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Regulatory Services

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Wyre Forest
District Council

2021 Air Quality Annual Status Report (ASR)

In fulfilment of Part IV of the Environment Act 1995
Local Air Quality Management

Date: June 2021

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Executive Summary: Air Quality in Our Area

Air Quality in Wyre Forest 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 28,000 to 36,000 deaths at typical ages³, with a total estimated healthcare cost to the NHS and social care of £157 million in 2017⁴.

Worcestershire Regulatory Services (WRS) have been responsible for managing (monitoring and reporting of) local air quality in the six Worcestershire District Councils since April 2011.

Monitoring across the Wyre Forest District area focuses on nitrogen dioxide (NO₂) via a network of passive diffusion tubes, the tubes are located in the main urban centres of Kidderminster, Stourport-on-Severn and Bewdley.

Two Air Quality Management Areas (AQMA's) were declared by Wyre Forest District Council for exceedances of the annual mean objective for nitrogen dioxide (NO₂):

- Welch Gate, Bewdley AQMA. Declared January 2003
- Horsefair, Kidderminster AQMA. Declared January 2003
Amended in July 2009 to include part of the Kidderminster Ring Road and Coventry Street.

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, July 2020

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 the declarations and maps of the AQMAs can be found on the following pages of WRS website:

<http://www.worcsregservices.gov.uk/pollution/air-quality/air-quality-management-areas.aspx>

In 2020 monitoring showed that, after annualisation and bias adjustment, there were no exceedances of the annual mean objective for NO₂ within the Horsefair/Coventry Street AQMA and the Welch Gate AQMA. This is likely to have been caused by the reduction in traffic during the 'lockdowns' in 2020 caused by the Covid-19 pandemic (see Appendix F for details) and the introduction of a one-way system within the Horsefair/Coventry Street AQMA in September 2020.

Monitoring results demonstrate a significant decrease in concentrations at all monitoring locations in the Wyre Forest District between 2019 and 2020 this is consistent with trends across Worcestershire and is likely to have been caused by the reduction in traffic during the 'lockdowns' in 2020 caused by Covid-19. There were no exceedances of the annual mean objective for NO₂ at any location within the Wyre Forest District area.

There is no discernible upward or downward trend in concentrations over the 5-year period 2016- 2020.

No annual means greater than 60ug/m³ have been recorded indicating that it is very unlikely that there have been any exceedances of the 1-hour mean objective for NO₂ at any monitoring sites.

Two additional diffusion tubes were deployed at the following locations in Kidderminster in January 2020:

- CRS1 - Signpost o/s King Charles 1 School. Junction of A449 & A448, Kidderminster
- PL2 - 2 Pelham Lodge, Kidderminster

This was to increase the monitoring of air quality in Chester Road South to further inform a detailed assessment due to be carried out in 2021.

Actions to Improve Air Quality

Whilst air quality has improved significantly in recent decades and will continue to improve due to national policy decisions, there are some areas where local action is needed to improve air quality further.

The 2019 Clean Air Strategy⁵ sets out the case for action, with goals even more ambitious than EU requirements to reduce exposure to harmful pollutants. The Road to Zero⁶ sets out 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.

In 2013, WRS produced a countywide Air Quality Action Plan (AQAP) for Worcestershire which was adopted by Wyre Forest District Council (WFDC) on 24th October 2013. WRS have produced two updates to the AQAP, the latest in September 2016. For details of all measures completed, in progress or planned, 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:

<http://www.worcsregservices.gov.uk/pollution/air-quality/air-quality-action-plan.aspx>

WRS set up the Worcestershire Air Quality Steering Group to facilitate progressing the implementation of actions identified in the AQAP. At the inaugural Steering Group meeting, on 18th June 2014, it was agreed to establish a number of sub-groups. The Welch Gate Sub-Group covers the Welch Gate AQMA and the Horsefair Sub-Group covers the Horsefair/Coventry Street AQMA. The sub-groups currently comprise representatives of WRS, the Worcestershire County Council Air Quality Liaison Officer and local County and district Councillors

Key actions in 2020 were:

- **Kidderminster Ring Road (Horsefair/Coventry Street) AQMA**

As part of the WFDC Churchfields Masterplan for improvements to the highways infrastructure, work was completed in September 2020 on building a new spur road from the Kidderminster Ringway roundabout at the bottom of Blackwell Street into Churchfields to create a one way system with traffic entering the Kidderminster Ringway using Blackwell Street and traffic exiting the Kidderminster Ringway using Churchfields. This should result in a significant improvement in air quality in Blackwell Street; however, air quality in Churchfields is expected to decline due to

⁵ Defra. Clean Air Strategy, 2019

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

the increase in traffic. The diffusion tube network in the area will be expanded into Churchfields to monitor air quality.

- **Welch Gate AQMA**

Various options have been explored to mitigate the air quality in the Welch Gate AQMA including closing the road to all but public service vehicles and buses together with prohibiting vehicles from using Park Lane, which runs parallel to Cleobury Road and Welch Gate, as an alternative route and prohibiting HGVs from accessing the B4190 Cleobury Road leading into Welch Gate to the B4194 Dowles Road. All options were found to have been either unworkable, ineffective or politically unacceptable. There was no progress on alternative solutions in 2020, but options will continue to be explored by Wyre Forest District Council and Worcestershire County Council in 2021.

A new Air Quality Partnership led by the officers of the Director of Public Health (DoPH), and supported by WRS Land and Air Quality Team, was set up in 2019 to discuss potential actions to improve air quality across the County and determine an action plan for implementation. The group 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 and Highways England. The group is largely driven by DoPH so, due to Covid-19 taking priority, the business of the partnership has been postponed indefinitely.

WRS is also a member of Central England Environmental Protection Managers Group (CEEPG) which provides a strategic overview and direction for the delivery of Environmental Protection Services across the area of Central England covered by participating authorities. CEEPG responsibilities covers all environmental health matters regarding air quality, noise, contaminated land and LAPPC/IPPC including cooperation and coordination with the Environment Agency and Public Health England.

Following direct contact WRS were invited by Defra LAQM Team to join their Local Authority Air Quality Advisory Group (LAQAG), formed in 2017. The group consists of a network of local authority officials acting as an informal sounding board by Defra to enable development of better-informed strategy and policy proposals across the two areas of work in air quality-local authorities and domestic combustion. It is an advisory body and not a decision-making body.

Conclusions and Priorities

There are currently two AQMAs declared in the Wyre Forest District, Horsefair/Coventry Street, Kidderminster and Welch Gate, Bewdley. Monitoring results for 2020 show that air quality in the Horsefair/Coventry Street AQMA and the Welch Gate AQMA was below the annual mean objective. This is likely to have been caused by the reduction in traffic during the 'lockdowns' in 2020 caused by Covid-19, both AQMAs will remain in place and continue to be reviewed.

The monitoring network was increased in January 2020 by two diffusion tubes at locations in Chester Road South (A449) to further inform a detailed assessment of the area due to be carried out in 2021.

Monitoring results demonstrate a significant decrease in NO₂ concentrations at all monitoring locations in 2020; this is consistent with trends across Worcestershire. This is likely to have been caused by the reduction in traffic during the 'lockdowns' in 2020 caused by Covid-19. There were no exceedances of the annual mean objective for NO₂ at any location within the Wyre Forest District area. The decrease between 2019 and 2020 monitoring data should not be considered as indicative of local trends. There is no discernible upward or downward trend in concentrations over the five-year period 2016 - 2020.

There are two major residential developments proposed on the eastern side of Kidderminster which may have an impact on air quality in the future. The Lea Castle, Cookley development for up to 600 dwellings, employment and retail use has been given planning permission and the second for a mixed use, residential led development with up to 1400 dwellings on land between the A456 Birmingham Road and A448 Comberton Road is pending a decision at the time of the report's writing..

The priorities for Wyre Forest District Council are to continue to monitor nitrogen dioxide at key points across the area. WRS on behalf of Wyre Forest District Council will continue to monitor locations in 2021 to assess any improvements or degradation in NO₂ concentrations. The data gathered will assist in further assessment of areas of poor air quality within the District. Further update on monitoring and action progress will be provided in the 2022 Annual Status Report.

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, leave your car at home:** Leaving your car at home and walking or cycling instead will benefit in three ways - increased exercise, reduced pollution exposure and will reduce individual's pollution emissions;
- **Turn off your engine when stationary or parked,** don't 'idle', particularly outside sensitive receptors such as schools, hospitals, care homes and residential properties;
- Worcestershire County Council have launched a car sharing website, **LiftShare**, to help people find others journeying to the same destinations to share journeys and costs and reduce traffic and emissions. Visit this link for more information <https://worcestershire.liftshare.com/>
- Contact Worcestershire County Council for help and advice on a **Travel Plan** for your business. General travel planning advice is available on Worcestershire County Council's website (including walking, cycling and bus maps and timetables).
- **Hold meetings by Conference Call** by phone or Video conference via Skype, Facetime, Zoom or other service rather than driving to meetings. This reduces fuel and other travel costs, vehicle maintenance and hire cost, increases productivity through reduction in hours lost through unnecessary travel;
- Facilitate **Flexible Working Arrangements** for non-front-line staff to **work remotely from home** or nearer home facilities for one or more days a week thus removing or reducing any journey to work. This reduces congestion which has beneficial impacts for delivery times, reduced business costs and thus economic benefits. Additionally, provides social benefits through improved work life balance for employees, reduces local air quality and reduced emergency vehicle response times.
- **Switch Fleet to Low Emission Vehicles:** The government is providing £80m funding to encourage installation of Electric Vehicle (EV) charging 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:

<https://www.gov.uk/government/collections/government-grants-for-low-emission-vehicles#workplace-charging-scheme>

- If you have to drive follow fuel efficient driving advice, often known as '**Smarter Driving Tips**', to save on fuel and reduce your emissions. A number of websites promote such advice including:

<http://www.theaa.com/driving-advice/fuels-environment/drive-smart>

<http://www.dft.gov.uk/vca/fcb/smarter-driving-tips.asp>

- **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/daqj>

⁷ <http://www.breathelondon.org/>

⁸ <https://www.londonair.org.uk/LondonAir/guide/MyActionsForMe.aspx>

- 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.

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 can currently be found at

<http://www.worcsregservices.gov.uk/pollution/air-quality/public-advice.aspx> .

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1 Local Air Quality Management

This report provides an overview of air quality in Wyre Forest District Council during 2020. It fulfils the requirements of Local Air Quality Management (LAQM) as set out in Part IV of the Environment Act (1995) 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 pursuit of the objectives. This Annual Status Report (ASR) is an annual requirement showing the strategies employed by Wyre Forest 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

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 12 months setting out measures it intends to put in place in pursuit of compliance with the objectives.

A summary of the Horsefair/Coventry Street and Welch Gate AQMAs declared by Wyre Forest District Council can be found in Table 2.1. The table presents a description of the two AQMAs that are currently designated within Wyre Forest District Council. D: Map(s) of Monitoring Locations and AQMAs provides maps of 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:

- NO₂ annual mean

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	Name and Date of AQAP Publication	Web Link to AQAP
The Kidderminster Ring Road (Horsefair/Coventry Street)	Declared 06/01/2003 Amended 30/07/2009	NO2 Annual Mean	An area of residential & commercial properties in The Horsefair & Blackwell Street. The AQMA was extended to include part of the Kidderminster Ring Road and residential properties in the vicinity of Coventry Street.	NO	54µg/m3	39µg/m3	Air Quality Action Plan for Worcestershire September 2013 Updated September 2016	Visit the AQAP for AQMA Kidderminster Ring Road Air Quality Action Plan - Worcestershire Regulatory Services (worcsregservices.gov.uk)
Welch Gate, Bewdley	Declared 06/01/2003	NO2 Annual Mean	A short section of Welch Gate encompassing a number of residential properties from the junction of Dog Lane running south west to north east to a point level with 84 Welch Gate	NO	47µg/m3	38µg/m3	Air Quality Action Plan for Worcestershire September 2013 Updated September 2016	Visit the AQAP for AQMA Welch Gate Air Quality Action Plan - Worcestershire Regulatory Services (worcsregservices.gov.uk)

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

Wyre Forest District Council confirm that all current AQAPs have been submitted to Defra.

Progress and Impact of Measures to address Air Quality in Wyre Forest 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. Trends are presented and discussed and a robust comparison with air quality objectives is provided.
2. The diffusion tube mapping demonstrates the monitoring network, however, on the diagram showing the Horsefair, Kidderminster AQMA Diffusion Tube "(F)69COV" is incorrectly labelled as "(F)68COV".
3. Following the repositioning and renaming of diffusion tube "23HF" to "21HF", this change needs to be carried out throughout the report. Table B.1 referred to 2019 data at "23HF" in the report despite the table being correctly amended in the spreadsheet provided.
4. Table A.3 has been filled in incorrectly for the six new diffusion tubes that required annualisation. It appears the percentage for data capture for 2019 at these tubes has been wrongly placed in the data capture for the period column. These tubes should state 100% data for the monitoring period and 33% for 2019, rather than 33% data capture for the monitoring period as is currently shown.
5. The introduction of new diffusion tube locations for 2019 is welcomed and the network should continue to be reviewed to ensure the most relevant locations are monitored as required. Especially, in the vicinity of the Horsefair, Kidderminster AQMA following the Kidderminster Ring Road development.
6. QA/QC of the data was considered to be thorough, with a national bias adjustment factor used for the non-automatic network and annualisation carried out as required for six sites in 2019.
7. Distance correction was performed at one site which recorded concentrations above or within 10% ($>36 \mu\text{g}/\text{m}^3$) and was not representative of relevant exposure and calculations were provided.
8. Feedback from last year's appraisal was included and addressed. This is welcomed and is encouraged to continue in future years.

Wyre Forest District Council has taken forward a number of direct measures during the current reporting year of 2020 in pursuit of improving local air quality. Details of all measures completed, in progress or planned are set out in Table 2.2. 14 measures are included within Table 2.2, with the type of measure and the progress Wyre Forest District Council have made during the reporting year of 2020 presented. Where there have been, or continue to be, barriers restricting the implementation of the measure, these are also presented within Table 2.2.

More detail on these measures can be found in the 'Air Quality Action Plan Progress Report for Worcestershire April 2015 – April 2016' at:

<http://www.worcsregservices.gov.uk/pollution/air-quality/air-quality-action-plan.aspx>

Key completed measures are:

- **Kidderminster Ring Road (Horsefair/Coventry Street) AQMA**

As part of the WFDC Churchfields Masterplan for improvements to the highways infrastructure, work was completed in September 2020 on building a new spur road from the Kidderminster Ringway roundabout at the bottom of Blackwell Street into Churchfields to create a one way system with traffic entering the Kidderminster Ringway using Blackwell Street and traffic exiting the Kidderminster Ringway using Churchfields. This should result in a significant improvement in air quality in Blackwell Street; however, air quality in Churchfields is expected to decline due to the increase in traffic. The diffusion tube network in the area will be expanded into Churchfields to monitor air quality.

- **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 included by WRS on relevant planning consents.

- **Produce Air Quality Supplementary Planning Document (SPD):**

WRS officers have produced the SPD, it has been formally adopted by the North Worcestershire Strategic Planning Authority and is currently being formulated by South Worcestershire Strategic Planning Authority.

WRS on behalf of Wyre Forest District Council will continue to monitor locations in 2020 to assess any improvements or degradation in NO₂ concentrations. The data gathered will assist in further assessment of areas of poor air quality outside the current AQMAs. Further update on monitoring and action progress will be provided in the 2021 Annual Status Report.

The principal challenges and barriers to implementation that that Wyre Forest District Council anticipates facing is in the Welch Gate AQMA in Bewdley, described as a 'street canyon', in that it is a narrow street with continuous buildings on either side and is a major route for traffic in and out of Bewdley. As a consequence, solving the problem of poor air quality at this location is proving to be difficult.

- **Welch Gate AQMA:** Various options have been explored to mitigate the air quality in the Welch Gate AQMA including closing the road to all but public service vehicles and buses together with prohibiting vehicles from using Park Lane which runs parallel to Cleobury Road and Welch Gate as an alternative route and prohibiting HGVs from accessing the B4190 Cleobury Road leading into Welch Gate to the B4194 Dowles Road. All options have been found to be either unworkable, ineffective or politically unacceptable. There was no progress on alternative solutions in 2020, but options will continue to be explored by Wyre Forest District Council and Worcestershire County Council in 2021.

Progress on the following measures has been slower than expected due to:

- **HGV or weight restriction on affected roads:**

The B4190 Cleobury Road/Welch Gate is the main access route for traffic from the B456 Bewdley By-pass to the B4194 Dowles Road which leads to towns in Shropshire. Enforcement of the 7.5 tonne weight limit and access only restriction is proving problematic as alternative routes in the area for HGVs are not considered viable.

Whilst the measures stated above and in Table 2.2 will help to contribute towards compliance, Wyre Forest District Council anticipates that further additional measures not yet prescribed will be required in subsequent years to achieve compliance and enable the revocation of the Horsefair/Coventry Street and Welch Gate AQMAs.

Table 2.2 – Progress on Measures to Improve Air Quality

Measure No.	Measure	Category	Classification	Year Measure Introduced	Estimated / Actual Completion Year	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
1	Loading and unloading restrictions during peak traffic times	Traffic Management	UTC, Congestion management, traffic reduction	2016	2016	WFDC		NO	Not Funded		Completed	2-5%	Decrease in illegally parked vehicles	WFDC parking enforcement targeting AQMA areas.	Currently in operation
2	HGV or weight restriction on affected roads	Freight and Delivery Management	Route Management Plans/ Strategic routing strategy for HGV's	2016	2016	WFDC		NO	Not Funded		Completed	2%	Less HGV's travelling through Welch Gate AQMA	A 7.5 tonne weight limit and access only restriction is currently in operation on the B4190 Cleobury Road leading into Welch Gate.	HGVs use the B4190 for access to the B4194 (Dowles Road)
3	Promote flexible working arrangements	Promoting Travel Alternatives	Encourage / Facilitate home-working	2017		WCC & WFDC		NO	Not Funded		Implementation	1%	Increase in uptake of personal travel planning services. Change in behaviour towards more sustainable modes of transport	Currently in operation	
4	Freight Quality Partnership – work with satellite navigation companies to route HGVs around AQMAs	Traffic Management	UTC, Congestion management, traffic reduction	2016		WCC		NO	Not Funded		Implementation	5 - 10%	Fewer HGVs travelling through AQMAs	Implementation on-going	It can take some time for the information to filter down to users.
5	Churchfields Urban Highway Improvement Scheme	Traffic Management	UTC, Congestion management, traffic reduction	2018	2020	WCC	WFDC, Worcestershire LEP, Homes England, Greater Birmingham & Solihull LEP	NO	Funded	£1 million - £10 million	Completed	10-40%	Improved flow through Horsefair/Coventry Street AQMA, reduction in congestion	Improvements to Highways Infrastructure in the Churchfields area via a one-way system. Opened in September 2020	
6	Introduction of traffic signals at roundabouts	Traffic Management	UTC, Congestion management, traffic reduction	2018		WCC		NO	Not Funded		Aborted				There are no current proposals for the Kidderminster ring road
7	Installing electric vehicle charging points	Promoting Low Emission Transport	Procuring alternative Refuelling infrastructure to promote Low Emission Vehicles, EV recharging, Gas fuel recharging	2014		WRS & WFDC		NO	Not Funded		Implementation	1%	Increase in availability of EV charging points and corresponding increase in use of electric vehicles	Recommendations for installation of EV Charging Points routinely recommended by WRS on relevant planning consents.	WRS technical guidance note for planning (v.5.1), produced on behalf of Worcestershire local authorities
8	Travel Planning	Promoting Travel Alternatives	Personalised Travel Planning	2017	2018	WCC		NO	Not Funded		Completed	<1%	Increased uptake of alternative modes of transport	WCC have developed a "one-stop-shop" online travel portal	
9	Measures linked to walking and cycling initiatives	Promoting Travel Alternatives	Promotion of cycling	2015	2016	WFDC		NO	Not Funded		Completed		Increased uptake of walking and cycling in Wyre Forest	WFDC has a web page dedicated to the promotion of walking and cycling.	
10	Car Sharing	Alternatives to private vehicle use	Car & lift sharing schemes	2015	2016	WCC		NO	Not Funded		Completed	<1%	Increase in number of people car sharing	LiftShare booking is available on the WCC Website	
11	Produce Air Quality Supplementary Planning Document	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	2017	2021	WRS & District Councils		NO	Not Funded		Completed	<1%	Formally adopted and utilised SPD at all six LPAs across County	Formally adopted by North Worcestershire Strategic Planning. Currently being formulated by South Worcestershire Strategic Planning	
12	Encourage developers to provide sustainable	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	2017	2021	WRS & District Councils		NO	Not Funded		Completed	<1%	Formally adopted and utilised SPD at	Formally adopted by North Worcestershire Strategic Planning.	

Measure No.	Measure	Category	Classification	Year Measure Introduced	Estimated / Actual Completion Year	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
	transport facilities and links serving new developments												all six LPAs across County	Currently being formulated by South Worcestershire Strategic Planning	
13	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	2014		WFDC & WRS		NO	Not Funded		Implementation	1%	Improved cross boundary working between local authorities in Worcestershire	WRS are members of the Midlands Joint Advisory Council (MJAC). Provision of AQ services to Tewkesbury Borough Council & Gloucester City Council	On-going
14	Forge closer links with local health agencies	Other	Other	2019	2019	WRS, District Councils & WCC		NO	Not Funded		Completed	,1%	Participation of relevant health agencies in the Worcestershire Air Quality Steering Group	Director of Public Health at Worcestershire County Council set up an air quality group in 2019 to discuss air quality issues in the County	On-going

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

As detailed in Policy Guidance LAQM.PG16 (Chapter 7), 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. The nearest AURN PM_{2.5} monitoring station is the Walsall Woodlands site approximately 23 kilometres to the north east of the Wyre Forest District.

WRS has reviewed the DEFRA national background maps to determine projected PM_{2.5} concentrations in the Wyre Forest District area for the 2020 calendar year. The annual average total PM_{2.5} at 197 locations (centre points of 1km x 1km grids) across the Wyre Forest District is 9.28µg/m³, with a minimum concentration of 8.28µg/m³ and a maximum concentration of 10.31µg/m³.

This indicates that PM_{2.5} concentrations within the Wyre Forest District are well below the annual average EU limit value for PM_{2.5} of 25µg/m³ and is just below the World Health Organisation (WHO) annual average limit of 10µg/m³.

WRS has reviewed the fraction of mortality attributable to particulate air pollution (indicator 3.01) as published by Public Health England. The fraction of mortality attributable to particulate emissions in Worcestershire in 2019 (the most recent year available) was 4.8%. This falls below the national figure for England (5.1% in 2019) and below the figure for the West Midlands region (5.3% in 2019). Recent trend data is not available for Worcestershire 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 - PHE](#)

A new Air Quality Partnership led by the DoPH, and supported by WRS Land and Air Quality Team, was set up in 2019 to discuss potential actions to improve air quality across the County and determine an action plan for implementation. The group 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

and Highways England. The group met initially in May 2019 to discuss terms and references and in September to discuss potential actions. The group is largely driven by DoPH so, due to Covid-19 taking priority, the business of the partnership has been postponed indefinitely.

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

There are currently four declared smoke control areas operating within the Wyre Forest District Council area:

- Habberley
- Offmore
- Hoobrook
- Spennells.

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

[Smokeless Zones - Worcestershire Regulatory Services \(worcsregservices.gov.uk\)](https://www.worcsregservices.gov.uk/Smokeless-Zones)

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

This section sets out the monitoring undertaken within 2020 by Wyre Forest District Council and how it compares with the relevant air quality objectives. In addition, monitoring results are presented for a five-year period between 2016 and 2020 to allow monitoring trends to be identified and discussed.

Summary of Monitoring Undertaken

3.1.1 Automatic Monitoring Sites

No automatic (continuous) monitoring was undertaken within the Wyre Forest District during 2020

3.1.2 Non-Automatic Monitoring Sites

Wyre Forest District Council undertook non- automatic (i.e. passive) monitoring of NO₂ at 51 sites during 2020. Table A.1 in Appendix A presents the details of the non-automatic sites.

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

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 33%), and distance correction. Further details on adjustments are provided in Appendix C.

3.1.3 Nitrogen Dioxide (NO₂)

Table A.2 in Appendix A compare the ratified and adjusted monitored NO₂ annual mean concentrations for the past five years with the air quality objective of 40µg/m³. Note that the concentration data presented represents the concentration at the location of the

monitoring site, following the application of bias adjustment and annualisation, as required (i.e. the values are exclusive of any consideration to fall-off with distance adjustment).

For diffusion tubes, the full 2020 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.

During 2020, Wyre Forest District Council monitored annual mean nitrogen dioxide concentrations using passive diffusion tubes at 51 locations across the District compared to 49 locations in 2019.

Two additional diffusion tubes were deployed at the following locations in Kidderminster in January 2020:

- CRS1 - Signpost o/s King Charles 1 School. Junction of A449 & A448, Kidderminster
- PL2 - 2 Pelham Lodge, Kidderminster

This was to increase the monitoring of air quality in Chester Road South to further inform a detailed assessment due to be carried out in 2021.

In 2020 monitoring showed that, after annualisation and bias adjustment, there were no exceedances of the annual mean objective for NO₂ within the Horsefair/Coventry Street AQMA and the Welch Gate AQMA. This is likely to have been caused by the reduction in traffic during the 'lockdowns' in 2020 caused by Covid-19 and the introduction of the one-way system within the Horsefair/Coventry Street AQMA in September 2020.

There was an average decrease in NO₂ concentrations of 25.9% (8.3µg/m³) within the Horsefair/Coventry Street AQMA and 21.4% (8µg/m³) within the Welch Gate AQMA between 2019 and 2020. The two diffusion tubes in Blackwell Street (HF(K) & HF(K)(F)) within the Horsefair/Coventry Street AQMA and now part of the new one-way system, showed a decrease in NO₂ concentrations of 43.8% (22.1µg/m³) and 45.2% (24.4µg/m³) respectively between 2019 and 2020.

Monitoring results demonstrate a significant decrease in concentrations at all monitoring locations between 2019 and 2020 this is consistent with trends across Worcestershire and is likely to have been caused by the reduction in traffic during the 'lockdowns' in 2020 caused by the Covid-19 pandemic. There was an average decrease in NO₂ concentrations of 23% (6.2µg/m³) across the district as a whole between 2019 and 2020. The decrease between 2019 and 2020 monitoring data should not be considered as indicative of local trends. There were no exceedances of the annual mean objective for NO₂ at any location within the Wyre Forest District area.

There is no discernible upward or downward trend in NO₂ concentrations over the five-year period 2016- 2020.

No annual means greater than 60ug/m₃ have been recorded indicating that it is very unlikely that there have been any exceedances of the 1-hour mean objective for NO₂ at any monitoring sites.

3.1.4 Particulate Matter (PM₁₀)

PM₁₀ is not monitored within the Wyre Forest District.

3.1.5 Particulate Matter (PM_{2.5})

PM_{2.5} is not monitored within the Wyre Forest District.

3.1.6 Sulphur Dioxide (SO₂)

Sulphur Dioxide is not monitored within the Wyre Forest District.

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)
HLR1	139 Stourport Road, Kidderminster	Roadside	382136	274589	NO2	No	0m	18.6	No	1.7m
SR113	Signpost O/S 113 Stourport Rd, Kidderminster	Roadside	382342	275054	NO2	No	2.6m	1m	No	2.3m
(F) 69COV	69 Coventry Street, Kidderminster	Roadside	383552	276870	NO2	Yes - Horsefair/Coventry Street	0m	5.5m	No	1.8m
(F)SGC	6/7 St George's Court, Kidderminster	Roadside	383475	276760	NO2	Yes - Horsefair/Coventry Street	0m	10m	No	1.8m
K1	50 Radford Avenue, Kidderminster	Roadside	383391	277086	NO2	Yes - Horsefair/Coventry Street	0m	2.1m	No	2.5m
21HF	21 Horsefair, Kidderminster	Roadside	383338	277215	NO2	Yes - Horsefair/Coventry Street	0m	4.7m	No	3m
HF(K)	Lamppost @ Peacock PH, Blackwell Street, Kidderminster	Roadside	383311	277087	NO2	Yes - Horsefair/Coventry Street	0m	2.5m	No	2.5m
HF(K) (F)	Hudson Florists, Blackwell Street, Kidderminster	Roadside	383304	277071	NO2	Yes - Horsefair/Coventry Street	0m	2.5m	No	2.5m
K4	1 Silver Street, Kidderminster	Roadside	383337	276998	NO2	Yes - Horsefair/Coventry Street	0m	18.2m	No	2.4m

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)
SBR121	121 Stourbridge Road, Kidderminster	Roadside	383905	277857	NO2	No	0m	2.4m	No	2.7m
334CRN	334 Chester Road North, Kidderminster	Roadside	383965	277823	NO2	No	0m	3.1m	No	2.2m
294CRN	Cambrian House, 294 Chester Road North, Kidderminster	Roadside	384054	277444	NO2	No	0m	11m	No	1.6m
383CRN	383 Chester Road North, Kidderminster	Roadside	384175	277275	NO2	No	0m	11m	No	2.4m
239CRN	239 Chester Road North, Kidderminster	Roadside	384221	276911	NO2	No	0m	6.1m	No	1.6m
CSLOC	Flats at top of Coventry Street - Land Oak Court, Kidderminster	Roadside	384205	277121	NO2	No	0m	7.9m	No	1.9m
K3	53 Coventry Street, Kidderminster	Roadside	383726	276909	NO2	Yes - Horsefair/Coventry Street	0m	2.7m	No	1.3m
K2	34 Leswell Lane, Kidderminster	Roadside	383657	276890	NO2	Yes - Horsefair/Coventry Street	0m	3.1m	No	1.8m
CAS1	Casper's Polish Shop, 99 Comberton Hill, Kidderminster	Roadside	383636	276377	NO2	No	4.2m	2.7m	No	2.5m
CR1	Cuts4Scruffs, 29 Comberton Hill, Kidderminster	Roadside	383696	276388	NO2	No	0m	4.6m	No	3m
CR2	Severn Valley Lock & Safe, 9/10	Roadside	383890	276333	NO2	No	0m	3.4m	No	2m

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)
	Comberton Road, Kidderminster									
(F)COMR(K)	Holmwood, Comberton Road, Kidderminster	Roadside	384214	276242	NO2	No	13.5m	3.5m	No	2.2m
CRS1	Signpost o/s King Charles 1 School. Junc. A449 & A448, Kidderminster	Roadside	384129	276263	NO2	No	32.6m	3.3m	No	2.3m
TCH	Lamppost, (On corner with the Firs) Top Comberton Hill, Kidderminster	Roadside	384086	276228	NO2	No	1m	2m	No	2m
PL2	2 Pelham Lodge, Kidderminster	Roadside	384065	276196	NO2	No	5.5m	10.4m	No	1.8m
CR3	20 Comberton Road, Kidderminster	Roadside	384069	276304	NO2	No	0m	13.1m	No	1.9m
470CRN	470 Chester Road North, Kidderminster	Roadside	384154	276340	NO2	No	0m	4.9m	No	1.9m
SP(K)	Lamppost, Spennells, Kidderminster (located at Jay Park Crescent)	Urban Background	384486	274596	NO2	No	11m	1.70m	No	2.3m
50CRS	50 Chester Road South, Kidderminster	Roadside	383699	275251	NO2	No	0m	14.6m	No	1.6m
100CRS	100 Chester Road South, Kidderminster	Roadside	383766	275723	NO2	No	0m	12.5m	No	1.6m
(F)447S	447 Stourport Road, Kidderminster	Roadside	382447	275506	NO2	No	0m	10.6m	No	1.7m

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)
SR(K)	Pole O/S 431 Stourport Road, Kidderminster	Roadside	382429	275315	NO2	No	9m	3m	No	2.3m
SPR2	Flat 2, Park House, Sutton Park Road, Kidderminster	Roadside	382496	275417	NO2	No	0m	7m	No	1.7m
SRLEC	Flats at crossroads - Lucy Edwards Court, Sutton Road, Kidderminster	Roadside	382183	276388	NO2	No	0m	9.5m	No	2m
BH166	Lamppost, 166 Bewdley HI, Kidderminster	Roadside	382135	276409	NO2	No	5m	2m	No	2.2m
(F)BR(K)	52 Bewdley Road, Kidderminster	Roadside	382437	276542	NO2	No	0m	6.5m	No	1.7m
HAB203	203 Habberley Lane, Kidderminster	Roadside	381713	278069	NO2	No	0m	3.1m	No	1.5m
(F)GIL	10 The Gilgal, Stourport-on-Severn	Roadside	381482	271534	NO2	No	0m	2m	No	2.3m
(F)LSNS(S)	Lumsdons Solicitors, New Street, Stourport-on-Severn	Roadside	380957	271284	NO2	No	0m	1.5m	No	2.3m
(F)FBS(S)	Flamingo's, 21 Bridge Street, Stourport-on-Severn	Roadside	380933	271247	NO2	No	0m	1.9m	No	2.4m
HS(S)	Lamppost, High Street, Corner of York Street, Stourport-on-Severn	Roadside	380974	271268	NO2	No	0m	2.3m	No	2.8m
(F)25YS(S)	22 York Street, Stourport-on-Severn	Roadside	380990	271268	NO2	No	0m	1.5m	No	2.5m
(F)19YS(S)	19 York Street, Stourport-on-Severn	Roadside	381086	271268	NO2	No	0m	1.7m	No	2.3m

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)
KSW(S)	Kodak Spectacles Warehouse, High Street, Stourport-on-Severn	Roadside	381072	271347	NO2	No	0m	2.2m	No	2.3m
HS15(S)	15 High Street, Stourport-on-Severn	Roadside	381114	271380	NO2	No	0m	2.2m	No	2.3m
HS4(S)	4 High Street Stourport-on-Severn	Roadside	381169	271420	NO2	No	0m	3.5m	No	2.4m
A1	35 High Street, Stourport-on-Severn	Roadside	380989	271298	NO2	No	0m	3.2m	No	2.4m
KID22(B)	22 Kidderminster Road, Bewdley	Roadside	373996	275464	NO2	No	0m	2m	No	2.4m
(F)WG42	42 Welch Gate, Bewdley	Roadside	378383	275328	NO2	No	0m	1.7m	No	2.5m
WG(B)	88 Welch Gate, Bewdley	Roadside	378465	275292	NO2	Yes - Welch Gate	0m	1m	No	2.5m
LS(B)	Lamppost, The Melting Pot, Load Street, Bewdley	Roadside	378590	275302	NO2	No	0m	3m	No	2.5m
B1	Lamppost, Adam & Eves, Load Street, Bewdley	Roadside	378513	275317	NO2	No	0m	1.1m	No	2.3m

Notes:

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

(2) N/A if not applicable.

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

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2020 (%) ⁽²⁾	2016	2017	2018	2019	2020
HLR1	382136	274589	Roadside	100	51.9	22.3	16.4	20.9	17.7	14.3
SR113	382342	275054	Roadside	100	51.9	32.0	30.7	33.6	27.7	24.5
(F) 69COV	383552	276870	Roadside	100	51.9	53.5	43.4	50.6	42.2	34.5
(F)SGC	383475	276760	Roadside	100	51.9	34.7	31.0	31.6	26.9	22.1
K1	383391	277086	Roadside	100	51.9	26.6	22.4	23.0	19.9	16.9
21HF	383338	277215	Roadside	67.7	34.6	-	-	-	22.5	21.2
HF(K)	383311	277087	Roadside	100	51.9	65.3	55.2	60.9	50.5	28.4
HF(K) (F)	383304	277071	Roadside	100	51.9	73.6	59.6	68.5	54.0	29.6
K4	383337	276998	Roadside	100	51.9	28.9	24.1	26.6	22.6	19.6
SBR121	383905	277857	Roadside	100	51.9	36.4	29.0	32.2	27.0	22.6
334CRN	383965	277823	Roadside	100	51.9	-	-	-	29.0	26.4
294CRN	384054	277444	Roadside	100	51.9	-	-	-	20.0	16.3
383CRN	384175	277275	Roadside	100	51.9	-	-	-	18.3	15.7
239CRN	384221	276911	Roadside	100	51.9	-	-	-	19.2	16.2
CSLOC	384205	277121	Roadside	100	51.9	36.7	32.1	32.5	27.6	23.4
K3	383726	276909	Roadside	100	51.9	40.9	29.0	38.0	30.1	25.3
K2	383657	276890	Roadside	100	51.9	26.5	20.4	23.2	20.0	16.2
CAS1	383636	276377	Roadside	100	51.9	37.1	32.0	40.7	34.4	26.4
CR1	383696	276388	Roadside	100	51.9	-	-	32.6	28.8	22.9
CR2	383890	276333	Roadside	100	51.9	-	-	35.8	29.5	22.8
(F)COMR(K)	384214	276242	Roadside	100	51.9	26.4	29.7	32.2	29.0	22.9
CRS1	384129	276263	Roadside	100	51.9	-	-	-	-	18.3
TCH	384086	276228	Roadside	100	51.9	47.6	44.0	48.8	38.7	28.8
PL2	384065	276196	Roadside	100	51.9	-	-	-	-	12.6
CR3	384069	276304	Roadside	100	51.9	-	-	23.7	20.7	16.0
470CRN	384154	276340	Roadside	100	51.9	-	-	34.0	29.1	22.3
SP(K)	384486	274596	Urban Background	83.3	44.2	13.2	10.9	12.5	11.1	9.4
50CRS	383699	275251	Roadside	100	51.9	-	-	-	16.6	13.0
100CRS	383766	275723	Roadside	100	51.9	-	-	-	14.8	11.2
(F)447S	382447	275506	Roadside	100	51.9	27.8	21.3	24.8	21.0	18.0
SR(K)	382429	275315	Roadside	100	51.9	35.1	33.5	41.7	35.0	28.3
SPR2	382496	275417	Roadside	100	51.9	36.5	29.6	34.0	29.5	23.1
SRLEC	382183	276388	Roadside	100	51.9	36.9	31.3	35.7	27.9	22.9
BH166	382135	276409	Roadside	100	51.9	27.3	25.3	30.5	25.6	19.6
(F)BR(K)	382437	276542	Roadside	100	51.9	32.8	27.1	31.5	25.3	19.8

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 2020 (%) ⁽²⁾	2016	2017	2018	2019	2020
HAB203	381713	278069	Roadside	100	51.9	34.4	27.2	32.9	25.4	18.9
(F)GIL	381482	271534	Roadside	83.3	44.2	30.8	22.6	28.6	24.1	20.6
(F)LSNS(S)	380957	271284	Roadside	100	51.9	30.8	23.6	30.1	22.5	18.5
(F)FBS(S)	380933	271247	Roadside	100	51.9	41.9	34.5	42.9	34.0	28.3
HS(S)	380974	271268	Roadside	100	51.9	32.5	31.1	38.7	31.7	24.7
(F)25YS(S)	380990	271268	Roadside	100	51.9	42.0	33.4	36.7	28.4	23.1
(F)19YS(S)	381086	271268	Roadside	100	51.9	30.4	24.4	28.8	23.5	19.0
KSW(S)	381072	271347	Roadside	100	51.9	34.2	26.2	31.8	27.2	21.5
HS15(S)	381114	271380	Roadside	100	51.9	32.8	26.3	31.4	26.5	21.7
HS4(S)	381169	271420	Roadside	100	51.9	33.4	26.9	33.4	27.8	21.6
A1	380989	271298	Roadside	100	51.9	43.2	34.9	42.2	34.7	27.0
KID22(B)	373996	275464	Roadside	100	51.9	36.4	29.7	36.3	28.3	22.6
(F)WG42	378383	275328	Roadside	100	51.9	30.4	25.3	30.0	25.0	19.4
WG(B)	378465	275292	Roadside	100	51.9	45.8	37.8	45.6	37.4	29.4
LS(B)	378590	275302	Roadside	100	51.9	34.2	27.8	34.0	27.6	20.9
B1	378513	275317	Roadside	100	51.9	37.8	30.6	38.1	29.9	23.0

Annualisation has been conducted where data capture is <75% and >33% in line with LAQM.TG16.

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 $\mu\text{g}/\text{m}^3$.

Exceedances of the NO_2 annual mean objective of $40\mu\text{g}/\text{m}^3$ are shown in **bold**.

NO_2 annual means exceeding $60\mu\text{g}/\text{m}^3$, 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.TG16 if valid data capture for the full calendar year is less than 75%. See Appendix C for details.

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

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

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

Figure A.1 –Trends in Annual Mean NO₂ Concentrations in Kidderminster Excluding the Horsefair/Coventry Street AQMA

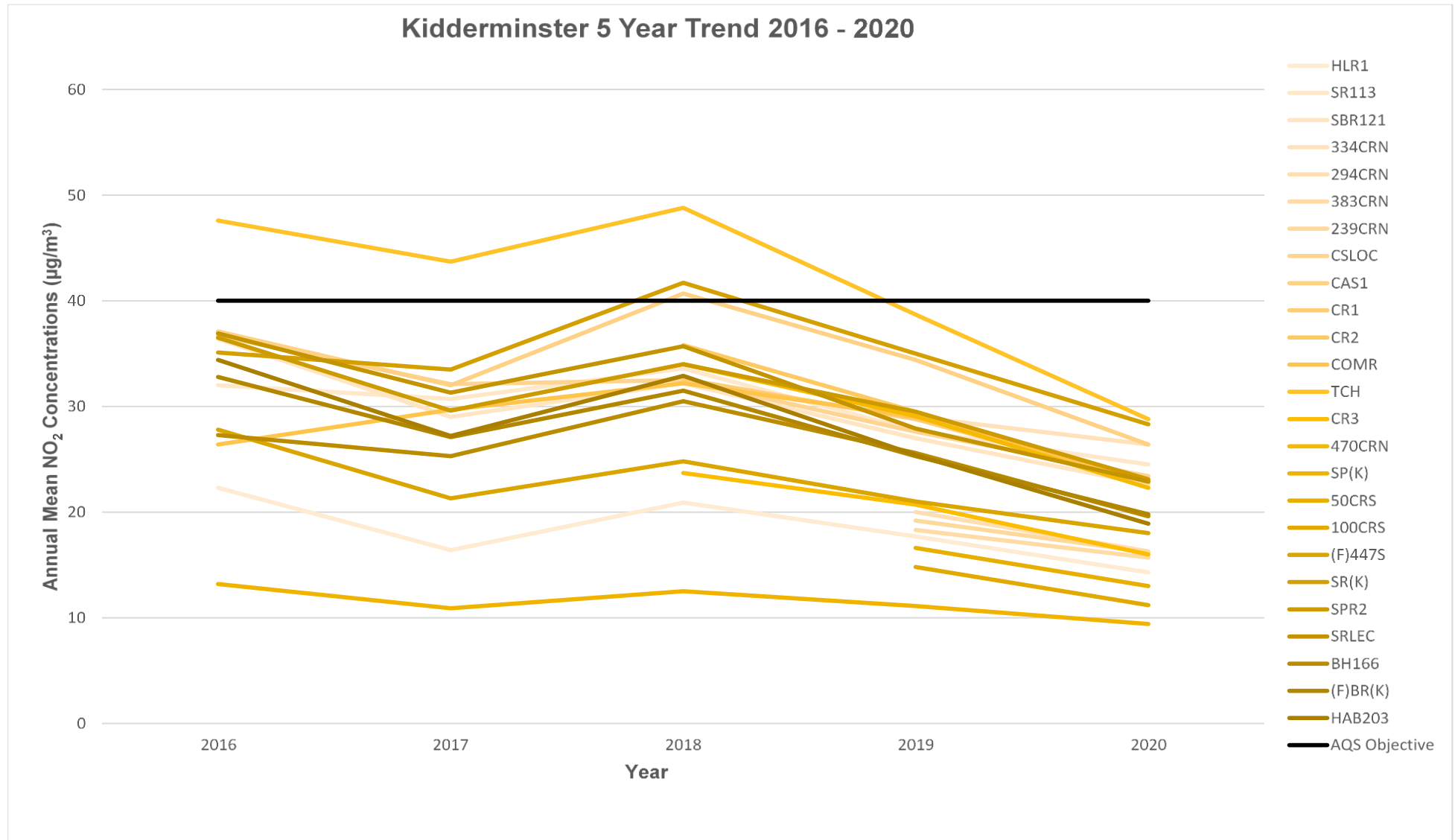


Figure A.2 – Trends in Annual Mean NO₂ Concentrations in the Horsefair/Coventry Street AQMA

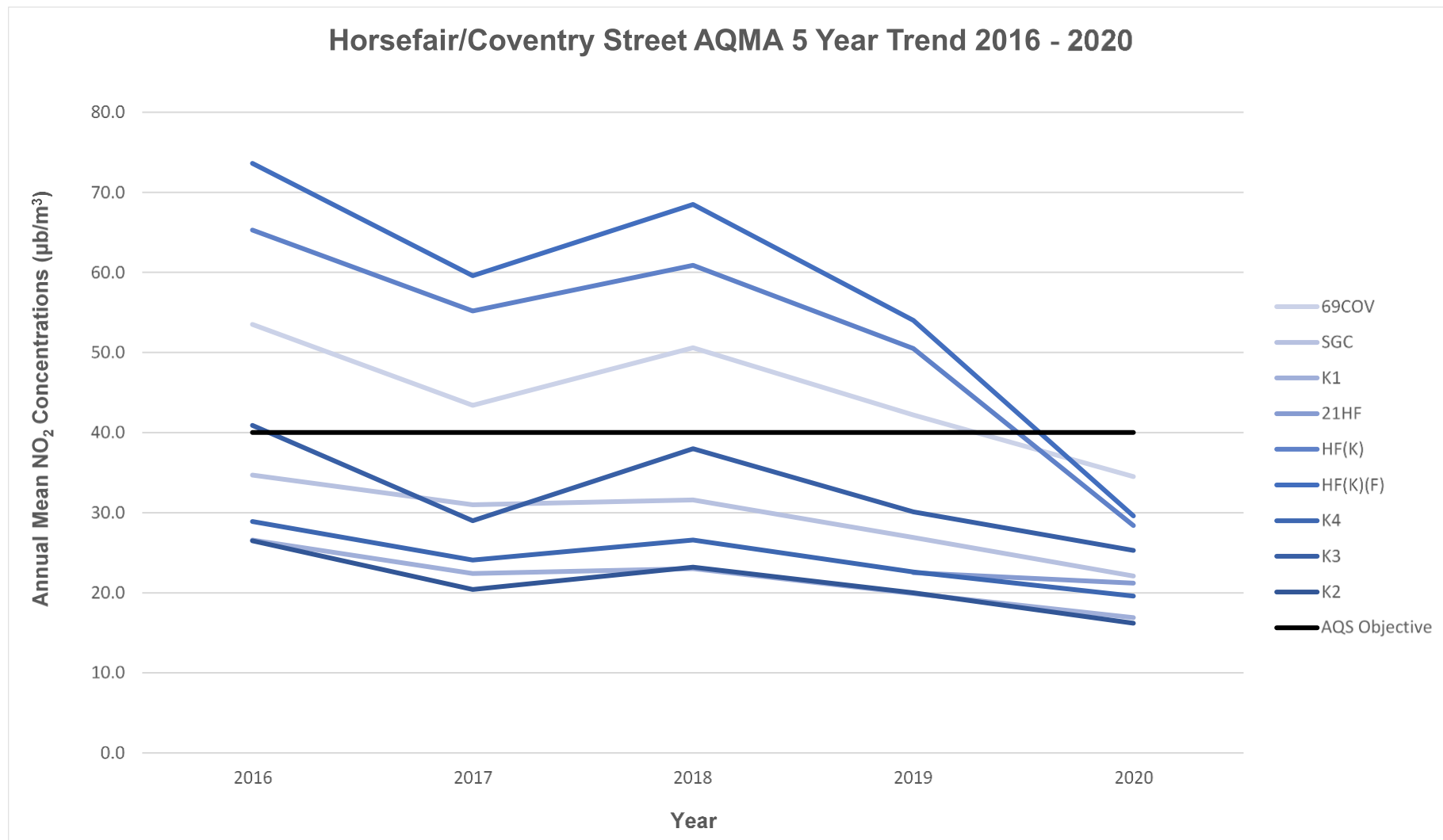


Figure A.3 – Trends in Annual Mean NO₂ Concentrations in Stourport-on-Severn

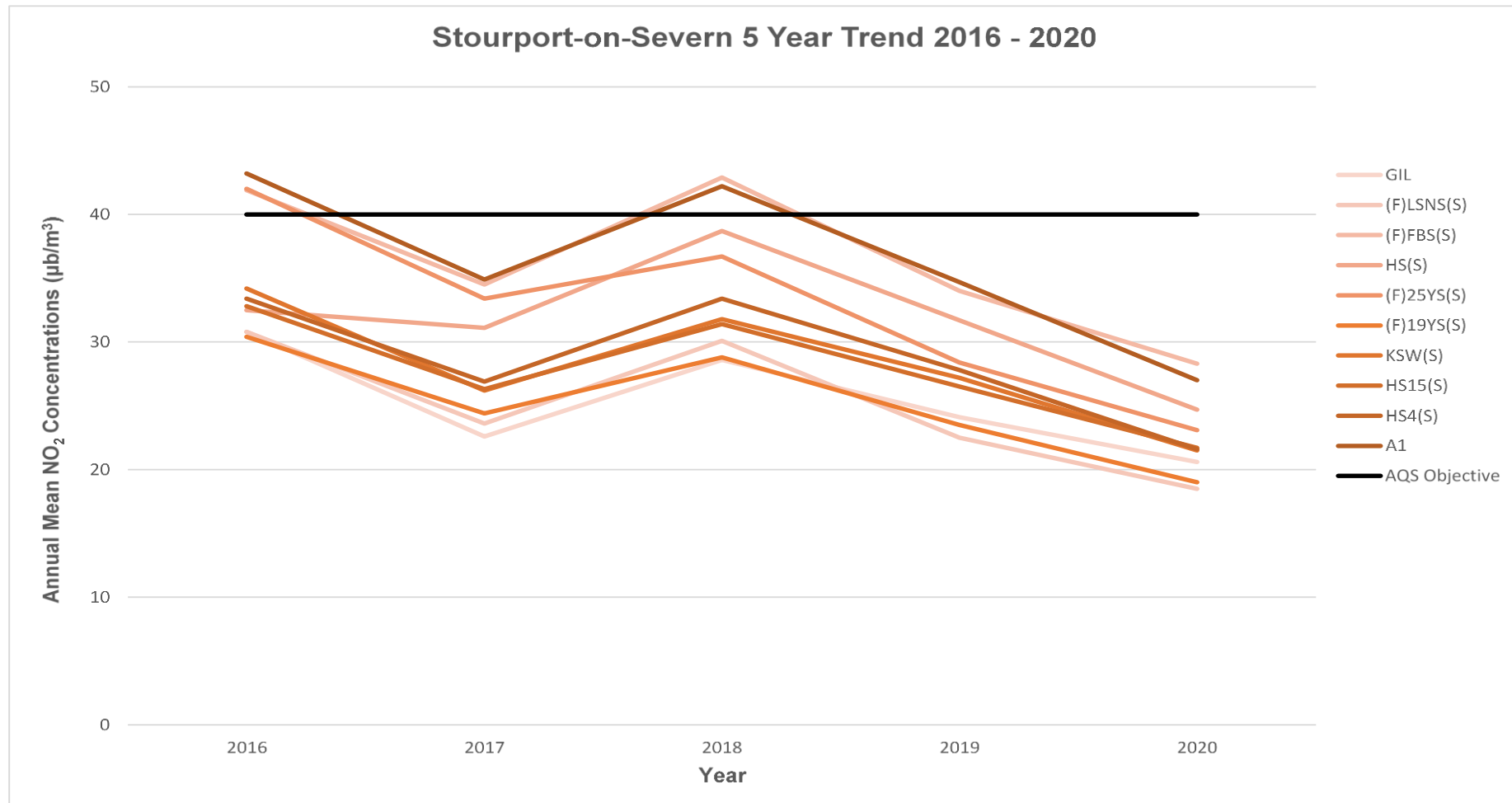
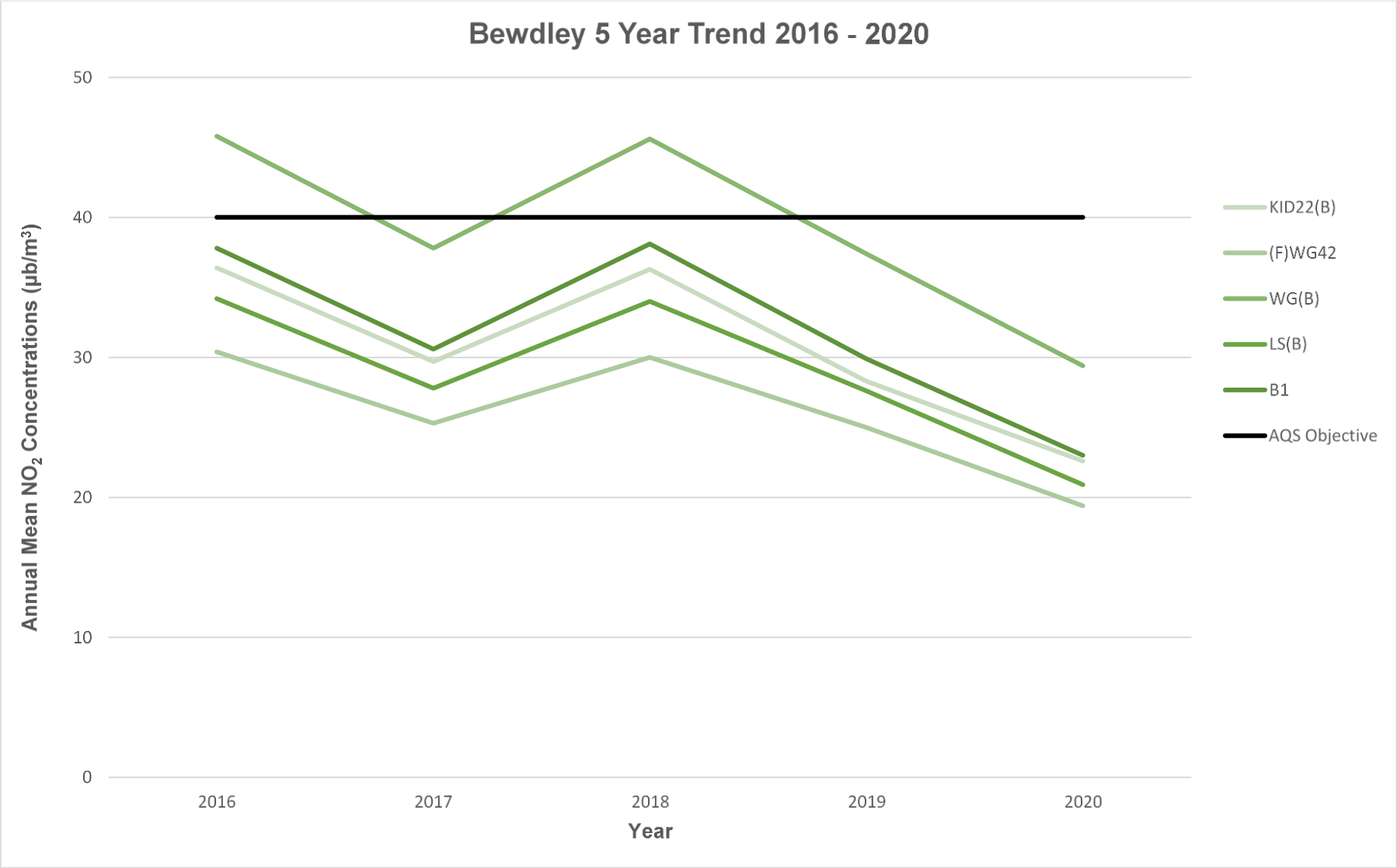


Figure A.4 – Trends in Annual Mean NO₂ Concentrations in Bewdley



Appendix B: Full Monthly Diffusion Tube Results for 2020

Table B.1 – NO₂ 2020 Diffusion Tube Results (µg/m³)

DT ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean: Raw Data	Annual Mean: Annualised and Bias Adjusted (0.81)	Annual Mean: Distance Corrected to Nearest Exposure	Comment
HLR1	382136	274589	-	-	-	-	-	-	8.9	17.0	18.2	18.2	24.5	24.5	18.5	14.3		
SR113	382342	275054	-	-	-	-	-	-	23.9	27.7	32.8	37.3	34.0	35.4	31.8	24.5		
(69COV	383552	276870	-	-	-	-	-	-	39.0	43.6	49.8	47.0	45.1	44.9	44.9	34.5		
(F)SGC	383475	276760	-	-	-	-	-	-	21.5	26.2	29.4	31.5	32.3	31.6	28.8	22.1		
K1	383391	277086	-	-	-	-	-	-	16.0	17.1	21.9	23.9	26.8	26.4	22.0	16.9		
21HF	383338	277215	-	-	-	-	-	-	18.5	-	-	32.9	35.7	32.6	29.9	21.2		
HF(K)	383311	277087	-	-	-	-	-	-	48.2	40.2	30.4	34.1	36.2	32.7	37.0	28.4		
HF(K) (F)	383304	277071	-	-	-	-	-	-	52.8	46.2	24.3	36.2	37.5	33.9	38.5	29.6		
K4	383337	276998	-	-	-	-	-	-	16.1	21.6	24.1	29.7	31.9	29.7	25.5	19.6		
SBR121	383905	277857	-	-	-	-	-	-	23.5	24.5	30.3	32.3	32.9	32.7	29.4	22.6		
334CRN	383965	277823	-	-	-	-	-	-	23.9	31.0	36.6	36.3	39.8	38.4	34.3	26.4		
294CRN	384054	277444	-	-	-	-	-	-	14.7	16.6	18.8	23.7	28.3	25.4	21.2	16.3		
383CRN	384175	277275	-	-	-	-	-	-	10.1	16.5	20.2	21.2	28.2	26.3	20.4	15.7		
239CRN	384221	276911	-	-	-	-	-	-	12.8	16.1	20.5	22.2	28.6	26.1	21.0	16.2		
CSLOC	384205	277121	-	-	-	-	-	-	26.0	25.5	30.5	33.3	35.0	32.5	30.5	23.4		
K3	383726	276909	-	-	-	-	-	-	23.6	31.2	36.7	36.5	34.0	35.6	32.9	25.3		
K2	383657	276890	-	-	-	-	-	-	12.8	18.7	21.1	23.6	25.8	24.3	21.1	16.2		
CAS1	383636	276377	-	-	-	-	-	-	28.7	31.3	28.0	34.6	44.3	39.2	34.3	26.4		
CR1	383696	276388	-	-	-	-	-	-	21.3	26.8	35.9	30.6	35.0	29.3	29.8	22.9		
CR2	383890	276333	-	-	-	-	-	-	20.9	29.1	30.7	30.1	34.0	33.1	29.6	22.8		
COMR(K)	384214	276242	-	-	-	-	-	-	22.5	28.4	31.6	31.2	32.4	32.7	29.8	22.9		
CRS1	384129	276263	-	-	-	-	-	-	18.3	22.0	24.3	25.3	26.9	26.3	23.8	18.3		
TCH	384086	276228	-	-	-	-	-	-	32.5	26.8	41.0	42.0	42.1	40.5	37.5	28.8		
PL2	384065	276196	-	-	-	-	-	-	9.5	12.1	16.3	17.8	21.6	20.9	16.3	12.6		
CR3	384069	276304	-	-	-	-	-	-	12.7	18.4	20.3	21.0	25.4	27.1	20.8	16.0		
470CRN	384154	276340	-	-	-	-	-	-	19.7	25.5	28.6	31.9	34.7	33.7	29.0	22.3		
SP(K)	384486	274596	-	-	-	-	-	-	6.1	9.0	-	12.7	16.8	17.1	12.3	9.4		
50CRS	383699	275251	-	-	-	-	-	-	9.7	11.8	17.2	19.0	21.5	22.3	16.9	13.0		
100CRS	383766	275723	-	-	-	-	-	-	9.6	10.4	15.0	15.3	16.6	20.6	14.6	11.2		
(F)447S	382447	275506	-	-	-	-	-	-	16.3	20.3	24.2	25.7	25.9	28.3	23.4	18.0		
SR(K)	382429	275315	-	-	-	-	-	-	22.6	35.7	37.0	38.8	44.7	42.2	36.8	28.3		
SPR2	382496	275417	-	-	-	-	-	-	20.8	27.3	29.5	30.7	35.2	36.9	30.1	23.1		
SRLEC	382183	276388	-	-	-	-	-	-	25.1	21.9	32.2	32.0	33.5	33.7	29.7	22.9		
BH166	382135	276409	-	-	-	-	-	-	15.3	26.3	27.6	25.7	27.0	31.2	25.5	19.6		
(F)BR(K)	382437	276542	-	-	-	-	-	-	16.7	23.7	25.4	25.3	30.3	33.3	25.8	19.8		
HAB203	381713	278069	-	-	-	-	-	-	17.9	24.2	25.6	23.7	26.6	29.7	24.6	18.9		
(F)GIL	381482	271534	-	-	-	-	-	-	17.4	23.7	-	28.9	32.8	32.2	27.0	20.6		
LSNS(S)	380957	271284	-	-	-	-	-	-	16.3	26.5	23.7	21.5	28.2	28.3	24.1	18.5		
(F)FBS(S)	380933	271247	-	-	-	-	-	-	31.3	37.6	38.1	37.5	36.8	39.3	36.8	28.3		
HS(S)	380974	271268	-	-	-	-	-	-	21.0	34.9	33.5	30.1	36.7	36.6	32.1	24.7		
25YS(S)	380990	271268	-	-	-	-	-	-	22.7	30.8	28.2	30.0	34.2	34.1	30.0	23.1		
(19YS(S)	381086	271268	-	-	-	-	-	-	20.0	24.9	24.4	25.2	26.3	27.8	24.8	19.0		
KSW(S)	381072	271347	-	-	-	-	-	-	15.8	30.0	27.3	28.0	33.2	33.2	27.9	21.5		
HS15(S)	381114	271380	-	-	-	-	-	-	18.3	28.1	28.9	26.0	34.7	33.2	28.2	21.7		
HS4(S)	381169	271420	-	-	-	-	-	-	18.0	27.5	28.2	28.0	33.4	33.6	28.1	21.6		
A1	380989	271298	-	-	-	-	-	-	26.8	36.1	38.7	36.0	36.8	36.7	35.2	27.0		
KID22(B)	373996	275464	-	-	-	-	-	-	21.5	30.1	28.5	29.4	31.9	35.4	29.5	22.6		

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 (0.81)	Annual Mean: Distance Corrected to Nearest Exposure	Comment
(F)WG42	378383	275328	-	-	-	-	-	-	17.5	23.9	27.0	25.1	29.1	29.0	25.3	19.4		
WG(B)	378465	275292	-	-	-	-	-	-	25.7	39.6	38.9	36.9	43.7	44.5	38.2	29.4		
LS(B)	378590	275302	-	-	-	-	-	-	19.9	28.4	27.4	29.4	26.8	30.9	27.1	20.9		
B1	378513	275317	-	-	-	-	-	-	21.1	32.0	31.9	27.4	33.3	33.8	29.9	23.0		

- All erroneous data has been removed from the NO₂ diffusion tube dataset presented in Table B.1.
- Annualisation has been conducted where data capture is <75% and >33% in line with LAQM.TG16.
- Local bias adjustment factor used.
- National bias adjustment factor used.
- Where applicable, data has been distance corrected for relevant exposure in the final column.
- Wyre Forest District Council confirm that all 2020 diffusion tube data has been uploaded to the Diffusion Tube Data Entry System.

Notes:

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

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

See Appendix C for details on bias adjustment and annualisation.

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

New or Changed Sources Identified Within Wyre Forest District Council During 2020

There are two major residential developments proposed on the eastern side of Kidderminster which may have an impact on air quality in the future. The Lea Castle, Cookley development for up to 600 dwellings, employment and retail use has been given planning permission and the second for a mixed use, residential led development with up to 1400 dwellings on land between the A456 Birmingham Road and A448 Comberton Road is pending a decision.

Additional Air Quality Works Undertaken Wyre Forest District Council by During 2020

Kidderminster station

Station enhancement project completed winter 2020, further details can be found at [Kidderminster Station Improvements | Worcestershire County Council](#)

Hoo Brook roundabout

Work has commenced on the improvements to the Hoo Brook roundabout in Kidderminster to improve the flow of traffic and reduce queuing time. Anticipated to be complete in Autumn 2021

QA/QC of Diffusion Tube Monitoring

Excluded Diffusion Tube Data

In 2020 Wyre Forest District Council changed diffusion tube supplier part way through the calendar year. In addition, Wyre Forest District Council experienced several months where diffusion tubes were not exposed due to the impact of the Covid-19 pandemic.

Tubes were exposed as follows:

Months	Tubes Exposed?	Tube Supplier
Jan- Feb	Yes	Somerset Scientific Services
March – June	No	n/a
July – December	Yes	Gradko International Limited

Diffusion tube data for January to February 2020 has been omitted from diffusion tube data processing and reporting. Data capture for tubes supplied by Somerset Scientific Services during 2020 is <33% and as such it cannot be annualised in accordance with the methodology outlined in LAQM.TG.16 and subsequently cannot be bias-adjusted in accordance with the methodology for bias-adjusting data from two laboratories as outlined in LAQM.TG.16.

Confirmation regarding this was sought from the LAQM Helpdesk which confirmed via email on 20th May 2021 that the January to February diffusion tube data for 2020 should be excluded from data processing and reporting as a result of insufficient data capture.

For information the raw diffusion tube data for January to February 2020 is provided below:

Diffusion Tube ID	Raw Nitrogen Dioxide Concentration ($\mu\text{g}/\text{m}^3$)	
	January 2020	February 2020
HLR1	22.0	13.4
SR113	44.1	-
(69COV	58.2	41.8
(F)SGC	37.0	29.1
K1	32.1	24.6
21HF	33.3	26.9
HF(K)	<u>76.7</u>	59.4
HF(K) (F)	80	<u>60.6</u>
K4	36.3	28
SBR121	41.8	31.1
334CRN	56.5	27.8
294CRN	33.9	23.6
383CRN	25.9	16.4
239CRN	29.3	21.5
CSLOC	42	33.8
K3	39.7	25.3
K2	28.6	20

Diffusion Tube ID	Raw Nitrogen Dioxide Concentration ($\mu\text{g}/\text{m}^3$)	
	January 2020	February 2020
CAS1	48.4	32.5
CR1	36.9	27.7
CR2	35.6	26.4
COMR(K)	49.8	30.1
CRS1	34.5	23.8
TCH	53.4	41.6
PL2	21.2	13.7
CR3	27.6	19.1
470CRN	42.6	26.8
SP(K)	16.3	9.9
50CRS	22.1	14.1
100CRS	22.6	15.3
(F)447S	29.3	16.8
SR(K)	52	32.9
SPR2	38.1	28.1
SRLEC	39.2	39.7
BH166	31.1	20.9
(F)BR(K)	38.2	20.8
HAB203	34.1	24.5
(F)GIL	31	22
LSNS(S)	27	22
(F)FBS(S)	45.3	39.2
HS(S)	36.7	28.2
25YS(S)	37.7	30.3
(19YS(S)	31.7	27
KSW(S)	36	25.5
HS15(S)	34.7	26.3
HS4(S)	38.5	30.8
A1	42.4	32.8
KID22(B)	39	26.4
(F)WG42	34.2	29.6
WG(B)	53.4	46.5
LS(B)	35.6	19.0
B1	30.2	21.7

Notes:

Exceedances of the NO_2 annual mean objective of $40\mu\text{g}/\text{m}^3$ are shown in **bold**.

NO_2 annual means exceeding $60\mu\text{g}/\text{m}^3$, indicating a potential exceedance of the NO_2 1-hour mean objective are shown in **bold and underlined**.

Tube data for July to December 2020 represents >33% data capture for tubes supplied by a single laboratory and as such has been annualised and bias-adjusted in accordance with the methodologies prescribed by LAQM.TG.16.

The following UKAS accredited company provides Wyre Forest District Council with nitrogen dioxide diffusion tubes and analysis:

Gradko International Ltd

St. Martins House

77 Wales Street

Winchester

SO23 0RH

01962 860 331

Diffusion@gradko.com

The 20% Triethanolamine (TEA) / De-ionised Water preparation method was used. Under the AIR NO₂ Proficiency Testing Scheme, Gradko International Ltd performed 75% satisfactory for January to February and September to October 2020. Results for May to June and July to August 2020 were not reported due to the Covid-19 pandemic. Tube precision was 'Good' throughout 2020. Monitoring has been completed in adherence with the 2020 Diffusion Tube Monitoring Calendar

Diffusion Tube Annualisation

Annualisation was required for all non-automatic monitoring sites in Wyre Forest District Council as only six months monitoring data was gathered for 2020. Data from three AURN monitoring sites, Birmingham Ladywood, Coventry Allesley and Walsall Woodlands was used to provide location specific diffusion tube average annualisation factors to apply to the raw data annual mean giving an annualised annual mean for each site.

Diffusion Tube Bias Adjustment Factors

The diffusion tube data presented within the 2020 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.TG16 provides guidance with regard to the application of a bias adjustment factor to correct diffusion tube monitoring. Triplicate co-location studies can be used to determine a local bias factor based on the comparison of diffusion tube results with data taken from NO_x/NO₂

continuous analysers. Alternatively, the national database of diffusion tube co-location surveys provides bias factors for the relevant laboratory and preparation method.

Wyre Forest District Council have applied a national bias adjustment factor of 0.81 to the 2020 monitoring data. A summary of bias adjustment factors used by Wyre Forest District Council over the past five years is presented in Table C.1.

The national factor bias adjustment factor used was taken from the 03/21 version of the national spreadsheet, derived from eighteen studies by Gradko International Ltd.

Table C.1 – Bias Adjustment Factor

Year	Local or National	If National, Version of National Spreadsheet	Adjustment Factor
2020	National	03/21	0.81
2019	National	03/20	0.78
2018	National	03/19	0.89
2017	National	09/18	0.77
2016	Local	-	0.89

NO₂ Fall-off with Distance from the Road

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

No diffusion tube NO₂ monitoring locations within Wyre Forest District Council required distance correction during 2020.

QA/QC of Automatic Monitoring

No Automatic Monitoring was completed in Wyre Forest District Council in 2020.

Table C.2 – Annualisation Summary (concentrations presented in $\mu\text{g}/\text{m}^3$)

Site ID	Annualisation Factor Birmingham Ladywood	Annualisation Factor Coventry Allesley	Annualisation Factor Walsall Woodlands	Average Annualisation Factor	Raw Data Annual Mean	Annualised Annual Mean	Comments
HLR1	0.9295	0.9614	0.9564	0.9491	18.5	17.6	
SR113	0.9295	0.9614	0.9564	0.9491	31.8	30.2	
(69COV	0.9295	0.9614	0.9564	0.9491	44.9	42.6	
(F)SGC	0.9295	0.9614	0.9564	0.9491	28.8	27.3	
K1	0.9295	0.9614	0.9564	0.9491	22.0	20.9	
21HF	0.8544	0.8786	0.8938	0.8756	29.9	26.2	
HF(K)	0.9295	0.9614	0.9564	0.9491	37.0	35.1	
HF(K) (F)	0.9295	0.9614	0.9564	0.9491	38.5	36.5	
K4	0.9295	0.9614	0.9564	0.9491	25.5	24.2	
SBR121	0.9295	0.9614	0.9564	0.9491	29.4	27.9	
334CRN	0.9295	0.9614	0.9564	0.9491	34.3	32.6	
294CRN	0.9295	0.9614	0.9564	0.9491	21.2	20.2	
383CRN	0.9295	0.9614	0.9564	0.9491	20.4	19.4	
239CRN	0.9295	0.9614	0.9564	0.9491	21.0	20.0	
CSLOC	0.9295	0.9614	0.9564	0.9491	30.5	28.9	
K3	0.9295	0.9614	0.9564	0.9491	32.9	31.3	
K2	0.9295	0.9614	0.9564	0.9491	21.1	20.0	
CAS1	0.9295	0.9614	0.9564	0.9491	34.3	32.6	
CR1	0.9295	0.9614	0.9564	0.9491	29.8	28.3	
CR2	0.9295	0.9614	0.9564	0.9491	29.6	28.1	
COMR(K)	0.9295	0.9614	0.9564	0.9491	29.8	28.3	
CRS1	0.9295	0.9614	0.9564	0.9491	23.8	22.6	
TCH	0.9295	0.9614	0.9564	0.9491	37.5	35.6	
PL2	0.9295	0.9614	0.9564	0.9491	16.3	15.5	
CR3	0.9295	0.9614	0.9564	0.9491	20.8	19.7	
470CRN	0.9295	0.9614	0.9564	0.9491	29.0	27.5	
SP(K)	0.9286	0.9493	0.9453	0.9411	12.3	11.6	
50CRS	0.9295	0.9614	0.9564	0.9491	16.9	16.0	
100CRS	0.9295	0.9614	0.9564	0.9491	14.6	13.8	
(F)447S	0.9295	0.9614	0.9564	0.9491	23.4	22.2	
SR(K)	0.9295	0.9614	0.9564	0.9491	36.8	34.9	
SPR2	0.9295	0.9614	0.9564	0.9491	30.1	28.5	

Site ID	Annualisation Factor Birmingham Ladywood	Annualisation Factor Coventry Allesley	Annualisation Factor Walsall Woodlands	Average Annualisation Factor	Raw Data Annual Mean	Annualised Annual Mean	Comments
SRLEC	0.9295	0.9614	0.9564	0.9491	29.7	28.2	
BH166	0.9295	0.9614	0.9564	0.9491	25.5	24.2	
(F)BR(K)	0.9295	0.9614	0.9564	0.9491	25.8	24.5	
HAB203	0.9295	0.9614	0.9564	0.9491	24.6	23.4	
(F)GIL	0.9286	0.9493	0.9453	0.9411	27.0	25.4	
LSNS(S)	0.9295	0.9614	0.9564	0.9491	24.1	22.9	
(F)FBS(S)	0.9295	0.9614	0.9564	0.9491	36.8	34.9	
HS(S)	0.9295	0.9614	0.9564	0.9491	32.1	30.5	
25YS(S)	0.9295	0.9614	0.9564	0.9491	30.0	28.5	
(19YS(S)	0.9295	0.9614	0.9564	0.9491	24.8	23.5	
KSW(S)	0.9295	0.9614	0.9564	0.9491	27.9	26.5	
HS15(S)	0.9295	0.9614	0.9564	0.9491	28.2	26.8	
HS4(S)	0.9295	0.9614	0.9564	0.9491	28.1	26.7	
A1	0.9295	0.9614	0.9564	0.9491	35.2	33.4	
KID22(B)	0.9295	0.9614	0.9564	0.9491	29.5	28.0	
(F)WG42	0.9295	0.9614	0.9564	0.9491	25.3	24.0	
WG(B)	0.9295	0.9614	0.9564	0.9491	38.2	36.2	
LS(B)	0.9295	0.9614	0.9564	0.9491	27.1	25.7	
B1	0.9295	0.9614	0.9564	0.9491	29.9	28.4	

D: Map(s) of Monitoring Locations and AQMAs

Figure D.1 – Map of Horsefair/Coventry Street AQMA and Monitoring Locations

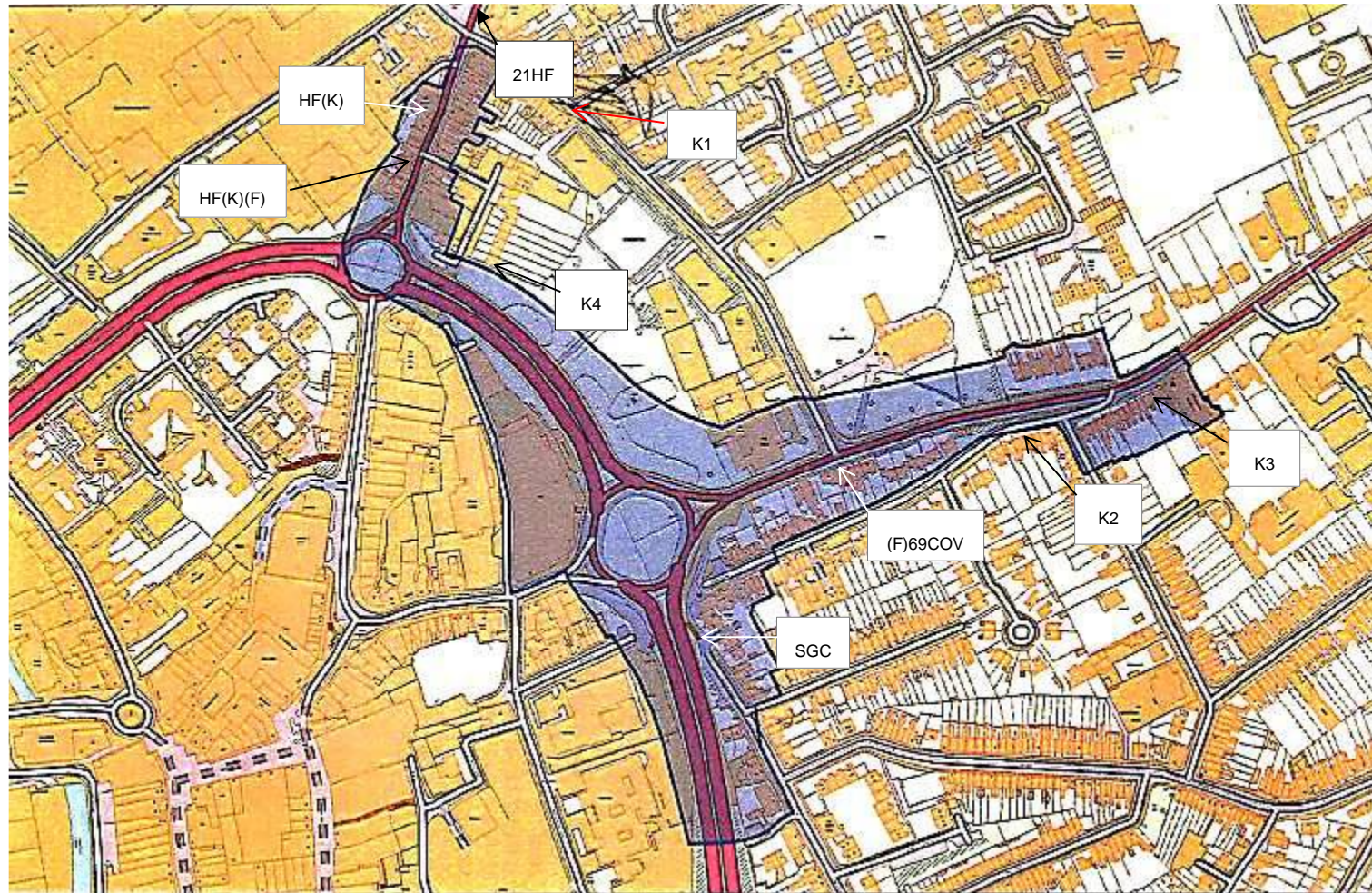


Figure D.2 – Map of Welch Gate AQMA and Monitoring Locations

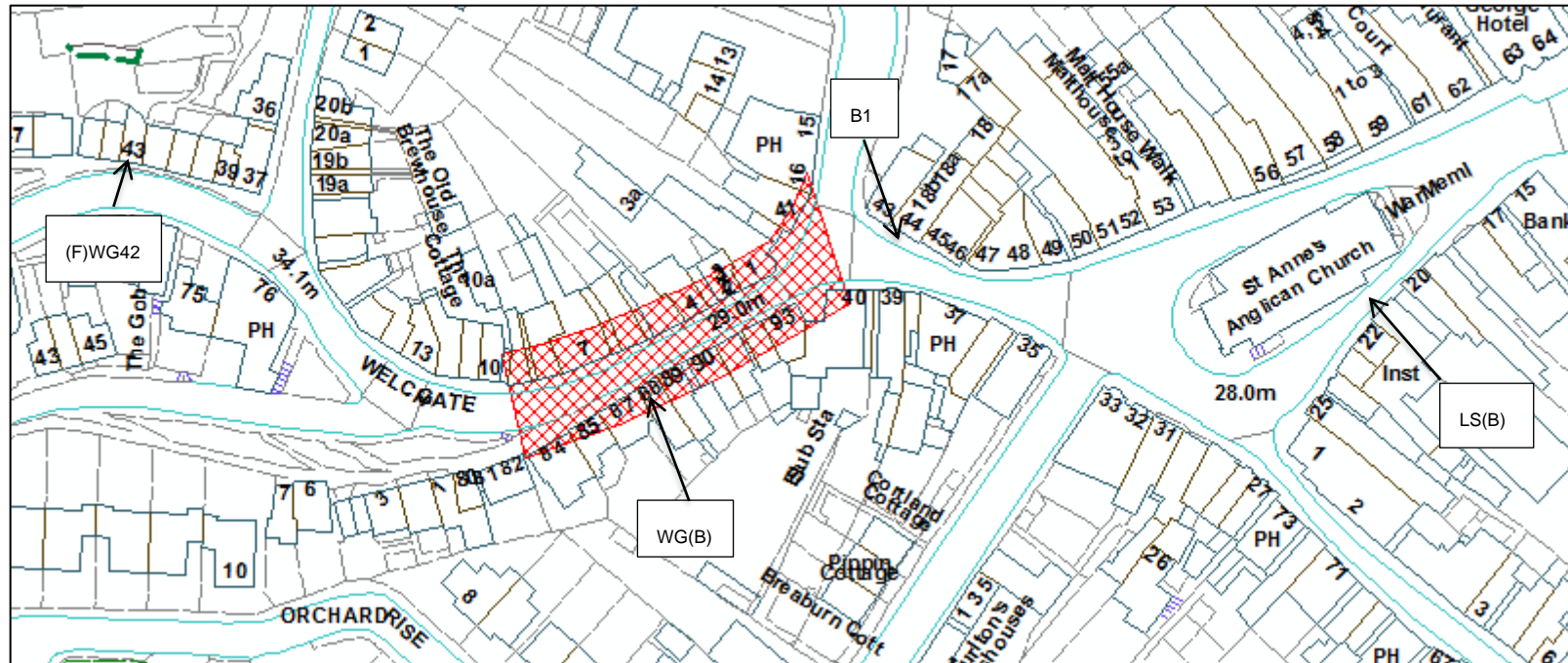


Figure D.3 – Map of Chester Road North (A449). East of Kidderminster Town Centre Monitoring Locations

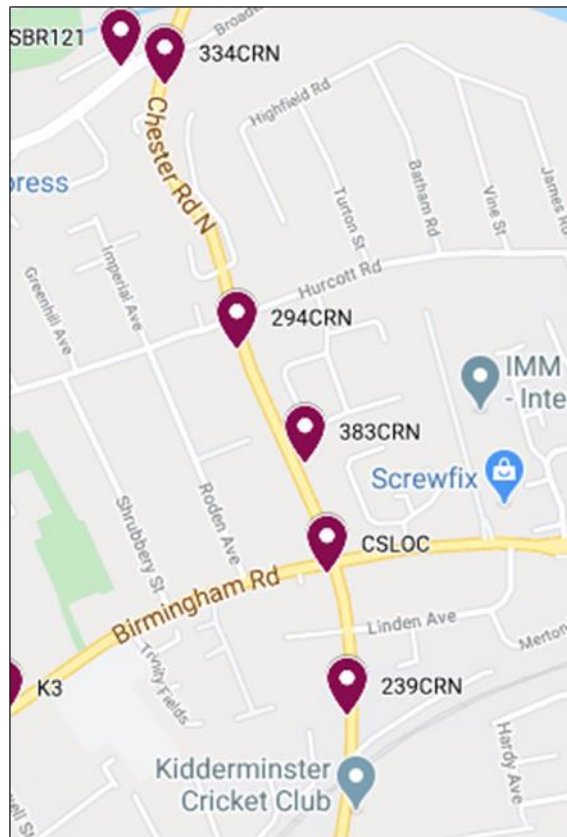


Figure D.4 – Map of Comberton Road, Comberton Hill and Chester Road North and South (A449). East of Kidderminster Town Centre Monitoring Locations

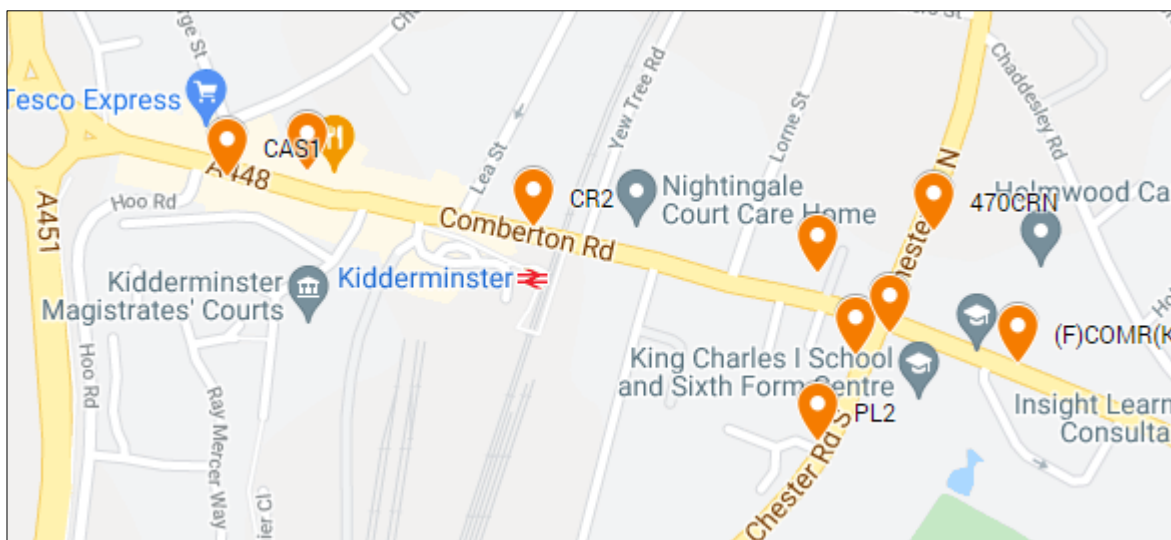


Figure D.5 – Map of Chester Road North South (A449) and Urban Background Monitoring Locations

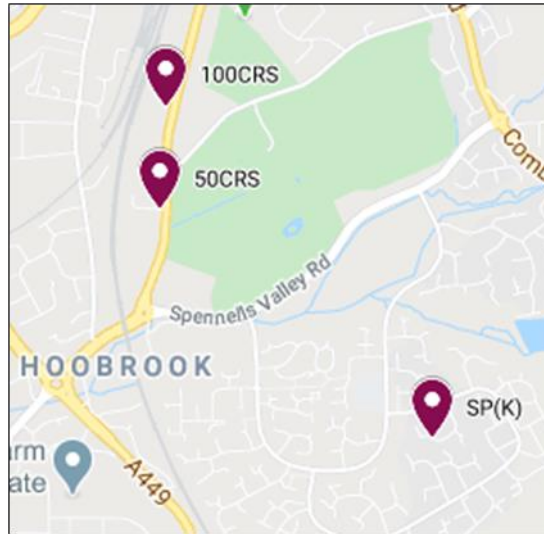


Figure D.6 – Map of West of Kidderminster Town Centre Monitoring Locations

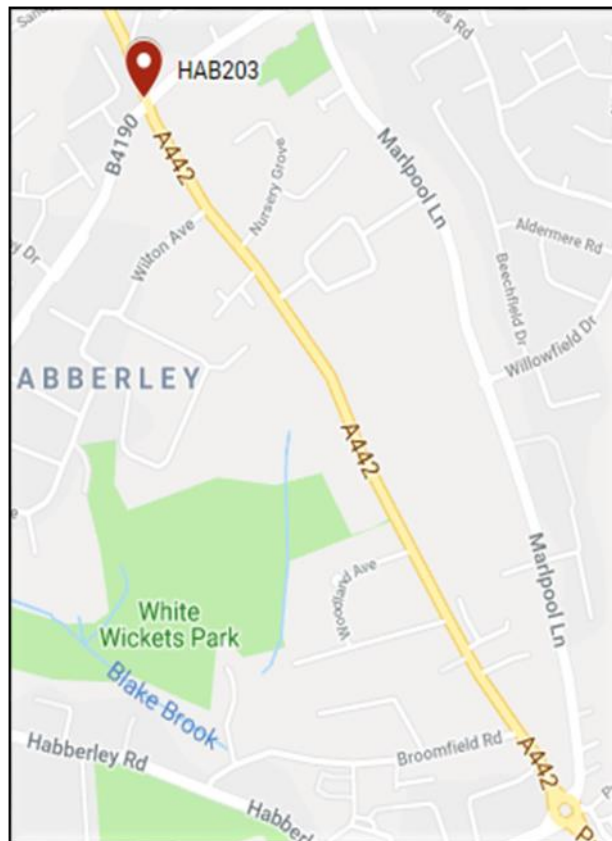


Figure D.7 – Map of South of Kidderminster Town Centre Monitoring Locations

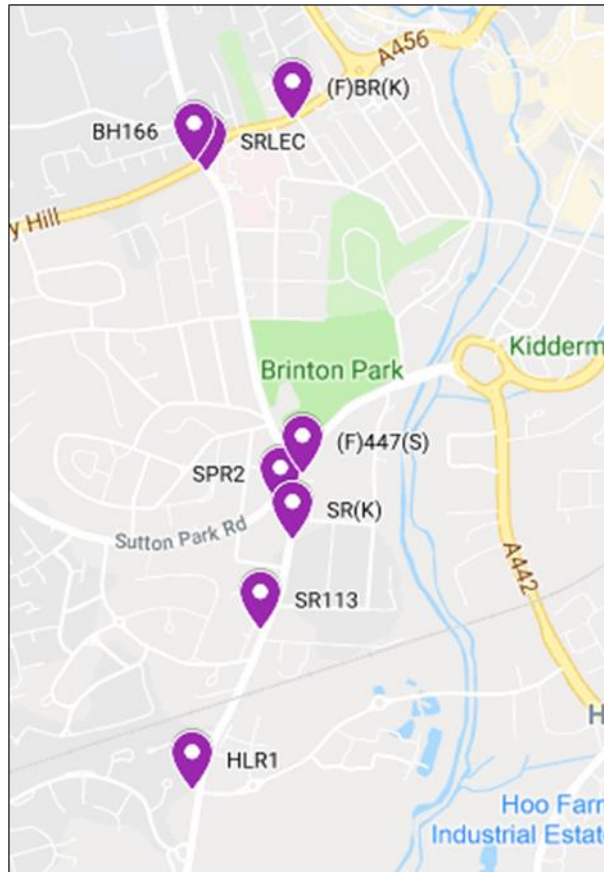


Figure D.8 – Map of Stourport-on-Severn Monitoring Locations

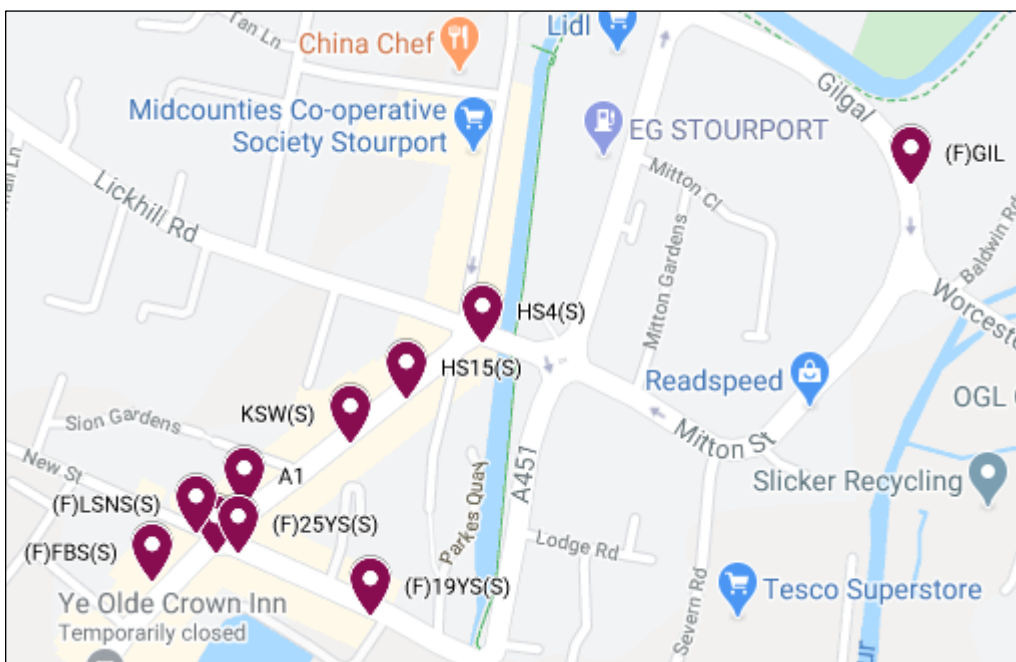


Figure D.9 – Map of East of Bewdley Town Centre Monitoring Location



Appendix E: Summary of Air Quality Objectives in England

Table E.1 – Air Quality Objectives in England⁹

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

⁹ The units are in microgrammes of pollutant per cubic metre of air (µg/m³).

Appendix F: Impact of COVID-19 upon LAQM

COVID-19 has had a significant impact on society. Inevitably, COVID-19 has also had an impact on the environment, with implications to air quality at local, regional and national scales.

COVID-19 has presented various challenges for Local Authorities with respect to undertaking their statutory LAQM duties in the 2021 reporting year. Recognising this, Defra provided various advice updates throughout 2020 to English authorities, particularly concerning the potential disruption to air quality monitoring programmes, implementation of Air Quality Action Plans (AQAPs) and LAQM statutory reporting requirements. Defra has also issued supplementary guidance for LAQM reporting in 2021 to assist local authorities in preparing their 2021 ASR. Where applicable, this advice has been followed.

Despite the challenges that the pandemic has given rise to, the events of 2020 have also provided Local Authorities with an opportunity to quantify the air quality impacts associated with wide-scale and extreme intervention, most notably in relation to emissions of air pollutants arising from road traffic. The vast majority (>95%) of AQMAs declared within the UK are related to road traffic emissions, where attainment of the annual mean objective for nitrogen dioxide (NO₂) is considered unlikely. On 23rd March 2020, the UK Government released official guidance advising all members of public to stay at home, with work-related travel only permitted when absolutely necessary. During this initial national lockdown (and to a lesser extent other national and regional lockdowns that followed), marked reductions in vehicle traffic were observed; Department for Transport (DfT) data¹⁰ suggests reductions in vehicle traffic of up to 70% were experienced across the UK by mid-April, relative to pre COVID-19 levels.

This reduction in travel in turn gave rise to a change of air pollutant emissions associated with road traffic, i.e. nitrous oxides (NO_x), and exhaust and non-exhaust particulates (PM). The Air Quality Expert Group (AQEG)¹¹ has estimated that during the initial lockdown period in 2020, within urbanised areas of the UK reductions in NO₂ annual mean concentrations were between 20 and 30% relative to pre-pandemic levels, which

¹⁰ Prime Minister's Office, COVID-19 briefing on the 31st of May 2020

¹¹ Air Quality Expert Group, Estimation of changes in air pollution emissions, concentrations and exposure during the COVID-19 outbreak in the UK, June 2020

represents an absolute reduction of between 10 to 20 $\mu\text{g}/\text{m}^3$ if expressed relative to annual mean averages. During this period, changes in $\text{PM}_{2.5}$ concentrations were less marked than those of NO_2 . $\text{PM}_{2.5}$ concentrations are affected by both local sources and the transport of pollution from wider regions, often from well beyond the UK. Through analysis of AURN monitoring data for 2018-2020, AQEG have detailed that $\text{PM}_{2.5}$ concentrations during the initial lockdown period are of the order 2 to 5 $\mu\text{g}/\text{m}^3$ lower relative to those that would be expected under business-as-usual conditions.

As restrictions are gradually lifted, the challenge is to understand how these air quality improvements can benefit the long-term health of the population.

Impacts of COVID-19 on Air Quality within Wyre Forest District Council

Traffic Data

Nitrogen Dioxide concentrations within Wyre Forest District and the Horsefair/Coventry Street and Welch Gate AQMAs are largely linked to road traffic. During the Covid-19 pandemic Worcestershire County Council has collated travel and traffic data for the County. This data has been compared with normal baseline data to give an indication of the impact of Covid-19 lockdowns and restrictions on traffic flows and travel behaviours. Data was gathered from County and DfT sources and included nine live traffic monitors in the Worcester City area and nine further monitors across the County.

Countywide traffic data shows that changes in traffic flows and patterns largely followed the trends seen nationally. Traffic volumes across the County dropped as low as 34% of normal baseline conditions during the March/April 2020 lockdown and as low as 63% of normal baseline conditions during December 2020 (Figure F.1 below).

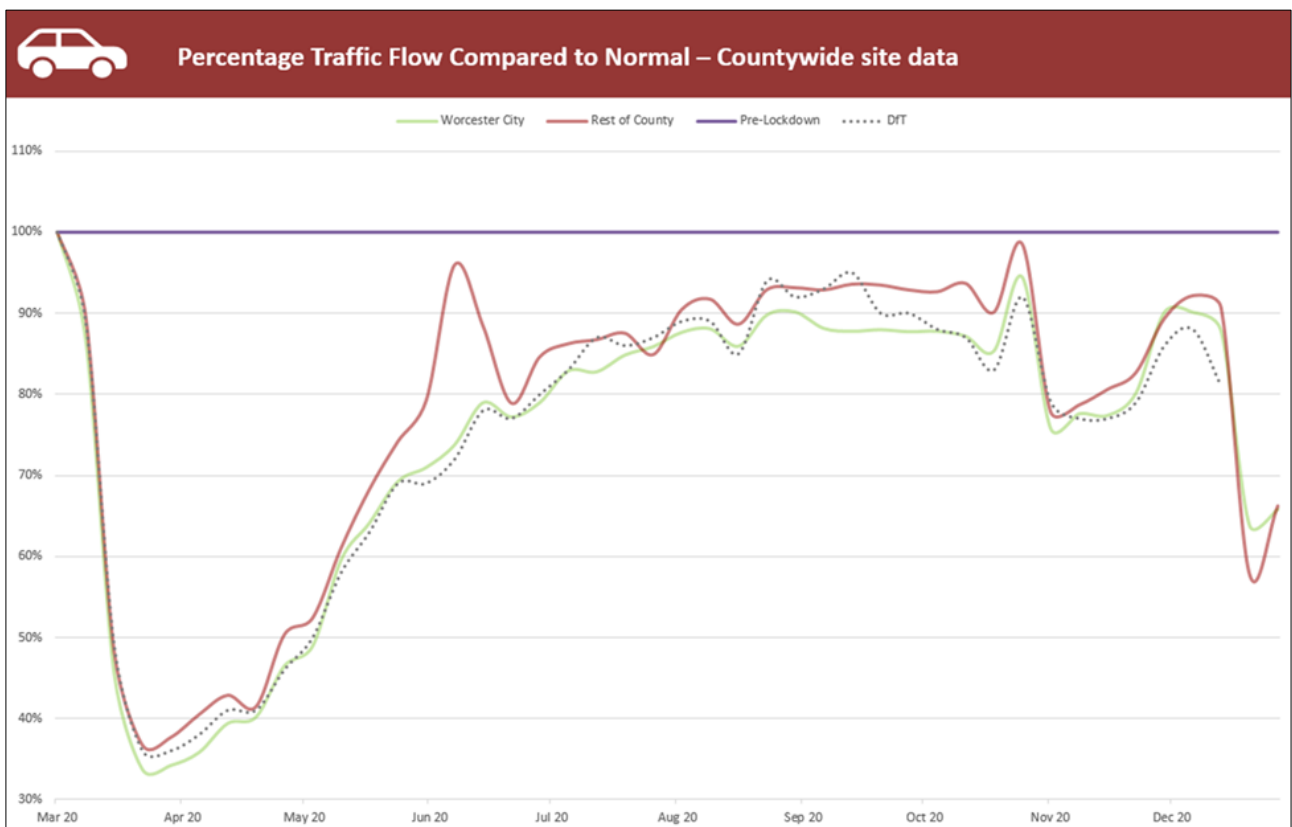
Due to a combination of Covid-19 restrictions and a change of laboratory diffusion tube data for January to June 2020 is not available for the Wyre Forest District and as such it is not possible to comment on any monthly changes in nitrogen dioxide concentrations for the first six months of 2020; including any changes experienced as a result of reductions in traffic associated with the first national lockdown.

A comparison of annual mean nitrogen dioxide concentrations across the Wyre Forest District between 2019 and 2020 shows a general decrease across the District at all locations. An average decrease in concentration of 23% (6.2 $\mu\text{g}/\text{m}^3$) can be observed across the District as a whole.

A comparison of annual mean nitrogen dioxide concentrations in the AQMAs between 2019 and 2020 shows a general decrease at all locations. An average decrease in concentration of 25.9% ($8.3\mu\text{g}/\text{m}^3$) can be observed in the Horsefair/Coventry Street AQMA and 21.4% ($8\mu\text{g}/\text{m}^3$) in the Welch Gate AQMA

Whilst Covid-19 restrictions and subsequent reductions in traffic volumes will have influenced nitrogen dioxide concentrations, the AQMAs have experienced no discernible trends in annual mean nitrogen dioxide concentrations over the period 2016 to 2019 and as such it is not possible to quantify the impact of traffic changes as a result of Covid-19 restrictions on nitrogen dioxide concentrations locally with the data available.

Figure F.1 – Worcestershire 2020 Percentage Traffic Flow Compared to Normal



Opportunities Presented by COVID-19 upon LAQM within Wyre Forest District Council

No LAQM specific related opportunities have arisen as a consequence of Covid-19 within the Wyre Forest District.

Challenges and Constraints Imposed by COVID-19 upon LAQM within Wyre Forest District Council

The following challenges and constraints imposed by Covid-19 impacted the LAQM work of the Council:

- Passive monitoring Data Capture – diffusion tubes were not exposed for the months March 2020 to June 2020 due to a combination of laboratory closures and a Council decision not to deploy officers to change tubes due to Covid-19 restrictions. This has affected data capture during 2020, resulting in data from all monitoring sites having to be annualised. **Small/Medium impact**
- Defra Diffusion Tube Exposure Calendar - during months where diffusion tubes were exposed the calendar was adhered to. **No impact**
- Diffusion Tube Storage - during months where diffusion tubes were sent for analysis they were stored and analysed in accordance with laboratory guidance. **No impact**
- Diffusion tube bias-adjustment - in 2019 diffusion tubes were supplied and analysed by Somerset Scientific Services and the national bias-adjustment factor for that laboratory used. The 2019 bias-adjustment factor for Somerset Scientific Services was based on 2 studies. Between July and December 2020 diffusion tubes were supplied and analysed by Gradko International Limited and the national bias-adjustment factor for Gradko used. The 2020 bias-adjustment factor for Gradko is based on 18 studies. **No impact**
- The work of the Worcestershire Air Quality Partnership was due to continue in 2020 however at the time of report writing the work of the group has been postponed indefinitely due to the Covid-19 pandemic. **Medium impact.**

Table F 1 – Impact Matrix

Category	Impact Rating: None	Impact Rating: Small	Impact Rating: Medium	Impact Rating: High
Automatic Monitoring – Data Capture (%)	More than 75% data capture	50 to 75% data capture	25 to 50% data capture	Less than 25% data capture
Automatic Monitoring – QA/QC Regime	Adherence to requirements as defined in LAQM.TG16	Routine calibrations taken place frequently but not to normal regime. Audits undertaken alongside service and maintenance programmes	Routine calibrations taken place infrequently and service and maintenance regimes adhered to. No audit achieved	Routine calibrations not undertaken within extended period (e.g. 3 to 4 months). Interruption to service and maintenance regime and no audit achieved
Passive Monitoring – Data Capture (%)	More than 75% data capture	50 to 75% data capture	25 to 50% data capture	Less than 25% data capture
Passive Monitoring – Bias Adjustment Factor	Bias adjustment undertaken as normal	<25% impact on normal number of available bias adjustment colocation studies (2020 vs 2019)	25-50% impact on normal number of available bias adjustment studies (2020 vs 2019)	>50% impact on normal number of available bias adjustment studies (2020 vs 2019) and/or applied bias adjustment factor studies not considered representative of local regime
Passive Monitoring – Adherence to Changeover Dates	Defra diffusion tube exposure calendar adhered to	Tubes left out for two exposure periods	Tubes left out for three exposure periods	Tubes left out for more than three exposure periods
Passive Monitoring – Storage of Tubes	Tubes stored in accordance with laboratory guidance and analysed promptly.	Tubes stored for longer than normal but adhering to laboratory guidance	Tubes unable to be stored according to be laboratory guidance but analysed prior to expiry date	Tubes stored for so long that they were unable to be analysed prior to expiry date. Data unable to be used
AQAP – Measure Implementation	Unaffected	Short delay (<6 months) in development of a new AQAP, but is on-going	Long delay (>6 months) in development of a new AQAP, but is on-going	No progression in development of a new AQAP
AQAP – New AQAP Development	Unaffected	Short delay (<6 months) in development of a new AQAP, but is on-going	Long delay (>6 months) in development of a new AQAP, but is on-going	No progression in development of a new AQAP

Glossary of Terms

Abbreviation	Description
AQAP	Air Quality Action Plan - A detailed description of measures, outcomes, achievement dates and implementation methods, showing how the local authority intends to achieve air quality limit values'
AQMA	Air Quality Management Area – An area where air pollutant concentrations exceed / are likely to exceed the relevant air quality objectives. AQMAs are declared for specific pollutants and objectives
ASR	Annual Status Report
Defra	Department for Environment, Food and Rural Affairs
DoPH	Director of Public Health
EU	European Union
LAQM	Local Air Quality Management
NO ₂	Nitrogen Dioxide
NO _x	Nitrogen Oxides
PM ₁₀	Airborne particulate matter with an aerodynamic diameter of 10µm or less
PM _{2.5}	Airborne particulate matter with an aerodynamic diameter of 2.5µm or less
QA/QC	Quality Assurance and Quality Control
SO ₂	Sulphur Dioxide
WCC	Worcestershire County Council
WRS	Worcestershire Regulatory Services
WFDC	Wyre Forest District Council

References

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