Bromsgrove District Council
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Worcestershire Regulatory Services
Supporting and protecting you

2023 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

June 2023

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Executive Summary: Air Quality in Our Area

Air Quality in Bromsgrove District Council

Air pollution is associated with a number of adverse health impacts. It is recognised as a contributing factor in the onset of heart disease and cancer. Additionally, air pollution particularly affects the most vulnerable in society: children, the elderly, and those with existing heart and lung conditions. There is also often a strong correlation with equalities issues because areas with poor air quality are also often less affluent areas[1,2].

The mortality burden of air pollution within the UK is equivalent to 29,000 to 43,000 deaths at typical ages[3], with a total estimated healthcare cost to the NHS and social care of £157 million in 2017[4].

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

There are currently three Air Quality Management Areas (AQMA's) within the Bromsgrove District declared for exceedances of the annual mean objective for nitrogen dioxide (NO_2). The Kidderminster Road, Hagley AQMA was revoked in 2018 following a detailed review which identified no significant exceedances of the national objectives in over five years with measured concentrations being well below the objective and not likely to be breached in future years.

The existing AQMAs are as follows:

- Lickey End, Bromsgrove AQMA declared 26th July 2001
- Redditch Road, Bromsgrove AMQA declared 17th February 2010
- Worcester Road, Bromsgrove AQMA declared 24th October 2011

[1] Public Health England. Air Quality: A Briefing for Directors of Public Health, 2017

[2] Defra. Air quality and social deprivation in the UK: an environmental inequalities analysis, 2006

[3] Defra. Air quality appraisal: damage cost guidance, January 2023

[4] Public Health England. Estimation of costs to the NHS and social care due to the health impacts of air pollution: summary report, May 2018

Details of declaration and plans of the AQMAs can be found on the following pages of the WRS website: Air Quality Management Area Declarations | Worcestershire Regulatory Services (worcsregservices.gov.uk)

No exceedances of the annual mean objective for nitrogen dioxide have been recorded in the Bromsgrove District during the 2022 monitoring year. It is possible that the effects of the Covid pandemic are still impacting the data as some restrictions were still in pace in the early part of 2022. No exceedances of the objective have been recorded in previous years 2020 and 2021 due to the effects of the pandemic and subsequent lockdowns. The last exceedances were recorded in 2019. Increases in NO_2, however, have been recorded at all locations across the district in 2022 compared to 2021, except for location '6 that was subject to annualisation due to poor data capture, and this therefore adds uncertainty regarding the accuracy of the result. An average increase of approximately 11% can be seen across all monitoring locations from 2021 to 2022. The largest increase of 6.5µg/m^3 was recorded at LIK1 within the Lickey End AQMA that saw a rise from 22.3µg/m^3 to 28.8µg/m^3 which represents a 29.1% increase at that location.

The highest concentration of NO_2 recorded across the monitoring network in 2022 was 37.4µg/m^3 at location BC, Ye Olde Black Cross, 70 Worcester Road. This concentration is 6.5% below the annual mean objective for NO_2. This site is located within the Worcester Road, AQMA.

Concentrations within all other AQMAs were well below the objective in 2022. The highest concentration recorded within the Redditch Road AQMA was 26.4µg/m^3 at locations HR and 19. This is 34% below the annual objective. Within the Lickey End AQMA the highest concentration was 32.4µg/m^3 at diffusion tube LE4. This is 19% below the objective.

No exceedances were recorded within the revoked Kidderminster Road, Hagley AQMA with a highest concentration of 23.9µg/m^3 recorded at RES2 within the former AQMA boundary area. This is 40.25% below the objective. Concentrations have been well below the objective since the AQMA was revoked with the last exceedance of 40.2µg/m^3 being recorded in 2013. Following revocation of the AQMA four new monitoring locations were established in May 2018 further to the south along Worcester Road, West Hagley, which had been highlighted as a potential concern.

Following annualisation of 2018 results a concentration of 47µg/m^3 was recorded at one of the new locations, HAG3, however there was a high level of uncertainty associated with the result as it was based upon only 7 months data. The 2019 result provided a full years' dataset with a value of 33.7µg/m^3 recorded at this location. Two new monitoring locations**,** HAG5 and HAG6, were established in the vicinity of HAG3 for the 2020 period to provide additional coverage in respect of air quality concentrations in the area. In 2022 a concentration of 31.8µg/m^3 was recorded at HAG3 and 35.8µg/m^3 at HAG5. It should be noted that HAG5 is located some distance away from residential exposure (approximately 7.3m). Concentrations therefore remain well below the objective within this area.

The monitoring network remained unchanged for the 2022 monitoring year with no new locations added and none removed. A full rationalisation of the diffusion network is programmed in for the autumn 2023. Concentrations from 2022 represent an increase to those recorded in 2020 and 2021 but are generally still lower than pre-pandemic levels recorded in 2018 and 2019.

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.

The Environmental Improvement Plan[5] sets out actions that will drive continued improvements to air quality and to meet the new national interim and long-term $PM_{2.5}$ targets. The National Air Quality Strategy, published in April 2023, will provide more information on local authorities' responsibilities to work towards these new targets and reduce $PM_{2.5}$ in their areas. The Road to Zero[6] details the approach to reduce exhaust emissions from road transport through a number of mechanisms; this is extremely important given that the majority of Air Quality Management Areas (AQMAs) are designated due to elevated concentrations heavily influenced by transport emissions.

A number of actions have been taken forward to improve air quality in the Bromsgrove area, both historically and ongoing. Information relating to the various actions is set out below.

In 2013, WRS produced a countywide Air Quality Action Plan (AQAP) for Worcestershire. WRS have produced two updates to the AQAP, the last in 2016. For details of the progress of those measures at that time, please refer to the 'Air Quality Action Plan Progress Report for Worcestershire April 2015-2016'. A copy of this, the previous update, and the AQAP, is available to view or download at: Bromsgrove District Council | Worcestershire Regulatory Services (worcsregservices.gov.uk)

Air Quality Actions Plan and Air Quality Strategy

A new Air Quality Action Plan is required for Worcestershire in accordance with the Environment Act 2021 and revised guidance published in August 2022 (LAQM.TG22 and PG22). In 2020 the COVID19 pandemic, unfortunately, led to the suspension of previous district air quality working groups and public health action groups programmes. In September 2022, WRS began discussions with Worcestershire County Council colleagues with a view to forming a new Steering Group and

[5] Defra. Environmental Improvement Plan 2023, January 2023

[6] DfT. The Road to Zero: Next steps towards cleaner road transport and delivering our Industrial Strategy, July 2018

producing a new plan of actions to improve air quality across the County, to comply with recent legislative changes.

The group membership has expanded considerably at the beginning of 2023 and is currently progressing a programme of works, outlined below, which will be reported on in the next ASR (2024). The group currently comprises officers from the County and District authorities from public health, air quality, strategic planning, highways, and representatives from the NHS.

The Action Plan will also incorporate an improving Air Quality Strategy, applicable across the whole County including areas outside of AQMAs, in accordance with the updated legislation and guidance.

The first step in action planning is to determine the contribution of sources of air pollution (source apportionment) to inform future actions. The AQMAs within Bromsgrove were declared between 2001 and 2011 and therefore the source apportionment needs to be renewed based on current data to enable development of appropriate actions within the action plan. WRS have completed this phase of source apportionment work for another district of Worcestershire in 2021. The initial Steering Group work is focussed on actions informed by this study in addition to countywide actions applicable to all districts.

Traffic surveys have been undertaken in 2023 to enable source apportionment work to be progressed for the Bromsgrove AQMAs in Spring 2024 when the relevant years' worth of monitoring data will be available in line with technical guidance. It should be noted that source apportionment can not be carried out whilst concentrations are below the objectives which has been the case within the Bromsgrove district since 2020. Consideration will also be given to any AQMAs that can be revoked where WRS are confident that no further exceedances of the objective will occur.

The timeline for the various stages and delivery of the Air Quality Strategy and Action Plan is set out below.

Timeline	Phase
Feb – Dec 2023	Identification of potential overarching Worcestershire County Council actions and Worcester City Council Specific actions, feasibility filter of measures, cost benefit analysis, determination of impact, timelines and funding sources, drafting of countywide action plan
Jan – Mar 2024	Submission of Draft for review by Senior Management Team and approval by Political Committees at Worcester City Council and Worcestershire County Council and revisions
March 2024	Submission of Draft countywide AQAP inc. local AQ strategy and Worcester City Council specific actions to DEFRA
April- June 2024	3-month Public Consultation on Draft countywide AQAP following revisions
July - Sept 2024	Revisions and finalisation of countywide AQAP inc. local AQ strategy and Worcester City Council specific actions
	Consideration for revocation of AQMAs and source apportionment work for other AQMAs in 1) Bromsgrove DC 2) Wyre Forest DC 3) Wychavon DC

Sept – Oct 2024	Submission of Finalised AQAP for review by Senior Management Team and approval by Political Committees at Worcester City Council and Worcestershire County Council and revisions
Sept 2024 - Mar 2025	AQAPSG work on Bromsgrove DC and Wyre Forest DC specific actions (if required), refresh SG membership with relevant stakeholders. Identification of district specific actions, feasibility filter of measures, cost benefit analysis, determination of impact, timelines and funding sources, and draft update to AQAP. Consultation on additional chapters/amendments
Nov 2024	Publication of Finalised countywide AQAP inc. local AQ strategy & Worcester City chapter and submission to DEFRA
Mar - May 2025	Annual review for any amendments requiring further work.

Real-time Air Quality Monitoring Project

In September 2022 officers from WRS applied to Defra's Air Quality Grant Scheme 2022/23. The scope of the bid was to establish an enhanced real-time air quality monitoring network across the main areas of air quality concern in Worcestershire for the purposes of informing the public and vulnerable groups of the status of air pollution. The scheme would see the installation of approximately 24 low-cost 'Air Quality Monitors' across the county which measure NO_2, PM_{10}, and $PM_{2.5}$ (with EA MCERTS certification of indicative particulate monitors). The results of monitoring would then be used to inform decision making and requirements for further action as necessary.

In February 2023 Defra announced that the WRS bid had been successful and the requested £248,400 was awarded. An additional 10% of funds will also be provided by each district council in Worcestershire, as per the match-funding requirement of the scheme, which equates to £27,600. Giving a grand total of £276,000 for the project.

At the time of writing the project is at the procurement stage, with the tender specification close to completion. Once a successful supplier has been appointed, exact monitoring locations will be agreed, and equipment installed. This is anticipated to be in the latter stages of 2023.

Three monitors are to be deployed within the Bromsgrove District Council area. Locations are currently to be confirmed but are expected to represent worst case conditions in relation to road traffic and any relevant impacts from industry, agriculture and solid fuel burning.

Ultra-Low Emission Taxi Infrastructure Scheme - In 2018 Bromsgrove District Council officers made a bid for funds to help deliver infrastructure to support existing taxi drivers using electrical vehicles and encourage further uptake. The bid was approved in early 2019. The scheme aims to provide a number of electric vehicle charging points for taxis and private hire vehicles equating to a total of £300,000. A ULEV Strategy was produced in 2019 by Bromsgrove District Council to provide a framework for implementation of this project.

In 2020 Bromsgrove District Council appointed a company to install and operate 13 rapid chargers across the district for the next 10 years. The chargers will use 100% renewable energy purchased from UK sources

The ULEV taxi scheme now has seen the installation of 10 rapid chargers. There are 3 more to locate with discussions ongoing due to suitable of sites and issues surrounding land ownership. The project is for a duration of 10 years.

Bromsgrove District Council and Redditch Borough Council Provision of Electric Vehicle Charging Infrastructure – the partnership councils are also progressing a scheme to create a comprehensive network of EV Chargers across both Local Authority areas. This will be a mixture of workplace and destination charging. The scheme will be extended after the initial 12-month period to provide charging within the Council's housing estates via working with their Housing Services teams. The project is currently at the background / pre-construction phase.

The published strategy for ultra-low emission vehicles aims to inform the development of appropriate infrastructure in the area to enable more people to use ultra-low emission vehicles (ULEVs). The document is available at:

Electric vehicles - bromsgrove.gov.uk

Officers from Bromsgrove District Council are also working with Worcestershire County Council to establish a full pipeline of sustainable schemes. To better inform the list of schemes funding has been secured by WCC for a Local Cycling and Walking infrastructure Plan (LCWIP). Planning officers have also requested to be involved in the brief for this work. The Worcestershire Strategic Transport Model is now complete and is being checked for use across Bromsgrove.

Information relating to climate change is also available on Bromsgrove District Council's website via the links below.

Climate emergency - bromsgrove.gov.uk

Carbon Reduction Strategy and Action Plan (bromsgrove.gov.uk)

Worcestershire County Council Highways Department have developed a number of major infrastructure improvement schemes within the district that are at various stages of delivery. These are briefly set out below.

A38 Bromsgrove Route Enhancement Programme (BREP) Major Scheme

The A38 Bromsgrove Route Enhancement Programme (BREP) aims to provide additional highway capacity and promote walking and cycling as an alternative, through a range of improvements along the whole corridor.

Phases 1 and 2 of the scheme have been completed. Phase 3 is understood to be largely agreed with Phase 4 requiring additional funding. Full details of the scheme can be found on the County Council's website below:-

A38 Bromsgrove Route Enhancement Programme (BREP) | Worcestershire County Council

Lickey End (M42 Junction 1) - Major Junction Enhancement Scheme

Scheme comprised widening of both the A38 northbound exit and southbound approaches to the roundabout and a new service road for properties facing the A38 southbound, offering improved access for vehicles. This was completed as part of Phase 1 of the BREP scheme: -

Phase 1 A38 BREP improvements | Worcestershire County Council

Reductions in NO_2 have been seen within the Lickey End AQMA over recent years which previously recorded some of the highest concentrations within the district. It is however unclear at this stage how much is attributable to the improvements and what is down to the impacts from the Covid Pandemic.

Bromsgrove Transport Strategy – This scheme is part of the Strategic Transport Assessment (STA) work which will identify infrastructure and services to support planned development growth. This is part of a Bromsgrove District Council collaborative process between Worcestershire County Council and Bromsgrove District Council. The scheme aims to provide a package of Public Realm Enhancements in Bromsgrove Town Centre and would be integrated with other schemes in the area (such as BREP/A38 and the Strategic Active Travel Investment Programme). The scheme is to provide a comprehensive multimodal review of network efficiency and infrastructure to identify where to focus investment to improve the operation of the local transport network. This would also include a review of Bromsgrove's highway network to explore options to improve and disperse traffic flow to increase efficiency and help AQMA remediation at Worcester Road.

Bromsgrove – Strategic Active Travel Network Investment Programme (Including Catshill, Marlbrook and Lickey End) – National Productivity Fund active travel network to facilitate working and cycling through a network of active travel routes through the town to provide an alternative to vehicular modes, reducing congestion and increasing physical activity. Details of this can be found at:
https://www.worcestershire.gov.uk/info/20055/strategies_plans_and_bids/1417/national_productivity_investment_fund

Improvements delivered during 2022 include a new active travel link from Harvington Road to Charford Road and access to South Bromgrove High School with a signal controlled crossing on Charford Road and New Road.

The Bromsgrove Local Cycling and Walking Infrastructure Plan (LCWIP) secured funding from Active Travel England and are due to be completed in the summer of 2024.

Parkside Junction improvements have been completed with changes to the signing, lining and lane system through this junction, with additional crossing phases for pedestrians and to improve efficiency

Conclusions and Priorities

Currently there are three AQMAs in place within the Bromsgrove District area all declared because of exceedances of the annual mean objective for nitrogen dioxide. The monitoring results from 2022 show there were no exceedances of the annual mean objective at any locations across the district. The highest concentrations of NO_2 recorded was a value of 37.4µg/m^3 at location BC.

In general monitoring results indicated an increase when comparing 2021 to 2022 data. This would be expected when considering the impacts of Covid-19 and subsequent lockdowns in previous years. Data from 2022 suggests trends are returning to pre-pandemic levels but remain slightly below those concentrations. It is difficult to gauge at this stage what is attributable to reductions based on improvements to the vehicular fleet and what is a result of changes to behaviour and whether those changes will be maintained.

Concentrations from 2022 represent an increase to those recorded in 2020 and 2021 but are generally still lower than pre-pandemic levels recorded in 2018 and 2019. No exceedances of the objectives have been recorded in the district since 2019.

Bromsgrove District Council has not identified any significant new sources of air pollution within the area for the reporting year of 2022. A number of planning applications for large developments have been made within the district during 2022. 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 New or Changed Sources Identified Within Bromsgrove District Council area During 2022.

Monitoring, review, and assessment of air quality will continue within the Bromsgrove District area at all existing and former AQMAs and other relevant areas. No changes to existing AQMAs are proposed at this stage. Work will continue with the development of a countywide Air Quality Strategy and Action Plan. Publication of the draft document is anticipated in Spring 2024 with a finalised version later that year following the necessary consultation process. This is to remain a 'live' document that can be added to and revised on a regular basis as things evolve. As part of the source apportionment work required to feed into that process WRS will assess if any of the AQMAs can be revoked.

A real time air quality monitoring network will be set up in the latter part of 2023. This will provide important data in respect of PM_{10} and $PM_{2.5}$ for which monitoring across the county has been very limited previously, as well as NO_2. Realtime information will enable a better understanding of air quality in the district and help quantify the impacts from road traffic and other sources, such as solid fuel burning, agriculture and industry. The system will also provide an alert in the event of poor air quality so that vulnerable groups can be informed and limit their exposure.

A full rationalisation of the diffusion tube monitoring network is also programmed for Autumn 2023. Any new locations will be added and removed as necessary.

Local Engagement and 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 reducing your pollution emissions.
- **Turn off your engine when stationary or parked,** don't 'idle', particularly when parked outside sensitive receptors such as schools, hospitals, care homes and residential properties. This both reduces emissions and saves fuel.
- **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, Skype, Facetime, or other service, rather than driving to meetings. This reduces fuel and other travel costs, vehicle maintenance and hire cost, and 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. Eligible businesses, charities and public sector organisations with off street parking for staff or vehicles fleets can apply for vouchers to redeem costs of electric vehicle charge-points. There is a limit of 1 voucher per applicant; however, applicants with a 'franchise' may apply for up to 20 franchisees. There is an approved charge points list and a list of authorised installers

  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)
- **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)[7,8]. 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/daqi
- If you are on social media, sign up to the WRS Twitter feed. WRS tweet when pollution is forecast by Defra to be moderate to very high.

[7] http://www.breathelondon.org/

[8] https://www.londonair.org.uk/LondonAir/guide/MyActionsForMe.aspx

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)

Local Responsibilities and Commitment

Prior to the pandemic WRS had enjoyed a good working relationship with the County Council's Strategic Transport Team and developed closer working ties with Public Health, Planning and Sustainability colleagues within the County Council. Unfortunately, the COVID-19 pandemic, led to the suspension of existing action groups in 2020 and delayed air quality improvement projects. Additionally, there have been significant personnel turnover within the WRS and County Council teams in the interim period.

As we have emerged from the pandemic during 2022-23, WRS are seeking to re-engage with those teams and new colleagues from the different disciplines that have a role in improving air quality.

This ASR was prepared by Worcestershire Regulatory Services Technical Services Department on behalf of Bromsgrove District Council with the support and agreement of officers from the following organisations:

Worcestershire Regulatory Services

Bromsgrove District Council

Worcestershire County Council

This ASR has been signed off by the Director of Public Health with the following comments:

"We welcome the submission of these reports, continued focus on improving air quality, and installation of new real time air quality monitors which will provide 'information for action' across the system. We recommend inclusion in future reports to recognise ageing population and increasing long term conditions sensitive to poor air quality".

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

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1 Local Air Quality Management

This report provides an overview of air quality in Bromsgrove District Council area during 2022. 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 Bromsgrove District 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.

A summary of AQMAs declared by Bromsgrove District Council can be found in Table 2.1. The table presents a description of the three AQMA that are currently designated within Bromsgrove District Council. Appendix D: Map(s) of Monitoring Locations and AQMAs provides maps of the AQMAs and also the air quality monitoring locations in relation to the AQMAs. The air quality objectives pertinent to the current AQMA designations are as follows:

- NO_2 annual mean objective

Table 2.1 – Declared Air Quality Management Areas

AQMA Name	Date of Declaration	Pollutants and Air Quality Objectives	One Line Description	Is air quality in the AQMA influenced by roads controlled by Highways England?	Level of Exceedance: Declaration	Level of Exceedance: Current Year	Number of Years Compliant with Air Quality Objective	Name and Date of AQAP Publication	Web Link to AQAP
Lickey End, Bromsgrove AQMA	26th July 2001	NO_2 Annual Mean	Residential properties along four roads emanating from the Junction 1 M42	YES	45.7µg/m^3	32.4µg/m^3	3	Air Quality Action Plan for Worcestershire 2013 - currently being renewed	http://www.worcsregservices.gov.uk/pollution/air-quality/air-quality-action-plan.aspx
Redditch Road, Bromsgrove AQMA	17th February 2010	NO_2 Annual Mean	Long stretch of the A38 including a number of residential properties	YES	45.6 µg/m^3	26.4µg/m^3	6		
Worcester Road, Bromsgrove AQMA	24th October 2011	NO_2 Annual Mean	Comprises mainly the B4091 Worcester Road single carriageway southwest of the town centre	NO	56µg/m^3	37.4µg/m^3	4		

☒ **Bromsgrove District Council confirm the information on UK-Air regarding their AQMA(s) is up to date.**

☒ **Bromsgrove District Council confirm that all current AQAPs have been submitted to Defra.**

2.2 Progress and Impact of Measures to address Air Quality in Bromsgrove District 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 progress against Action Plan measures table has still not been updated from 2013 despite feedback from multiple previous appraisals. This is important considering the current AQAP is regarded as being out of date. The Council have stated states that they will continue to review future monitoring data to ascertain whether the AQMAs are still required and whether there is still a need for an AQAP. Even though the Council anticipate the AQMA will continue to remain compliant with the AQOs in future reporting years, it is still strongly recommended that the Council provide an updated AQAP as advised by DEFRA. The AQAP is extremely out of date and many of the measures in Table 2 are now complete. It would be extremely beneficial for the Council to update Table 2 with new measures for future reporting years.

2. Extensive Trend graphs have been provided for all monitoring data, which is commended

3. The Council have provided good mapping of all monitoring locations within the district and included a map clearly showing AQMA boundaries

4. The council is recommended to continue to review their current monitoring regime, specifically the addition of several new non-automatic monitoring sites (diffusion tubes) across the region. This is important as additional sites will help to identify whether there are other key areas of relevant exposure where there may be exceedances and the appropriate measures can be adopted accordingly.

5. The use of the Public Health Outcomes Framework to account for the health effects of PM2.5 is to be commended. The Council is highly encouraged to develop specific measures to address PM2.5 emissions in future reporting years

6. The Council have provided good evidence of local engagement and are commended for the launch of their car sharing website "Lift Share"

7. There are several formatting issues within the report. The text "Error! Reference source not found" appears in several places in the report. For future ASR reports, the council is highly encouraged to download the latest version of the Annual Status Report Template on Defra's Website (https://laqm.defra.gov.uk/air-quality/annual-reporting/annual-status-report-templates-england-exc-london/). This will ensure that any minor formatting issues are removed from future reports.

The above points are noted. In relation to point 1, work is ongoing to produce a new Air Quality Action Plan. Historically new actions have been added into the action table and reported on in the ASR as they have come about such as the EV taxi charging project and BREP scheme which are and will be ongoing for a number of years. In relation to point 4, 44 diffusion tubes are present across the district which represents a significant number. The network will be expanded or reduced as necessary. A full rationalisation of tube locations is programmed for the autumn of 2023. As per point 7, the latest report template has been downloaded and will be scrutinised for any formatting errors.

Bromsgrove District Council has taken forward a number of direct measures during the current reporting year of 2022 in pursuit of improving local air quality. Details of all measures are set out in Table 2.2. Where there have been, or continue to be, barriers restricting the implementation of the measure, these are also presented within Table 2.2.

Some of the key measures are described briefly below:

Air Quality Actions Plan and Air Quality Strategy

A new Air Quality Action Plan is required for Worcestershire in accordance with the Environment Act 2021 and revised guidance published in August 2022 (LAQM.TG22 and PG22). In 2020 the COVID19 pandemic, unfortunately, led to the suspension of previous district air quality working groups and public health action groups programmes. In September 2022, WRS began discussions with Worcestershire County Council colleagues with a view to forming a new Steering Group and producing a new plan of actions to improve air quality across the County, to comply with recent legislative changes.

The group membership has expanded considerably at the beginning of 2023 and is currently progressing a programme of works, outlined below, which will be reported on in the next ASR (2024). The group currently comprises officers from the County and District authorities from public health, air quality, strategic planning, sustainability, highways and transport disciplines, and also representatives from the NHS.

The Action Plan will also incorporate an improving Air Quality Strategy, applicable across the whole County including areas outside of AQMAs, in accordance with the updated legislation and guidance.

The first step in action planning is to determine the contribution of sources of air pollution (source apportionment) to inform future actions. The AQMAs within Bromsgrove were declared between 2001 and 2011 and therefore the source apportionment needs to be renewed based on current data to enable development of appropriate actions within the action plan. WRS have completed this phase of source apportionment work for another district in 2021. The initial Steering Group work is focussed on actions informed by that study in addition to countywide actions applicable to all districts.

Traffic surveys have been undertaken in 2023 to enable source apportionment work to be progressed for the Bromsgrove AQMAs in Spring 2024 when the relevant years' worth of monitoring data will be available in line with technical guidance. It should be noted that source apportionment cannot be carried out whilst concentrations are below the objectives which has been the case within the Bromsgrove district since 2020. Consideration will also be given to any AQMAs that can be revoked where WRS are confident that no further exceedances of the objective will occur.

The timeline for the various stages and delivery of the Air Quality Strategy and Action Plan is set out below.

Timeline	Phase
Feb – Dec 2023	Identification of potential overarching Worcestershire County Council actions and Worcester City Council Specific actions, feasibility filter of measures, cost benefit analysis, determination of impact, timelines and funding sources, drafting of countywide action plan
Jan – Mar 2024	Submission of Draft for review by Senior Management Team and approval by Political Committees at Worcester City Council and Worcestershire County Council and revisions
March 2024	Submission of Draft countywide AQAP inc. local AQ strategy and Worcester City Council specific actions to DEFRA
April- June 2024	3-month Public Consultation on Draft countywide AQAP following revisions
July - Sept 2024	Revisions and finalisation of countywide AQAP inc. local AQ strategy and Worcester City Council specific actions
	Consideration for revocation of AQMAs and source apportionment work for other AQMAs in 1) Bromsgrove DC 2) Wyre Forest DC 3) Wychavon DC
Sept – Oct 2024	Submission of Finalised AQAP for review by Senior Management Team and approval by Political Committees at Worcester City Council and Worcestershire County Council and revisions
Sept 2024 - Mar 2025	AQAPSG work on Bromsgrove DC and Wyre Forest DC specific actions (if required), refresh SG membership with relevant stakeholders. Identification of district specific actions, feasibility filter of measures, cost benefit analysis, determination of impact, timelines and funding sources, and draft update to AQAP. Consultation on additional chapters/amendments
Nov 2024	Publication of Finalised countywide AQAP inc. local AQ strategy & Worcester City chapter and submission to DEFRA
Mar - May 2025	Annual review for any amendments requiring further work.

Real-time Air Quality Monitoring Project

In September 2022 officers from WRS applied to Defra's Air Quality Grant Scheme 2022/23. The scope of the bid was to establish an enhanced real-time air quality monitoring network across the main areas of air quality concern in Worcestershire for the purposes of informing the public and vulnerable groups of the status of air pollution. The scheme would see the installation of approximately 24 low-cost 'Air Quality Monitors' across the county which measure NO_2, PM_{10}, and $PM_{2.5}$ (with EA MCERTS certification of indicative particulate monitors). The results of monitoring would then be used to inform decision making and requirements for further action as necessary.

In February 2023 Defra announced that the WRS bid had been successful and the requested £248,400 was awarded. An additional 10% of funds will also be provided by each district council in Worcestershire, as per the match-funding requirement of the scheme, which equates to £27,600. Giving a grand total of £276,000 for the project.

At the time of writing the project is at the procurement stage, with the tender specification close to completion. Once a successful supplier has been appointed, exact monitoring locations will be agreed, and equipment installed. This is anticipated to be in the latter stages of 2023.

Three monitors are to be deployed within the Bromsgrove District Council area. Locations are currently to be confirmed but are expected to represent worst case conditions in relation to road traffic and any relevant impacts from industry, agriculture and solid fuel burning.

Ultra-Low Emission Taxi Infrastructure Scheme - In 2018 Bromsgrove District Council officers made a bid for funds to help deliver infrastructure to support existing taxi drivers using electrical vehicles and encourage further uptake. The bid was approved in early 2019. The scheme aims to provide a number of electric vehicle charging points for taxis and private hire vehicles equating to a total of £300,000. A ULEV Strategy was produced in 2019 by Bromsgrove District Council to provide a framework for implementation of this project.

In 2020 Bromsgrove District Council appointed a company to install and operate 13 rapid chargers across the district for the next 10 years. The chargers will use 100% renewable energy purchased from UK sources

The ULEV taxi scheme now has seen the installation of 10 rapid chargers. There are 3 more to locate with discussions ongoing due to suitable of sites and issues surrounding land ownership. The project is for a duration of 10 years.

Bromsgrove District Council and Redditch Borough Council Provision of Electric Vehicle Charging Infrastructure – the partnership councils are also progressing a scheme to create a comprehensive network of EV Chargers across both Local Authority areas. This will be a mixture of workplace and destination charging. The scheme will be extended after the initial 12-month period to provide charging within the Council's housing estates via working with their Housing Services. The project is currently at the background / pre-construction phase.

Officers from Bromsgrove District Council are also working with Worcestershire County Council to establish a full pipeline of sustainable schemes. To better inform the list of schemes funding has been secured by WCC for a Local Cycling and Walking infrastructure Plan (LCWIP). Planning officers have also requested to be involved in the brief for this work. The Worcestershire Strategic Transport Model is now complete and is being checked for use across Bromsgrove.

The published strategy for ultra-low emission vehicles aims to inform the development of appropriate infrastructure in the area to enable more people to use ultra-low emission vehicles (ULEVs). The document is available at:

Electric vehicles - bromsgrove.gov.uk

Information relating to climate change is also available on Bromsgrove District Council's website via the links below.

Climate emergency - bromsgrove.gov.uk

Carbon Reduction Strategy and Action Plan (bromsgrove.gov.uk)

Worcestershire County Council Highways Department have also developed a number of major infrastructure improvement schemes within the district that are at various stages of delivery. These are briefly set out below.

A38 Bromsgrove Route Enhancement Programme (BREP) Major Scheme

The A38 Bromsgrove Route Enhancement Programme (BREP) aims to provide additional highway capacity and promote walking and cycling as an alternative, through a range of improvements along the whole corridor.

Phases 1 and 2 of the scheme have been completed. Phase 3 is understood to be largely agreed with Phase 4 requiring additional funding. Full details of the scheme can be found on the County Council's website below:-

A38 Bromsgrove Route Enhancement Programme (BREP) | Worcestershire County Council

Lickey End (M42 Junction 1) - Major Junction Enhancement Scheme

Scheme comprised widening of both the A38 northbound exit and southbound approaches to the roundabout and a new service road for properties facing the A38 southbound, offering improved access for vehicles. This was completed as part of Phase 1 of the BREP scheme: -

Phase 1 A38 BREP improvements | Worcestershire County Council

Reductions in NO_2 have been seen within the Lickey End AQMA over recent years which previously recorded some of the highest concentrations within the district. It is however unclear at this stage how much is attributable to the improvements and what is down to the impacts from the Covid Pandemic.

Bromsgrove Transport Strategy – This scheme is part of the Strategic Transport Assessment (STA) work which will identify infrastructure and services to support planned development growth. This is part of a Bromsgrove District Council collaborative process between Worcestershire County Council and Bromsgrove District Council. The scheme aims to provide a package of Public Realm

Enhancements in Bromsgrove Town Centre and would be integrated with other schemes in the area (such as BREP/A38 and the Strategic Active Travel Investment Programme). The scheme is to provide a comprehensive multimodal review of network efficiency and infrastructure to identify where to focus investment to improve the operation of the local transport network. This would also include a review of Bromsgrove's highway network to explore options to improve and disperse traffic flow to increase efficiency and help AQMA remediation at Worcester Road.

Bromsgrove – Strategic Active Travel Network Investment Programme (Including Catshill, Marlbrook and Lickey End) – National Productivity Fund active travel network to facilitate working and cycling through a network of active travel routes through the town to provide an alternative to vehicular modes, reducing congestion and increasing physical activity. Details of this can be found at:
https://www.worcestershire.gov.uk/info/20055/strategies_plans_and_bids/1417/national_productivity_investment_fund

Improvements delivered during 2022 include a new active travel link from Harvington Road to Charford Road and access to South Bromgrove High School with a signal controlled crossing on Charford Road and New Road.

The Bromsgrove Local Cycling and Walking Infrastructure Plan (LCWIP) secured funding from Active Travel England and are due to be completed in the summer of 2024.

Parkside Junction improvements have been completed with changes to the signing, lining and lane system through this junction, with additional crossing phases for pedestrians and to improve efficiency

Other actions that have either been completed or are ongoing are as follows: -

Freight Quality Partnership - On-going work with satellite navigation companies to route HGVs around AQMAs.

Installing electric vehicle charging points - Recommendations for the installation of EV Charging Points are routinely recommended by WRS to the planning authorities for planning applications meeting relevant criteria.

Greening Council and Business Fleets - Worcestershire County Council Local Transport Plan (LTP4) was formally adopted in November 2017 and incorporates policy on alternative fuels and associated infrastructure:

Car Sharing - A Liftshare scheme was previously in operation for Worcestershire however it is understood that this has closed for new applicants.

https://liftshare.com/uk/community/worcestershire

Technical Planning Document - WRS officers drafted the guidance document in 2017 and updated it in 2018, 2020, and 2022. The document includes guidance on requirements for air

quality assessments, standard recommendations expected for air quality mitigation measures, and advice relating to good practice for new development. It was hoped the document would be adopted by the Planning Departments of the district councils within Worcestershire as a formal Supplementary Planning Document however this has not been the case. Consultants / agents are signposted to the information so that they are aware of the requirements in relation to development and submitting suitable assessments.

Challenges and Barriers - Whilst concentrations of NO_2 have seen large decreases in recent years due to the Covid Pandemic it is possible that exceedances of the objectives will continue in the coming years. The principal challenges and barriers to implementation that Bromsgrove District Council face are numerous. Some of these challenges relate to the specific site conditions at each AQMA, as well as cost implications and difficulties associated with improving existing infrastructure.

The Lickey End AQMA is located around the A38 where it meets Junction 1 of the M42. There are numerous properties within the vicinity of this major junction and arterial route. Whilst works have been undertaken on the junction as part of the A38 BREP, with additional works on the corridor planned subject to funding, it is not currently possible to see what impacts the works have made on NO_2 concentrations given the significant reduction in recent years due to Covid.

The Redditch Road AQMA relates to another stretch of the A38. The main measured exceedances of the objective have been recorded where properties are located very close to the carriageway. The last exceedances were recorded in 2016 and were marginal. Consideration will be given to whether this AQMA can be revoked as part of the program of works surrounding the renewal of the AQAP and AQ Strategy dependant on 2023 results.

The area of the Worcester Road AQMA, where regular exceedances of the objectives have been recorded, is best described as a ‘street canyon’. It comprises narrow streets with continuous buildings on either side and is a major route for traffic in and out of Bromsgrove. According to the most recent traffic survey approximately 17000 vehicles use this route every day during ‘normal’ circumstances. The street canyon restricts the dispersal of NO_2 and therefore represents a more significant issue than would be the case in a more open scenario.

Although the Kidderminster Road, Hagley AQMA has been revoked the area remains a major arterial route where congestion is still a significant issue. Approximately 36000 vehicles travel daily along this route on average. A large diffusion tube network is in place here to ensure a good coverage of monitoring.

Securing funding for improvement schemes is a key factor. Ensuring uptake of greener methods of transport and changes in behaviour are also difficult to achieve without incentives or a lack of alternative options being in place. The current cost of electrical vehicles or hybrids means this alternative is out of the reach of many people.

Large scale residential development is also proposed within the Bromsgrove District and the wider area in future years. Consequently, solving the problem of poor air quality at problem locations within the district is proving to be difficult. Even without further development, and increasing numbers of vehicles, the current road network is already stretched with significant congestion.

Some priority actions relevant to the three Bromsgrove AQMAs, first highlighted within the original 2013 action plan, relate to specific highway actions. Historically the County Council had stated that these actions would not be considered for progression in isolation but may have been considered as part of one of the larger schemes set out in LTP4. Now that the detail of those schemes is known a number of these actions will not be progressed. LTP5 is however currently in the early stages of development. The AQAP is currently being renewed and will incorporate the relevant schemes from LTP5 as and when more detail is known.

The coronavirus pandemic and subsequent lockdowns has obviously had a positive impact on air quality concentrations with fewer journeys being undertaken and more people working from home. This is clearly identifiable within the monitoring results for the last 3 years when compared with historical monitoring data. The pandemic also delayed some of the schemes reported on in this document such as installation of the EV taxi charge point project and the various highways works. However, it is understood that these schemes have now all resumed and largely caught up with progress.

The pandemic has also impacted on WRS work in relation to the update of the AQAP and has delayed activities such as source apportionment. It also makes decision making harder as monitoring data has not been reflective of normal circumstances.

Measures stated above and in Table 2.2 will help to contribute towards compliance within the Bromsgrove District Council area and help enable the revocation of the existing AQMAs.

Table 2.2 – Progress on Measures to Improve Air Quality

Measure No.	Measure	Category	Classification	Year Measure Introduced in AQAP	Estimated / Actual Completion Date	Organisations Involved	Funding Source	Defra AQ Grant Funding	Funding Status	Estimated Cost of Measure	Measure Status	Reduction in Pollutant / Emission from Measure	Key Performance Indicator	Progress to Date	Comments / Barriers to Implementation
Lickey End, Bromsgrove AQMA															
BREP1	A38 Bromsgrove Route Enhancement Package	Traffic Management	UTC, Congestion management, traffic reduction	2017	2025	WCC DFT	WLEP	NO	Not Funded	> £10 million	Implementation	Reduction in Pollutant / Emission from Measure	Improved traffic flow and less queuing	Phase 1 and 2 complete. Phase 3 largely funded. Phase 4 subject to funding.	Some aspects of the scheme not yet funded.
5.1.1	Alteration to traffic light systems	Traffic Management	UTC, Congestion management, traffic reduction	2013	2021	WCC DFT	WLEP	NO	Funded	£1 million - £10 million	Implementation	Reduction in Pollutant / Emission from Measure	Improved traffic flow and less queuing	Phase 1 of the scheme specifically includes changes to the A38/M42 J1 and has been completed.	
LE4	Narrowing of two lanes into one causes bottleneck A38 south	Traffic Management	UTC, Congestion management, traffic reduction	2013	2025	WCC DFT	WLEP	NO	Not Funded	> £10 million	Planning	Reduction in Pollutant / Emission from Measure	Improved traffic flow and less queuing	Not included as Phase 1 of the A38 scheme but Scheme F proposes revision of road markings and road widening to provide one lane northbound and two lanes southbound to remove bottleneck.	Subject to funding
LE6	Traffic exiting Barnsley Hall Road right - no right turn restriction.	Traffic Management	UTC, Congestion management, traffic reduction	2013				no	Not Funded	£1 million - £10 million	Aborted	unknown	Improved traffic flow and less queuing	Not included as part of the A38 BREP scheme	Wasn't included in the BREP package. No funding to progress.
LE7	Turn right into Harvester PH from A38 south. Action no right turn restriction.	Traffic Management	UTC, Congestion management, traffic reduction	2013				no	Not Funded	£1 million - £10 million	Aborted	unknown	Improved traffic flow and less queuing	Not included as part of the A38 BREP scheme	
Redditch Road, Bromsgrove AQMA															
5.1.1	Alteration to traffic light systems	Traffic Management	UTC, Congestion management, traffic reduction	2013	2025	WCC DFT	WLEP	no	Not Funded	£1 million - £10 million	Planning	Reduction in Pollutant / Emission from Measure	Improved traffic flow and less queuing	Improvements within the AQMA included within A38 enhancement package which includes 12 schemes along the A38 corridor.	Scheme B1 relates to AQMA. Subject to formal planning and funding.
RR7	Two in road bus stops on carriageway either side of central street canyon	Traffic Management	UTC, Congestion management, traffic reduction	2013	2030	WCC DFT	WLEP	NO	Not Funded	> £10 million	Planning	Reduction in Pollutant / Emission from Measure	Improved traffic flow and less queuing	Improvements within the AQMA included within A38 enhancement package which includes 12 schemes along the A38 corridor.	Scheme B1 relates to AQMA. Subject to formal planning and funding.
Worcester Road, Bromsgrove AQMA															

Measure No.	Measure	Category	Classification	Year Measure Introduced in AQAP	Estimated / Actual Completion Date	Organisations Involved	Funding Source	Defra AQ Grant Funding	Funding Status	Estimated Cost of Measure	Measure Status	Reduction in Pollutant / Emission from Measure	Key Performance Indicator	Progress to Date	Comments / Barriers to Implementation
BR1	Bromsgrove Town Centre Network Review (Bromsgrove Transport Strategy)	Traffic Management	UTC, Congestion management, traffic reduction	2017	2025	WCC BDC	NPIF	No	Partially Funded	> £10 million	Planning	Reduction in Pollutant / Emission from Measure	Improved traffic flow through Bromsgrove town centre and improved journey times	This is now part of the Strategic Transport Assessment (STA) work which will identify infrastructure and services to support planned development growth; this is a collaborative process with WCC and BDC.	Subject to funding
WR3	Zebra crossing at Hanover Street/Worcester Road junction causes congestion	Traffic Management	UTC, Congestion management, traffic reduction	2013	2022	WCC BDC	NPIF	no	Partially Funded	£100k - £500k	Implementation	Reduction in Pollutant / Emission from Measure	Improved traffic flow and less queuing	Proposals for crossing to be upgraded to Puffin / Toucan crossing as part of improvements to walking and cycling.	
WR9	Local school traffic causes congestion exiting Shrubbery Road – requires junction review	Traffic Management	UTC, Congestion management, traffic reduction	2013	2030	WCC		no	Not Funded	£50k - £100k	Planning	Reduction in Pollutant / Emission from Measure	Improved traffic flow and less queuing	County Council have included package of improvements within LTP4. WCC has commissioned a Strategic Transport Assessment (STA) to support the BDC local plan process and ultimately identify infrastructure schemes to support local plan growth.	cost of scheme reliant on successful funding bids
Actions applicable to whole district															
RTAQMN	Real-time air quality monitoring network	Public Information	Via the Internet	2022	2025	WRS BDC MHDC RBC WDC WC WFDC	Defra	Yes	Funded	£100k - £500k	Planning	Zero	Increase in website hits and raising profile of AQ	WRS submitted a bid to the Defra AQ funding grant on behalf of the Worcs districts for real-time monitoring network via low-cost sensors for NO2 PM10 & PM2.5. Funding approved and grant awarded of £246k plus 10% to be match funded. Tender specification currently being completed. Monitors to be installed latter part of 2023.	Suitable monitoring sites to be identified.

Measure No.	Measure	Category	Classification	Year Measure Introduced in AQAP	Estimated / Actual Completion Date	Organisations Involved	Funding Source	Defra AQ Grant Funding	Funding Status	Estimated Cost of Measure	Measure Status	Reduction in Pollutant / Emission from Measure	Key Performance Indicator	Progress to Date	Comments / Barriers to Implementation
ULEVTIS	Ultra-Low Emission Taxi Infrastructure Scheme	Promoting Low Emission Transport	Procuring alternative Refuelling infrastructure to promote Low Emission Vehicles, EV recharging, Gas fuel recharging	2019	2029	BDC	ULEV	no	Funded	£100k - £500k	Implementation	Decrease in emission	Increase in EV taxi numbers	BDC successful funding bid in 2018 for taxi electric vehicle charging points of £300,000. A ULEV Strategy for the Bromsgrove District was produced in 2019. Company appointed in 2020 to install/operate 13 rapid chargers for next 10 years. Sites identified and roll out of installation beginning in 2021. 10 sites currently installed. 3 more to follow.	issues with land ownership and suitable sites
PEVCIS	Bromsgrove District Council and Redditch Borough Council Provision of Electric Vehicle Charging Infrastructure	Promoting Low Emission Transport	Procuring alternative Refuelling infrastructure to promote Low Emission Vehicles, EV recharging, Gas fuel recharging	2022	2027	BDC RBC	ULEV	NO	Funded	£100k - £500k	Planning	Increase in EV numbers	Decrease in emissions	scheme to create a comprehensive network of EV Chargers across both Local Authority areas. This will be a mixture of workplace and destination charging. The scheme will be extended after the initial 12-month period to provide charging within the Council's housing estates via working with their Housing Services.	The project is currently at the background / pre-construction phase.
5.2.2	freight Quality Partnership	Traffic Management	UTC, Congestion management, traffic reduction	2013	2022	WCC	WCC	NO	Partially Funded	£50k - £100k	Implementation	Unknown	Fewer HGVs travelling through AQMAs	On-going duty under traffic management	Reliant on HGVs avoiding AQMAs
5.2.5	Greening Council and Business Fleets	Promoting Low Emission Transport	Procuring alternative Refuelling infrastructure to promote Low Emission Vehicles, EV recharging, Gas fuel recharging	2013	2032	BDC WCC	BDC WCC	No	Not Funded			Reduction in Pollutant / Emission from Measure	Increase in number of Council fleet and contractors vehicles of higher Euro Standard and/or utilising alternative fuels	Ongoing	Reliant on uptake from private sector companies
5.2.10	Installing Electrical Vehicle Charging Points	Promoting Low Emission Transport	Procuring alternative Refuelling infrastructure to promote Low Emission Vehicles, EV recharging, Gas fuel recharging	2013		BDC WRS	As part of development	No	Partially Funded	£100k - £500k	Implementation	Reduction in Pollutant / Emission from Measure	Increased uptake in EV vehicles	Ongoing	
5.3.2	Car Sharing	Alternatives to private car use	Car and lift sharing schemes	2013		WCC	WCC	NO	Not Funded	£10k - 50k	Implementation	unknown	Increase in number of people car sharing	Liftshare website scheme launched Autumn 2015.	Service understood to be suspended not currently taking on new members.
5.3.4	Promote Flexible Working arrangements	Promoting Travel Alternatives	Encourage / Facilitate homeworking	2013		WCC BDC	Various	NO	Not Funded	£50k - £100k	Implementation	unknown	Increase in number of people able to work at home	Fibre optic broadband delivered across the county	Reliant on uptake from private sector companies

Measure No.	Measure	Category	Classification	Year Measure Introduced in AQAP	Estimated / Actual Completion Date	Organisations Involved	Funding Source	Defra AQ Grant Funding	Funding Status	Estimated Cost of Measure	Measure Status	Reduction in Pollutant / Emission from Measure	Key Performance Indicator	Progress to Date	Comments / Barriers to Implementation
5.5.1	Produce Air Quality Supplementary Planning Document	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	2013		WRS	WRS BDC	NO	Not Funded	< £10k	Completed	unknown	Formal adoption and use by BDC planning authority	Document produced in 2017 and kept updated since. Used as Technical Guidance Document.	Conflicting views on SPD from 6 different local authorities. Document not adopted by LPAs.
5.5.4	Encourage developers to provide sustainable transport facilities and links serving new developments		Personalised travel planning	2013		BDC WCC WRS	WCC BDC	NO	Not Funded	£50k - £100k	Implementation	unknown	Increased uptake of alternative modes of transport	WCC is delivering PTP services on behalf of developers. Building on best practice developed by the Council this proven tool encourages modal shift in new developments towards more sustainable and space efficient forms of transport. WRS make recommendation for standard AQ mitigation measures on all relevant planning apps.	
5.6.3	Air Quality Networks	Policy Guidance and Development Control	Regional Groups Co-ordinating programmes to develop Area wide Strategies to reduce emissions and improve air quality	2013		WRS CEEPG DEFRA BDC	Officer time (WRS)	NO	Not Funded	< £10k	Implementation	unknown	Improved cross boundary working between local	WRS are member of regional environmental protection managers group (CEEPG) and member of Defra LAQM Team Local Authority Advisory Group both formed in 2017.	Differing AQ issues, priorities and resources in regional authorities. Largely ceased due to global Covid pandemic.
5.6.8	Forge closer links with local health agencies	Other	Other	2013		WRS WCC DoPH NHS	WRS WCC DoPH NHS	NO	Not Funded	< £10k	Implementation	unknown	Increase participation of Public Health in	County Air Quality Partnership set up May 2019 by DoPH supported by WRS. Partnership re-established 2022. DoPH and NHS representatives involved with development of AQAP and other work streams.	

Measure No.	Measure	Category	Classification	Year Measure Introduced in AQAP	Estimated / Actual Completion Date	Organisations Involved	Funding Source	Defra AQ Grant Funding	Funding Status	Estimated Cost of Measure	Measure Status	Reduction in Pollutant / Emission from Measure	Key Performance Indicator	Progress to Date	Comments / Barriers to Implementation
5.3.1	Travel Planning	Promoting Travel Alternatives	Personalised travel planning	2013		WCC	WCC	NO	Not Funded	On-going	Implementation	unknown	Increased uptake of alternative modes of transport	WCC is delivering PTP services on behalf of developers. Building on best practice developed by the Council this proven tool encourages modal shift in new developments towards more sustainable and space efficient forms of transport.	
5.3.6 (5.3.8 & 5.3.9)	Improve cycling and walking routes in local areas	Promoting Travel Alternatives	Promotion of cycling	2013		WCC BDC	WCC DFT	NO	Funded	> £10 million	Completed	unknown	Increased uptake of alternative modes of transport	The Active Travel Investment Programme is a systemic investment in walking and cycling links across the Bromsgrove area to create a safe, comprehensive, integrated network linking residential areas with key trip attractors, including schools, rail stations, town centre and employment locations	
5.4.4	Make air quality information more available and accessible	Public Information	Via the Internet	2013		WRS	Officer time (WRS)	NO	Not Funded	£10k - 50k	Implementation	unknown	Website hits and enquiries for information	All existing LAQM reports and details of AQMAs are available to public on WRS website. WRS use Twitter account to release information.	Ongoing
5.4.2	Provide link to real time air quality information	Public Information	Via the Internet	2013		WRS WCC PHE	Officer time (WRS)	NO	Not Funded	£10k - 50k	Implementation	unknown	Increase in WRS Twitter subscribers	System put in place at WRS to tweet alerts when Air pollution is moderate or worse in any given 5 day forecast on Defra Daily Air Quality Index and shared with County Public Health representative	Limited to Twitter users. Ongoing.
5.45	Raise the profile and increase awareness of air quality within the region	Other	Other	2017		WRS CEEPG MJAC DEFRA	Officer time (WRS)	NO	Not	£10k - 50k	Implementation	unknown	Improved cross boundary knowledge sharing between local authorities in West Midlands	WRS held position of Air Quality technical coordinator for MJAC, member of CEEPG and member of Defra LAQM Team Local Authority Advisory Group both formed in 2017.	Largely suspended following Covid
5.4.1	Smarter Driving Tips	Public Information	Via the Internet	2017		WRS & WCC	Officer time (WRS)	NO	Not Funded	£10k - 50k	Implementation	unknown	Increase in website hits	Advice page created for all groups affected by and impacting air quality and shared with County Public Health.	Created March 2017, updated periodically

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

As detailed in Policy Guidance LAQM.PG22 (Chapter 8), local authorities are expected to work towards reducing emissions and/or concentrations of $PM_{2.5}$ (particulate matter with an aerodynamic diameter of 2.5µm or less). There is clear evidence that $PM_{2.5}$ has a significant impact on human health, including premature mortality, allergic reactions, and cardiovascular diseases.

There are currently no automatic $PM_{2.5}$ monitoring stations in Worcestershire that are recognised by Defra for measuring against ambient air quality directives. The nearest AURN $PM_{2.5}$ monitoring station is the Birmingham Ladywood site approximately 20km to the north of the Bromsgrove District. However, WRS have assisted the Defra AURN expansion project team with potential locations for two $PM_{2.5}$ monitors in Worcestershire, and it is hoped these will be in place within the next 6 to 12 months. The nearest of these is to be placed in neighbouring Redditch.

WRS has reviewed the DEFRA national background maps to determine projected $PM_{2.5}$ concentrations within the Bromsgrove District area for the 2022 calendar year. The average total $PM_{2.5}$ at 218 locations (centre points of 1km x 1km grids) across Bromsgrove District Council is 7.31µg/m^3, with a minimum concentration of 7.11µg/m^3 and a maximum concentration of 9.33µg/$m^{3.}$ This indicates that $PM_{2.5}$ concentrations within Bromsgrove District are well below the annual average EU limit value for $PM_{2.5}$ of 25µg/m^3 and is below the proposed annual average limit value for $PM_{2.5}$target of 10µg/m^3 to be met across England by 2040.

The Air Quality Partnership led by the Director of Public Health at Worcestershire County Council, and supported by WRS, was set up in May 2019 to discuss potential actions to improve air quality across the County and determine an action plan for implementation. The group comprised officers from the County and District authorities from public health, air quality, strategic planning, sustainability, highways and transport disciplines, and also representatives from the NHS and Highways England. The work of the group, however, was postponed indefinitely due to the Covid-19 pandemic. Work recommenced in summer 2022 when WRS met with colleagues from Public Health numerous times to discuss the ongoing situation with air quality, relevant changes, and workstreams going forward. The DoPH represents a key partner in the ongoing development of the Air Quality Strategy and Action Plan work and has several representatives sitting on the steering group.

WRS has reviewed the fraction of mortality attributable to particulate air pollution (indicator D01) as published by Public Health England as part of the Public Health Outcomes Framework[9]. The

[9] Public Health Outcomes Framework - OHID (phe.org.uk)

fraction of mortality attributable to particulate emissions in Bromsgrove District in 2021 (the most recent year available) was 5.3%. This falls below the national figure for England (5.5% in 2021) and below the figure for the West Midlands region (5.5% in 2021). Recent trend data is not available for the district due to a lack of data points with valid values.

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

The successful bid for funding from the Defra Air Quality Grant 2022/23 to establish a real time monitoring network across Worcestershire will allow for particulate monitoring in the district for the first time. It is anticipated that 3 low-cost real time air quality monitors will be installed within the district area at worst case locations representative of heavy traffic, industry, agriculture, solid fuel burning and other sources. The project is ongoing, and it is anticipated that the monitors will be fully operational within the next 12 months.

There are currently no declared smoke control areas operating within the Bromsgrove Distict area.

More information, maps and guides on the type of fuels that can be used can be found at:

Smoke Control Areas | Worcestershire Regulatory Services (worcsregservices.gov.uk)

WRS hold no record of complaints of nuisance from smoke, dust or fumes in the Bromsgrove District in 2022.

In light of the above no additional actions are currently planned by Bromsgrove District Council specifically in relation to the reduction of $PM_{2.5}$ levels. However, it is anticipated that any actions taken to improve NO_2 levels across the region as part of the revised future countywide AQAP will likely result in a linked improvement in $PM_{2.5}$ levels. Additionally, the new countywide AQAP will include the local air quality strategy for all Worcestershire districts and have due regard for the new responsibilities on local authority for $PM_{2.5}$ outlined within the revised national Air Quality Strategy (28 April 2023) published at the time of producing this report.

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

This section sets out the monitoring undertaken within 2022 by Bromsgrove District Council and how it compares with the relevant air quality objectives. In addition, monitoring results are presented for a five-year period between 2018 and 2022 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 was undertaken within the Bromsgrove District Council area during 2022.

3.1.2 Non-Automatic Monitoring Sites

Bromsgrove District Council undertook non- automatic (i.e. passive) monitoring of NO_2 at 44 sites during 2022. Table A. in Appendix A presents the details of the non-automatic sites.

Maps showing the location of the monitoring sites are provided in Appendix D: Map(s) of Monitoring Locations and AQMAs. 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 (NO_2)

Table A.2 in Appendix A compares the ratified and adjusted monitored NO_2 annual mean concentrations for the past five years with the air quality objective of 40µg/m^3. 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 2022 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.

No exceedances of the annual mean objective for nitrogen dioxide have been recorded in the Bromsgrove District during the 2022 monitoring year. It is possible that the effects of the Covid pandemic are still impacting the data as some restrictions were still in pace in the early part of 2022. No exceedances of the objective have been recorded in previous years 2020 and 2021 due to the effects of Covid. The last exceedances were recorded in 2019. Increases in NO_2, however, have been recorded at all locations across the district in 2022 compared to 2021, except for location '16' that was subject to annualisation due to poor data capture and therefore reduces the certainty of the result. An average increase of 11.11% can be seen across all monitoring locations from 2021 to 2022. The largest increase of 6.5µg/m^3 was recorded at LIK1 within the Lickey End AQMA which saw a rise from 22.3µg/m^3 to 28.8µg/m^3 which represents a 29.1% increase.

The highest concentration of NO_2 recorded across the monitoring network in 2022 was 37.4µg/m^3 at location BC, Ye Olde Black Cross, 70 Worcester Road. This concentration is 6.5% below the annual mean objective for NO_2. This site is located within the Worcester Road, AQMA.

Concentrations within all of the other AQMAs were well below the objective in 2022. The highest concentration recorded within the Redditch Road AQMA was 26.4µg/m^3 at locations HR and 19. This is 34% below the annual objective. Within the Lickey End AQMA the highest concentration was 32.4µg/m^3 at diffusion tube LE4. This is 19% below the objective.

No exceedances were recorded within the revoked Kidderminster Road, Hagley AQMA with a highest concentration of 23.9µg/m^3 recorded at RES2 within the former AQMA boundary area. This is 40.25% below the objective. Concentrations have been well below the objective since the AQMA was revoked with the last exceedance of 40.2µg/m^3 being recorded in 2013. Following revocation of the AQMA in 2018 four new monitoring locations were established in May 2018 further to the south along Worcester Road, West Hagley, which had been highlighted as a potential concern.

Following annualisation of 2018 results a concentration of 47µg/m^3 was recorded at one of the new locations, HAG3, however there was a high level of uncertainty associated with the result as it was based upon only 7 months data. The 2019 result provided a full calendar years' worth of data with a value of 33.7µg/m^3 recorded at HAG3. Two new monitoring locations**,** HAG5 and HAG6, were established in the vicinity of HAG3 for the 2020 period to provide additional coverage in respect of air quality concentrations in the area. In 2022 a concentration of 31.8µg/m^3 was recorded at HAG3 and 35.8µg/m^3 at HAG5. It should be noted that HAG5 is located some distance away from residential exposure (approximately 7.3m). Concentrations therefore remain well below the objective.

The monitoring network remained unchanged for the 2022 monitoring year with no new locations added and none removed. Concentrations from 2022 represent an increase to those recorded in 2020 and 2021 but are generally still lower than pre-pandemic levels recorded in 2018 and 2019.

No annual means greater than 60ug/m^3 have been recorded indicating that it is extremely unlikely that there have been any exceedances of the 1-hour mean objective for NO_2 at any monitoring sites. The 60ug/m^3 value is a surrogate figure to indicate exceedances of the 1-hour objective based on annual average concentrations. The concentrations recorded across the district in 2022 are generally 40% or more below that value.

It is noted that no exceedances of the objectives have been recorded within the Redditch Road and Lickey End AQMAs for a number of years. Given the impacts of Covid it is necessary to treat the last 3 years results with caution as restrictions have been in place which has significantly affected people's movements and travel patterns. Given that there have been no restrictions in place in 2023, as far as anticipated, it is considered that this will represent a much more representative year in terms of air quality data. The LIckey End AQMA has seen very high concentrations of NO_2 historically with the last exceedances recorded in 2018. Concentrations within the Redditch Road have been much lower with marginal exceedances of the objective in 2016. Bias adjustment factors were particularly low for 2017 and 2019 which reduces concentrations to lower values than might have otherwise been expected. This, coupled with the impacts of Covid, make it difficult to rely on 5 out of the last 6 years' worth of data when looking at long term trends and confidently make decisions as to whether revocation of AQMAs is appropriate. It is anticipated that the data for 2023 will provide more surety in this respect.

3.2.2 Particulate Matter (PM_{10})

PM_{10} has not been monitored in 2022.

3.2.3 Particulate Matter ($PM_{2.5}$)

$PM_{2.5}$ has not been monitored in 2022.

3.2.4 Sulphur Dioxide (SO_2)

SO_2 has not been monitored in 2022.

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)
FL1	2C Fox Lane	Roadside	395079	269797	NO2	No	0.0	7.0	No	2.1
FL2	new houses close to road on Fox Lane	Roadside	395118	269721	NO2	No	0.0	1.6	No	2.1
RH1	8 Rock Hill, Bromsgrove	Roadside	395243	269844	NO2	No	0.0	6.3	No	2.2
WR4	188 Worcester Road, Bromsgrove	Roadside	395312	269938	NO2	Yes - Worcester Road AQMA	0.0	7.5	No	2.2
WR2	Downpipe of 159 Worcester Road	Roadside	395511	270180	NO2	Yes - Worcester Road AQMA	0.0	2.2	No	2.2
WR3	Downpipe of 138 Worcester Road	Roadside	395501	270190	NO2	Yes - Worcester Road AQMA	0.0	4.4	No	2.5
BC	Downpipe on Ye Olde Black Cross, 70 Worcester Road	Roadside	395685	270424	NO2	Yes - Worcester Road AQMA	0.0	2.1	No	2.3
BCX	Downpipe of 16 Hanover Place, Worcester Road	Roadside	395807	270549	NO2	Yes - Worcester Road AQMA	0.0	2.7	No	2.3
WR	Downpipe of 14 Hanover Street	Roadside	395702	270423	NO2	Yes - Worcester Road AQMA	0.0	6.4	No	1.4
BG1	Wall of Davenal House Doctors Surgery, top of The Strand	Roadside	396238	271108	NO2	No		2.6	No	2.6

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)
BR	Downpipe on 35 Birmingham Road	Roadside	396292	271210	NO2	No	0.0	3.4	No	2.2
LE7	Near 371 Birmingham Road, Lickey End	Urban Background	396916	273014	NO2	Yes - Lickey End AQMA	0.0	15.9	No	2.1
1	Downpipe of 3a Alcester Road, Lickey End	Roadside	396999	272979	NO2	Yes - Lickey End AQMA	0.0	11.7	No	1.8
LE4	Harvester Pub Birmingham Road, Lickey End (Sign)	Roadside	396935	272949	NO2	Yes - Lickey End AQMA	11.0	1.4	No	2.1
LIK1	288 Birmingham Road (next to Harvester)	Roadside	396939	272934	NO2	Yes - Lickey End AQMA	0.0	10.0	No	1.5
LIK 2	1 Old Birmingham Road Lickey End	Roadside	396995	273129	NO2	Yes - Lickey End AQMA	0.0	5.5	No	1.5
LE5	5 Old Birmingham Road, Lickey End	Roadside	396999	273143	NO2	Yes - Lickey End AQMA	0.0	6.5	No	1.9
LE6	308 Birmingham Road, Lickey End	Urban Background	396958	273157	NO2	Yes - Lickey End AQMA	0.0	18.3	No	2.1
F1	J1 M42 roundabout, Street light LP 4957 at junction with Old B'ham Rd	Kerbside	397010	273112	NO2	Yes - Lickey End AQMA	20.0	2.3	No	2.0
TS	Up past Blue Cross, The Smallholdings, off Wildmoor Lane	Rural	396613	275085	NO2	No	0.0	51.0	No	1.8
RUB 1	Library Way Way off New Road	Roadside	398555	277200	NO2	No	12.0	2.0	No	1.6
RES 1	26 Stourbridge Road, Hagley	Roadside	391445	281179	NO2	No	0.0	15.0	No	2.1
RES 2	21 Birmingham Road, Hagley	Roadside	391556	281042	NO2	No	0.0	15.0	No	2.2

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)
9	Fence to side of 78 Kidderminster Road	Roadside	391210	280668	NO2	No	0.0	8.3	No	2.0
KR62	62 Kidderminster Rd	Roadside	391182	280631	NO2	No	0.0	7.0	No	2.0
RES 3	104 Kidderminster Road South, Hagley,	Roadside	389827	279590	NO2	No	0.0	14.3	No	2.0
HAG 4	Lamppost opp Shell Garage on Worcester Road, West Hagley	Roadside	389850	279588	NO2	No	1.0	5.5	No	2.0
HAG 3	1 Cross Keys Mews , Worcester Road, West Hagley	Roadside	389909	279629	NO2	No	0.0	3.0	No	1.6
RES 4	23 Worcester Road, Hagley	Roadside	390025	279765	NO2	No	0.0	14.5	No	2.1
HAG 2	69 Worcester Road, West Hagley	Roadside	390203	279945	NO2	No	0.0	13.0	No	1.8
HAG 1	79 Worcester Road, Hagley	Roadside	390247	279996	NO2	No	0.0	12.0	No	1.9
11	Downpipe on corner of 74 Worcester Road	Roadside	390295	280043	NO2	No		2.8	No	1.9
HAG5	On low sign nr 4 Cross Keys Mews	Roadside	389929	279650	NO2	No	7.3	4.5	No	1.6
HAG6	1 SpoutSomething Cottage	Roadside	389939	279664	NO2	No	0.0	5.0	No	1.8
SBR1	Lamppost o/s 61 Stourbridge Road, Bromsgrove	Roadside	396127	271516	NO2	No	4.8	2.2	No	1.9
SBR2	Lamppost o/s Sainsbury Local 189 Stourbridge Road	Roadside	395996	272063	NO2	No		3.5	No	2.0

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)
SBR3	Lamppost o/s 285 Stourbridge Road	Roadside	395825	272841	NO2	No	12.0	1.0	No	1.9
KEN	Lampost o/s 12 & 14 Kendal Close	Roadside	396683	270354	NO2	No	0.0	1.7	No	2.4
SR	Downpipe of 2 Stoke Road, Aston Fields	Roadside	396780	269450	NO2	Yes - Redditch Road AQMA	0.0	4.9	No	1.9
18	Downpipe on corner of 84 Redditch Road	Roadside	395180	268549	NO2	Yes - Redditch Road AQMA	0.0	1.6	No	2.0
19	Downpipe through gate at 93 Redditch Road	Roadside	395188	268564	NO2	Yes - Redditch Road AQMA	0.0	2.7	No	1.9
HR	52 Hanbury Road, Stoke Heath	Roadside	394772	268441	NO2	Yes - Redditch Road AQMA	0.0	5.0	No	2.2
16	Downpipe of 58 Redditch Road	Roadside	394701	268444	NO2	Yes - Redditch Road AQMA	0.0	2.3	No	2.2
255	255 Worcs Road (Roundabout)	Roadside	394408	268417	NO2	No	0.0	12.0	No	2.3

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 NO_2 Monitoring Results: Non-Automatic Monitoring (µg/m^3)

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 2022 (%) (2)	2018	2019	2020	2021	2022
FL1	395079	269797	Roadside	92.3	92.3	21.2	16.4	13.9	13.0	18.7
FL2	395118	269721	Roadside	90.4	90.4	37.2	29.1	24.8	27.2	29.7
RH1	395243	269844	Roadside	100	100.0	31.1	23.7	20.4	22.0	25.1
WR4	395312	269938	Roadside	100	100.0	31.2	24.4	19.3	21.4	23.9
WR2	395511	270180	Roadside	100	100.0	36.7	31.0	22.4	25.6	27.8
WR3	395501	270190	Roadside	100	100.0	30.8	24.6	20.0	21.5	27.4
BC	395685	270424	Roadside	84.6	84.6	**44.0**	38.0	27.7	31.5	37.4
BCX	395807	270549	Roadside	100	100.0	**44.0**	36.5	26.3	29.6	32.4
WR	395702	270423	Roadside	100	100.0	37.9	31.5	29.4	32.3	36.2
BG1	396238	271108	Roadside	100	100.0	32.5	26.3	19.6	23.1	27.0
BR	396292	271210	Roadside	92.3	92.3	29.2	23.5	18.9	21.1	23.1
LE7	396916	273014	Urban Background	92.3	92.3	33.4	23.6	17.7	20.0	22.0
1	396999	272979	Roadside	92.3	92.3	27.0	19.4	15.4	22.0	22.7

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 2022 (%) (2)	2018	2019	2020	2021	2022
LE4	396935	272949	Roadside	100	100.0	**50.9**	**40.1**	29.1	31.5	32.4
LIK1	396939	272934	Roadside	100	100.0		26.9	23.7	22.3	28.8
LIK 2	396995	273129	Roadside	100	100.0		26.2	22.0	21.5	24.7
LE5	396999	273143	Roadside	100	100.0	32.5	26.9	20.2	21.0	23.8
LE6	396958	273157	Urban Background	100	100.0	29.7	23.0	17.5	23.6	26.1
F1	397010	273112	Kerbside	100	100.0	**50.9**	**43.4**	27.8	28.5	29.4
TS	396613	275085	Rural	100	100.0	23.6	18.2	15.2	16.3	19.0
RUB 1	398555	277200	Roadside	100	100.0		23.6	18.5	21.0	21.7
RES 1	391445	281179	Roadside	100	100.0	20.7	17.1	13.9	14.2	16.5
RES 2	391556	281042	Roadside	100	100.0	30.7	24.6	19.5	21.4	23.9
9	391210	280668	Roadside	100	100.0	30.9	23.7	19.5	21.5	22.8
KR62	391182	280631	Roadside	100	100.0	31.1	24.0	17.8	20.0	20.7
RES 3	389827	279590	Roadside	100	100.0	19.6	15.7	12.1	15.8	18.4
HAG 4	389850	279588	Roadside	100	100.0	33.9	25.1	18.8	22.9	25.1

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 2022 (%) [2]	2018	2019	2020	2021	2022
HAG 3	389909	279629	Roadside	90.4	90.4	**47.0**	33.7	27.2	26.7	31.8
RES 4	390025	279765	Roadside	100	100.0	32.4	24.7	20.3	22.6	23.7
HAG 2	390203	279945	Roadside	100	100.0	28.4	21.4	17.3	17.9	19.8
HAG 1	390247	279996	Roadside	100	100.0	24.5	21.3	17.1	17.0	18.4
11	390295	280043	Roadside	84.6	84.6	27.7	22.0	18.0	18.4	18.7
HAG5	389929	279650	Roadside	100	100.0			29.5	32.7	35.8
HAG6	389939	279664	Roadside	100	100.0			16.6	20.6	21.4
SBR1	396127	271516	Roadside	92.3	92.3			24.9	26.6	28.6
SBR2	395996	272063	Roadside	100	100.0			18.4	20.5	22.8
SBR3	395825	272841	Roadside	100	100.0			25.9	27.8	31.7
KEN	396683	270354	Roadside	100	100.0	21.3	17.6	15.3	16.5	17.8
SR	396780	269450	Roadside	100	100.0	26.4	21.7	17.2	19.0	21.7
18	395180	268549	Roadside	100	100.0	33.7	26.5	22.4	25.1	25.9
19	395188	268564	Roadside	100	100.0	35.1	27.6	23.1	25.5	26.4

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 2022 (%) (2)	2018	2019	2020	2021	2022
HR	394772	268441	Roadside	90.4	90.4	32.9	25.5	20.4	23.5	26.4
16	394701	268444	Roadside	59.6	59.6	28.2	25.0	20.4	21.8	21.7
255	394408	268417	Roadside	92.3	92.3	23.8	16.8	15.9	17.3	19.8

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

☒ **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/m^3.

Exceedances of the NO_2 annual mean objective of 40µg/m^3 are shown in **bold**.

NO_2 annual means exceeding 60µg/m^3, indicating a potential exceedance of the NO_2 1-hour mean objective are shown in **bold and underlined**.

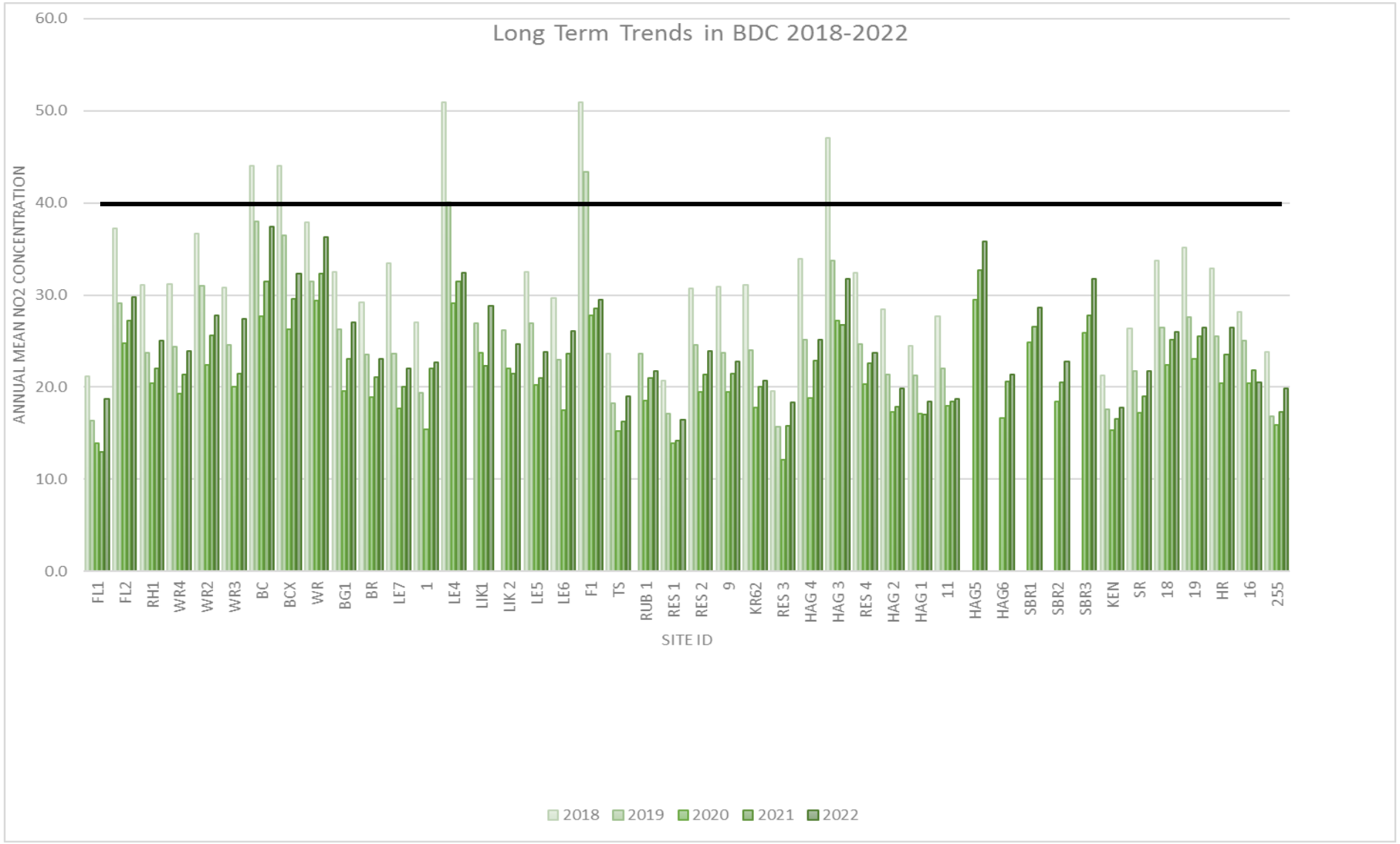
Means for diffusion tubes have been corrected for bias. All means have been "annualised" as per LAQM.TG22 if valid data capture for the full calendar year is less than 75%. See Appendix C for details.

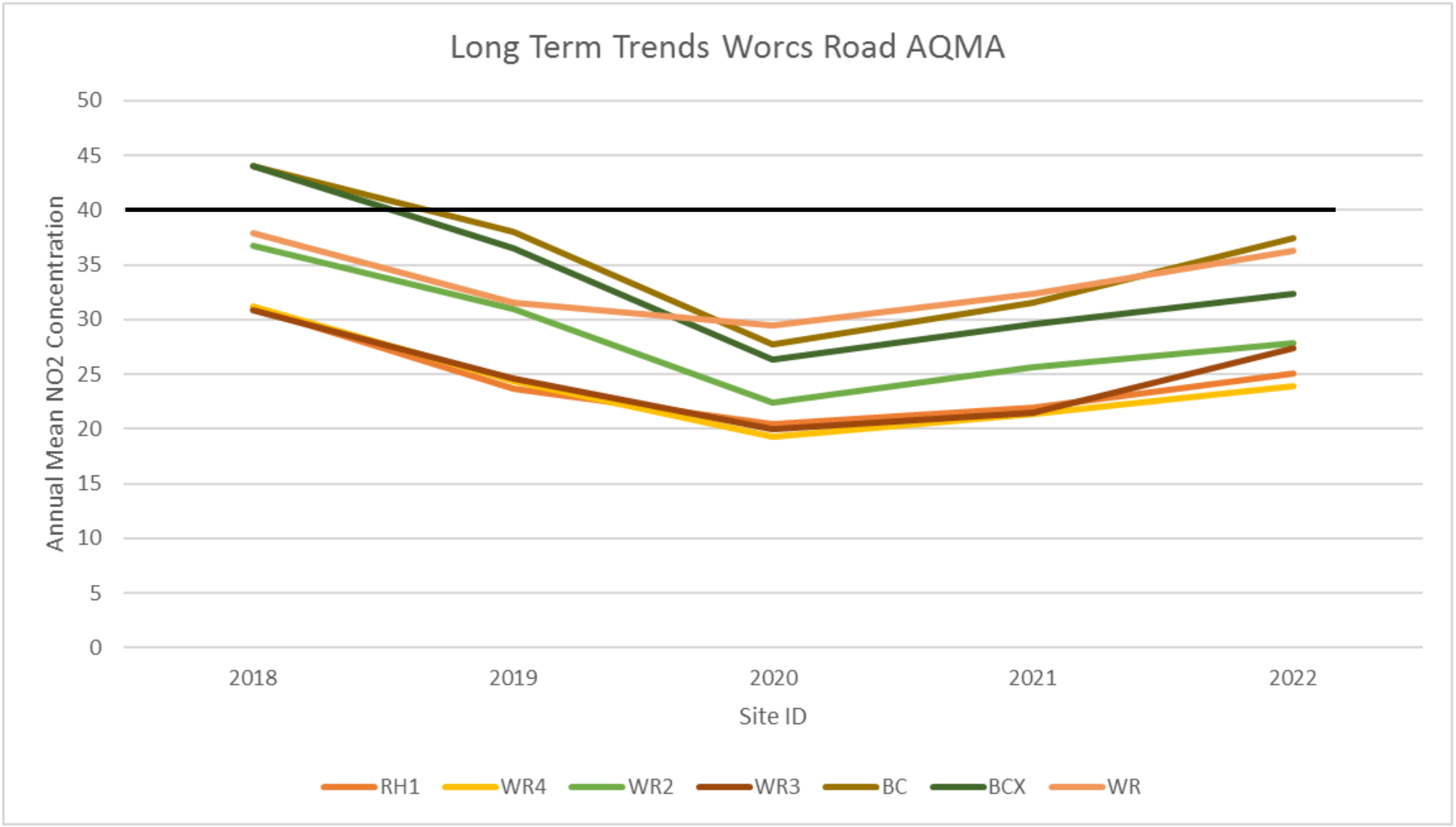
Concentrations are those at the location of monitoring and not those following any fall-off with distance adjustment.

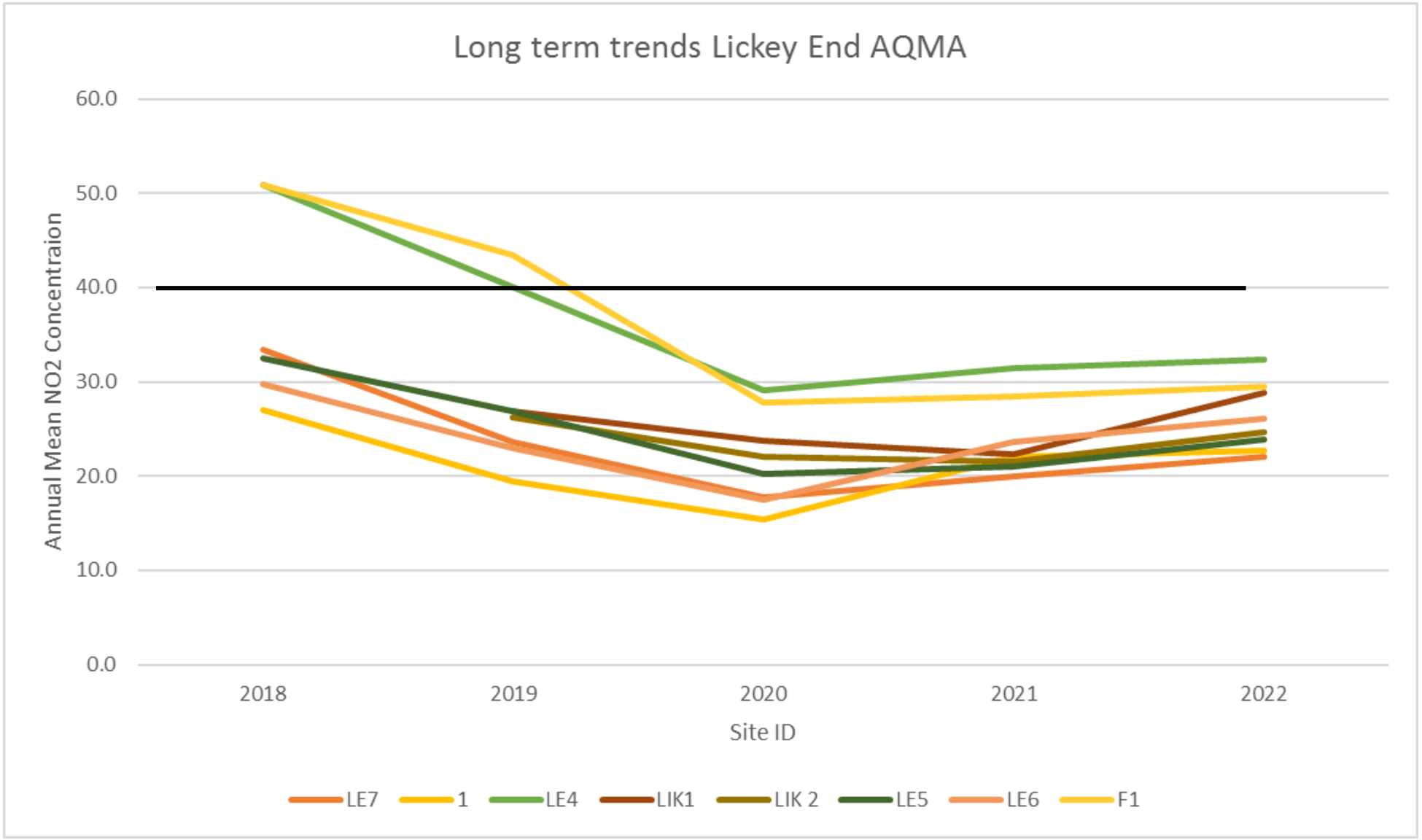
(1) Data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.

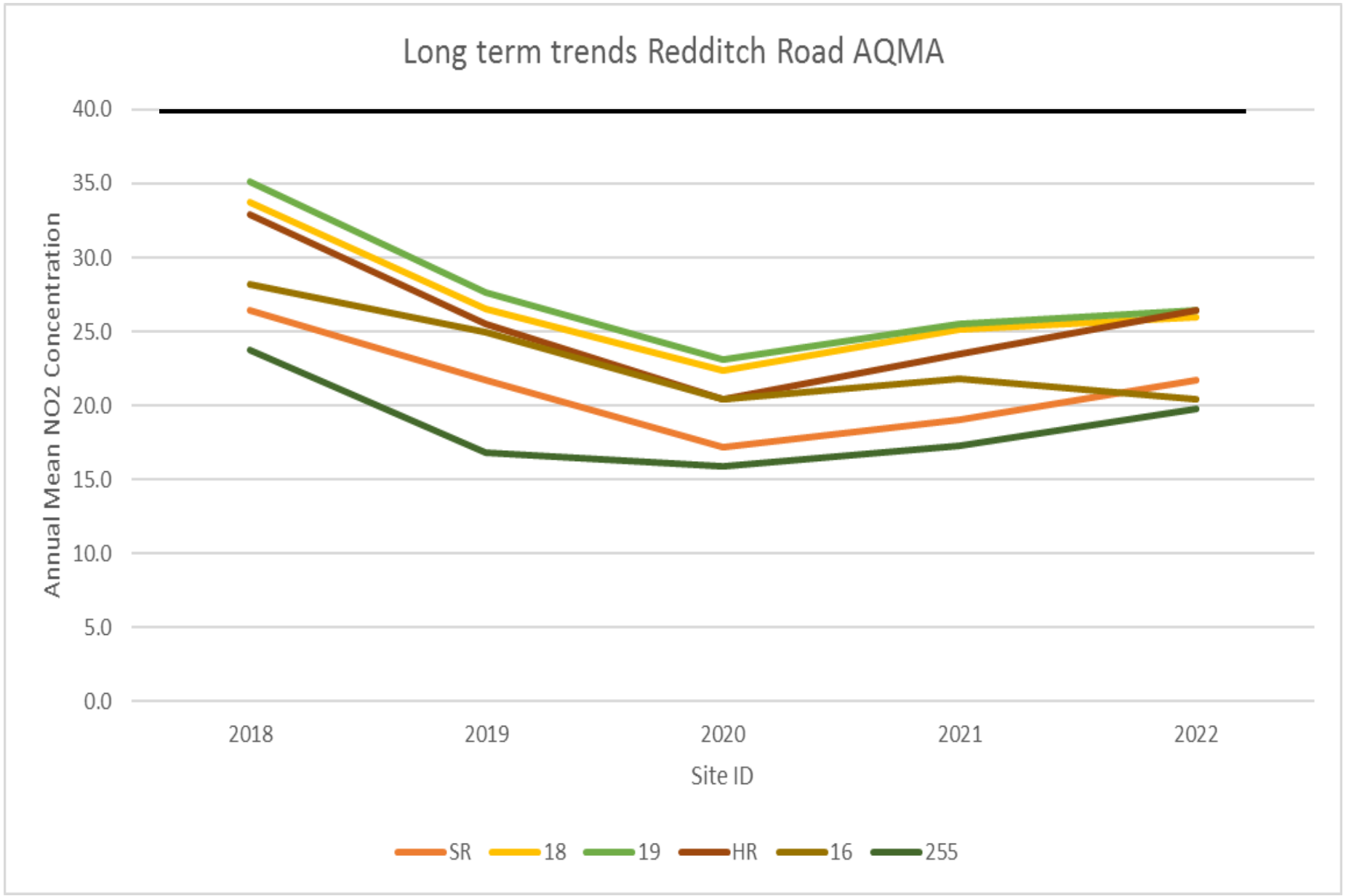
(2) Data capture for the full calendar year (e.g. if monitoring was carried out for 6 months, the maximum data capture for the full calendar year is 50%).

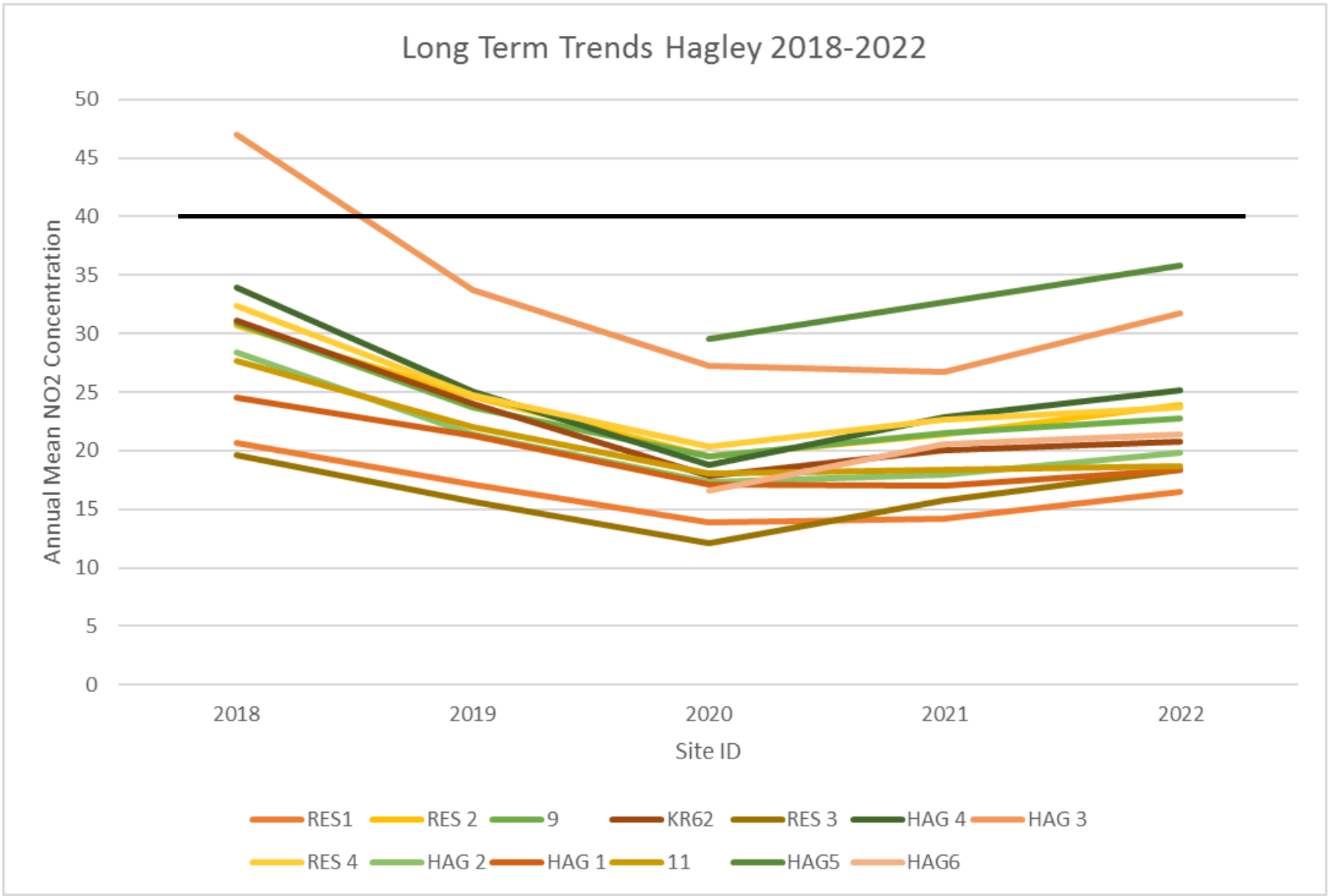
Figure A.1 – Trends in Annual Mean NO_2 Concentrations

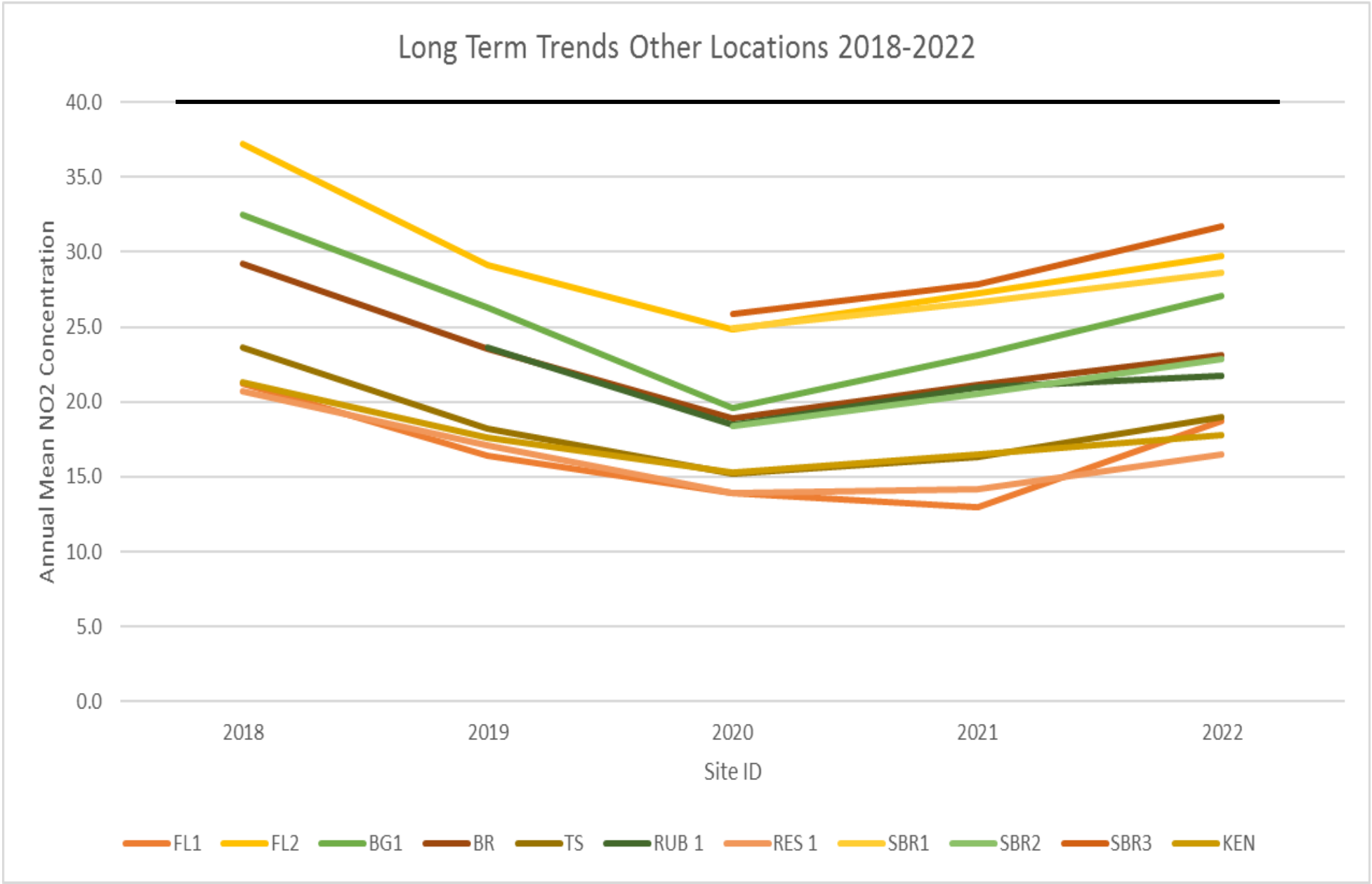



Long Term Trends Worcs Road AQMA
Annual Mean NO2 Concentration
50
45
40
35
30
25
20
15
10
5
0
2018
2019
2020
2021
2022
Site ID
RH1
WR4
WR2
WR3
BC
BCX
WR


Long term trends Lickey End AQMA
60.0
50.0
40.0
30.0
20.0
10.0
0.0
Annual Mean NO2 Concentraion
2018
2019
2020
2021
2022
Site ID
LE7
1
LE4
LIK1
LIK 2
LE5
LE6
F1


Long term trends Redditch Road AQMA
40.0
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0.0
Annual Mean NO2 Concentration
2018
2019
2020
2021
2022
Site ID
SR
18
19
HR
16
255


Long Term Trends Hagley 2018-2022
Annual Mean NO2 Concentration
50
45
40
35
30
25
20
15
10
5
0
2018
2019
2020
2021
2022
Site ID
RES1
RES 2
9
KR62
RES 3
HAG 4
HAG 3
RES 4
HAG 2
HAG 1
11
HAG5
HAG6


Long Term Trends Other Locations 2018-2022
40.0
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0.0
Annual Mean NO2 Concentration
2018
2019
2020
2021
2022
Site ID
FL1
FL2
BG1
BR
TS
RUB 1
RES 1
SBR1
SBR2
SBR3
KEN

Appendix B: Full Monthly Diffusion Tube Results for 2022

Table B.1 – NO_2 2022 Diffusion Tube Results ($\mu g/m^3$)

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 (0.97)	Annual Mean: Distance Corrected to Nearest Exposure	Comment
FL1	395079	269797		32.6	20.0	17.7	12.1	11.4	13.2	14.7	18.7	17.1	18.7	35.7	19.3	18.7	-	
FL2	395118	269721	40.6	23.0	33.3	28.6	26.6	30.7	26.4	27.9	31.7	32.2	36.3		30.7	29.7	-	
RH1	395243	269844	37.1	23.3	29.0	25.6	21.1	23.5	24.0	22.3	24.5	24.8	25.1	30.0	25.9	25.1	-	
WR4	395312	269938	34.4	23.4	27.7	26.0	19.8	19.5	22.3	21.9	23.5	21.4	26.9	28.9	24.6	23.9	-	
WR2	395511	270180	38.6	25.0	36.4	28.0	22.9	24.7	27.5	26.8	25.2	24.0	35.4	30.0	28.7	27.8	-	
WR3	395501	270190	35.5	44.2	24.0	22.4	20.4	20.9	24.3	22.1	32.3	28.3	25.5	39.1	28.3	27.4	-	
BC	395685	270424	54.3	31.6	36.4	33.0	34.5			33.4	39.1	37.9	41.2	44.0	38.5	37.4	-	
BCX	395807	270549	41.2	34.4	35.9	30.8	25.9	27.8	30.5	30.5	39.5	30.8	35.9	37.3	33.4	32.4	-	
WR	395702	270423	47.3	27.1	44.1	36.3	30.0	31.2	35.2	35.0	33.1	38.5	42.8	47.7	37.4	36.2	-	
BG1	396238	271108	37.0	20.5	33.9	28.8	21.8	23.0	24.4	26.8	28.0	26.2	30.5	33.7	27.9	27.0	-	
BR	396292	271210	32.5	15.7	27.6	23.1	19.1	18.3		23.2	25.0	22.1	25.0	30.3	23.8	23.1	-	
LE7	396916	273014	31.1	15.6		26.1	17.7	16.6	21.8	23.8	26.3	21.1	21.8	27.6	22.7	22.0	-	
1	396999	272979	28.7	40.8	21.4	20.7	15.0	35.0		19.3	21.1	16.1	16.1	23.6	23.4	22.7	-	
LE4	396935	272949	38.5	24.7	34.1	34.8	35.2	23.2	41.0	40.5	42.2	24.6	22.3	39.8	33.4	32.4	-	
LIK1	396939	272934	58.7	28.3	25.3	25.7	24.4	14.1	25.5	25.5	27.8	31.0	37.8	32.1	29.7	28.8	-	
LIK 2	396995	273129	34.5	7.1	23.7	20.8	23.4	21.4	22.1	22.2	32.8	39.6	27.9	29.4	25.4	24.7	-	
LE5	396999	273143	33.4	24.8	23.2	21.1	20.8	19.2	25.1	26.2	20.4	22.6	28.5	29.5	24.6	23.8	-	
LE6	396958	273157	31.3	37.0	22.5	18.3	20.1	34.7	19.7	16.5	25.4	25.3	43.2	29.2	26.9	26.1	-	
F1	397010	273112	45.1	13.1	43.0	31.2	34.2	23.4	22.5	34.0	25.0	24.1	28.9	39.9	30.4	29.4	-	

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 (0.97)	Annual Mean: Distance Corrected to Nearest Exposure	Comment
TS	396613	275085	26.7	20.8	22.2	20.2	12.9	12.8	14.8	18.2	19.0	21.1	21.7	24.4	19.6	19.0	-	
RUB 1	398555	277200	34.6	14.6	25.6	23.4	16.6	18.9	21.3	24.2	23.3	19.3	19.1	28.0	22.4	21.7	-	
RES 1	391445	281179	22.2	20.3	19.4	12.0	14.0	13.4	15.3	14.0	17.0	17.1	18.5	20.9	17.0	16.5	-	
RES 2	391556	281042	34.4	22.1	26.1	24.6	20.4	20.2	26.1	25.3	26.7	21.7	23.1	25.1	24.6	23.9	-	
9	391210	280668	30.8	21.5	26.0	24.8	20.5	18.9	20.7	23.2	23.9	20.9	23.2	27.7	23.5	22.8	-	
KR62	391182	280631	30.1	11.1	23.2	20.8	22.1	20.3	20.3	20.3	22.5	17.9	21.6	26.1	21.4	20.7	-	
RES 3	389827	279590	21.0	19.9	22.0	16.4	12.5	10.1	12.8	14.2	42.4	16.3	18.2	21.3	18.9	18.4	-	
HAG 4	389850	279588	31.7	30.9	28.6	26.2	20.7	18.8	23.4	26.2	26.5	21.9	25.4	30.5	25.9	25.1	-	
HAG 3	389909	279629	43.1	36.6	33.0		29.6	29.4	32.3	34.9	22.6	31.3	31.4	36.0	32.7	31.8	-	
RES 4	390025	279765	34.6	16.4	27.8	26.4	20.9	19.1	24.7	24.6	26.4	20.5	23.0	28.6	24.4	23.7	-	
HAG 2	390203	279945	28.5	16.7	23.4	22.4	15.5	14.6	18.4	18.7	22.0	17.9	20.8	26.4	20.4	19.8	-	
HAG 1	390247	279996	25.9	16.9	23.0	20.2	15.3	13.0	15.4	17.1	18.4	17.3	20.4	25.1	19.0	18.4	-	
11	390295	280043			25.5	22.8	17.1	15.6	17.7	19.6	21.3	0.5	23.1	29.9	19.3	18.7	-	
HAG5	389929	279650	44.1	19.8	39.1	44.1	38.2	35.5	41.1	43.2	34.4	33.1	33.4	37.1	36.9	35.8	-	
HAG6	389939	279664	28.0	22.6	25.5	23.6	18.3	17.3	19.8	22.8	15.7	22.0	22.5	26.1	22.0	21.4	-	
SBR1	396127	271516	48.1	19.7		27.0	24.5	28.1	32.3	27.3	29.0	24.5	30.8	33.3	29.5	28.6	-	
SBR2	395996	272063	32.8	23.4	25.8	20.0	17.2	17.3	20.6	20.3	24.4	23.4	26.4	30.8	23.5	22.8	-	
SBR3	395825	272841	41.9	22.7	36.1	33.0	25.8	27.6	33.0	32.5	38.9	31.4	30.0	39.3	32.7	31.7	-	
KEN	396683	270354	30.0	16.8	20.7	16.6	13.2	12.7	15.4	16.4	18.7	15.3	18.9	25.6	18.3	17.8	-	
SR	396780	269450	31.8	20.7	26.0	22.0	17.6	16.4	18.8	21.7	23.8	19.3	22.4	28.2	22.4	21.7	-	
18	395180	268549	39.5	24.0	24.7	30.0	21.2	18.9	23.3	27.7	25.1	25.3	26.6	34.7	26.7	25.9	-	
19	395188	268564	40.2	23.0	27.4	27.0	24.1	17.9	26.3	26.3	29.5	24.8	25.8	34.8	27.3	26.4	-	

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 (0.97)	Annual Mean: Distance Corrected to Nearest Exposure	Comment
HR	394772	268441	35.9	22.1	30.2	26.7		22.0	26.5	27.4	29.6	21.8	24.7	32.7	27.2	26.4	-	
16	394701	268444	34.2	23.0	29.0	23.9	20.3		21.4					30.4	26	21.7	-	
255	394408	268417	29.3	20.8	26.5	20.1	13.6	13.0	16.0		21.2	17.1	19.6	27.3	20.4	19.8	-	

☒ **All erroneous data has been removed from the NO_2 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.**

☒ **Bromsgrove District Council confirm that all 2022 diffusion tube data has been uploaded to the Diffusion Tube Data Entry System.**

Notes:

Exceedances of the NO_2 annual mean objective of 40µg/m^3 are shown in **bold**.

NO_2 annual means exceeding 60µg/m^3, indicating a potential exceedance of the NO_2 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 Bromsgrove District Council area During 2022

Bromsgrove District Council has not identified any new significant sources impacting air quality within the reporting year of 2022.

Applications for a number of new developments have been identified within the Bromsgrove District 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 Bromsgrove District Council in 2022 are as follows:-

Planning Ref	Address	Proposal
21/01106/FUL	Newlands Seafield Lane Portway Birmingham Worcestershire B48 7HJ	Proposed mixed agricultural and equestrian storage building and stable block with shared yard. Change of use from agricultural to mixed agricultural and equestrian
21/01580/FUL	Site Of 2 And 3 Storey Flats Burcot Lane Bromsgrove Worcestershire B60 1AQ	Wall render to existing building wall elevations, new external lighting scheme to footpaths and new bin stores.
22/00469/FUL	The Stables Dale Lane Lickey End Bromsgrove Worcestershire B60 1GZ	Mixed use application for the stationing of caravans for residential use and the keeping of horses, with dayrooms and existing stable ancillary to that use'
22/00351/FUL	Land Adjacent To Fieldhouse Lane Fieldhouse Lane Romsley Worcestershire B62 0NH	Change of use to equestrian land, the erection of a stable block and operational development.
22/00801/FUL	Seafield Farm Seafield Lane Portway Redditch	Demolition of 2No. existing poultry building and erection of clear span portal frame building to form additional seasonal livestock area

Planning Ref	Address	Proposal
	Worcestershire B98 9DB	
22/01114/FUL	Units 2B To 2D Oakland Seafield Lane Portway Worcestershire B98 9DB	Demolition of a warehouse and its replacement with an agricultural building for vertical farming
22/01146/FUL	Prince Of Wales High Street Solihull Solihull B90 1JW	Demolition of the former Prince of Wales public house and the erection of a 72 bedroom care home facility with frontage parking together with the change of use of former agricultural land at the rear to ancillary amenity space for residents including the provision of Green Care Farming with landscaping, and associated works. (Cross boundary application - Solihull and Bromsgrove).
22/00908/FUL	Land Off Claypit Lane Bournheath Worcestershire	Change of use of agricultural land to equestrian, the erection of a stable block and associated operational development inclusive of hard-standing
22/01241/S73	Attwell Farm Park Seafield Farm Seafield Lane Portway Redditch Worcestershire B98 9DB	Variation of condition 8 planning permission 19/01544/FUL - Variation of opening hours to visiting members of the public
22/01129/FUL	Land At Heath End Road Belbroughton Worcestershire DY9 9XG	Change of use from land formally agricultural to providing a recreation area for dog owners and dog carers. The application includes the erection of a 1.5 high lightweight netting around the perimeter of the boundary. The field will be accessed from Heath End Road using the existing farm driveways.
22/01220/FUL	Former Poultry Houses Rose Cottage Farm Seafield Lane Portway Worcestershire B48 7HN	Demolition of one existing agricultural building; repair of three further agricultural buildings (retrospective)
22/01302/FUL	Sunfield Childrens Home Ltd Woodman Lane Clent Worcestershire DY9 9PB	Erection of new lower school building with herb garden, erection of 2no. new farm yard buildings, demolition and erection of a new building to create a research, library and café, demolition and engineering works to create a new upper school entrance garden, extension to existing shop and other associated works.
22/01506/FUL	Land Adjacent Houndsfield Industrial Estate Houndsfield Lane	Change of use of land and erection of a new non-residential training centre (use Class F.1) for infrastructure training in construction and employment skills and associated outside training area. New vehicular access point with new track,

Planning Ref	Address	Proposal
	Hollywood Worcestershire	landscaping, parking area, plant / equipment storage area, cycle storage and new pedestrian footpath onto Houndsfield Lane (part retrospective).
22/01530/FUL	Plot At Buntsford Gate Business Park Buntsford Drive Bromsgrove Worcestershire	Erection of employment and commercial units Use Class E(g)(ii) and (iii), B2, B8 with ancillary offices, with vehicle parking and all associated engineering, including site clearance and all associated works.

Additional Air Quality Works Undertaken by Bromsgrove District Council Area During 2022

Bromsgrove District Council has not completed any additional works within the reporting year of 2022.

QA/QC of Diffusion Tube Monitoring

The following UKAS accredited company provided Bromsgrove District Council with nitrogen dioxide diffusion tubes and analysis in 2022:

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 NO_2 Proficiency Testing Scheme (AIR-PT).

All monitoring undertaken has been completed in accordance with the 2022 Diffusion Tube Monitoring Calendar, i.e. on or within ± 2 days of the specified date.

Diffusion Tube Annualisation

Table C.1 – Annualisation Summary (concentrations presented in µg/m^3)

Site ID	Annualisation Factor Birmingham Ladywood	Annualisation Factor Leamington Spa	Annualisation Factor Leominster	Annualisation Factor West Bromwich Kendrick Park	Average Annualisation Factor	Raw Data Annual Mean	Annualised Annual Mean
16	0.8898	0.8327	0.8581	0.8621	0.8607	26.0	22.4

Diffusion Tube Bias Adjustment Factors

The diffusion tube data presented within the 2022 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/NO_2 continuous analysers. Alternatively, the national database of diffusion tube co-location surveys provides bias factors for the relevant laboratory and preparation method.

Bromsgrove District Council have applied a local bias adjustment factor of 0.97 to the 2022 monitoring data. A summary of bias adjustment factors used by Bromsgrove District Council over the past five years is presented in Table C.2

WRS has determined the appropriate local bias adjustment factor utilising the Diffusion Tube Data Processing Tool v3.0. The site used was the colocation study at Wyre Forest House, Kidderminster. The local bias adjustment factor has been used as it is more conservative compared with the national bias adjustment factor (0.83, Defra published National Diffusion Tube Bias Adjustment Spreadsheet Version 03/23), following consultation with Defra LAQM helpdesk and technical guidance.

Table C.2 – Bias Adjustment Factor

Monitoring Year	Local or National	If National, Version of National Spreadsheet	Adjustment Factor
2022	Local	-	0.97
2021	National	03/22	0.84
2020	National	03/21	0.81
2019	National	03/20	0.78
2018	National	03/19	0.89

Table C.3 – 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	11				
Bias Factor A	0.97 (0.92 - 1.04)				
Bias Factor B	3% (-4% - 9%)				
Diffusion Tube Mean (µg/m^3)	13.0				
Mean CV (Precision)	2.7%				
Automatic Mean (µg/m^3)	12.7				
Data Capture	100%				
Adjusted Tube Mean (µg/m^3)	13 (12 - 14)				

Notes:

A single local bias adjustment factor has been used to bias adjust the 2022 diffusion tube results.

NO_2 Fall-off with Distance from the Road

Wherever possible, monitoring locations are representative of exposure. However, where this is not possible, the NO_2 concentration at the nearest location relevant for exposure has been estimated using the Diffusion Tube Data Processing Tool/NO_2 fall-off with distance calculator available on the LAQM Support website. Where appropriate, non-automatic annual mean NO_2 concentrations corrected for distance are presented in Table B.1.

No diffusion tube NO_2 monitoring locations within Bromsgrove District Council area required distance correction during 2022.

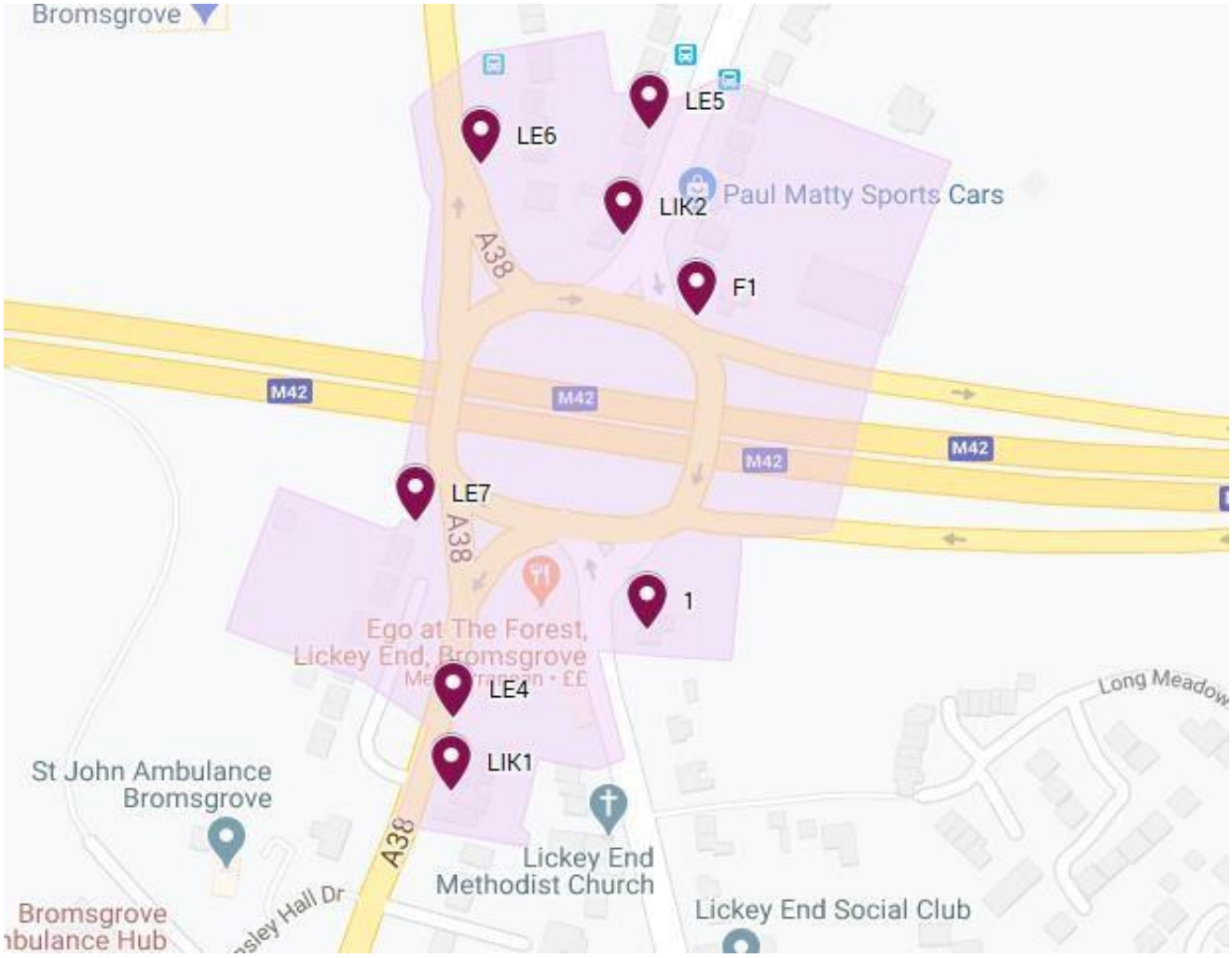
QA/QC of Automatic Monitoring

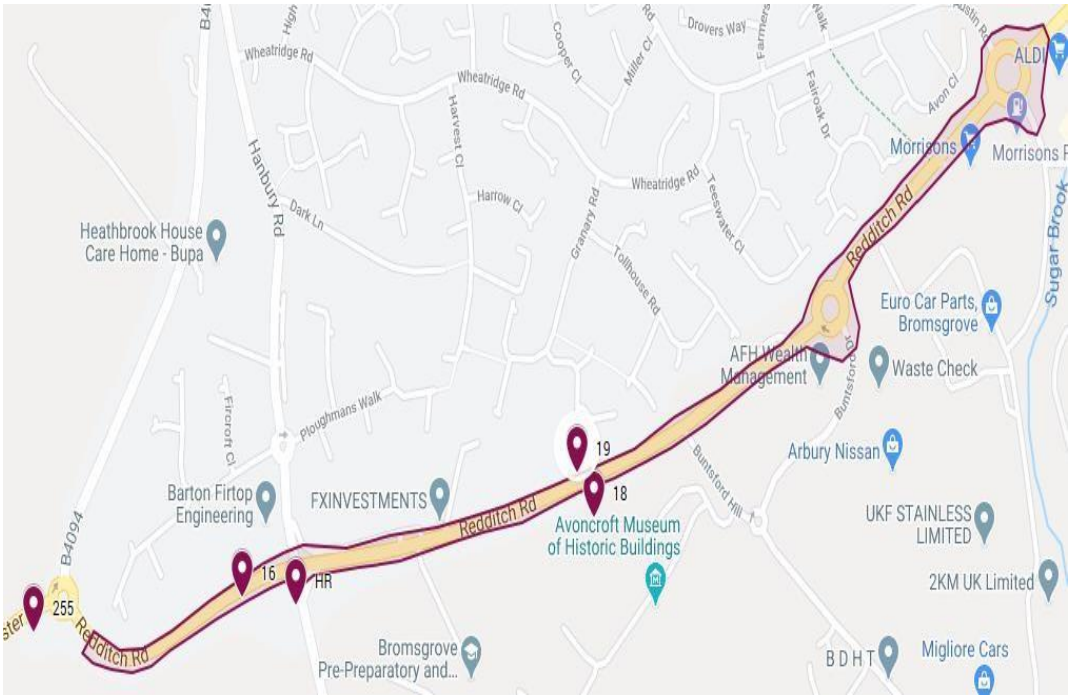
No automatic monitoring has been undertaken.

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

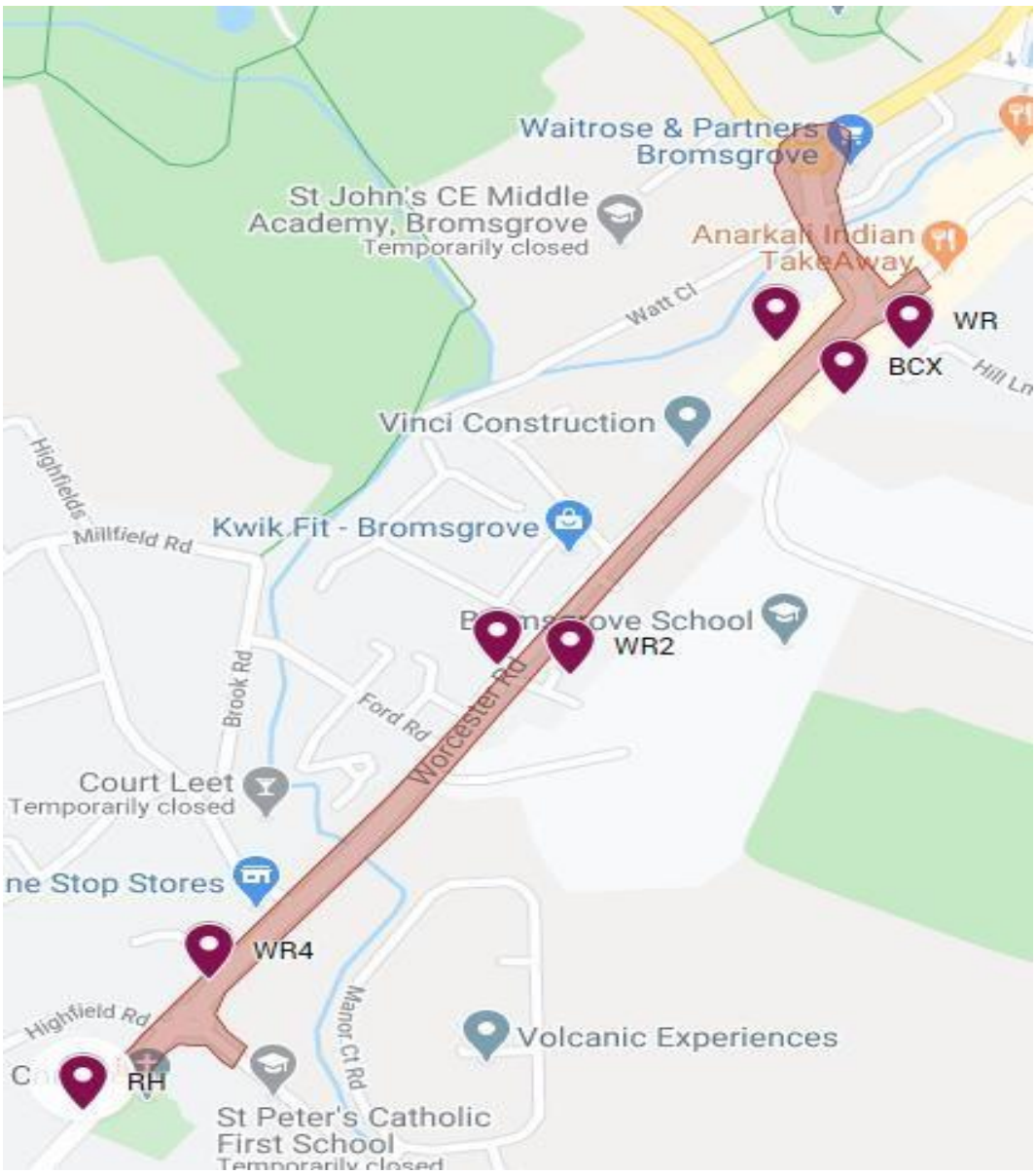
Figure D.1 – Maps of Non-Automatic Monitoring Sites

All Monitoring Locations within Bromsgrove District (fig D.1a)

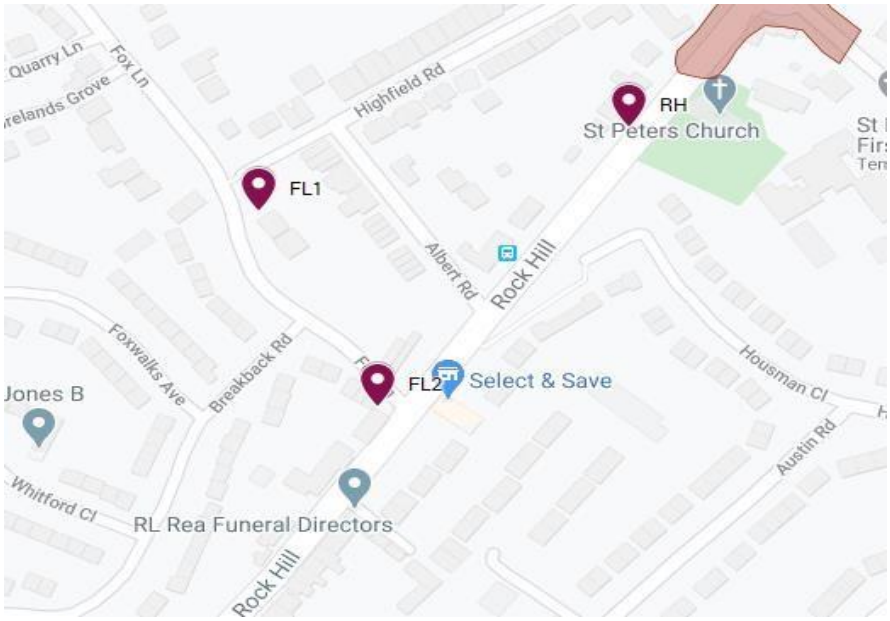




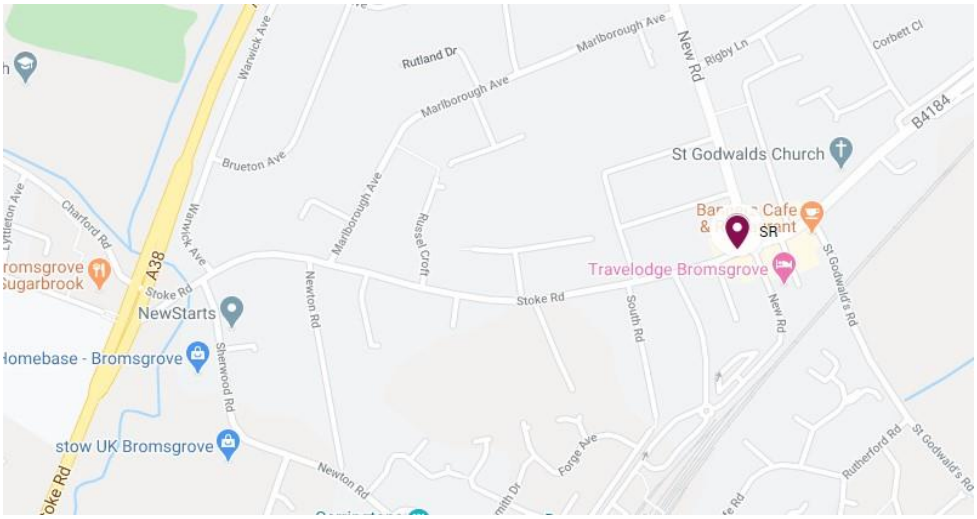
Redditch Road AQMA and Monitoring Locations (19, 18, HR, 16, 255) (fig D.1c)



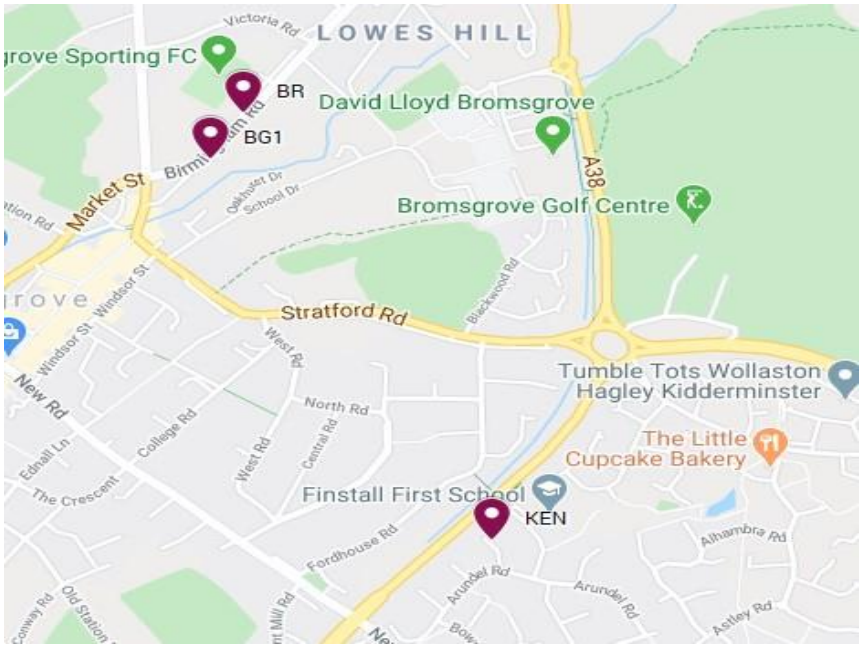
Worcester Road AQMA and Monitoring Locations (WR, BC, BCX, WR2, WR3, WR4, RH) (fig D.1d)



Rock Hill, Bromsgrove Monitoring Locations (FL1, FL2, RH) (fid D.1e)

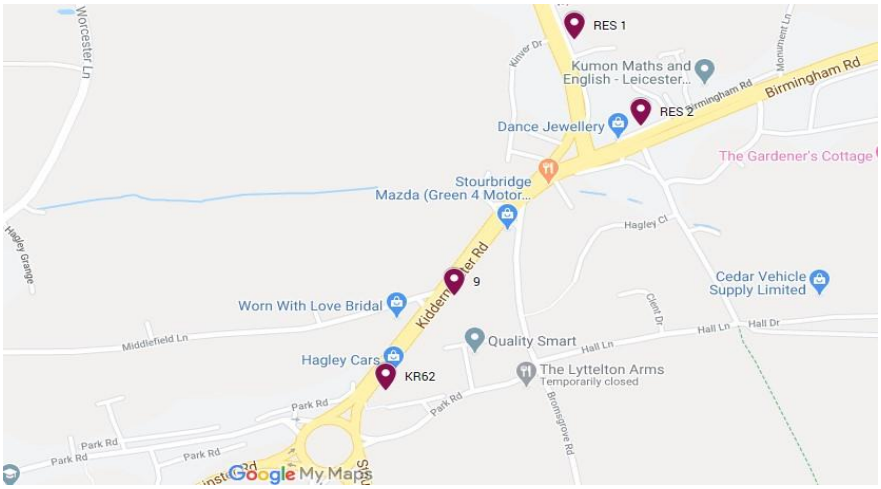


Aston Fields, Bromsgrove Monitoring Location (SR) (Fig D.2f)



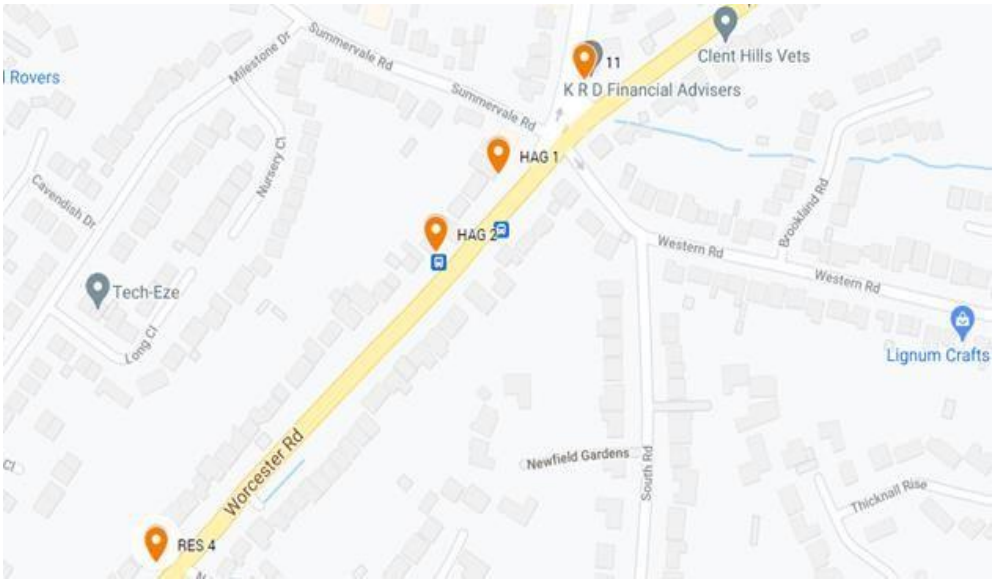
Bromsgrove Monitoring Locations (BR, BG1, KEN) (fig D.1g)

Wildmoor, Bromsgrove Monitoring Location (TS) (fig D.1h)

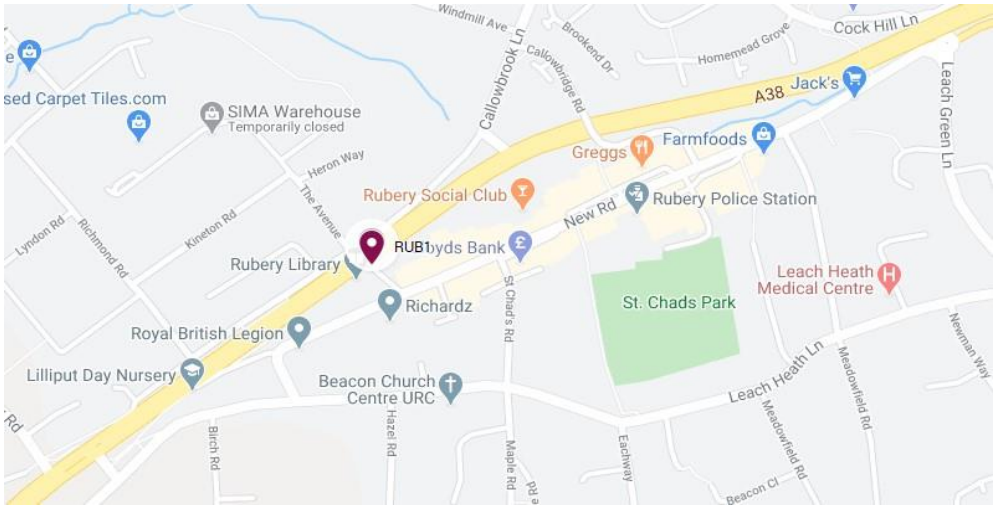


Monitoring Locations Former Hagley AQMA (RES1, RES2, 9, KR62) (fig D.1i)

West Hagley Monitoring Locations (HAG6, HAG5, HAG3, HAG4, RES3) (fig D.1j)



West Hagley Monitoring Locations (11, HAG1, HAG2, RES4) (fig D.1k)



Rubery Monitoring Location (RUB1) (fig D.1l)

Stourbridge Road, Bromsgrove Monitoring Locations (SBR1, SBR2, SBR3) (fig D.1m)

Appendix E: Summary of Air Quality Objectives in England

Table E.1 – Air Quality Objectives in England[10]

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

[10] The units are in microgrammes of pollutant per cubic metre of air (µg/m^3).

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'
AQAPSG	Air Quality Action Plan Steering Group
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
AURN	Automatic Urban and Rural Network (Defra) - UK's largest automatic monitoring network and is the main network used for compliance reporting against the Ambient Air Quality Directives (by Gov't)
Defra	Department for Environment, Food and Rural Affairs
DoPH	Director of Public Health
LAQM	Local Air Quality Management
LCWIP	Local Cycling and Walking Infrastructure Plan
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
WRS	Worcestershire Regulatory Services

References

- DEFRA (2023) National Diffusion Tube Bias Adjustment Factor Spreadsheet v.03/23
- DEFRA (2018) Background Mapping for Local Authorities
- 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.
- Worcestershire Regulatory Services (2013) 'Air Quality Action Plan for Worcestershire'
- Worcestershire Regulatory Services (2015) 'Air Quality Action Plan Progress Report for Worcestershire April 2013-April 2015'
- Worcestershire Regulatory Services (2016) 'Air Quality Action Plan Progress Report for Worcestershire April 2015 – April 2016'
- Worcestershire Regulatory Services (2022) Air Quality Annual Status Report for Bromsgrove District Council