avoid skewing of results.

The requirements for minimum data capture and time coverage do not include losses of data due to regular calibration or normal maintenance of the instrumentation. Twenty-four-hour

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sampling is required for the measurement of benzo(a)pyrene and other polycyclic aromatic hydrocarbons. With care, individual samples taken over a period of up to one month can be combined and analysed as a composite sample, provided the method ensures that the samples are stable for that period. The three congeners benzo(b)fluoranthene, benzo(j)fluoranthene, benzo(k)fluoranthene can be difficult to resolve analytically. In such cases they can be reported as sum.<sup>[F2]</sup> Twenty-four hour sampling is also advisable for the measurement of arsenic, cadmium and nickel concentrations.] Sampling must be spread evenly over the weekdays and the year. For the measurement of deposition rates monthly, or weekly, samples throughout the year are recommended.

#### Textual Amendments

**F2** Deleted by [Commission Directive \(EU\) 2015/1480 of 28 August 2015 amending several annexes to Directives 2004/107/EC and 2008/50/EC of the European Parliament and of the Council laying down the rules concerning reference methods, data validation and location of sampling points for the assessment of ambient air quality \(Text with EEA relevance\).](#)

<sup>[F3]</sup>The provisions on individual samples in the previous paragraph apply also to arsenic, cadmium, nickel and total gaseous mercury. Moreover, sub-sampling of PM<sub>10</sub> filters for metals for subsequent analysis is allowed, providing there is evidence that the sub-sample is representative of the whole and that the detection sensitivity is not compromised when compared with the relevant data quality objectives. As an alternative to daily sampling, weekly sampling for metals in PM<sub>10</sub> is allowed provided that the collection characteristics are not compromised.]

#### Textual Amendments

**F3** Inserted by [Commission Directive \(EU\) 2015/1480 of 28 August 2015 amending several annexes to Directives 2004/107/EC and 2008/50/EC of the European Parliament and of the Council laying down the rules concerning reference methods, data validation and location of sampling points for the assessment of ambient air quality \(Text with EEA relevance\).](#)

Member States may use wet only instead of bulk sampling if they can demonstrate that the difference between them is within 10 %. Deposition rates should generally be given as µg/m<sup>2</sup> per day.

Member States may apply a minimum time coverage lower than indicated in the table, but not lower than 14 % for fixed measurements and 6 % for indicative measurements provided that they can demonstrate that the 95 % expanded uncertainty for the annual mean, calculated from the data quality objectives in the table according to ISO 11222:2002 — ‘Determination of the uncertainty of the time average of air quality measurements’ will be met.

## II. Requirements for air quality models

Where an air quality model is used for assessment, references to descriptions of the model and information on the uncertainty shall be compiled. The uncertainty for modelling is defined as the maximum deviation of the measured and calculated concentration levels, over a full year, without taking into account the timing of the events.

## III. Requirements for objective estimation techniques

Where objective estimation techniques are used, the uncertainty shall not exceed 100 %.

## IV. Standardisation

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For substances to be analysed in the PM<sub>10</sub> fraction, the sampling volume refers to ambient conditions.