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

Date: June 2023

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Executive Summary: Air Quality in Our Area

Air Quality in Warwick 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].

Since 2022, air quality in Warwick has shown a marked decline, largely attributable to a shift in public behaviour once COVID-19 restrictions were lifted. This shift was particularly noticeable at monitoring site W13, a high-traffic intersection that recorded an exceedance over the air quality standards for NO_2 at an annual mean of 42.5µg/m^3. An average increase of 3µg/m^3 across 58 monitoring locations were observed, our highest change, W1 increased by 4.8µg/m^3. Despite a recorded increase in air pollution levels since 2021, excluding the anomalous years of 2020 and 2021 reveals a continued overall decrease in air pollution. Therefore, while the absolute readings might be higher compared to the years of reduced activity from the pandemic, the general trend towards better air quality persists.

No monitoring location reported an annual mean NO_2 concentration exceeding 60µg/m^3, which suggests that there has not been a breach of the 1-hour mean NO_2 AQS objective. Additionally, no automatic monitoring site reported any 1-hour mean NO_2 concentrations exceeding 200µg/m^3.

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[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

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, due to be published in 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.

Warwick District Council continued to implement and pursue measures to improve air quality during 2022. Key completed measures are as follows:

- Europa Way corridor improvements at the section between Tachbrook Park and Olympus Avenue;
- Continued improvements to the Europa Way corridor.
- Active Travel website

Conclusions and Priorities

Site W13, a monitoring location within the Leamington Spa AQMA exceeded air quality standards with an annual average 42.5µg/m^3.

[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

A noticeable trend is that all diffusion tube sites increased in NO_2 concentrations since last reporting year but have not risen to 2019 levels.

The New Street Kenilworth AQMA has met the Air Quality objective for the last 14 years and there is justifiable claim to revoke the AQMA. The Council wishes to keep these designations in place until the long-term impacts on COVID-19 can be accurately assessed, to ensure that compliance will be maintained in future years.

Warwick District Council will continue to implement measures outlined in the existing AQAP (Air Quality Action Plan). Over five years have elapsed since the previous AQAP was published. The AQAP is scheduled to be updated with after an updated source apportionment study.

Local Engagement and How to get Involved

All Warwick District Council residents can help to improve air quality in the borough by choosing sustainable travel alternatives such as walking, cycling or using public transport. Warwickshire and Coventry have an ongoing carsharing programme, available online via the Carshare Warwick website.

All enquiries pertaining to air quality should be directed to the Environmental Protection Section, either by email (pollution@warwickdc.gov.uk) or by phone (01926 456725).

An air pollution page is available on the Council website, all statutory reports and up to date information is uploaded to, and presented within this page. Additionally, the Active Travel website is available to provide information on sustainable modes of transport within the district. Information and maps showing the locations of EV charging points are also now available on the Council's website.

Local Responsibilities and Commitment

This ASR was prepared by the Safer Communities, Leisure and Environment Service of Warwick District Council.

This ASR has been approved by:

Name	Title	Signature
Katie Hunt	Councillor	*Katie Hunt*

This ASR has not been signed off by a Director of Public Health.

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

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1 Local Air Quality Management

This report provides an overview of air quality in Warwick District Council 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 Warwick 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 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 Warwick District Council can be found in Table 2.1. The table presents a description of the five AQMAs that are currently designated within Warwick District Council. Appendix 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:

- NO_2 annual mean; and
- NO_2 1-hour 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	Number of Years Compliant with Air Quality Objective	Name and Date of AQAP Publication	Web Link to AQAP
Warwick Coventry Road	Mar-11	NO_2 Annual Mean	Warwick	The area covers the east side of Coventry Road from the junction with St. Johns / Coten End, incorporating 2-4 Coventry Road and Montgomery Court, properties fronting on to Coventry Road only.	50.8µg/m^3	35.8µg/m3	5 years	Air Quality Action Plan: Warwick District Council. Published June 1st 2015	Visit the AQAP for the Warwick Coventry Road AQMA
Warwick Road (Kenilworth) AQMA	Nov-08	NO_2 Annual Mean	Kenilworth	An area encompassing all properties along Warwick Road, Kenilworth between the junctions with Station Road and Waverley Road.	48.1µg/m^3	24.7µg/m3	5 years	Air Quality Action Plan: Warwick District Council. Published June 1st 2015	Visit the AQAP for the Warwick Road (Kenilworth) AQMA
New Street Kenilworth AQMA	Nov-08	NO_2 Annual Mean	Kenilworth	An area encompassing all properties fronting New Street, Kenilworth from the junction with Bridge Street/Fieldgate Lane up to and	39.8µg/m^3	25.3µg/m3	5 years	Air Quality Action Plan: Warwick District Council. Published June 1st 2015	Visit the AQAP for New Street Kenilworth AQMA

				including No. 17 New Street.					
Leamington Spa AQMA	Dec-04 Amended 2014	NO_2 Annual Mean	Leamington Spa	An area of South Town, Leamington Spa, centred on High Street, Clemens Street and Bath Street.	52.9µg/m^3	42.5µg/m3	Not compliant	Air Quality Action Plan: Warwick District Council. Published June 1st 2015	Visit the AQAP for the Leamington Spa AQMA
Warwick AQMA	Dec-04 Amended 2008	NO_2 Annual and 1-Hour Mean	Warwick	An area in the centre of Warwick, encompassing properties along High Street, Jury Street, Bowling Green Street, Theatre Street, Northgate, The Butts, Smith Street, Church St and part of Saltisford, and also including a number of nearby properties. This AQMA is now declared for both annual and hourly mean nitrogen	58.3µg/m^3	34.4µg/m3	4 years	Air Quality Action Plan: Warwick District Council. Published June 1st 2015	Visit the AQAP for the Warwick AQMA

				dioxide objectives.					

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

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

Progress and Impact of Measures to address Air Quality in Warwick District Council

Defra's appraisal of last year's ASR concluded that "On the basis of the evidence provided by the local authority the conclusions reached are accepted for all sources and pollutants".

Warwick District Council has taken forward a number of direct measures during the current reporting year of 2023 in pursuit of improving local air quality. Details of all measures completed, in progress or planned are set out in Table 2.2. 42 measures are included within Table 2.2, with the type of measure and the progress Warwick District Council have made during the reporting year of 2023 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 their respective Action Plans. Key completed measures are:

- WDC's Low Emission Strategy Guidance has been superseded by an Air Quality Supplementary Planning Document (SPD) which has been adopted;
- Funding has been secured New Footpath/cycleway link between Myton Road and Fusiliers Way – CIL scheme project serving schools and new housing and existing housing and existing employment areas.
- 'Choose How You Move in Warwick District' programme, in conjunction with Betterpoints, to include rewards for participants making active and sustainable travel choices across the District;
- Bath Street traffic improvement scheme – CIL Scheme project and use of WDC land to reduce traffic in AQMA area of Leamington and improve public transport terminus
- Installation of 20 twin headed EV charging points in off-street car parks within Leamington, Warwick and Kenilworth.
- WDC website includes links to maps showing the locations of EV charging points in the District; and,
- The Active Travel website

Warwick District Council expects the following measures to be completed over the course of the next reporting year:

- An investigation of 20 mph zones as part of the wider transport strategy, where this will smooth traffic flow
- Coventry Rd Cycle Scheme. The proposed scheme is part of our programme of new cycle route developments to make it easier for people to cycle for short local journeys, helping to tackle congestion, improve air quality, reduce carbon emissions, and support an increase in physical activity.

Warwick District Council worked to implement these measures in partnership with the following stakeholders during 2022:

- Warwickshire County Council

The principal challenges and barriers to implementation that Warwick District Council anticipates facing are limitations of funding and capacity of staff to implement projects.

Progress on the following measures has been slower than expected due to a lack of resources and funding for some of the schemes and measures outlined in Table 2.2.

Warwick District Council anticipates that the measures stated above and in Table 2.2 will aid in achieve compliance in all five of the AQMAs.

Whilst the measures stated above and in Table 2.2 will help to contribute towards compliance, Warwick District Council anticipates that further additional measures not yet prescribed will be required in subsequent years to achieve compliance and enable the revocation in all five of the AQMA's.

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	Area wide improvements to walking and cycling infrastructure	Promoting Travel Alternatives	Promotion of Cycling and Promotion of Walking	Ongoing	Ongoing implementation of schemes	WCC	WCC, possible CIL contribution to some schemes, Getting Building Fund	NO	-	-	Implementation	n/a	n/a	1. Europa Way Corridor Improvements commenced in May 2018 and are ongoing. 2. Shared use cycle path created on Priory Road, Warwick. 3. Traffic model developed for a two way cycle link between Leamington Spa and Warwick along Emscote Road with funding now secured for this scheme. 4. Works have been completed at Northgate, Warwick to improve pedestrian routes between Warwick railway station and the town centre. 5. Bicycle hire/share scheme is being explored that could serve Leamington Spa railway station, Warwick Technology Park, and Heathcote Industrial Estate.	Europa Way corridor improvements are ongoing with section between Tachbrook Park Road and Olympus Avenue due to open summer 2021. Feasibility work on Harbury Lane connections, including to new school site, is being carried out in 2021/22. Funding has been secured from Getting Building Fund through the CWLEP to deliver the following new schemes / upgrades of existing schemes during 2021/22: Stratford Rd & Shakespeare Ave Warwick, Vittle Drive Warwick, Coventry Rd Warwick including link to Woodloes, St Nicholas Park Warwick, Kenilworth Road Leamington Spa. The Stanks Island scheme in Warwick is complete including improved cycle connectivity
2	Smarter Choices and Travel Planning programme	Promoting Travel Alternatives	School Travel Plans and Workplace Travel Planning	Ongoing	Ongoing implementation of schemes	WCC	WCC, DfT	NO	-	-	Implementation	n/a	n/a	1. Engagement with large employers at Warwick Technology Park in relation to active travel. A lift share scheme introduced by local employer Wolseley has proved to be successful, with significant uptake by employees. WCC have since taken this example of a successful scheme to the Coventry and Warwickshire LEP and have promoted the concept to other local companies. 2. Active travel website is	WCC's Road Safety Education continue to engage with employers and schools to promote active travel in partnership with road safety initiatives. Funding has been secured for 2 x Safe and Active Travel Officers, who have recently been appointed

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														operational and being maintained.	
3	Targeted bus stop infrastructure upgrades on key public transport corridors	Transport Planning and Infrastructure	Bus Route Improvements	Ongoing	Ongoing implementation of schemes	WCC	WCC, DfT	NO	-	-	Implementation	n/a	n/a	Feasibility work undertaken on some corridors	WCC has been successful in obtaining funding from DfT for electric buses to be introduced on cross boundary routes between Warwick, Leamington and Coventry. The initiative is part of a wider project to introduce all electric buses within Coventry by 2024/25. The introduction of electric buses will be supported by some bus priority measures along the corridor. This project could also provide opportunities for bus charging infrastructure to be installed within the District.
4	Improving infrastructure to improve walking and cycling signage	Promoting Travel Alternatives	Promotion of Cycling and Promotion of Walking	Ongoing	Ongoing implementation of schemes	WCC	WCC	NO	-	-	Planning	n/a	n/a	1. New signage nodes installed in Leamington Spa town centre and railway station in May 2018 showing walking routes/times. Signages nodes at Warwick and Warwick Parkway railway stations also now in place. 2. Bike hire/share scheme being explored to serve Leamington Railway station and large employment sites such as Warwick Technology Park and Heathcote Industrial Estate.	Options for a bike share scheme are still being explored by WDC in conjunction with Stratford DC and WCC.

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5	Hearts and Minds campaign to encourage modal shift away from private car use	Public Information	Other	Ongoing	Ongoing campaigns	WCC	WCC, grant funding where available	NO	-	-	Implementation	n/a	n/a	1. The 'Choose how you move' (CHYM) Active Travel campaign is continuing. The campaign has also been expanded in Leamington Spa where WDC, in partnership with WCC, have set up a rewards programme using the 'BetterPoints' app. The scheme encourages walking, cycling and use of public transport in Leamington by allowing users to log their green travel in return for BetterPoints that are then redeemable on the high street. 2. Warwickshire Public Health secured funding for 50 personal air quality monitors and an initial project was carried out looking at air quality awareness and impact on travel behaviours.	The 'Choose How You Move in Warwick District' programme, in conjunction with Betterpoints, is continuing and has been expanded to include rewards for participants making active and sustainable travel choices across the District.
6	Further consideration of Park and Ride	Alternatives to private vehicle use	Bus based Park and Ride	Ongoing	Unknown at this time	WCC	WCC	NO	-	-	Planning	n/a	n/a	1. Park and Ride facilities outlined in key transport corridor proposals. 2. 500 space park and ride scheme at Europa Way has been committed and is required to be developed prior to occupation of residential development along this corridor. 3. A park and ride at Blackdown (North of Leamington Spa) is included in local plan and on Community Infrastructure Levy (CIL) list. 4. Warwickshire County Council commissioning works to explore park and ride facilities to the	The Park and Ride feasibility report has been completed and identifies a number of Park and Ride and Park and Stride sites in and around Warwick and Leamington that could be introduced. Some of the assumptions may need to be reviewed in light of future working patterns for key employers in the area post-Covid

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														North and South of Leamington Spa.	
8	Publicising CarShare Coventry and Warwickshire	Alternatives to private vehicle use	Car and lift sharing schemes	Ongoing	Ongoing	WCC	WCC	NO	-	-	Implementation	n/a	n/a	1. Active Travel website publicising car sharing opportunities. Following the success of the Wolseley car share scheme WCC have presented to the Cov and Warks LEP with a view to expanding the scheme to other local employers. 2. Signage in Leamington Spa and Warwick being explored to further promote scheme.	Limited scope for impact at the current time while the Covid-19 situation has led to increased home working and a reduction in the number of employees commuting to workplaces.
9	Supporting future opportunities for funding for Low Emission Vehicles, in particular for vehicle charging infrastructure	Promoting Low Emission Transport	n/a	Ongoing	Ongoing implementation	WDC / WCC	WCC, OLEV grant	NO	-	-	Implementation	n/a	n/a	WCC currently developing an Electric Vehicle Charging Strategy. OLEV funding secured for approximately 100 twin-headed charging points to be installed across Warwickshire. WCC have introduced electric vehicles for their pool fleet (four vehicles)	OZEV funding has enabled delivery of 26 twin headed charging points in off-street car parks within Leamington, Warwick and Kenilworth. Further funding has been secured from the LEP which will allow charging points to be introduced in on-street locations within the District. The on-street locations are currently being finalised.
10	Use of the planning system to ensure a more widespread infrastructure for low emission vehicles	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	Ongoing	Ongoing implementation	WDC	WDC	NO	-	-	Implementation	n/a	n/a	Implementation of Low Emission Strategy Guidance, and more recently WDC's Air Quality Supplementary Planning Document which was adopted by WDC in 2019.	EV infrastructure continues to be sought and implemented as part of the planning process and in line with the Air Quality SPD.
11	Moving the Warwick DC fleet to electric vehicles where practicable	Promoting Low Emission Transport	Public Vehicle procurement	Ongoing	Vehicles in place as of 2016. Ongoing commitment where feasible	WDC	WDC, grant funding	NO	-	-	Implementation	n/a	n/a	Five vehicles ordered as pool vehicles	A further electric vehicle has been added to the WDC fleet bringing the total number of vehicles to 6. Options for adding a further two vehicles are also being considered.

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12	Strive to set up an Ecostars scheme in Warwick District Council whereby fleet operators can join for free and strive to reduce their environmental impacts.	Vehicle Fleet Efficiency	Fleet efficiency and recognition schemes	TBC	Subject to grant funding	WDC	Grant funding if available	NO	-	-	Aborted	n/a	n/a	Not taken forward yet – no grant funding available	No Update
13	Working with Warwickshire County Council and bus operators to encourage lower emission buses (either retrofitting existing buses or use of alternative fuels).	Vehicle fleet efficiency	Promoting Low Emission Public Transport	Ongoing	Subject to grant funding	WCC, DfT	Grant funding if available	NO	-	-	Implementation	n/a	n/a	1. Meetings held with bus providers in the Warwick district. Obtained details on composition of vehicle fleet and have identified eight Euro 4 buses that are eligible for retrofitting. 2. Initial discussions with local bus providers and bus manufacturers on possibility of trialling an electric bus route through the Leamington Spa AQMA. An initial electric bus funding bid was submitted in 2018 but was unsuccessful. Coventry City Council have since applied for funding under the 'all electric bus town' scheme and cross-boundary routes between Coventry and Warwickshire are being considered as part of the bid, a business case will be developed over the coming months. If the bid is successful there is potential for routes between Coventry and the towns within Warwick District to become electric. It would also provide opportunities for bus charging infrastructure to be installed within the District	WCC successfully submitted a bid with CCC to introduce electric buses on cross-boundary routes between Coventry and Leamington/Warwick. The electric buses will be introduced by 2024/25.

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14	Ensuring that the electric taxi within Warwick District Council is utilised to promote Low Emission Vehicles to commercial operators and the public.	Promoting Low Emission Transport	Taxi emission incentive	Ongoing	n/a	WDC		NO	-	-	Aborted	n/a	n/a	Not feasible as taxi is privately owned	No update
15	Promotion of electric vehicles through the Warwickshire Drive Electric Website. http://www.warwickshire.gov.uk/driveelectric	Promoting Low Emission Transport	Other	Ongoing	Ongoing implementation	WCC	WCC	NO	-	-	Implementation	n/a	n/a	Website is updated and maintained.	Ongoing. WDC website includes links to maps showing the locations of EV charging points in the District
16	Use the taxi and private hire licensing system to try and reduce emissions from taxis and private hire vehicles.	Promoting Low Emission Transport	Taxi emission incentive	Ongoing	To be confirmed	WDC	WDC, grant funding	NO	-	-	Planning	n/a	n/a	Preliminary review of WDC licensed taxi fleet completed in November 2017. Explored possibility of a county-wide taxi euro emission licensing policy through the Coventry and Warwickshire Air Quality Alliance, however, limited interest from neighbouring local authorities.	An electric taxi project is currently underway with a view to introducing electric charging infrastructure for taxis and incentives to encourage taxi drivers to make the switch to electric vehicles.
17	Investigation with procurement colleagues to produce a sustainable procurement guide to ensure transport emissions are as low as possible	Policy Guidance and Development Control	Sustainable Procurement Guidance	TBC	2018	WDC (Procurement)	WDC	NO	-	-	Planning	n/a	n/a	WDC declared a Climate Emergency in 2019 which includes a commitment to becoming a net-zero carbon organisation by 2025, including all contracted out services. It is expected that sustainable procurement will be considered as part of a Climate Emergency Action Programme and that this will impact positively on local air quality at the same time as reducing carbon emissions.	Ongoing

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18	Ensuring that the Warwick Low Emission Strategy Guidance for Developers is kept up to date, and implemented	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	Ongoing	Ongoing	WDC	WDC	NO	-	-	Implementation	n/a	n/a	1. Good progress in implementing mitigation through development control. 2. WDC's Low Emission Strategy Guidance has been superseded by an Air Quality SPD which is now being implemented.	The SPD makes similar requirements of developers to those made under the previous guidance but with some changes. Additional trigger criteria have been added for major developments which must now be considered when determining the classification of a proposed development, and therefore the level of assessment and mitigation required. Also, a requirement for construction emission control measures, including non-road mobile machinery (NRMM) controls, is now included where type 2 mitigation is necessary.
19	Working with planning policy colleagues to ensure that the Local Plan fully addresses air quality issues with appropriate policies included	Policy Guidance and Development Control	Other policy	Ongoing	Ongoing	WDC	WDC	NO	-	-	Completed	n/a	n/a	Planning policy relevant to air quality included in new Local Plan	
20	Working with planning colleagues and developers to ensure that new developments are based around the 'five-minute walkable neighbourhood', thereby encouraging active travel as the preferred methods of transport to access local facilities	Policy Guidance and Development Control	Other policy	Ongoing	Ongoing encouragement of active travel	WCC Public Health	WCC Public Health	NO	-	-	Implementation	n/a	n/a	Five minute walkable neighbourhoods have been investigated within work undertaken by WYG on how developments should look	Ongoing
21	Ensure that green infrastructure is integrated into all residential and commercial developments, in line with the National Planning Policy Framework (NPPF)	Policy Guidance and Development Control	Other policy	Ongoing	Ongoing	WDC	WDC	NO	-	-	Implementation	n/a	n/a	NPPF followed for new development. Green infrastructure included where relevant	Ongoing
22	Ensuring that planning applications with potential air quality impacts are fully assessed for their impacts, at relevant locations using appropriate methodologies	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	Ongoing	Ongoing	WDC	WDC	NO	-	-	Implementation	n/a	n/a	Air quality assessments asked for on a regular basis and mitigation sought where necessary	Ongoing
23	Ensuring that where possible, cumulative impacts are taken into account. Any committed developments should be included within a given air quality assessment	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	Ongoing	Ongoing	WDC	WDC	NO	-	-	Implementation	n/a	n/a	Ongoing work required where large areas of development are allocated in Local Plan. Potential cumulative impacts raised at pre-application and outline planning	Ongoing

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														application stages as necessary.	
24	Ensuring that appropriate mitigation is implemented where any relevant impacts are identified	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	Ongoing	Ongoing	WDC	WDC	NO	-	-	Implementation	n/a	n/a	Mitigation asked for on a regular basis as part of the Low Emission Strategy (superseded in 2019 by WDC's Air Quality SPD).	Ongoing
25	Junction improvements on key travel corridors in Warwick and Leamington Spa AQMAs are proposed which include junction/ highway modifications, improvements for walking and cycling and bus priority measures	Traffic Management	Strategic Highway Improvements	Ongoing	Ongoing for different corridors, Europa Way works commenced in 2018 and are continuing.	WCC (Transport)	WCC (Transport) / CIL contribution	NO	-	-	Implementation	n/a	n/a	Good progress on planning and starting to implement corridor proposals. Work on the Europa Way corridor has begun and is ongoing. A scheme to address air quality issues in the Bath Street, Leamington area is being developed. Options include priority measures for buses, traffic management proposals to reduce queuing traffic in and around the Bath Street area, and improved connectivity for pedestrians and cyclists.	Two proposals for the Bath Street scheme have been developed. Option assessment will include impact on air quality using Ricardo air quality modelling tool alongside traffic modelling.
26	An investigation of 20 mph zones as part of the wider transport strategy, where this will smooth traffic flow	Traffic Management	Reduction of Speed Limits, 20 mph zones	Ongoing	2022	WCC (Transport)	WCC (Transport)	NO	-	-	Implementation	n/a	n/a	Good progress	No update

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27	Targeted re-allocation of road space to prioritise and facilitate movement of pedestrians, cyclists, public transport and car share users	Traffic Management	Strategic Highway Improvements	Ongoing	Ongoing for different corridors, Europa Way works commenced in 2018 and are continuing. Shared use cycle link completed on Priory Road, Warwick which is to be expanded to Northgate, Eastgate, Westgate, St. Johns, and Emscote Road	WCC (Transport)	WCC (Transport)	NO	-	-	Implementation	n/a	n/a	Good progress on planning and starting to implement corridor proposals. Northgate pedestrian improvement works were completed in 2019 and funding has been secured to complete the remainder of the planned Warwick town centre works which will act to make movement easier for pedestrians and cyclists. All of the remaining works planned for Warwick, including junction improvements at Eastgate and Westgate and the introduction of one-way routing in some areas, are expected to go ahead.	Work on the Europa Way corridor is ongoing. Funding secured for Warwick town centre scheme, including road space reallocation to improve pedestrian and cycle facilities
28	Manage deliveries across Warwick District Council to ensure that no additional congestion is caused by stationary delivery vehicles in busy locations	Traffic Management	Congestion Management	Ongoing	n/a	WCC (Transport)	WCC (Transport)	NO	-	-	Planning	n/a	n/a	Will review at future Steering Group meetings	No update, ongoing
29	Re-investigate funding for a website to engage with the public on air quality, the health impacts of poor air quality, sustainable transport and strategies to improve air quality	Public Information	Via the internet	Ongoing	Ongoing implementation	WCC Public Health	WCC Public Health	NO	-	-	Implementation	n/a	n/a	Air quality information incorporated into Active Travel website. Further information about air quality and local AQMAs to be included.	Active travel website being progressed by Safe and Active Travel team. Due for launch in 2021
30	Working with planners and developers to embed Public Health's Evidence for Planning guidance, thereby encouraging any new developments to support access to active travel	Policy Guidance and Development Control	Other policy	Ongoing	Ongoing	WCC Public Health	WCC Public Health	NO	-	-	Implementation	n/a	n/a	The guidance document is used when responding to planning applications, pre-planning applications and local plan consultations on an ad-hoc basis.	Ongoing
31	Investigate implementing a campaign aimed at vulnerable members of the public (i.e. those with existing respiratory or cardiovascular conditions) in order that they could change behaviour to reduce exposure when pollution levels are high	Public Information	Via the internet	Ongoing	Ongoing	WCC Public Health	WCC Public Health	NO	-	-	Implementation	n/a	n/a	Instead will embed active travel in everything we do, aimed at whole population	Funding for personal air monitors was secured and an initial project completed.

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
32	Continuation of monitoring within Warwick District Council, focussed on AQMAs, but also in other strategic locations	n/a	n/a	Ongoing	Ongoing	WDC	WDC	NO	-	-	Implementation	n/a	n/a	Monitoring reported in this report. Three additional diffusion tubes have been installed in and around Castle Hill, Warwick to determine whether the current boundary of the Warwick AQMA should be adjusted. Two further tubes have also been added to the network for the purpose of investigating any temporary air quality concerns, these have been deployed in Dale Street,	Ongoing
33	Regular assessment of air quality against air quality objectives as specified by the LAQM process with reports to Defra and the public	n/a	n/a	Ongoing	Ongoing	WDC	WDC	NO	-	-	Implementation	n/a	n/a	Undertaken in this report	
34	Review of measures set out in this Air Quality Action Plan on a regular basis to ensure they are up to date and being implemented	n/a	n/a	Ongoing	Ongoing	WDC	WDC	NO	-	-	Implementation	n/a	n/a	Undertaken in this report	
35	Bath St - Potential Interim Scheme	Alternatives to private vehicle use/Traffic Management	Strategic Highway Improvements	2023	2023	WCC	TBC	NO	-	-	Planning	n/a	n/a	Inception	
36	Bath St./ Leamington Old Town Identify a mitigation scheme. Mitigate impacts on air quality.	Alternatives to private vehicle use/Traffic Management	Strategic Highway Improvements	2024	2024	WCC	TBC + CIL	NO	-	-	Planning	n/a	NOx & PM2.5	Feasibility	Currently developing an LUF bid for submission in July. Local contribution required. CIL likely to meet requirements of local contribution
37	Warwick Town Centre Multi-Modal Scheme (including St Johns)	Alternatives to private vehicle use/Traffic Management	Strategic Highway Improvements		2025/2026	WCC	WCC CIF	NO	Funded	-	Planning/Implementation	n/a	NOx?		
38	Emscote Rd Sustainable Transport Corridor Scheme	Alternatives to private vehicle use/Traffic Management	Strategic Highway Improvements		2025	WCC (Transport)	WCC, CIL, s106	NO	Funded	-	Planning/Implementation	n/a		Initial modelling and concept design undertaken. Feasibility studies ongoing.	
39	Coventry Rd Cycle Scheme	Alternatives to private vehicle use/Traffic Management	Strategic Highway Improvements		2022/2023	WCC	CIF	NO	Funded	-	Implementation	n/a	n/a		

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
40	K2L	Alternatives to private vehicle use/Traffic Management	Strategic Highway Improvements		2028	WCC	CIF	NO	Funded	-	Implementation	n/a	n/a		
41	Local Cycling and Walking Infrastructure Plan schemes	Alternatives to private vehicle use/Traffic Management	Strategic Highway Improvements		2032	WCC	tbc	NO	Unfunded	tbc	Planning	n/a	n/a	A walking and cycling survey was undertaken in Summer 2021 with over 2,000 comments. Other evidence gathering, in line with DfT technical guidance, continued during 2021. A Draft Warwickshire LCWIP has now been prepared and will go out to consultation in Summer 2022.	Adoption of LCWIP may be delayed if consultation response is higher than expected and more detailed analysis/ report changes are needed. Over 200 potential LCWIP schemes means that implementation is dependent on prioritisation, public support, additional funding and timely delivery.
42	Coventry All Electric Bus City Scheme	Alternatives to private vehicle use/Traffic Management	Public Transport Improvements	2023	2025	DfT, TfWM, WMCA, WCC, CCC	DfT, Bus Operators, WCC	No	Part Funded / Leasing Arrangements	£124million	Implementation	n/a	n/a	TfWM and bus operators confirming vehicle leasing arrangements and provision of supporting on-street charging infrastructure in Coventry and Warwickshire alongside WCC officers	Stagecoach Midlands yet to provide firm funding commitment and recently issued a letter to WCC Transport Deliery Team confirming that they would require financial support to enhance their fleet with electric vehicles

$PM_{2.5}$ – 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.

Warwick District Council is taking the following measures to address $PM_{2.5}$:

Although the existing AQAP and AQMAs focus on reducing NO_2 emissions, the majority of measures will also lead to reductions in $PM_{2.5}$ emissions. Transport sources result in both NO_2 and $PM_{2.5}$ emissions, and in the latter case this is mostly from break and tyre wear. Therefore, any measures that target reducing NO_2 emissions by reducing overall vehicle trips and usage would also lead to a decrease in reducing $PM_{2.5}$ emissions.

Alongside this, the Council continues to monitor and review combustion emissions from industrial processes and domestic appliances, whilst enforcing statutory controls through the use of permitting etc.

The Department of Health's Public Health Outcomes Framework has a number of public health indicators that are used focus public health action, identify areas of health inequality and concern and monitor the differences in health impacts across regions in the UK. This framework includes an indicator "D01- Fraction of Mortality Attributable to Particulate Air Pollution" which is calculated using background annual average PM2.5 concentrations, modelled at a 1km2 resolution based on measured concentrations from the AURN. Warwick has a 5.1% fraction of mortality calculated for 2019, which is equal to the average for England overall, however lower than that of the West Midlands Region (5.3%). The 2019 data is used as the 2022 dataset has not been made available at the time of writing.

Measures to improve air quality often have shared wins with other public health indicators, a good example being the encouragement of active travel and commuting leading to increased physical activity and increased wellbeing.

Monitoring of $PM_{2.5}$ is completed at two Automatic Urban and Rural Network (AURN) sites within the District – Leamington Spa Hamilton Terrace (UKA00265) and Leamington Spa Rugby Road (UKA00564), referred to as AURN1 and AURN2 respectively within this

report. AURN1 concentrations have mostly shown a steady decrease across a five year period. However annual mean concentration has risen 0.2µg/m^3 in 2022 compared to 2021. The roadside AURN2 site has seen $PM_{2.5}$ concentrations showing a slight increase with a reported decrease of 0.6µg/m^3 reported from 2021 to 2022.

There are a number of Smoke Control Areas (SCA) within the Council's boundary. In these areas, only authorised and smokeless fuels are allowed to be burnt, unless being used in an exempt appliance. This helps control and reduce $PM_{2.5}$ emissions in these areas. Further information on these, including authorised fuels, can be found on Warwick District Council's website.

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

This section sets out the monitoring undertaken within 2022 by Warwick 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.

Summary of Monitoring Undertaken

3.1.1 Automatic Monitoring Sites

Warwick District Council undertook automatic (continuous) monitoring at one site during 2021. Additionally, there are two AURN automatic monitoring stations located within the district. Table A.1 in Appendix A shows the details of the automatic monitoring sites. Table A.3 presents automatic monitoring results for Warwick, with the AURN monitoring results available through the UK-AIR website. All automatic monitoring data carried out in the district is also available to be requested from WeCare4Air.

Maps showing the location of the monitoring sites are provided in Appendix D. Further details on how the monitors are calibrated and how the data has been adjusted are included in Appendix C.

3.1.2 Non-Automatic Monitoring Sites

Warwick District Council undertook non-automatic (i.e. passive) monitoring of NO_2 at 56 sites during 2022, inclusive of two triplicate locations. Table A.2 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 25%), and distance correction. Further details on adjustments are provided in Appendix C.

3.1.3 Nitrogen Dioxide (NO_2)

Table A.3 and Table A.4 in Appendix A compare 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.

Table A.5 in Appendix A compares the ratified continuous monitored NO_2 hourly mean concentrations for the past five years with the air quality objective of 200µg/m^3, not to be exceeded more than 18 times per year.

In 2022, all monitoring sites except site ID W13, both automatic and non-automatic, have reported an annual mean NO2 concentration less than the annual mean NO2 AQS objective of 40µg/m3. W13 exceeded the annual mean NO2 AQS, with an annual mean concentration of 42.5µg/m^3. All sites except Automatic Monitoring Site CM1 measured an average 11.8% increase in concentration. This is likely due to a change in public behaviour without COVID-19 Pandemic restrictions. Further information on this is detailed in Appendix F.

The maximum reported annual mean NO2 concentration at any of the sites was 42.5µg/m3, site ID W13, which had reported an exceedance in 2019. Site ID W13 has historically been the highest exceeding site.

No diffusion tube monitoring locations required distance correction, as all sites either reported an annual mean NO_2 concentration below 42.5µg/m^3, in accordance with LAQM.TG(16), or is already located at a site or relevant exposure.

With direct reference to each of the AQMAs:

- Warwick AQMA - an exceedance was last reported in 2019, therefore this should remain in place;
- Warwick Coventry Road AQMA – an exceedance was last reported in 2017, with concentrations decreasing since. Although there has now been four years of compliance, 2020 and 2021 may be an atypical years, therefore revocation of this AQMA will be considered once the long-term impacts of COVID-19 are understood;
- Leamington Spa AQMA – an exceedance was last reported in 2022, therefore this should remain in place;
- Warwick Road (Kenilworth) AQMA – an exceedance was last reported in 2017, with concentrations decreasing since. Although there has now been four years of compliance, 2020 and 2021 may be an atypical years, therefore revocation of this AQMA will be considered once the long-term impacts of COVID-19 are understood; and
- New Street Kenilworth AQMA – an exceedance was last reported in 2017, with concentrations decreasing since. Although there has now been four years of compliance, 2020 and 2021 may be an atypical years, therefore revocation of this AQMA will be considered once the long-term impacts of COVID-19 are understood.

In regards to the 1-hour mean NO_2 AQS objective, whereby there should be no more than 18 hourly NO_2 concentrations greater than 200µg/m^3, both AURN1, AURN2 CM1, (Hamilton Terrace in Leamington Spa, Rugby Road in Leamington Spa and Jury St/Pageant House in Warwick) continued to reported 0 exceedances. CM1 had reported 25 exceedances in 2019, therefore a decrease in short-term exceedances has been observed but this may again be attributable to the impacts of the COVID-19 pandemic. The designation for the 1-hour mean NO_2 AQS objective Warwick AQMA should therefore remain in place as less than three years of compliance has been maintained.

3.1.4 Particulate Matter (PM_{10})

Table A.6 in Appendix A: Monitoring Results compares the ratified and adjusted monitored PM_{10} annual mean concentrations for the past five years with the air quality objective of 40µg/m^3.

Table A.7 in Appendix A compares the ratified continuous monitored PM_{10} daily mean concentrations for the past five years with the air quality objective of 50µg/m^3, not to be exceeded more than 35 times per year.

In 2022, there have been no reported exceedances of the annual mean PM_{10} AQS objective of 40µg/m^3 at either of the AURN sites, AURN1 or AURN2. AURN1 has increased by 1.6µg/m^3 and AURN2 has increased by 1µg/m^3. Similarly to NO_2 concentrations, this may likely be a result of removed COVID-19 pandemic restrictions.

In terms of the 24-hour average PM_{10} AQS objective of no more than 35 exceedances of 50µg/m^3, both AURN sites reported 0 exceedances. This again is a decrease on the 3 – 4 exceedances reported in 2019.

3.1.5 Particulate Matter ($PM_{2.5}$)

Table A.8 in Appendix A presents the ratified and adjusted monitored $PM_{2.5}$ annual mean concentrations for the past five years.

Annual mean $PM_{2.5}$ concentrations have shown a minor increase between both monitoring sites AURN1 and AURN2 in 2022. At the continuous monitoring site AURN1 an increase of 0.2µg/m^3 and at AURN2, a decrease of 0.6µg/m^3 compared to 2021.

Appendix A: Monitoring Results

Table A.1 – Details of Automatic Monitoring Sites

Site ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Monitoring Technique	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Inlet Height (m)
AURN1	Hamilton Terrace, Leamington Spa	Urban Background	431943	265730	NO	NO	Chemiluminescence, Ultra-violet fluorescence (UVF), FDMS	9	50	4
AURN2	Rugby Road, Leamington Spa	Roadside	431271	266404	NO_2, PM_{10}, $PM_{2.5}$	NO	Chemiluminescence, FDMS	23	8	3.5
CM1	Jury St/Pageant House, Warwick	Roadside	428263	264877	NO_2	YES – Warwick AQMA	Chemiluminescence	13	2.8	2.4

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 – 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)
W1	Bath Street	Kerbside	431978	265280	NO2	Y - Leamington Spa AQMA	3.4	0.7	No	2.7
W2	High Street	Roadside	432075	265234	NO2	Y - Leamington Spa AQMA	0.0	2.2	No	2.7
W5	Hampton Street (3)	Roadside	427615	264563	NO2	N	2.4	2.0	No	1.5
W6, W7, W8	Hamilton Terrace	Urban Background	431943	265730	NO2	N	9.0	n/a	Yes	3.1
W10	Farley Street	Roadside	432560	265254	NO2	N	11.0	0.1	No	2.9
W11	Clemens Street	Roadside	432051	265060	NO2	Y - Leamington Spa AQMA	2.0	3.2	No	2.9
W12	Spencer Street	Roadside	431866	265371	NO2	Y - Leamington Spa AQMA	2.9	5.0	No	2.8
W13	Wise Street	Roadside	431900	265189	NO2	Y - Leamington Spa AQMA	0.0	1.0	No	2.7
W14	Tachbrook Road	Roadside	431862	265169	NO2	N	2.9	5.2	No	2.8
W15	Old Warwick Road	Roadside	431849	265193	NO2	N	2.4	2.0	No	2.6
W16	Parade	Roadside	431951	265397	NO2	Y - Leamington Spa AQMA	6.3	7.5	No	2.8
W17	Coventry Road (Woodville Road)	Kerbside	428704	265236	NO2	N	12.7	1.0	No	1.5
W18	Coventry Road (Coachouse Mews)	Roadside	428735	265362	NO2	N	2.3	1.5	No	1.5
W19	West Street Torry's	Roadside	427937	264586	NO2	N	6.1	3.2	No	1.5

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)
W23	Moorlands Road Jcn	Roadside	429078	271207	NO2	N	8.8	4.2	No	1.5
W24	Waverley Road	Roadside	428974	271402	NO2	Y - Warwick Road (Kenilworth) AQMA	4.7	2.8	No	4.5
W25	New Street No 1	Roadside	428707	272556	NO2	Y - New Street (Kenilworth) AQMA	0.0	0.4	No	1.5
W26	New Street No 2	Roadside	428733	272578	NO2	Y - New Street (Kenilworth) AQMA	0.0	1.7	No	1.5
W27	New Street No 3	Kerbside	428750	272612	NO2	N	8.8	1.1	No	4.5
W28	Fieldgate Lane Jcn	Roadside	428652	272524	NO2	Y - New Street (Kenilworth) AQMA	0.0	0.7	No	4.5
W30	The Square	Roadside	428714	271769	NO2	N	0.0	3.4	No	4.5
W31	Barrow Road	Kerbside	428816	271618	NO2	Y - Warwick Road (Kenilworth) AQMA	2.1	1.4	No	4.5
W32	Warwick Road	Roadside	428906	271497	NO2	Y - Warwick Road (Kenilworth) AQMA	0.0	1.3	No	1.5
W33, W34, W35	Pageant House	Roadside	428263	264877	NO2	Y - Warwick AQMA	13.0	2.8	Yes	1.5

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)
W36	Jury Street	Roadside	428391	264966	NO2	Y - Warwick AQMA	10.0	2.1	No	1.5
W37	High Street	Roadside	428132	264799	NO2	Y - Warwick AQMA	0.0	2.9	No	1.5
W38	West Street	Kerbside	427959	264624	NO2	N	4.5	0.6	No	1.5
W39	Crompton Street/ West Street	Roadside	427910	264541	NO2	N	0.0	4.1	No	1.5
W40	Bowling Green Street	Kerbside	427992	264695	NO2	Y - Warwick AQMA	0.0	0.9	No	1.5
W41	Friars Street	Roadside	427905	264682	NO2	N	1.8	1.0	No	1.5
W42	Theatre Street	Roadside	427938	264947	NO2	Y - Warwick AQMA	0.0	2.3	No	4.5
W43	Saltisford/northgate	Roadside	428026	265158	NO2	Y - Warwick AQMA	0.0	1.5	No	2.5
W44	West Rock	Roadside	427930	265200	NO2	Y - Warwick AQMA	3.6	2.3	No	2.6
W45	Albert Street/satilsford Junction	Roadside	427867	265275	NO2	Y - Warwick AQMA	0.0	2.7	No	2.5
W46	The Butts	Roadside	428240	265088	NO2	Y - Warwick AQMA	1.9	1.6	No	2.5
W48	Smith Street	Roadside	428522	265039	NO2	Y - Warwick AQMA	0.0	2.0	No	3.0
W49	Gerrard Street	Roadside	428501	264967	NO2	N	0.0	1.8	No	2.6
W50	St Nicholas' Church St 1.	Roadside	428600	264983	NO2	Y - Warwick AQMA	0.0	1.7	No	2.6
W51	St Mary's Churchyard	Urban Background	428270	264982	NO2	N	7.8	n/a	No	2.7
W52	Coventry Road/crown Hotel	Kerbside	428710	265165	NO2	Y - Warwick Coventry Road AQMA	17.5	1.0	No	2.5

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)
W53	Coventry Road No 1 (Mongomery Court)	Roadside	428715	265202	NO2	Y - Warwick Coventry Road AQMA	1.2	1.8	No	2.4
W54	Coventry Road No 2 (28 Coventry Road)	Roadside	428715	265285	NO2	N	0.0	1.9	No	2.4
W55	Coventry Road No 3 (Great Western Arms)	Roadside	428710	265341	NO2	N	3.3	1.2	No	2.5
W56	St Johns	Roadside	428619	265113	NO2	N	0.0	1.1	No	2.5
W57	Coten End	Roadside	428748	265166	NO2	N	0.0	3.0	No	2.5
W58	Emscote Road	Roadside	429514	265469	NO2	N	9.8	3.8	No	2.5
W59	Charles Street	Roadside	429501	265494	NO2	N	1.5	2.0	No	2.6
W60	Bridge Street	Roadside	430015	265718	NO2	N	6.7	2.4	No	2.6
W61	Greville Road	Roadside	429974	265733	NO2	N	6.7	5.4	No	2.5
W62	St Nicholas' Church St. 2	Roadside	428608	265042	NO2	Y - Warwick AQMA	0.0	2.1	No	3.0
W67	Castle Hill	Roadside	428477	264939	NO2	N	1.2	3.2	No	2.5
W69	Castle Hill (2)	Roadside	428513	264921	NO2	N	1.5	2.1	No	2.5
W70	Mill Street	Roadside	428554	264870	NO2	N	9.8	3.1	No	2.4
W71	Banbury Road	Roadside	428599	264857	NO2	N	20.4	2.1	No	2.5
W72	Dale Street East	Roadside	431464	265903	NO2	N	2.9	3.1	No	2.5
W73	Dale Street West	Roadside	431480	265878	NO2	N	2.6	0.3	No	2.5
W61	Greville Road	Roadside	429974	265733	NO2	N	6.7	5.4	No	2.5
W62	St Nicholas' Church St. 2	Roadside	428608	265042	NO2	Y - Warwick AQMA	0.0	2.1	No	3.0
W67	Castle Hill	Roadside	428477	264939	NO2	N	1.2	3.2	No	2.5
W69	Castle Hill (2)	Roadside	428513	264921	NO2	N	1.5	2.1	No	2.5
W70	Mill Street	Roadside	428554	264870	NO2	N	9.8	3.1	No	2.4
W71	Banbury Road	Roadside	428599	264857	NO2	N	20.4	2.1	No	2.5
W72	Dale Street East	Roadside	431464	265903	NO2	N	2.9	3.1	No	2.5

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)
W73	Dale Street West	Roadside	431480	265878	NO2	N	2.6	0.3	No	2.5
W61	Greville Road	Roadside	429974	265733	NO2	N	6.7	5.4	No	2.5
W62	St Nicholas' Church St. 2	Roadside	428608	265042	NO2	Y - Warwick AQMA	0.0	2.1	No	3.0
W67	Castle Hill	Roadside	428477	264939	NO2	N	1.2	3.2	No	2.5
W69	Castle Hill (2)	Roadside	428513	264921	NO2	N	1.5	2.1	No	2.5
W70	Mill Street	Roadside	428554	264870	NO2	N	9.8	3.1	No	2.4
W71	Banbury Road	Roadside	428599	264857	NO2	N	20.4	2.1	No	2.5
W72	Dale Street East	Roadside	431464	265903	NO2	N	2.9	3.1	No	2.5
W73	Dale Street West	Roadside	431480	265878	NO2	N	2.6	0.3	No	2.5
W61	Greville Road	Roadside	429974	265733	NO2	N	6.7	5.4	No	2.5
W62	St Nicholas' Church St. 2	Roadside	428608	265042	NO2	Y - Warwick AQMA	0.0	2.1	No	3.0
W67	Castle Hill	Roadside	428477	264939	NO2	N	1.2	3.2	No	2.5
W69	Castle Hill (2)	Roadside	428513	264921	NO2	N	1.5	2.1	No	2.5
W70	Mill Street	Roadside	428554	264870	NO2	N	9.8	3.1	No	2.4
W71	Banbury Road	Roadside	428599	264857	NO2	N	20.4	2.1	No	2.5
W72	Dale Street East	Roadside	431464	265903	NO2	N	2.9	3.1	No	2.5
W73	Dale Street West	Roadside	431480	265878	NO2	N	2.6	0.3	No	2.5

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.3 – Annual Mean NO_2 Monitoring Results: Automatic Monitoring (µg/m^3)

Site 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
AURN1	431943	265730	Urban Background	89	89	17.5	17.8	12.8	15	15.7
AURN2	431271	266404	Roadside	80	88	17	16.3	10.6	12.1	13.3
CM1	428263	264877	Roadside	98	98	32.4	35.6	27.5	33.83	31.3

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

☒ **Reported concentrations are those at the location of the monitoring site (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**.

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%).

Table A.4 – 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
W1	431978	265280	Kerbside	100	100.0	**42.3**	**40.5**	33.9	30.5	35.4
W2	432075	265234	Roadside	100	100.0	36.0	35.9	30.3	29.8	33.1
W5	427615	264563	Roadside	100	100.0	27.7	26.5	22.8	20.7	22.8
W6, W7, W8	431943	265730	Urban Background	100	100.0	17.6	17.0	14.1	13.1	14.6
W10	432560	265254	Roadside	100	100.0	22.8	22.0	18.4	17.2	19.7
W11	432051	265060	Roadside	92	92.3	21.9	21.7	17.6	18.0	20.8
W12	431866	265371	Roadside	100	100.0	31.4	30.0	26.3	23.8	28.0
W13	431900	265189	Roadside	100	100.0	**46.4**	**45.8**	36.8	37.2	**42.5**
W14	431862	265169	Roadside	100	100.0	36.6	37.9	30.6	30.2	35.4
W15	431849	265193	Roadside	92	92.3	**40.9**	38.2	33.2	33.1	37.4
W16	431951	265397	Roadside	92	92.3	27.8	26.3	22.2	21.4	24.1
W17	428704	265236	Kerbside	100	100.0	26.1	25.3	20.1	18.3	22.4
W18	428735	265362	Roadside	100	100.0	23.9	22.8	17.7	17.3	20.7

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
W19	427937	264586	Roadside	92	89.8	27.3	27.3	20.4	24.4	26.1
W23	429078	271207	Roadside	100	100.0	27.2	25.6	18.1	19.7	22.6
W24	428974	271402	Roadside	100	100.0	25.3	22.8	19.6	19.2	21.7
W25	428707	272556	Roadside	100	100.0	22.8	25.4	19.6	21.7	23.8
W26	428733	272578	Roadside	83	84.6	23.6	21.4	18.1	16.4	18.0
W27	428750	272612	Kerbside	92	92.3	21.0	18.1	15.4	14.3	14.8
W28	428652	272524	Roadside	83	82.7	31.8	29.3	22.9	23.8	25.3
W30	428714	271769	Roadside	100	100.0	22.6	20.9	16.2	15.3	18.4
W31	428816	271618	Kerbside	100	100.0	32.0	28.4	22.5	20.0	24.7
W32	428906	271497	Roadside	100	100.0	32.4	28.8	23.1	21.6	24.6
W33, W34, W35	428263	264877	Roadside	97	100.0	37.4	34.5	27.7	26.7	31.5
W36	428391	264966	Roadside	92	92.9	**40.3**	37.7	28.8	28.0	30.9
W37	428132	264799	Roadside	92	90.4	33.6	31.3	25.4	25.9	28.7
W38	427959	264624	Kerbside	100	100.0	31.8	30.7	25.4	20.1	26.1

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
W39	427910	264541	Roadside	100	100.0	24.6	23.2	19.4	19.7	21.5
W40	427992	264695	Kerbside	100	100.0	36.9	35.7	27.3	26.4	30.0
W41	427905	264682	Roadside	92	89.8	23.2	21.3	26.0	16.2	19.1
W42	427938	264947	Roadside	100	100.0	28.3	28.3	21.1	21.1	22.2
W43	428026	265158	Roadside	100	100.0	38.5	**40.9**	30.1	31.0	33.1
W44	427930	265200	Roadside	100	100.0	28.0	25.3	20.7	19.9	23.5
W45	427867	265275	Roadside	100	100.0	25.9	25.2	19.9	19.3	21.9
W46	428240	265088	Roadside	92	92.3	30.6	27.9	23.5	23.6	26.5
W48	428522	265039	Roadside	100	100.0	32.9	30.5	22.7	23.2	26.1
W49	428501	264967	Roadside	100	100.0	21.3	20.1	15.4	15.7	17.5
W50	428600	264983	Roadside	83	82.7	25.4	24.5	19.9	19.0	23.4
W51	428270	264982	Urban Background	100	100.0	16.2	15.6	11.7	11.4	13.4
W52	428710	265165	Kerbside	100	100.0	37.4	32.5	29.0	31.6	35.8
W53	428715	265202	Roadside	83	82.1	37.4	34.7	28.5	27.6	32.5

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
W54	428715	265285	Roadside	100	100.0	29.4	28.9	23.0	21.8	25.2
W55	428710	265341	Roadside	100	100.0	27.5	24.9	21.1	18.6	22.4
W56	428619	265113	Roadside	100	100.0	19.1	20.3	15.9	15.2	16.9
W57	428748	265166	Roadside	100	100.0	28.5	26.0	21.9	20.2	24.4
W58	429514	265469	Roadside	100	100.0	26.9	26.6	21.7	19.8	23.0
W59	429501	265494	Roadside	100	100.0	32.0	30.6	27.1	25.1	29.6
W60	430015	265718	Roadside	83	82.1	26.5	25.4	22.5	20.7	23.9
W61	429974	265733	Roadside	100	100.0	24.8	25.1	20.0	19.4	22.1
W62	428608	265042	Roadside	100	100.0	39.3	37.9	31.4	30.2	34.4
W67	428477	264939	Roadside	92	92.3	**42.2**	39.4	31.6	32.0	37.1
W69	428513	264921	Roadside	100	100.0	39.9	35.7	25.8	28.0	30.6
W70	428554	264870	Roadside	100	100.0	29.4	25.6	20.0	20.9	22.3
W71	428599	264857	Roadside	92	92.0	33.4	32.4	24.4	24.1	29.0
W72	431464	265903	Roadside	100	100.0	31.2	29.1	24.1	23.2	26.1

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
W73	431480	265878	Roadside	75	72.8	27.5	27.4	22.3	21.0	23.1

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

☒ **Diffusion tube data has been bias adjusted.**

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

Notes:

The annual mean concentrations are presented as µg/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: Leamington Spa

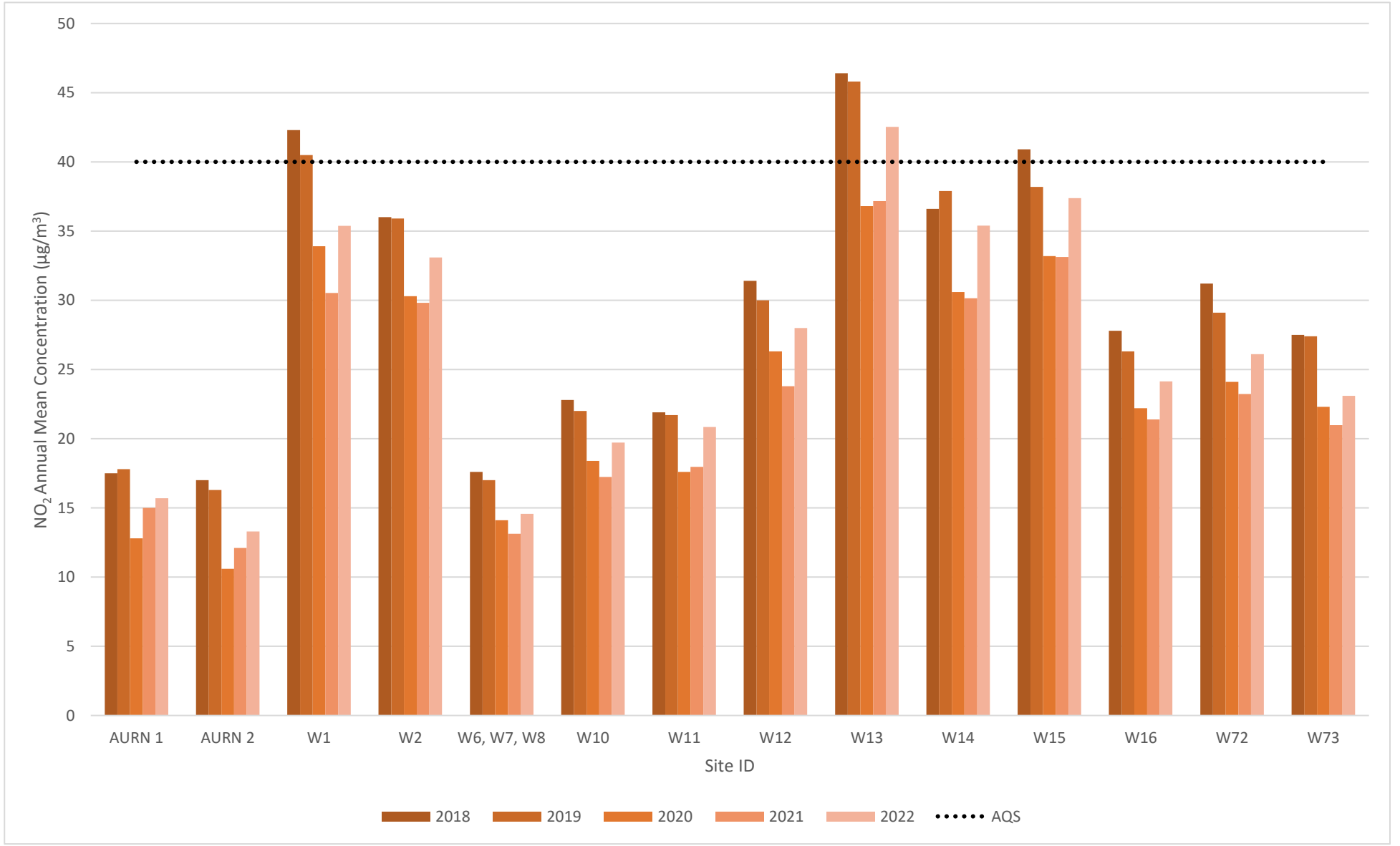


Figure A.2 – Trends in Annual Mean NO2 Concentrations: Warwick

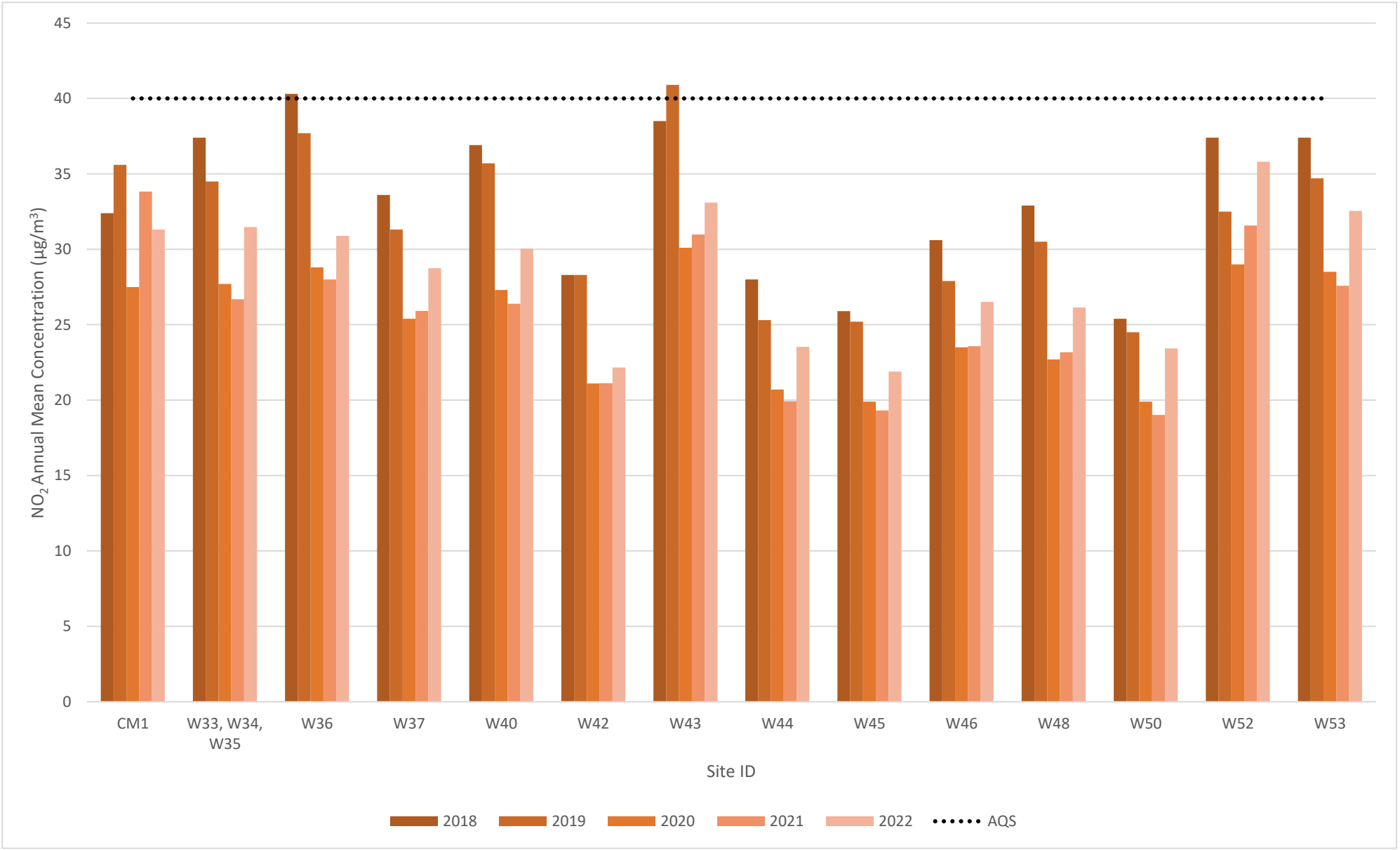


Figure A.3 – Trends in Annual Mean NO_2 Concentrations: Outside Warwick AQMAs

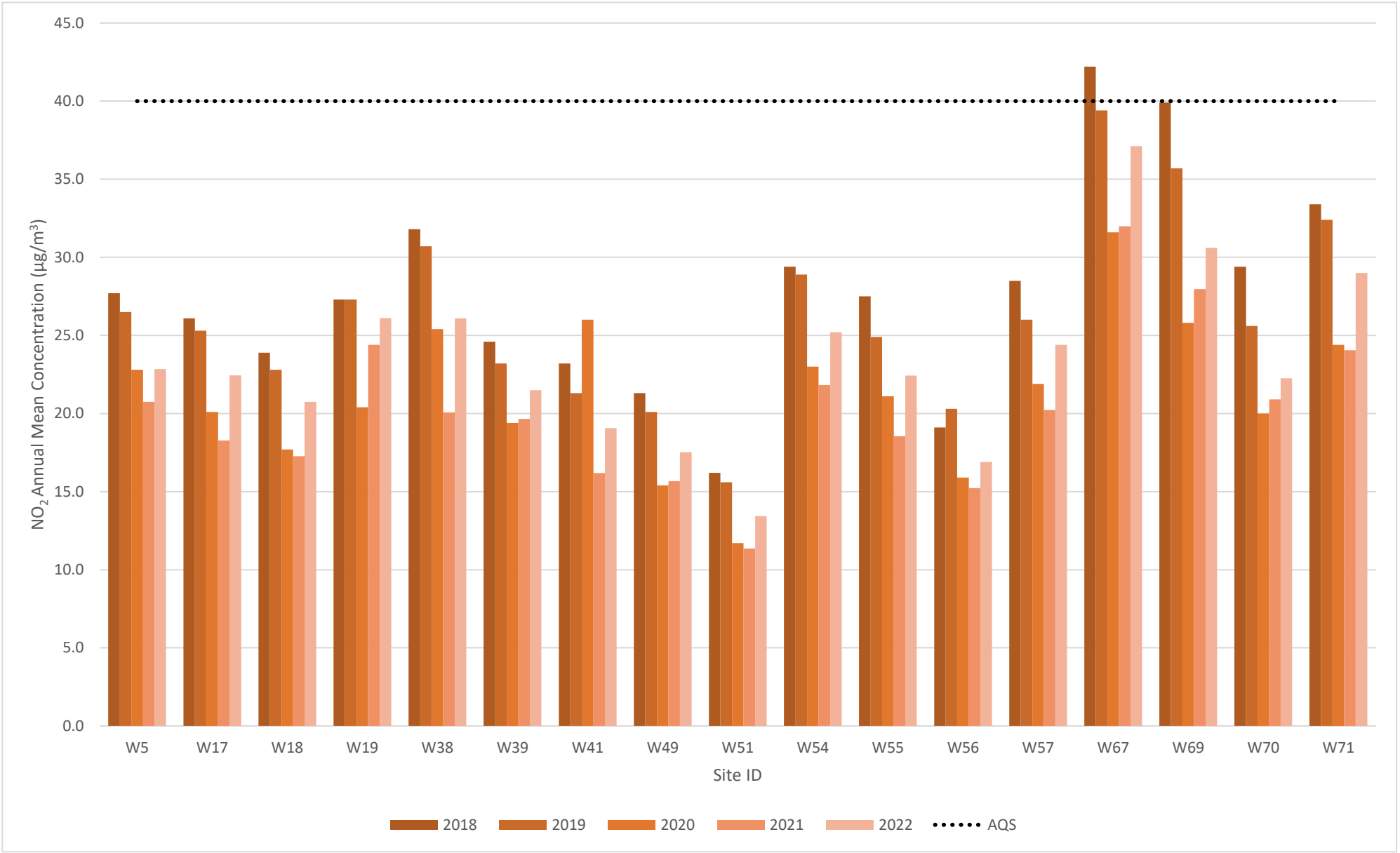


Figure A.4 – Trends in Annual Mean NO_2 Concentrations: Kenilworth and Stoneleigh

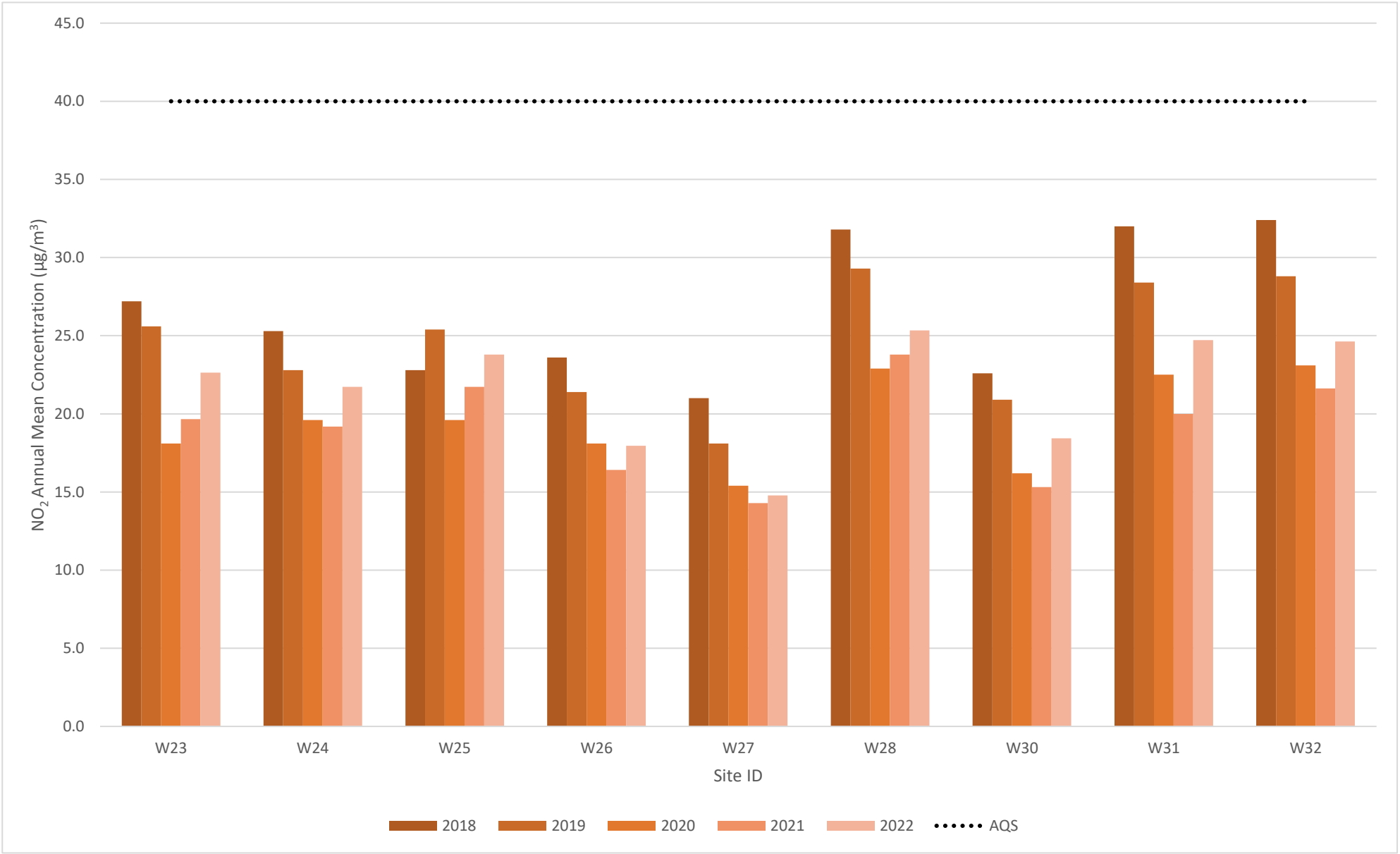


Figure A.5 – Trends in Annual Mean NO_2 Concentrations: Emscote

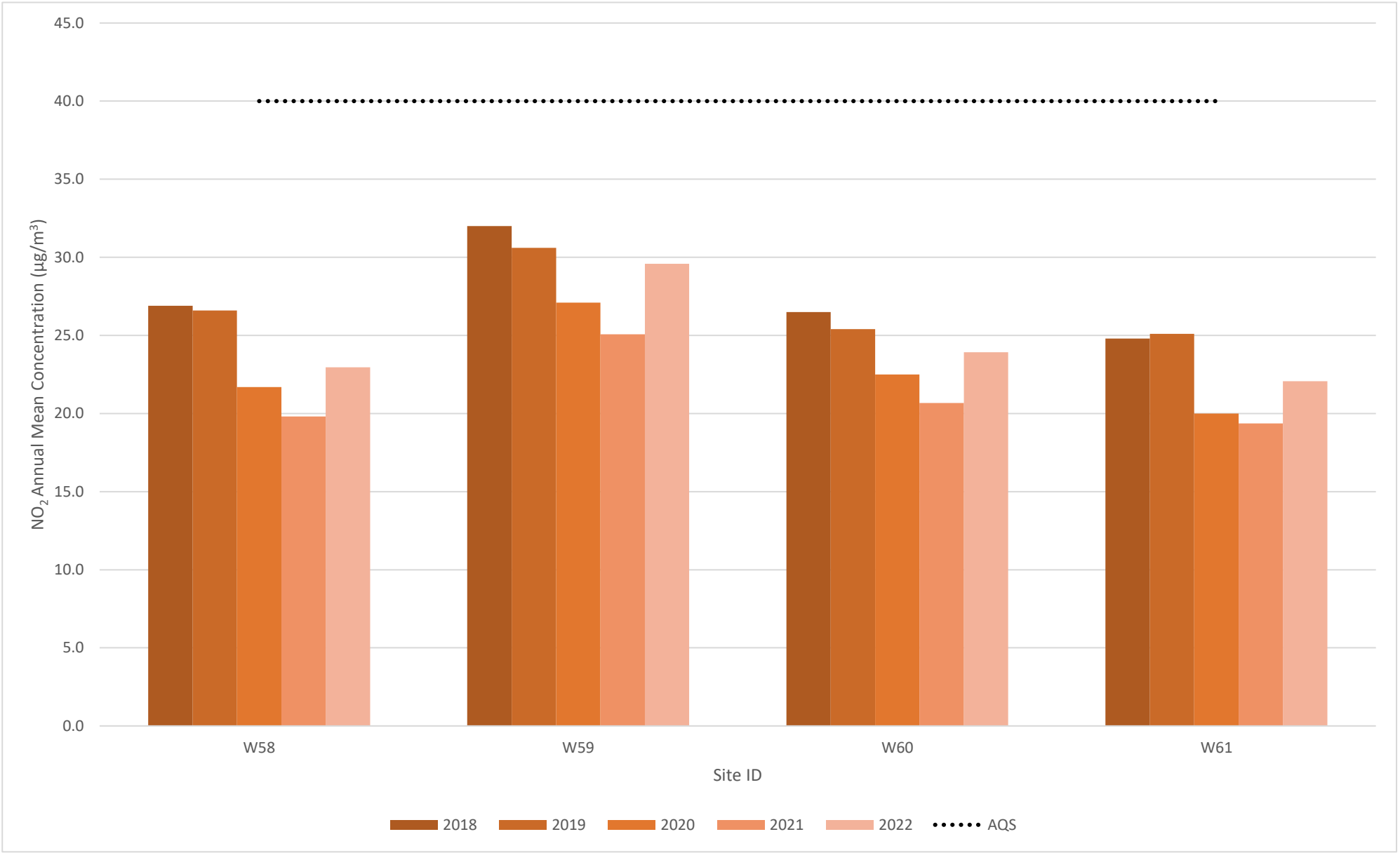


Table A.5 – 1-Hour Mean NO_2 Monitoring Results, Number of 1-Hour Means > 200µg/m^3

Site 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
AURN1	431943	265730	Urban Background	95	95	0	0	0	0	0
AURN2	431271	266404	Roadside	99	99	0	0	0	0	0
CM1	428263	264877	Roadside	99	99	0	25	1	0	0

Notes:

Results are presented as the number of 1-hour periods where concentrations greater than 200µg/m^3 have been recorded.

Exceedances of the NO_2 1-hour mean objective (200µg/m^3 not to be exceeded more than 18 times/year) are shown in **bold**.

If the period of valid data is less than 85%, the 99.8th percentile of 1-hour means is provided in brackets.

(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%).

Table A.6 – Annual Mean PM_{10} Monitoring Results (µg/m^3)

Site 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
AURN1	431943	265730	Urban Background	99	99	14	13.4	11	11.2	12.8
AURN2	431271	266404	Roadside	99	99	13.9	14.4	11.5	10.3	11.3

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

Notes:

The annual mean concentrations are presented as µg/m^3.

Exceedances of the PM_{10} annual mean objective of 40µg/m^3 are shown in **bold**.

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.

(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.2 – Trends in Annual Mean PM_{10} Concentrations

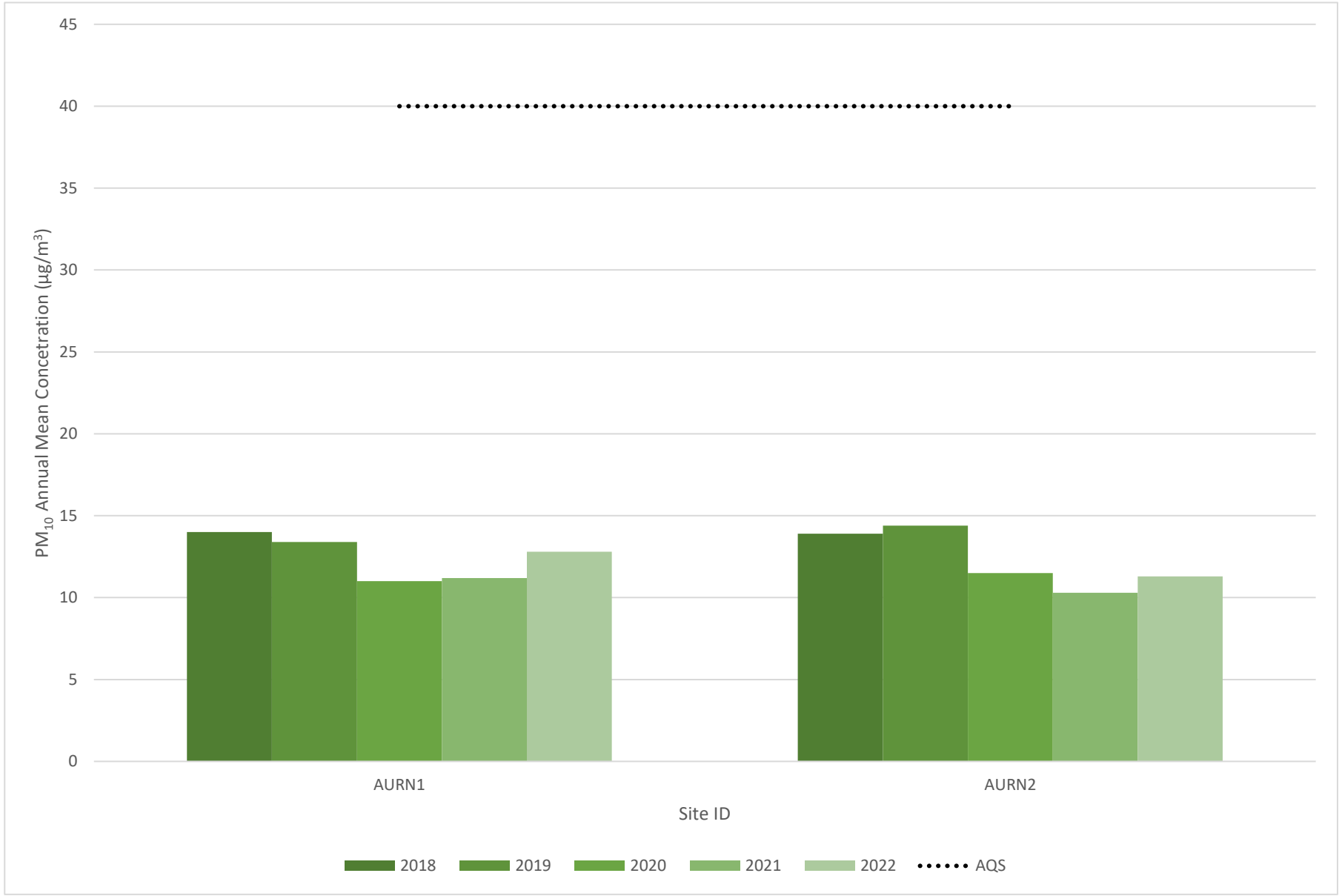


Table A.7 – 24-Hour Mean PM_{10} Monitoring Results, Number of PM_{10} 24-Hour Means > 50µg/m^3

Site 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
AURN1	431943	265730	Urban Background	100	100	1	3	0	0	0
AURN2	431271	266404	Roadside	100	100	1 (23.6)	4	0	0	0

Notes:

Results are presented as the number of 24-hour periods where daily mean concentrations greater than 50µg/m^3 have been recorded.

Exceedances of the PM_{10} 24-hour mean objective (50µg/m^3 not to be exceeded more than 35 times/year) are shown in **bold**.

If the period of valid data is less than 85%, the 90.4th percentile of 24-hour means is provided in brackets.

(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%).

Table A.8 – Annual Mean $PM_{2.5}$ Monitoring Results (µg/m^3)

Site 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
AURN1	431943	265730	Urban Background	99	99	9.8	9.2	6.5	7.4	7.6
AURN2	431271	266404	Roadside	99	99	12	9.8	6.9	6.7	7.3

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

Notes:

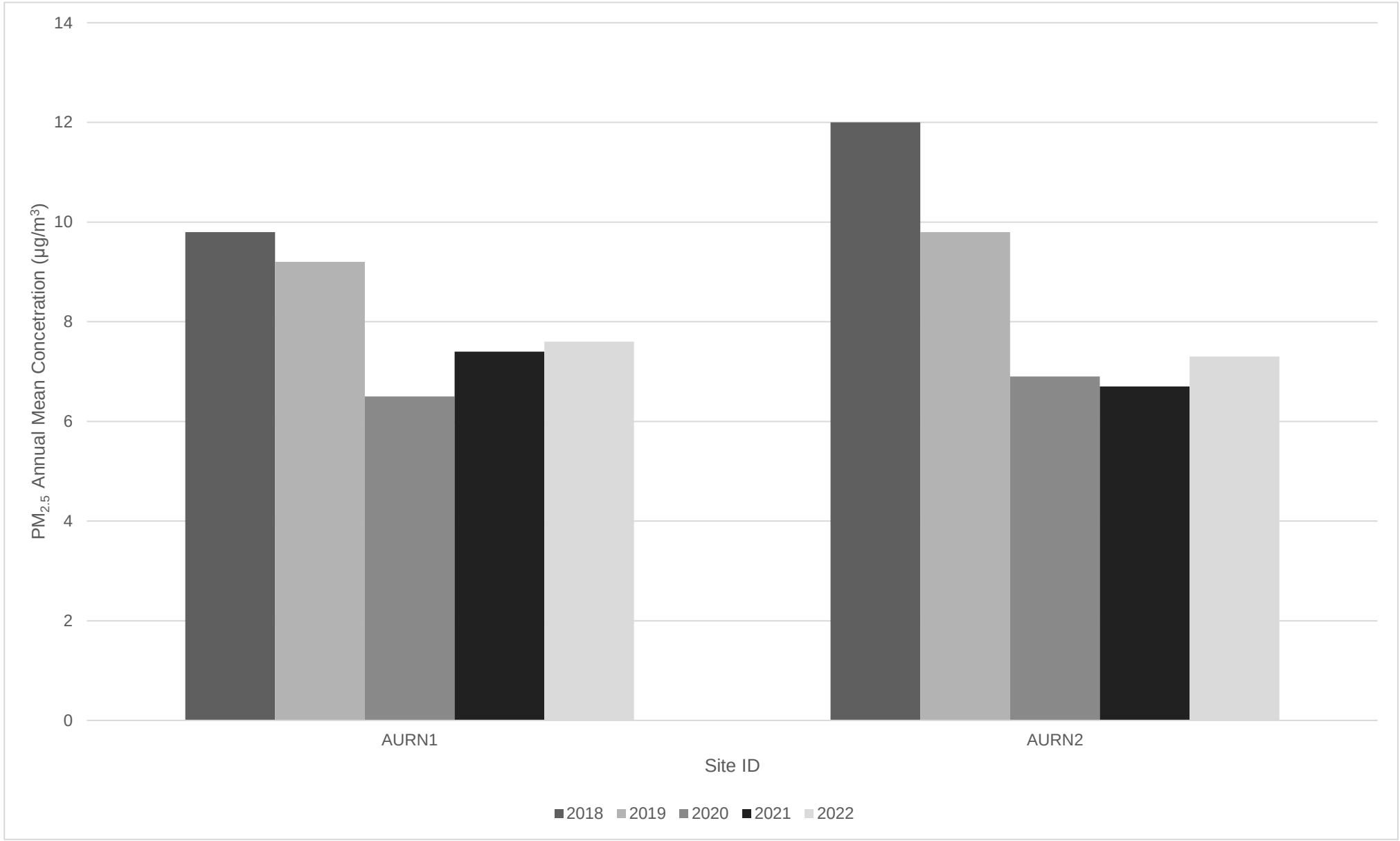
The annual mean concentrations are presented as µg/m^3.

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.

(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.3 – Trends in Annual Mean $PM_{2.5}$ Concentrations



Appendix B: Full Monthly Diffusion Tube Results for 2022

Table B.1 – NO2 2022 Diffusion Tube Results (µg/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 <(x.x)>	Annual Mean: Distance Corrected to Nearest Exposure	Comment
W1	431978	265280	54.4	43.8	38.5	26.7	30.4	33.4	32.5	31.7	37.4	37.2	41.3	25.7	36.1	35.4	-	
W2	432075	265234	47.8	34.6	30.1	26.6	28.2	31.3	33.1	33.4	37.8	34.8	34.0	33.3	33.8	33.1	-	
W5	427615	264563	34.3	19.3	22.3	19.9	17.4	21.0	20.7	24.2	23.9	21.7	23.1	31.8	23.3	22.8	-	
W6	431943	265730	25.4	16.0	16.7	12.7	11.0	8.7	10.2	11.4	14.2	16.5	18.5	18.7	-	-	-	Triplicate Site with W6, W7 and W8 - Annual data provided for W8 only
W7	431943	265730	25.5	15.6	16.9	10.5	9.8	9.6	10.0	11.1	14.8	16.1	19.2	18.7	-	-	-	Triplicate Site with W6, W7 and W8 - Annual data provided for W8 only
W8	431943	265730	24.7	17.2	16.6	10.5	9.6	9.8	10.3	11.5	15.1	16.5	18.3	17.4	14.9	14.6	-	Triplicate Site with W6, W7 and W8 - Annual data provided for W8 only
W10	432560	265254	33.3	19.0	22.4	16.6	14.6	15.8	14.5	16.6	18.4	20.2	23.5	26.5	20.1	19.7	-	
W11	432051	265060	30.8		25.2	19.7	14.1	15.6	17.6	20.5	25.7	19.6	21.8	23.3	21.3	20.8	-	
W12	431866	265371	43.4	31.1	32.3	23.3	20.9	21.2	21.5	25.7	27.8	29.2	34.1	32.2	28.6	28.0	-	
W13	431900	265189	56.3	46.3	46.9	33.8	33.8	44.8	41.7	43.7	44.2	40.4	48.6	40.0	43.4	**42.5**	-	
W14	431862	265169	50.3	40.0	31.5	28.3	31.4	35.4	37.3	37.5	38.3	32.2	36.5	34.6	36.1	35.4	-	
W15	431849	265193	48.8		41.6	33.0	32.2	35.1	35.7	37.2	36.6	37.0	41.5	40.8	38.1	37.4	33.2	
W16	431951	265397	37.4		24.6	18.6	19.2	19.2	21.9	24.8	23.3	23.6	27.5	30.7	24.6	24.1	-	
W17	428704	265236	31.0	20.5	29.0	22.0	14.1	17.9	20.8	23.3	24.9	20.0	24.6	26.5	22.9	22.4	-	
W18	428735	265362	27.9	14.7	32.0	19.0	13.8	16.3	17.9	20.9	21.9	19.3	22.1	28.1	21.2	20.7	-	
W19	427937	264586	35.6	23.1	22.5	21.2	< 1.5	44.2	23.2	21.3	23.0	23.7	25.7	29.4	26.6	26.1	-	
W23	429078	271207	35.3	21.3	27.8	17.5	16.5	19.1	18.0	20.3	22.0	22.6	25.8	30.8	23.1	22.6	-	
W24	428974	271402	33.6	18.0	23.4	18.0	16.3	18.3	18.2	21.4	23.7	21.2	25.1	28.7	22.2	21.7	-	

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 <(x.x)>	Annual Mean: Distance Corrected to Nearest Exposure	Comment
W25	428707	272556	37.4	21.8	31.5	19.5	17.5	5.6	21.3	25.3	26.8	19.9	29.2	35.4	24.3	23.8	-	
W26	428733	272578			19.9	13.5	13.3	16.6	15.8	17.1	18.4	19.1	24.8	24.6	18.3	18.0	-	
W27	428750	272612		16.9	16.3	12.0	11.0	11.2	11.7	14.5	15.8	14.9	18.6	23.0	15.1	14.8	-	
W28	428652	272524	35.6	24.9			19.8	22.7	22.2	27.8	28.5	25.9	29.0	22.0	25.8	25.3	-	
W30	428714	271769	28.5	16.9	20.0	13.0	13.5	15.5	16.6	16.0	18.2	18.7	23.3	25.5	18.8	18.4	-	
W31	428816	271618	33.9	23.1	26.1	19.5	18.9	22.3	24.3	23.5	25.8	26.1	27.8	31.3	25.2	24.7	-	
W32	428906	271497	31.3	18.1	30.9	24.2	18.7	18.8	23.8	29.2	30.2	21.8	25.2	29.3	25.1	24.6	-	
W33	428263	264877	44.6	27.7	38.8	24.1	25.2	21.3	26.5	28.9	28.8	33.3	38.1	33.9	-	-	-	Triplicate Site with W33, W34 and W35 - Annual data provided for W35 only
W34	428263	264877	39.1	32.6		30.3	26.7	28.0	27.5	32.1	31.5	35.7	37.4	38.6	-	-	-	Triplicate Site with W33, W34 and W35 - Annual data provided for W35 only
W35	428263	264877	40.3	29.2		25.5	25.5	30.3	27.2	28.9	29.1		38.0	38.9	32.1	31.5	-	Triplicate Site with W33, W34 and W35 - Annual data provided for W35 only
W36	428391	264966	41.7	27.7	44.6	28.7	21.8		25.9	28.0	30.4	28.1	36.2	33.4	31.5	30.9	-	
W37	428132	264799	39.4	26.7	33.2		24.5	25.3	25.0	30.8	30.8	25.7	27.1	34.0	29.3	28.7	-	
W38	427959	264624	35.5	23.5	25.2	26.4	22.6	24.8	25.6	27.4	29.5	23.0	25.1	30.8	26.6	26.1	-	
W39	427910	264541	31.9	19.3	24.0	19.5	16.0	18.1	20.7	21.3	23.7	19.1	21.2	28.2	21.9	21.5	-	
W40	427992	264695	39.4	29.5	28.5	25.5	26.8	28.4	31.4	28.7	30.1	30.2	34.5	34.7	30.6	30.0	-	
W41	427905	264682	29.5	17.4	25.8	14.6		13.5	15.3	17.8	19.1	15.6	18.5	26.8	19.4	19.1	-	
W42	427938	264947	23.6	17.4	32.7	20.1	17.5	19.5	22.4	22.4	25.2	22.0	24.2	24.3	22.6	22.2	-	
W43	428026	265158	41.2	24.6	42.9	31.5	28.0	33.8	39.1	38.6	32.7	31.7	34.2	26.7	33.8	33.1	-	
W44	427930	265200	32.6	21.7	30.9	18.4	18.4	20.5	21.3	22.2	24.7	23.1	25.8	28.4	24.0	23.5	-	
W45	427867	265275	29.8	18.6	28.7	18.4	14.7	17.9	19.0	21.6	21.6	23.5	25.0	29.2	22.3	21.9	-	
W46	428240	265088	37.6		32.6	23.2	18.4	22.5	23.7	28.7	30.2	26.9	27.2	26.4	27.0	26.5	-	

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 <(x.x)>	Annual Mean: Distance Corrected to Nearest Exposure	Comment
W48	428522	265039	41.9	26.7	29.3	22.4	16.0	22.6	20.8	22.8	25.5	27.9	29.1	34.9	26.7	26.1	-	
W49	428501	264967	27.6	16.6	21.0	15.5	11.0	13.8	14.7	16.1	17.9	18.1	20.8	21.5	17.9	17.5	-	
W50	428600	264983	27.6	21.4	30.9	23.6			18.5	22.2	22.4	20.2	24.0	28.1	23.9	23.4	-	
W51	428270	264982	22.5	10.7	17.4	11.0	8.8	9.3	11.3	13.0	14.2	12.2	14.1	19.8	13.7	13.4	-	
W52	428710	265165	43.4	26.8	46.1	37.4	28.6	34.8	36.2	43.7	38.3	34.2	35.0	33.8	36.5	35.8	-	
W53	428715	265202	40.7	24.1	42.1	33.3	25.2	29.4	30.2	38.4	35.8			32.8	33.2	32.5	-	
W54	428715	265285	35.4	21.9	31.9	24.6	18.0	21.8	21.6	23.6	24.8	23.4	30.2	31.3	25.7	25.2	-	
W55	428710	265341	31.1	16.4	29.3	20.0	16.9	19.8	20.7	22.3	24.2	21.6	24.1	28.1	22.9	22.4	-	
W56	428619	265113	28.0	14.6	22.3	14.2	11.9	12.2	13.5	17.4	18.3	16.6	18.9	18.8	17.2	16.9	-	
W57	428748	265166	32.3	24.1	30.9	22.0	17.8	20.8	23.4	26.3	25.8	21.7	26.5	27.0	24.9	24.4	-	
W58	429514	265469	35.3	23.4	31.1	17.7	15.8	18.1	18.4	19.8	22.7	22.6	26.9	29.3	23.4	23.0	-	
W59	429501	265494	44.1	28.5	27.0	22.3	24.6	27.9	29.4	27.6	29.4	30.7	33.6	37.1	30.2	29.6	-	
W60	430015	265718	33.8	21.3	27.5	22.0	17.0	18.9	22.5	27.9	27.3			25.8	24.4	23.9	-	
W61	429974	265733	33.5	18.6	24.7	16.9	17.0	19.5	20.8	22.6	23.3	23.7	24.5	25.0	22.5	22.1	-	
W62	428608	265042	27.6	32.9	35.6	32.4	28.7	32.6	34.3	38.3	37.8	30.1	48.8	42.4	35.1	34.4	-	
W67	428477	264939	42.2		38.8	40.4	29.3	32.9	36.9	43.7	36.1	36.4	37.0	42.7	37.9	37.1	35.0	
W69	428513	264921	42.8	26.3	35.4	33.8	28.1	29.4	30.6	36.3	33.2	28.3	29.9	20.5	31.2	30.6	-	
W70	428554	264870	30.7	18.9	29.5	24.9	16.8	16.3	22.2	29.0	27.5	13.2	19.1	24.3	22.7	22.3	-	
W71	428599	264857	34.9	23.4	37.7	30.5	23.5	26.7	26.6	34.9	33.9	25.3		27.9	29.6	29.0	-	
W72	431464	265903	39.6	27.6	27.7	22.6	20.0	23.7	25.2	24.8	28.9	25.7	26.6	27.1	26.6	26.1	-	
W73	431480	265878	26.7	19.1	30.7	22.5	17.5	20.2	20.2	25.7	29.4				23.6	23.1	-	

☒ **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.**

☒ **Warwick 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 Warwick District Council During 2023

Warwick District Council has not identified any new sources relating to air quality within the reporting year of 2022.

Additional Air Quality Works Undertaken by Warwick District Council During 2022

- Carrying out campaigns for Clean Air Day 2022. Warwick District Council has been working with local action groups Clean Air for Leamington and Warwick and Clean Air (now Clean Air Warwickshire) with emphasis on vehicle idling and educating schools.
- The "Choose How You Move" App has gained considerable traction, supported by a number of high-profile local companies that are advocating sustainable travel. Among these supporters are the Everyone Active Leisure Centres and the Stagecoach bus company, with ongoing discussions involving Chiltern Railways. The team is also liaising with Clean Air Warwickshire and colleagues within C&HP, with particular focus on Clean Air Day. An online competition has been launched, which aligns with the anticipation of the Commonwealth Games. This competition not only encourages sustainable travel to the Games but also promotes the overall goal of the app. Looking ahead, when the current contract concludes post the Commonwealth Games, there's an aspiration to re-procure and expand the app's reach, incorporating the Stratford-on-Avon District Council (SDC), thereby covering all of South Warwickshire.
- On the front of Electric Vehicle Infrastructure Strategy, collaboration is ongoing with Cenex to develop a comprehensive South Warwickshire EV Infrastructure Strategy. The aim is to secure approval from both Warwick District Council (WDC) & SDC Cabinets in July. The team is maintaining close contact with Warwickshire County

Council (WCC) to ensure the strategic work aligns with their plans. Post the anticipated strategy approval, a South Warwickshire Working Group has been established to drive progress on the initiative.

- Abbey Fields Cycle Path project, collaborative work is ongoing with WCC and Kenilworth Town Council. The aim is to generate a refined Cabinet report that examines the pros and cons of a shared and segregated cycle path across the Park.
- Improved Cycle Parking initiative in Leamington, the project has a confirmed date of July for the new cycle parking installations within the Chandos Street Car Park. The team is also finalising the installation date for a few sites within Victoria Park, intending to complete these improvements before the commencement of the Commonwealth Games. This advancement is expected to further promote cycling as a sustainable and convenient means of transport within the area.

QA/QC of Diffusion Tube Monitoring

The diffusion tubes for the year 2022 were supplied and analysed by Staffordshire Scientific Services (SSS), the tubes were prepared using the 20% Triethanolamine (TEA) in water preparation method. All results have been bias adjusted and annualised where required before being presented in Table A.4.

Staffordshire Scientific Services participates in the AIR-PT scheme which is an independent analytical proficiency-testing (PT) scheme, operated by LGC Standards and supported by the Health and Safety Laboratory (HSL).

Defra and the Devolved Administrations advise that diffusion tubes used for Local Air Quality Management should be obtained from laboratories that have demonstrated satisfactory performance in the AIR-PT scheme. Laboratory performance in AIR-PT is also assessed, by the National Physical Laboratory (NPL), alongside laboratory data from the monthly NPL Field Intercomparison Exercise carried out at Marylebone Road, central London. A laboratory is assessed and given a ‘z’ score. A score of 2 or less indicates satisfactory laboratory performance.

In the 2022 AIR-PT results, AIR-PT AR036 (January to February 2020), SSS scored 100%. The percentage score reflects the results deemed to be satisfactory based upon the z-score of < ±2.

Additionally, the precision of the NO_2 diffusion tubes supplied by SSS has been classified as 'good' for all observations during 2021. This precision reflects the laboratory's performance and consistency in preparing and analysing the tubes, as well as the subsequent handling of the tubes in the field. Precision summary results are available from the LAQM website.

Diffusion Tube Annualisation

Annualisation was not required for any non-automatic monitoring sites. Annualisation was not required because data capture was greater than 75%.

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.

Warwick District Council have applied a local bias adjustment factor of 0.98 to the 2022 monitoring data. A summary of bias adjustment factors used by Warwick District Council over the past five years is presented in Table C..

Table C.1 – Bias Adjustment Factor

Monitoring Year	Local or National	If National, Version of National Spreadsheet	Adjustment Factor
2022	Local	-	0.98
2021	National	03/22	0.86
2020	Local	-	0.97
2019	Local and National – both factors had the same value	06/20	0.93
2018	Local	-	0.88

Table C.2 – Local Bias Adjustment Calculation

	Local Bias Adjustment Input 1	Local Bias Adjustment Input 2	Local Bias Adjustment Input 3	Local Bias Adjustment Input 4	Local Bias Adjustment Input 5
Periods used to calculate bias	11	11			
Bias Factor A	1.03 (0.93 - 1.14)	0.94 (0.83 - 1.07)			
Bias Factor B	-3% (-13% - 7%)	7% (-7% - 20%)			
Diffusion Tube Mean (µg/m^3)	15.2	31.5			
Mean CV (Precision)	4.1%	6.8%			
Automatic Mean (µg/m^3)	15.6	29.5			
Data Capture	95%	99%			
Adjusted Tube Mean (µg/m^3)	16 (14 - 17)	30 (26 - 34)			

Notes:

A combined local bias adjustment factor of 0.98 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 Warwick District Council required distance correction during 2022.

QA/QC of Automatic Monitoring

All automatic monitoring sites in Warwick, other than AURN2 Rugby Road, are calibrated by the Council's Local Site Operator (LSO) – AURN1 Hamilton Terrace and CM1 Jury Street/Pageant House. The QA/QC of the two Leamington Spa sites (AURN1 and AURN2) is undertaken through its status as part of the AURN and therefore conforms to AURN standards (undertaken by Ricardo-Energy and Environment), whereas WeCare4Air is responsible for data management of the non-AURN site, CM1. WeCare4Air is also responsible for the servicing and call out contract for AURN1 and CM1. The service contract for AURN2 is arranged by Bureau Veritas and Defra and is provided by Enviro Technology Services

PM_{10} and $PM_{2.5}$ Monitoring Adjustment

The type of PM_{10} and $PM_{2.5}$ monitor(s) utilised within Warwick District Council do not require the application of a correction factor.

Automatic Monitoring Annualisation

All automatic monitoring locations within Warwick District Council recorded data capture of greater than 75% therefore it was not required to annualise any monitoring data. In addition, any sites with a data capture below 25% do not require annualisation.

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 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 automatic NO_2 monitoring locations within Warwick District Council required distance correction during 2022.

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

Figure D.1 – Map of Monitoring Sites: Warwick

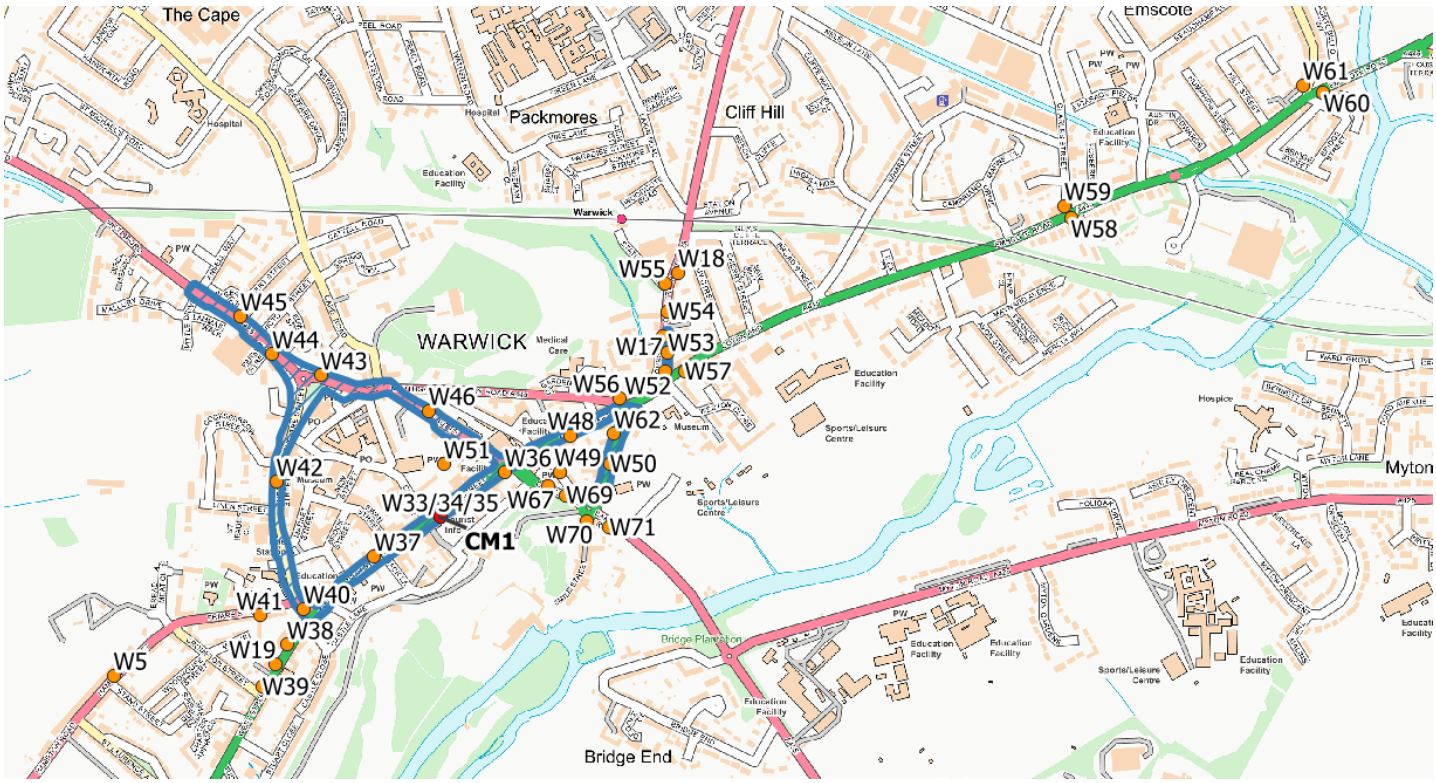
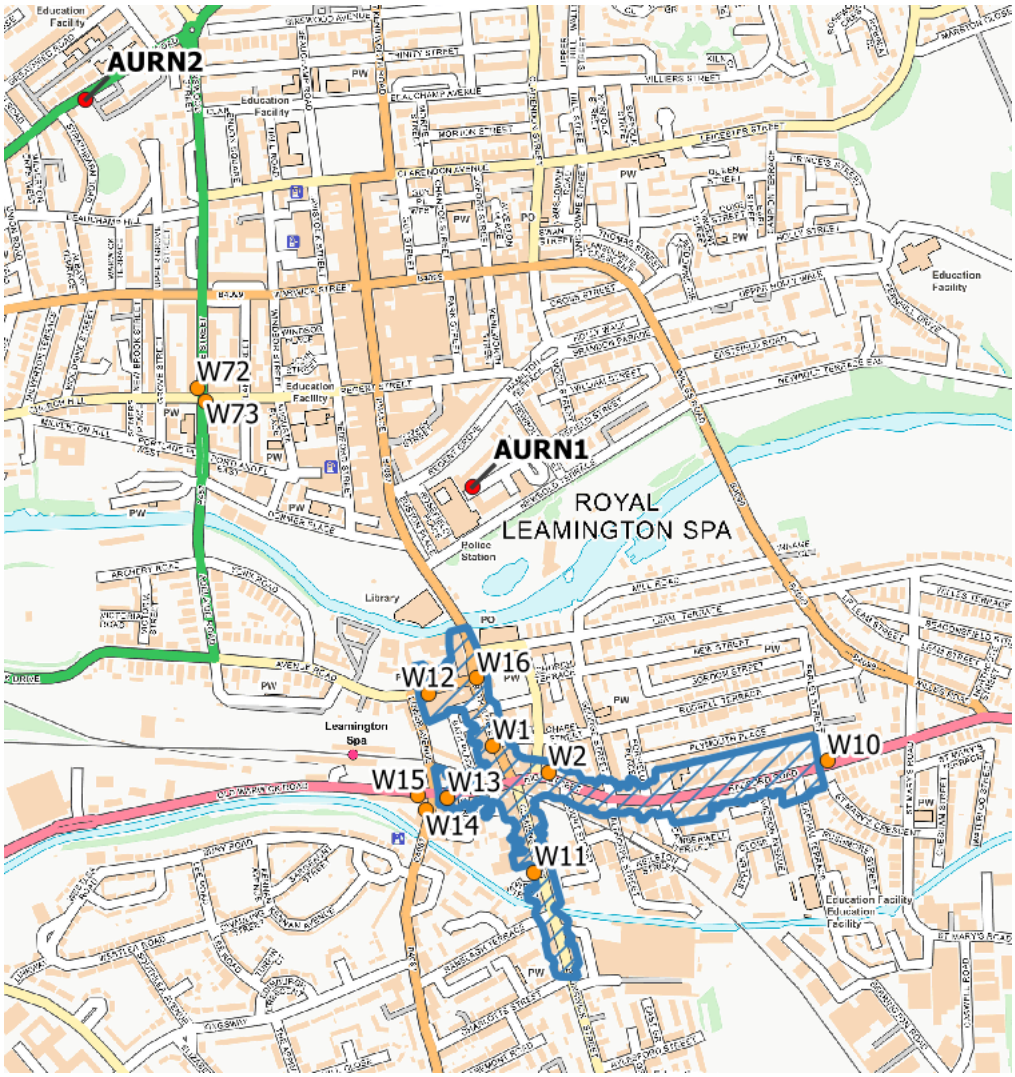


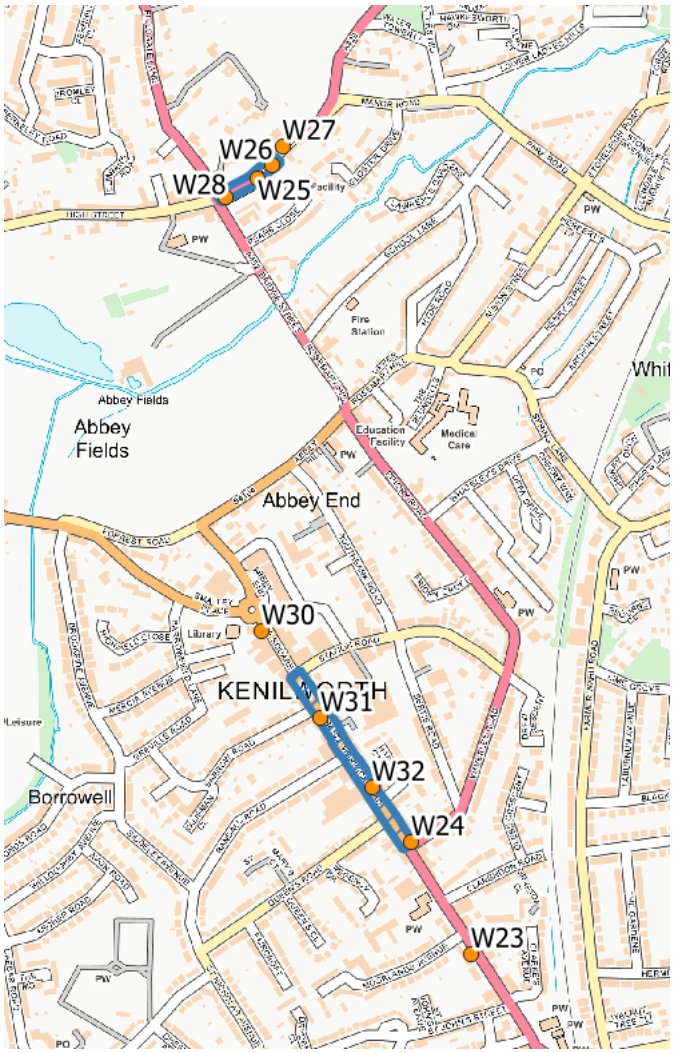
Figure D.2 – Map of Monitoring Sites: Leamington Spa Central



Legend

- Automatic Sites
- Diffusion Tubes
- Air Quality Management Areas

Figure D.3 – Map of Monitoring Sites: Kenilworth



Appendix E: Summary of Air Quality Objectives in England

Table E.1 – Air Quality Objectives in England[7]

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

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

Glossary of Terms

Abbreviation	Description
AQAP	Air Quality Action Plan - A detailed description of measures, outcomes, achievement dates and implementation methods, showing how the local authority intends to achieve air quality limit values'
AQMA	Air Quality Management Area – An area where air pollutant concentrations exceed / are likely to exceed the relevant air quality objectives. AQMAs are declared for specific pollutants and objectives
ASR	Annual Status Report
Defra	Department for Environment, Food and Rural Affairs
DMRB	Design Manual for Roads and Bridges – Air quality screening tool produced by National Highways
EU	European Union
FDMS	Filter Dynamics Measurement System
LAQM	Local Air Quality Management
NO_2	Nitrogen Dioxide
NO_x	Nitrogen Oxides
PM_{10}	Airborne particulate matter with an aerodynamic diameter of 10µm or less
$PM_{2.5}$	Airborne particulate matter with an aerodynamic diameter of 2.5µm or less
QA/QC	Quality Assurance and Quality Control
SO_2	Sulphur Dioxide

References

- Local Air Quality Management Technical Guidance LAQM.TG22. August 2022. Published by Defra in partnership with the Scottish Government, Welsh Assembly Government and Department of the Environment Northern Ireland.
- Local Air Quality Management Policy Guidance LAQM.PG22. August 2022. Published by Defra in partnership with the Scottish Government, Welsh Assembly Government and Department of the Environment Northern Ireland.