Gloucester City Council
Transforming Your City

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 Gloucester City

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].

Gloucester is a small city of approximately 150,000 inhabitants situated on the eastern bank of the River Severn, between the Cotswolds to the east and the Forest of Dean to the west.

The key pollutants of concern in Gloucester are nitrogen dioxide (NO_2) and fine particulates ($PM_{2.5}$ and PM_{10}), with road traffic emissions being the principal local emission source. There are several major roads in Gloucester, notably the A40, A417, A430 and the A38 that connect Gloucester City with the strategic highway in Gloucestershire. The M5 motorway demarcates the city's eastern border and is a major emission source.

Gloucester City Council has a network of passive diffusion tubes across the city, measuring NO_2 at 25 locations during 2022, an increase of three sites compared to 2021. Gloucester City Council does not carry out monitoring for PM_{10} or $PM_{2.5}$. Air Quality in Gloucester is generally acceptable and in 2022, there were no recorded exceedances of the UK Air Quality Objectives.

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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

Furthermore, there is a long-term trend showing a decline in concentrations of NO_2. For example, in 2022, annual mean concentrations of NO_2 were lower than those measured at the same sites in 2018, 2019 and 2021. Measured concentrations were, at some locations, lower in 2020, likely as a result of the Covid-19 pandemic and associated lockdowns. Air quality is improving across much of the UK, where road traffic is the major source of emissions, due to the replacement of older, "dirtier" vehicles with those with "cleaner" engines, including electric vehicles. As such, these results are in line with national trends.

Due to historic exceedances of the of the 40µg/m3 annual mean objective for NO_2, three Air Quality Management Areas (AQMAs) (i.e. known pollutant hotspots) have been declared in Gloucester. These are:

- Barton Street AQMA (in the city centre) declared in 2005.
- Priory Road AQMA (on the A417) also declared in 2005.
- Painswick Road AQMA (in the city centre, consisting of a section of the B4073 between the railway line and the A38) declared in 2007.

Gloucester City Council has implemented an Air Quality Action Plan (AQAP) that details the actions they are taking to reduce pollution concentrations in the AQMAs and across the district. All AQMAs have been compliant with the objectives for the last three years and as such, Gloucester City Council will be investigating whether there is sufficient evidence to revoke these AQMAs.

Actions to Improve Air Quality

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

The Environmental Improvement Plan[5] sets out actions that will drive continued improvements to air quality and to meet the new national interim and long-term $PM_{2.5}$ targets. The National Air Quality Strategy, published in April 2023, provides more information on local authorities' responsibilities to work towards these new targets and

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

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.

The aftermath of the Covid-19 pandemic has had a residual effect on air quality in Gloucester in 2022. Many businesses have re-assessed how their staff work, with increased amounts working from home and hence not driving to work. However, many environmental health staff were seconded to Covid-19 associated roles in 2022, impacting resources within environmental health.

In 2019, Gloucester City Council commissioned an update to the 2008 Air Quality Action Plan (AQAP) (last updated 2011)[7]. As part of this process a review of the current AQMAs has been completed and stakeholder workshops have been held in order to inform new measures. The draft of the revised AQAP has now been completed and has gone through Public Health and District Council consultation. There has been a delay in public consultation as Gloucester City Council had to wait for the publication of the County Council's Climate Action Plan. Public consultation on the AQAP is anticipated to take place in July 2023. The measures from the 2011 Gloucester Air Quality Action Plan are included within this document, along with the progress that has been made on implementation to date. A brief summary of core actions is as follows:

- Greater restriction and better timing of deliveries;
- Encouraging Stagecoach to buy new vehicles for bus services;
- Upgrading/retrofitting the existing bus fleet;
- Reducing illegal parking contributing to congestion;
- Introducing air quality measures into Gloucester City Council Taxi Licensing Policy;
- Improving age and euro standard of vehicles within Ubico recycling and street cleaning fleet;
- Improving Planning Application validation requirements;
- Requiring new developments to install electric charging points where possible;
- Prioritising uptake of low emission vehicles for taxis and company vehicle procurement;

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

- Encouraging residents not to burn waste;
- Promoting travel alternatives, including adding a pop-up cycle route into the city on London Road

Going forward, Gloucester City Council and Gloucester County Council aim to work closer together on air quality. This process began pre-pandemic but was halted as a result of the Covid-19 pandemic.

Conclusions and Priorities

In 2022, no exceedances of the NO_2 annual mean objective were recorded within or outside existing AQMAs. Furthermore, there has been at least three years since an exceedance of the annual mean objective, in any AQMA. There are, however, no safe levels of some pollutants and as such, Gloucester City Council is committed to minimising pollution concentrations across the city.

The following actions are considered to be key priorities for Gloucester City Council in 2023:

- Carry out detailed air quality modelling to re-assess whether any of the AQMAs could be amended or revoked. This may be undertaken as part of the AQMA review as part of the AQAP update.
- Continue to review the monitoring locations across the city, particularly in vicinity of new development and highly sensitive uses.
- Ensure the AQAP consultation process recommences and adopt the revised AQAP.

As highlighted above, Gloucester City Council expect to release an updated AQAP this year. The revised set of targeted measures, as set out in the revised AQAP, will be included within next year's ASR following the consultation process.

Gloucester City Council anticipate that these measures will further contribute to achieving compliance with the NO_2 annual mean objective within the existing AQMAs, as well as contributing to improved pollutant concentrations throughout the rest of the city.

Local Engagement and How to get Involved

The public can engage with Gloucester City Council via their website which contains further local information on the following:

- Air quality monitoring;

- Declared AQMAs;
- Government grants for workplace and domestic property electric vehicle charge points; and
- Open fires and wood burning stoves.

In addition, Gloucestershire County Council host the Think Travel website which provides further information about the sustainable travel options available across the county of Gloucestershire, such as:

- Local walking maps;
- Cycle routes;
- Public transport journey planner
- Park & Ride facilities;
- Eco driving;
- Car sharing; and
- Electric vehicles.

Local Responsibilities and Commitment

This ASR was prepared by the Community Wellbeing Health Department of Gloucester City Council with the support and agreement of the following officers and departments:

- Planning
- Licencing
- Gloucestershire County Council highways
- Harley Parfitt (External Consultant: Greenavon Air Quality Consultants)

This ASR has been approved by:

Gloucestershire County Council Director of Public Health – Siobhan Farmer

Community Wellbeing Portfolio Holder – Richard Cook

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1 Local Air Quality Management

This report provides an overview of air quality in Gloucester City 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 Gloucester City 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 Gloucester City Council can be found in Table 2.1. The table presents a description of the three AQMAs that are currently designated within Gloucester City 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

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
Painswick Road AQMA	05/10/2007	NO$_2$ Annual Mean	An area encompassing a number of properties on either side of Painswick Road, Gloucester.	No	48 µg/m3	26.3 µg/m3	>5	Gloucester AQAP 2008 (2011 Review)	https://www.gloucester.gov.uk/media/2346/gloucester-city-aqap-2011.pdf
Barton Street AQMA	08/08/2005	NO$_2$ Annual Mean	An area encompassing Barton Street, Gloucester from its junction with Trier Way/Bruton Way to the northwest and Upton Street to the southeast.	No	47 µg/m3	32.9 µg/m3	3	Gloucester AQAP 2008 (2011 Review)	https://www.gloucester.gov.uk/media/2346/gloucester-city-aqap-2011.pdf
Priory Road AQMA	08/08/2005	NO$_2$ Annual Mean	An area encompassing the junction of St Oswalds Road and Priory Road.	No	48 µg/m3	33.4 µg/m3	3	Gloucester AQAP 2008 (2011 Review)	https://www.gloucester.gov.uk/media/2346/gloucester-city-aqap-2011.pdf

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

☒ **Gloucester City Council confirm that all current AQAPs have been submitted to Defra.**

Progress and Impact of Measures to address Air Quality in Gloucester City 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.   Reference to the Public Health Outcomes Framework has been made and this practice should continue going forward.

2.   Trends have been presented with a robust comparison to the Air Quality Objectives.#

3.   QA/QC procedures are robust, with sufficient supporting evidence provided.

Reference to the Public Health Outcomes Framework has been made and Gloucester City Council the structure and QA/QC procedures of the previous report have been replicated in this report.

Gloucester City Council has taken forward a number of direct measures during the current reporting year of 2022 in pursuit of improving local air quality. Details of all measures completed, in progress or planned are set out in Table 2.2. Fifteen measures are included within Table 2.2, with the type of measure and the progress Gloucester City Council have made during the reporting year of 2022 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 Gloucester Air Quality Action Plan 2008 (2011 Review).

Gloucester City Council expects the following measures to be completed over the course of the next reporting year:

- Carry out detailed air quality modelling to re-assess whether any of the AQMAs could be amended or revoked. This may be undertaken as part of the AQMA review as part of the AQAP update.
- Continue to review the monitoring locations across the city, particularly in vicinity of new development and highly sensitive uses.
- Ensure the AQAP consultation process recommences and adopt the revised AQAP.

As highlighted above, Gloucester City Council expect to release an updated AQAP in July 2023,for consultation. The revised set of targeted measures, as set out in the revised AQAP, will be included within next year's ASR following the consultation process.

Gloucester City Council worked to implement these measures in partnership with the following stakeholders during 2022:

- Gloucestershire County Council
- Gloucester City Climate change manager
- Planning

The principal challenges and barriers to implementation that Gloucester City Council anticipates facing relate to funding and resourcing pressures.

Progress on some measures has been slower due to the impact of Covid 19 and other major incidents following Covid-19. The consultation and publication of the Climate Action Plan also delayed the release of the AQAP.

Gloucester City Council anticipates that the measures stated above and in Table 2.2 will achieve compliance in Painswick Road AQMA, Barton Street AQMA and Priory Road AQMA, as well as work to minimise concentrations across the city.

Table 2.2 – Progress on Measures to Improve Air Quality

Measure No.	Measure	Category	Classification	Year Measure Introduced in AQAP	Estimated / Actual Completion Date	Organisations Involved	Funding Source	Defra AQ Grant Funding	Funding Status	Estimated Cost of Measure	Measure Status	Reduction in Pollutant / Emission from Measure	Key Performance Indicator	Progress to Date	Comments / Barriers to Implementation
1	Schools Initiatives	Promoting Travel Alternatives	School Travel Plans	2023	ongoing	County Council supported by City Council	County council	No	Funded	< £10k	ongoing	Minor	Diffusion tube data	3 schools monitored at present	GCC's active travel work with Schools - Gloucestershire County Council (thinktravel.info)
2	Local Walking and cycling infrastructure	Promoting Travel Alternatives	Other	2023	ongoing	County Council supported by City Council	County Council grant from DfT	No	Funded	< £10k	Ongoing	Minor		London Road Cycle route	The production of a plan to present all routes within the city suitable for cycling and walking. Infrastructure upgrades could also be developed following the completion of the plan. Needs to be a holistic plan
														Council announces further details of green travel plans - Gloucestershire County Council	
3	Improvements/Control of the signals	Traffic Management	UTC, Congestion management, traffic reduction	2017	-	Gloucestershire County Council	Gloucestershire County Council	No	Not Funded	< £10k	Planning	< 0.2µg/m3	N/A	No planned improvements for the foreseeable future.	
4	Greater restriction and better timing of deliveries	Freight and Delivery Management	Route Management Plans/ Strategic routing strategy for HGV's	2011	On-going	Gloucestershire County Council	No additional funding required	No	Funded	< £10k	Implementation	< 0.2µg/m3	Number of HGVs on named roads	banned from 8 Currently deliveries are - 9am and 5-6pm	

Measure No.	Measure	Category	Classification	Year Measure Introduced in AQAP	Estimated / Actual Completion Date	Organisations Involved	Funding Source	Defra AQ Grant Funding	Funding Status	Estimated Cost of Measure	Measure Status	Reduction in Pollutant / Emission from Measure	Key Performance Indicator	Progress to Date	Comments / Barriers to Implementation
5	Travel planning / Behavioural Change Campaigns	Promoting Travel Alternatives	Intensive active travel campaign & infrastructure		On-going	County Council supported by City Council	Gloucestershire County Council	No	Funded	< £10k	Planning	Minor			
6	Low Emission Fleet	Promoting Low Emission Transport	Company Vehicle Procurement – Prioritising uptake of low emission vehicles as pool cars	2019	Ongoing	Gloucester City Council	Local Authority, Funding: Defra Air Quality Grant	No	Funded		Implementation	Reduced vehicle emissions	Diffusion tube data	Implementation going - on-	Low Emission Fleet
7	Reduce illegal parking	Traffic Management	UTC, Congestion management, traffic reduction	2011	On-going	Gloucestershire County Council	No additional funding required	No	Funded	< £10k	Implementation	< 0.2µg/m3	Reduction in illegal parking and less parking on city centre roads.	Controlled zones established and Civil Enforcement Officer's in place to enforce zones.	
8	Introduce air quality measures into Gloucester City Council Taxi Licensing Policy	Promoting Low Emission Transport	Taxi Licensing conditions	2018	Completed	Gloucestershire County Council	funding required No additional	No	Funded	< £10k	Completed	Reduced vehicle emissions	Improvement in age and euro standard of vehicles within the taxi fleet	December 18 saw introduction of new rule book where vehicles must comply with specific condition in relation to the age and length of service, e.g. Euro 6 compliant by 2023	
9	Ubico Fleet	Promoting Low Emission Transport	Company Vehicle Procurement – Prioritising uptake of low emission vehicles	2018	2022	Gloucester City Council/ Ubico	No additional funding required	No	Funded		Implementation	Reduced vehicle emissions	Improvements in age and euro standard of vehicles within Ubico fleet	Ongoing	Changed to Ubico in April 2022 and the contract will see the procurement of new waste, recycling and street cleansing vehicles, including carbon reduction technologies

Measure No.	Measure	Category	Classification	Year Measure Introduced in AQAP	Estimated / Actual Completion Date	Organisations Involved	Funding Source	Defra AQ Grant Funding	Funding Status	Estimated Cost of Measure	Measure Status	Reduction in Pollutant / Emission from Measure	Key Performance Indicator	Progress to Date	Comments / Barriers to Implementation
10	Planning Application Validation Requirements	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	2018	On-going	Gloucester City Council	developers Building	No	Funded	< £10k	Implementation	Construction dust emissions controlled during the construction phase and NO2 controlled during the operational phase.	Increase in air quality assessments being received with the submission of applications for major developments	Liaison with Planning Department to provide criteria for air quality in relation to major developments. Applications are not validated until all information is received.	Travel Plan Guide - Gloucestershire County Council
11	Low Emission Infrastructure	Promoting Low Emission Transport	Other	2017	Ongoing	Local Authority Planning	Building developers	No	Funded		Implementation	Reduced vehicle emissions	Diffusion tube data	New developments – to install electric charging points where possible. In the JCS.	
12	Low Emission Taxis	Promoting Low Emission Transport	Taxi emission incentives	2018	Ongoing	Local taxi drivers	Taxi drivers	No			ongoing	Reduced vehicle emissions	Diffusion tube data	Currently 1 electric taxi in city. Report going to committee where euro 6 standard to be achieved by end of 2023 with the exception of wheelchair accessible vehicles.	Cost of new vehicles and lack of infrastructure
13	Scooter/cycle rental.	Promoting Travel Alternatives	Promotion of cycling	2020	Ongoing	City Council / County Council / Cheltenham Borough Council	Zwings	No	Funded		On going	Reduced vehicle emissions	Number of users	Trial of e-scooters currently being undertaken within Gloucester and Cheltenham by the firm Zwings. Liaise with county upon results of trial and feasibility to develop into a permanent travel option. Understood that trial went well and there is the possibility of transferring to a cycle scheme.	

Measure No.	Measure	Category	Classification	Year Measure Introduced in AQAP	Estimated / Actual Completion Date	Organisations Involved	Funding Source	Defra AQ Grant Funding	Funding Status	Estimated Cost of Measure	Measure Status	Reduction in Pollutant / Emission from Measure	Key Performance Indicator	Progress to Date	Comments / Barriers to Implementation
14	Improve Public awareness of Air Quality via Public messaging	Information Public	Via the Internet	2020	Ongoing	Gloucester City Council	-	No	Funded		Implementation	Visible smoke plumes. Reduction in complaints.	Smoke control zone	Encouraging residents not to burn waste. Consider expanding smoke control zone	
15	Active Travel - Cycling	Promoting Travel Alternatives	Promotion of cycling	2020	Ongoing	Gloucester City Council and Gloucestershire County Council	County Council	No	Funded		Implementation	Number of people cycling in Gloucester	Annual Reports	Adding a pop-up cycle route into the city on London Road.	

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.

A regional estimate of the fraction of mortality attributable to PM$_{2.5}$ has been estimated from work carried out by Public Health England. Public Health England estimates 5.8% of all mortality was attributable with particulate air pollution in 2021. This is greater than both the South West (5.1%) and England's average (5.5%). This information is available from Public Health England's Public Health Data webpage.

Efforts within Gloucester are being concentrated on monitoring and reducing NO$_2$ levels, with a particular focus on the established AQMAs. As particulates are also associated with road traffic, the measures implemented to reduce NO$_2$ levels within Gloucester will also reduce levels of PM$_{10}$ and PM$_{2.5}$.

Gloucester is currently prioritizing its efforts towards monitoring and decreasing NO$_2$ levels to meets the legal limits in their AQMAs. The initiatives aimed at reducing NO$_2$ levels in Gloucester will also have a positive impact on reducing the levels of PM$_{10}$ and PM$_{2.5}$ since particulate matter is also linked to road traffic through direct emissions (exhaust emissions, brake and tyre wear and road abrasion) and secondary formation.

According to the Defra background mapped data for Gloucester, based on the reference year of 2018, all the 2022 background concentrations of PM$_{2.5}$ were significantly below the annual mean AQS objective of 20μg/m^3 for PM$_{2.5}$. The highest concentration, predicted to be 10.4μg/m3, was found within a 1km x 1km grid square located south of the city centre with a centroid grid reference of 383500, 217500. It is worth noting that although this grid square slightly exceeds the UK's 2040 Air Quality Target of 10μg/m^3, on average, levels of PM$_{2.5}$ in Gloucester remain within the 2040 target.

Although predicted background PM$_{2.5}$ levels are generally below the Air Quality Objective and 2040 target value, it is noted concentrations may be higher in close proximity to emissions sources, such as roads and industry. Secondary PM$_{2.5}$, of which some would be formed in-situ through reactions associated with local NO$_X$, makes up the greatest

proportion of $PM_{2.5}$ in the city. Domestic emissions and industry and also a significant local source.

Gloucester has had a small smoke control area since the 1960's. The area includes the Cathedral, the Gaol and the County Council offices. Housing built before the area was designated is excluded from control, as it was expected that the area would be redeveloped. This has indeed taken place over the years, so that the only excluded housing today is in Priory Road, Mount Street and Pitt Street. Gloucester's smoke control order means you cannot emit smoke from a chimney unless you're burning an authorised fuel or using exempt appliances, for example burners or stoves. The aim is to prevent air pollution, particularly emissions of smoke and hence fine particulates (including $PM_{2.5}$). As such, the enforcement of the smoke control area is helping to minimise emissions of $PM_{2.5}$. The LAPPC/ Environmental Permitting regime and nuisance investigations associated with the 1990 Environmental Act are also tools that manage emissions of $PM_{2.5}$

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

This section sets out the monitoring undertaken within 2022 by Gloucester City 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

Gloucester City Council did not undertake automatic (continuous) monitoring during 2022.

3.1.2 Non-Automatic Monitoring Sites

Gloucester City Council undertook automatic (continuous) monitoring at 25 sites during 2022. Gloucester City Council stopped measuring at one location in 2022, meaning that at the beginning of 2023, there were 24 diffusion tubes in the field.

This is an increase of 3 sites in comparison to 2021, with the addition of:

- **6 The Elms Longlevens** – Done in conjunction with Gloucestershire County Council since April 2022, to measure air quality at a school.

- **Tanners Hall Gouda Way** – Started monitoring May 2022 as a result of the introduction of a new highly sensitive use near a main road.

- **Widden Primary School** - Done in conjunction with Gloucestershire County Council since April 2022, to measure air quality at a school.

Error! Reference source not found. in Appendix A shows the details of the non-automatic monitoring 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.

The [Gloucester City Council Air Quality page](#) presents all non-automatic monitoring results (including historic results) for Gloucester City Council.

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.2 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.

Data capture for five of the diffusion tubes were below 75%,therefore annualisation (short-term to long-term adjustment) has been completed in line with LAQM.TG(22) using data from background automatic monitoring stations located within 50 miles of the diffusion tube locations. The NO$_2$ results for 2021 have been bias adjusted using a national bias adjustment factor of 0.83. Full details of the annualisation, bias adjustment, and QA/QC monitoring procedures are provided in Appendix C.

Gloucester City Council have analysed the 2022 monitoring data, breaking down the analysis by AQMA, below.

- **Barton Street AQMA**

Monitored concentrations are presented in Table A.2 and Figure A.2. There are six diffusion tube locations within the Barton Street AQMA.

All measurements were below the annual mean air quality objective in 2022. The highest concentration, in 2022, was recorded at site 14 (32.9 µg/m^3). All measured annual mean concentrations have been at least 10% below the 40.0 µg/m^3 objective for at least three

years. As such, Gloucester City Council will investigate whether this AQMA could be revoked or amended.

- **Priory Road AQMA**

Monitored concentrations are presented in Table A.2 and Figure A.3. There are three diffusion tube locations within the Priory Road AQMA.

All measurements were below the annual mean air quality objective in 2022. The highest concentration, in 2022, was recorded at site 24 (33.4 µg/m^3). All measured annual mean concentrations in Priory Road AQMA have been below the 40.0 µg/m^3 objective for at least three years. However, concentrations were within 10% of the annual objective (within the uncertainty of diffusion tubes) as recently as 2021 and as such, whilst Gloucester City Council could undertake further work to investigate whether this AQMA could be amended or revoked, it is recommended to remain in force, pending further measurements.

Site 27 is located at 38 Priory Road, just outside of the Priory Road AQMA. The concentration monitored at this site during 2021 was 20.7µg/m^3. This is well below the NO$_2$ annual mean objective, providing evidence to support the current boundary of the AQMA.

Gloucester City Council will investigate whether this AQMA could be revoked or amended.

- **Painswick Road AQMA**

Monitored concentrations are presented in Table A.2 and Figure A.4.

There are three diffusion tube locations within the Painswick Road AQMA. All measurements were below the annual mean air quality objective in 2022. The highest concentration, in 2022, was recorded at site 8 (26.3 µg/m^3). All measured annual mean concentrations in Painswick Road AQMA have been at least 10% below the 40.0 µg/m^3 objective for at least five years.

As such, Gloucester City Council should investigate whether this AQMA could be revoked.

- **Diffusion Tubes Outside of Existing AQMAs**

Monitored concentrations are presented in Table A.2 and Figure A.1.

There were 13 diffusion tube monitoring sites located outside of the existing AQMAs in 2022. Sites 27, 28, 29 and 30 were added in 2021. Site 30 was removed in early 2023 and in April 2022, sites 31, 32 and 33 were added to monitor at schools and at a new block of flats. The monitors that began operating in 2022 required annualisation.

All measurements were below the annual mean air quality objective in 2022. The highest concentration at a site outside of the AQMA, in 2022, was recorded at site 20 ($25.7\mu g/m^3$).

The sites outside of the AQMAs also measure concentrations at background sites, giving a good indication of average exposure across the city. The highest background measurement in 2022 was at site 21 ($17.1\mu g/m^3$).

Due to all monitoring locations reporting concentrations below the annual mean objective, no further AQMAs need to be designated within Gloucester at the current time. Gloucester City Council will carry out further assessment to determine whether any of the local AQMAs can be revoked and/ or amended.

The annual mean NO_2 concentration was not greater than $60\mu g/m^3$ at any monitoring site and therefore, as per LAQM.TG(22) guidance, it is unlikely there were any exceedances of the NO_2 1-hour mean objective at any of the sites.

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)
3	35 Buscombe Gardens	Roadside	387670	217250	NO2	No	0.0	26.8	No	2.6
5	97 Painswick Road	Roadside	384558	216946	NO2	Yes - Painswick Road	0.0	4.6	No	2.6
7	76 Painswick Road	Roadside	384490	217027	NO2	Yes - Painswick Road	0.0	3.5	No	2.7
8	88 Painswick Road	Roadside	384509	216998	NO2	Yes - Painswick Road	0.0	3.5	No	2.5
12	219A Barton Street (post)	Roadside	384000	217863	NO2	Yes - Barton Street	0.0	2.0	No	2.6
13	99 Barton Street	Roadside	383717	218094	NO2	Yes - Barton Street	0.0	2.0	No	2.5
14	124 Barton Street	Roadside	383726	218074	NO2	Yes - Barton Street	0.0	1.5	No	2.6
15	196 Barton Street (Lamppost)	Roadside	383989	217857	NO2	Yes - Barton Street	0.0	2.5	No	2.6
16	240 Barton Street	Roadside	384081	217725	NO2	Yes - Barton Street	0.0	1.9	No	2.6

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) [1]	Distance to kerb of nearest road (m) [2]	Tube Co-located with a Continuous Analyser?	Tube Height (m)
17	316 Barton Street	Roadside	384175	217501	NO2	Yes - Barton Street	0.0	2.3	No	2.6
18	79 Millbrook Road	Roadside	384190	218160	NO2	No	0.0	1.0	No	2.6
19	61 Barnwood Road	Roadside	385130	218585	NO2	No	0.0	5.0	No	2.6
20	53 Barnwood Road	Roadside	385113	218595	NO2	No	0.0	2.3	No	2.5
21	Elmbridge Road	Urban Background	385430	218870	NO2	No	9.5	101.6	No	2.6
23	46 Priory Road	Roadside	382898	219029	NO2	Yes - Priory Road	0.0	4.5	No	2.5
24	56 Priory Road	Roadside	382921	219034	NO2	Yes - Priory Road	0.0	4.4	No	2.5
25	66 Priory Road	Roadside	382950	219040	NO2	Yes - Priory Road	0.0	5.4	No	2.7
26	16 London Road	Roadside	383560	218775	NO2	No	30.0	2.7	No	2.5
27	38 Priory Road	Roadside	382818	218993	NO2	No	0.0	10.0	No	2.2
28	Sweetbriar Street	Urban background	383639	219134	NO2	No	3.0	2.5	No	2.3
29	21 Parliament Street	Kerbside	383027	218253	NO2	No	10.0	0.5	No	2.2
30	Black Dog Way	Roadside	383483	218830	NO2	No	0.0	3.5	No	2.0

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) [1]	Distance to kerb of nearest road (m) [2]	Tube Co-located with a Continuous Analyser?	Tube Height (m)
31	3 The Elms Longlevens	Urban Background	385366	219777	NO2	No	2.5	1.1	No	2.2
32	Tanners Hall Gouda Way	Roadside	383357	218909	NO2	No	0.0	4.5	No	2.2
33	Widden Primary School	Urban Background	383911	218195	NO2	No	6.5	1.1	No	2.0

Notes:

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

(2) N/A if not applicable.

Table A.2 – Annual Mean NO$_2$ Monitoring Results: Non-Automatic Monitoring (µg/m^3)

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) [1]	Valid Data Capture 2022 (%) [2]	2018	2019	2020	2021	2022
3	387670	217250	Roadside	100.0	100.0	23.7	24.3	16.9	19.4	18.0
5	384558	216946	Roadside	100	100.0	29.6	27.3	21.6	25.4	22.7
7	384490	217027	Roadside	100	100.0	29.8	31.9	23.8	27.8	25.6
8	384509	216998	Roadside	100	100.0	33.7	34.2	27.9	29.9	26.3
12	384000	217863	Roadside	100	100.0	36.8	36.2	27.8	32.3	29.6

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
13	383717	218094	Roadside	100	100.0	37.6	37.2	31.7	30.9	28.3
14	383726	218074	Roadside	100	100.0	**42.4**	**43.9**	31.5	35.1	32.9
15	383989	217857	Roadside	100	100.0	38.4	39.7	30.1	32.5	29.0
16	384081	217725	Roadside	84.6	84.6	32.1	31.2	21.6	24.8	22.4
17	384175	217501	Roadside	40.4	40.4	32.7	35.5	26.1	29.9	23.7
18	384190	218160	Roadside	100	100.0	29.1	29.4	21.8	25.5	23.9
19	385130	218585	Roadside	100	100.0	35.4	34.1	25.8	29.8	24.9
20	385113	218595	Roadside	75	75.0	33.0	34.7	24.8	28.3	25.7
21	385430	218870	Urban Background	100	100.0	17.5	17.7	17.2	18.7	17.1
23	382898	219029	Roadside	100	100.0	**46.3**	**40.5**	29.5	34.1	31.1
24	382921	219034	Roadside	100	100.0	**47.4**	**43.0**	32.5	37.6	33.4
25	382950	219040	Roadside	100	100.0	**47.1**	**43.2**	31.9	35.1	33.2
26	383560	218775	Roadside	100	100.0	33.4	33.9	26.5	27.2	25.5
27	382818	218993	Roadside	100	100.0				25.1	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
28	383639	219134	Urban background	100	100.0				14.0	13.6
29	383027	218253	Kerbside	100	100.0				21.4	19.3
30	383483	218830	Roadside	100	32.7				21.4	18.9
31	385366	219777	Urban Background	77.8	51.9					12.2
32	383357	218909	Roadside	100	67.3					19.9
33	383911	218195	Urban Background	100	67.3					13.0

☒ **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 $\mu g/m^3$.

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

NO_2 annual means exceeding $60\mu g/m^3$, 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%).

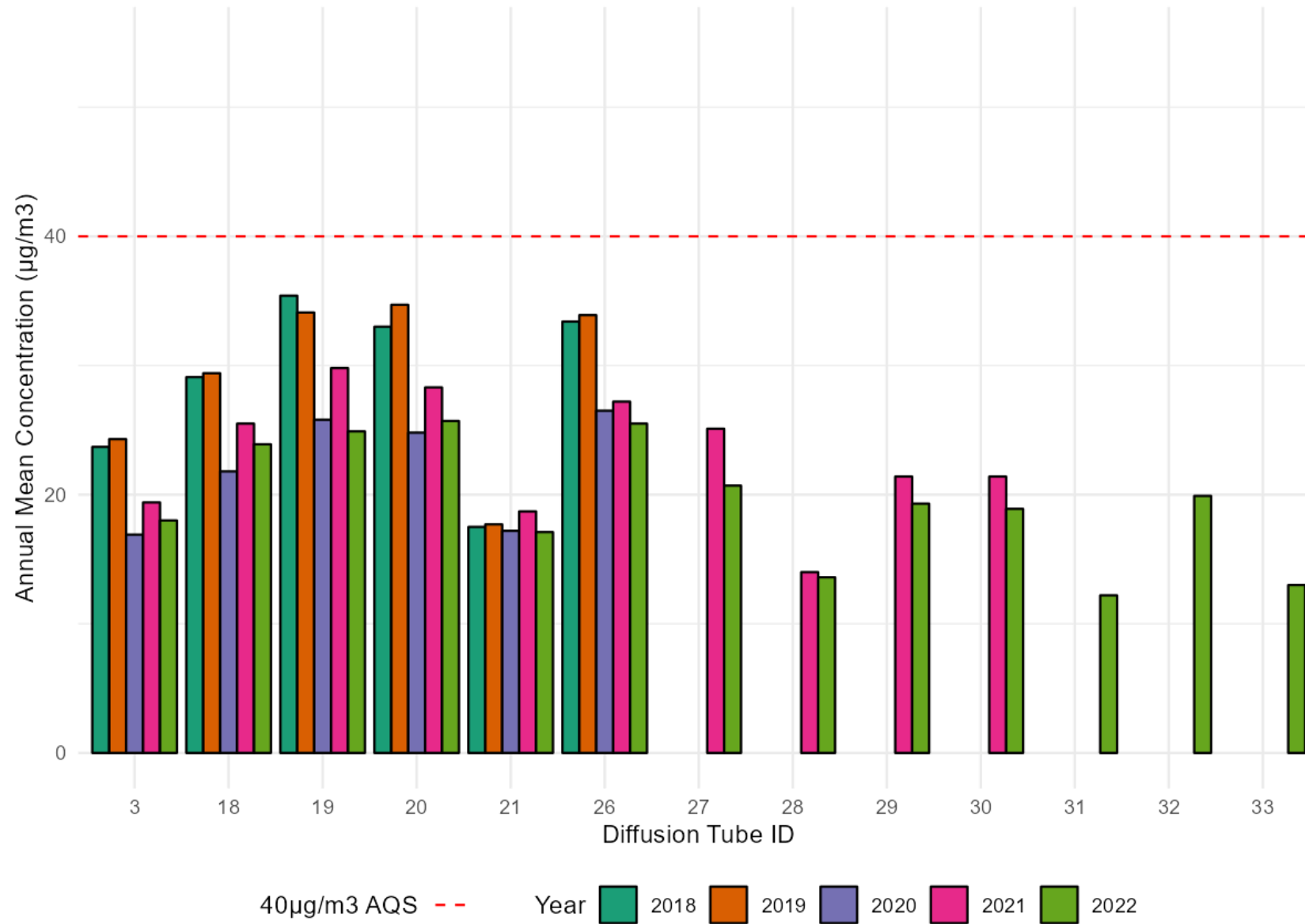**Figure A.1 – Trends in Annual Mean NO₂ Concentrations (Outside AQMAs)**

Figure A.2 – Trends in Annual Mean NO₂ Concentrations (Barton Street AQMA)
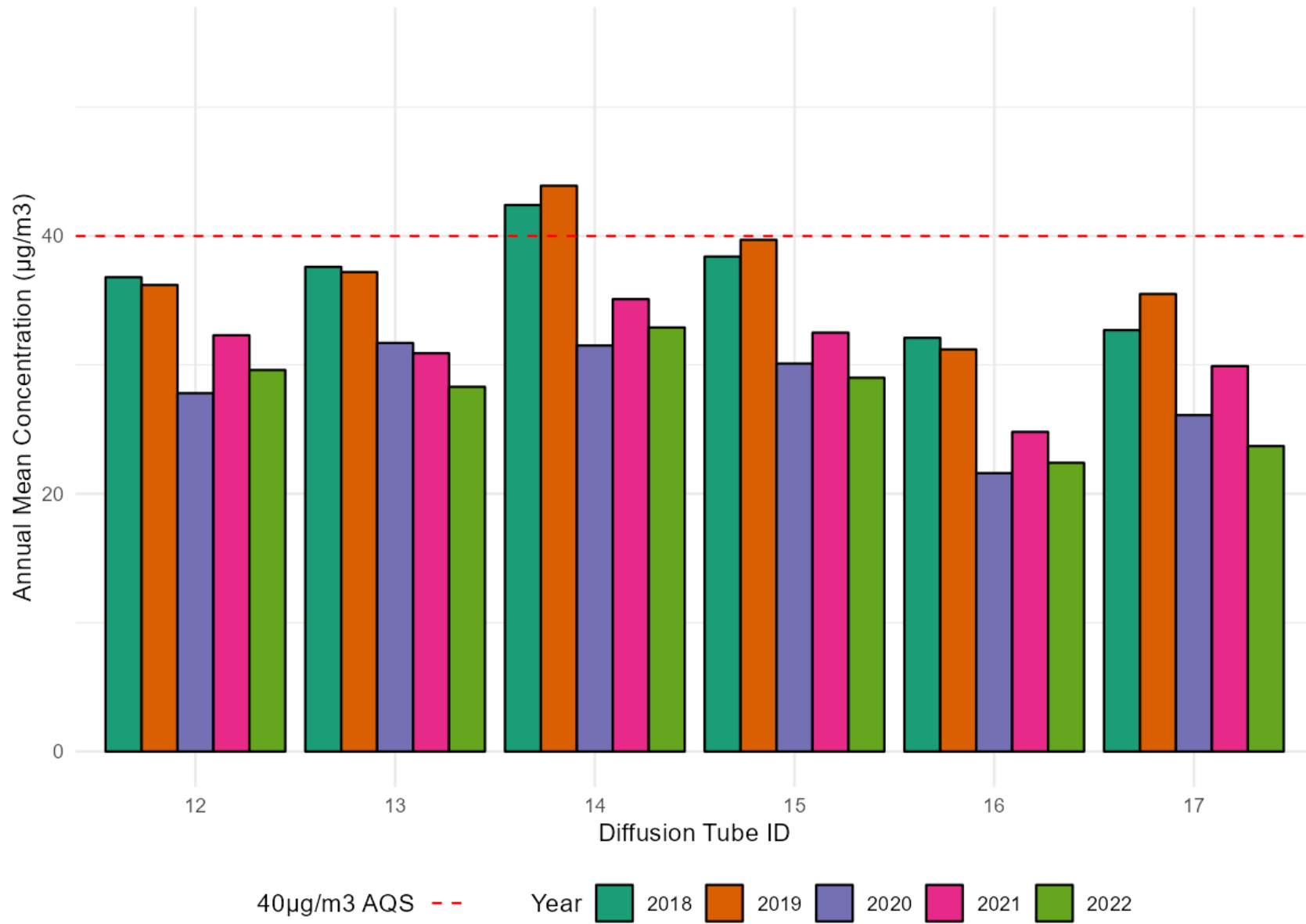
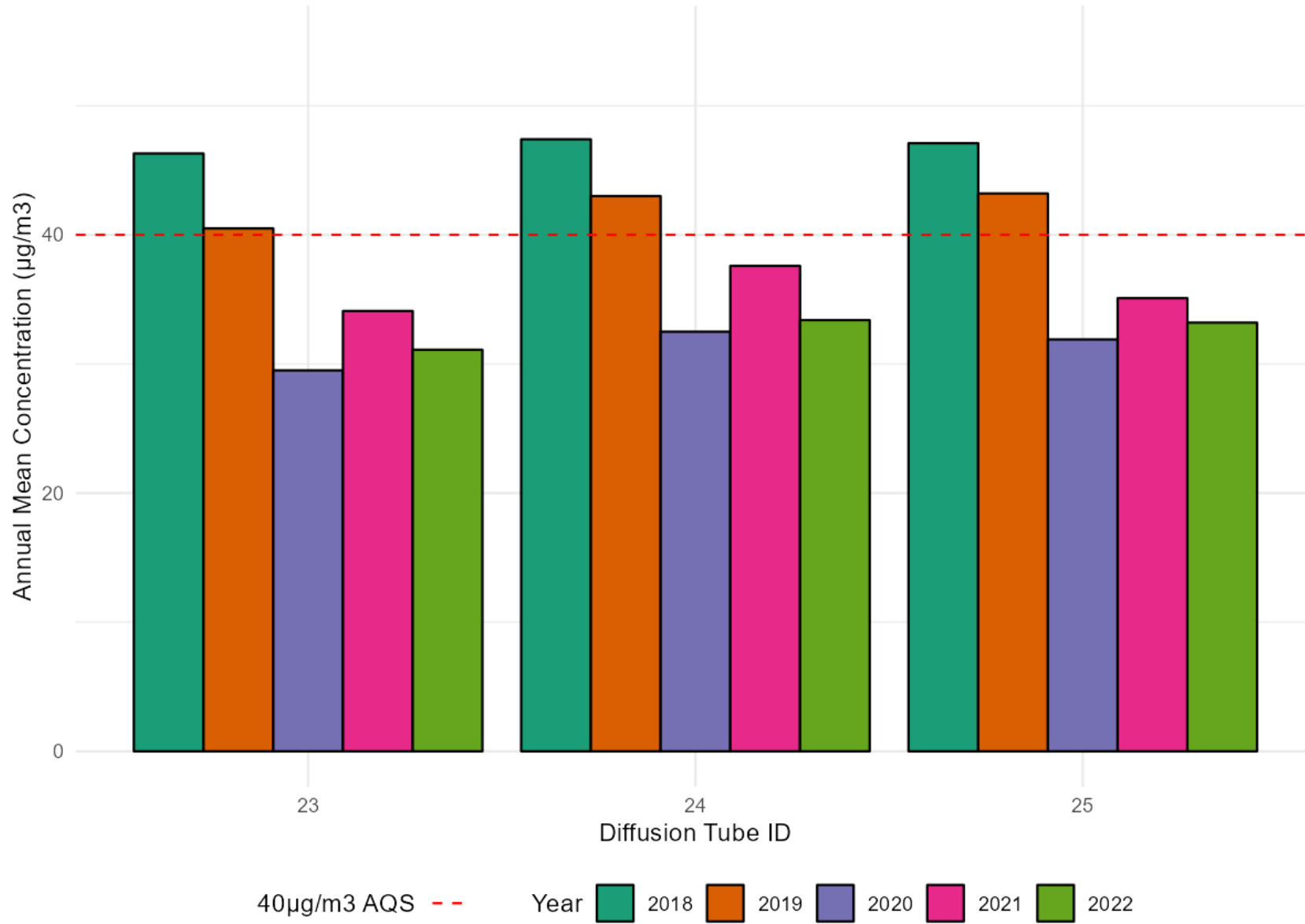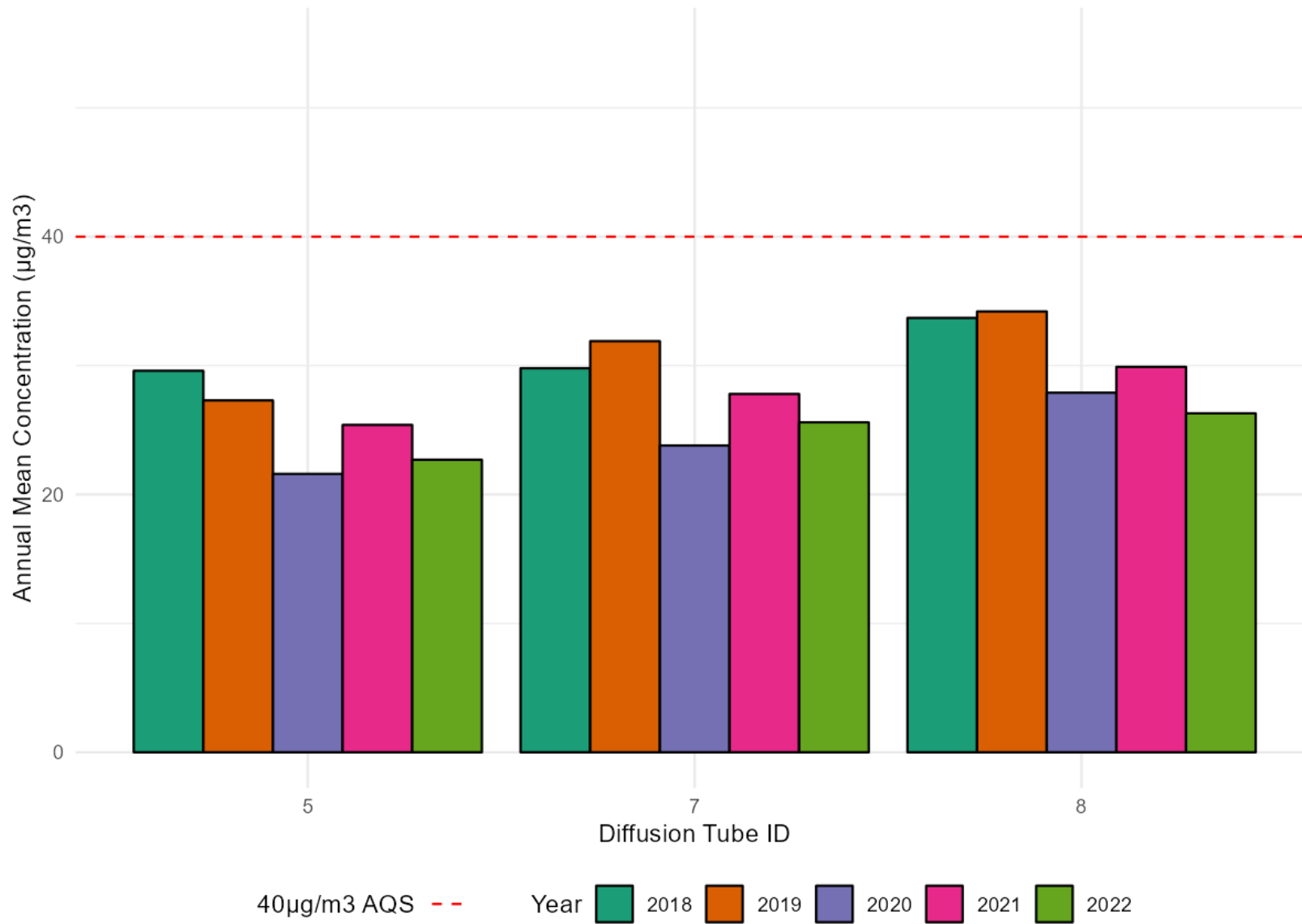**Figure A.3 – Trends in Annual Mean NO₂ Concentrations (Priory Road AQMA)**

Figure A.4 – Trends in Annual Mean NO₂ Concentrations (Painswick Road AQMA)

Appendix B: Full Monthly Diffusion Tube Results for 2022

Table B.1 – NO₂ 2022 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 (0.83)	Annual Mean: Distance Corrected to Nearest Exposure	Comment
3	387670	217250	28.0	17.7	30.5	21.1	16.7	9.6	17.6	18.6	23.3	22.5	27.8	27.3	21.7	18.0	-	
5	384558	216946	36.6	22.5	36.3	28.1	21.1	11.2	26.2	30.0	29.1	24.8	27.9	33.8	27.3	22.7	-	
7	384490	217027	43.8	31.8	33.9	26.2	25.0	12.2	29.1	27.9	31.6	30.9	37.5	39.8	30.8	25.6	-	
8	384509	216998	44.0	31.4	34.7	29.1	24.7	13.7	32.8	30.7	32.8	30.7	37.6	38.2	31.7	26.3	-	
12	384000	217863	46.9	35.3	42.7	35.7	26.7	10.9	38.5	43.3	41.2	29.0	34.3	43.7	35.7	29.6	-	
13	383717	218094	44.5	29.4	39.4	34.3	28.6	10.2	38.3	39.5	38.2	29.8	35.0	41.7	34.1	28.3	-	
14	383726	218074	52.5	39.8	39.9	40.9	35.1	13.2	42.3	40.4	43.0	37.3	44.9	46.8	39.7	32.9	-	
15	383989	217857	50.2	28.0	41.2	34.1	30.4	12.1	37.5	34.0	38.9	32.5	41.1	39.9	35.0	29.0	-	
16	384081	217725	39.8	21.4	32.0	27.9	21.8	9.5			30.2	23.2	29.2	35.3	27.0	22.4	-	
17	384175	217501	47.3	31.3	38.3					30.4				43.7	38.2	23.7	-	
18	384190	218160	42.7	24.7	30.9	28.2	21.9	14.2	30.3	28.7	32.5	24.1	30.4	36.4	28.8	23.9	-	
19	385130	218585	41.4	27.7	40.3	35.9	4.4	10.9	32.0	36.0	36.6	28.3	31.1	36.0	30.1	24.9	-	
20	385113	218595	44.4	27.8	37.6	31.6	27.9	12.0			34.7	28.3	34.8		31.0	25.7	-	
21	385430	218870	34.7	21.5	25.2	20.4	13.8	6.6	16.4	17.5	19.2	16.9	24.1	30.3	20.6	17.1	-	
23	382898	219029	47.9	36.9	46.2	38.4	37.6	12.7	36.6	37.4	39.8	31.6	42.1	41.8	37.4	31.1	-	
24	382921	219034	43.3	43.2	47.9	36.9	40.0	17.7	41.9	44.7	43.3	36.1	44.9	43.6	40.3	33.4	-	
25	382950	219040	49.1	39.6	46.6	40.2	34.8	12.7	40.4	45.1	42.8	35.8	47.1	45.6	40.0	33.2	-	
26	383560	218775	46.4	30.9	38.1	24.8	24.3	10.0	26.5	23.2	30.4	34.1	41.9	38.5	30.8	25.5	-	

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 (0.83)	Annual Mean: Distance Corrected to Nearest Exposure	Comment
27	382818	218993	35.8	26.6	32.5	25.7	26.3	11.3	21.4	20.8	22.7	19.6	25.7	30.1	24.9	20.7	-	
28	383639	219134	30.1	17.7	19.9	13.3	11.5	5.9	10.6	9.6	14.3	17.2	23.0	24.2	16.4	13.6	-	
29	383027	218253	36.1	20.2	29.5	22.5	16.8	10.3	21.1	21.5	22.4	21.3	26.5	31.4	23.3	19.3	-	
30	383483	218830	36.7	29.0	30.8	21.8									29.6	18.9	-	
31	385366	219777					10.7			11.9	13.8	14.3	19.0	25.2	15.8	12.2	-	
32	383357	218909					19.6	11.5	20.2	18.5	23.9	25.9	34.1	35.4	23.6	19.9	-	
33	383911	218195					12.3	7.0	13.7	15.2	16.6	14.4	18.9	25.5	15.4	13.0	-	

☒ **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 >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**

☒ **Gloucester City Council confirm that all 2022 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 Gloucester City Council During 2022

Gloucester City Council has not identified any new major sources relating to air quality within the reporting year of 2022. An appeal for outline permission for the erection of up to 245 dwellings Land At Hill Farm Hempsted Lane was allowed in 2022. An air quality assessment accompanied this application, which concluded that it would have no significant impact on air quality. This development will have a minor impact on local air quality.

Additional Air Quality Works Undertaken by Gloucester City Council During 2022

Gloucester City Council has not completed any additional works within the reporting year of 2022.

QA/QC of Diffusion Tube Monitoring

Gloucester City Council's diffusion tubes are prepared and analysed by Gradko International Ltd. using the 20% TEA in water method. This laboratory takes part in the QA/QC Field Intercomparison, operated on behalf of Defra. Gradko International Ltd are a UKAS accredited laboratory.

The precision of the current 27 local authority co-location studies in 2022 (who used the 20% TEA in water method) detailed within the national bias adjustment factor spreadsheet (version 03/22) was rated as 'good' (tubes are considered to have "good" precision where the coefficient of variation of duplicate or triplicate diffusion tubes for eight or more periods during the year is less than 20%), adding to the confidence in the measurements and Gradko's procedures.

Diffusion tube monitoring during 2022 was undertaken in line with the 2022 Diffusion Tube Monitoring Calendar.

Diffusion Tube Annualisation

As per LAQM.TG(22), annualisation is required for any site which has a data capture of less than 75%, but greater than 25%. Five sites therefore required annualisation. Annualisation was carried out using the March 2023 version of the Diffusion Tube Data Processing Tool. Following the approach of the previous Air Quality Status report, the four closest continuous monitoring background locations were selected to annualise the data. These were:

- Swindon Walcot;
- Newport;
- Bristol St. Pauls; and
- Leamington Spa.

All of these sites have a data capture of >85% and therefore could be used for annualisation. Table C.1 presents the annualisation summary and is taken directly from the Diffusion Tube Data Processing Tool.

Table C.1 – Annualisation Summary (concentrations presented in µg/m³)

Site ID	Annualisation Factor Bristol St Pauls	Annualisation Factor Leamington Spa	Annualisation Factor Newport	Annualisation Factor Swindon Walcot	Average Annualisation Factor	Raw Data Annual Mean	Annualised Annual Mean
17	0.7885	0.7238		0.7338	0.7487	38.2	28.6
30	0.8009	0.7629		0.7501	0.7713	29.6	22.8
31	0.9915	0.9444	0.7195	1.0748	0.9325	15.8	14.8
32	1.0741	1.0337	0.7730	1.1786	1.0148	23.6	24.0
33	1.0741	1.0337	0.7730	1.1786	1.0148	15.4	15.7

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.

Gloucester City Council have applied a national bias adjustment factor of 0.83 to the 2022 monitoring data. A summary of bias adjustment factors used by Gloucester City Council over the past five years is presented in Table C.2.

Table C.2 – Bias Adjustment Factor

| Monitoring Year	Local or National	If National, Version of National Spreadsheet	Adjustment Factor
2022	National	03/23	0.83
2021	National	06/22	0.84
2020	National	03/21	0.81
2019	National	03/19	0.93
2018	National	03/18	0.93

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 Gloucester City Council required distance correction during 2022.

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

Figure D.1 – Map of Non-Automatic Monitoring Site (Painswick AQMA)
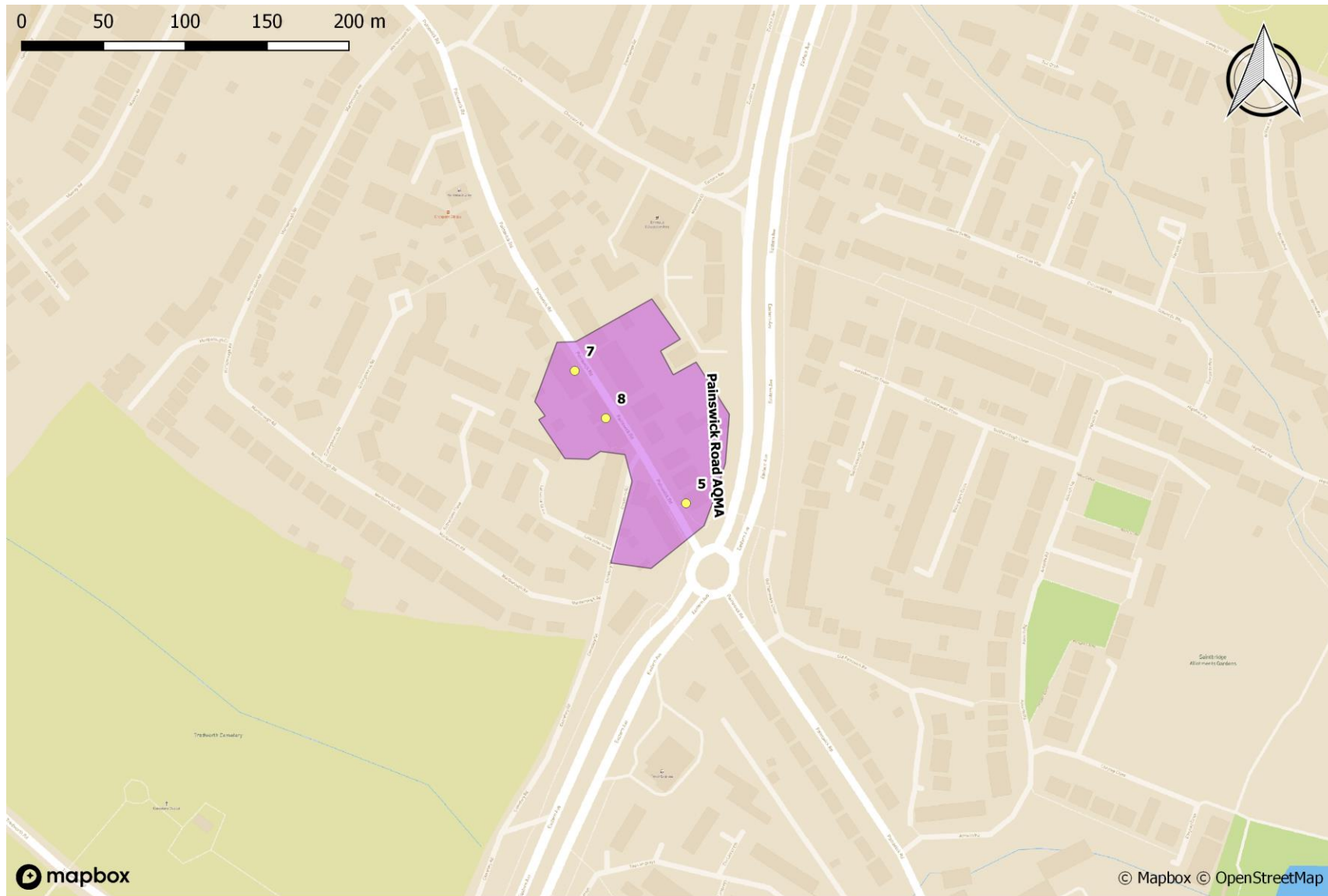
Diffusion Tubes 　 Gloucester 　 AQMA

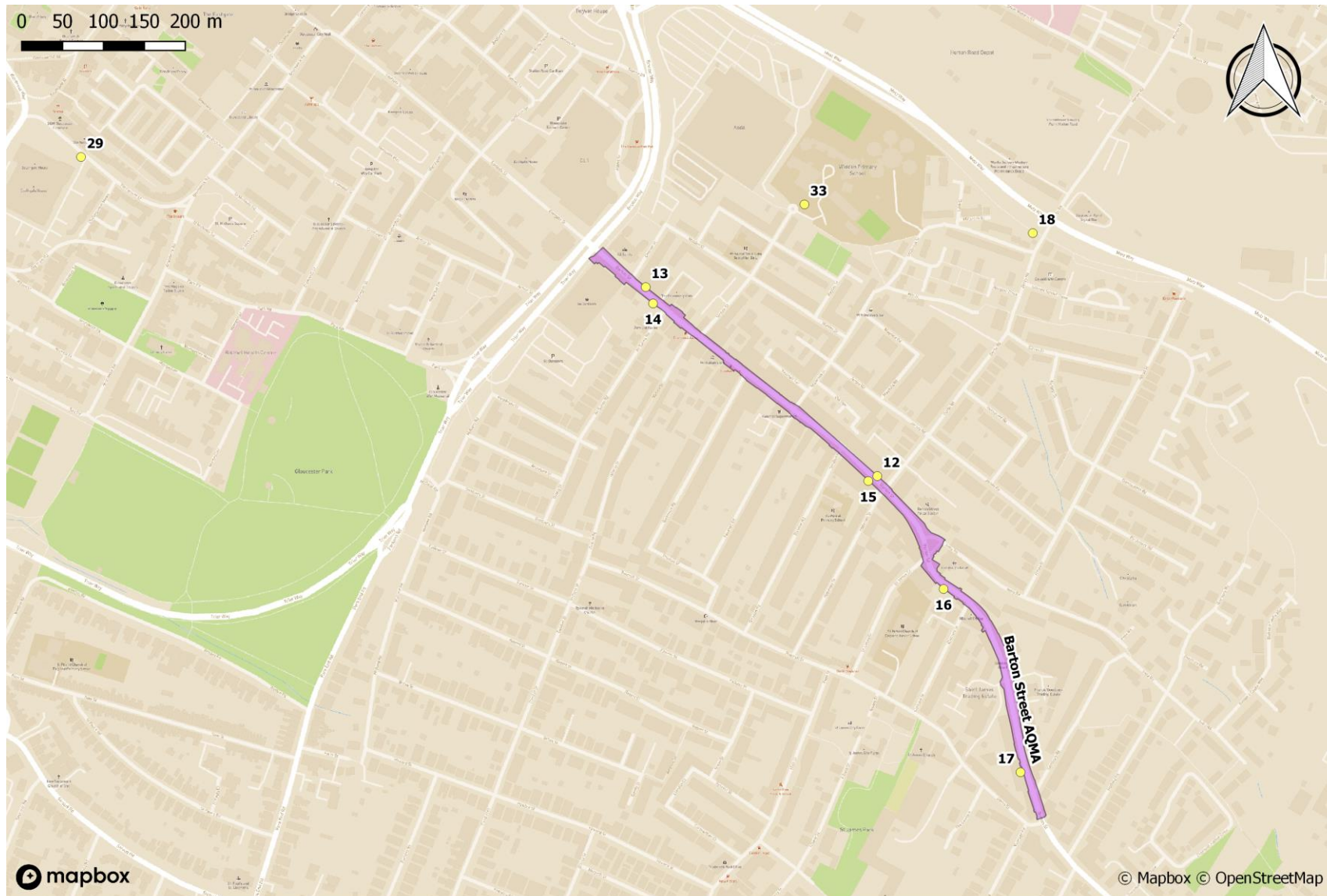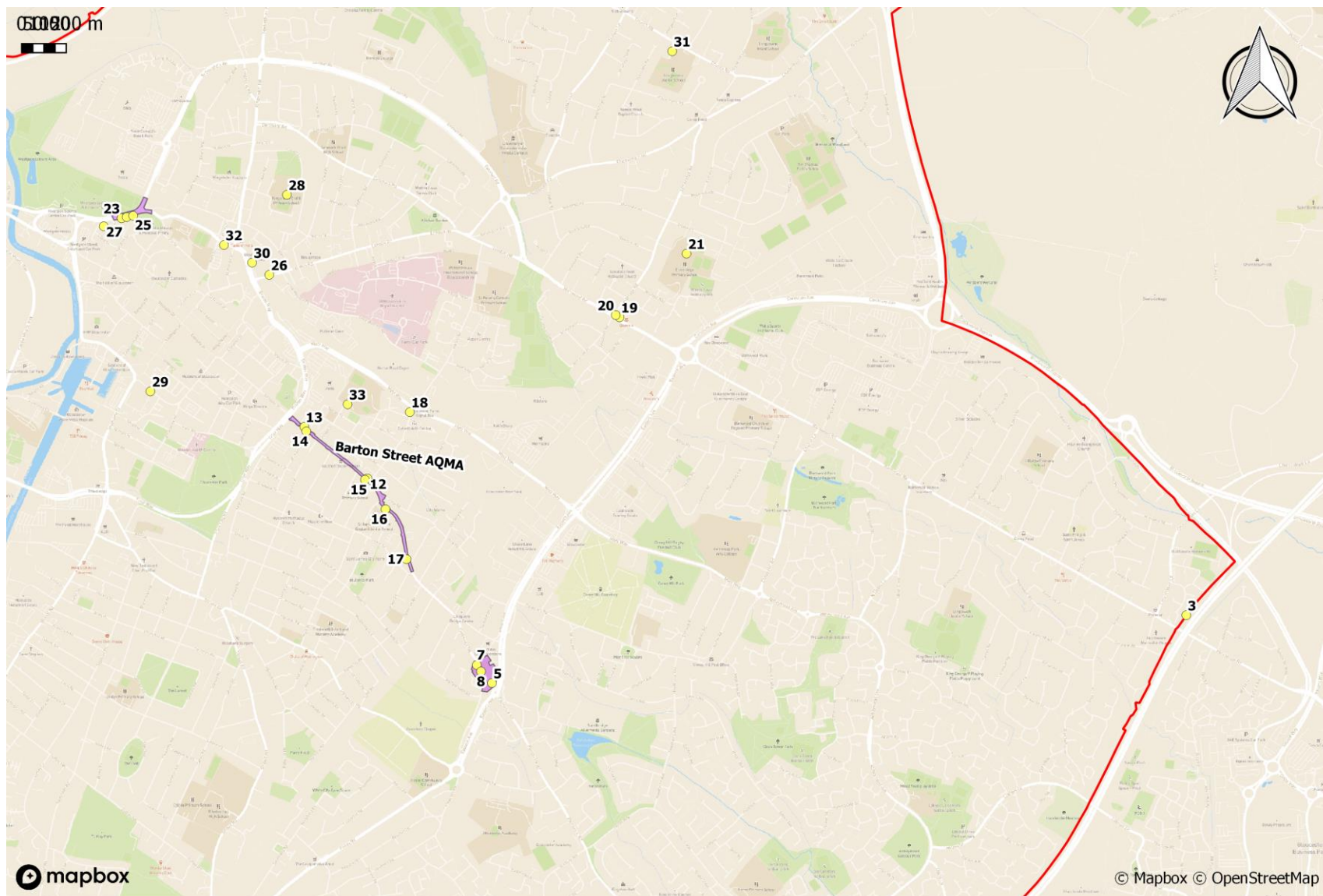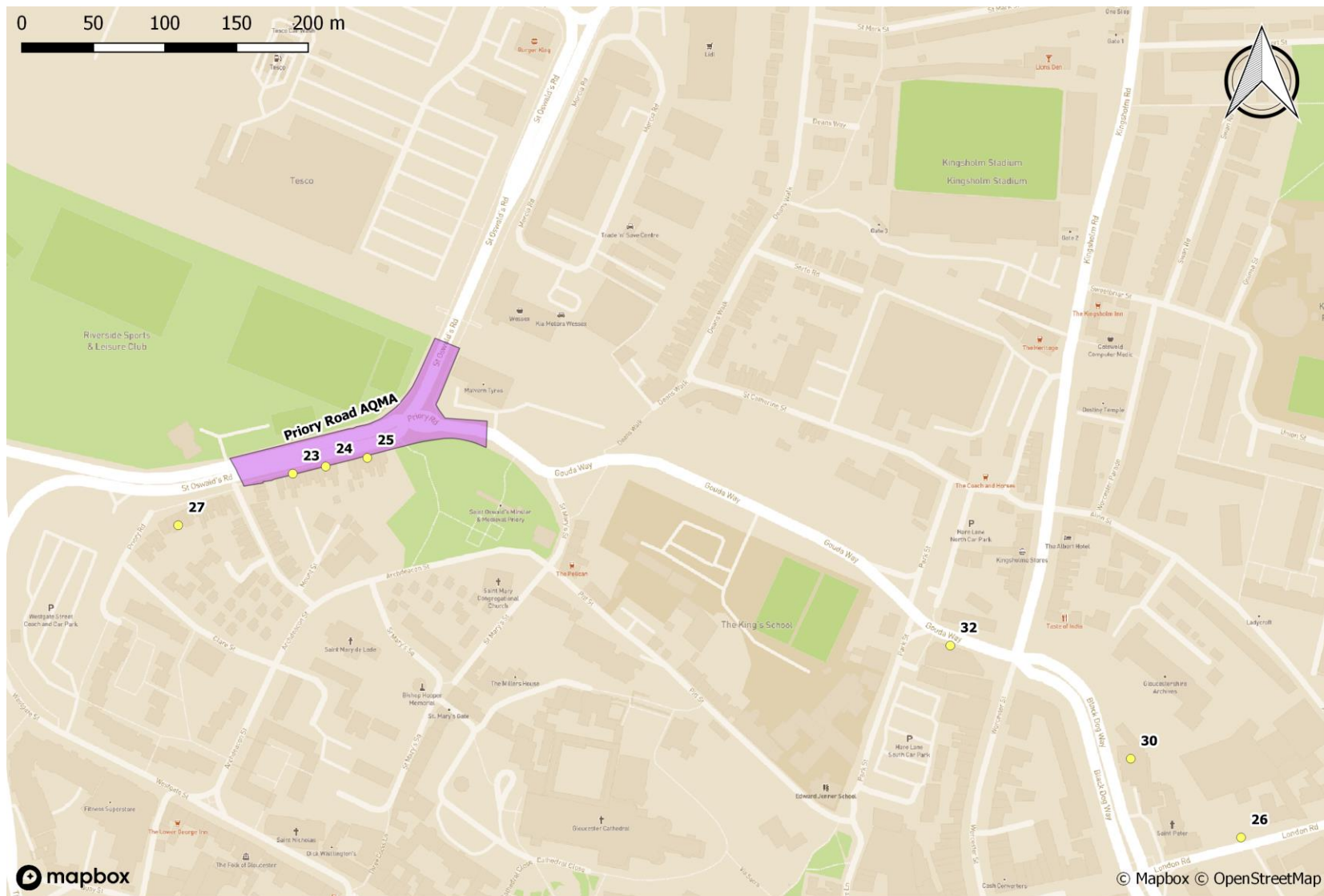**Figure D.2 – Map of Non-Automatic Monitoring Site (Barton Street AQMA)**

Figure D.3 – Map of Non-Automatic Monitoring Site (All Sites)

Figure D.4 – Map of Non-Automatic Monitoring Site (Priory Road AQMA)

Appendix E: Summary of Air Quality Objectives in England

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

Pollutant	Air Quality Objective: Concentration	Air Quality Objective: Measured as
Nitrogen Dioxide (NO_2)	$200\mu g/m^3$ not to be exceeded more than 18 times a year	1-hour mean
Nitrogen Dioxide (NO_2)	$40\mu g/m^3$	Annual mean
Particulate Matter (PM_{10})	$50\mu g/m^3$, not to be exceeded more than 35 times a year	24-hour mean
Particulate Matter (PM_{10})	$40\mu g/m^3$	Annual mean
Sulphur Dioxide (SO_2)	$350\mu g/m^3$, not to be exceeded more than 24 times a year	1-hour mean
Sulphur Dioxide (SO_2)	$125\mu g/m^3$, not to be exceeded more than 3 times a year	24-hour mean
Sulphur Dioxide (SO_2)	$266\mu g/m^3$, not to be exceeded more than 35 times a year	15-minute mean

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

Glossary of Terms

Abbreviation	Description
AQAP	Air Quality Action Plan - A detailed description of measures, outcomes, achievement dates and implementation methods, showing how the local authority intends to achieve air quality limit values'
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.