



2025 Air Quality Annual Status Report (ASR)

In fulfilment of Part IV of the Environment Act 1995
Local Air Quality Management, as amended by the
Environment Act 2021

Date: June 2025

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Local Responsibilities and Commitment

This ASR was prepared by the Worcestershire Regulatory Services Technical Services on behalf of Redditch Borough Council with the support and agreement of the following officers and departments:

Worcestershire Regulatory Services

Redditch Borough Council

Worcestershire County Council

Worcestershire Regulatory Services (WRS) is a shared service formed from the Environmental Health and Licensing departments of the six Worcestershire District Councils. Responsibility of managing (monitoring and reporting of) local air quality transferred from the partnership councils to WRS in April 2011.

This ASR has not been signed off by a Director of Public Health. The DoPH office has requested a copy of the ASR be forwarded for information post publication.

If you have any comments on this ASR please send them to:

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Executive Summary: Air Quality in Our Area

Air Quality in Redditch Borough

Breathing in polluted air affects our health and costs the NHS and our society billions of pounds each year. Air pollution is recognised as a contributing factor in the onset of heart disease and cancer and can cause a range of health impacts, including effects on lung function, exacerbation of asthma, increases in hospital admissions and mortality.

Air pollution particularly affects the most vulnerable in society, children, the elderly, and those with existing heart and lung conditions. Low-income communities are also disproportionately impacted by poor air quality, exacerbating health and social inequalities.

Table ES 1 provides a brief explanation of the key pollutants relevant to Local Air Quality Management and the kind of activities they might arise from.

Table ES 1 - Description of Key Pollutants

Pollutant	Description
Nitrogen Dioxide (NO ₂)	Nitrogen dioxide is a gas which is generally emitted from high-temperature combustion processes such as road transport or energy generation.
Sulphur Dioxide (SO ₂)	Sulphur dioxide (SO ₂) is a corrosive gas which is predominantly produced from the combustion of coal or crude oil.
Particulate Matter (PM ₁₀ and PM _{2.5})	<p>Particulate matter is everything in the air that is not a gas.</p> <p>Particles can come from natural sources such as pollen, as well as human made sources such as smoke from fires, emissions from industry and dust from tyres and brakes.</p> <p>PM₁₀ refers to particles under 10 micrometres. Fine particulate matter or PM_{2.5} are particles under 2.5 micrometres.</p>

The Redditch Borough area currently does not have any declared Air Quality Management Areas (AQMAs) and none have been declared historically. Concentrations generally continue to fall well below the annual mean objective for nitrogen dioxide at measured locations.

Monitoring across the Redditch area focuses on nitrogen dioxide (NO₂) via a network of passive diffusion tubes. The tubes are located in the main urban centre of Redditch.

The monitoring network had no new monitoring sites added in 2024. Diffusion tubes OR4 and OR6 were removed. However, it should be noted that diffusion tubes OR4, OR5 and OR6 were a triplicate location (Misty Florist, Other Road); meaning they were averaged, and bias adjusted and resulted in one NO₂ concentration figure. Therefore, the number of concentration figures received has not changed.

Monitoring results within the Redditch Borough area demonstrate that there were no exceedances of the NO₂ air quality objective of 40µg/m³ in 2024. There has not been a discernible trend within the data: three of the monitoring sites demonstrate an increase from 2023 to 2024 and the other two monitoring sites shown a decrease.

The largest increase was 2.4µg/m³ which was recorded at OR1, this saw a rise from 26.6µg/m³ to 29.0µg/m³ which represents a 9.2% increase.

The largest decrease of 13.1µg/m³ was recorded at location SS, 7 Summer Street, Redditch with concentrations reducing from 28.0µg/m³ to 14.9µg/m³. This represents a decrease of 46.7%. This represents a decrease of 46.7%. This substantial decrease is unknown, however it has been noted and will continue to be monitored and reported on in 2026.

The lowest concentration was 10.5µg/m³ recorded at STOR, 18 Washford Lane. All concentrations are on average 43.9% below the annual mean objective of 40µg/m³.

No annual means greater than 60µg/m³ have been recorded indicating it is extremely unlikely that there have been any exceedances of the 1-hour mean objective for NO₂ at any monitoring sites. The 60µg/m³ value is a surrogate figure to indicate exceedances of the 1-hour objective based on annual average conditions. The concentrations recorded across the district in 2024 are on average 62.6% below the surrogate figure.

Actions to Improve Air Quality

Whilst air quality has improved significantly in recent decades, there are some areas where local action is needed to protect people and the environment from the effects of air pollution.

No AQMAs have been declared within the Redditch Borough area and therefore no specific action plan has been developed to date.

Redditch Borough Council has taken forward a number of direct measures during the current reporting year of 2024 in pursuit of improving local air quality.

Bromsgrove District Council and Redditch Borough Council Provision of Electric Vehicle Charging Infrastructure

About 120 new chargers are set to be placed at 33 locations in the area, after Redditch Borough Council teamed up with Bromsgrove District Council to agree a long-term contract with EV infrastructure provider Zest.

There are currently two new sites which are active and working these are located in Astwood Bank car park, Redditch and Aston Fields car park, Bromsgrove. More work is currently underway for approximately another 8 sites; these are expected to be installed by the end of 2025.

Air Quality Action Plan and Air Quality Strategy

The timeline for the various stages and delivery of a revised countywide AQAP, and establishment of a new countywide Air Quality Strategy, were set out in the [ASR 2023](#). However, following the introduction of a new enforcement policy by Defra in June 2023, it has been necessary to amend the previously published framework to prioritise production of a standalone AQAP for each district with an existing AQMA.

As previously discussed, Redditch has no AQMAs therefore no Action Plan for the borough is required.

Development of an ambitious countywide Air Quality Strategy as reported in the last ASR, has been postponed for 2025. Progress has been delayed until local authority reorganisation, announced by government in Dec 2024, has been completed in Worcestershire. However, certain potential elements of the strategy, such as improving communication of air quality, are evolving through other work streams for example Behavioural Change interactions with local schools and communities, Clean Air Day 2025

campaign and working with LA teams around the county to ensure air quality is considered appropriately within local strategy and policy.

From 2023, local authorities that do not have any AQMAs in their areas are required to produce an Air Quality Strategy outlining how air quality will be maintained.

Production of an interim air quality strategy for the Redditch Borough will begin from July 2025 following the completion of this ASR.

Real-time Air Quality Monitoring Project

In February 2023, Defra confirmed that WRS had been successful in a bid to the Air Quality Grant Scheme 2022/23 to establish an enhanced real-time air quality monitoring network across Worcestershire. The scope of the bid was to establish a real-time air quality monitoring network across the main areas of air quality concern in Worcestershire for purposes of providing enhanced monitoring data on a range of pollutants. Additionally, the proposal included informing the public and vulnerable groups of the status of air pollution in real time to encourage behaviour change.

The scheme has involved the installation of approximately 26 'low-cost Air Quality Monitors' across the county which measure NO₂, PM₁₀, and PM_{2.5} across the county for a period of 3 years (with EA MCERTS standard accreditation as indicative ambient particulate matter devices).

In 2023 the experienced sensor provider [Earthsense](#) were appointed as successful suppliers following a rigorous procurement process. The sensors, known as '[Zephyrs](#)' are provided, operated and serviced by [Earthsense](#) who also provide data access.

Appropriate monitoring locations were determined by WRS in collaboration with Public Health, Worcestershire County Council Street Lighting team and Earthsense taking into consideration requirements of Redditch Borough Council.

The locations have been chosen to maximise data capture within locations proximal to vulnerable communities and/or from a range of sources of air pollution including transport, solid fuel burning, industry and agriculture.

Two of the twenty-six monitors were installed in the Redditch Borough District in January 2024, following the completion of required structural assessments. These are located on:

- Meadowhill Road
- Rickyard Lane

Earthsense and WRS designed a publicly accessible portal to the real time monitoring data which launched in May 2024.

The results of monitoring will be used to inform decision making and requirements for further action as necessary and this year's results from 2024 can be found in Appendix F.

Worcestershire County Council Actions

Worcestershire County Council Highways Department have progressed the following schemes within the Redditch Borough area during 2024:

The Redditch Local Cycling and Walking Infrastructure Plan (LCWIP)

Public engagement has concluded. The engagement report and the final version of the Redditch LCWIP will be published on Worcestershire County Council Highways website in summer 2025.

[Local cycling and walking infrastructure plans \(LCWIPs\) | Worcestershire County Council](#)

Redditch Rail Quarter

The project will improve connectivity between the railway station, town centre, bus, taxi and active travel options. This will in turn move people away from travelling by private car, improving congestion and air quality on key corridors. The scheme proposes the redevelopment of Redditch Station facilities, including a new station building, minor car park works, and adjacent highway works.

Work is ongoing and further details can be found here: [Redditch Railway Station redevelopment background | Worcestershire County Council](#).

Conclusions and Priorities

There are currently no AQMAs declared in the Redditch Borough area. Concentrations at identified worst-case scenario locations have been recorded at well below the objectives for nitrogen dioxide. There has not been a discernible trend within the data, this is because three of the monitoring sites had seen an increase from 2023 to 2024 and the other two monitoring sites had seen a decrease.

Local Authorities that do not have any AQMAs in their areas are required to produce an Air Quality Strategy outlining how air quality will be maintained.

Production of an interim air quality strategy for the Redditch Borough will begin from July 2025 following the completion of this ASR.

Redditch Borough Council has not identified any significant new sources of air pollution within the area for the reporting year of 2024. A number of planning applications for large developments have been made within the district during 2024. The proposals have been assessed as part of the planning process and are not expected to have a significant impact on local air quality when they are operational. Details of these applications are listed in Appendix C.

Where air quality is a relevant concern in terms of new developments there will be proportionate mitigation measures. Relationships with neighbouring authorities and institutions will be maintained to stay abreast of issues and developments that could impact or benefit air quality in Redditch Borough, and to ensure our work is recognised in the wider West Midlands Community.

Monitoring, reviewing, and assessing air quality will continue within Redditch Borough area at relevant areas. A full rationalisation is programmed for Autumn 2025. Additional tubes were added to the monitoring network at the beginning of 2025 and these results will be reported on in the next ASR.

Development of an ambitious countywide Air Quality Strategy as reported in the last ASR, has been postponed for 2025. Progress has been delayed until local authority reorganisation, announced by government in December 2024, has been completed in Worcestershire. However, certain potential elements of the strategy, such as improving communication of air quality, are evolving through other work streams for example Behavioural Change interactions with local schools and communities, Clean Air Day 2025 campaign and working with LA teams around the county to ensure air quality is considered appropriately within local strategy and policy.

As referred to in the previous section a real-time air quality monitoring network has been set up. This has involved the installation and operation of 26 Zephyr Air Quality monitors' that measure NO₂, PM₁₀ and PM_{2.5}, as well as other parameters, across the county. Two of these low-cost sensors have been monitors deployed within the Redditch Borough Council area in January 2024. This has provided significant data in respect of PM₁₀ and PM_{2.5} for which monitoring across the county has been very limited previously.

Review and assessment of the first calendar years data will be conducted to help inform future projects and strategies to improve air quality across the district. Real time information will enable a better understanding of air quality in the borough to help inform decision making and requirements for further action as necessary.

Key priorities for the next year:

- Continue to monitor air pollutants at key locations across the district by use of the diffusion tube network
- Utilise the data from the new real-time low-cost sensors to inform future steps in improving air quality across the district.
- Produce an interim air quality strategy for the Redditch Borough from July 2025.
- Review and assessment of first calendar year's data from low-cost sensors to inform future projects and strategies to improve air quality across the district. Promoting public access to the Earthsense portal of real time monitoring data on a range of air pollutants to enhance public knowledge and encourage behavioural change.
- Improving air quality information and direction to WRS webpages following recommendations of Defra's Air Quality Information Systems review. Exploring a potential PM_{2.5} source apportionment study within Worcestershire with the University of Birmingham.
- Ensure proportionate mitigation measures are included within new developments where air quality is a relevant concern.
- Work with teams from around the county to ensure air quality is considered appropriately within local strategy and policy where appropriate.
- Maintain relationships with neighbouring authorities and institutions to stay abreast of issues and developments that could impact or benefit air quality in Redditch Borough, and to ensure our work is recognised in the wider West Midlands community.

How to get Involved

There are a number of ways members of the public can help to improve local air quality:

- **Walk or cycle instead of driving:** Leaving your car at home and walking or cycling instead will benefit in three ways - increased exercise, reduced pollution exposure and will reduce individual's pollution emissions.
- **Turn off your engine when stationary or parked**, don't 'idle', particularly outside sensitive receptors such as schools, hospitals, care homes and residential properties.
- **General travel planning advice** is available on Worcestershire County Council's website (including walking, cycling and bus maps and timetables) and Government website:
 - [Travel and Roads | Worcestershire County Council](#)
 - [Smarter choices: changing the way we travel – GOV.UK\(www.gov.uk\)](#)
- **Hold meetings by Conference Call** by phone or video conference via Teams, Zoom or Facetime, or other service rather than driving to meetings. This reduces fuel and other travel costs, vehicle maintenance and hire cost, increases productivity through reduction in hours lost through unnecessary travel.
- **Facilitate Flexible Working Arrangements** for non-front-line staff to work remotely from home or nearer home facilities for one or more days a week thus removing or reducing any journey to work. This reduces congestion which has beneficial impacts for delivery times, reduced business costs and thus economic benefits. Additionally, provides social benefits through improved work life balance for employees, reduces local air quality and reduced emergency vehicle response times.
- **Switch Fleet to Low Emission Vehicles:** The government is currently providing grants for up to 75% of Electric Vehicle (EV) charging points, up to 40 charge points:

[Workplace Charging Scheme: guidance for applicants - GOV.UK \(www.gov.uk\)](#)
- If you must drive, follow fuel efficient driving advice, often known as '**Smarter Driving Tips**', to save on fuel and reduce your emissions. Several websites promote such advice including:
 - [Save money and emissions through ecodriving - Energy Saving Trust](#)
 - [How to drive economically - Eco-driving tips | AA \(theaa.com\)](#)

- [Fuel Consumption & CO2 Databases | Vehicle Certification Agency \(vehiclecertification-agency.gov.uk\)](https://www.vehiclecertification-agency.gov.uk)
- **Reduce air pollution from open fires and wood-burning stoves:** Advice is available from Defra on choosing the right stove, using the right fuels and maintenance, enabling householders to reduce their impact on their health and air quality from open fires and wood burning stoves. Further information is available on the [Smokeless Zones](#) and [Public Advice](#) pages on WRS website.

Air pollution can affect all of us over our lifetime however certain groups will be more sensitive to the effects of air pollution. Vulnerable groups include adults and children with lung or heart conditions such as asthma, chronic bronchitis, emphysema and chronic obstructive lung disease (COPD). Senior citizens are more likely to be affected by respiratory diseases and children are more likely to be affected by air pollution due to relatively higher breathing and metabolic rates as well as a developing lung and immune system.

Vulnerable individuals and groups can keep informed of:

- Current levels and forecasts of air pollution from Defra at: <https://uk-air.defra.gov.uk/>.
- If you are sensitive to the effects of air pollution, it may be appropriate to limit the length of time spent in areas of local poor air quality – see advice from Defra at <https://uk-air.defra.gov.uk/air-pollution/daq>
- Pollution levels can be monitored on our Earthsense portal and can provide advice on what to do when levels are high at: [Worcestershire Air\ EarthSense](#)

Further information for the general public on reducing your family's exposure to poor air quality in Worcestershire and how individuals, business and schools can assist with reducing their impact on local air quality is available at [Protecting Me and Others from Air Pollution | Worcestershire Regulatory Services \(worcsregservices.gov.uk\)](#).

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1 Local Air Quality Management

This report provides an overview of air quality in Redditch Borough Council during 2024. It fulfils the requirements of Local Air Quality Management (LAQM) as set out in Part IV of the Environment Act (1995), as amended by the Environment Act (2021), and the relevant Policy and Technical Guidance documents.

The LAQM process places an obligation on all local authorities to regularly review and assess air quality in their areas, and to determine whether or not the air quality objectives are likely to be achieved. Where an exceedance is considered likely the local authority must declare an Air Quality Management Area (AQMA) and prepare an Air Quality Action Plan (AQAP) setting out the measures it intends to put in place in order to achieve and maintain the objectives and the dates by which each measure will be carried out. This Annual Status Report (ASR) is an annual requirement showing the strategies employed by Redditch Borough Council to improve air quality and any progress that has been made.

The statutory air quality objectives applicable to LAQM in England are presented in Table E.1.

2 Actions to Improve Air Quality

2.1 Air Quality Management Areas

Air Quality Management Areas (AQMAs) are declared when there is an exceedance or likely exceedance of an air quality objective. After declaration, the authority should prepare an Air Quality Action Plan (AQAP) within 18 months. The AQAP should specify how air quality targets will be achieved and maintained and provide dates by which measures will be carried out.

Redditch Borough Council (RBC) currently does not have any declared AQMAs. A local Air Quality Strategy is a priority action for RBC for 2025.

2.2 Progress and Impact of Measures to address Air Quality in Redditch Borough Council

Defra's appraisal of last year's ASR concluded *"the report is well structured, detailed, and provides the information specified in the Guidance. The following comments are designed to help inform future reports:*

1. *The Council should include additional information regarding the co-location in future reports. In particular, clarification should be provided on which laboratory and preparation method was used for the co-location study. The quoted national bias adjustment factor (0.84) does not match that of the national bias adjustment factor within v03/24 of the spreadsheet (0.81) for tubes prepared by Gradko using 20% TEA in water. A screen capture of the appropriate spreadsheet would assist in clarifying that the correct methodology was used.*
2. *The data capture for the monitoring period in Table A.2 should be provided to less decimal places.*
3. *A good discussion regarding PM_{2.5} has been included, particularly as both the Public Health Outcomes Framework indicator D01 and Defra modelled backgrounds have been discussed. The Council should continue to include these discussions in future reports.*
4. *It is encouraging to note that low-cost sensors have been installed within Redditch to monitor particulate matter. Although these cannot be used as a definitive comparison to the relevant objectives, these monitors will provide an indication of current particulate matter concentrations within Redditch. Where possible, the Council should comment on any monitored concentrations within the next report.*
5. *Annualisation calculations have been provided for OR1, although no annualisation was undertaken. This is correct and is consistent with LAQM.TG(22), however the Council should note within their report that the annualised concentration has not been determined as monitoring was aligned with the Defra calendar and only 3 months of data was missing.*
6. *Figures have been provided to highlight the location of monitoring sites. It may be useful to make the locations of monitoring sites larger and these can be quite difficult to identify on top of the current background mapping."*

The above points are noted. In relation to point 1 see Appendix C QA/QC section in terms of justification for the methodology used.

No AQMAs have been declared within the Redditch borough area and therefore no specific action plan is required at this time.

Bromsgrove District Council and Redditch Borough Council Provision of Electric Vehicle Charging Infrastructure

About 120 new chargers are set to be placed at 33 locations in the area, after Redditch Borough Council teamed up with Bromsgrove District Council to agree a long-term contract with EV infrastructure provider Zest.

There are currently two new sites which are active and working these are located in Astwood Bank car park, Redditch and Aston Fields car park, Bromsgrove. More work is currently underway for approximately another 8 sites; these are expected to be installed by the end of 2025.

Climate Emergency

The Council declared a climate emergency in 2019. On declaration of a climate emergency, an LA is affirming that it will place the Climate Emergency at the centre of its decision-making process. RBC aim to reduce carbon emission by 50% by 2030 and achieve Net Zero by 2040. Many Net Zero actions and policies have co-benefits of reducing air pollution.

Climate emergency and electric vehicle information is available on the County Council's website via the following links:

[Climate emergency– redditchbc.gov.uk](https://redditchbc.gov.uk/climate-emergency)

[Electric vehicles – redditchbc.gov.uk](https://redditchbc.gov.uk/electric-vehicles)

Air Quality Actions Plan and Air Quality Strategy

The timeline for the various stages and delivery of a revised countywide AQAP, and establishment of a new countywide Air Quality Strategy, were set out in the [ASR 2023](#). However, following the introduction of a new enforcement policy by Defra in June 2023, it has been necessary to amend the previously published framework to prioritise production of a standalone AQAP for each district with an existing AQMA.

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[Local cycling and walking infrastructure plans \(LCWIPs\) | Worcestershire County Council](#)

Redditch Rail Quarter

The project will improve connectivity between the railway station, town centre, bus, taxi and active travel options. This will in turn move people away from travelling by private car, improving congestion and air quality on key corridors. The scheme proposes the redevelopment of Redditch Station facilities, including a new station building, minor car park works and adjacent highway works.

Work is ongoing and further details can be found here: [Redditch Railway Station redevelopment background | Worcestershire County Council](#).

2.3 PM_{2.5} – Local Authority Approach to Reducing Emissions and/or Concentrations

As detailed in Policy Guidance LAQM.PG22 (Chapter 8) and the Air Quality Strategy¹, local authorities are expected to work towards reducing emissions and/or concentrations of fine particulate matter (PM_{2.5}). There is clear evidence that PM_{2.5} (particulate matter smaller 2.5 micrometres) has a significant impact on human health, including premature mortality, allergic reactions, and cardiovascular diseases.

There were no automatic PM_{2.5} monitoring stations in Worcestershire in 2024 that were recognised by Defra for measuring against ambient air quality directives. The nearest AURN PM_{2.5} monitoring station is the Birmingham Ladywood site approximately 28km north of the Redditch Borough. As part of the Defra AURN expansion project a PM_{2.5} monitor is anticipated to be installed in Redditch 2025 at Chadwick Mews. However, work for this is still ongoing and further progress on this monitoring station will be reported on in next year's ASR.

WRS has reviewed the DEFRA national background maps to determine projected PM_{2.5} concentrations within the Redditch borough area for the 2024 calendar year. The average total PM_{2.5} at the 54 locations (centre points 1km x 1km grids) across the Redditch Borough is 6.47µg/m³ with the lowest concentration of 5.87µg/m³ and the highest concentration being 7.62µg/m³. PM_{2.5} concentrations within the Redditch Borough are well below the annual average EU limit value for PM_{2.5} of 25µg/m³ and are below the proposed annual average limit value for PM_{2.5} target of 10µg/m³ across England by 2040.

The successful bid for funding from the Defra Air Quality Grant Scheme 2022/23 to establish a real time monitoring network across Worcestershire has provided particulate monitoring in the borough for the first time. Two low-cost real time air quality monitors offering publicly accessible real time monitoring data were deployed within Redditch Borough in 2024.

The sensors, known as '[Zephyrs](#)' provide data on a range of pollutants including PM₁, PM_{2.5} and PM₁₀. Graphical results for 2024 are shown in the appendices and PM_{2.5} averages for 2024 are summarised in table below:

¹ Defra. Air Quality Strategy – Framework for Local Authority Delivery, August 2023

Location	2024 average PM _{2.5} (µg/m ³)	Installation
Meadowhill Road	6.97	January 2024
Rickyard lane	6.57	January 2024

These low-cost sensors have been certified as suitable for indicative monitoring for particulate matter within the UK using the Environment Agency's Indicative instrument certification scheme (MCERTS). However, the following advice from Defra is acknowledged: 'While low-cost sensors can provide useful indicative data, at present they are not approved for use in statutory legal reporting (LAQM) of data against the National air quality objectives as they are not accurate enough to meet the expanded uncertainty requirements of equivalent [scientific reference] instruments.'

The measured data from the low-cost sensor network and Defra background pollution maps indicate that PM_{2.5} concentrations within the Bromsgrove District are well below the interim and legally binding targets set out in the Air Quality Strategy (England) 2023:

Pollutant and Metric	Target	Target Year
PM_{2.5} annual mean concentration	Interim target: 12µg/m ³	2028
PM_{2.5} annual mean concentration	Legally binding target: 10µg/m ³	2040

WRS has reviewed the fraction of mortality attributable to particulate air pollution published by the Department of Health & Social Care. The estimated fraction of mortality attributable to particulate air pollution in 2023 (most recent year available) was 4.6%. This is below the national figure for England (5.2% in 2023) and the Bromsgrove figure is lower than the West Midlands figure (5.1% for 2023).

[Fingertips | Department of Health and Social Care](#)

More information on the Public Health Outcomes Frameworks that examines indicators that help to understand the trends in public health can be found at [Public Health Outcomes Framework - OHID \(phe.org.uk\)](#)

There are currently no declared smoke control areas operating within the Redditch Borough. More information, maps, and guides on the types of fuels that can be used can be found at:

[Smoke Control Areas | Worcestershire Regulatory Services \(worcsregservices.gov.uk\)](https://www.worcsregservices.gov.uk)

WRS hold 17 records of complaints of nuisance from smoke in the Redditch Borough District in 2024, most of which relate to bonfires or burning of other waste or other enquires. None of the records of complaints are attributable to wood burning stoves in residential developments.

In light of the above no additional actions are currently planned by Redditch Borough Council in relation to the reduction of PM_{2.5} levels. However, it is anticipated that any actions taken to improve NO₂ levels across the region will likely result in a linked improvement in PM_{2.5} levels.

3 Air Quality Monitoring Data and Comparison with Air Quality Objectives and National Compliance

This section sets out the monitoring undertaken within 2024 by Redditch Borough Council and how it compares with the relevant air quality objectives. In addition, monitoring results are presented for a five-year period between 2020 and 2024 to allow monitoring trends to be identified and discussed.

3.1 Summary of Monitoring Undertaken

3.1.1 Automatic Monitoring Sites

No automatic (continuous) monitoring that are recognised by Defra for measuring against ambient air quality directives was undertaken within the Redditch Borough Council area during 2024.

3.1.2 Non-Automatic Monitoring Sites

Redditch Borough Council undertook non- automatic (i.e. passive) monitoring of NO₂ at 5 sites during 2024. Table A.1 in Appendix A presents the details of the non-automatic sites.

Maps showing the location of the monitoring sites are provided in Appendix D. Further details on Quality Assurance/Quality Control (QA/QC) for the diffusion tubes, including bias adjustments and any other adjustments applied (e.g. annualisation and/or distance correction), are included in Appendix C.

3.2 Individual Pollutants

The air quality monitoring results presented in this section are, where relevant, adjusted for bias, annualisation (where the annual mean data capture is below 75% and greater than 25%), and distance correction. Further details on adjustments are provided in Appendix C.

3.2.1 Nitrogen Dioxide (NO₂)

Table A.1 and Table A.2 in Appendix A compare the ratified and adjusted monitored NO₂ annual mean concentrations for the past five years with the air quality objective of

40µg/m³. Note that the concentration data presented represents the concentration at the location of the monitoring site, following the application of bias adjustment and annualisation, as required (i.e. the values are exclusive of any consideration to fall-off with distance adjustment).

For diffusion tubes, the full 2024 dataset of monthly mean values is provided in Appendix B. Note that the concentration data presented in Table B.1 includes distance corrected values, only where relevant.

Monitoring results within the Redditch Borough area demonstrate that there were no exceedances of the NO₂ air quality objective of 40µg/m³ in 2024. There has not been a discernible trend within the data: three of the monitoring sites demonstrated an increase from 2023 to 2024 and the other two monitoring sites show a decrease.

The largest increase was 2.4µg/m³ which was recorded at OR1, this saw a rise from 26.6µg/m³ to 29.0µg/m³ which represents a 9.2% increase.

The largest decrease of 13.1µg/m³ was recorded at location SS, 7 Summer Street, Redditch with concentrations reducing from 28.0µg/m³ to 14.9µg/m³. This represents a decrease of 46.7%. This substantial decrease is unknown, however it has been noted and will continue to be monitored and reported on in 2026.

The lowest concentration was 10.5µg/m³ recorded at STOR, 18 Washford Lane. All concentrations are on average 43.9% below the annual mean objective of 40µg/m³.

The monitoring network had no new monitoring sites added in 2024. Diffusion tubes OR4 and OR6 were removed. However, it should be noted that diffusion tubes OR4, OR5 and OR6 were a triplicate location (Misty Florist, Other Road); meaning they were averaged, and bias adjusted and resulted in one NO₂ concentration figure. Therefore, the number of concentration figures received has not changed. Additional tubes were added to the monitoring network at the beginning 2025 and these results will be reported on in the next ASR.

No annual means greater than 60µg/m³ have been recorded indicating it is extremely unlikely that there have been any exceedances of the 1-hour mean objective for NO₂ at any monitoring sites. The 60µg/m³ value is a surrogate figure to indicate exceedances of the 1-hour objective based on annual average conditions. The concentrations recorded across the district in 2024 are on average 62.6% below the surrogate figure.

3.2.2 Particulate Matter (PM₁₀)

There were no automatic PM₁₀ monitoring stations within the Redditch Borough in 2024 that were recognised by Defra for measuring against ambient air quality directives.

3.2.3 Particulate Matter (PM_{2.5})

There were no PM_{2.5} monitoring stations within the Redditch Borough in 2024 that were recognised by Defra for measuring against ambient air quality directives.

3.2.4 Sulphur Dioxide (SO₂)

SO₂ is not monitored within the Redditch Borough area.

Appendix A: Monitoring Results

Table A.1 – Details of Non-Automatic Monitoring Sites

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) ⁽¹⁾	Distance to kerb of nearest road (m) ⁽²⁾	Tube Co-located with a Continuous Analyser?	Tube Height (m)
OR1	Other Road Street	Roadside	404599	267542	NO ₂	NO	3.0	1.5	No	2.4
OR2	14 Other Road	Roadside	404620	267495	NO ₂	NO	0.0	3.0	No	2.1
OR5 (29N)	Other Road Misty Florist	Roadside	404629	267467	NO ₂	NO	0.0	4.0	No	2.0
SS	7 Summer Street	Suburban	404376	267242	NO ₂	NO	0.0	2.6	No	2.0
STOR	Lampost 18 Washford Lane	Urban Background	406603	265783	NO ₂	NO	14.6	0.8	No	2.2

Notes:

(1) 0m if the monitoring site is at a location of exposure (e.g. installed on the façade of a residential property).

(2) N/A if not applicable.

Table A.2 – Annual Mean NO₂ Monitoring Results: Non-Automatic Monitoring (µg/m³)

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2024 (%) ⁽²⁾	2020	2021	2022	2023	2024
OR1	404599	267542	Roadside	100.0	100.0	26.1	26.3	28.6	26.6	29.0
OR2	404620	267495	Roadside	100.0	100.0	24.4	28.8	33.1	29.5	30.1
OR5 (29N)	404629	267467	Roadside	100.0	100.0	23.0	28.0	30.3	28.0	27.7
SS	404376	267242	Suburban	100.0	100.0	23.0	28.0	30.3	28.0	14.9
STOR	406603	265783	Urban Background	100.0	100.0	8.9	9.3	11.6	9.8	10.5

☒ Annualisation has been conducted where data capture is <75% and >25% in line with LAQM.TG22.

☒ Diffusion tube data has been bias adjusted.

☒ Reported concentrations are those at the location of the monitoring site (bias adjusted and annualised, as required), i.e. prior to any fall-off with distance correction.

Notes:

The annual mean concentrations are presented as µg/m³.

Exceedances of the NO₂ annual mean objective of 40µg/m³ are shown in **bold**.

NO₂ annual means exceeding 60µg/m³, indicating a potential exceedance of the NO₂ 1-hour mean objective are shown in **bold and underlined**.

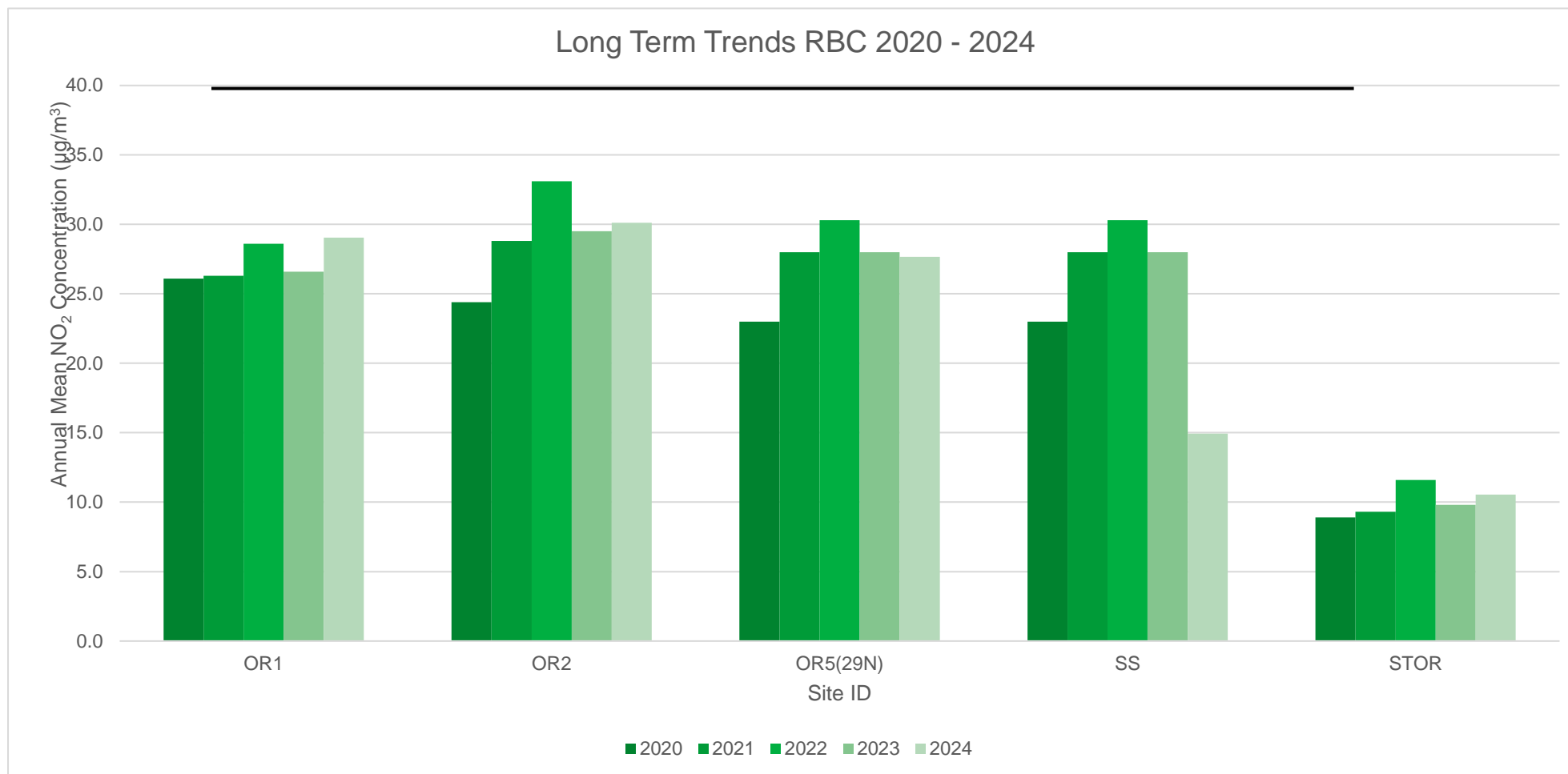
Means for diffusion tubes have been corrected for bias. All means have been “annualised” as per LAQM.TG22 if valid data capture for the full calendar year is less than 75%. See Appendix C for details.

Concentrations are those at the location of monitoring and not those following any fall-off with distance adjustment.

(1) Data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.

(2) Data capture for the full calendar year (e.g. if monitoring was carried out for 6 months, the maximum data capture for the full calendar year is 50%).

Figure A.1 – Trends in Annual Mean NO₂ Concentrations



Appendix B: Full Monthly Diffusion Tube Results for 2024

Table B.1 – NO₂ 2024 Diffusion Tube Results (µg/m³)

DT ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean: Raw Data	Annual Mean: Annualised and Bias Adjusted <(1.03)>	Annual Mean: Distance Corrected to Nearest Exposure	Comment
OR1	404599	267542	32.1	31.2	29.4	27.0	28.7	22.9	25.5	24.2	26.7	31.3	32.3	26.9	28.2	29.0		
OR2	404620	267495	33.8	32.8	30.6	27.7	33.5	24.7	27.5	23.3	28.4	34.4	27.7	26.4	29.2	30.1		
OR5 (29N)	404629	267467	32.3	28.3	25.7	27.5	29.4	22.2	23.3	22.2	32.6	30.6	22.3	25.4	26.8	27.7		
SS	404376	267242	15.6	17.0	14.2	12.1	13.9	9.2	11.0	10.2	13.0	16.9	23.2	17.6	14.5	14.9		
STOR	406603	265783	18.0	13.0	9.9	6.8	8.1	5.9	7.0	7.0	8.0	10.7	15.3	13.2	10.2	10.5		

- ☒ All erroneous data has been removed from the NO₂ diffusion tube dataset presented in Table B.1.
- ☒ Annualisation has been conducted where data capture is <75% and >25% in line with LAQM.TG22.
- ☒ Local bias adjustment factor used.
- ☐ National bias adjustment factor used.
- ☒ Where applicable, data has been distance corrected for relevant exposure in the final column.
- ☒ Redditch Borough Council confirm that all 2024 diffusion tube data has been uploaded to the Diffusion Tube Data Entry System.

Notes:

Exceedances of the NO₂ annual mean objective of 40µg/m³ are shown in **bold**.

NO₂ annual means exceeding 60µg/m³, indicating a potential exceedance of the NO₂ 1-hour mean objective are shown in **bold and underlined**.

See Appendix C for details on bias adjustment and annualisation.

Appendix C: Supporting Technical Information / Air Quality Monitoring Data QA/QC

New or Changed Sources Identified Within Redditch Borough Council During 2024

Applications for several new developments have been identified within the Redditch Borough area. The proposals have been assessed as part of the planning process and are not expected to have a significant impact on local air quality should they become operational.

Details of applications for significant developments received by Redditch Borough Council in 2024 are as follows:

Planning Ref	Address	Proposal
24/02570/PLAN	Brockhill East Hewell Road Redditch	Reserved matters approval (appearance, landscaping, layout and scale) for the construction of 241 dwellings and associated works and infrastructure, pursuant to the outline planning permissions 19/00976/HYB and 19/00977/HYB (Cross boundary application with Redditch BC 24/00083/REM)
24/11538/PLAN	Crumpfields Lane Redditch Worcestershire	Air quality assessment for a proposed residential development located on land at Webheath, Redditch

Additional Air Quality Works Undertaken by Redditch Borough Council During 2024

Redditch Borough Council has not completed any additional works within the reporting year of 2024.

QA/QC of Diffusion Tube Monitoring

The following UKAS accredited company provided Redditch Borough Council with nitrogen dioxide tubes and analysis in 2024:

Gradko International Limited

St Martins House

77 Wales Street

Winchester

SO23 0RH

diffusion@gradko.com

The 20% Triethanolamine (TEA)/ De-ionised Water preparation method is used.

Gradko International Limited participate in the AIR NO₂ Proficiency Testing Scheme (AIR-PT).

All monitoring undertaken has been completed in accordance with the 2024 Diffusion Tube Monitoring Calendar, i.e. on or within \pm days of the specified date.

Diffusion Tube Annualisation

All diffusion tube monitoring locations within Redditch Borough Council recorded data capture of 75% therefore it was not required to annualise any monitoring data. In addition, any sites with a data capture below 25% do not require annualisation.

Diffusion Tube Bias Adjustment Factors

The diffusion tube data presented within the 2024 ASR have been corrected for bias using an adjustment factor. Bias represents the overall tendency of the diffusion tubes to under or over-read relative to the reference chemiluminescence analyser. LAQM.TG22 provides

guidance with regard to the application of a bias adjustment factor to correct diffusion tube monitoring. Triplicate co-location studies can be used to determine a local bias factor based on the comparison of diffusion tube results with data taken from NO_x/NO₂ continuous analysers. Alternatively, the national database of diffusion tube co-location surveys provides bias factors for the relevant laboratory and preparation method.

Redditch Borough Council have used a local bias adjustment factor of 1.03 to the 2024 monitoring data, this has been calculated using the 'Diffusion Tube Data Processing Tool spreadsheet'. The calculation details have also been provided in 'Table C.3 – Local Bias Adjustment Calculation'.

WRS has determined the appropriate local bias adjustment factor utilising the Diffusion Tube Data Processing Tool v5.3. The site used was the colocation study at Wyre Forest House, Kidderminster which is the head office for WRS. The installation is collocated with three diffusion tubes and is largely run and managed for the purpose of undertaking a local bias adjustment factor for the county. WRS are responsible for maintaining the monitoring network across the six-district councils within Worcestershire and therefore the handling and processing of the diffusion tubes is the same for each area.

The local bias adjustment factor has been utilised again for this assessment as it is more conservative compared with the national bias adjustment factor (0.84, Defra published National Diffusion Tube Bias Adjustment Spreadsheet Version 04/25). This approach is consistent with the previous two ASRs and undertaken, following consultation with Defra LAQM helpdesk and technical guidance.

A summary of bias adjustment factors used by Redditch Borough Council over the past five years is presented in Table C.2.

Table C.1 – Bias Adjustment Factor

Monitoring Year	Local or National	If National, Version of National Spreadsheet	Adjustment Factor
2024	Local	-	1.03
2023	Local	-	0.96
2022	Local	-	0.97
2021	National	03/22	0.84
2020	National	03/21	0.81

Table C.2 – Local Bias Adjustment Calculation

	Local Bias Adjustment Input 1	Local Bias Adjustment Input 2	Local Bias Adjustment Input 3	Local Bias Adjustment Input 4	Local Bias Adjustment Input 5
Periods used to calculate bias	12				
Bias Factor A	1.03 (0.97 – 1.08)				
Bias Factor B	-3% (-8% - 3%)				
Diffusion Tube Mean ($\mu\text{g}/\text{m}^3$)	11.8				
Mean CV (Precision)	2.8%				
Automatic Mean ($\mu\text{g}/\text{m}^3$)	12.1				
Data Capture	97%				
Adjusted Tube Mean ($\mu\text{g}/\text{m}^3$)	12 (11 – 13)				

Notes:

A single local bias adjustment factor has been used to bias adjust the 2024 diffusion tube results.

NO₂ Fall-off with Distance from the Road

Wherever possible, monitoring locations are representative of exposure. However, where this is not possible, the NO₂ concentration at the nearest location relevant for exposure has been estimated using the Diffusion Tube Data Processing Tool/NO₂ fall-off with distance calculator available on the LAQM Support website. Where appropriate, non-automatic annual mean NO₂ concentrations corrected for distance are presented in Table B.1.

No diffusion tube NO₂ monitoring locations within the Redditch Borough area required distance correction during 2024.

QA/QC of Automatic Monitoring

No automatic monitoring has been undertaken.

Appendix D: Map(s) of Monitoring Locations and AQMAs

Figure D.1 – Map of Non-Automatic Monitoring Site



Figure D.1a: Redditch monitoring locations: OR1, OR2, OR5

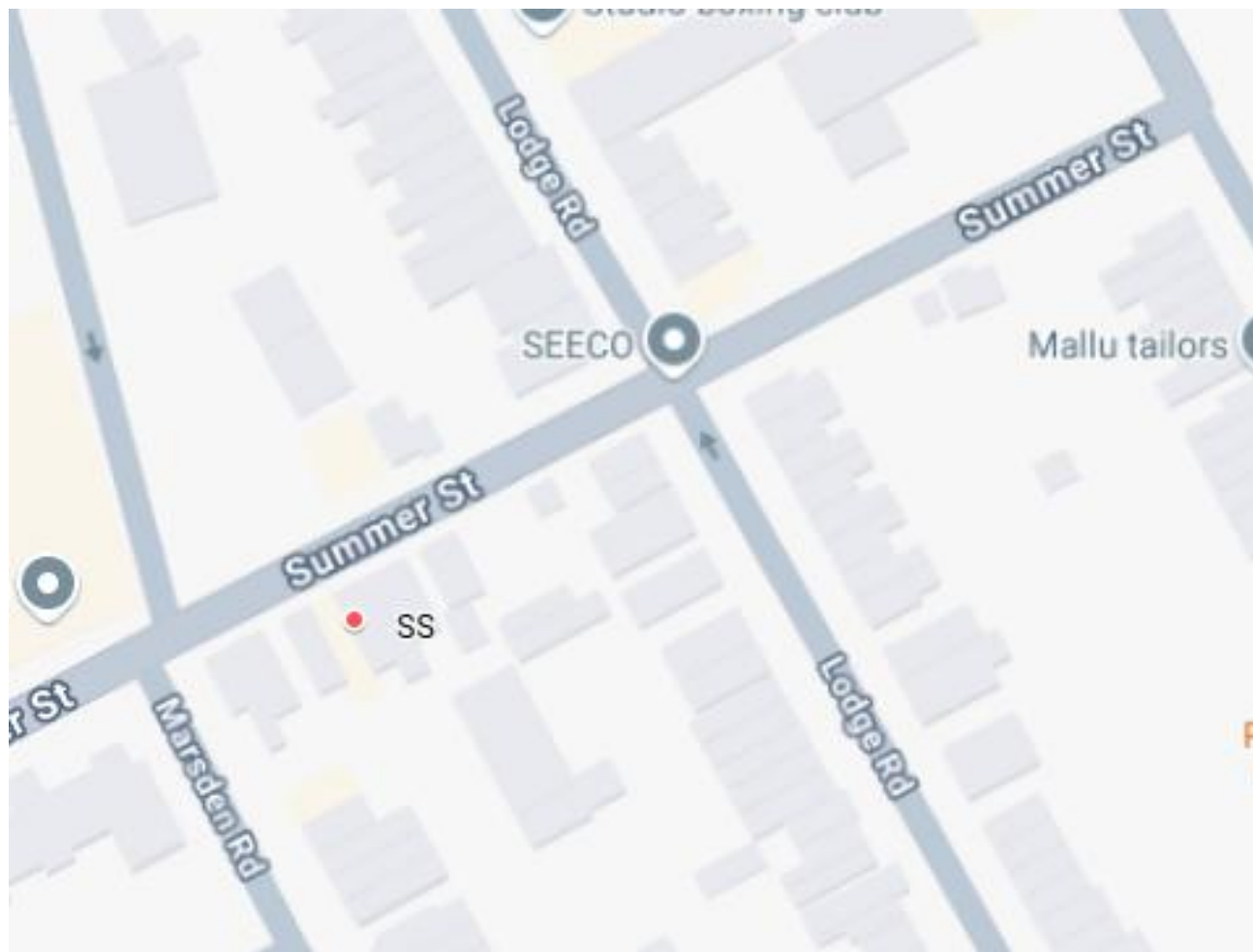


Figure D.1b: Redditch monitoring location: SS



Figure D.1c: Redditch monitoring location: STOR

Appendix E: Summary of Air Quality Objectives in England

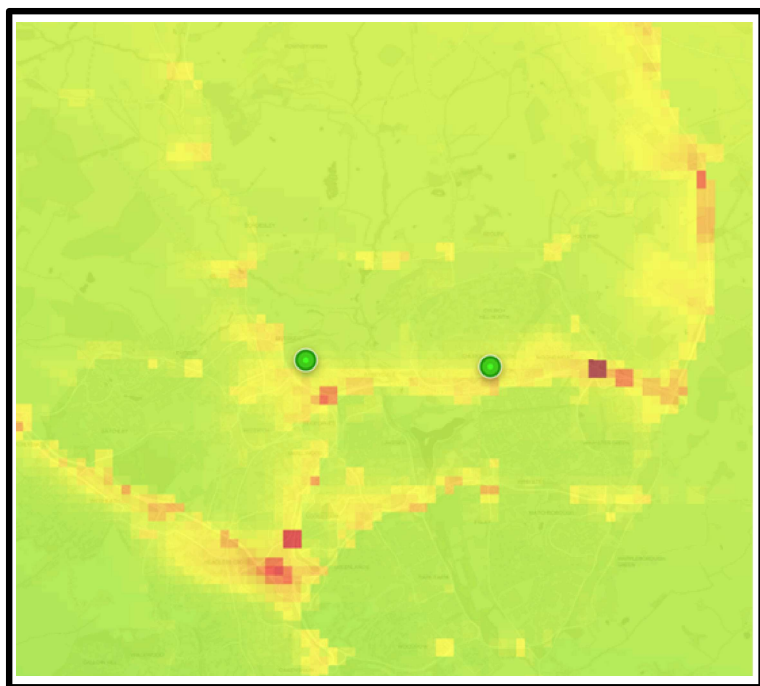
Table E.1 – Air Quality Objectives in England²

Pollutant	Air Quality Objective: Concentration	Air Quality Objective: Measured as
Nitrogen Dioxide (NO ₂)	200µg/m ³ not to be exceeded more than 18 times a year	1-hour mean
Nitrogen Dioxide (NO ₂)	40µg/m ³	Annual mean
Particulate Matter (PM ₁₀)	50µg/m ³ , not to be exceeded more than 35 times a year	24-hour mean
Particulate Matter (PM ₁₀)	40µg/m ³	Annual mean
Sulphur Dioxide (SO ₂)	350µg/m ³ , not to be exceeded more than 24 times a year	1-hour mean
Sulphur Dioxide (SO ₂)	125µg/m ³ , not to be exceeded more than 3 times a year	24-hour mean
Sulphur Dioxide (SO ₂)	266µg/m ³ , not to be exceeded more than 35 times a year	15-minute mean

² The units are in microgrammes of pollutant per cubic metre of air (µg/m³).

Appendix F: Low – Cost Air Quality Sensors Measurements 2024: Redditch

Low-Cost Air Quality Sensors Measurements 2024: Redditch



Public Portal: [Worcestershire Air](#) | [EarthSense](#)

Project Information

Real time air quality monitoring for 3-year period funded by Defra Air Quality Grant (2022-23) and 10% match funding by each Worcestershire district council. Low-cost sensors (Zephyrs) installed and maintained by Earthsense who also provide real time data portal. Sensors were installed between January and May 2024.

General information

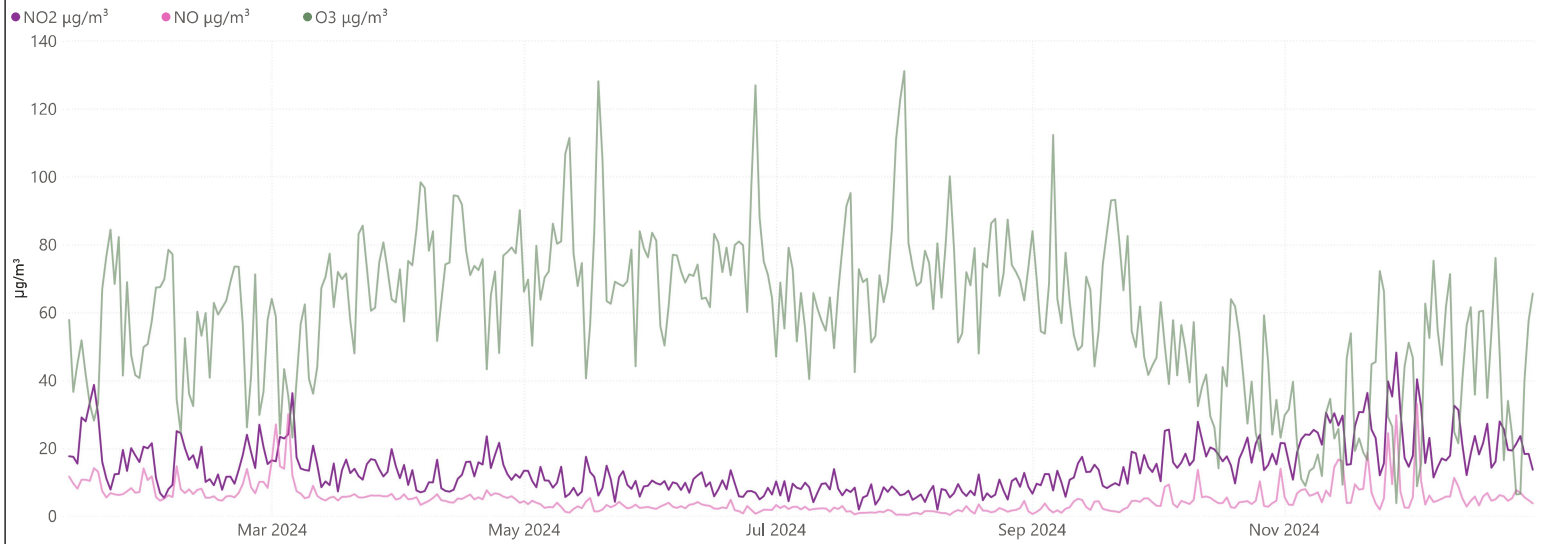
Zephyrs are one of the available low-cost sensors that have been certified as suitable for indicative monitoring for particulate matter within the UK using the Environment Agency's Indicative instrument certification scheme (MCERTS).

While low-cost sensors can provide useful indicative data, at present they are not approved for use in statutory legal reporting (LAQM) of data against the National air quality objectives. as they are not accurate enough to meet the expanded uncertainty requirements of equivalent [scientific reference] instruments. However, Defra recognise there is growing interest in using these sensors among local authorities and are looking into producing a new FAQ on the use of low-cost sensors to make the position clearer.

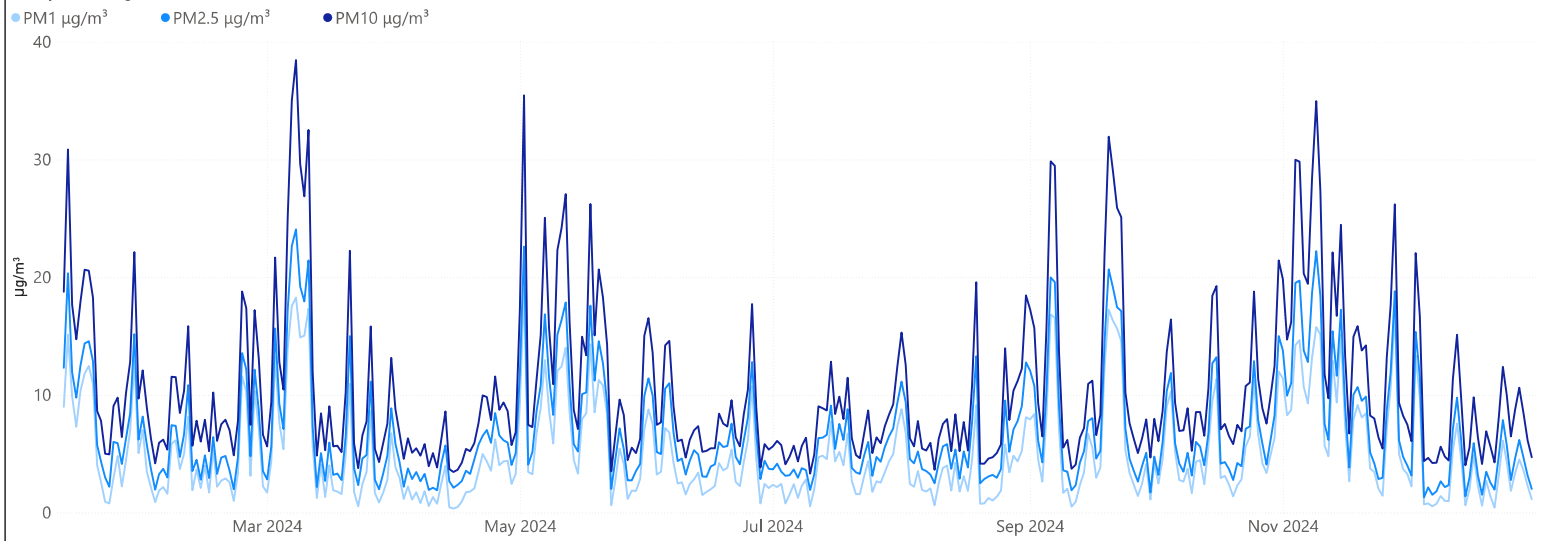
Meadowhill Road - Redditch

Worcestershire
Regulatory Services
Supporting and protecting you

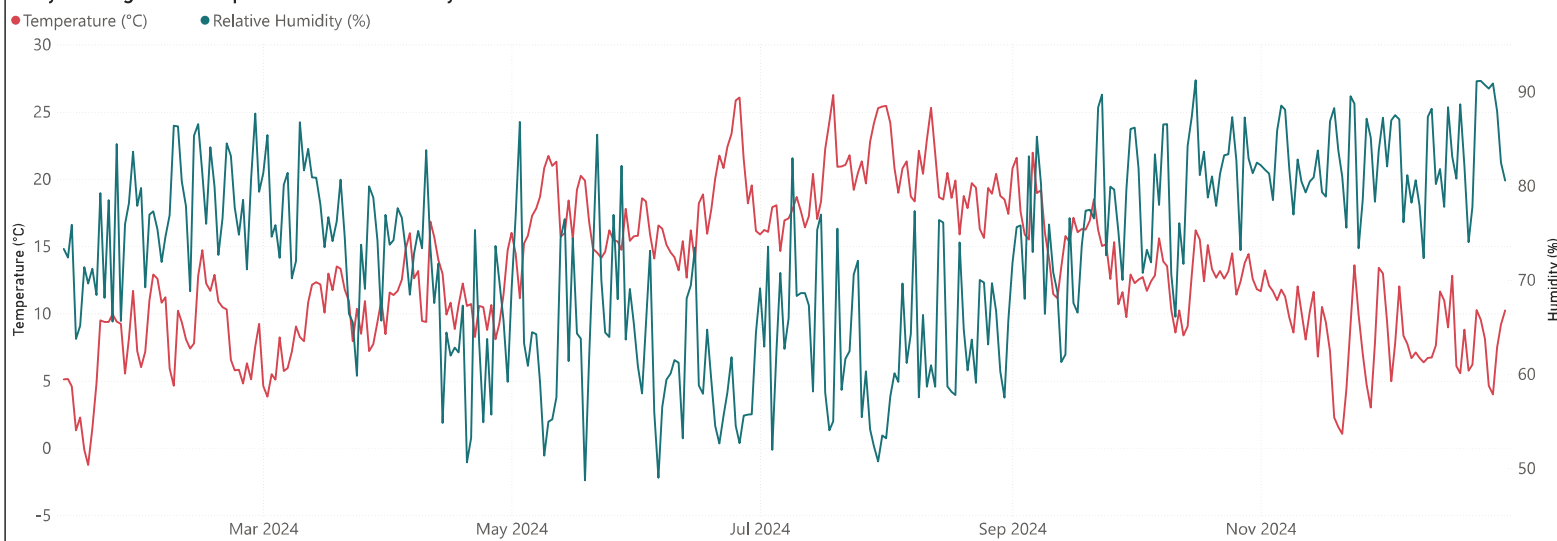
Daily Averages of NO₂, NO and O₃



Daily Averages of PM₁, PM_{2.5} and PM₁₀



Daily Averages of Temperature and Humidity



Yearly Averages

14.32

Average NO₂ µg/m³

5.17

Average NO µg/m³

59.77

Average O₃ µg/m³

13.18

Average Temperature (°C)

5.09

Average PM₁ µg/m³

6.97

Average PM_{2.5} µg/m³

10.57

Average PM₁₀ µg/m³

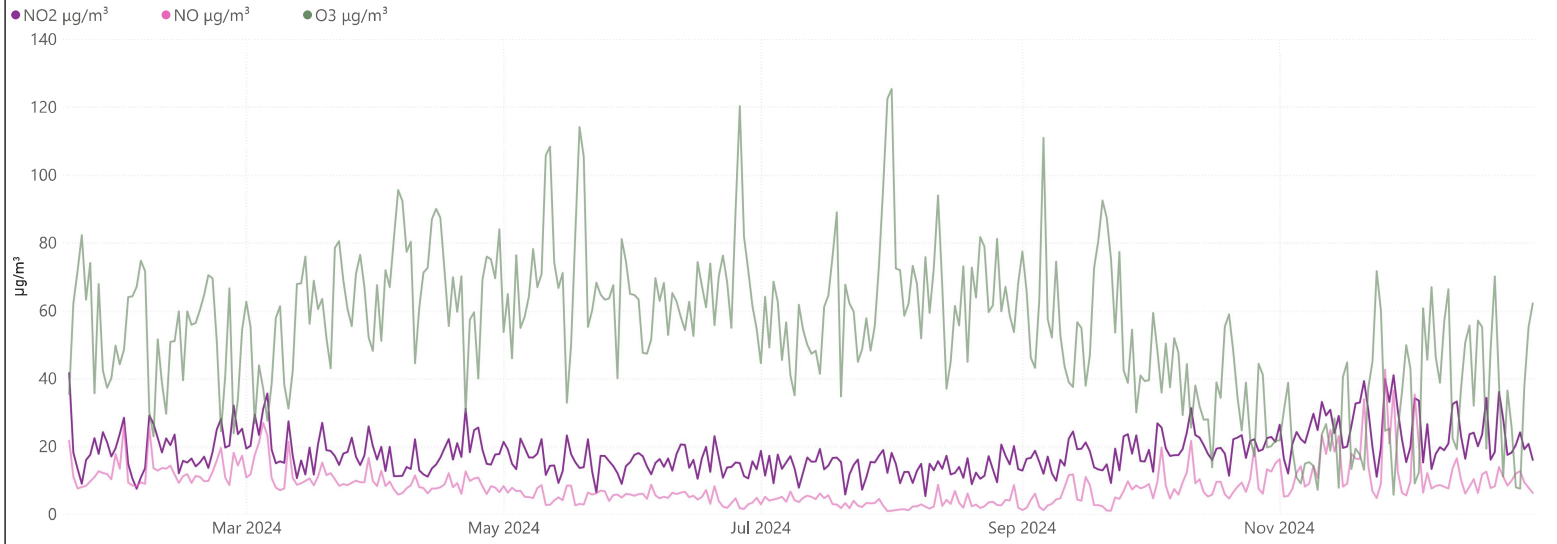
72.52

Average Relative Humidity (%)

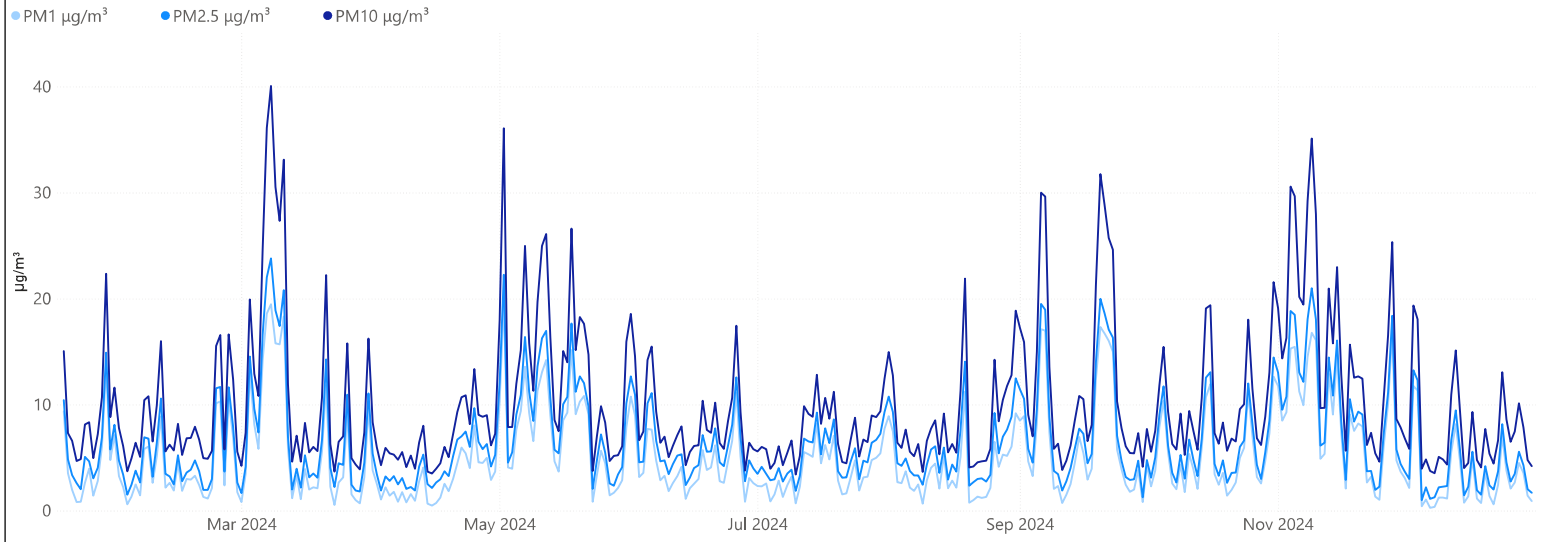
Rickyard Lane - Redditch

Worcestershire
Regulatory Services
Supporting and protecting you

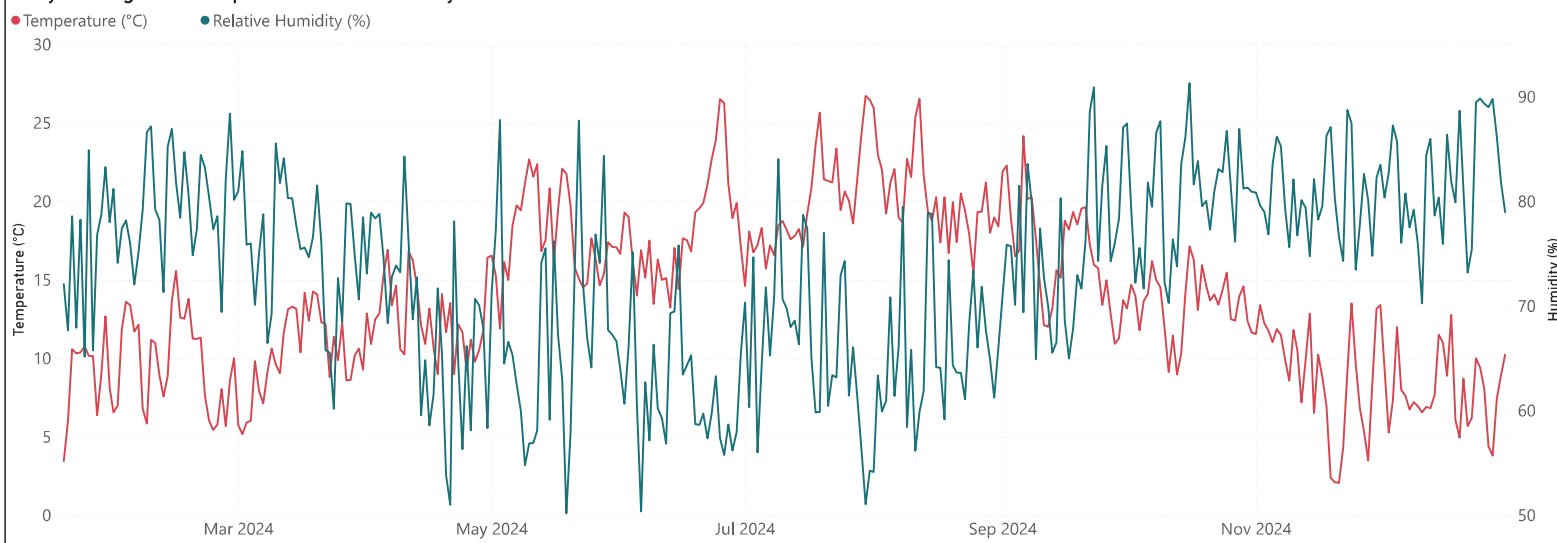
Daily Averages of NO₂, NO and O₃



Daily Averages of PM₁, PM_{2.5} and PM₁₀



Daily Averages of Temperature and Humidity



Yearly Averages

18.31

Average NO₂ µg/m³

8.55

Average NO µg/m³

54.48

Average O₃ µg/m³

14.03

Average Temperature (°C)

5.16

Average PM₁ µg/m³

6.57

Average PM_{2.5} µg/m³

10.21

Average PM₁₀ µg/m³

73.17

Average Relative Humidity (%)

Glossary of Terms

Abbreviation	Description
AQAP	Air Quality Action Plan - A detailed description of measures, outcomes, achievement dates and implementation methods, showing how the local authority intends to achieve air quality limit values'
AQMA	Air Quality Management Area – An area where air pollutant concentrations exceed / are likely to exceed the relevant air quality objectives. AQMAs are declared for specific pollutants and objectives
ASR	Annual Status Report
Defra	Department for Environment, Food and Rural Affairs
DMRB	Design Manual for Roads and Bridges – Air quality screening tool produced by National Highways
LAQM	Local Air Quality Management
NO ₂	Nitrogen Dioxide
NO _x	Nitrogen Oxides
PM ₁₀	Airborne particulate matter with an aerodynamic diameter of 10µm or less
PM _{2.5}	Airborne particulate matter with an aerodynamic diameter of 2.5µm or less
QA/QC	Quality Assurance and Quality Control
SO ₂	Sulphur Dioxide

References

- Local Air Quality Management Technical Guidance LAQM.TG22. August 2022. Published by Defra in partnership with the Scottish Government, Welsh Assembly Government and Department of the Environment Northern Ireland.
- Local Air Quality Management Policy Guidance LAQM.PG22. August 2022. Published by Defra in partnership with the Scottish Government, Welsh Assembly Government and Department of the Environment Northern Ireland.
- Chemical hazards and poisons report: Issue 28. June 2022. Published by UK Health Security Agency
- Air Quality Strategy – Framework for Local Authority Delivery. August 2023. Published by Defra.
- Worcestershire Regulatory Services (2024) Air Quality Annual Status Report for Redditch Borough Council.