

Assessment of Levels of Nitrogen Dioxide in Ambient Air: Guidance for the Interpretation and Use of Monthly, Uncorrected Passive Diffusion Tube Monitoring Data

The City of Edinburgh Council publishes uncorrected monitoring data for nitrogen dioxide concentrations in air in order to ensure public access to environmental information for which it is responsible. The data is produced by the Council in accordance with its duty to review and assess local air quality within its area and provides technical information for Edinburgh's Air Quality Action Plan.

In Edinburgh, the two main air pollutants that City of Edinburgh Council monitors regularly are Nitrogen Dioxide (NO₂) and Fine Particles (PM₁₀). The monthly, uncorrected data provided here relates specifically to nitrogen dioxide data obtained by the Passive Diffusion Tube sampling method. All other monitoring data is publicly available on the Scottish Government Air Quality Website www.scottishairquality.co.uk

Nitrogen dioxide is monitored using a combination of automatic real-time gas analysers and Passive Diffusion Tube Samplers.

1. **Automatic Analysers** continuously sample and record ambient concentrations of nitrogen dioxide in real-time. The equipment is housed in special cabinets sited at a number of locations across the city e.g. Salamander Street, St John's Road, Gorgie Road. This data is subjected to ratification and quality assurance processes, undertaken on behalf of the Scottish Government. Data from monitoring stations is published on the [Scottish Government Air Quality Website](http://www.scottishairquality.co.uk).
2. **Passive Diffusion Tube Samplers (PDT)** provide a simple, cost-effective method for assessing ambient levels of nitrogen dioxide over an extended network. They are sited at appropriate locations for a period of one month prior to laboratory analysis.

The Passive Diffusion Tube Sampler assessment procedure is approved by the Scottish and UK Governments and is a well-established means for estimating concentrations of nitrogen dioxide in ambient air over extended time periods. Proper application of PDT methodology is set out in government approved technical guidance: <https://laqm.defra.gov.uk/air-quality/featured/uk-regions-exc-london-technical-guidance/>

A number of factors must be taken into consideration when utilising PDT data for air quality assessment purposes. The data provided here is in **uncorrected form**, and City of Edinburgh Council emphasises that no direct comparison with Air Quality Standards for nitrogen dioxide can be made, nor any inferences drawn about monthly concentrations at individual sites. The PDT monitoring data is intended to determine **annual** nitrogen dioxide concentration in air for assessment against Air Quality Standards. This requires the complete annual data set collected over the calendar year to be subjected to a range of corrections and quality assurance checks. These checks and adjustments are made in accordance with government technical guidance and can be carried out only at the end of each calendar year.

The monthly monitoring data cannot be used to assess monthly nitrogen dioxide concentrations, assess monthly trends in concentration, calculate monthly rolling annual mean values, or assess monthly data against the annual Air Quality Standard. Such assessments and calculations will misinterpret the data and could produce misleading conclusions on air quality.

Fully corrected, ratified air quality monitoring data is reported annually by the City of Edinburgh Council, in accordance with requirements of the Local Air Quality Management Framework, the National Air Quality Strategy and the Environment Act 1995.

The accompanying Table presents uncorrected, monthly monitoring data for each PDT monitoring site. Passive diffusion tubes are exposed in duplicate at a few monitoring locations for quality control purposes. Both sets of data are presented in the Table. Quality assessment of the duplicate data is made at the end of the calendar year.

Air Quality Standards relate to the locations where the public may be regularly exposed to pollutants; this is termed the 'Relevant Receptor'. At residential locations government guidance designates the 'Relevant Receptor' as the façades of residential properties. When the PDT monitor is located at the kerbside, a distance adjustment must be made to estimate the concentration of pollutant at the building façade.

The monthly monitoring data presented in the Table is expressed as $\mu\text{g}/\text{m}^3$. The data is uncorrected and not validated. Monitoring tubes which were removed during the monitoring period are indicated as M (Missing) in the Table.