



2024 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: July 2024

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Executive Summary: Air Quality in Our Area

Breathing in polluted air affects our health and costs the NHS and our society billions of pounds each year. Air pollution is recognised as a contributing factor in the onset of heart disease and cancer and can cause a range of health impacts, including effects on lung function, exacerbation of asthma, increases in hospital admissions and mortality. In the UK, it is estimated that the reduction in healthy life expectancy caused by air pollution is equivalent to 29,000 to 43,000 deaths a year¹.

Air pollution particularly affects the most vulnerable in society, children, the elderly, and those with existing heart and lung conditions. Additionally, people living in less affluent areas are most exposed to dangerous levels of air pollution².

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

Table ES 1 - Description of Key Pollutants

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

¹ UK Health Security Agency. Chemical Hazards and Poisons Report, Issue 28, 2022.

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

Air Quality in South Gloucestershire

South Gloucestershire lies to the north and east of the city of Bristol with the River Severn to the west and the Cotswold escarpment to the east. The area is a diverse mix of urban and rural areas, including major residential, industrial and commercial developments. The major junction of the M4 and M5 motorways (the Almondsbury Interchange) is within South Gloucestershire.

The overall population in South Gloucestershire was recorded as 290,400 in the 2021 Census, which was an increase of 10.5% compared to the 2011 census (262,800)³. The population growth in South Gloucestershire in those 10 years was higher than in all of its neighbouring authorities; Bristol, Bath and North East Somerset, North Somerset and Gloucestershire⁴. The latest population estimate for South Gloucestershire is 299,439 based on the 2023 Mid-Year population estimate from the Office of National Statistics (ONS)⁵. Most of the population lives within the urban areas on the north and east fringes of Bristol and in the towns of Yate and Thornbury, while the remainder live in the villages and more rural areas of South Gloucestershire.

The main pollutant of concern locally is nitrogen dioxide (NO₂), with road traffic being the main source (34%, rising to 80% near roadsides)⁶. Particulate matter (PM₁₀ and PM_{2.5}) is also a concern with the main source being domestic wood and coal burning (38%)⁷.

Air Quality Management Areas

There are two AQMAs currently declared in South Gloucestershire in relation to previous exceedances of the annual mean objective for nitrogen dioxide (40 µg/m³):

- Kingswood – Warmley – from the Bristol/ South Gloucestershire boundary in Kingswood along the A420 to the junction with Goldney Avenue in Warmley.

³ [Census | BETA - South Gloucestershire Council \(southglos.gov.uk\)](https://www.southglos.gov.uk/beta/census)

⁴ [Key facts and figures about the area | BETA - South Gloucestershire Council \(southglos.gov.uk\)](https://www.southglos.gov.uk/beta/key-facts-and-figures-about-the-area)

⁵ [Population estimates for England and Wales - Office for National Statistics \(ons.gov.uk\)](https://www.ons.gov.uk/population-estimates-for-england-and-wales)

⁶ Defra Clean Air Strategy 2019 [Clean Air Strategy 2019 \(publishing.service.gov.uk\)](https://www.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/421127/clean-air-strategy-2019.pdf)

⁷ Defra Clean Air Strategy 2019 [Clean Air Strategy 2019 \(publishing.service.gov.uk\)](https://www.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/421127/clean-air-strategy-2019.pdf)

- Staple Hill – in the centre around the Broad Street/ High Street/ Soundwell Road/ Victoria Street crossroads and the High Street/ Acacia Road/ Pendennis Road crossroads.

Details of the current AQMAs are included in Table 2.1 of this report and maps are available in Appendix D. Further information on the AQMAs is available on the Council website [Air quality | BETA - South Gloucestershire Council \(southglos.gov.uk\)](https://www.southglos.gov.uk) and on the Defra UK-AIR website [Local Authority Details - Defra, UK](https://www.gov.uk/government/collections/uk-air-quality-reports).

The former Cribbs Causeway AQMA adjacent to the M5 Motorway Junction 17 roundabout was revoked in July 2020 as nitrogen dioxide concentrations within the AQMA have consistently been below the annual mean objective since 2010. Further information is provided in Section 2.1 of the report.

Trends in monitored pollutant concentrations

South Gloucestershire Council carried out automatic (continuous) monitoring at the following three sites during 2023 (the pollutant(s) monitored at each site are shown in brackets):

- Yate Station Road (NO₂ and PM₁₀) – a long standing site operational since 2000
- Stoke Gifford A4174 Ring Road near Coldharbour Lane and the University of West England (NO₂, PM₁₀, PM_{2.5} and Ozone (O₃)) – began operating in August 2021
- Hambrook A4174 Ring Road (NO₂) – began operating in April 2022.

The key outcomes from the automatic monitoring in 2023 are:

- NO₂ concentrations were well below the annual mean objective of 40 µg/m³ and the 1-hour objective (200 µg/m³ not to be exceeded more than 18 times a year) was met at all three automatic sites.
 - There were decreases in the 2023 annual mean NO₂ concentrations at Yate (12.4 µg/m³), Stoke Gifford A4174 (17.9 µg/m³) and Hambrook A4174 (22.5 µg/m³) compared to 2022.
 - The Yate annual mean showed a 35% decrease from the pre-pandemic 2019 annual mean of 19 µg/m³. This follows a similar trend across the national automatic urban and rural monitoring network (AURN) roadside sites where the

average 2023 NO₂ annual mean concentration was 30% lower than 2019 levels⁸.

- The long-term trend data for Yate shows an overall continuing decline in annual mean NO₂ concentrations over the last decade with concentrations reducing by 52% from 26 µg/m³ in 2013.
- PM₁₀ concentrations were below the annual mean objective of 40 µg/m³ and met the 24-hour mean objective (50 µg/m³ not to be exceeded more than 35 times a year) at both the Yate and Stoke Gifford sites.
 - The annual mean PM₁₀ concentration at Yate was 12.3 µg/m³ (similar to 2022) and 17.9 µg/m³ at Stoke Gifford (an 11% decrease on 2022 levels).
 - The longer-term data at Yate shows a slight decrease compared to pre-pandemic annual mean of 13 µg/m³ in 2019 but the levels remain slightly higher than the 2020 annual mean of 11 µg/m³. Overall, the annual mean PM₁₀ concentrations have been slowly declining over the last decade at Yate from 15 µg/m³ in 2013 but more recently stabilising. This follows the trend in annual average PM₁₀ concentrations at the national AURN roadside sites which have remained relatively stable between 2015 and 2023, although roadside PM₁₀ pollution has generally reduced in the longer-term⁹.
 - There was 1 exceedance of the 24-hour daily mean at Stoke Gifford, however 35 exceedances are allowed so the objective was met. This compares to 3 exceedances of the daily mean in 2022. There were no exceedances of the daily mean at Yate.
- PM_{2.5} concentrations monitored at Stoke Gifford were below the annual mean limit of 20 µg/m³ and the new annual mean concentration target of 10 µg/m³ to be met by 2040 (and the interim target of 12 µg/m³ by 2028) introduced under the Environment Act 2021.
 - The annual mean concentration in 2023 was 7.6 µg/m³ at Stoke Gifford, which is a 16% decrease from the 2022 annual mean of 9 µg/m³.

⁸ [Nitrogen dioxide \(NO₂\) - GOV.UK \(www.gov.uk\)](https://www.gov.uk)

⁹ [Particulate matter \(PM₁₀/PM_{2.5}\) - GOV.UK \(www.gov.uk\)](https://www.gov.uk)

- Ozone (O₃) concentrations monitored at Stoke Gifford were above the maximum running 8-hour mean objective of 100 µg/m³ on 9 days during 2023, compared to 22 days in 2022. However, the ozone objective (100 µg/m³ not to be exceeded more than 10 times a year) has an allowance of 10 days so this objective was not exceeded in 2023. The responsibility for meeting this objective sits with national government because of the transboundary nature of ozone. Nevertheless, it is useful to monitor ozone as reducing levels of NO₂ are invariably accompanied by an increase in ozone levels. This is of concern due to the health impacts of ozone¹⁰ and because ozone is a greenhouse gas in the lower atmosphere.

There was also extensive monitoring of nitrogen dioxide at the 99 non-automatic (passive) diffusion tube monitoring sites that formed the local air quality management (LAQM) network across South Gloucestershire in 2023.

The key outcomes from the diffusion tube monitoring are:

- NO₂ concentrations were below the annual mean objective of 40 µg/m³ so there were no exceedances of the objective at any of the LAQM diffusion tube monitoring sites in South Gloucestershire, including in the Kingswood – Warmley and Staple Hill AQMAs.
- The 2023 annual mean NO₂ concentrations decreased by an average of 20% across the LAQM diffusion tube sites compared to 2022. This shows a greater reduction than the trend observed across the national automatic urban and rural monitoring network (AURN) roadside sites where the average 2023 NO₂ annual mean concentration decreased by 7% from 2022 levels. Overall since 2019, the NO₂ concentrations across the long-term sites reduced by 34% on average, which compares well to 30% reduction observed across the AURN roadside sites from 2019 levels¹¹.
- In the Kingswood – Warmley AQMA, annual mean NO₂ concentrations decreased by an average of 18% from 2022 to 2023. There were no exceedances of the annual mean NO₂ objective or any “borderline” sites (within 10% of the annual mean objective, so greater than 36 µg/m³) in this AQMA. From 2019 to 2023, the NO₂ concentrations reduced by an average of 36% in the AQMA.

¹⁰ [Ozone \(O₃\) - GOV.UK \(www.gov.uk\)](https://www.gov.uk)

¹¹ [Nitrogen dioxide \(NO₂\) - GOV.UK \(www.gov.uk\)](https://www.gov.uk)

- At the single previously exceeding site pre-pandemic in 2019 (and 2018) in South Gloucestershire within the Kingswood – Warmley AQMA (Site 146 Kingswood - Hill Street), the NO₂ concentration decreased by 37% from 2019 (42.3 µg/m³) to 2023 (26.7 µg/m³). The 2023 NO₂ concentration monitored at this site was the highest in either of the AQMAs.
- In the Staple Hill AQMA, NO₂ concentrations decreased by an average of 20% from 2022 to 2023 at the monitoring sites in the AQMA. Overall, from 2019 to 2023, the NO₂ concentrations have reduced by an average of 34% in this AQMA. There were no exceedances of the annual mean NO₂ objective or any “borderline” sites in this AQMA.
- Outside of the AQMAs across the rest of the district, there were no “borderline” monitoring sites with NO₂ concentrations greater than 36 µg/m³. At the previously borderline site in 2022 (Site 188 located next to the A38 Gloucester Road in Patchway), the 2023 annual mean NO₂ concentration decreased to 30.1 µg/m³. This was the highest annual mean concentration monitored at any of the LAQM diffusion tube sites across the district, including in the AQMAs, although the façade of the nearest house is set back further from the road so adjusting the result to take account of the distance to the house façade would further reduce the NO₂ concentration.

The details of the monitoring sites and results are provided in Appendix A. The monitoring results and trends in the data are discussed further in Section 3.2 of the report and trend graphs are available in Appendix A. The monitoring data from the South Gloucestershire automatic sites is available to view on the [Air Quality in the United Kingdom \(ukairquality.net\)](https://ukairquality.net) website.

How the Council works to manage local air quality

South Gloucestershire Council (SGC) is a unitary authority and Planning, Transport and Environmental Health are all within the Directorate for Place enabling close working between these teams. There is also a close working relationship with the Public Health Team in the Directorate for People, and their work on the built environment recognises the importance of aligning spatial planning and transport work with its associated impacts on air quality and health.

The development of a council-wide approach to air quality has brought services which have an interest and/or impact on air quality, including Public Health, Environmental Health, Transport Policy, Environment and Climate Change, Spatial Planning, Development Control, Street Care and Highways and Strategic Communications, together

into a Board. The Clean Air and Climate Change Board is co-chaired by the Executive Director for Place and the Director of Public Health. With the Board also covering Climate Change, this ensures there is a joined-up approach across the two work areas, which are closely interlinked with often the same sources and interventions and secures alignment with the Council's Climate Emergency Strategy and Action Plans¹².

The Clean Air and Climate Change Board has overseen the development of the South Gloucestershire Clean Air Strategy¹³, which was approved by the Council in July 2020, and subsequently, the draft Clean Air Action Plan (CAAP), which has been developed to implement the visions and priorities contained within the Clean Air Strategy and to fulfil the Council's statutory local air quality management duties to update the 2012 Air Quality Action Plan for the Kingswood and Staple Hill AQMAs¹⁴.

South Gloucestershire Council continues to work closely with other neighbouring authorities in the West of England (Bath and North East Somerset, Bristol City and North Somerset Councils), and with the West of England Combined Authority (WECA), to develop, implement and refine schemes with cross-boundary characteristics, particularly in key regional strategic work areas such as transport, with the Joint Local Transport Plan (JLTP4)¹⁵ being an example of this.

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 Plan¹⁶ sets out actions that will drive continued improvements to air quality and to meet the new national interim and long-term targets for fine particulate matter (PM_{2.5}), the pollutant of most harm to human health. The Air Quality

¹² [Climate and nature emergency in South Gloucestershire | BETA - South Gloucestershire Council \(southglos.gov.uk\)](https://www.southglos.gov.uk/beta)

¹³ [SGC Clean Air Strategy 2020-2024 \(southglos.gov.uk\)](https://www.southglos.gov.uk/clean-air-strategy)

¹⁴ [2012 Air Quality Action Plan Kingswood and Staple Hill \(southglos.gov.uk\)](https://www.southglos.gov.uk/2012-air-quality-action-plan)

¹⁵ [Joint Local Transport Plan - Combined Authority \(westofengland-ca.gov.uk\)](https://www.westofengland-ca.gov.uk/jltp4)

¹⁶ Defra. Environmental Improvement Plan 2023, January 2023

Strategy¹⁷ provides more information on local authorities' responsibilities to work towards these new targets and reduce fine particulate matter in their areas.

The Road to Zero¹⁸ details the Government's approach to reduce exhaust emissions from road transport through a number of mechanisms, in balance with the needs of the local community. This is extremely important given that cars are the most popular mode of personal travel and the majority of Air Quality Management Areas (AQMAs) are designated due to elevated concentrations heavily influenced by transport emissions.

A key regional plan is the West of England Joint Local Transport Plan 4 (JLTP4) 2020 – 2036¹⁹. One of the five key objectives within the JLTP4 is to "Take action against climate change and address poor air quality" thereby placing a greater emphasis on air quality and climate change in strategic transport planning through to 2036.

South Gloucestershire Council has prepared a comprehensive, area-wide draft Clean Air Action Plan to replace the 2012 Air Quality Action Plan, which will be the focus of our efforts in future years, once the plan is finalised and approved.

Public Consultation was undertaken on the draft Clean Air Action Plan between 6 December 2022 and 31 January 2023. The consultation sought the views of the public and businesses on a wide range of proposed actions designed to improve air quality within the AQMAs and across South Gloucestershire. Further information, including the draft Clean Air Action Plan itself and a consultation report summarising the responses, is available on the [Clean Air Action Plan - South Gloucestershire Online Consultations \(southglos.gov.uk\)](https://southglos.gov.uk/clean-air-action-plan-south-gloucestershire-online-consultations) webpage. The feedback from the consultation has been considered and will help shape the final Clean Air Action Plan. Work continues to finalise the draft CAAP with completion of the final CAAP anticipated in late 2024.

During 2023, actions progressed in South Gloucestershire and across the wider West of England region aimed at reducing traffic congestion and improving air quality include:

¹⁷ Defra. Air Quality Strategy – Framework for Local Authority Delivery, August 2023

¹⁸ DfT. The Road to Zero: Next steps towards cleaner road transport and delivering our Industrial Strategy, July 2018

¹⁹ [Joint Local Transport Plan - Combined Authority \(westofengland-ca.gov.uk\)](https://westofengland-ca.gov.uk/joint-local-transport-plan-combined-authority)

- Cribbs Patchway Metrobus Extension²⁰ - this extension of the Metrobus network²¹ provides an alternative, fast and direct route between The Mall at Cribbs Causeway and Bristol Parkway railway station (and onto Bristol City centre via the University of West of England). It benefits communities in Stoke Gifford, Patchway and the forthcoming Brabazon new neighbourhood on the former Filton Airfield site. Passenger services began in January 2023 on the M4 Metrobus route. There are currently four Metrobus routes in operation; three of which run between South Gloucestershire and Bristol (M1, M3 and M4 Metrobus services).
- MetroWest²² – improved rail services and infrastructure being delivered in two phases by the West of England councils, working in partnership with Network Rail and Great Western Railway. In South Gloucestershire, Phase 1 has enhanced local passenger train services on the Severn Beach line to an hourly service to Bristol Temple Meads from December 2021. Phase 2 proposes to re-open the Henbury Line to an hourly spur passenger service and increase train services between Bristol Temple Meads and Gloucester via Yate to a half-hourly service; the latter commenced in May 2023. Plans for new rail stations are progressing with WECA funding. Planning permission for the new rail station at North Filton was granted in January 2023 and for Charfield²³ station in March 2023. The target for these stations to be opened is 2027²⁴.
- A38 and Bradley Stoke Way improvements – SGC are developing a scheme along the Thornbury to Bradley Stoke Way corridor to improve conditions for people walking, cycling, and travelling by bus to encourage mode shift and improve air quality. Funding has been secured to advance the scheme to detailed design and it is envisaged to be open by March 2027.
- A432 Yate to A4174 Ring Road Corridor - SGC are developing a similar scheme along this corridor to the above scheme with the same aim of improving conditions for walking, cycling, and travelling by bus to encourage mode shift and improve air

²⁰ [m4: Cribbs Causeway to City Centre - WEST \(travelwest.info\)](#)

²¹ [metrobus - WEST \(travelwest.info\)](#)

²² [MetroWest - WEST \(travelwest.info\)](#)

²³ [Charfield train station | BETA - South Gloucestershire Council \(southglos.gov.uk\)](#)

²⁴ [MetroWest - West of England Combined Authority \(westofengland-ca.gov.uk\)](#)

quality. Funding has also been secured to progress this scheme to detailed design and it is envisaged to be open by March 2027.

- South Gloucestershire Electric Vehicle (EV) Charging Strategy – this strategy was adopted in March 2023²⁵. The strategy aims to support residents transitioning to EVs through a variety of measures, including the expansion of public charging infrastructure. During 2023/24, SGC completed an On-Street Residential Charging Scheme, which provided 14 fast (22kW) charging points in eight residential locations to satisfy the current or future demand of residents unable to charge at home due to a lack of off-street parking.
- SGC are developing plans with local communities for better active travel facilities in Yate and Thornbury ([Have Your Say Today - Getting About In Thornbury - Commonplace](#)). The aim is to make it easier, safer and more attractive to walk, wheel (using a mobility scooter, wheelchair or pushchair) or cycle, especially for those local everyday journeys to school or the shops. When implemented, it is expected the measures will reduce congestion, make the roads and streets quieter and safer, reduce harmful emissions and improve air quality, and encourage more people to get active, contributing to improved public health.
- SGC continued developing measures to support active travel across the region. The Council set up a new Active Travel Grant with over 40 organisations bidding for a grant, of which 21 organisations were successful. Most successful applicants used their grant for either a pool bicycle/e-bicycle or providing cycle parking. Participating organisations have reported back that the scheme has led to a reduction in vehicular journeys to and from their sites, reducing their carbon emissions and vehicle emissions. SGC have also organised a series of cycle training sessions for residents to improve their skills and confidence to encourage more sustainable travel choices.
- Kingswood Town Centre Regeneration²⁶ - WECA funding from the “Love our High Streets” programme enabled investigation into the redevelopment potential of Kingswood Town Centre. Initial proposals focused on the possibility of re-routing traffic and pedestrianising Regent Street, but detailed technical work uncovered

²⁵ [Electric Vehicle Charging Strategy \(southglos.gov.uk\)](#)

²⁶ [Have Your Say Today - Kingswood Regeneration - Commonplace](#)

significant challenges in being able to deliver a suitable diversion route for traffic to enable pedestrianisation, so the pedestrianisation proposal will not be pursued any further. Alternative measures to deliver improvements are being developed, in consultation with local residents and businesses, and delivered, for example, construction is due to start in Summer 2024 on the first phase of walking and cycling improvements in Kingswood²⁷. Improvements in local air quality will remain a key consideration in future proposals.

- The introduction of the Bristol Clean Air Zone in November 2022, which as a class D CAZ also includes private cars, may have also had a beneficial impact on NO₂ concentrations in South Gloucestershire during 2023 as this was the first full year that the CAZ was in operation. NO₂ levels decreased by 10% on average across Bristol and by almost 13% inside the Clean Air Zone in the first year of operation²⁸. Further information is available on [Bristol's Clean Air Zone](#) webpages and the [Clean Air for Bristol](#) website²⁹. The Government's Vehicle Checker tool can be used to check whether there is a charge to drive any vehicle in any CAZ – [Check your vehicle \(GOV.UK\)](#).

Further information is provided in Section 2.2 of the report. This includes a summary of the A4174 Hambrook Air Quality Scheme that South Gloucestershire Council was legally directed to implement to reduce roadside nitrogen dioxide levels on the A4174 Ring Road between the A4017 Bromley Heath and M32 Motorway Junction 1 roundabouts to meet the annual mean NO₂ concentration limit (40 µg/m³), as set out in the Air Quality Standards Regulations 2010³⁰, in the shortest time possible.

It should be noted that the monitoring data for the Hambrook scheme is not reported in the SGC Air Quality Annual Status Reports (ASRs) as it does not come under our Local Air Quality Management (LAQM) duties. It is reported separately to the Government's Joint Air Quality Unit (JAQU). JAQU are currently assessing the 2022 and 2023 monitoring data and the outcome of this assessment will be published when it is available on the scheme

²⁷ [Community Forum - Kingswood Walking and Cycling Improvements - Commonplace](#)

²⁸ [Bristol's Clean Air Zone Cabinet Report](#)

²⁹ [Clean Air for Bristol | Clean air for everyone | Bristol Clean Air Zone](#)

³⁰ [UK Air Quality Limits - Defra, UK](#)

webpage [Hambrook lights – changes to traffic movements | BETA - South Gloucestershire Council \(southglos.gov.uk\)](#).

Conclusions and Priorities

In 2023, there were no exceedences of the NO₂, PM₁₀, PM_{2.5} and Ozone (O₃) pollutant objectives identified at any of the automatic or non-automatic (diffusion tube) monitoring sites in South Gloucestershire, including in the Kingswood – Warmley and Staple Hill AQMAs. Monitored concentrations of NO₂, PM₁₀, PM_{2.5} in 2023 all decreased from 2022 levels, apart from the PM₁₀ annual mean concentration at the Yate automatic site and the Ozone annual mean concentration at the Stoke Gifford A4174 automatic site, both of which remained similar to 2022 levels.

The 2023 annual mean NO₂ concentrations decreased by an average of 20% across the LAQM diffusion tube sites compared to 2022. Overall since 2019, the NO₂ concentrations across the long-term sites reduced by 34% on average. At the long-standing Yate automatic site, the 2023 NO₂ annual mean concentration decreased by 35% from 2019 and there have been long-term declining trends in both NO₂ and PM₁₀ concentrations over the past decade, although PM₁₀ concentrations have more recently stabilised.

The overall trend of lower NO₂ concentrations than pre-pandemic continued in 2023 at the diffusion tube monitoring sites in both AQMAs with NO₂ concentrations remaining below the annual mean objective and borderline level. Aside from the significant decreases in concentrations in 2020, there has been an overall gradual downward trend in nitrogen dioxide concentrations in the Kingswood – Warmley and Staple Hill AQMAs over the past decade.

The overall reducing trend in NO₂ concentrations since 2019 is likely to be due to the combination of the Covid-19 pandemic restrictions initially and ongoing change in travel behaviour since, along with a cleaner vehicle fleet as newer, cleaner vehicles replace older, more polluting vehicles. The introduction of the Bristol Clean Air Zone in November 2022 may also have had an impact on NO₂ concentrations in South Gloucestershire in 2023 with it being the first full year the CAZ was in operation. However, pollutant concentrations can also vary significantly from one year to the next due to the influence of meteorological conditions.

As of 2023, the Kingswood – Warmley AQMA has been compliant with both the NO₂ annual mean objective and borderline level for 4 years (2020 – 2023), and the Staple Hill AQMA has been compliant with the annual mean objective for 6 years (2018 – 2023) and

the borderline level for 4 years (2020 – 2023). Having reviewed the relevant Defra guidance on when it is considered appropriate to revoke AQMAs, the compliant periods include 2020 and 2021, both of which were impacted by the Covid-19 pandemic and associated lockdowns, so both years are not considered to be representative of long-term trends in NO₂ concentrations.

Noting also that pollutant concentrations can vary significantly from one year to the next due to the influence of meteorological conditions, and with the continuing uncertainties and changes in traffic volumes and travel patterns following the Covid-19 pandemic, a precautionary approach in reviewing the possible revocation of the AQMAs is considered appropriate to ensure reasonable certainty there would not be further objective exceedances, and that below borderline concentrations would be maintained.

For these reasons, and as recommended in the Defra appraisal of SGC's 2023 Air Quality Annual Status Report (Section 2.2, point 1 in the report), we do not propose to consider revocation of either AQMA at this stage but the 2024 monitoring data will be reviewed to ensure that it supports continued compliance before revocation is considered in the 2025 Air Quality Annual Status Report.

Continuing improvement in air quality beyond compliance across South Gloucestershire is of key importance as there is no clear evidence of a safe level of exposure to particulate matter (PM) or NO₂ below which there is no risk of adverse health impacts, so further reductions of particulate matter and NO₂ concentrations below current targets is likely to bring additional health benefits³¹. This emphasises the need for the new Clean Air Action Plan, which aims to improve air quality across the whole district as well as in the AQMAs.

South Gloucestershire Council's priorities for the coming year are to:

- Produce the final Clean Air Action Plan, taking into consideration the outcome of the public consultation, and seek formal approval of the CAAP to enable implementation of the actions to improve air quality within the AQMAs and across South Gloucestershire as a whole.
- Continue to monitor and assess the effectiveness of the JAQU scheme on the A4174 at Hambrook in achieving compliance with the annual mean NO₂ limit value.

³¹ [Air Quality - A guide for directors of public health \(defra.gov.uk\)](https://www.defra.gov.uk/air-quality/guidance/)

- Review the 2024 monitoring data to consider whether revocation of either the Kingswood — Warmley and/or the Staple Hill AQMAs would be appropriate.

The principal challenges and barriers to implementation that South Gloucestershire Council anticipates facing are:

- Significant continued pressure on local government funding, exacerbated by the cost of living crisis and inflationary pressures, which could impact on delivering air quality improvements and funding and resources to implement the final Clean Air Action Plan measures.
- Travel patterns and traffic volumes have changed following the Covid-19 pandemic. Continuing uncertainties and changes in travel behaviour make future transport trends harder to predict.
- Public transport usage continues to be below pre-Covid-19 pandemic levels, which is impacting on the commercial viability of many bus routes with operators responding by reducing or withdrawing services. This makes it harder for travellers to choose sustainable modes of transport over the private car.
- With the increased uptake of electric powered vehicles being constrained due to their upfront cost and the improvements needed to ensure reliable, accessible charging infrastructure³², the knock-on impacts on fleet composition and future trends in pollutant concentrations is difficult to predict.

Local Engagement and How to get Involved

Some local engagement was carried out through the public consultation on our draft Clean Air Action Plan. One of the questions asked in the consultation survey was “How concerned are you about air quality in South Gloucestershire?”. Just over half (55%) of the people who responded to this question said they were concerned about air quality. However, the number of people who responded was relatively small (115 people) considering the population of South Gloucestershire. Continuing to raise awareness and understanding of the impacts of air pollution on health is a key focus and measures to address this are included in the new Clean Air Action Plan.

³² [Electric vehicles and infrastructure - House of Commons Library \(parliament.uk\)](https://www.parliament.uk/libraries/commons/electric-vehicles-and-infrastructure)

What can you do to reduce air pollution?

There are many ways that everyone can help contribute towards improving air quality in South Gloucestershire. By making informed personal choices, particularly around how we travel and heat our homes, we can all reduce our personal contribution to air pollution and help improve air quality and improve our own health in the process.

To reduce pollution when travelling:

- Swap some trips in the car for walking, cycling or taking a bus or train, where possible, as this not only reduces air pollution but also, if walking and cycling, improves your health and wellbeing.
- Consider sharing lifts which will save you money on fuel as well as reducing the number of cars on the road.
- Travel outside peak hours and/or work from home, if possible, to save time spent in traffic and use less fuel, reducing emissions while saving time and money.
- If you are thinking of changing your vehicle, try switching to a less polluting type of vehicle and opt for the cleanest vehicle you feasibly can. Electric vehicles have the lowest emissions and older diesels tend to have the highest emissions. You can check the emissions of a vehicle you are considering purchasing using the Government's [Get vehicle information from DVLA - GOV.UK \(www.gov.uk\)](https://www.gov.uk) website.
- Visit the [West](#)³³ travel information website and the [Better by Bike](#)³⁴ website for live information on public transport, traffic reports, routes and journey planning for walkers and cyclists and other information that simplifies travel choices.

To help reduce pollution from domestic heating:

- From an air quality perspective, if a property does not already have a solid fuel burner, e.g. a stove or fireplace, the best option is not to install one. Even the cleanest wood burning appliance emits significantly more particulate matter pollution than a gas oil or gas appliance.
- If you already own a stove or fireplace and choose to use it, make sure you use the right fuels in the right way to help reduce the amount of fine particulate matter the

³³ [Homepage - WEST \(travelwest.info\)](https://www.travelwest.info)

³⁴ [Homepage - Better By Bike](#)

stove or open fire emits, and reduce the negative impacts on health. Further information is available on the Defra [Burn Better, Breathe Better](#) website. Some of South Gloucestershire is covered by a [Smoke Control Area](#) which allows only approved appliances and fuels to be used.

- Consider installing “clean” renewable energy generation, for example, solar photovoltaics or an air source or ground source heat pump.

There are choices that we can all make to reduce air pollution. Relatively small changes all add up, and if everyone contributes, it can make a big difference overall. Further information is available on our website – [Air quality | BETA - South Gloucestershire Council \(southglos.gov.uk\)](#)

Local Responsibilities and Commitment

This ASR was prepared by South Gloucestershire Council Environmental Protection Team with the support and agreement of officers from the following teams:

Transport Policy (Department for Place)

Public Health and Wellbeing (Department for People)

This ASR has been approved by:

Executive Director of Place (Nigel Riglar), Environmental Health and Trading Standards Manager (Shaun Fudge) and Environmental Protection Team Leader (Allison Jay).

This ASR has been signed off by the Director of Public Health (Sarah Weld).

If you have any comments on this ASR, please contact the Environmental Protection Team at:

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1 Local Air Quality Management

This report provides an overview of air quality in South Gloucestershire during 2023. 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 South Gloucestershire Council to improve air quality and any progress that has been made.

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

2 Actions to Improve Air Quality

2.1 Air Quality Management Areas

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

In 2010, three AQMAs were declared in the centres of both Kingswood and Staple Hill and at Cribbs Causeway adjacent to the M5 Junction 17 roundabout. The Kingswood and Staple Hill AQMAs were extended in 2012 following further assessment and the Council produced an Air Quality Action Plan for the Kingswood and Staple Hill AQMAs³⁵ in 2012, focusing mainly on transport measures.

In December 2015, the Kingswood - Warmley AQMA was declared, extending the 2012 Kingswood AQMA along the A420 corridor east to Warmley. This followed a detailed assessment in 2014 which had identified new locations on this corridor where the nitrogen dioxide annual mean objective was being exceeded.

Work continues to finalise the new Air Quality Action Plan, known as the South Gloucestershire Clean Air Action Plan (CAAP), to replace the 2012 Air Quality Action Plan for Kingswood and Staple Hill. The draft Clean Air Action Plan has been produced to implement the visions and priorities contained within South Gloucestershire's Clean Air Strategy³⁶ and to fulfil the Council's statutory local air quality management duties to update the action plan for the AQMAs. The draft CAAP includes a broad range of actions to improve air quality both within the Kingswood – Warmley and Staple Hill AQMAs and across South Gloucestershire as a whole. Further information is provided in Section 2.2.

Since the declaration of the Cribbs Causeway AQMA in 2010, the nitrogen dioxide concentrations at the façade of the single residential property within the AQMA have been

³⁵ [2012 Air Quality Action Plan Kingswood and Staple Hill \(southglos.gov.uk\)](https://southglos.gov.uk)

³⁶ [Clean Air Strategy 2020 – 2024 BETA - South Gloucestershire Council \(southglos.gov.uk\)](https://southglos.gov.uk)

below the annual mean objective ($40 \mu\text{g}/\text{m}^3$). Following Defra's recommendation to revoke the AQMA and the subsequent consultation in 2019, the Cribbs Causeway AQMA was revoked by a legal order in July 2020.

A summary and description of the two AQMAs currently declared by South Gloucestershire Council can be found in Table 2.1. The air quality objective pertinent to the current AQMA designations is as follows:

- NO₂ annual mean

The levels of exceedance at the declaration of the AQMAs in 2010 and in 2023 are compared in Table 2.1, however the monitoring undertaken within the AQMAs has changed during this timeframe to reflect extensions to the AQMAs and to better represent relevant exposure. Consequently, the monitoring locations in 2023 are not necessarily directly comparable to those in 2010 and comparison between the exceedance levels may not provide a true reflection of trends in NO₂ levels over that timeframe.

In 2020 and 2021, the reduced traffic levels as a result of the Covid-19 pandemic restrictions significantly impacted NO₂ concentrations to the extent that there were no exceedences or "borderline" concentrations i.e. within 10% of the objective ($>36 \mu\text{g}/\text{m}^3$) in either the Kingswood – Warmley or Staple Hill AQMAs. Lower NO₂ concentrations have continued post-pandemic with the 2023 concentrations in both AQMAs remaining below the annual mean objective and borderline level.

The Kingswood – Warmley AQMA has been compliant with both the annual mean objective and borderline level for 4 years (2020 – 2023 inclusive), and the Staple Hill AQMA has been compliant with the annual mean objective for 6 years (2018 – 2023 inclusive) and the borderline level for 4 years (2020 – 2023). Having considered the LAQM Technical Guidance (LAQM.TG22)³⁷ (paragraph 3.57) and the Frequently Asked Question (FAQ) 142³⁸, the compliant periods include 2020 and 2021, both of which were impacted by the Covid-19 pandemic and associated lockdowns, so both years are not considered to be representative of long-term trends in NO₂ concentrations.

Noting also that pollutant concentrations can vary significantly from one year to the next due to the influence of meteorological conditions, and with the continuing uncertainties and

³⁷ [LAQM-TG22-August-22-v1.0.pdf \(defra.gov.uk\)](#)

³⁸ [FAQ 142 - Three or more years of compliance with air quality objectives | LAQM \(defra.gov.uk\)](#)

changes in traffic volumes and travel patterns following the Covid-19 pandemic, a precautionary approach in reviewing the possible revocation of the AQMAs is considered appropriate to ensure reasonable certainty there would not be further objective exceedances and that below borderline concentrations would be maintained to avoid cycling between revoking and declaring the AQMAs again.

For these reasons, and as recommended in the Defra appraisal of SGC's 2023 Air Quality Annual Status Report (Section 2.2, point 1), we do not propose to consider revocation of either AQMA at this stage but the 2024 monitoring data will be reviewed to ensure that it supports continued compliance before revocation is considered in the 2025 Air Quality Annual Status Report.

The trends in annual mean nitrogen dioxide concentrations in the Kingswood –Warmley and Staple Hill AQMAs are shown in Appendix A and discussed in Section 3.2.1.

Further information on the declared or revoked AQMAs, including maps, are available on the Council website [Air quality | BETA - South Gloucestershire Council \(southglos.gov.uk\)](https://www.southglos.gov.uk/air-quality) and on the Defra UK-AIR website [Local Authority Details - Defra, UK](https://www.gov.uk/government/collections/uk-air-quality-reports).

Alternatively, Appendix D provides maps of the current AQMAs and the revoked Cribbs Causeway AQMA and also maps of the air quality monitoring locations in relation to the AQMAs.

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
AQMA 2 Kingswood – Warmley	Declared 14 April 2010 Amended 25 May 2012 Amended 16 December 2015	NO ₂ Annual Mean	The area incorporates A420 road from South Gloucestershire /Bristol City Council boundary in Kingswood extending eastwards to junction of Goldney Avenue in Warmley; to the south along Hanham Road (up to and including The Folly); and to the south-east along Tower Road North to the junction of Crown Gardens; and includes any properties that lie within the outlined boundary.	NO	45.0 µg/m ³ (Site 68 at façade in Kingswood AQMA as declared in 2010. NB: no ground floor exposure)	26.7 µg/m ³ (Site 146ABC at façade in Kingswood – Warmley AQMA) 21.8 µg/m ³ (Site 68 at façade for comparison in former Kingswood AQMA. NB: no ground floor exposure)	4 years (however includes 2020 & 2021 Covid-19 Pandemic impacted years not typical of long-term trends)	Air Quality Action Plan for Kingswood and Staple Hill 2012 (Consultation undertaken on new draft Action Plan from 6 Dec 2022 - 31 Jan 2023)	Visit the 2012 Air Quality Action Plan for Kingswood and Staple Hill (Visit the Draft Clean Air Action Plan)
AQMA 3 Staple Hill	Declared 14 April 2010 Amended 25 May 2012	NO ₂ Annual Mean	The area incorporates the Broad Street (A4175), High Street (B4465), Victoria Street and Soundwell Road (A4017) crossroads; along Broad Street to the junction with York Road; High Street (up to and including nos. 40 and 49); Soundwell Road (up to and including no's 16a	NO	47.9 µg/m ³ (Site 73 in Staple Hill AQMA as declared in 2010. NB: not distance adjusted, no ground floor exposure)	26.2 µg/m ³ (Site 61 in Staple Hill AQMA. NB: Distance adjusted to façade 25.0 µg/m ³ , no ground floor exposure)	6 years (however includes 2020 & 2021 Covid-19 Pandemic impacted years not typical of long term trends)	Air Quality Action Plan for Kingswood and Staple Hill 2012 (Consultation undertaken on new draft Action Plan	Visit the 2012 Air Quality Action Plan for Kingswood and Staple Hill (Visit the Draft Clean Air

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
			and 47); Victoria Street to the junction of Clarence Road; and includes any properties that lie within the outlined boundary.		(For comparison with current year: 47.3 µg/m ³ Site 61 in Staple Hill AQMA as declared in 2010. NB: Not distance adjusted, no ground floor exposure)	(Site 73 unable to compare as no longer operational)		from 6 Dec 2022 - 31 Jan 2023)	Action Plan

- South Gloucestershire Council confirm the information on UK-Air regarding their AQMA(s) is up to date.
- South Gloucestershire Council confirm that all current AQAPs have been submitted to Defra.

2.2 Progress and Impact of Measures to address Air Quality in South Gloucestershire

Defra's appraisal of the 2023 ASR concluded the following:

(The Council's responses are shown in brackets where appropriate)

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. Both of SGDC's AQMAs have been compliant, as assessed as below 10% of the objective at diffusion tube sites, for 3 years (i.e. since 2020). The Council have reviewed their AQMAs and do not intend to revoke at this stage. SGDC are advised to ensure 2023 and 2024 monitoring data supports compliance before considering plans to revoke their AQMAs. (Noted and discussed in this report)*
- 2. SGDC's AQAP was first published in 2012, which is beyond the recommended 5-year period for update. It is noted a new AQAP has undergone consultation into 2023. SGDC should proceed with updating and adopting their new AQAP and provide an update in the next ASR. (An update is provided in this report)*
- 3. The report features a good discussion of the Council's progress with measures to improve air quality, key priorities for the coming year and anticipated challenges. This is encouraging to see.*
- 4. The Council have provided a detailed discussion of PM_{2.5} concentrations, including details on the fraction of mortality attributable to particulate matter and compared this to national and regional values. It is clear that the Council are committed to reducing particulate matter concentrations and should continue the good work in future ASRs.*
- 5. The ASR has been signed off by a Director of Public Health. The collaboration and consultation with those who have responsibility for Public Health is welcomed. It is expected to increase support for measures to improve air quality, with co-benefits for all.*
- 6. Trends have been discussed in detail, with a robust comparison to air quality objectives. The Council have included separate tables which report only monitoring data within each of the AQMAs. This is useful.*

7. *SGDC have included figures which represent the temporal patterns in monitoring data. However, only automatic sites and diffusion tubes within AQMAs have been graphed. It would be beneficial to illustrate trends outside of AQMAs as well. (Graphs will be included in future reports to also show trends in monitoring data outside of the AQMAs)*
8. *PM_{2.5} is not monitored at SG1 however, SGDC have estimated PM_{2.5} concentrations from its PM₁₀ data. This is welcomed.*
9. *Detailed mapping of the Councils monitoring network and AQMAs have been provided in the appendix, with figures at various scales to show both wider context across the District, and also characteristics at each site.*
10. *SGDC have reported on their ozone monitoring in a separate appendix. There were 22 running 8-hour periods where the daily mean concentration was greater than 100µg/m³. This is above the allowed 10 times per year. (An update on ozone monitoring in 2023 is provided in this report in Appendix F)*

South Gloucestershire Council has taken forward a number of measures during the current reporting year of 2023 in pursuit of improving air quality.

Details of the existing Air Quality Action Plan's 41 measures (completed, in progress or planned) are set out in Table 2.2. More detail on these measures can be found in the 2012 Air Quality Action Plan for Kingswood and Staple Hill³⁹. Delivery against this Action Plan has largely been completed where possible. Where there have been, or continue to be, barriers restricting the implementation of the measure, these are also presented within Table 2.2. The top three key Action Plan measures considered to have most effectively contributed to reducing pollution are shown in the top three shaded rows of Table 2.2.

Looking forward, South Gloucestershire Council has prepared a comprehensive, area-wide draft Clean Air Action Plan to replace the 2012 Air Quality Action Plan, which will be the focus of our efforts in future years, once the plan is finalised and approved.

Public Consultation was undertaken on the draft Clean Air Action Plan between 6 December 2022 and 31 January 2023. The consultation sought the views of the public and businesses who may be affected by the actions and gather opinions on a wide range of proposed actions designed to improve air quality within the AQMAs and across South

³⁹ [2012 Air Quality Action Plan Kingswood and Staple Hill \(southglos.gov.uk\)](https://southglos.gov.uk)

Gloucestershire. In total 1,285 copies of the Clean Air Action Plan were downloaded from the consultation webpage⁴⁰ and 119 surveys responses were received. Further information, including a consultation report summarising the responses, is available on the [Clean Air Action Plan - South Gloucestershire Online Consultations \(southglos.gov.uk\)](https://southglos.gov.uk/clean-air-action-plan) webpage. The feedback from the consultation has been considered and will help shape the final Clean Air Action Plan. Work continues to finalise the draft CAAP with completion of the final CAAP anticipated in late 2024.

A key regional plan is the West of England Joint Local Transport Plan 4 (JLTP4) 2020 – 2036⁴¹. One of the five key objectives within the JLTP4 is to “Take action against climate change and address poor air quality” thereby placing a greater emphasis on air quality and climate change in strategic transport planning through to 2036.

During 2023, actions progressed in South Gloucestershire and across the wider West of England region aimed at reducing traffic congestion and improving air quality include:

- Cribbs Patchway Metrobus Extension⁴² - this extension of the Metrobus network⁴³ provides an alternative, fast and direct route between The Mall at Cribbs Causeway and Bristol Parkway railway station (and onto Bristol City centre via the University of West of England). It benefits communities in Stoke Gifford, Patchway and the forthcoming Brabazon new neighbourhood on the former Filton Airfield site. Passenger services began in January 2023 on the M4 Metrobus route. There are currently four Metrobus routes in operation; three of which run between South Gloucestershire and Bristol (M1, M3 and M4 Metrobus services).
- MetroWest ⁴⁴– improved rail services and infrastructure being delivered in two phases by the West of England councils, working in partnership with Network Rail and Great Western Railway.
 - Phase 1 proposes to re-open the Portishead rail line and to enhance local passenger train services on the Bath to Bristol lines and on the Severn

⁴⁰ [Clean Air Action Plan - South Gloucestershire Online Consultations \(southglos.gov.uk\)](https://southglos.gov.uk/clean-air-action-plan)

⁴¹ [Joint Local Transport Plan - Combined Authority \(westofengland-ca.gov.uk\)](https://westofengland-ca.gov.uk/jltp4)

⁴² [m4: Cribbs Causeway to City Centre - WEST \(travelwest.info\)](https://travelwest.info/m4-cribbs-causeway-to-city-centre-west)

⁴³ [metrobus - WEST \(travelwest.info\)](https://travelwest.info/metrobus-west)

⁴⁴ [MetroWest - WEST \(travelwest.info\)](https://travelwest.info/metrowest-west)

Beach/Avonmouth line; this was achieved on the latter line in December 2021 with services from Bristol Temple Meads hourly to Severn Beach and half hourly to Avonmouth, which are funded by WECA.

- Phase 2 proposes to re-open the Henbury Line to an hourly spur passenger service and increase train services between Bristol Temple Meads and Gloucester via Yate to a half-hourly service; the latter commenced from May 2023 and is funded by WECA. Plans for new rail stations are progressing with WECA funding. The Portway Park & Ride station opened in August 2023 and the construction of Ashley Down station began in March 2023 and currently due to be completed in 2024⁴⁵. Planning permission for the new rail station at North Filton was granted in January 2023 and for Charfield⁴⁶ station in March 2023. The target for these stations to be opened is 2027⁴⁷.
- A38 and Bradley Stoke Way improvements – SGC are developing a scheme along the Thornbury to Bradley Stoke Way corridor aimed at improving conditions for people walking, cycling, and travelling by bus. The aim is to encourage mode shift, reduce carbon emissions and consequently improve air quality. Measures include the provision of sections of bus lane and Local Transport Note (LTN) 1/20 standard cycling infrastructure⁴⁸. Funding has been secured to advance the scheme to detailed design and it is envisaged to be open by March 2027.
- A432 Yate to A4174 Ring Road Corridor - SGC are developing a similar scheme along this corridor to improve conditions for people walking, cycling, and travelling by bus to encourage mode shift, reduce carbon emissions and improve air quality. Measures include provision of sections of bus lane and LTN 1/20 standard cycling infrastructure. Funding has also been secured to advance this scheme to detailed design and it is envisaged to be open by March 2027.

⁴⁵ [Ashley Down station - WEST \(travelwest.info\)](https://travelwest.info)

⁴⁶ [Charfield train station | BETA - South Gloucestershire Council \(southglos.gov.uk\)](https://southglos.gov.uk)

⁴⁷ [MetroWest - West of England Combined Authority \(westofengland-ca.gov.uk\)](https://westofengland-ca.gov.uk)

⁴⁸ [Cycle infrastructure design \(LTN 1/20\) - GOV.UK \(www.gov.uk\)](https://www.gov.uk)

- South Gloucestershire Electric Vehicle (EV) Charging Strategy – was adopted in March 2023⁴⁹. The strategy aims to support residents transitioning to EVs through a variety of measures, including the expansion of public charging infrastructure. During 2023/24, the Council have successfully completed an On-Street Residential Charging Scheme, which provided 14 fast (22kW) charging points in eight residential locations. The scheme was implemented to satisfy the current or future demand of residents unable to charge at home due to a lack of off-street parking. The expectation is that this additional infrastructure will continue to support our transition to zero-emission vehicles, improving local air quality and supporting our climate emergency goals.
- SGC are developing plans with local communities for better active travel facilities in Yate and Thornbury ([Have Your Say Today - Getting About In Thornbury - Commonplace](#)). The aim is to make it easier, safer and more attractive to walk, wheel (using a mobility scooter, wheelchair or pushchair) or cycle, especially for those local everyday journeys to school or the shops. When implemented, it is expected the measures will reduce congestion, make the roads and streets quieter and safer, reduce harmful emissions and improve air quality, and encourage more people to get active, thus improving public health.
- SGC continued developing measures to support active travel across the region. The Council set up a new Active Travel Grant with over 40 organisations bidding for a grant, of which 21 organisations were successful. Most successful applicants used their grant for either a pool bicycle/e-bicycle or providing cycle parking. Varying types of organisations received a grant, including community hubs, offices, restaurants, care homes, churches and shops. Participating organisations have reported back that the scheme has led to a reduction in vehicular journeys to and from their sites, reducing their carbon emissions and vehicle emissions. SGC have also organised a series of cycle training sessions for residents to improve their skills and confidence to encourage more sustainable travel choices.
- Kingswood Town Centre Regeneration⁵⁰ - WECA funding from the “Love our High Streets” programme enabled investigation into the redevelopment potential of

⁴⁹ [Electric Vehicle Charging Strategy \(southglos.gov.uk\)](#)

⁵⁰ [Have Your Say Today - Kingswood Regeneration - Commonplace](#)

Kingswood Town Centre. Initial proposals focused on the possibility of re-routing traffic and pedestrianising Regent Street. However, further detailed technical work uncovered significant challenges in being able to deliver a suitable diversion route for traffic to enable pedestrianisation, so the pedestrianisation proposal will not be pursued any further. Alternative measures to deliver improvements are being developed, in consultation with local residents and businesses, and delivered, e.g. construction is due to start in Summer 2024 on the first phase of walking and cycling improvements in Kingswood⁵¹. Improvements in local air quality will remain a key consideration in future proposals.

South Gloucestershire Council will also continue to engage with Bristol City Council and Bath and North East Somerset Council on their Clean Air Plans, both of which include Clean Air Zones, through meetings organised by the West of England Combined Authority.

The Bath Clean Air Zone (CAZ) launched on 15 March 2021 and is a class C CAZ charging high-emission buses, coaches, taxis, private hire vehicles, heavy goods vehicles, vans and minibuses to travel through the zone but not private cars and motorbikes.

Further information, including the CAZ monitoring reports, is available on [Bath's Clean Air Zone](#) website⁵².

The Bristol Clean Air Zone⁵³ launched on 28 November 2022 and, as a Class D CAZ, charges for non-compliant private cars, in addition to the vehicles listed above for the Class C CAZ. Further information is available on [Bristol's Clean Air Zone](#) webpages and the [Clean Air for Bristol](#) website⁵⁴. The Government's Vehicle Checker tool can be used to check whether there is a charge to drive any vehicle in any CAZ – [Check your vehicle \(GOV.UK\)](#).

⁵¹ [Community Forum - Kingswood Walking and Cycling Improvements - Commonplace](#)

⁵² [Bath's Clean Air Zone | Bath and North East Somerset Council \(bathnes.gov.uk\)](#)

⁵³ [Bristol's Clean Air Zone](#)

⁵⁴ [Clean Air for Bristol | Clean air for everyone | Bristol Clean Air Zone](#)

A4174 Hambrook Air Quality Action

Following the Government's UK Air Quality Plan⁵⁵ for nitrogen dioxide published in July 2017, South Gloucestershire Council was mandated to undertake a Targeted Feasibility Study by the Government via a Ministerial Direction issued in March 2018. The study was required to identify actions that could be taken to reduce roadside nitrogen dioxide levels on the A4174 Ring Road between the A4017 Bromley Heath Road and M32 Motorway Junction 1 roundabouts to meet the annual mean NO₂ concentration limit (40 µg/m³) as set out in the Air Quality Standards Regulations 2010⁵⁶, in the shortest time possible.

The study concluded that it would be possible to bring forward compliance on this section of the A4174 if certain traffic management measures were put in place at the Hambrook junction. The outcome of the study was approved by the Joint Air Quality Unit (JAQU); a joint unit formed between Defra and the Department for Transport (DfT) to deliver the national nitrogen dioxide reduction strategies. The feasibility studies of all 33 mandated authorities in the "third wave" of Government air quality action were used to develop the supplement⁵⁷ to the 2017 UK Air Quality Plan and were also published separately by Defra⁵⁸.

The Council was subsequently legally directed through a further Ministerial Direction to implement the identified measures with full funding provided by JAQU. The following measures, also shown in Figure 2.1, were implemented at the A4174 Hambrook junction in August 2019:

- Removal of the right turn onto the B4058 from the westbound carriageway of the A4174 ring road
- Removal of the straight on movement for the B4058 northbound from Frenchay
- Removal of the right turn from the B4058 from Frenchay onto the A4174

⁵⁵ [Air quality plan for nitrogen dioxide \(NO₂\) in UK \(2017\) - GOV.UK \(www.gov.uk\)](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/624222/air-quality-plan-for-nitrogen-dioxide-no2-in-uk-2017.pdf)

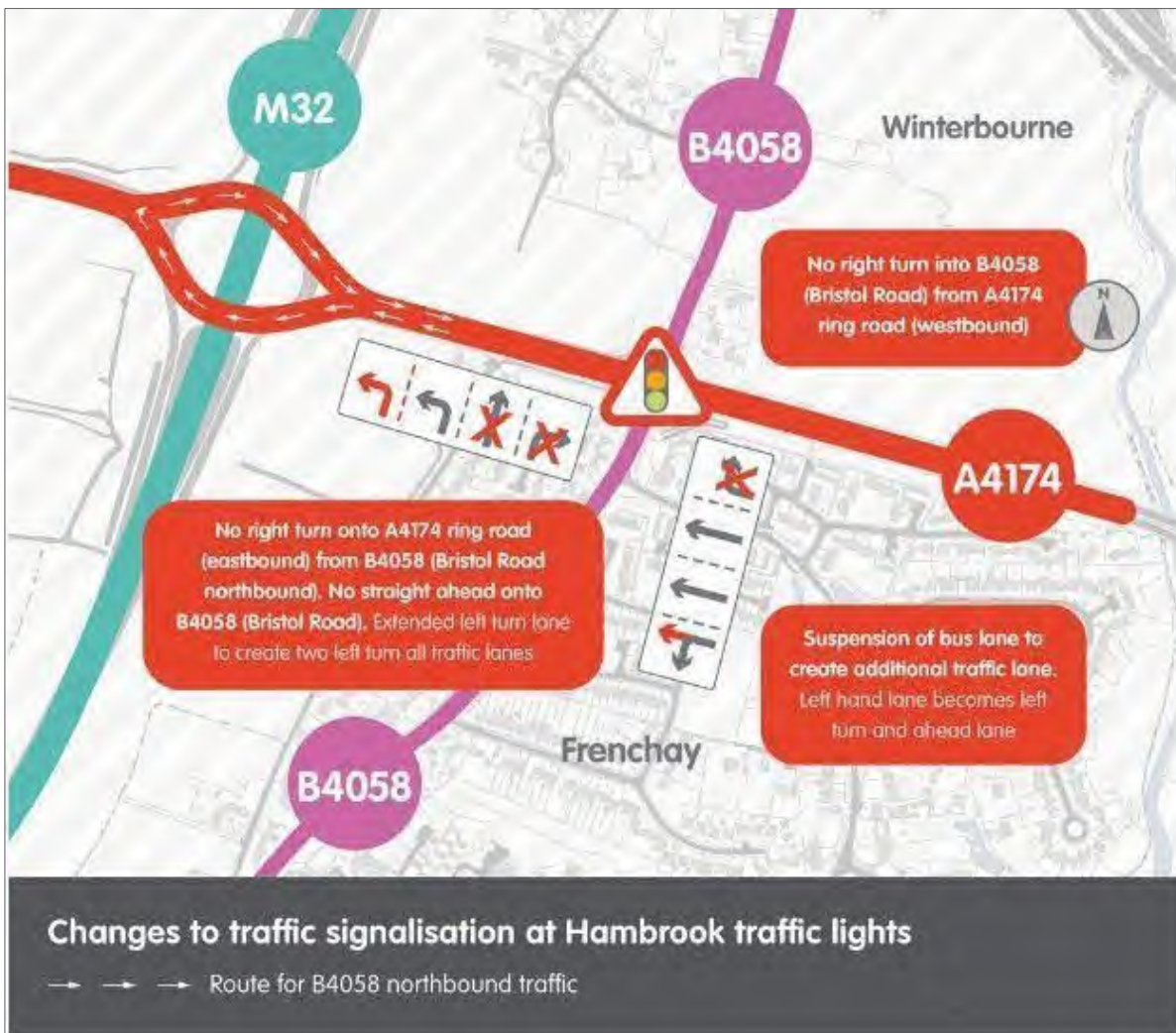
⁵⁶ [UK Air Quality Limits - Defra, UK](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/624222/air-quality-plan-for-nitrogen-dioxide-no2-in-uk-2017.pdf)

⁵⁷ [Supplement to the UK plan for tackling roadside nitrogen dioxide concentrations \(publishing.service.gov.uk\)](https://publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/624222/air-quality-plan-for-nitrogen-dioxide-no2-in-uk-2017.pdf)

⁵⁸ [Supplement to the UK plan for tackling roadside nitrogen dioxide concentrations: local authorities feasibility studies - Defra, UK](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/624222/air-quality-plan-for-nitrogen-dioxide-no2-in-uk-2017.pdf)

- Changing the westbound bus lane to an all-traffic lane on the A4174 through the junction to the M32 traffic signals.

Figure 2.1 – Traffic measures at A4174 Hambrook Junction



While the impacts of these changes result in slightly longer journey times for some routes, as drivers need to go around the M32 Junction 1 roundabout to access the B4058 northbound, and/or the ring road from Frenchay, reducing the time vehicles are stationary at the Hambrook traffic lights and allowing ring road traffic to flow more efficiently, should reduce emissions and improve air quality. Furthermore, changing the bus lane to an all-traffic lane improves the westbound capacity through the junction to the M32 junction.

Additional monitoring was set up at the roadside to monitor the impact of the traffic restrictions at the junction on NO₂ concentrations along the A4174 ring road between the M32 Junction 1 and Bromley Heath roundabouts. This is because the NO₂ annual mean limit value applies where there is public access (with some exceptions), so includes pedestrian and cycle paths. However, the national (UK) air quality objectives, which form the basis of the Local Air Quality Management framework, take “relevant exposure” into

consideration with the objectives applying where the public are regularly present for the averaging period of the objective.; so relevant exposure for the national annual mean NO₂ objective generally relates to long-term exposure, such as at the façades of residential properties and care homes but also schools and hospitals.

The Council has been monitoring nitrogen dioxide levels where people live near this junction for some years in line with LAQM requirements. These results show that the levels are below the national air quality objectives where people live. This is mainly because the houses are set back from the road and pollutant concentrations quickly drop off with increasing distance from the roadside.

Assessment of the effectiveness of the scheme was delayed as it took longer than expected to obtain the required data due to the Covid-19 pandemic. The monitoring data for 2020 and 2021 was not typical of normal conditions due to the reduced traffic levels, and therefore, was not considered to be representative of long-term trends in NO₂ concentrations. 2022 was considered to be representative of “new normal” conditions following the pandemic, although the Bristol Clean Air Zone (CAZ) introduced on 28 November 2022 may have since altered traffic patterns.

Subsequently, diverting traffic from the sudden closure of the A432 Badminton Road/ National Highways M4 Motorway overbridge⁵⁹ in July 2023 has also impacted the surrounding road network, including the A4174 at Hambrook. The M4 overbridge is due to be demolished in Autumn 2024 and replaced with a new overbridge by early 2026.

The Joint Air Quality Unit are currently assessing the 2022 and 2023 monitoring data and the results of this assessment are due later in 2024. The outcome of this assessment will be published when it is available.

Two consecutive years of monitoring data showing roadside NO₂ concentrations comply with the annual mean limit of 40 µg/m³ are required in order to be released from the Ministerial Direction, in addition to demonstrating that NO₂ levels will comply with the legal limit in the future, with or without the restrictions in place.

Further information about the scheme is available on the following webpage [Hambrook lights – changes to traffic movements | BETA - South Gloucestershire Council \(southglos.gov.uk\)](https://www.southglos.gov.uk/transport-and-roads/hambrook-lights-changes-to-traffic-movements) and any updates will also be published here.

⁵⁹ [A432 Badminton Road bridge, crossing the M4 - National Highways](#)

Air Quality and Public Health Progress

Work continued during 2023 to progress the alignment of the air quality agenda and public health outcomes and this has been recognised in the April 2024 refresh of the 2022 – 2025 Divisional Plan for the South Gloucestershire Public Health & Wellbeing (PHWB) Division. The April 2024 refresh specifically mentions the provision of ongoing public health input into the council wide clean air programme as part of the Healthy Lifestyles and Places programme area 2024/2025 priorities.

The South Gloucestershire Population Health Intelligence Portal (PHIP)⁶⁰ is the home of the Joint Strategic Needs Assessment (JSNA). Further information on the PHIP is provided in Section 2.3. The JSNA continues to recognise the built and natural environment as a wider determinant of health and the influence it has on physical and mental health, and on health inequalities. The built and natural environment page was updated in 2023 to include information on the impact that air quality has on health and wellbeing, with accompanying local indicator data. It also highlights the links between access to green space, housing, active travel and sustainable transport and the mutual benefits of these for both mental and physical health.

The South Gloucestershire Joint Health and Wellbeing Strategy 2021 - 2025⁶¹ focusses on four “Strategic Objectives” for collective action. One of these is to “Maximise the potential of our built and natural environment to enable healthy lifestyles and prevent disease”. The Public Health division prepared a detailed report on the above strategic objective for review and comment by the Health and Wellbeing Board in July 2023. The report evidences the progress made towards the seven components of this strategic objective, which includes work contributing to reducing air pollution and maximising use of active travel and community transport. The Board members welcomed the report and discussed opportunities for promoting active travel within their organisations.

The continued commitment of resource from the Public Health team into built environment and air quality work, recognises the importance of this work in terms of public health. This resource was strengthened through the Public Health and Wellbeing Division ‘reset’ in November 2021, where a clear focus on healthy places was recognised and the ‘healthy lifestyles and places’ (HLP) programme area was created and has allowed for aspects of

⁶⁰ [Population Health Intelligence Portal | BETA - South Gloucestershire Council \(southglos.gov.uk\)](#)

⁶¹ [Joint Health and Wellbeing Strategy 2021-25 | BETA - South Gloucestershire Council \(southglos.gov.uk\)](#)

the built and natural environment to be included in the workplans of wider members of the HLP team. This has included an air quality communications schedule in the HLP programme area, which includes the Clean Air Day and Clean Air Night campaigns. Members of the Public Health division also attend the Office for Health Improvement and Disparities (OHID) South West Built Environment network which aims to share developments across this field of work, including air quality.

A succession of Public Health Registrars have led on clean air work, including the 2020 – 2024 South Gloucestershire Clean Air Strategy and the 2022 Director of Public Health (DPH) Annual Report, which was entitled “Clean Air and Climate Change”⁶². The DPH report outlines the potential health and wellbeing impacts of clean air and climate change and recognises the commitment to strengthen the relationship between environmental health and public health to address air quality issues.

The Clean Air and Climate Change Board, co-chaired by the Executive Director of Place and the Director of Public Health, continues to oversee the Clean Air Strategy and development of the Clean Air Action Plan and also covers the Council’s work on Climate Change. This ensures a joined-up approach across the two work areas, which are closely interlinked with often the same sources and interventions and secures alignment with the Council’s Climate Emergency Strategy and Action Plans⁶³.

The Public Health team, and other relevant teams, have also had input into the emerging new South Gloucestershire Council Local Plan⁶⁴. The South Gloucestershire draft local plan phase 3 consultation ran until February 2024. The next stage (Regulation 19 stage) will be the formal publication version of the plan later in 2024.

South Gloucestershire Council continues to work in close partnership with its neighbouring local authorities and the West of England Combined Authority to develop, implement and refine schemes with cross-boundary characteristics. The Council also continues to work with JAQU regarding the A4174 Hambrook Air Quality Scheme.

⁶² [DPH-report-2022.pdf \(southglos.gov.uk\)](#)

⁶³ [Climate and nature emergency in South Gloucestershire | BETA - South Gloucestershire Council \(southglos.gov.uk\)](#)

⁶⁴ [South Gloucestershire New Local Plan | BETA - South Gloucestershire Council \(southglos.gov.uk\)](#)

South Gloucestershire Council's priorities for the coming year are to:

- Produce the final Clean Air Action Plan, taking into consideration the outcome of the public consultation, and seek formal approval of the CAAP to enable implementation of the actions to improve air quality within the AQMAs and across South Gloucestershire as a whole.
- Continue to monitor and assess the effectiveness of the JAQU scheme on the A4174 at Hambrook in achieving compliance with the annual mean NO₂ limit value.
- Review the 2024 monitoring data to consider whether revocation of either the Kingswood — Warmley and/or the Staple Hill AQMAs would be appropriate.

The principal challenges and barriers to implementation that South Gloucestershire Council anticipates facing are:

- Significant continued pressure on local government funding, exacerbated by the cost of living crisis and inflationary pressures, which could impact on delivering air quality improvements and funding and resources to implement the final Clean Air Action Plan measures.
- Travel patterns and traffic volumes have significantly changed following the Covid-19 pandemic. Many organisations have continued to offer flexible working arrangements to their staff, including the ability to work from home for all or part of their contracted hours. This has helped reduce the pressures on the highway network (with Tuesday, Wednesday and Thursdays typically now being the busiest days akin to pre-pandemic conditions). However, the acceleration in the popularity of home delivery services has increased the number of delivery vehicles on the road. Continuing uncertainties and changes in travel behaviour make future transport trends harder to predict.
- Public transport usage continues to be below pre-Covid-19 pandemic levels, which is impacting on the commercial viability of many bus routes with operators responding by reducing or withdrawing services. This makes it harder for travellers to choose sustainable modes of transport over the private car.
- With the increased uptake of electric powered vehicles being constrained due to their upfront cost and the improvements needed to ensure reliable, accessible

charging infrastructure⁶⁵, the knock-on impacts on fleet composition and future trends in pollutant concentrations is difficult to predict.

While South Gloucestershire Council anticipates that the measures stated above and in Table 2.2 should contribute towards continued compliance in the Kingswood - Warmley and Staple Hill AQMAs, the situation will be reviewed in light of the 2024 monitoring data (in the 2025 Annual Status Report) as to whether revocation of the AQMAs could be considered appropriate. The implementation of the new Clean Air Action Plan once finalised and approved, should significantly contribute to maintaining compliance and to improving air quality beyond compliance in future years across South Gloucestershire.

Continuing improvement in air quality is of key importance as there is no clear evidence of a safe level of exposure to particulate matter (PM) or NO₂ below which there is no risk of adverse health impacts, so further reductions of PM and NO₂ concentrations below current targets are likely to bring additional health benefits⁶⁶.

⁶⁵ [Electric vehicles and infrastructure - House of Commons Library \(parliament.uk\)](#)

⁶⁶ [Air Quality - A guide for directors of public health \(defra.gov.uk\)](#)

Table 2.2 – Progress on Measures to Improve Air Quality

Measure No.	Measure Title	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
KS4	Bus partnership (Kingswood) Working with operators to address AQ issues	Vehicle Fleet Efficiency	Promoting Low Emission Public Transport	2013		South Gloucestershire Council in partnership with bus operators and neighbouring local authorities	OLEV Grant	NO	Funded	£1 million - £10 million	Completed	No specific target emissions reduction	Number of buses replaced for lower emission vehicles	The £4.79m OLEV funding for bio-methane buses enabled the delivery of 98 buses and 2 re-fuelling stations in the area. The latest round of Clean Bus Technology Fund (CBTF) enabled 149 buses to be retrofitted with cleaner engines.	Ongoing measure. <i>Note: Progress to date also applies to the corresponding Bus Partnership Measure SS2 for Staple Hill AQMA.</i>
SL3	Review traffic signal numbers and operations (Staple Hill)	Traffic Management	UTC, Congestion management, traffic reduction	2012 - 13	2013/14	South Gloucestershire Council	Defra Air Quality Grant funding/ LTCP	YES	Funded		Completed	No specific target emissions reduction	Improved traffic speeds and reduced congestion	Traffic signals reviewed and amended at the junction of A4175 Broad Street/A4017 Victoria Street in 2012. Upgrading of the traffic signals at the Pendennis Road and Acacia Road junction was completed in 2013, using Defra AQ Grant funding.	<i>Also note corresponding Review traffic signal numbers and operations measure KL4 for Kingswood AQMA where progress includes MOVA signalling system installation at 3 junctions in 2013/14 to improve traffic flow.</i>
SM6	Cycling infrastructure (Staple Hill)	Transport Planning and Infrastructure	Cycle network	2014 - 16		South Gloucestershire Council	DfT Grant funding	NO	Partially Funded	£1 million - £10 million	Implementation	No specific target emissions reduction	Increases in numbers of cyclists.	Two grant funded cycle route lighting schemes were implemented nearby between 2014 and 2016. Priority routes in the area have been identified through the Local Cycling and Walking Infrastructure Plan (LCWIP) adopted by WECA in 2020.	Ongoing measure. Further progress on implementation of LCWIP routes subject to funding availability.
KS1	Travel Plan for Kingswood Civic Centre	Promoting Travel Alternatives	Workplace Travel Planning	2012		South Gloucestershire Council	Local Transport Capital Programme (LTCP)	NO	Funded	£10k - 50k	Completed	No specific target emissions reduction	<ul style="list-style-type: none"> Reduction in solo occupancy vehicles Increased cycling levels Increased walking levels 	Action complete. Implementation of travel plan is continuous process.	
KS2	Parking review (Kingswood)	Traffic Management	Workplace Parking Levy, Parking Enforcement on highway	2015/16	2015/16	South Gloucestershire Council	LTCP	NO	Funded	£10k - 50k	Completed	None, impact considered too small to be measurable	<ul style="list-style-type: none"> Road safety benefits Reduced congestion 	Initial parking review implemented in 2015/16. Following 2nd review, three additional waiting restriction schemes delivered. An electric vehicle charging point with 2 vehicle capacity has been installed at Cecil Road car park in Kingswood.	
KS3	Ensure air quality is a priority in development of transport schemes (Kingswood)	Transport Planning and Infrastructure	Other	2013/14	2013	South Gloucestershire Council	LTCP	NO	Funded		Completed	No specific target emissions reduction	Number of actions taken forward within Capital Programme	The prioritisation framework for the Local Transport Capital Programme (LTCP) was reviewed in 2013, and now includes an assessment of the contribution to meeting LTP carbon emissions/air quality goals.	
KS4	Bus partnership (Kingswood) Working with operators to address AQ issues	Vehicle Fleet Efficiency	Promoting Low Emission Public Transport	2013		South Gloucestershire Council in partnership with bus operators and	OLEV Grant	NO	Funded	£1 million - £10 million	Completed	No specific target emissions reduction	Number of buses replaced for lower emission vehicles	The £4.79m OLEV funding for bio-methane buses has enabled the delivery of 98 buses and 2 re-fuelling stations in the area. The latest round of Clean Bus Technology Fund (CBTF) enabled	

Measure No.	Measure Title	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
						neighbouring local authorities								149 buses to be retrofitted with cleaner engines.	
KS5	Review of Council Fleet to ensure lowest emission vehicles (Kingswood)	Vehicle Fleet Efficiency	Other	2016		South Gloucestershire Council	OLEV Grant	NO	Partially Funded	£100k - £500k	Implementation	No specific target emissions reduction	Reduction in vehicle emissions	The Council has continued to introduce low or zero emission vehicles into its Fleet. All replacement vehicles introduced into the fleet meet or better the latest emission standards. The Council has also been successful in reducing its overall Fleet size. We have conducted base line assessments of CO ₂ emissions across the fleet to assist in targeting future emissions reductions. The Council has also introduced further charging infrastructure to allow the introduction of more electric or hybrid vehicles.	
KS6	Promotion of more efficient use of taxi ranks and bus stops (Kingswood).	Vehicle Fleet Efficiency	Driver training and ECO driving aids	2013		South Gloucestershire Council in liaison with taxi operators and bus operators	Local Transport Capital Programme (LTCP)	NO	Funded	£10k - 50k	Completed	No specific target emissions reduction	Number of bus/taxi operators signed up to programme	Bus lay-by and taxi bay on Regent Street altered to improve traffic flow in June 2013. First Bus regularly review vehicle timing points to remove excessive idling times. The Council continues to work with local bus and taxi operators to encourage the transition of fleets to low emission vehicles.	
KS7	Ensure adequate landscaping is considered within new planning applications and urban designs (Kingswood)	Policy Guidance and Development Control	Other policy	2013	2013	South Gloucestershire Council	Council Funds	NO	Funded	£10k - 50k	Completed	No specific target emissions reduction	Number of new trees planted. NB: Data relating to the indicator for this measure is not currently available.	Policies CS2 and CS9 within the Councils adopted Core Strategy set out how Green Infrastructure and the natural environment is to be planned, delivered and managed within proposed development. Planting schemes using Council own funds have been completed.	
KS8	Promotion of VOSA Smoky Vehicle Hotline (Kingswood)	Public Information	Via the Internet	2013	2013	South Gloucestershire Council	n/a	NO	Funded	< £10k	Completed	No specific target emissions reduction	Number of vehicles reported to VOSA (data not currently available).	Information was added to the Council's website on the Exhaust emissions testing and Improving air quality webpages.	
KM1	School travel planning (Kingswood)	Promoting Travel Alternatives	School Travel Plans	2013		South Gloucestershire Council in conjunction with local schools	DfT Grant Funding	NO	Funded	£500k - £1 million	Implementation	No specific target emissions reduction	'Hands up' surveys within participating schools indicate mode share for pupils arriving at school.	A series of interventions undertaken with LSTF, STTY and Access West funding to promote sustainable travel in schools. The Road Safety Team works with schools to promote active travel across the region, including a school street scheme at Kings Oak Academy.	Further progress subject to funding availability.
KM2	Travel planning for Kingswood Town Centre (Kingswood)	Promoting Travel Alternatives	Intensive active travel campaign & infrastructure	2013		South Gloucestershire Council in conjunction with Kingswood Business Association DfT Grant Funding	DfT Grant Funding	NO	Funded	£500k - £1 million	Implementation	No specific target emissions reduction	Measured by increased: • Cycling levels • Bus patronage • Walking levels	Measures to encourage sustainable travel were previously delivered through LSTF and STTY projects and Access West. In March 2020, the DfT confirmed funding to March 2021 (Access West Y4) to continue to work with Businesses, Schools and Communities to promote and support sustainable and active travel choices. Capability Funding followed	Further progress subject to funding availability.

Measure No.	Measure Title	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
														Access West Y4 and was completed at the end of Q2 2022. This builds on the previous work completed by Access West.	
KM3	Review bus terminals and timing points (Kingswood)	Vehicle Fleet Efficiency	Promoting Low Emission Public Transport	2014/15	2014/15	South Gloucestershire Council in conjunction with bus operators	Undertaken by operators	NO	Funded	< £10k	Implementation	No specific target emissions reduction	Reduction in number of buses idling at bus stops	Review of bus network to reduce number of services terminating in AQMA. Bus stop infrastructure and parking review schemes to improve traffic flow.	
KM4	Smarter Choices promotions/ roadshows (Kingswood)	Promoting Travel Alternatives	Intensive active travel campaign & infrastructure	2014		South Gloucestershire Council	DfT Grant Funding	NO	Funded	£500k - £1 million	Implementation	No specific target emissions reduction	Measured by increased: <ul style="list-style-type: none"> • Cycling levels • Bus patronage • Walking levels Also measure by number of proactive events	The Access West project (finished March 2020) built on work delivered through LSTF and STTY, working with Businesses, Schools and Communities across South Gloucestershire to promote and support sustainable and active travel modes. Access West Year 4 ran through 2020. Large elements of the project had to be adapted quickly in response to Covid-19 restrictions and the impact on travel and engagement work. The Project continued to run the Wheels to Work Project and the Kingswood One Stop Shop was one of the key partners. The Communities Team also continued work by Southern Brooks in uploading the Discover Guide for Kingswood to the Around Your Way microsite for promoting the local area and encouraging active travel modes. The Capability Fund followed Access West Y4 and was completed at the end of Q2 2022. This continued the work of Access West providing support to encourage sustainable and active travel modes across South Gloucestershire.	
KM5	Cycling infrastructure (Kingswood)	Transport Planning and Infrastructure	Cycle network	2015		South Gloucestershire Council	LTCP and DfT Grant Funding	NO	Partially Funded	£1 million - £10 million	Planning	No specific target emissions reduction	Increases in numbers of cyclists.	Priority routes in the area have been identified through the Local Cycling and Walking Infrastructure Plan (LCWIP) adopted by WECA in 2020.	Further progress subject to funding availability.
KL1	ECO Stars Fleet Recognition Scheme (Kingswood)	Vehicle Fleet Efficiency	Fleet efficiency and recognition schemes	n/a		South Gloucestershire Council	Unknown at Present	NO	Not Funded		Planning	No specific target emissions reduction	Membership numbers.	Not currently feasible to implement due to resource availability. Progression of this action is unlikely but will be reviewed as part of AQAP review.	Resource availability currently prevents implementation.
KL2	Car club (Kingswood)	Alternatives to private vehicle use	Car Clubs	n/a		South Gloucestershire Council	Unknown at Present	NO	Not Funded	£50k - £100k	Planning	No specific target emissions reduction	Car club membership	Discussions held in the past with car club operators failed to firm commitment. May be considered as part of the on-going regeneration of the Kingswood shopping area.	
KL3	Restrict traffic turning movements onto A420 (Kingswood)	Traffic Management	UTC, Congestion management, traffic reduction	n/a		South Gloucestershire Council	LTCP	NO	Partially Funded		Aborted	No specific target emissions reduction	Reduction in volume of traffic travelling towards and along A420	Traffic modelling was undertaken to test options commissioned to assess impact of LTCP and developer proposals upon air quality, however no measures were identified that improved the flow of traffic.	

Measure No.	Measure Title	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
KL4	Review traffic signal numbers and operations (Kingswood)	Traffic Management	UTC, Congestion management, traffic reduction	2014		South Gloucestershire Council	LTCP	NO	Partially Funded		Planning	No specific target emissions reduction	Improved traffic speeds and reduced congestion	MOVA signalling system was installed at 3 junctions in the AQMA in 2013/14 to improve traffic flow. A review of mid-block pedestrian signals within the AQMA was undertaken in 2014 and recommended the removal of 1 or 2 pedestrian crossings from Kingswood High Street. The on-going regeneration of Kingswood may make some changes to traffic flow and access arrangements.	Implementation dependant on securing funding.
KL5	Review of delivery bays (Kingswood)	Freight and Delivery Management	Delivery and Service plans	2016/17	2016/17	South Gloucestershire Council	LTCP	NO	Funded	£50k - £100k	Completed	No specific target emissions reduction	<ul style="list-style-type: none"> Number of reported issues with delivery bays Reduced congestion 	Entry and exit kerbing into delivery bays on the High Street have been adjusted to allow easier access and reduce delays and traffic queues. A signing review of delivery bays was completed in 2016/17.	
KL6	Controlled deliveries/collections (Kingswood)	Freight and Delivery Management	Freight Consolidation Centre	n/a		South Gloucestershire Council	Unknown at Present	NO	Not Funded		Planning	No specific target emissions reduction	Number of delivery & collection agreements made with businesses	No further progress. The plans for Kingswood Town Centre will mean this will not be a standalone action and will be considered as part of the town centre regeneration work.	
KL7	Reclassify strategic routes and signing strategy (Kingswood)	Traffic Management	Other	n/a		South Gloucestershire Council	Unknown at Present	NO	Not Funded		Planning	No specific target emissions reduction	Reduction in traffic volumes on and travelling towards A420	No further progress. The new Clean Air Action Plan does not propose to take the measure forward.	
KL8	Taxi ranks (Kingswood)	Promoting Low Emission Transport	Taxi emission incentives	n/a		South Gloucestershire Council in conjunction with taxi operators	Unknown at Present	NO	Not Funded		Planning	No specific target emissions reduction	Production of review report	No further progress. The new Clean Air Action Plan proposes to undertake a review of Taxi Licensing Standards across our area.	
CR39/2013	Improved pedestrian crossing facilities at High St/ Alma Rd	Promoting Travel Alternatives	Promotion of walking	2015/16	2015/16	South Gloucestershire Council	LTCP	NO	Funded	£100k - £500k	Completed	No specific target emissions reduction	Implement infrastructure improvements to promote walking	Scheme added to the Council's Local Transport Capital Programme using the scheme prioritisation framework (see Action KS3). Following design and public consultation the scheme was implemented in 2015/16.	
SS1	Ensure air quality is a priority in development of transport schemes (Staple Hill)	Transport Planning and Infrastructure	Other	2013	2013	South Gloucestershire Council	LTCP	NO	Funded	< £10k	Completed	No specific target emissions reduction	Number of actions taken forward within Capital Programme	The prioritisation framework for the Local Transport Capital Programme (LTCP) was reviewed in 2013, and now includes an assessment of the contribution to meeting LTP carbon emissions/air quality goals.	
SS2	Bus partnership (Staple Hill) Working with operators to address AQ issues	Vehicle Fleet Efficiency	Promoting Low Emission Public Transport	2013		South Gloucestershire Council in partnership with bus operators	OLEV Grant	NO	Funded	£1 million - £10 million	Completed	No specific target emissions reduction	Number of buses replaced for lower emission vehicles.	<p>The £4.79m OLEV funding for bio-methane buses has enabled the delivery of 98 buses and 2 re-fuelling stations in the area.</p> <p>Clean Bus Technology Fund (CBTF) enabled 149 buses to be retrofitted with cleaner engines.</p>	

Measure No.	Measure Title	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
SS3	Review of Council Fleet to ensure lowest emission vehicles (Staple Hill)	Vehicle Fleet Efficiency	Other	2016		South Gloucestershire Council	OLEV Grant	NO	Partially Funded	£100k - £500k	Implementation	No specific target emissions reduction	Reduction in vehicle emissions	The Council has continued to introduce low or zero emission vehicles into its Fleet. All replacement vehicles introduced into the fleet meet or better the latest emission standards. The Council has also been successful in reducing its overall Fleet size. We have conducted base line assessments of CO ₂ emissions across the fleet to assist in targeting future emissions reductions. The Council has also introduced further charging infrastructure to allow the introduction of more electric or hybrid vehicles.	
SS4	Promotion of more efficient use of taxi ranks and bus stops (Staple Hill)	Vehicle Fleet Efficiency	Driver training and ECO driving aids	2015		South Gloucestershire Council in liaison with taxi operators and bus operators	LTCP	NO	Funded	< £10k	Implementation	No specific target emissions reduction	Number of bus/taxi operators signed up to programme	The parking review as part of SM4 is complete. First Bus regularly review vehicle timing points to remove excessive idling times. The Council continues to work with local bus and taxi operators to encourage the transition of fleets to low emission vehicles.	
SS5	Ensure adequate landscaping is considered within new planning applications and urban designs (Staple Hill)	Policy Guidance and Development Control	Other policy	2013	2013	South Gloucestershire Council	Council Funds	NO	Funded	£10k - 50k	Completed	No specific target emissions reduction	Number of new trees planted. NB: Data relating to the indicator for this measure is not currently available.	Policies CS2 and CS9 within the Councils adopted Core Strategy set out how Green Infrastructure and the natural environment is to be planned, delivered and managed within proposed development. Planting schemes using Council own funds have been completed.	
SS6	Promotion of VOSA Smoky Vehicle Hotline (Staple Hill)	Public Information	Via the Internet	2013	2013	South Gloucestershire Council	n/a	NO	Funded	< £10k	Completed	No specific target emissions reduction	Number of vehicles reported to VOSA (data not currently available).	Information was added to the Council's website on the Exhaust emissions testing and Improving air quality webpages.	
SM1	School travel planning (Staple Hill)	Promoting Travel Alternatives	School Travel Plans	2013		South Gloucestershire Council in conjunction with local schools	DfT Grant funding	NO	Funded	£500k - £1 million	Implementation	No specific target emissions reduction	'Hands up' surveys within participating schools indicate mode share for pupils arriving at school.	A series of interventions undertaken annually with LSTF, STTY and Access West funding since 2013 to promote sustainable travel in schools.	Further progress subject to funding availability.
SM2	Travel planning for Staple Hill Town Centre	Promoting Travel Alternatives	Intensive active travel campaign & infrastructure	2014		South Gloucestershire Council in conjunction with Staple Hill Chamber of Trade	DfT Grant funding	NO	Funded	£500k - £1 million	Implementation	No specific target emissions reduction	Measured by increased: • Cycling levels • Bus patronage • Walking levels	Measures to encourage sustainable travel were previously delivered through LSTF and STTY projects and Access West. In March 2020, the DfT confirmed funding to March 2021 (Access West Y4) to continue to work with Businesses, Schools and Communities to promote and support sustainable and active travel choices. The Capability Fund	Further progress subject to funding availability.

Measure No.	Measure Title	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
														followed Access West Y4 and was completed at the end of Q2 in 2022. This has now been replaced by the Capability and Ambition Fund which supports a range of activities across South Gloucestershire.	
SM3	Relocation of bus stops on Soundwell Road (Staple Hill)	Traffic Management	UTC, Congestion management, traffic reduction	n/a		South Gloucestershire Council	LTCP	NO	Partially Funded		Aborted	No specific target emissions reduction	Measured by relocation of bus stop	Bus stop locations reviewed when the shelters were replaced, but due to site constraints a better location could not be found. Action closed, as the bus stops are unable to be re-located.	
SM4	Parking Review (Staple Hill)	Traffic Management	Workplace Parking Levy, Parking Enforcement on highway	2014/15	2014/15	South Gloucestershire Council	LTCP	NO	Funded	£50k - £100k	Completed	Impact of action considered too small to be measurable	Measured by: • Road safety benefits • Reduced congestion	A new electric vehicle charging point with 2 vehicle capacity has been installed at Haynes Lane car park in Staple Hill. A review of parking restrictions within Staple Hill was undertaken. The resulting scheme was delivered as part of the 2014/15 local transport capital programme. Any subsequent issues have been addressed in a further review which is also now complete.	
SM5	Smarter Choices promotions /roadshows (Staple Hill)	Promoting Travel Alternatives	Intensive active travel campaign & infrastructure	2014		South Gloucestershire Council	DfT Grant Funding	NO	Funded	£500k - £1 million	Completed	No specific target emissions reduction	Measured by increased: • Cycling levels • Bus patronage • Walking levels Also measure by number of proactive events	The Access West project (finished March 2020) built on work delivered through LSTF and STTY, working with Businesses, Schools and Communities across South Gloucestershire to promote and support sustainable and active travel modes. Access West Year 4 ran through 2020. Large elements of the project had to be adapted quickly in response to Covid-19 restrictions and the impact on travel and engagement work. The Capability Fund followed Access West Y4 and was completed at the end of Q2 in 2022. This has now been replaced by the Capability and Ambition Fund which supports a range of activities across South Gloucestershire.	
SM6	Cycling infrastructure (Staple Hill)	Transport Planning and Infrastructure	Cycle network	2014 - 16		South Gloucestershire Council	DfT Grant funding	NO	Partially Funded	£1 million - £10 million	Implementation	No specific target emissions reduction	Increases in numbers of cyclists.	Two grant funded cycle route lighting schemes were implemented nearby between 2014 and 2016. Priority routes in the area have been identified through the Local Cycling and Walking Infrastructure Plan (LCWIP) adopted by WECA in 2020.	Further progress subject to funding availability.
SL1	ECO Stars Fleet Recognition Scheme (Staple Hill)	Vehicle Fleet Efficiency	Fleet efficiency and recognition schemes	n/a		South Gloucestershire Council	Unknown at Present	NO	Not Funded		Planning	No specific target emissions reduction	Membership numbers.	Not currently feasible to implement due to resource availability. Progression of this action is unlikely for the foreseeable future but will be reviewed as part of AQAP review.	Resource availability currently prevents implementation.

Measure No.	Measure Title	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
SL2	Car club (Staple Hill)	Alternatives to private vehicle use	Car Clubs	n/a	2025	South Gloucestershire Council	Unknown at Present	NO	Not Funded	£50k - £100k	Planning	No specific target emissions reduction	Car club membership	SGC are supporting the operation of a car club in Staple Hill. Expected to be operational by March 2025	
SL3	Review traffic signal numbers and operations (Staple Hill)	Traffic Management	UTC, Congestion management, traffic reduction	2012 - 13	2013/14	South Gloucestershire Council	Defra Air Quality Grant funding/ LTCP	YES	Funded		Completed	No specific target emissions reduction	Improved traffic speeds and reduced congestion	Traffic signals reviewed and amended at the junction of A4175 Broad Street/A4017 Victoria Street in 2012. Upgrading of the traffic signals at the Pendennis Road and Acacia Road junction was completed in 2013, using Defra AQ Grant funding.	
SL4	Review of delivery bays (Staple Hill)	Freight and Delivery Management	Delivery and Service plans	2013/14	2013/14	South Gloucestershire Council	LTCP	NO	Funded		Completed	No specific target emissions reduction	Measured by • Number of reported issues with delivery bays • Reduced congestion	This action was programmed as part of the Local Transport capital programme. The parking review completed in 2013/14 under SM4 including the review of delivery bays.	
SL5	Restrict traffic turning movements at A4017 junction (Staple Hill)	Traffic Management	UTC, Congestion management, traffic reduction	n/a		South Gloucestershire Council	Unknown at Present	NO	Not Funded		Planning	No specific target emissions reduction	Measured by reduction in traffic volumes at A4017 junction	No progress. The measure is not proposed to be taken forward in the new Clean Air Action Plan.	
SL6	Controlled deliveries/collections (Staple Hill)	Freight and Delivery Management	Freight Consolidation Centre	n/a		South Gloucestershire Council	Unknown at Present	NO	Not Funded		Planning	No specific target emissions reduction	Measured by number of delivery & collection agreements made with businesses	No progress. The measure is not proposed to be taken forward in the new Clean Air Action Plan.	
SL7	Reclassify strategic routes and signing strategy (Staple Hill)	Traffic Management	Other	n/a		South Gloucestershire Council	Unknown at Present	NO	Not Funded		Planning	No specific target emissions reduction	Measured by reduction in traffic volumes on and travelling towards A4017.	No progress. The measure is not proposed to be taken forward in the new Clean Air Action Plan.	

Note:

The top three shaded rows show the top three key Action Plan measures considered to have most effectively contributed to reducing pollution.

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

As detailed in LAQM Policy Guidance (LAQM.PG22)⁶⁷ (Chapter 8) and the Air Quality Strategy⁶⁸, local authorities are expected to work towards reducing emissions and/or concentrations of fine particulate matter (PM_{2.5}). There is clear evidence that PM_{2.5} (particulate matter with an aerodynamic diameter of 2.5 micrometres (µm) or less) has a significant impact on human health, including premature mortality, allergic reactions, and cardiovascular diseases. Short term exposure is known to exacerbate the impact of pre-existing cardiovascular and respiratory health conditions, whilst long term exposure is linked to cardiovascular and respiratory disease, cancer and dementia. There is no evidence of a safe limit for PM_{2.5} exposure.

The inclusion of indicators related to PM_{2.5} in the Public Health Outcomes Framework (PHOF) recognises the significance of this pollutant and its health impacts.

The detail of one of these indicators (formerly known as D01) changed in May 2022. It was previously described as:

Fraction of all cause adult mortality attributable to anthropogenic (originating from human activity) particulate air pollution (measured as fine particulate matter PM_{2.5}).

This has been amended to:

Fraction of all cause adult mortality attributable to particulate air pollution (concentrations of total PM_{2.5}) (new method)

The previous indicator was based on estimates of mortality burden from modelled annual average concentrations of PM_{2.5} originating from human activities in each local authority area.

The indicator has been amended based on recommendations made by the Committee on the Medical Effects of Air Pollutants (COMEAP). Total concentrations of PM_{2.5} are now used as the basis for this indicator. Modelled concentrations of the anthropogenic component of PM_{2.5} (human-made only) are no longer used because of the uncertainty

⁶⁷ [LAQM-Policy-Guidance-2022.pdf \(defra.gov.uk\)](#)

⁶⁸ Defra. Air Quality Strategy – Framework for Local Authority Delivery, August 2023

associated with the assignment to anthropogenic and non-anthropogenic sources, and because non-anthropogenic sources make only a small contribution to total concentrations.

The new indicator can be viewed as the mortality burden associated with long-term exposure to particulate air pollution at current levels, expressed as the percentage of annual deaths from all causes in those aged 30 and over.

The PHOF Indicator; Fraction of mortality attributable to particulate air pollution (new method) (2022)⁶⁹ for South Gloucestershire compared to the neighbouring West of England local authorities, the South West and England values are shown in Table 2.3. Due to indicator methodology, 2022 is the most recent data release for this indicator.

Table 2.3 – PHOF Indicator – Fraction of mortality attributable to particulate air pollution (new method) (2022)

Area	Value (%)
England	5.8
South West Region	4.6
South Gloucestershire	5.7
Bristol	5.7
North Somerset	4.8
Bath and North East Somerset	5.1

Furthermore, the total concentration of PM_{2.5} has been added as an additional PHOF indicator:

Air Pollution: fine particulate matter (new method – concentrations of total PM_{2.5})

The new PHOF indicator; Concentrations of total PM_{2.5} (2022)⁷⁰ for South Gloucestershire, neighbouring local authorities, the South West and England are shown in Table 2.4. Whilst

⁶⁹ [Public health profiles - Fraction of mortality attributable to particulate air pollution - OHID \(phe.org.uk\)](https://publichealthprofiles.org.uk/indicators/fraction-of-mortality-attributable-to-particulate-air-pollution)

⁷⁰ [Public health profiles - Concentrations of total PM_{2.5} - OHID \(phe.org.uk\)](https://publichealthprofiles.org.uk/indicators/concentrations-of-total-pm25)

2021 is the most recent data that can be obtained using the Public Health Outcomes Framework Data Tool, the 2022 data is available at source through Defra’s UK Air Information Resource website⁷¹ so this data has been included in Table 2.4. The indicator is based on population-weighted annual mean concentrations ($\mu\text{g}/\text{m}^3$). Confidence intervals are not produced for this indicator as there is no accepted way of fully quantifying the uncertainty associated with modelled concentrations of $\text{PM}_{2.5}$, therefore, there are limitations with comparing this data to other areas.

Table 2.4 – PHOF Indicator – Concentrations of total $\text{PM}_{2.5}$ (2022)

Area	Value ⁽¹⁾ ($\mu\text{g}/\text{m}^3$)
England	7.8
South West Region	6.1
South Gloucestershire	7.6
Bristol	7.6
North Somerset	6.5
Bath and North East Somerset	6.8

⁽¹⁾ Updated using Defra UK Air Information Resource

Public Health Intelligence Portal

The Public Health Intelligence Portal⁷² is a one-stop shop for data and intelligence on the population of South Gloucestershire. The portal forms part of the South Gloucestershire Health and Wellbeing Board’s Joint Strategic Needs Assessment (JSNA). Its purpose is to use data and intelligence to provide a current and comprehensive overview of the health and wellbeing of the South Gloucestershire population, framed in the context of health inequalities and local strategies. The portal utilises data from the Public Health Outcomes

⁷¹ [Modelled background pollution data - Defra, UK](#)

⁷² [Population Health Intelligence Portal | BETA - South Gloucestershire Council \(southglos.gov.uk\)](#)

Framework, including the data on fine particulate matter detailed above. This ensures that this data is drawn to the attention of those using the portal and also provides a context in which the data can be used, to support a range of work both across and outside the council.

South Gloucestershire Council is taking the following measures to address PM_{2.5}:

- The progress made in implementing measures in the existing Air Quality Action Plan, as detailed in Section 2.2, will contribute to reducing emissions and concentrations of PM_{2.5} as while the measures are primarily aimed at reducing nitrogen dioxide, road traffic is also a source of particulate matter so the implementation of measures will have co-benefits.
- Alongside measures to tackle nitrogen dioxide in the draft Clean Air Action Plan, reducing emissions and concentrations of PM_{2.5} has been considered. The Council understands the potential co-benefits of action plan measures on multiple pollutants of concern and has followed appropriate guidance in developing the new CAAP to include measures that are likely to be beneficial in also reducing PM_{2.5} levels.
- The wider regional transport initiatives, such as the Metrobus services, MetroWest improvements to rail services, improvements in EV charging provision, and facilitating active travel through providing walking and cycling infrastructure, will contribute to reducing emissions and concentrations of PM_{2.5}.
- Dust Management Plans (DMPs), which are usually incorporated into Construction Environmental Management Plans (CEMPs), are routinely conditioned on major development planning permissions to control and minimise the risk of construction dust impacts, and therefore PM_{2.5} emissions, on nearby receptors.
- Regular inspections of industrial processes permitted by the Council where combustion and non-combustion processes could lead to anthropogenic emissions of PM_{2.5}.
- In May 2021, the Air Quality (Domestic Solid Fuels Standards) (England) Regulations 2020⁷³ came into force. These regulations have been introduced to reduce particulate emissions from the residential burning of wood and other solid fuels in domestic heating appliances. The sale of traditional house (bituminous) coal has been phased

⁷³ [The Air Quality \(Domestic Solid Fuels Standards\) \(England\) Regulations 2020 \(legislation.gov.uk\)](https://www.legislation.gov.uk)

out⁷⁴ and the burning of unseasoned “wet” wood has been limited, through tighter controls on the supply, distribution and sale of wood. Burning wet wood can result in at least twice the amount of smoke emissions produced than when seasoned or dry wood is burned. These regulations are being enforced by the Council as appropriate.

- Some of South Gloucestershire is covered by a Smoke Control Area⁷⁵ which allows only approved fuels and appliances to be used. Further expansion of the smoke control area is included as an action in the draft Clean Air Action Plan to better control particulate (and NO_x) emissions from open fires and wood-burning stoves.
- Amendments to the Clean Air Act 1993 made under the Environment Act 2021 came into force from 1 May 2022 which introduced civil financial penalties as a means of enforcement in Smoke Control Areas, thereby changing the offence from a criminal to a civil penalty. Effective enforcement in Smoke Control Areas is a key element of the Government’s plan to reduce particulate pollution levels and the populations exposure to it. The Council’s Environmental Health team will continue to investigate smoke complaints and will issue financial penalties, as appropriate, in line with the approved charging policy of £175 for a first offence and £300 for repeat offences for breaches in our Smoke Control Areas.
- The Council will continue to promote initiatives such as the “Ready to burn” scheme, which aims to increase peoples understanding of the right fuels and the right way to use them, and also Defra’s Burn Better, Breathe Better campaign, which aims to encourage those who use a stove or open fire to take actions that help reduce the amount of fine particulate matter their stove or open fire emits, thereby reducing the negative impacts on health. Further information is available on the following website [Burn Better, Breathe Better: Reduce the negative impact your stove or open fire can have on your health - Defra, UK](#).

PM_{2.5} Targets

While the responsibility for meeting the PM_{2.5} targets sits with national government, local authorities have a role to play in delivering reductions in PM_{2.5}. Although there is no PM_{2.5} regulatory standard for local authorities, the pre-existing annual mean limit value of 20

⁷⁴ [Selling coal for domestic use in England - GOV.UK \(www.gov.uk\)](#)

⁷⁵ [Smoke control areas | South Gloucestershire Council \(southglos.gov.uk\)](#)

$\mu\text{g}/\text{m}^3$ and the exposure reduction target of 20% reduction in concentrations at urban background locations between 2010 and 2020, are a guide. The Environment Act 2021 also introduced new $\text{PM}_{2.5}$ targets through The Environmental Targets (Fine Particulate Matter) (England) Regulations 2023. These are:

- Annual mean concentration target of $10 \mu\text{g}/\text{m}^3$ to be met by 2040 (with an interim target of $12 \mu\text{g}/\text{m}^3$ by 2028). This is to be assessed at national AURN monitoring locations.
- A population exposure reduction target of 35% by 2040, compared to 2018 (with an interim target of 22% reduction in exposure compared to 2018, by 2028). This will be assessed by national modelling.

$\text{PM}_{2.5}$ monitoring started in August 2021 at the Stoke Gifford automatic monitoring site on the A4174 Ring Road near Coldharbour Lane and the University of the West of England (UWE). This site, which also monitors NO_2 , PM_{10} and Ozone (O_3), was set up as part of the Council's "Umbrella" Network for the air quality use case, to provide reference standard pollutant measurements for comparison with data from a network of low-cost indicative sensors located along the A4174 Ring Road from the Bristol and Bath Science Park at Lyde Green to the UWE Frenchay campus. Further information regarding the Umbrella Network is available on the Council website at [UMBRELLA network | BETA - South Gloucestershire Council \(southglos.gov.uk\)](https://www.southglos.gov.uk/umbrella-network).

The $\text{PM}_{2.5}$ monitoring results from the Stoke Gifford A4174 automatic monitoring site are provided in Table A.8 in Appendix A and discussed in Section 3.2.3. In summary, the $\text{PM}_{2.5}$ annual mean for 2023 was $7.6 \mu\text{g}/\text{m}^3$ which is below the pre-existing limit and new target annual means.

To provide an indication of the long-term trends, the local $\text{PM}_{2.5}$ concentrations have also been estimated from the PM_{10} concentrations measured at the Yate automatic monitoring site, using the method specified in Technical Guidance LAQM TG16 Box 7.7 for 2010 to 2020, and from 2021, the concentrations have been estimated as per LAQM.TG22⁷⁶ using national roadside factor provided for each year. The estimated $\text{PM}_{2.5}$ values are compared to the monitored $\text{PM}_{2.5}$ concentrations at the nearest AURN monitoring station (Bristol St Paul's) and the results are presented in Table A.11 in Appendix A.

⁷⁶ [Estimating \$\text{PM}_{2.5}\$ from \$\text{PM}_{10}\$ Measurements | LAQM \(defra.gov.uk\)](https://www.defra.gov.uk/laqm-tg22)

The estimated PM_{2.5} concentration of 6.4 µg/m³ in 2023 for the Yate automatic monitoring site is also below the pre-existing annual mean limit and the new target annual means. The estimated PM_{2.5} concentration shows a greater reduction (45%) in concentrations between 2010 and 2020 than the pre-existing 20% reduction target. A greater reduction (29.7%) in concentrations between 2018 to 2023 is also shown in a shorter time period than the new interim target of 22% reduction in exposure by 2028 (compared to 2018), although, it does not currently meet the 35% reduction in exposure target (compared to 2018) by 2040.

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

This section sets out the monitoring undertaken within 2023 by South Gloucestershire Council and how it compares with the relevant air quality objectives. In addition, monitoring results are presented for a five-year period between 2019 and 2023 to allow monitoring trends to be identified and discussed.

3.1 Summary of Monitoring Undertaken

3.1.1 Automatic Monitoring Sites

South Gloucestershire Council undertook automatic (continuous) monitoring at the following three sites during 2023 with the pollutants monitored shown in brackets:

- Yate – Station Road (NO₂ and PM₁₀)
- Stoke Gifford – A4174 Ring Road near Coldharbour Lane and the University of West England (NO₂, PM₁₀, PM_{2.5} and Ozone (O₃))
- Hambrook – A4174 Ring Road near Old Gloucester Road (NO₂).

Table A.1 in Appendix A shows the details of the automatic monitoring sites. The website [Air Quality in the United Kingdom \(ukairquality.net\)](https://www.ukairquality.net) presents the automatic monitoring results for South Gloucestershire Council. The automatic monitoring results are also available through the UK-Air website⁷⁷, along with national network monitoring results and other local authority automatic monitoring results.

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.

⁷⁷ [Home - Defra, UK-AIR](https://www.ukairquality.net)

3.1.2 Non-Automatic Monitoring Sites

South Gloucestershire Council undertook non- automatic (i.e. passive) monitoring of NO₂ at 99 sites during 2023. Table A.2 in Appendix A presents the details of the non-automatic diffusion tube sites.

Triplicate monitoring (using three diffusion tubes) was undertaken at the three automatic monitoring sites in Yate (Diffusion Tube ID 4A, B & C), Stoke Gifford (192A, B & C) and at Hambrook (191A, B & C) for the co-location studies during 2023.

Triplicate monitoring was also newly set up at the existing single tube site 146 in Kingswood - 34 Hill Street in 2023 to provide additional robust monitoring at this site in light of the possible future revocation of the Kingswood – Warmley AQMA, as site 146 had previously been the single exceeding LAQM site in South Gloucestershire prior to the Covid-19 pandemic in 2018 and 2019.

Ten new single tube sites (sites 193 – 202) were set up in Kingswood in 2023 in response to a proposal for the potential pedestrianisation of Regent Street (East) as part of the Kingswood Regeneration Masterplan⁷⁸. The purpose of the monitoring was to obtain before and after scheme monitoring data (should pedestrianisation go ahead), for the potential traffic diversion routes through the town centre and surrounding area to assess any potential impacts at nearby receptors. However, as explained in Section 2.2, the pedestrianisation scheme is not going to be taken forward due to significant challenges with delivering a suitable diversion route, although the monitoring will remain in place for 2024 as it is nonetheless useful as a wider study of air quality in Kingswood.

The following three diffusion tube sites ceased operation at the start of 2023:

- Site 153 Bradley Stoke – Wheatfield Drive
- Site 155 Stoke Gifford – Earl Close
- Site 156 Stoke Gifford – Lancelot Road

The above three sites were set up in 2015 as part of the North Fringe – Hengrove Metrobus Scheme to obtain before and after monitoring data because the scheme involved new and/or altered highway, which could potentially impact nearby receptors. The planned 8 year monitoring period finished at the end of 2022. The monitored

⁷⁸ [Kingswood Masterplan | BETA - South Gloucestershire Council \(southglos.gov.uk\)](#)

concentrations were consistently well below the annual mean objective at these three sites throughout the duration of the monitoring.

Monitoring has continued at four other sites that were also set up as part of the Metrobus scheme in 2015; Site 152 (Bradley Stoke – Oaktree Crescent), site 154 (Bradley Stoke - Ellan Hay Road), site 157 (Hambrook – Bristol Rd) and site 158 (Downend – Wick Wick Close). While concentrations at these sites have also been consistently below the annual mean objective, the sites remain useful to monitor longer-term trends under the LAQM programme and the results are presented in this report.

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

3.2 Individual Pollutants

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

The results of the Ozone monitoring at the Stoke Gifford A4174 Ring Road automatic monitoring site are reported separately in Appendix F as the Ozone objective is not included in the local air quality management regime due to the transboundary nature of this pollutant.

3.2.1 Nitrogen Dioxide (NO₂)

Table A.3 and Table A.4 in Appendix A compare the ratified and adjusted monitored NO₂ annual mean concentrations for the past five years with the air quality objective of 40µg/m³. Note that the concentration data presented represents the concentration at the location of the monitoring site, following the application of bias adjustment and annualisation, as required (i.e. the values are exclusive of any consideration to fall-off with distance adjustment).

Automatic Monitoring Data

The NO₂ measurements are made using chemiluminescence analysers. The automatic monitoring results at the Yate, Stoke Gifford A4174 and Hambrook A4174 sites show the

NO₂ concentrations were below the annual mean objective of 40 µg/m³ in 2023 (Table A.3).

At Yate, the 2023 annual mean of 12.4 µg/m³ was well below the objective and shows a 5% decrease on the 2022 annual mean of 13 µg/m³. It also shows a 35% decrease from the pre-pandemic 2019 annual mean of 19 µg/m³. This is similar to the trends observed across the national automatic urban and rural monitoring network (AURN) roadside sites where the average 2023 NO₂ annual mean concentration decreased by 7% from 2022 levels and was 30% lower than 2019 levels⁷⁹.

At the A4174 Ring Road automatic monitoring sites, the 2023 NO₂ annual mean at the Stoke Gifford site near Coldharbour Lane was 17.9 µg/m³, which is a 16% reduction from the 2022 annual mean of 21.4 µg/m³. At the Hambrook site, the annual mean was 22.5 µg/m³, which shows a 24% decrease from the 2022 annualised mean of 29.6 µg/m³ (as the site began operating in April 2022). The higher concentrations at these sites compared to Yate is due to the much higher traffic volumes on the A4174 Ring Road.

The trends in the annual mean NO₂ concentrations at the automatic monitoring sites are presented in Figure A.1 (Appendix A). The long-term trend data for Yate shows an overall continuing decline in annual mean NO₂ concentrations since 2013 when the annual mean concentration was 26 µg/m³ and a 52% reduction in NO₂ levels during this period.

Table A.5 in Appendix A compares the ratified continuous monitored NO₂ hourly mean concentrations for the past five years with the air quality objective of 200 µg/m³, not to be exceeded more than 18 times per year.

In 2023, the maximum 1-hour mean at Yate was 77.1 µg/m³ so the 1-hour mean objective was not exceeded. At the Stoke Gifford A4174 Ring Road site, the maximum 1-hour mean was 95.6 µg/m³ and at the Hambrook A4174 site, the maximum 1-hour mean was 136.6 µg/m³ so there were no exceedances of the 1-hour mean objective at either Ring Road site.

Non-Automatic (Diffusion tube) Monitoring Data

The NO₂ annual mean concentrations from the diffusion tube monitoring sites are provided in Table A.4 in Appendix A. The reported data has been bias adjusted and annualised.

⁷⁹ [Nitrogen dioxide \(NO₂\) - GOV.UK \(www.gov.uk\)](https://www.gov.uk)

The full 2023 dataset of monthly mean values for the diffusion tubes is provided in Appendix B. Note that the concentration data presented in Table B.1 includes distance corrected values, only where relevant.

Discussion of 2023 Diffusion Tube Monitoring Data

Exceeding sites

In 2023, there were no exceedences of the annual mean NO₂ objective (40 µg/m³) at the diffusion tube monitoring sites in South Gloucestershire, including in the AQMAs. This has been the case since the Covid-19 pandemic in 2020.

In comparison, prior to the pandemic, there was an exceedance measured at one LAQM monitoring site in South Gloucestershire in both 2019 (42.3 µg/m³) and 2018 (40.8 µg/m³). The single exceeding site was located in the Kingswood – Warmley AQMA at site 146 Kingswood - 34 Hill Street and is at a façade with relevant residential exposure.

In the Staple Hill AQMA, the last exceedance was monitored at one site in 2017. However, relevant exposure was set back from the exceeding site (site 75) and the result at façade when adjusted for distance, was below the objective. A new site at façade (site 164) set up in 2017, which represented relevant exposure better than site 75, showed no exceedance. These two sites ran concurrently until monitoring ceased at site 75 at the end of 2019 when site 164 effectively replaced it.

In the former Cribbs Causeway AQMA, the monitored concentration (17.3 µg/m³) at the façade of the single residential property was well below the annual mean objective in 2023, demonstrating sustained compliance and justifying the revocation of the AQMA in July 2020.

As there were no exceedences of the annual mean objective of 40 µg/m³ in 2023 at the LAQM diffusion tube monitoring sites, consequently there were no annual means greater than 60 µg/m³, which indicates compliance with the 1-hour mean objective.

Borderline sites

There were also no borderline exceedences (i.e. within 10% of the objective at 36 µg/m³ or above) at any of the diffusion tube monitoring sites in 2023, including in either of the AQMAs.

Previously in 2022, there was one site (site 188), located in the north Bristol fringe and outside of the AQMAs, that was approaching the objective (38.7 µg/m³). This was the highest annual mean NO₂ concentration measured at a LAQM diffusion tube site in South

Gloucestershire in 2022. Although the annual mean NO₂ concentration decreased quite significantly to 30.1 µg/m³ at site 188 in 2023, it was again the highest annual mean concentration monitored at any of the LAQM diffusion tube sites in the district.

Site 188 is a roadside monitoring site adjacent to the A38 Gloucester Road in Patchway close to the junction with Hayes Way, which serves as a link to major new development within the Cribbs Patchway new neighbourhood and regional retail and leisure facilities at Cribbs Causeway. As the façades of the nearest residential properties are set back further from the road at site 188, the 2022 borderline result was distance adjusted to the marginally borderline concentration 36.1 µg/m³ at the nearest façade of relevant exposure. While the NO₂ levels reduced at this site in 2023, the site will continue to be closely observed and planning developments that may affect future nitrogen dioxide concentrations at this site will be carefully considered.

Trends in Annual Mean Nitrogen Dioxide Concentrations

In 2023, there were reductions in NO₂ concentrations observed at all of the South Gloucestershire diffusion tube monitoring sites, including in the AQMAs. The annual mean NO₂ concentrations across the LAQM diffusion tube monitoring sites decreased by an average of 20% from the 2022 results. This is a greater reduction than the trend observed across the national automatic urban and rural monitoring network (AURN) roadside sites where the average 2023 NO₂ annual mean concentration decreased by 7% from 2022 levels. Overall since 2019, the average annual mean NO₂ concentration across the long-term LAQM diffusion tube monitoring sites has reduced by 34% which compares well to 30% reduction observed across the AURN roadside sites from 2019 levels⁸⁰.

The overall reducing trend in NO₂ concentrations since 2019 is likely to be due to the combination of the Covid-19 pandemic restrictions initially and ongoing change in travel behaviour since, along with a cleaner vehicle fleet as newer, cleaner vehicles replace older, more polluting vehicles. Pollutant concentrations can also vary significantly from one year to the next due to the influence of meteorological conditions.

The introduction of the Bristol Clean Air Zone in November 2022, which as a class D CAZ also includes private cars, may also have had an impact on NO₂ concentrations in South Gloucestershire during 2023 as this was the first full year that the CAZ was in operation.

⁸⁰ [Nitrogen dioxide \(NO₂\) - GOV.UK \(www.gov.uk\)](https://www.gov.uk)

NO₂ levels decreased by 10% on average across Bristol and by almost 13% inside the Clean Air Zone in the first year of operation⁸¹.

In the Kingswood – Warmley AQMA, the annual mean NO₂ concentrations decreased by an average of 18% from 2022 to 2023 at the monitoring sites in the AQMA. From 2019 to 2023, the annual mean concentrations reduced by an average of 36% in the AQMA.

Until 2020, site 146 on Hill Street in the Kingswood – Warmley AQMA had consistently exceeded the annual mean objective since 2014, and it remained as the only exceeding LAQM site in South Gloucestershire in 2018 and 2019. The pre-pandemic exceedances were likely due to the property façade being very close to the road (approximately 1.6m from the kerb) and that it is on an uphill section of the A420 main road, so vehicles have to work harder to travel up the hill and produce more emissions. In 2023, the highest annual mean concentration in the AQMA was monitored at this site (26.7 µg/m³), however this shows an 18.6% decrease from the 2022 annual mean of 32.8 µg/m³. In comparison to 2019 when site 146 last exceeded the objective with an annual mean concentration of 42.3 µg/m³, there has been an overall decrease of 37% in NO₂ concentrations at this site.

In the Staple Hill AQMA, the annual mean NO₂ concentrations decreased by an average of 20% from 2022 to 2023 at the monitoring sites in the AQMA. Overall, from 2019 to 2023, the annual mean concentrations have reduced by an average of 34% in this AQMA. The 2023 concentrations were below the borderline level of 36 µg/m³ at all the monitoring sites in the AQMA, with the highest concentration (26.2 µg/m³) monitored at site 61 – 1 Broad Street. However, as this site is not at façade, adjusting for distance reduces this to 25.0 µg/m³ at façade. The highest monitored concentration at façade was 22.8 µg/m³ at site 165 – 3 Soundwell Road, which is a 24% reduction on the 2022 monitored concentration (29.9 µg/m³) at this site.

The Kingswood – Warmley AQMA has been compliant with both the annual mean objective and borderline level for 4 years (2020 – 2023), and the Staple Hill AQMA has been compliant with the annual mean objective for 6 years (2018 – 2023) and borderline level for 4 years (2020 – 2023). For the reasons discussed previously in Section 2.1, it is not proposed to consider revocation of either AQMA at this stage but the 2024 monitoring data will be reviewed to ensure it supports continued compliance before revocation is considered in the 2025 Air Quality Annual Status Report.

⁸¹ [Bristol's Clean Air Zone Cabinet Report](#)

The trends in annual mean nitrogen dioxide concentrations measured at the diffusion tube monitoring sites in the Kingswood - Warmley and Staple Hill Air Quality Management Areas are shown in graphs in Appendix A. Aside from the significant decreases in concentrations in 2020 due to Covid-19 pandemic impacts, an overall gradual downward trend can be seen in nitrogen dioxide concentrations in the Kingswood – Warmley and Staple Hill AQMAs over the past decade. For ease of reference, the diffusion tube monitoring results for the Kingswood – Warmley and Staple Hill AQMAs can be found in Table A.9 and Table A.10 respectively.

3.2.2 Particulate Matter (PM₁₀)

The PM₁₀ measurements are made using BAM 1020 particulate monitors and the monitoring data has been adjusted to gravimetric equivalent, using the appropriate factor depending on instrument type, and annualised where relevant (see Appendix C).

Table A.6 in Appendix A: Monitoring Results compares the ratified and adjusted monitored PM₁₀ annual mean concentrations for the past five years with the air quality objective of 40µg/m³. In 2023, the PM₁₀ concentrations measured at the Yate and Stoke Gifford A4174 automatic sites were below the annual mean objective.

The 2023 PM₁₀ annual mean at the Yate site was 12.3 µg/m³, which is similar to the 2022 annual mean of 12 µg/m³. Concentrations have remained below the pre-pandemic annual mean of 13 µg/m³ in 2019, although slightly higher than the 2020 annual mean of 11 µg/m³. This is similar to the trend in annual average PM₁₀ concentrations observed at the national AURN roadside sites⁸², which have remained relatively stable between 2015 and 2023, but overall, roadside PM₁₀ concentrations have shown long-term improvement.

The trends in the annual mean PM₁₀ concentrations at the automatic monitoring sites are presented in Figure A.2 (Appendix A). The long-term trend data for Yate shows that overall, the annual mean PM₁₀ concentrations have been slowly declining from 15 µg/m³ in 2013 but more recently stabilising. There has been an 18% reduction in annual mean PM₁₀ concentrations over the last decade at Yate.

At the Stoke Gifford A4174 site, the annual PM₁₀ mean for 2023 was 17.9 µg/m³, which is a 11% decrease from the 2022 annual mean of 20 µg/m³. The higher concentrations at

⁸² [Particulate matter \(PM₁₀/PM_{2.5}\) - GOV.UK \(www.gov.uk\)](https://www.gov.uk)

this site than those monitored at Yate is likely to be due to the much greater volume of traffic on the A4174 Ring Road and the relative proximity of the M32 and M4 motorways.

Table A.7 in Appendix A compares the ratified continuous monitored PM₁₀ daily mean concentrations for the past five years with the air quality objective of 50µg/m³, not to be exceeded more than 35 times per year.

In 2023, at Yate, the maximum 24-hour mean was 35.9 µg/m³ so the daily limit was not exceeded. At the Stoke Gifford A4174 site, the maximum 24-hour mean was 59.2 µg/m³ and there was 1 exceedance of the 24-hour daily mean (on 7th February). However there is an allowance of 35 days, so the objective was not exceeded.

3.2.3 Particulate Matter (PM_{2.5})

South Gloucestershire Council started monitoring PM_{2.5} from August 2021 at the Stoke Gifford A4174 Ring Road automatic monitoring site near Coldharbour Lane and the University of the West of England. The PM_{2.5} measurements are made using a smart heated Beta Attenuation Monitor (BAM 1020) particulate monitor and do not require correction.

Table A.8 in Appendix A presents the ratified and adjusted monitored PM_{2.5} annual mean concentrations for the past three years from the Stoke Gifford automatic monitoring site.

The PM_{2.5} annual mean for 2023 was 7.6 µg/m³ which is a 16% decrease from the 2022 annual mean of 9 µg/m³. This is below the pre-existing annual mean limit of 20 µg/m³ and the new annual mean concentration target of 10 µg/m³ to be met by 2040 (and the interim target of 12 µg/m³ by 2028) introduced by The Environmental Targets (Fine Particulate Matter) (England) Regulations 2023.

While these targets are not set as an LAQM standard because the responsibility for meeting PM_{2.5} targets sits with national government, local authorities have a role to play in delivering reductions in PM_{2.5} as discussed previously in Section 2.3.

The PM_{2.5} concentrations have also been estimated from the PM₁₀ concentrations measured at the Yate automatic monitoring site to provide an indication of local long-term trends in Section 2.3.

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)
SG1	Yate Station Road	Roadside	370418	182525	NO ₂ PM ₁₀	NO	Chemiluminescent Gravimetric (BAM 1020 Unheated)	N/A	6	NO ₂ 1.6 PM ₁₀ 1.8
SG2	Stoke Gifford A4174 Coldharbour Lane	Roadside	362384	178562	NO ₂ PM ₁₀ PM _{2.5} O ₃	NO	Chemiluminescent Gravimetric (BAM 1020 Smart Heated) Gravimetric (BAM 1020 Smart Heated) Absorption	N/A	10.2	NO ₂ 2.7 PM ₁₀ 2.9 PM _{2.5} 2.9 O ₃ 2.7
SG3	Hambrook A4174 Old Gloucester Road	Roadside	363772	178501	NO ₂	NO	Chemiluminescent	N/A	6.3	1.5

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.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)
1	Yate - 88 Station Road The Candle	Roadside	370692	182499	NO ₂	No	4.6	2.5	No	2.7
4A, 4B, 4C	Yate - Station Road Co-location	Roadside	370418	182525	NO ₂	No		6.0	Yes	2.4
10	Filton - 152 Gloucester Road North Pizza Bello façade	Roadside	360266	179136	NO ₂	No	0.0	3.5	No	2.3
11	Thornbury - 48 High Street	Kerbside	363654	189893	NO ₂	No	2.8	0.6	No	2.5
12	Stoke Gifford - Church Road rear of Aviva	Roadside	362161	179570	NO ₂	No		1.0	No	2.5
13	Filton - A4174 MOD roundabout	Roadside	361523	178732	NO ₂	No		1.0	No	2.3
21	Downend - Boscombe Crescent St Augustine's Church	Urban Background	365673	177475	NO ₂	No		1.5	No	2.5
27	Kingswood - 90 Regent Street Nat West	Roadside	364866	173835	NO ₂	Yes (Kingswood - Warmley)	0.0	2.0	No	2.8
29	Staple Hill - 123 High Street Backhouse Bet	Roadside	364822	175932	NO ₂	Yes (Staple Hill)	2.0	1.0	No	2.7
34	Bradley Stoke - 109 Ormonds Close (M4 East of Almondsbury Interchange)	Roadside	362395	182544	NO ₂	No	11.0	24.8 (M4 33)	No	2.5
35	Bradley Stoke - Woodlands Lane (M4 East of Almondsbury Interchange)	Roadside	362118	183031	NO ₂	No	9.8	3.3 (M4 22.5)	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)
37	Almondsbury - Old Aust Road (M4 West of Almondsbury Interchange)	Roadside	361147	184846	NO ₂	No		7 (M4)	No	2.3
38	Severn Beach - Ableton Lane Severn Beach Primary School façade	Urban Background	354282	184653	NO ₂	No	0.0	49.0	No	2.3
44	Stoke Gifford - Hatchet Road	Roadside	362061	180025	NO ₂	No	14.0	4.0	No	2.5
46	Winterbourne - High Street opp Winterbourne Academy	Roadside	364852	180758	NO ₂	No	16.5	1.3	No	2.6
53	Hambrook - Bristol Road rear of 17 Fenbrook Close	Roadside	363907	178389	NO ₂	No	16.0	6.5	No	1.9
54	Longwell Green - A431/Aldermoor Way	Roadside	365256	171656	NO ₂	No		1.5	No	2.7
57	Coalpit Heath - 225 Badminton Road GT Plumbing & Heating	Roadside	367742	181160	NO ₂	No	12.0	2.0	No	2.5
61	Staple Hill - 1 Broad Street William Hill	Roadside	364926	175926	NO ₂	Yes (Staple Hill)	1.0	2.3	No	2.4
62	Staple Hill - 2 Broad Street 501 Bar	Roadside	364909	175908	NO ₂	Yes (Staple Hill)	0.0	1.5	No	2.5
63	Patchway - 28 Park Leaze	Roadside	359487	182479	NO ₂	No	8.0	1.5	No	2.5
67	Kingswood - 40 Regent Street Hays Travel	Roadside	364671	173877	NO ₂	Yes (Kingswood - Warmley)	0.0	2.5	No	2.8
68	Kingswood - 26-32 Regent Street Store Twenty One	Roadside	364631	173886	NO ₂	Yes (Kingswood - Warmley)	0.0	2.5	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)
69	Kingswood - 12 Regent Street Domino's Pizza	Roadside	364597	173892	NO ₂	Yes (Kingswood - Warmley)	0.0	2.5	No	2.6
70	Kingswood - Two Mile Hill Road Job Centre Plus	Roadside	364533	173896	NO ₂	Yes (Kingswood - Warmley)	0.0	2.5	No	2.5
71	Staple Hill - 11 The Square Bunch Florist	Roadside	365075	175918	NO ₂	Yes (Staple Hill)	0.5	6.5	No	2.6
72	Staple Hill - 25 Broad Street Westbury Inks	Roadside	364990	175920	NO ₂	Yes (Staple Hill)	6.5	1.5	No	2.7
74	Staple Hill - 29-31 Soundwell Rd opp Page Comm Assoc	Kerbside	364885	175772	NO ₂	Yes (Staple Hill)	4.0	0.4	No	2.5
76	Staple Hill - 84-86 High Street Staple Hill Oak Pub	Roadside	364722	175926	NO ₂	Yes (Staple Hill)	0.0	2.0	No	2.6
83	Chipping Sodbury - 51A Broad Street façade	Roadside	372791	182241	NO ₂	No	0.0	4.7	No	2.2
87	Cribbs Causeway - Blackhorse Hill Hollywood Cottage façade	Roadside	357739	181334	NO ₂	No	0.0	13.0	No	1.7
92	Kingswood - Regent Street Entertainment & Sports Club	Roadside	364968	173836	NO ₂	Yes (Kingswood - Warmley)	0.0	2.0	No	2.4
93	Kingswood - Hanham Road Exchange Court Flats	Roadside	364979	173801	NO ₂	Yes (Kingswood - Warmley)	0.0	2.0	No	2.4
95	Kingswood - 45 High Street Adam Lee	Roadside	365078	173846	NO ₂	Yes (Kingswood - Warmley)	0.0	2.7	No	2.7

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)
105	Staple Hill - 2 North Street	Roadside	364932	176147	NO ₂	Yes (Staple Hill)	2.5	2.0	No	2.7
113	Patchway - 5 Falcon Close façade	Roadside	359112	181909	NO ₂	No	0.0	7.5 (M5 45)	No	1.9
114	Pilning - 23 Keens Grove façade	Roadside	355263	185351	NO ₂	No	0.0	7.0	No	2.3
115	Pilning - 2 Wick Road façade	Roadside	355212	185360	NO ₂	No	0.0	8.5	No	2.3
117	Filton Northville - 29 Gloucester Rd Nth Rowe Vets	Roadside	359874	178259	NO ₂	No	2.5	2.9	No	2.5
119	Filton - 137 Gloucester Rd Nth	Roadside	360263	179250	NO ₂	No	0.5	3.6	No	2.5
122	Filton - 549 Filton Avenue	Roadside	360566	178229	NO ₂	No	4.5	4.0	No	2.1
124	Filton - 702a Filton Ave Way Ahead	Roadside	360918	178905	NO ₂	No	6.6	1.9	No	2.3
125	Filton - 71 Station Rd	Roadside	360891	179005	NO ₂	No	5.4	0.5 (A4174 9.3)	No	2.4
128	Kingswood - 109 Downend Road	Roadside	364587	174431	NO ₂	No	1.6	1.4	No	2.6
129	Cribbs Causeway – 1 Holly Cottages façade	Roadside	357508	181059	NO ₂	No	0.0	18 (M5 44)	No	2.1
132	Hanham - 66 High St Sassy Hair Studio	Roadside	364178	172337	NO ₂	No	0.6	2.7	No	2.5
133	Hambrook - 123 Old Gloucester Road façade	Roadside	363736	178507	NO ₂	No	0.0	10.4 (A4174)	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)
134	Hambrook - Bristol Rd Old Bakery façade	Roadside	364048	178719	NO ₂	No	0.0	2.2	No	1.9
135	Frenchay - Harford Drive Dyrham Flats	Roadside	364029	178413	NO ₂	No	12.7	24.5 (A4174)	No	2.3
136	Little Stoke - 26 Gipsy Lane façade	Roadside	361242	180544	NO ₂	No	0.0	12.0	No	2.8
137	Warmley - 35 High Street	Roadside	366984	173563	NO ₂	Yes (Kingswood - Warmley)	0.0	1.9	No	2.5
138	Warmley - 18 High Street façade	Roadside	366941	173558	NO ₂	Yes (Kingswood - Warmley)	0.0	2.0	No	2.4
139	Warmley - 14 High Street (former Webbs) façade	Roadside	366890	173560	NO ₂	Yes (Kingswood - Warmley)	0.0	2.3	No	2.6
141	Warmley - 41 Deanery Road façade	Roadside	366705	173581	NO ₂	Yes (Kingswood - Warmley)	0.0	7.7	No	2.7
142	Warmley - 33 Deanery Road Warmley Court façade	Roadside	366613	173597	NO ₂	Yes (Kingswood - Warmley)	0.0	8.9 (A4174 18.2)	No	2.1
143	Warmley - 1 High Street Ideal Pharmacy façade	Roadside	366815	173574	NO ₂	Yes (Kingswood - Warmley)	0.0	5.0	No	2.5
146A, 146B, 146C	Kingswood - 34 Hill St façade	Roadside	365910	173680	NO ₂	Yes (Kingswood - Warmley)	0.0	1.6	No	2.2
147	Soundwell - 264 Soundwell Rd façade	Roadside	364586	174496	NO ₂	No	0.0	2.6	No	2.3
148	Filton - 109 Gloucester Road North façade	Roadside	360077	178900	NO ₂	No	0.0	10.2	No	1.9

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)
149	Filton - 707 Southmead Road façade	Roadside	360050	179021	NO ₂	No	0.0	9.8	No	1.8
150	Soundwell - 296 Soundwell Road façade	Roadside	364528	174425	NO ₂	No	0.0	4.3	No	1.7
151	Hambrook - Bristol Road Old Bakery FP Signpost	Roadside	364049	178726	NO ₂	No	0.0	1.2	No	2.3
152	Bradley Stoke - 188 Oaktree Crescent	Roadside	360945	182831	NO ₂	No	0.3	9.0	No	2.3
154	Bradley Stoke - 166 Ellan Hay Road façade	Roadside	363242	180724	NO ₂	No	0.0	9.7	No	1.8
157	Hambrook - Bristol Road Poplars House Garage façade	Roadside	363999	178505	NO ₂	No	14.5	20.2 (A4174 25.1)	No	1.9
158	Downend - 5 Wick Wick Close façade	Roadside	366157	178557	NO ₂	No	0.0	20.2 (A4174)	No	2.1
159	Wickwar - 21 High Street façade	Roadside	372395	188581	NO ₂	No	0.0	2.5	No	2.3
160	Staple Hill - 62 High Street	Roadside	364655	175931	NO ₂	Yes (Staple Hill)	0.4	1.6	No	2.9
161	Staple Hill - 13 Victoria Street façade	Roadside	364906	176022	NO ₂	Yes (Staple Hill)	0.0	4.4	No	2.0
162	Staple Hill - 28 Victoria Street façade	Roadside	364925	176062	NO ₂	Yes (Staple Hill)	0.0	4.8	No	1.9
163	Staple Hill - 2 Victoria Street façade	Roadside	364918	175979	NO ₂	Yes (Staple Hill)	0.0	4.8	No	1.9
164	Staple Hill - 102 High Street Jay Jays Hair façade	Roadside	364811	175919	NO ₂	Yes (Staple Hill)	0.0	3.5	No	2.1

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)
165	Staple Hill - 3 Soundwell Rd Chinese Kitchen façade	Roadside	364906	175864	NO ₂	Yes (Staple Hill)	0.0	1.5	No	2.5
166	Kingswood - 12 Cecil Road	Roadside	364770	173695	NO ₂	No	2.1	1.5	No	2.6
167	Kingswood - 7 Downend Road	Roadside	364652	173957	NO ₂	No	2.9	2.3	No	2.4
168	Kingswood - 133 High Street façade	Roadside	365366	173805	NO ₂	Yes (Kingswood - Warmley)	0.0	3.1	No	2.4
169	Warmley - 20 Deanery Road Warmley Community Centre façade	Roadside	366714	173560	NO ₂	Yes (Kingswood - Warmley)	0.0	4.2	No	2.4
170	Patchway - 204 Gloucester Road front façade	Roadside	360606	181675	NO ₂	No	0.0	10.5	No	2.3
172	Downend - 31 Badminton Road Forage façade	Roadside	365153	176812	NO ₂	No	0.0	5.4	No	2.2
173	Mangotsfield - 10 Cossham Street façade	Roadside	366459	176139	NO ₂	No	0.0	2.4	No	2.3
174	Charfield - 25 Wotton Road façade	Roadside	372011	192189	NO ₂	No	0.0	4.7	No	2.4
180	Wick - 70 High Street The Old Post Office façade	Roadside	370605	172681	NO ₂	No	0.0	1.6	No	2.3
181	Warmley - 16 London Road façade	Roadside	367298	173452	NO ₂	Yes (Kingswood - Warmley)	0.0	1.7	No	2.1
185	Staple Hill - High Street Pendennis Park Flats	Roadside	364634	175946	NO ₂	Yes (Staple Hill)	1.4	4.0	No	2.4

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)
187	Thornbury - Rock Street Grace Lodge	Roadside	363785	189856	NO ₂	No	2.5	1.4	No	2.5
188	Patchway - 43 Gloucester Road nr Hayes Way	Roadside	360450	181066	NO ₂	No	2.3	3.6	No	2.8
189	Kingswood - 2 Hill St Premier Store	Roadside	365668	173738	NO ₂	Yes (Kingswood - Warmley)	0.0	2.6	No	2.3
191A, 191B, 191C	Hambrook - A4174 Old Gloucester Road Co-location	Roadside	363773	178500	NO ₂	No		6.7	Yes	2.1
192A, 192B, 192C	Stoke Gifford - A4174 Coldharbour Lane Co-location	Roadside	362384	178562	NO ₂	No		10.2	Yes	2.6
193	Kingswood - 285 New Cheltenham Road	Roadside	365981	174370	NO ₂	No	0.0	2.1	No	2.8
194	Kingswood - Kimberley Road nr Downend Rd Junction	Kerbside	364655	174020	NO ₂	No	5.0	0.7	No	2.8
195	Kingswood - 7 Gilbert Road	Roadside	364874	174009	NO ₂	No	2.0	1.6	No	2.8
196	Kingswood - 23 Hanham Road	Roadside	364991	173592	NO ₂	No	3.4	1.5	No	2.8
197	Kingswood - 26 Moravian Road	Kerbside	364813	173730	NO ₂	No	2.6	0.4	No	2.8
198	Kingswood - 17A Cecil Road nr Blackhorse Rd junction	Roadside	364538	173666	NO ₂	No	0.0	2.1	No	2.8
199	Kingswood - Blackhorse Road Flat 6 Sunday House	Roadside	364510	173746	NO ₂	No	0.0	1.2	No	2.8

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)
200	Kingswood - 3 Regent Street Zahringer Jewellers	Roadside	364583	173906	NO ₂	Yes (Kingswood - Warmley)	2.4	2.2	No	2.4
201	Kingswood - 25 Regent Street Centre of Attention Hair & Beauty façade	Roadside	364645	173895	NO ₂	Yes (Kingswood - Warmley)	0.0	2.3	No	2.4
202	Kingswood - 123 Regent Street Cut & Run Barbers	Roadside	364952	173851	NO ₂	Yes (Kingswood - Warmley)	0.0	3.4	No	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.

(3) Co-ordinates for sites 128, 147 and 150 are in South Gloucestershire – these sites are adjacent to SGC/Bristol CC boundary.

Table A.3 – Annual Mean NO₂ Monitoring Results: Automatic Monitoring (µg/m³)

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2023 (%) ⁽²⁾	2019	2020	2021	2022	2023
SG1 Yate Station Road	370418	182525	Roadside	98.8	98.8	19	14	15	13	12.4
SG2 Stoke Gifford A4174 Coldharbour Lane	362384	178562	Roadside	99.5	99.5			21.4	21	17.9
SG3 Hambrook A4174 Old Gloucester Road	363772	178501	Roadside	95.2	95.2				29.6	22.5

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

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

Where exceedances of the NO₂ annual mean objective occur at locations not representative of relevant exposure, the fall-off with distance concentration has been calculated and reported concentration provided in brackets for 2023.

Notes:

The annual mean concentrations are presented as µg/m³.

Exceedances of the NO₂ annual mean objective of 40µg/m³ 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%).

Figure A.1 – Trends in Annual Mean NO₂ Concentrations at Automatic Monitoring Sites

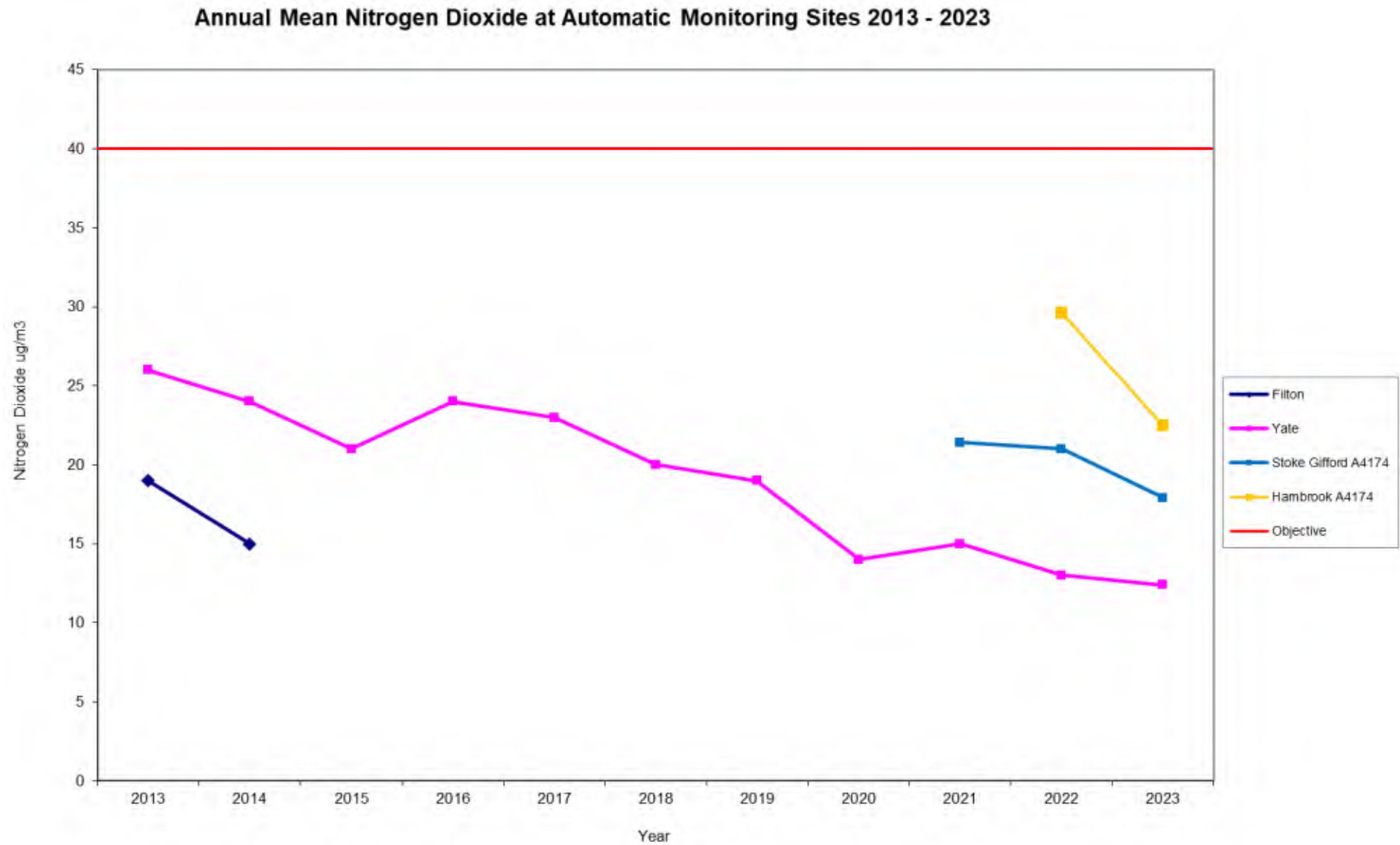


Table A.4 – Annual Mean NO₂ Monitoring Results: Non-Automatic Monitoring (µg/m³)

Diffusion Tube ID	Site Name	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2023 (%) ⁽²⁾	2019	2020	2021	2022	2023
1	Yate - 88 Station Road The Candle	370692	182499	Roadside	100	100.0	28.2	22.7	23.9	23.6	20.3
4A, 4B, 4C	Yate - Station Road Co-location	370418	182525	Roadside	100	100.0	20.3	15.9	16.8	17.0	14.1
10	Filton - 152 Gloucester Road North Pizza Bello façade	360266	179136	Roadside	100	100.0	35.9	30.0	28.0	27.7	21.8
11	Thornbury - 48 High Street	363654	189893	Kerbside	100	100.0	24.2	14.7	13.3	13.0	10.8
12	Stoke Gifford - Church Road rear of Aviva	362161	179570	Roadside	90.4	90.4	25.1	19.3	19.9	20.6	17.2
13	Filton - A4174 MOD roundabout	361523	178732	Roadside	100	100.0	30.5	25.2	27.4	27.4	21.2
21	Downend - Boscombe Crescent St Augustine's Church	365673	177475	Urban Background	100	100.0	14.5	11.6	12.4	13.4	9.2
27	Kingswood - 90 Regent Street Nat West	364866	173835	Roadside	92.3	92.3	27.3	19.7	20.7	20.3	17.1
29	Staple Hill - 123 High Street Backhouse Bet	364822	175932	Roadside	100	100.0	28.0	20.8	23.4	24.8	19.3
34	Bradley Stoke - 109 Ormonds Close (M4 East of Almondsbury Interchange)	362395	182544	Roadside	82.7	82.7	24.0	19.2	20.2	20.8	15.9
35	Bradley Stoke - Woodlands Lane (M4 East of Almondsbury Interchange)	362118	183031	Roadside	100	100.0	25.8	21.0	22.0	22.9	17.5
37	Almondsbury - Old Aust Road (M4 West of Almondsbury Interchange)	361147	184846	Roadside	100	100.0	27.1	21.8	24.7	26.9	18.9

Diffusion Tube ID	Site Name	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2023 (%) ⁽²⁾	2019	2020	2021	2022	2023
38	Severn Beach - Ableton Lane Severn Beach Primary School façade	354282	184653	Urban Background	100	100.0	12.3	9.8	10.8	12.4	8.8
44	Stoke Gifford - Hatchet Road	362061	180025	Roadside	80.8	80.8	30.4	24.1	21.6	23.2	18.8
46	Winterbourne - High Street opp Winterbourne Academy	364852	180758	Roadside	92.3	92.3	25.7	18.9	20.8	21.4	18.1
53	Hambrook - Bristol Road rear of 17 Fenbrook Close	363907	178389	Roadside	100	100.0	26.2	19.7	21.8	22.5	16.8
54	Longwell Green - A431/Aldermoor Way	365256	171656	Roadside	100	100.0	28.4	22.7	23.6	23.4	19.3
57	Coalpit Heath - 225 Badminton Road GT Plumbing & Heating	367742	181160	Roadside	100	100.0	23.6	19.9	20.5	19.6	14.3
61	Staple Hill - 1 Broad Street William Hill	364926	175926	Roadside	100	100.0	36.6	29.3	30.9	31.9	26.2
62	Staple Hill - 2 Broad Street 501 Bar	364909	175908	Roadside	100	100.0	36.3	26.8	28.6	29.2	21.2
63	Patchway - 28 Park Leaze	359487	182479	Roadside	92.3	92.3	19.0	15.2	16.3	16.7	13.0
67	Kingswood - 40 Regent Street Hays Travel	364671	173877	Roadside	90.4	90.4	35.6	25.8	25.8	26.3	22.0
68	Kingswood - 26-32 Regent Street Store Twenty One	364631	173886	Roadside	100	100.0	36.5	27.8	26.7	28.3	21.8
69	Kingswood - 12 Regent Street Domino's Pizza	364597	173892	Roadside	92.3	92.3	35.0	25.1	24.4	25.0	20.3
70	Kingswood - Two Mile Hill Road Job Centre Plus	364533	173896	Roadside	100	100.0	29.6	21.4	22.7	23.6	17.4

Diffusion Tube ID	Site Name	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2023 (%) ⁽²⁾	2019	2020	2021	2022	2023
71	Staple Hill - 11 The Square Bunch Florist	365075	175918	Roadside	100	100.0	22.7	16.7	17.3	17.6	14.5
72	Staple Hill - 25 Broad Street Westbury Inks	364990	175920	Roadside	92.3	92.3	28.1	22.5	24.5	25.0	20.2
74	Staple Hill - 29-31 Soundwell Rd opp Page Comm Assoc	364885	175772	Kerbside	100	100.0	25.6	18.9	20.8	20.6	17.0
76	Staple Hill - 84-86 High Street Staple Hill Oak Pub	364722	175926	Roadside	100	100.0	31.2	24.0	24.1	23.8	20.2
83	Chipping Sodbury - 51A Broad Street façade	372791	182241	Roadside	90.4	90.4	21.7	15.7	16.8	17.3	14.7
87	Cribbs Causeway - Blackhorse Hill Hollywood Cottage façade	357739	181334	Roadside	100	100.0	25.3	19.3	20.7	22.6	17.3
92	Kingswood - Regent Street Entertainment & Sports Club	364968	173836	Roadside	100	100.0	30.4	22.7	22.9	21.2	17.7
93	Kingswood - Hanham Road Exchange Court Flats	364979	173801	Roadside	92.3	92.3	24.4	19.1	21.0	20.0	16.1
95	Kingswood - 45 High Street Adam Lee	365078	173846	Roadside	100	100.0	37.0	25.7	25.0	24.2	19.3
105	Staple Hill - 2 North Street	364932	176147	Roadside	90.4	90.4	26.0	19.5	20.6	19.6	16.1
113	Patchway - 5 Falcon Close façade	359112	181909	Roadside	90.4	90.4	24.7	19.6	21.3	21.6	16.6
114	Pilning - 23 Keens Grove façade	355263	185351	Roadside	84.6	84.6	22.1	18.7	20.6	20.0	16.5
115	Pilning - 2 Wick Road façade	355212	185360	Roadside	100	100.0	22.9	19.6	21.1	20.9	16.0

Diffusion Tube ID	Site Name	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2023 (%) ⁽²⁾	2019	2020	2021	2022	2023
117	Filton Northville - 29 Gloucester Rd Nth Rowe Vets	359874	178259	Roadside	100	100.0	29.2	24.0	25.5	25.7	20.4
119	Filton - 137 Gloucester Rd Nth	360263	179250	Roadside	100	100.0	29.1	23.3	24.0	23.7	19.1
122	Filton - 549 Filton Avenue	360566	178229	Roadside	100	100.0	28.0	21.9	22.3	23.0	18.9
124	Filton - 702a Filton Ave Way Ahead	360918	178905	Roadside	100	100.0	30.7	23.4	24.7	24.4	21.1
125	Filton - 71 Station Rd	360891	179005	Roadside	82.7	82.7	27.3	20.7	22.0	22.3	17.8
128	Kingswood - 109 Downend Road	364587	174431	Roadside	100	100.0	28.1	23.9	23.2	24.2	20.3
129	Cribbs Causeway – 1 Holly Cottages façade	357508	181059	Roadside	100	100.0	23.9	19.6	21.3	21.4	17.3
132	Hanham - 66 High St Sassy Hair Studio	364178	172337	Roadside	100	100.0	23.8	17.0	20.0	20.2	15.5
133	Hambrook - 123 Old Gloucester Road façade	363736	178507	Roadside	84.6	84.6	25.5	21.4	22.5	22.0	17.1
134	Hambrook - Bristol Rd Old Bakery façade	364048	178719	Roadside	100	100.0	29.5	22.8	23.2	23.9	19.5
135	Frenchay - Harford Drive Dyrham Flats	364029	178413	Roadside	100	100.0	23.8	19.1	20.7	21.5	16.0
136	Little Stoke - 26 Gipsy Lane façade	361242	180544	Roadside	100	100.0	20.8	16.3	15.7	17.6	14.7
137	Warmley - 35 High Street	366984	173563	Roadside	90.4	90.4	34.5	26.1	29.4	27.7	23.1
138	Warmley - 18 High Street façade	366941	173558	Roadside	100	100.0	31.9	26.0	27.1	25.5	21.9

Diffusion Tube ID	Site Name	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2023 (%) ⁽²⁾	2019	2020	2021	2022	2023
139	Warmley - 14 High Street (former Webbs) façade	366890	173560	Roadside	100	100.0	34.4	29.1	32.1	28.9	23.8
141	Warmley - 41 Deanery Road façade	366705	173581	Roadside	82.7	82.7	27.7	22.6	23.2	24.0	18.6
142	Warmley - 33 Deanery Road Warmley Court façade	366613	173597	Roadside	100	100.0	26.7	23.2	21.3	22.1	17.9
143	Warmley - 1 High Street Ideal Pharmacy façade	366815	173574	Roadside	100	100.0	22.5	17.1	19.0	18.9	15.1
146A, 146B, 146C	Kingswood - 34 Hill St façade	365910	173680	Roadside	100	100.0	42.3	35.9	34.1	32.8	26.7
147	Soundwell - 264 Soundwell Rd façade	364586	174496	Roadside	100	100.0	35.3	28.5	31.3	32.2	24.9
148	Filton - 109 Gloucester Road North façade	360077	178900	Roadside	100	100.0	22.1	17.9	19.6	19.6	16.5
149	Filton - 707 Southmead Road façade	360050	179021	Roadside	100	100.0	25.1	21.0	22.8	22.6	17.5
150	Soundwell - 296 Soundwell Road façade	364528	174425	Roadside	100	100.0	24.1	18.2	20.0	22.3	20.4
151	Hambrook - Bristol Road Old Bakery FP Signpost	364049	178726	Roadside	90.4	90.4	29.2	23.2	23.4	25.1	19.7
152	Bradley Stoke - 188 Oaktree Crescent	360945	182831	Roadside	90.4	90.4	26.9	21.8	22.5	22.6	17.2
154	Bradley Stoke - 166 Ellan Hay Road façade	363242	180724	Roadside	100	100.0	20.3	17.2	17.1	17.6	13.5
157	Hambrook - Bristol Road Poplars House Garage façade	363999	178505	Roadside	100	100.0	26.5	21.4	21.1	23.3	18.1

Diffusion Tube ID	Site Name	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2023 (%) ⁽²⁾	2019	2020	2021	2022	2023
158	Downend - 5 Wick Wick Close façade	366157	178557	Roadside	100	100.0	23.4	17.3	19.4	20.5	15.4
159	Wickwar - 21 High Street façade	372395	188581	Roadside	100	100.0	25.8	19.8	22.6	22.9	19.9
160	Staple Hill - 62 High Street	364655	175931	Roadside	100	100.0	30.0	23.7	24.1	23.4	19.4
161	Staple Hill - 13 Victoria Street façade	364906	176022	Roadside	100	100.0	29.1	23.1	24.1	24.3	19.0
162	Staple Hill - 28 Victoria Street façade	364925	176062	Roadside	100	100.0	25.4	20.5	22.0	22.6	17.9
163	Staple Hill - 2 Victoria Street façade	364918	175979	Roadside	100	100.0	26.9	21.0	23.1	22.8	18.5
164	Staple Hill - 102 High Street Jay Jays Hair façade	364811	175919	Roadside	100	100.0	28.2	22.1	23.0	22.5	19.1
165	Staple Hill - 3 Soundwell Rd Chinese Kitchen façade	364906	175864	Roadside	100	100.0	39.2	28.7	31.2	29.9	22.8
166	Kingswood - 12 Cecil Road	364770	173695	Roadside	100	100.0	27.5	21.1	22.3	22.2	17.4
167	Kingswood - 7 Downend Road	364652	173957	Roadside	100	100.0	29.5	22.8	24.3	23.4	18.7
168	Kingswood - 133 High Street façade	365366	173805	Roadside	92.3	92.3	25.6	19.7	21.6	20.4	17.0
169	Warmley - 20 Deanery Road Warmley Community Centre façade	366714	173560	Roadside	92.3	92.3	28.3	24.1	24.3	24.1	21.2
170	Patchway - 204 Gloucester Road front façade	360606	181675	Roadside	100	100.0	22.7	18.6	20.2	20.3	16.2
172	Downend - 31 Badminton Road Forage façade	365153	176812	Roadside	100	100.0	30.8	25.3	25.2	24.9	19.4

Diffusion Tube ID	Site Name	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2023 (%) ⁽²⁾	2019	2020	2021	2022	2023
173	Mangotsfield - 10 Cossham Street façade	366459	176139	Roadside	100	100.0	25.0	19.3	20.7	20.5	16.3
174	Charfield - 25 Wotton Road façade	372011	192189	Roadside	100	100.0	17.0	13.0	14.5	15.0	12.5
180	Wick - 70 High Street The Old Post Office façade	370605	172681	Roadside	100	100.0	26.8	20.1	22.6	22.5	17.9
181	Warmley - 16 London Road façade	367298	173452	Roadside	84.6	84.6	23.7	19.5	20.8	21.2	17.6
185	Staple Hill - High Street Pendennis Park Flats	364634	175946	Roadside	100	100.0		22.7	23.3	24.0	19.0
187	Thornbury - Rock Street Grace Lodge	363785	189856	Roadside	100	100.0			20.0	22.4	17.1
188	Patchway - 43 Gloucester Road nr Hayes Way	360450	181066	Roadside	100	100.0			38.8	38.7	30.1
189	Kingswood - 2 Hill St Premier Store	365668	173738	Roadside	100	100.0				24.1	20.7
191A, 191B, 191C	Hambrook - A4174 Old Gloucester Road Co-location	363773	178500	Roadside	100	100.0				28.5	21.1
192A, 192B, 192C	Stoke Gifford - A4174 Coldharbour Lane Co-location	362384	178562	Roadside	100	100.0				21.1	16.7
193	Kingswood - 285 New Cheltenham Road	365981	174370	Roadside	100	84.6					16.2
194	Kingswood - Kimberley Road nr Downend Rd Junction	364655	174020	Kerbside	100	84.6					14.0
195	Kingswood - 7 Gilbert Road	364874	174009	Roadside	100	84.6					11.2

Diffusion Tube ID	Site Name	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2023 (%) ⁽²⁾	2019	2020	2021	2022	2023
196	Kingswood - 23 Hanham Road	364991	173592	Roadside	100	84.6					15.3
197	Kingswood - 26 Moravian Road	364813	173730	Kerbside	100	84.6					12.6
198	Kingswood - 17A Cecil Road nr Blackhorse Rd junction	364538	173666	Roadside	100	84.6					12.7
199	Kingswood - Blackhorse Road Flat 6 Sunday House	364510	173746	Roadside	100	84.6					23.1
200	Kingswood - 3 Regent Street Zahringer Jewellers	364583	173906	Roadside	90	75.0					19.6
201	Kingswood - 25 Regent Street Centre of Attention Hair & Beauty façade	364645	173895	Roadside	90	75.0					19.9
202	Kingswood - 123 Regent Street Cut & Run Barbers	364952	173851	Roadside	100	84.6					12.5

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

Diffusion tube data has been bias adjusted.

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

Notes:

The annual mean concentrations are presented as $\mu\text{g}/\text{m}^3$.

Exceedances of the NO₂ annual mean objective of $40\mu\text{g}/\text{m}^3$ are shown in **bold**.

NO₂ annual means exceeding $60\mu\text{g}/\text{m}^3$, indicating a potential exceedance of the NO₂ 1-hour mean objective are shown in **bold and underlined**.

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

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

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

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

(3) Aside from the triplicate co-located sites 4, 191 and 192, sites 87 & 147 also operated as triplicate sites 2019 – 2021, Site 185 operated as triplicate site in 2020 and site 146 operated as a triplicate site in 2023 so the triplicate average annual means are reported for the relevant years.

Table A.5 – 1-Hour Mean NO₂ Monitoring Results, Number of 1-Hour Means > 200µg/m³

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2023 (%) ⁽²⁾	2019	2020	2021	2022	2023
SG1 Yate Station Road	370418	182525	Roadside	98.8	98.8	0	0	0	0	0
SG2 Stoke Gifford A4174 Coldharbour Lane	362384	178562	Roadside	99.5	99.5			0 (90)	0	0
SG3 Hambrook A4174 Old Gloucester Road	363772	178501	Roadside	95.2	95.2				0 (103)	0

Notes:

Results are presented as the number of 1-hour periods where concentrations greater than 200µg/m³ have been recorded.

Exceedances of the NO₂ 1-hour mean objective (200µg/m³ 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 PM₁₀ Monitoring Results (µg/m³)

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2023 (%) ⁽²⁾	2019	2020	2021	2022	2023
SG1 Yate Station Road	370418	182525	Roadside	97	97	13	11	12	12	12.3
SG2 Stoke Gifford A4174 Coldharbour Lane	362384	178562	Roadside	99.7	99.7			15.5	20	17.9

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/m³.

Exceedances of the PM₁₀ annual mean objective of 40µg/m³ 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 PM₁₀ Concentrations

Annual Mean PM₁₀ at Automatic Monitoring Sites 2013 - 2023

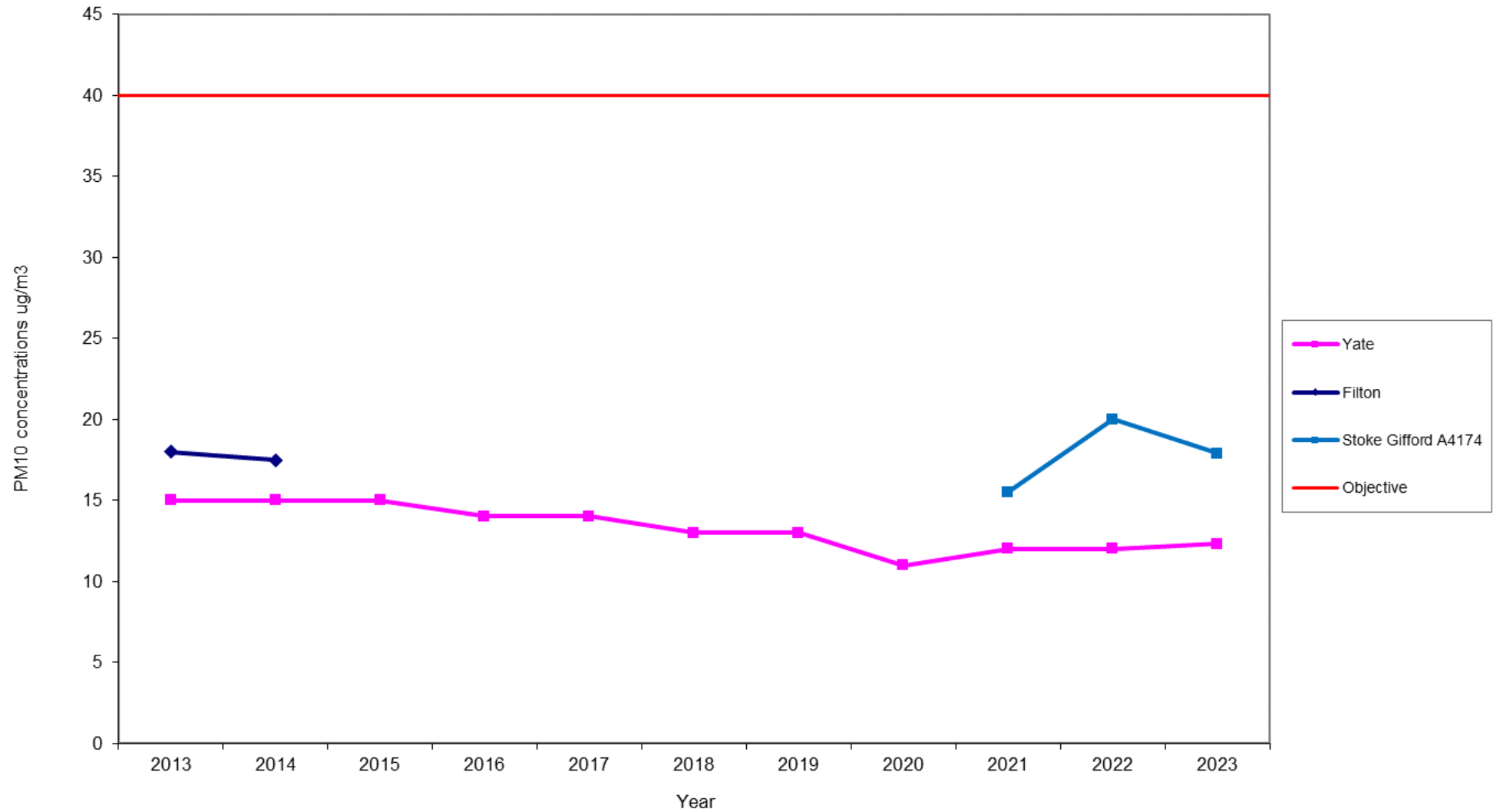


Table A.7 – 24-Hour Mean PM₁₀ Monitoring Results, Number of PM₁₀ 24-Hour Means > 50µg/m³

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2023 (%) ⁽²⁾	2019	2020	2021	2022	2023
SG1 Yate Station Road	370418	182525	Roadside	97	97	0	0	0	0	0
SG2 Stoke Gifford A4174 Coldharbour Lane	362384	178562	Roadside	99.7	99.7			0 (27)	3	1

Notes:

Results are presented as the number of 24-hour periods where daily mean concentrations greater than 50µg/m³ have been recorded.

Exceedances of the PM₁₀ 24-hour mean objective (50µg/m³ 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/m³)

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2023 (%) ⁽²⁾	2019	2020	2021	2022	2023
SG2 Stoke Gifford A4174 Coldharbour Lane	362384	178562	Roadside	99.5	99.5			7.4	9	7.6

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/m³.

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%).

Table A.9 – Kingswood - Warmley AQMA Annual Mean NO₂ Non-Automatic Monitoring Results (µg/m³)

Diffusion Tube ID	Site Name	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2023 (%) ⁽²⁾	2019	2020	2021	2022	2023
27	Kingswood - 90 Regent Street Nat West	364866	173835	Roadside	92.3	92.3	27.3	19.7	20.7	20.3	17.1
67	Kingswood - 40 Regent Street Hays Travel	364671	173877	Roadside	90.4	90.4	35.6	25.8	25.8	26.3	22.0
68	Kingswood - 26-32 Regent Street Store Twenty One	364631	173886	Roadside	100	100.0	36.5	27.8	26.7	28.3	21.8
69	Kingswood - 12 Regent Street Domino's Pizza	364597	173892	Roadside	92.3	92.3	35.0	25.1	24.4	25.0	20.3
70	Kingswood - Two Mile Hill Road Job Centre Plus	364533	173896	Roadside	100	100.0	29.6	21.4	22.7	23.6	17.4
92	Kingswood - Regent Street Entertainment & Sports Club	364968	173836	Roadside	100	100.0	30.4	22.7	22.9	21.2	17.7
93	Kingswood - Hanham Road Exchange Court Flats	364979	173801	Roadside	92.3	92.3	24.4	19.1	21.0	20.0	16.1
95	Kingswood - 45 High Street Adam Lee	365078	173846	Roadside	100	100.0	37.0	25.7	25.0	24.2	19.3
137	Warmley - 35 High Street	366984	173563	Roadside	90.4	90.4	34.5	26.1	29.4	27.7	23.1
138	Warmley - 18 High Street façade	366941	173558	Roadside	100	100.0	31.9	26.0	27.1	25.5	21.9
139	Warmley - 14 High Street (former Webbs) façade	366890	173560	Roadside	100	100.0	34.4	29.1	32.1	28.9	23.8
141	Warmley - 41 Deanery Road façade	366705	173581	Roadside	82.7	82.7	27.7	22.6	23.2	24.0	18.6
142	Warmley - 33 Deanery Road Warmley Court façade	366613	173597	Roadside	100	100.0	26.7	23.2	21.3	22.1	17.9

Diffusion Tube ID	Site Name	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2023 (%) ⁽²⁾	2019	2020	2021	2022	2023
143	Warmley - 1 High Street Ideal Pharmacy façade	366815	173574	Roadside	100	100.0	22.5	17.1	19.0	18.9	15.1
146A, 146B, 146C ⁽³⁾	Kingswood - 34 Hill St façade	365910	173680	Roadside	100	100.0	42.3	35.9	34.1	32.8	26.7
168	Kingswood - 133 High Street façade	365366	173805	Roadside	92.3	92.3	25.6	19.7	21.6	20.4	17.0
169	Warmley - 20 Deanery Road Warmley Community Centre façade	366714	173560	Roadside	92.3	92.3	28.3	24.1	24.3	24.1	21.2
181	Warmley - 16 London Road façade	367298	173452	Roadside	84.6	84.6	23.7	19.5	20.8	21.2	17.6
189	Kingswood - 2 Hill St Premier Store	365668	173738	Roadside	100	100.0				24.1	20.7
200	Kingswood - 3 Regent Street Zahringer Jewellers	364583	173906	Roadside	90	75.0					19.6
201	Kingswood - 25 Regent Street Centre of Attention Hair & Beauty façade	364645	173895	Roadside	90	75.0					19.9
202	Kingswood - 123 Regent Street Cut & Run Barbers	364952	173851	Roadside	100	84.6					12.5

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

Diffusion tube data has been bias adjusted.

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

Notes:

The annual mean concentrations are presented as $\mu\text{g}/\text{m}^3$.

Exceedances of the NO₂ annual mean objective of $40\mu\text{g}/\text{m}^3$ are shown in **bold**.

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

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

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

- (1) Data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.
- (2) Data capture for the full calendar year (e.g. if monitoring was carried out for 6 months, the maximum data capture for the full calendar year is 50%).
- (3) Site 146 operated as triplicate site (146ABC) in 2023 so triplicate average annual mean reported for 2023. The site operated as single tube site in all years otherwise.

Figure A.3 – Trends in Annual Mean NO₂ Concentrations in Kingswood section of Kingswood – Warmley AQMA

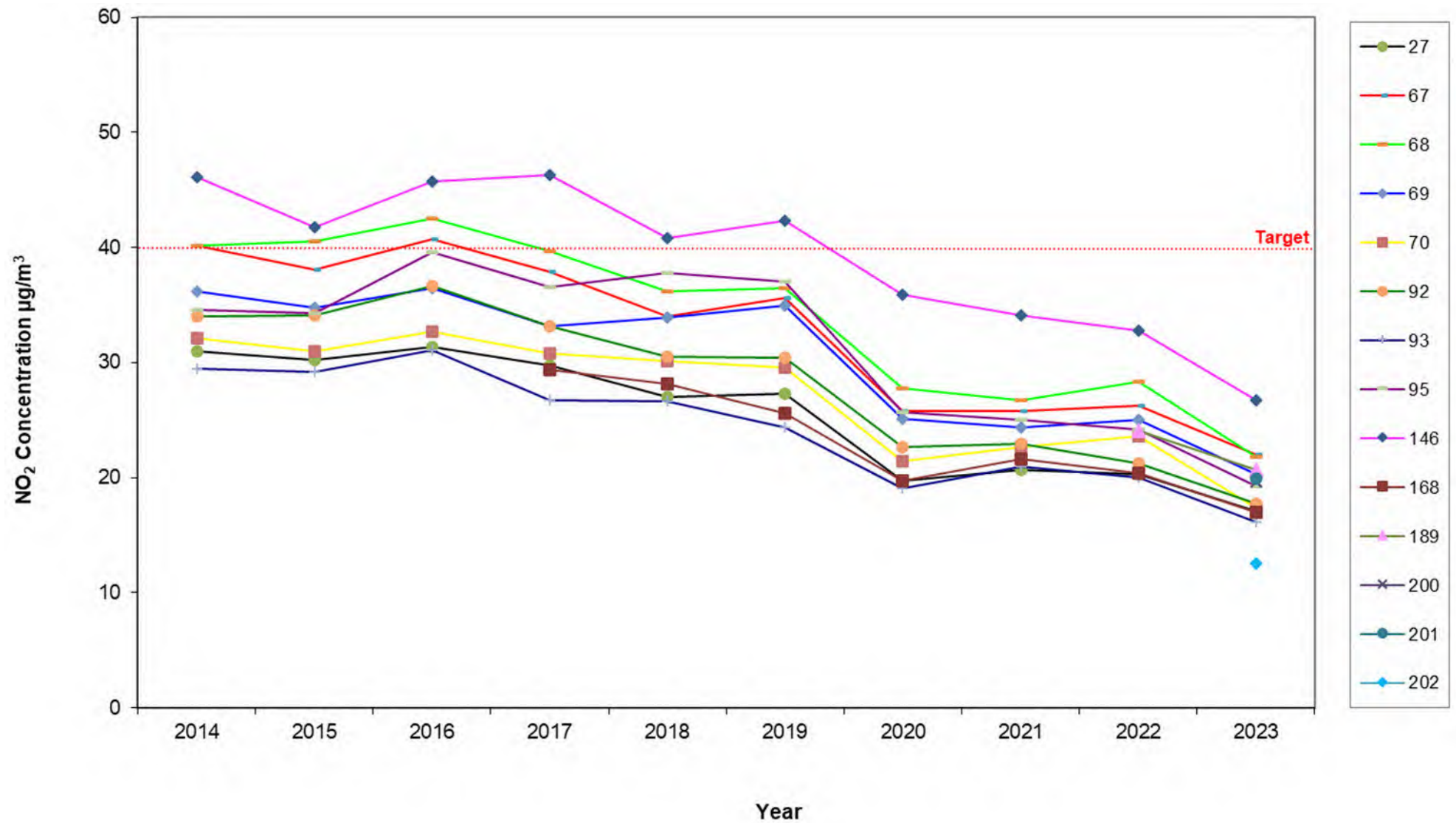


Figure A.4 – Trends in Annual Mean NO₂ Concentrations in Warmley section of Kingswood – Warmley AQMA

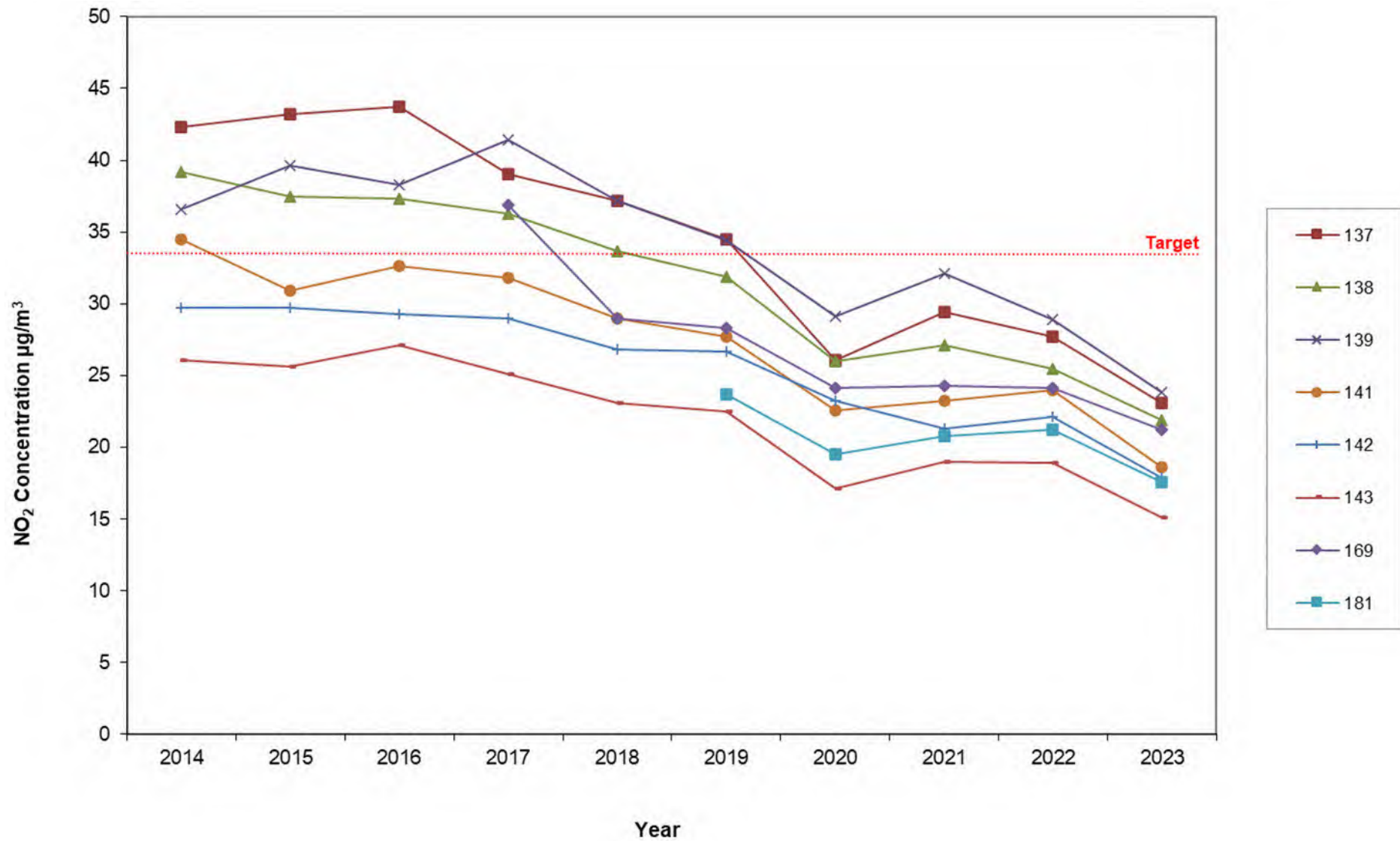


Table A.10 – Staple Hill AQMA Annual Mean NO₂ Non-Automatic Monitoring Results (µg/m³)

Diffusion Tube ID	Site Name	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2023 (%) ⁽²⁾	2019	2020	2021	2022	2023
29	Staple Hill - 123 High Street Backhouse Bet	364822	175932	Roadside	100	100.0	28.0	20.8	23.4	24.8	19.3
61	Staple Hill - 1 Broad Street William Hill	364926	175926	Roadside	100	100.0	36.6	29.3	30.9	31.9	26.2
62	Staple Hill - 2 Broad Street 501 Bar	364909	175908	Roadside	100	100.0	36.3	26.8	28.6	29.2	21.2
71	Staple Hill - 11 The Square Bunch Florist	365075	175918	Roadside	100	100.0	22.7	16.7	17.3	17.6	14.5
72	Staple Hill - 25 Broad Street Westbury Inks	364990	175920	Roadside	92.3	92.3	28.1	22.5	24.5	25.0	20.2
74	Staple Hill - 29-31 Soundwell Rd opp Page Comm Assoc	364885	175772	Kerbside	100	100.0	25.6	18.9	20.8	20.6	17.0
76	Staple Hill - 84-86 High Street Staple Hill Oak Pub	364722	175926	Roadside	100	100.0	31.2	24.0	24.1	23.8	20.2
105	Staple Hill - 2 North Street	364932	176147	Roadside	90.4	90.4	26.0	19.5	20.6	19.6	16.1
160	Staple Hill - 62 High Street	364655	175931	Roadside	100	100.0	30.0	23.7	24.1	23.4	19.4
161	Staple Hill - 13 Victoria Street façade	364906	176022	Roadside	100	100.0	29.1	23.1	24.1	24.3	19.0
162	Staple Hill - 28 Victoria Street façade	364925	176062	Roadside	100	100.0	25.4	20.5	22.0	22.6	17.9
163	Staple Hill - 2 Victoria Street façade	364918	175979	Roadside	100	100.0	26.9	21.0	23.1	22.8	18.5
164	Staple Hill - 102 High Street Jay Jays Hair façade	364811	175919	Roadside	100	100.0	28.2	22.1	23.0	22.5	19.1

Diffusion Tube ID	Site Name	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2023 (%) ⁽²⁾	2019	2020	2021	2022	2023
165	Staple Hill - 3 Soundwell Rd Chinese Kitchen facade	364906	175864	Roadside	100	100.0	39.2	28.7	31.2	29.9	22.8
185 ⁽³⁾	Staple Hill - High Street Pendennis Park Flats	364634	175946	Roadside	100	100.0		22.7	23.3	24.0	19.0

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

Exceedances of the NO₂ annual mean objective of 40 $\mu\text{g}/\text{m}^3$ are shown in **bold**.

NO₂ annual means exceeding 60 $\mu\text{g}/\text{m}^3$, indicating a potential exceedance of the NO₂ 1-hour mean objective are shown in **bold and underlined**.

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

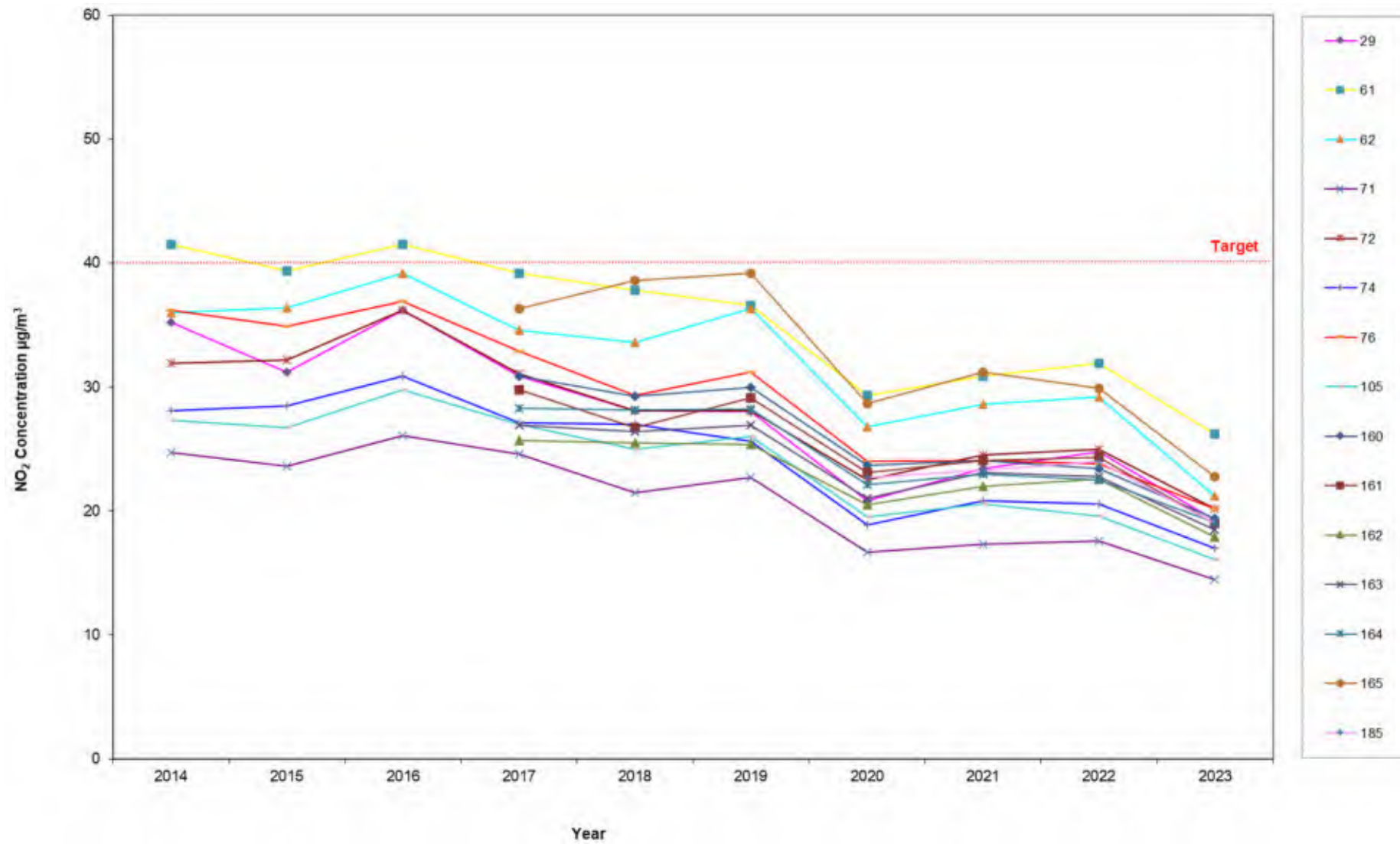
Concentrations are those at the location of monitoring and not those following any fall-off with distance adjustment.

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

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

(3) Site 185 operated as triplicate site (185ABC) in 2020 so triplicate average annual mean reported for 2020. Site 185 operated as single tube site from 2021 onwards.

Figure A.5 – Trends in Annual Mean NO₂ Concentrations in Staple Hill AQMA



Estimated PM_{2.5} Concentrations from Yate PM₁₀ Automatic Monitoring

Table A.11 – Estimation of PM_{2.5} concentrations at Yate and % reductions

Year	Yate PM ₁₀ Annual Means (µg/m ³)	Yate Estimated PM _{2.5} Annual Means ^{(1) (2) (3) (4)} (µg/m ³)	Bristol St. Pauls (AURN) Monitored PM _{2.5} Annual Means ⁽⁵⁾ (µg/m ³)
2010	20	14	14
2011	18	12.6	15
2012	16	11.2	13
2013	15	10.5	13
2014	15	10.5	13
2015	15	10.5	10
2016	14	9.8	12
2017	14	9.8	10
2018	13	9.1	12
2019	13	9.1	11
2020	11	7.7	10
2021	12	6.3	8
2022	12	5.6	8
2023	12.3	6.4	8
% Reduction 2010 -2020 ⁽⁶⁾		45%	28.6%
% Reduction 2018 -2023 ⁽⁷⁾		29.7%	33.3%

Notes:

(1) 2010 to 2020 PM_{2.5} concentrations estimated as per LAQM.TG16 Box 7.7 (PM₁₀ x 0.7)

- (2) 2021 PM_{2.5} concentrations estimated as per LAQM.TG22⁸³ using 2021 national roadside factor of 5.7 (PM₁₀ annual mean concentration – national factor = estimated PM_{2.5} annual mean concentration).
- (3) 2022 PM_{2.5} concentrations estimated as per LAQM.TG22 using 2022 national roadside factor of 6.4.
- (4) 2023 PM_{2.5} concentrations estimated as per LAQM.TG22 using 2023 national roadside factor of 5.9.
- (5) Data obtained from UK-AIR Data Archive⁸⁴
- (6) Target of 20% reduction in concentrations (at urban background) between 2010 and 2020.
- (7) Target of 35% reduction in exposure compared to 2018 by 2040 (interim target of 22% reduction in exposure compared to 2018 by 2028).

⁸³ [Estimating PM_{2.5} from PM₁₀ Measurements | LAQM \(defra.gov.uk\)](https://www.defra.gov.uk/air/laqm/estimating-pm25-from-pm10-measurements)

⁸⁴ [Annual and Exceedance Statistics - Defra, UK](https://www.defra.gov.uk/air/laqm/annual-and-exceedance-statistics)

Appendix B: Full Monthly Diffusion Tube Results for 2023

Table B.1 – NO₂ 2023 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 (0.79)	Annual Mean: Distance Corrected to Nearest Exposure	Comment
1	370692	182499	33.6	30.5	25.1	24.7	20.9	22.2	21.0	22.2	26.3	28.7	31.4	21.5	25.7	20.3	-	
4A	370418	182525	26.4	24.4	15.0	17.0	9.5	10.7	12.9	14.7		21.0	23.8	19.2	-	-	-	Triplicate Site with 4A, 4B and 4C - Annual data provided for 4C only
4B	370418	182525	27.4	24.1	17.8	18.2	11.3	11.9	14.3	14.7	16.8	17.2	23.5	15.1	-	-	-	Triplicate Site with 4A, 4B and 4C - Annual data provided for 4C only
4C	370418	182525	28.0	26.3	15.8	16.4	10.1	11.7	14.7	14.2	17.4	19.4	26.1	16.4	17.8	14.1	-	Triplicate Site with 4A, 4B and 4C - Annual data provided for 4C only
10	360266	179136	34.5	35.1	26.7	27.4	23.3	22.6	21.3	21.1	30.5	33.8	29.9	25.4	27.6	21.8	-	
11	363654	189893	17.1	17.8	13.2	13.9	7.9	8.6	11.6	10.7	16.8	15.2	18.5	13.0	13.7	10.8	-	
12	362161	179570	26.6	26.2		21.3	18.7	15.8	12.9	18.3	25.7	25.5	31.0	17.2	21.7	17.2	-	
13	361523	178732	31.4	34.4	29.0	28.6	29.2	26.1	18.6	15.2	25.3	32.4	32.0	20.3	26.9	21.2	-	
21	365673	177475	19.7	16.3	11.3	11.4	8.2	7.3	8.3	8.6	11.2	12.7	12.1	12.5	11.6	9.2	-	
27	364866	173835	26.7	26.0	19.5	21.3		15.2	16.6	18.5	21.0	24.0	27.4	22.0	21.7	17.1	-	
29	364822	175932	31.4	29.9	22.7	24.6	19.6	21.0	21.8	24.6	25.1	22.8	28.1	21.5	24.4	19.3	-	
34	362395	182544	23.4	27.3		21.1	15.7	16.8		14.9	20.8	19.4	23.4	18.0	20.1	15.9	-	
35	362118	183031	27.5	28.0	23.3	22.7	22.1	18.5	13.5	16.4	25.2	23.3	25.4	19.2	22.1	17.5	-	
37	361147	184846	28.6	19.9	30.7	30.6	24.0	24.9	17.3	20.8	15.5	28.8	26.3	20.2	24.0	18.9	-	
38	354282	184653	15.8	16.0	10.6	10.1	6.7	8.0	8.8	9.5	11.4	13.7	14.3	9.0	11.2	8.8	-	
44	362061	180025	29.0	30.7	22.1	23.1	16.2	18.5	19.5		27.9	28.3		22.7	23.8	18.8	-	
46	364852	180758	29.2	28.4	22.0		15.8	16.9	17.1	20.0	25.6	26.6	29.0	21.3	22.9	18.1	-	
53	363907	178389	26.8	26.2	22.2	21.8	22.7	18.4	12.2	17.4	23.2	22.4	22.6	18.6	21.2	16.8	-	

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 (0.79)	Annual Mean: Distance Corrected to Nearest Exposure	Comment
54	365256	171656	31.2	29.7	20.8	24.1	19.3	23.0	19.1	20.7	24.7	27.9	32.7	20.1	24.5	19.3	-	
57	367742	181160	27.0	23.3	17.2	18.5	13.6	15.3	14.0	10.7	17.3	19.2	24.2	17.2	18.1	14.3	-	
61	364926	175926	44.0	34.9	29.4	29.0	31.4	28.0	26.1	24.5	24.9	40.9	44.4	41.1	33.2	26.2	-	
62	364909	175908	30.5	33.0	26.5	29.7	23.0	24.2	23.3	23.1	18.2	33.0	33.2	24.1	26.8	21.2	-	
63	359487	182479	22.9	21.2	14.9	14.6	10.9	9.0		14.0	17.1	17.6	22.3	15.9	16.4	13.0	-	
67	364671	173877	33.3	30.9	28.0	29.1	19.2		23.8	23.9	29.8	29.8	33.2	25.9	27.9	22.0	-	
68	364631	173886	34.6	36.0	28.0	29.2	20.2	21.2	24.4	19.0	28.3	30.4	32.6	27.4	27.6	21.8	-	
69	364597	173892	33.2	33.7	25.1		19.2	19.8	22.1	22.5	28.7	26.8	29.9	21.5	25.7	20.3	-	
70	364533	173896	30.7	26.5	21.6	22.7	16.4	17.6	14.2	20.1	24.6	24.8	27.2	17.7	22.0	17.4	-	
71	365075	175918	25.5	22.9	15.1	16.5	13.4	13.9	14.3	13.5	25.0	20.4	23.2	16.4	18.3	14.5	-	
72	364990	175920	34.0	28.5	22.3	24.6	20.5	17.2	19.9	20.0	36.8		33.3	23.8	25.6	20.2	-	
74	364885	175772	28.7	25.2	19.4	21.1	19.0	18.1	13.5	16.1	33.6	23.7	24.4	15.9	21.6	17.0	-	
76	364722	175926	33.4	32.8	25.2	24.2	16.6	20.0	22.8	22.5	24.7	27.9	31.2	26.1	25.6	20.2	-	
83	372791	182241	23.8	21.6	17.7	19.3	16.0	16.7	12.1		18.5	20.6	24.2	14.7	18.7	14.7	-	
87	357739	181334	24.7	25.9	20.2	24.8	11.0	14.4	19.0	22.8	24.8	29.7	26.3	19.5	21.9	17.3	-	
92	364968	173836	29.8	25.4	18.8	21.5	15.8	18.8	18.5	20.7	25.2	24.8	29.8	20.2	22.4	17.7	-	
93	364979	173801	25.8	22.8	18.4		17.4	18.4	13.7	17.4	22.7	21.6	23.8	22.6	20.4	16.1	-	
95	365078	173846	32.6	29.8	22.5	24.6	20.1	22.3	18.6	20.3	26.9	26.0	30.1	19.5	24.4	19.3	-	
105	364932	176147	27.9	26.7		18.7	15.5	14.6	13.1	14.9	19.6	22.6	29.8	20.6	20.4	16.1	-	
113	359112	181909	27.8	26.3		18.5	18.9	16.8	19.0	20.3	21.5	21.1	25.1	16.4	21.1	16.6	-	
114	355263	185351	26.3	26.3	19.6			18.8	16.4	18.0	20.8	21.2	24.4	16.7	20.8	16.5	-	

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 (0.79)	Annual Mean: Distance Corrected to Nearest Exposure	Comment
115	355212	185360	25.1	23.0	19.8	19.6	9.7	16.8	17.6	18.4	20.9	28.6	24.8	18.6	20.2	16.0	-	
117	359874	178259	31.5	34.9	28.7	23.9	20.5	21.0	20.9	20.3	23.5	29.7	33.3	21.1	25.8	20.4	-	
119	360263	179250	30.6	30.0	22.3	21.6	22.5	20.0	17.8	22.7	25.4	27.4	29.2	20.3	24.1	19.1	-	
122	360566	178229	29.0	28.5	25.3	26.1	19.5	16.5	15.4	19.9	27.1	30.0	30.1	20.3	24.0	18.9	-	
124	360918	178905	28.4	31.2	25.3	30.2	26.0	23.4	15.9	23.4	30.8	32.0	32.7	21.2	26.7	21.1	-	
125	360891	179005	27.4	30.6			16.4	14.0	16.1	17.7	26.2	26.8	28.7	21.1	22.5	17.8	-	
128	364587	174431	35.1	31.8	24.2	23.6	20.9	20.6	18.1	19.5	34.0	26.9	29.0	24.2	25.7	20.3	-	Site co-ordinates in South Gloucestershire – site adjacent to SGC/Bristol CC boundary
129	357508	181059	25.9	29.2	21.9	22.3	19.2	19.0	15.6	19.9	23.3	23.8	25.5	17.7	22.0	17.3	-	
132	364178	172337	26.6	25.8	17.1	19.7	15.0	15.1	15.5	18.1	21.6	19.5	26.7	15.0	19.6	15.5	-	
133	363736	178507	26.3	25.5	19.1	24.0	24.2	24.3	11.8	21.1			24.4	15.4	21.6	17.1	-	
134	364048	178719	27.2	25.8	21.1	24.7	20.3	21.1	17.8	27.1	32.4	31.3	27.8	20.3	24.7	19.5	-	
135	364029	178413	28.6	26.8	18.6	20.6	19.7	17.1	11.4	18.9	22.7	20.3	22.8	15.9	20.3	16.0	-	
136	361242	180544	25.3	22.9	17.9	19.0	13.5	13.1	14.6	15.9	18.7	21.1	24.8	16.7	18.6	14.7	-	
137	366984	173563	37.5	37.7		29.6	27.1	25.9	22.5	18.5	30.2	30.5	38.5	23.5	29.2	23.1	-	
138	366941	173558	34.9	31.1	26.3	26.7	18.1	21.1	28.0	25.7	28.8	29.8	30.7	31.6	27.7	21.9	-	
139	366890	173560	38.2	37.8	30.0	29.4	18.6	24.9	26.6	29.4	30.3	30.9	35.1	30.4	30.1	23.8	-	
141	366705	173581	32.9	29.1	23.1	22.5	14.5	20.6	19.8	22.3	25.9	25.3			23.6	18.6	-	
142	366613	173597	30.3	28.5	22.7	20.9	16.2	15.3	18.4	22.1	22.8	25.3	29.3	20.8	22.7	17.9	-	
143	366815	173574	24.4	24.0	17.3	20.0	13.8	17.0	16.1	16.7	19.1	20.8	24.1	16.4	19.1	15.1	-	
146A	365910	173680	39.2	39.5	29.6	32.8	21.0	27.8	28.7	31.6	39.5	39.5	45.0	32.5	-	-	-	Triplicate Site with 146A, 146B and 146C - Annual data provided for 146C only
146B	365910	173680	41.0	38.0	32.8	31.7	21.1	28.2	30.4	31.4	42.5	37.4	43.0	33.4	-	-	-	Triplicate Site with 146A, 146B and 146C - Annual data provided for 146C only

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 (0.79)	Annual Mean: Distance Corrected to Nearest Exposure	Comment
146C	365910	173680	40.2	33.0	28.9	31.8	23.0	28.0	30.1	33.3	40.8	37.7	40.8	29.2	33.7	26.7	-	Triplicate Site with 146A, 146B and 146C - Annual data provided for 146C only
147	364586	174496	42.1	39.8	32.1	30.7	27.2	27.9	29.6	27.1	22.9	35.4	37.3	26.5	31.6	24.9	-	Site co-ordinates in South Gloucestershire – site adjacent to SGC/Bristol CC boundary
148	360077	178900	24.8	28.6	21.5	19.5	22.1	18.1	13.7	16.1	22.2	22.0	24.6	17.0	20.8	16.5	-	
149	360050	179021	26.0	30.7	21.0	20.4	21.1	17.6	14.1	19.2	22.6	26.4	28.2	18.1	22.1	17.5	-	
150	364528	174425	33.6	35.2	27.7	27.5	26.5	23.2	14.4	19.6	25.6	28.1	28.5	19.5	25.8	20.4	-	Site co-ordinates in South Gloucestershire – site adjacent to SGC/Bristol CC boundary
151	364049	178726	30.6	26.8	22.4	21.7	17.9		22.2	23.5	26.8	26.3	29.5	26.4	24.9	19.7	-	
152	360945	182831	26.1	29.0	20.2	21.6	15.5	17.7	14.2		22.0	23.1	32.4	18.1	21.8	17.2	-	
154	363242	180724	24.4	23.0	14.8	16.5	10.9	10.9	12.8	12.9	19.4	20.8	22.0	16.6	17.1	13.5	-	
157	363999	178505	30.4	27.7	20.7	20.5	15.6	16.1	18.7	20.3	26.3	26.5	28.0	23.5	22.9	18.1	-	
158	366157	178557	26.1	23.6	17.5	20.1	19.2	17.3	10.7	16.1	20.9	18.7	29.4	14.6	19.5	15.4	-	
159	372395	188581	33.1	31.3	24.7	27.4	24.0	21.6	16.0	21.7	24.2	28.1	31.5	18.7	25.2	19.9	-	
160	364655	175931	32.3	32.1	21.1	23.0	19.2	19.9	18.5	20.5	27.7	26.8	30.5	23.4	24.6	19.4	-	
161	364906	176022	32.7	31.4	21.8	22.0	17.4	17.1	19.5	22.6	24.2	26.3	30.1	22.9	24.0	19.0	-	
162	364925	176062	29.0	30.2	22.4	23.5	18.1	16.7	19.7	14.7	24.7	25.6	27.6	19.2	22.6	17.9	-	
163	364918	175979	29.5	29.8	24.0	23.9	19.0	18.5	17.1	17.1	25.7	28.0	27.6	20.4	23.4	18.5	-	
164	364811	175919	29.0	28.7	21.5	25.0	16.6	18.7	20.1	18.6	36.5	25.8	28.7	20.9	24.2	19.1	-	
165	364906	175864	36.5	35.7	30.7	35.1	32.3	28.5	19.7	21.2	18.1	32.9	34.2	21.0	28.8	22.8	-	
166	364770	173695	27.6	29.8	18.8	21.8	13.9	17.6	18.7	20.2	26.0	26.2	25.4	17.9	22.0	17.4	-	
167	364652	173957	38.0	29.3	21.1	20.5	17.1	17.0	20.0	20.7	22.8	27.1	29.7	20.7	23.7	18.7	-	
168	365366	173805	29.6	26.1	20.9		20.4	20.4	14.6	17.6	23.7	21.7	25.1	16.6	21.5	17.0	-	
169	366714	173560	32.5	30.6	23.7	20.4		22.0	23.8	24.3	26.9	32.7	32.0	26.9	26.9	21.2	-	

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 (0.79)	Annual Mean: Distance Corrected to Nearest Exposure	Comment
170	360606	181675	27.2	26.0	21.5	22.4	16.2	15.8	13.4	17.7	24.1	21.2	24.7	16.0	20.5	16.2	-	
172	365153	176812	33.6	31.2	25.4	23.4	18.3	19.5	20.0	21.8	24.5	24.7	29.2	23.0	24.5	19.4	-	
173	366459	176139	28.0	24.1	22.1	21.8	13.1	15.9	17.0	17.0	23.8	21.8	24.9	18.6	20.7	16.3	-	
174	372011	192189	22.0	19.6	14.5	15.0	12.3	13.3	10.8	13.3	13.8	20.2	21.3	13.9	15.8	12.5	-	
180	370605	172681	33.8	26.2	19.8	24.1	22.7	22.5	15.4	20.6	23.8	22.5	25.0	15.4	22.7	17.9	-	
181	367298	173452	27.4	27.0	18.6			18.9	17.4	19.9	21.6	24.0	27.7	20.3	22.3	17.6	-	
185	364634	175946	31.8	30.2	22.7	24.6	17.2	21.6	17.1	20.1	26.7	25.8	30.3	19.8	24.0	19.0	-	
187	363785	189856	23.2	25.7	22.0	21.8	20.2	19.8	14.2	17.6	27.4	25.0	25.3	17.0	21.6	17.1	-	
188	360450	181066	45.4	45.2	38.0	35.2	30.0	35.4	33.2	34.9	42.7	42.1	41.5	33.1	38.1	30.1	-	
189	365668	173738	56.3	30.2	23.8	23.0	16.3	18.1	20.2	20.5	27.3	27.6	29.8	22.1	26.3	20.7	-	
191A	363773	178500	29.8	30.2	25.5	32.4	26.6	27.8	13.3	28.6	29.1	25.3	28.4	18.2	-	-	-	Triplicate Site with 191A, 191B and 191C - Annual data provided for 191C only
191B	363773	178500	31.4	34.0	23.0	31.9	30.9	29.2	14.9	25.0	30.8	25.7	30.0	18.4	-	-	-	Triplicate Site with 191A, 191B and 191C - Annual data provided for 191C only
191C	363773	178500	32.2	35.3	25.1	32.4	29.0	29.5	14.6	25.9	25.9	26.0	26.6	17.5	26.7	21.1	-	Triplicate Site with 191A, 191B and 191C - Annual data provided for 191C only
192A	362384	178562	29.1	28.5	21.3	23.0	20.5	22.3	14.0	18.9	20.7	23.3	27.3	16.1	-	-	-	Triplicate Site with 192A, 192B and 192C - Annual data provided for 192C only
192B	362384	178562	29.2	27.9	17.7	19.0	17.3	17.2	11.8	17.0	20.0	21.7	27.4	15.8	-	-	-	Triplicate Site with 192A, 192B and 192C - Annual data provided for 192C only
192C	362384	178562	28.0	29.3	19.6	21.4	20.4	18.0	11.9	18.2	19.9	22.0	27.3	16.0	21.1	16.7	-	Triplicate Site with 192A, 192B and 192C - Annual data provided for 192C only
193	365981	174370			19.8	20.6	19.4	17.8	14.5	18.4	24.1	23.5	25.0	21.5	20.5	16.2	-	
194	364655	174020			17.9	17.2	12.0	11.8	15.0	16.9	20.6	21.1	24.8	20.1	17.7	14.0	-	
195	364874	174009			13.3	13.0	10.2	10.0	10.1	14.5	15.8	15.9	22.1	17.0	14.2	11.2	-	
196	364991	173592			20.0	21.5	16.1	17.3	12.7	15.9	22.5	23.2	26.7	18.3	19.4	15.3	-	

DT ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean: Raw Data	Annual Mean: Annualised and Bias Adjusted (0.79)	Annual Mean: Distance Corrected to Nearest Exposure	Comment
197	364813	173730			15.4	15.4	11.7	10.7	11.7	15.3	21.4	21.2	22.8	14.4	16.0	12.6	-	
198	364538	173666			15.1	17.4	11.0	13.9	12.9	13.7	20.0	18.8	23.5	14.9	16.1	12.7	-	
199	364510	173746			26.7	31.0	24.9	26.4	27.2	29.0	35.0	28.4	37.3	26.4	29.2	23.1	-	
200	364583	173906			24.7	26.8	22.8		18.1	21.8	29.5	25.7	29.8	23.7	24.8	19.6	-	
201	364645	173895			24.3	27.0	26.1	25.7	22.1	24.1	29.3	26.9		21.9	25.2	19.9	-	
202	364952	173851			15.4	17.2	11.4	12.1	13.5	11.8	17.7	20.3	22.3	16.4	15.8	12.5	-	

All erroneous data has been removed from the NO₂ diffusion tube dataset presented in Table B.1.

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

Local bias adjustment factor used (NB: 2023 Local bias adjustment factor is the same as the national bias adjustment factor used).

National bias adjustment factor used.

Where applicable, data has been distance corrected for relevant exposure in the final column.

South Gloucestershire Council confirm that all 2023 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 South Gloucestershire During 2023

South Gloucestershire Council has not identified any new sources relating to air quality that have not been otherwise assessed through the planning process within the reporting year of 2023.

Additional Air Quality Works Undertaken by South Gloucestershire Council During 2023

South Gloucestershire Council has not completed any additional studies within the reporting year of 2023 other than the continued monitoring and management of the JAQU Air Quality scheme implemented on the A4174 at Hambrook. Further details are provided in Section 2.2 on this work.

QA/QC of Diffusion Tube Monitoring

The diffusion tubes have been prepared and analysed by Somerset County Council Scientific Services since 2019, following a change from Gradko for the years 2017 and 2018. Somerset County Council Scientific Services also previously prepared and analysed the diffusion tubes for the period 2012 – 2016. The tubes are prepared by the laboratory using 20% triethanolamine (TEA) in water and the method follows the Diffusion Tubes for Ambient NO₂ Monitoring: Practical Guidance document⁸⁵.

While the laboratory is not UKAS accredited, it participates in the AIR NO₂ Proficiency Testing (PT) scheme. The latest available AIR PT report (released November 2023) includes the four AIR PT testing rounds (AR055, AR056, AR058 & AR059) during 2023 and indicates the laboratory performance is satisfactory (95%) over the relevant rolling five round AIR PT window; AR053 Sept- Oct 2022 (100%), AR055 Jan – Feb 2023 (100%), AR056 May- Jun 2023 (75%), AR058 Jul- Aug (100%) and AR059 Sept – Oct 2023

⁸⁵ [Practical Guidance: NO₂ Diffusion Tubes for LAQM | LAQM \(defra.gov.uk\)](https://www.defra.gov.uk/laqm/practical-guidance-no2-diffusion-tubes-for-laqm/)

(100%)⁸⁶. Laboratory performance in AIR PT is also assessed by the National Physical Laboratory (NPL), alongside the laboratory's data from the monthly NPL Field Intercomparison Exercise carried out at the continuous monitoring station in Marylebone Road, central London.

The diffusion tube Precision Summary Results⁸⁷ also show Somerset County Council Scientific Services to have good tube precision (the ability for a measurement to be consistently reproduced) in 2023.

The tube changing frequency was completed in adherence with the Diffusion Tube Monitoring Calendar of suggested exposure periods for 2023⁸⁸ and was carried out by South Gloucestershire Council officers.

Diffusion Tube Annualisation

In 2023, all the diffusion tube monitoring locations within South Gloucestershire recorded data capture of at least 75%, therefore it was not required to annualise any monitoring data.

Diffusion Tube Bias Adjustment Factors

The diffusion tube data presented within the 2024 ASR have been corrected for bias using an adjustment factor. Bias represents the overall tendency of the diffusion tubes to under or over-read relative to the reference chemiluminescence analyser. LAQM.TG22 provides guidance with regard to the application of a bias adjustment factor to correct diffusion tube monitoring. Triplicate co-location studies can be used to determine a local bias factor based on the comparison of diffusion tube results with data taken from NO_x/NO₂ continuous analysers. Alternatively, the national database of diffusion tube co-location surveys provides bias factors for the relevant laboratory and preparation method.

National Bias Adjustment Factor

During 2023, the Council operated co-location studies at Yate, Stoke Gifford A4174 and Hambrook A4174 automatic monitoring sites. These three studies were included in the

⁸⁶ [QA QC Framework | LAQM \(defra.gov.uk\)](#)

⁸⁷ [Precision and Accuracy | LAQM \(defra.gov.uk\)](#)

⁸⁸ [NO₂ Diffusion Tube Monitoring Calendar | LAQM \(defra.gov.uk\)](#)

national database of co-location surveys for 2023⁸⁹. The national bias adjustment factor (BAF) for 2023 was 0.79 (spreadsheet version 03/24) for Somerset County Council Scientific Services (4 studies). The subsequently revised BAF (spreadsheet version 06/24) was 0.83 (12 studies, as 8 Bristol City Council co-location studies were added).

Local Bias Adjustment Factor

The Diffusion Tube Precision and Accuracy Bias spreadsheet⁹⁰ was used to compare the triplicate co-located diffusion tubes with the automatic monitoring data at the Yate, Stoke Gifford and Hambrook sites and calculate local bias adjustment factors of 0.70 (Yate), 0.85 (Stoke Gifford) and 0.84 (Hambrook) for 2023, as shown in Figure C.1, Figure C.2 and Figure C.3 respectively. The Local Bias Adjustment calculations are also shown in Table C.1.

Apart from one period of poor data capture at the Hambrook automatic monitoring site where data capture was 58.4%, data capture was otherwise above 90% for all periods at the Hambrook, Yate and Stoke Gifford sites. The precision of the co-located triplicate tubes was classed as good for all sites in all months.

The three local BAFs were combined using the method in LAQM.TG22 Chapter 7 (p141) to calculate a South Gloucestershire 2023 Local BAF of 0.79.

⁸⁹ [National Bias Adjustment Factors | LAQM \(defra.gov.uk\)](#)

⁹⁰ [Local Bias Adjustment Factors | LAQM \(defra.gov.uk\)](#)

Figure C.1 – 2023 Yate Co-location Study Precision and Accuracy

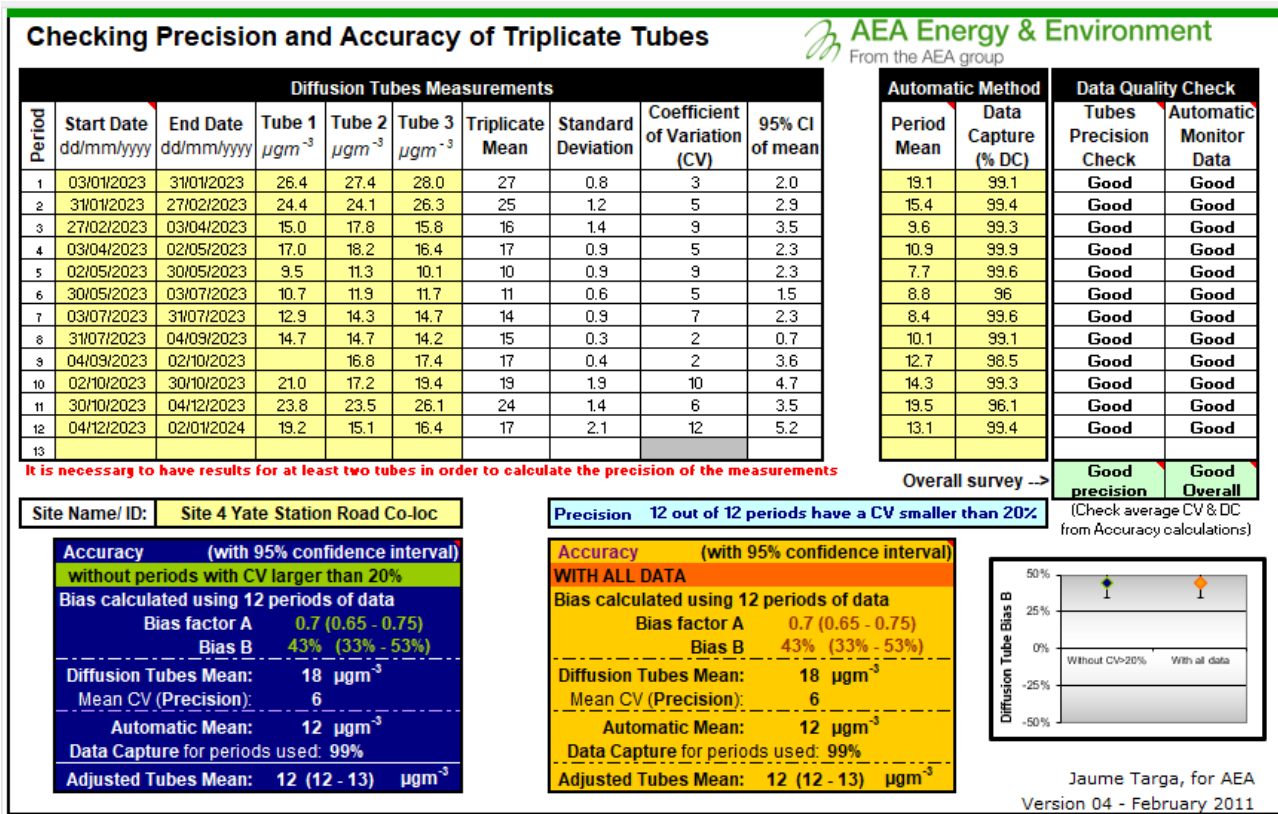


Figure C.2 – 2023 Stoke Gifford A4174 Co-location Study Precision and Accuracy

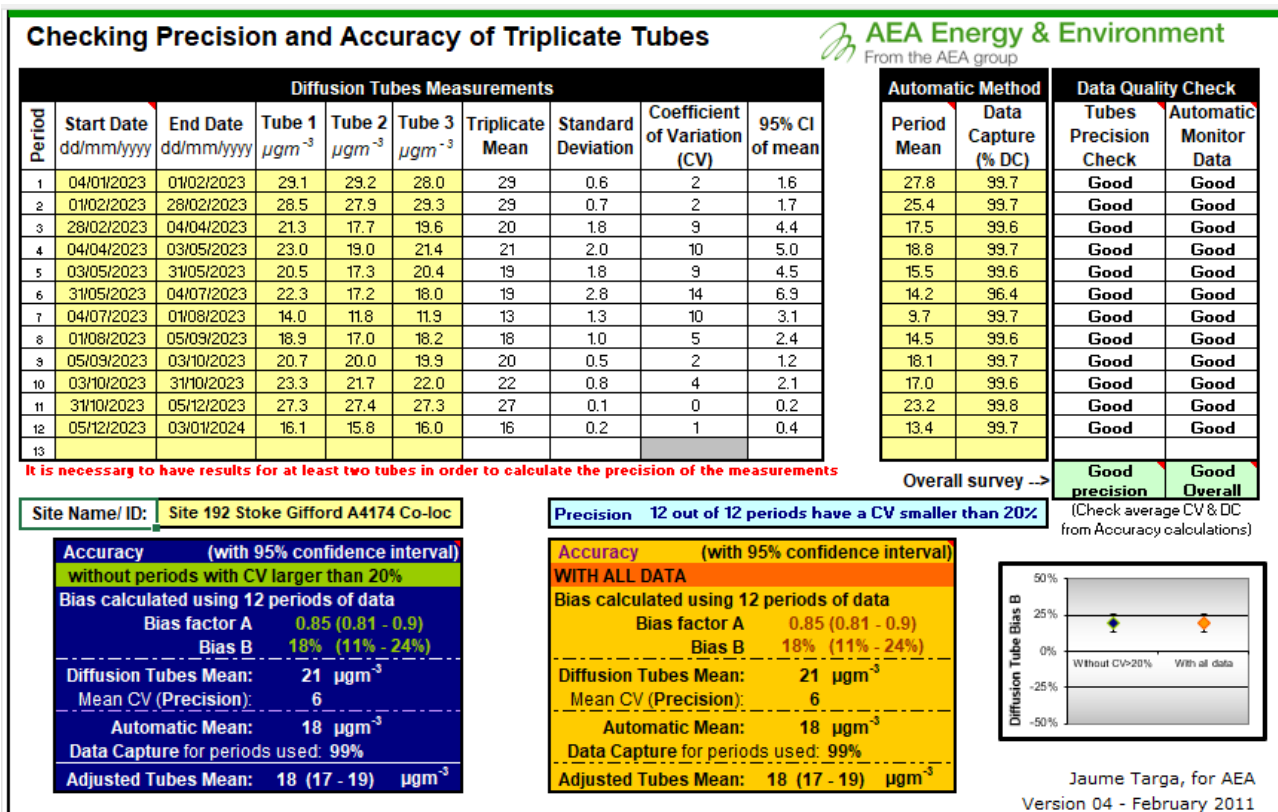


Figure C.3 – 2023 Hambrook A4174 Co-location Study Precision and Accuracy

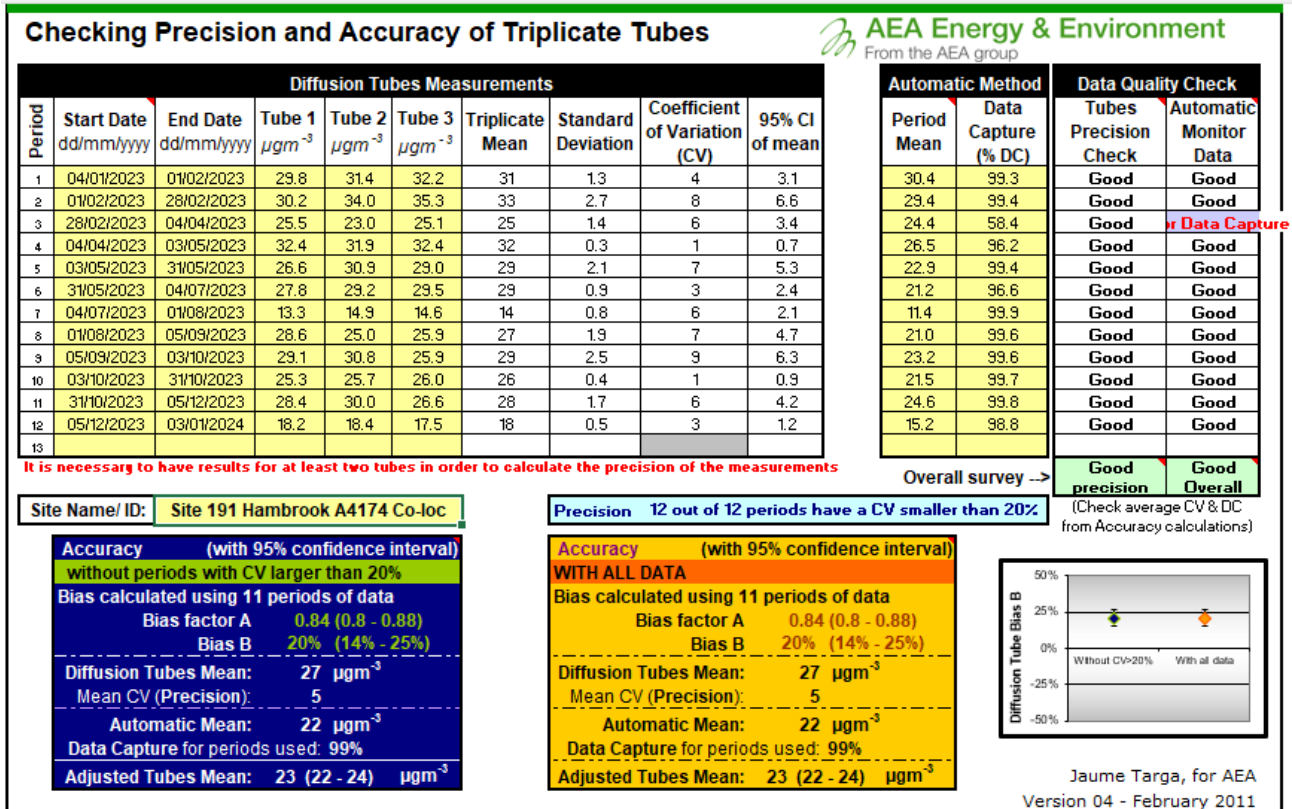


Table C.1 – Local Bias Adjustment Calculation

	Local Bias Adjustment Input 1 Yate Station Rd	Local Bias Adjustment Input 2 Stoke Gifford A4174	Local Bias Adjustment Input 3 Hambrook A4174
Periods used to calculate bias	12	12	11
Bias Factor A	0.7 (0.65 - 0.75)	0.85 (0.81 - 0.9)	0.84 (0.8 - 0.88)
Bias Factor B	43% (33% - 53%)	18% (11% - 24%)	20% (14% - 25%)
Diffusion Tube Mean ($\mu\text{g}/\text{m}^3$)	18	21	27
Mean CV (Precision)	6%	6%	5%
Automatic Mean ($\mu\text{g}/\text{m}^3$)	12	18	22
Data Capture	99%	99%	99%
Adjusted Tube Mean ($\mu\text{g}/\text{m}^3$)	12 (12 – 13)	18 (17 – 19)	23 (22 – 24)

Notes:

A combined local bias adjustment factor of 0.79 was calculated using the method in LAQM.TG22 (Chapter 7 p141) which is the same value as the national BAF for Somerset County Council (spreadsheet version 03/24) used to bias adjust the 2023 diffusion tube results.

Discussion of Choice of Factor to use

South Gloucestershire Council have applied a national bias adjustment factor of 0.79 (spreadsheet version 03/24) to the 2023 monitoring data. This happens to be the same as the local bias adjustment factor calculated for 2023 from the three co-location studies at Yate, Stoke Gifford A4174 and Hambrook A4174 automatic monitoring sites. The national factor, however, has the advantage of being slightly more robust with an additional fourth co-location study.

The subsequently updated national BAF (spreadsheet version 06/24) for Somerset County Council was 0.83 (12 studies). However, while use of the updated June BAF would have been preferable as it is slightly more conservative (higher in value) and more robust (higher number of studies), it was not used as both the LAQM data and JAQU data for the Hambrook scheme had already been processed using the national March/ local BAF of 0.79, and the JAQU Hambrook data had already been submitted for State Assessment. For consistency, use of the same BAF is preferable across all the South Gloucestershire NO₂ diffusion tube monitoring data.

A summary of bias adjustment factors used by South Gloucestershire 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
2023	National	03/24	0.79
2022	National	06/23	0.85
2021	National	06/22	0.86
2020	National	06/21	0.85
2019	National	06/20	0.83

NO₂ Fall-off with Distance from the Road

Wherever possible, monitoring locations are representative of exposure. However, where this is not possible, the NO₂ concentration at the nearest location relevant for exposure can be estimated using the Diffusion Tube Data Processing Tool/NO₂ fall-off with distance calculator available on the LAQM Support website.

Distance correction should be considered at any monitoring site where the annual mean concentration is greater than 36 µg/m³ and the monitoring site is not located at a point of relevant exposure (taking the limitations of the calculator into account). No diffusion tube NO₂ monitoring locations within South Gloucestershire required distance correction during 2023 as no annual mean concentrations greater than 36 µg/m³ were recorded. However, the monitoring result at site 61 (Staple Hill – 1 Broad Street) was distance adjusted so that the result at façade could be reported in Table 2.1 because the highest monitored concentration within the Staple Hill AQMA was recorded at this site (26.2 µg/m³) in 2023. It should be noted though that there is no relevant exposure at ground floor at this site. The NO₂ Fall-off with Distance Calculator⁹¹ was used for the distance adjustment and the input data and result from the calculator is shown in Table C.3.

Table C.3 – Non-Automatic NO₂ Fall off With Distance Calculations (concentrations presented in µg/m³)

Site ID	Distance (m): Monitoring Site to Kerb	Distance (m): Receptor to Kerb	Monitored Concentration (Annualised and Bias Adjusted)	Background Concentration	Concentration Predicted at Receptor	Comments
61	2.3	3.3	26.2	12.4	25.0	

QA/QC of Automatic Monitoring

The automatic monitoring sites follow the QA/QC programme outlined below:

- Regular checks on the data to ensure analysers and communications are operating correctly and faults are reported as soon as possible by Air Quality Data Management (AQDM) under contract to South Gloucestershire Council
- Monthly Local Site Operator (LSO) duties, including site inspections and calibration checks on the analysers using certified traceable standard gases, by Bristol City Council (BCC) at Yate and Enviro Technology Services at Stoke Gifford and Hambrook, under contract to South Gloucestershire Council

⁹¹ [NO₂ Fall Off With Distance Calculator | LAQM \(defra.gov.uk\)](https://www.defra.gov.uk/laqm-calculator/)

- Ad-hoc site inspections to check equipment operational status, site safety and security and investigate equipment malfunction as necessary by SGC Environmental Protection Officers
- Planned six monthly servicing and re-calibration of the analysers and repairs as necessary by Enviro Technology Services under contract to South Gloucestershire Council.

Calibration methods

Calibration procedures are carried out monthly. The methodology for the calibration procedure, which includes a two point zero/span calibration check, is derived from the manufacturers' instruction handbooks and from the AURN Site Operator's Manual as follows:

- Pre-calibration check - the site condition and status of the analyser is recorded prior to the zero/span check being conducted
- Zero check – the response of the analyser to the absence of the gas being monitored
- Span check – the response of the analyser to the presence of the gas of a known concentration
- Post calibration check - the site condition and status of the analyser on completion of all checks.

The two point calibration is conducted on the NO_x analysers using a zero air scrubber and a reference nitric oxide (NO) mixture at a concentration of approximately 470 ppb. The contents of the portable scrubber used for zero air generation (hopcalite, activated charcoal, purafil and drierite) are changed when necessary or at least every six months.

Equipment Servicing and Maintenance

The automatic analysers and associated equipment are serviced and re-calibrated at six monthly intervals following manufacturers' instructions by the equipment suppliers, Enviro Technology Services. For the NO_x analysers, this includes multi-point recalibrations as detailed above and a check on the efficiency of the molybdenum converter. The service contract also covers unscheduled site visits and repairs, for example in the event of equipment failure, within a specified period of time to minimise data loss.

The results of all service, maintenance and calibrations checks are held and used in the data scaling and ratification process by AQDM.

Data Processing, Validation and Ratification

Since 2022, Air Quality Data Management (AQDM) have been collecting and managing the automatic monitoring data on behalf of the Council as SGC no longer directly collects the data itself. AQDM undertake the subsequent validation, scaling and ratification of the data in accordance with LAQM.TG22.

Data validation involves continually screening algorithmically and manually for anomalies. This includes visual examination of the data to check for any spurious or unusual measurements, such as large spikes, 'flat lines' and excessive negative data. Suspicious data is "flagged" for further investigation. The data is scaled against the monthly and full six monthly calibration data.

During data ratification, all the information relating to the dataset and monitoring location is critically reviewed and any initial spurious data that was flagged is re-examined and appropriately edited. The original raw dataset is kept for reference. The monitoring data is compared to trends at nearby AURN sites throughout the whole process. The ratified data is the final data presented in this report.

The real-time automatic monitoring data for South Gloucestershire is available on the [Air Quality in the United Kingdom \(ukairquality.net\)](https://ukairquality.net) website. Historic data for the automatic monitoring stations that have ceased operation; Filton (NO₂ and PM₁₀), Kingswood (NO₂ and PM₁₀) and Badminton (O₃), is also available on this website.

PM₁₀ and PM_{2.5} Monitoring Adjustment

The PM₁₀ data measured by the unheated Beta Attenuation Monitor (BAM) at the Yate automatic monitoring site have been adjusted to gravimetric equivalent by using a factor of 0.833. The PM₁₀ measurements are made using a smart heated BAM 1020 at the Stoke Gifford A4174 automatic monitoring site so have been adjusted to gravimetric equivalent using a factor of 0.96618.

The PM_{2.5} measurements are made at the Stoke Gifford A4174 automatic monitoring site using a smart heated BAM 1020 and do not require the application of a correction factor.

Automatic Monitoring Annualisation

All automatic monitoring locations within South Gloucestershire recorded data capture greater than 75% in respect of all monitored pollutants in 2023, therefore annualisation was not required.

NO₂ Fall-off with Distance from the Road

Wherever possible, monitoring locations are representative of exposure but where this is not possible, distance correction to a point of relevant exposure should be considered at any automatic monitoring site where the NO₂ annual mean concentration is greater than 40µg/m³. However, the 2023 NO₂ annual mean concentrations were all below 40µg/m³ at the automatic NO₂ monitoring locations within South Gloucestershire and also, there is no relevant exposure in relation to the Yate, Stoke Gifford A4174 or Hambrook A4174 automatic monitoring sites, therefore, distance adjustment of the automatic NO₂ data was not appropriate or possible.

Appendix D: Maps of Monitoring Locations and AQMAs

Figure D.1 – Staple Hill AQMA (amended 2012)

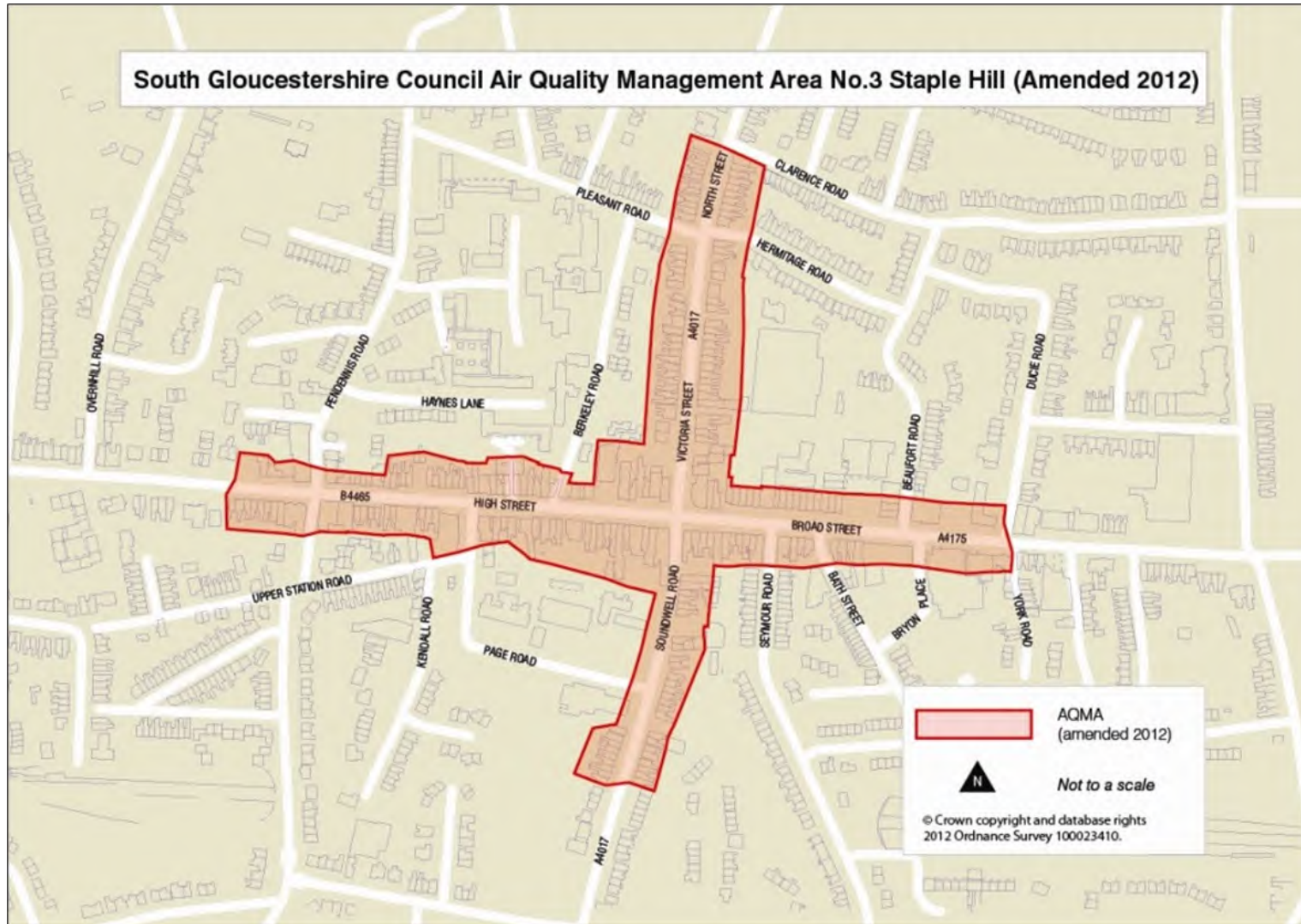


Figure D.2 – Kingswood – Warmley AQMA (Amended 2015)

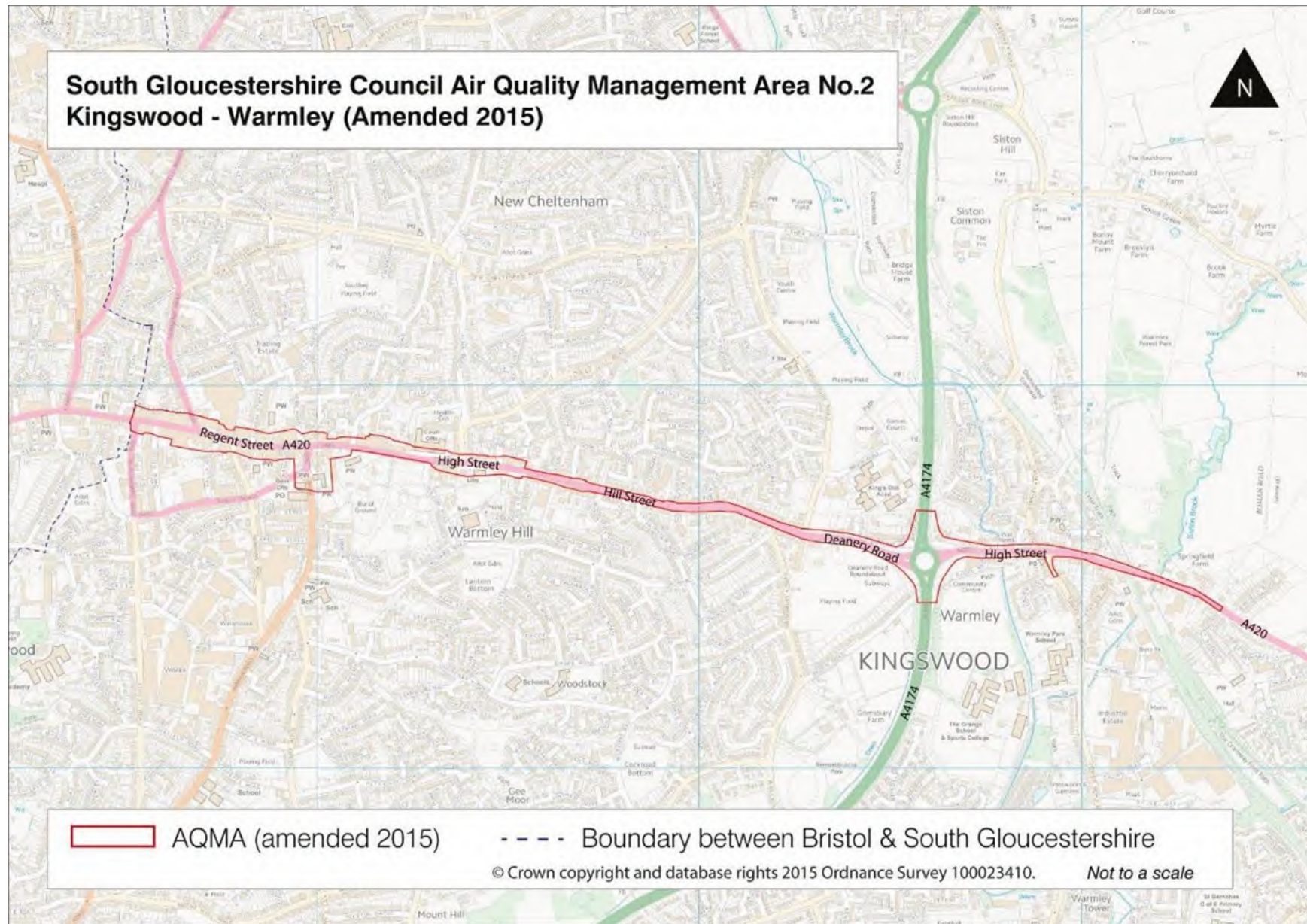


Figure D.3 – Cribbs Causeway AQMA (Revoked 2020)

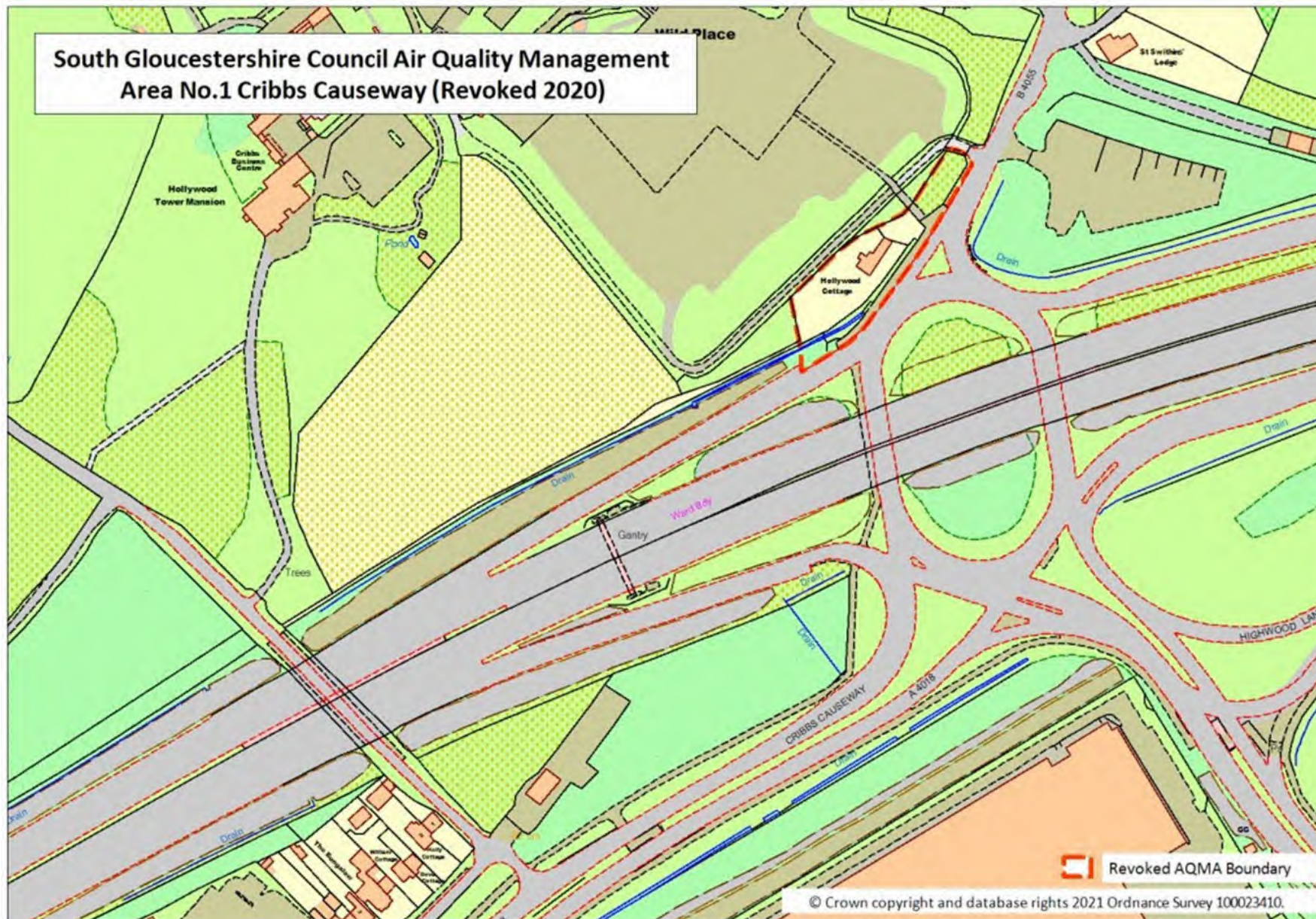


Figure D.4 – Automatic Monitoring Sites in South Gloucestershire

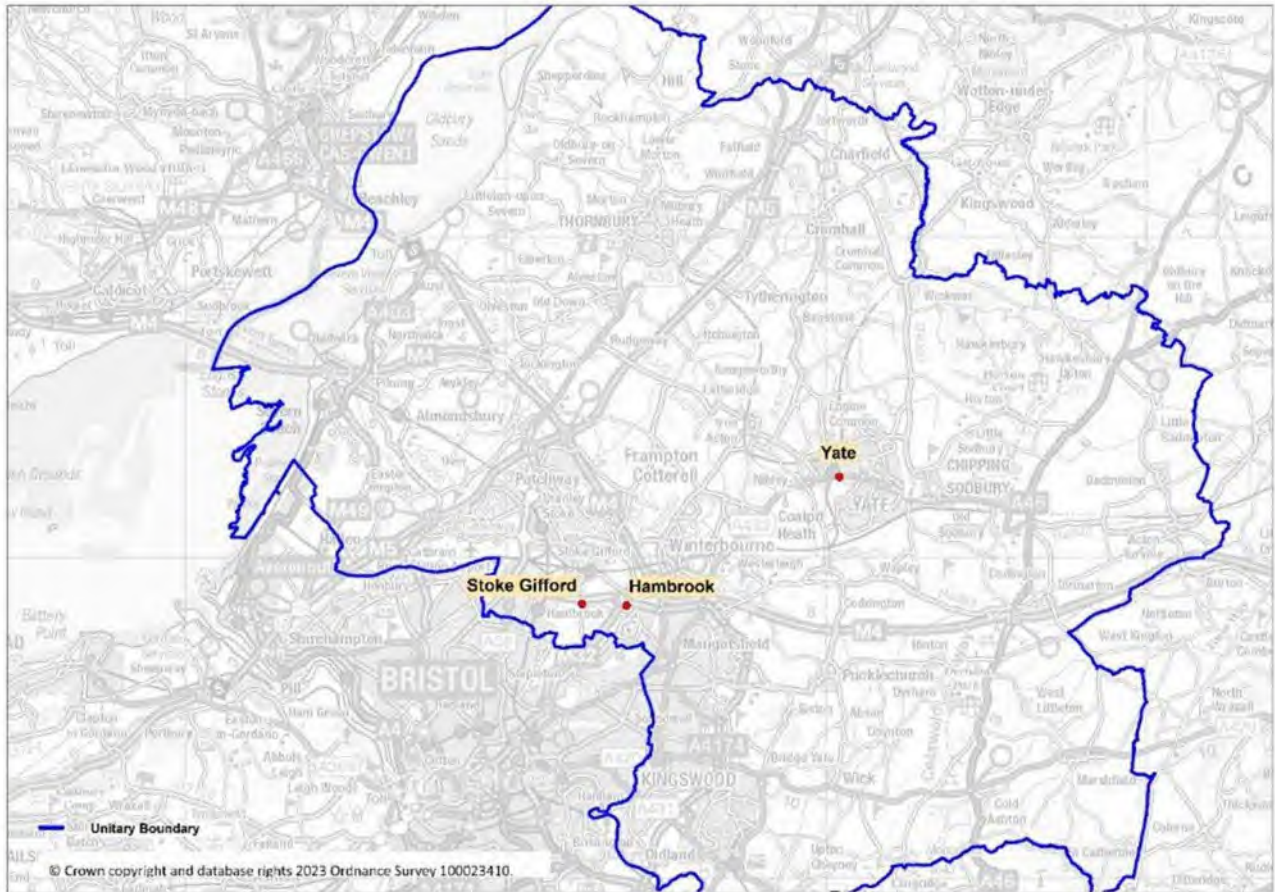


Figure D.5 – Automatic Monitoring Site Yate - Station Road

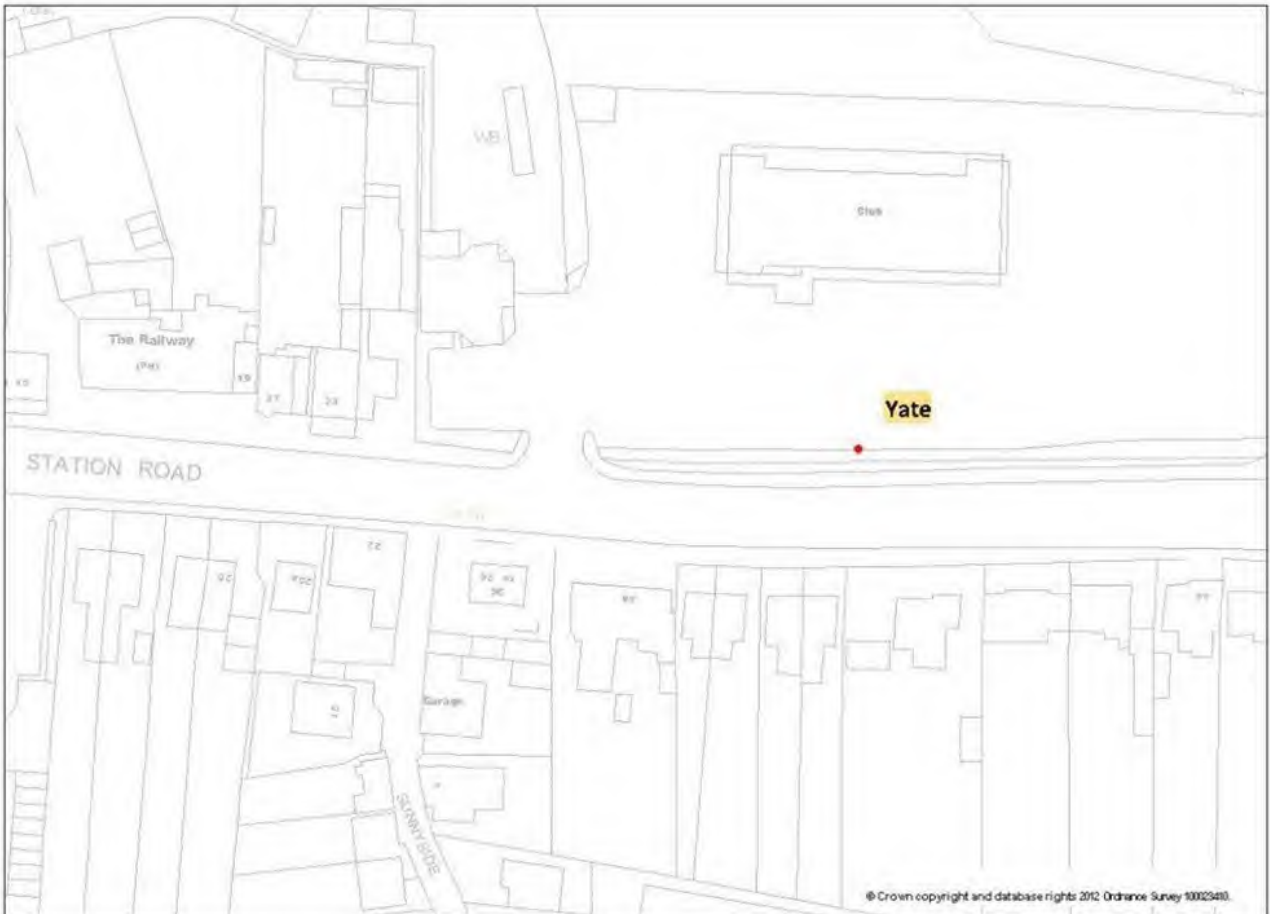


Figure D.6 – Automatic Monitoring Site Stoke Gifford A4174 Ring Road

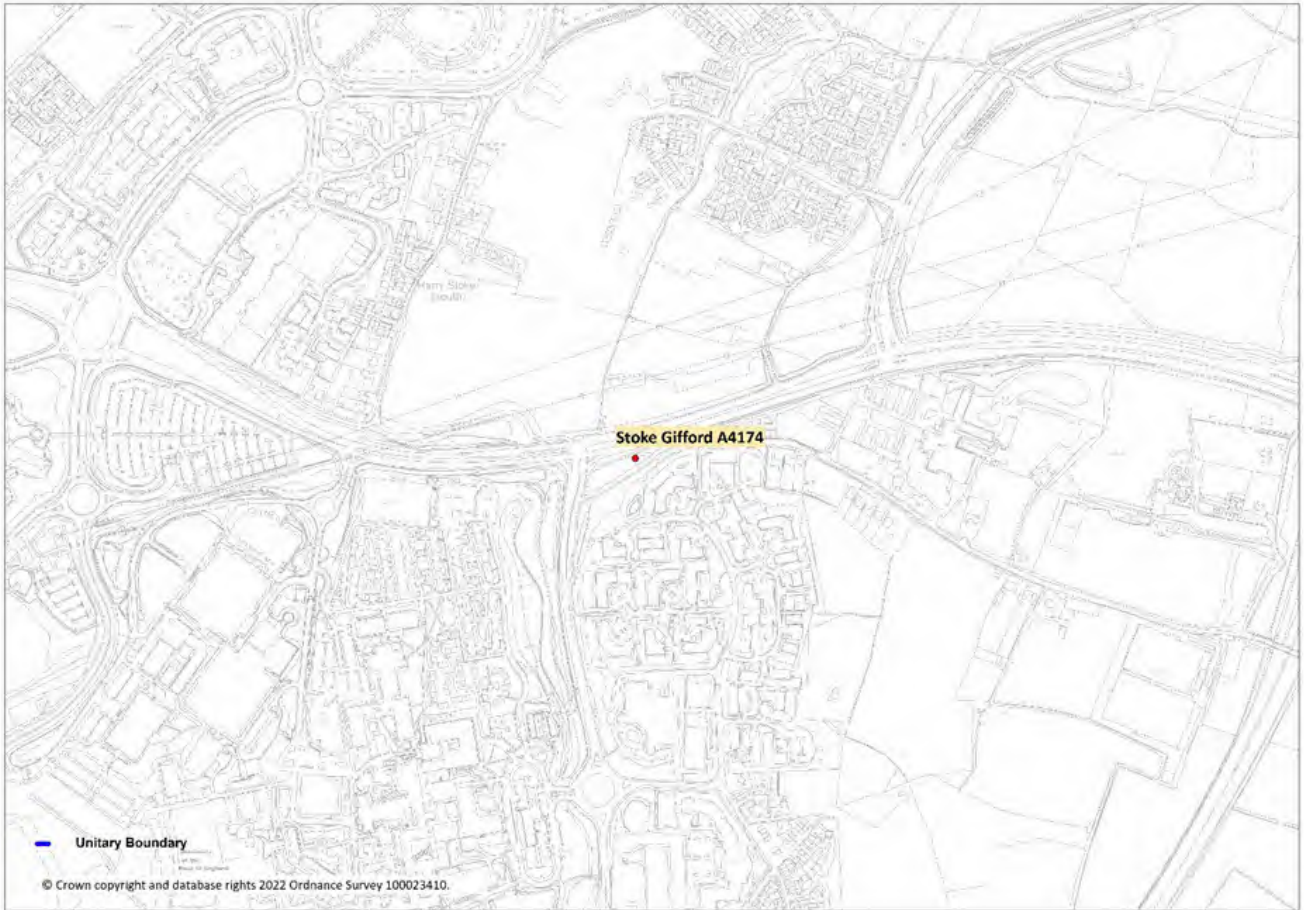


Figure D.7 – Automatic Monitoring Site Hambrook A4174 Ring Road

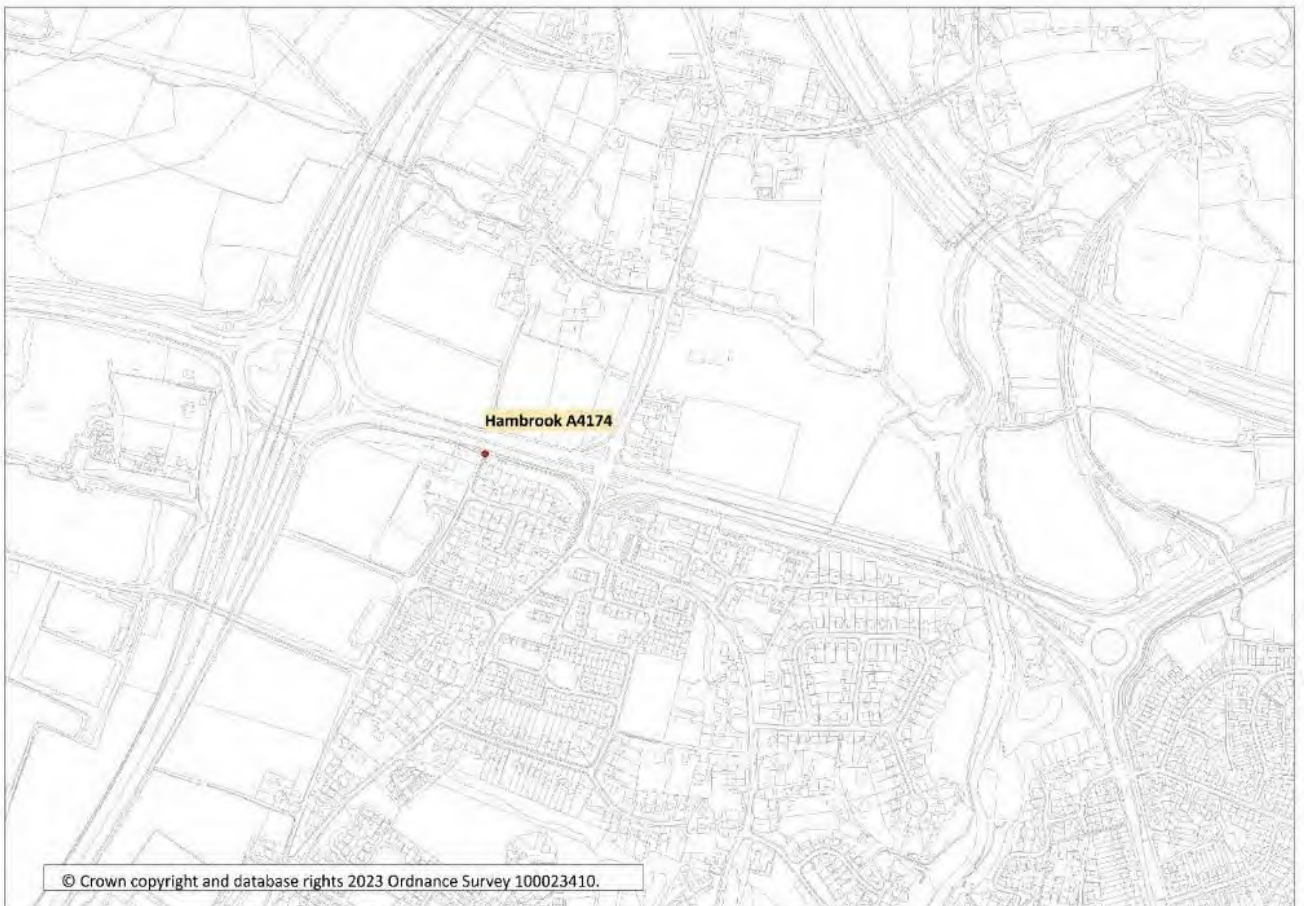


Figure D.8 – All Diffusion Tube Sites showing locations of following Figures

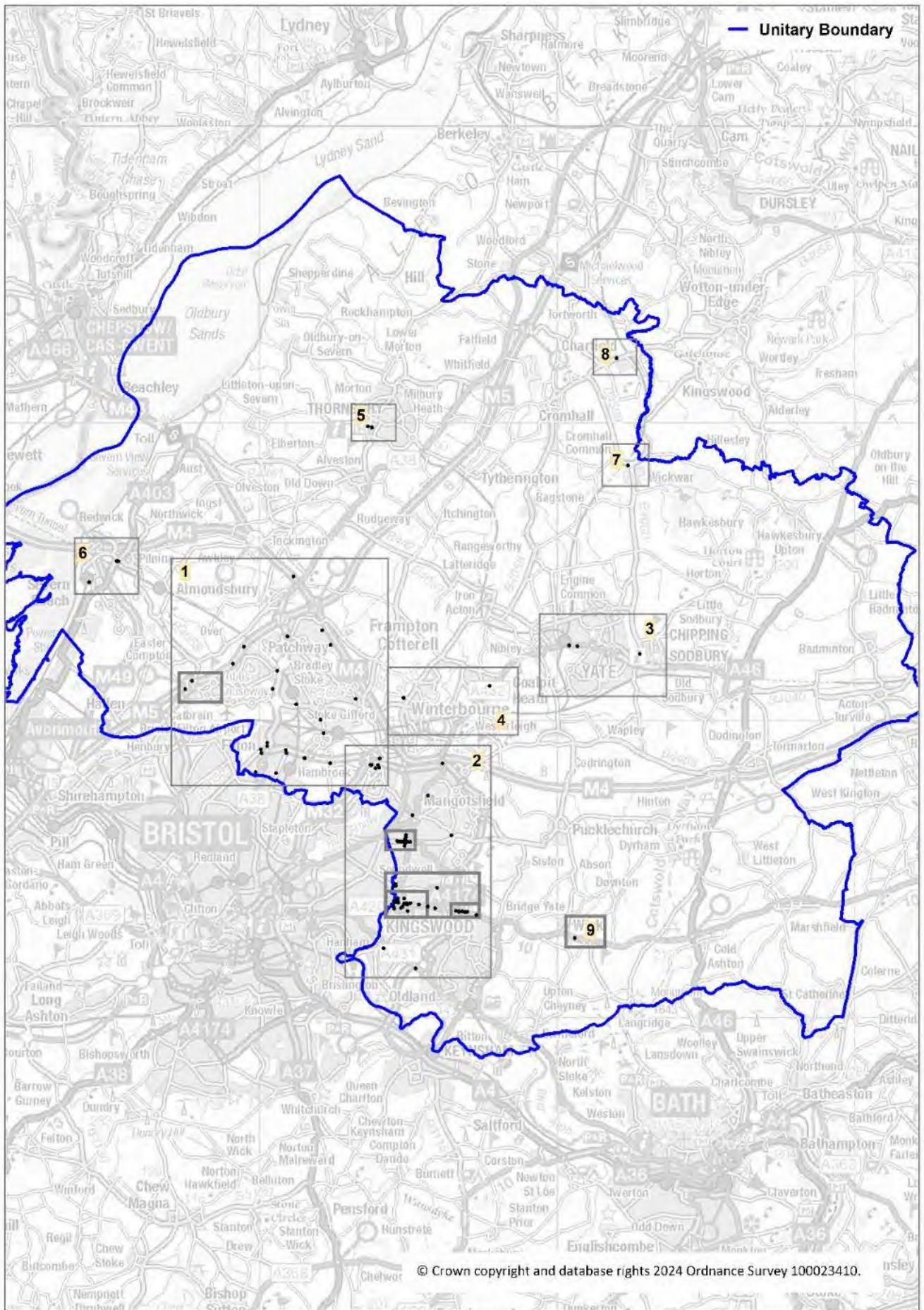


Figure D.9 – Diffusion Tube Sites in Bristol North (Box 1 Figure D.8)

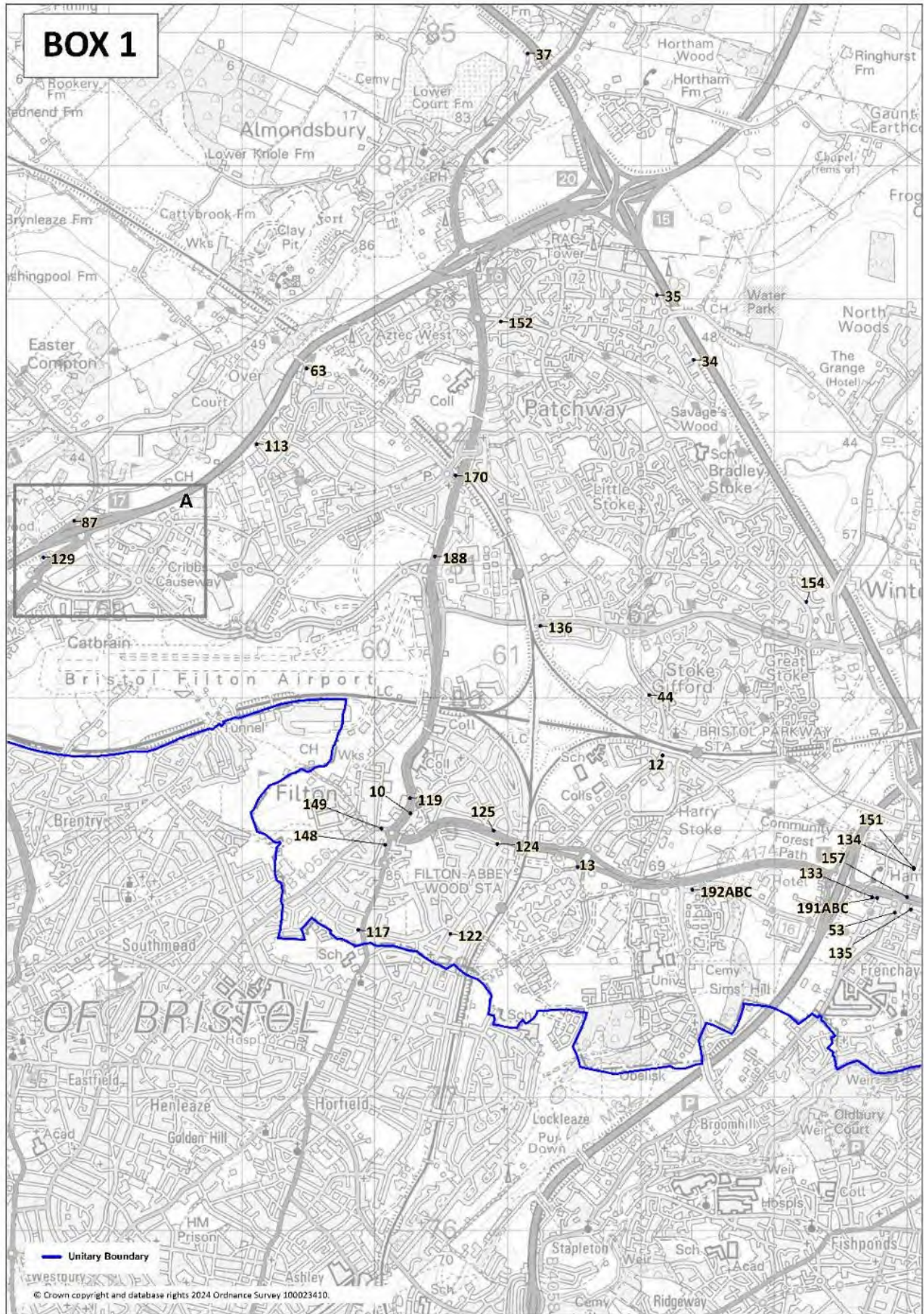


Figure D.10 – Diffusion Tube Sites in Cribbs Causeway (Box A Figure D.9)

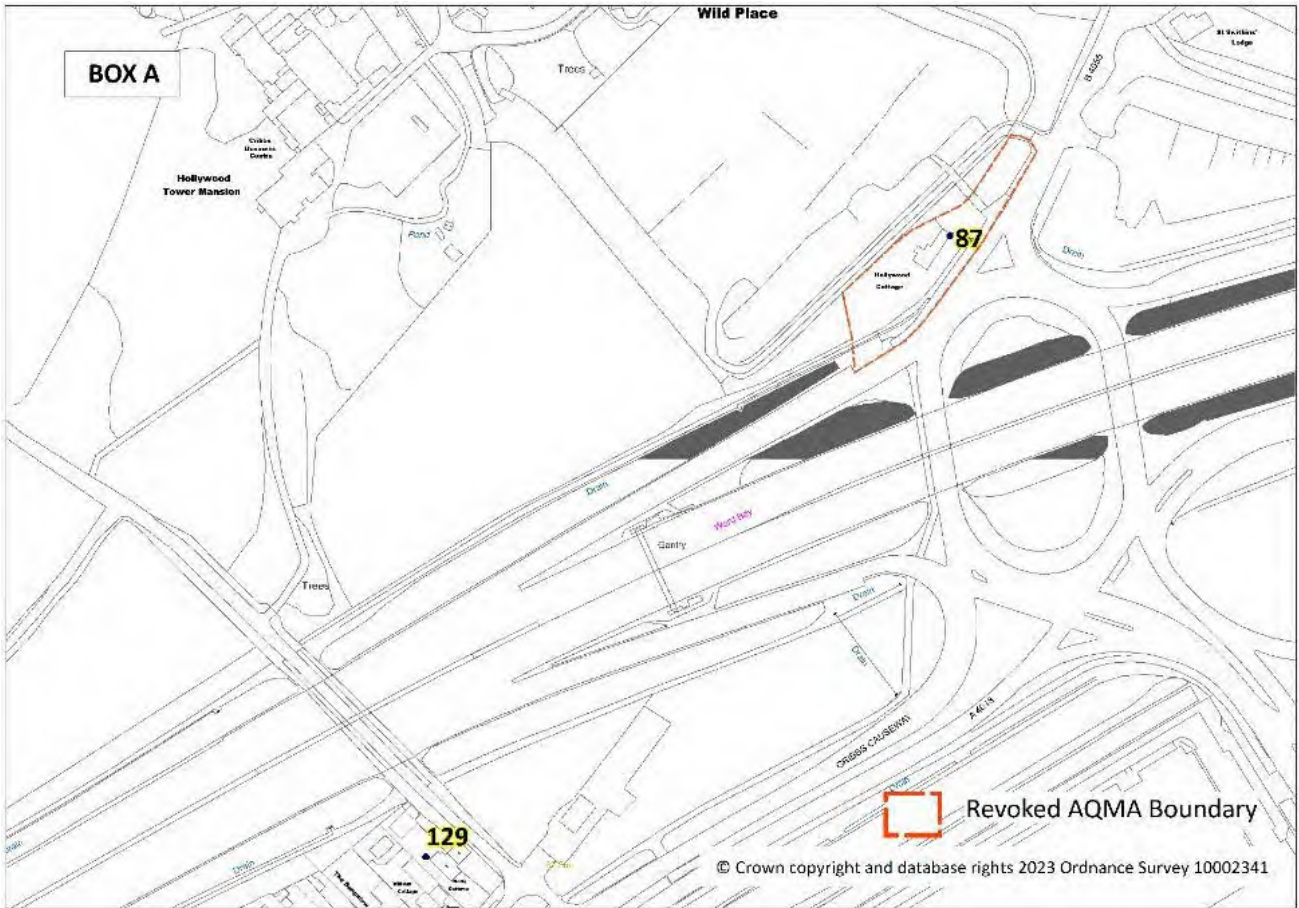


Figure D.11 – Diffusion Tube Sites in Bristol East (Box 2 Figure D.8)

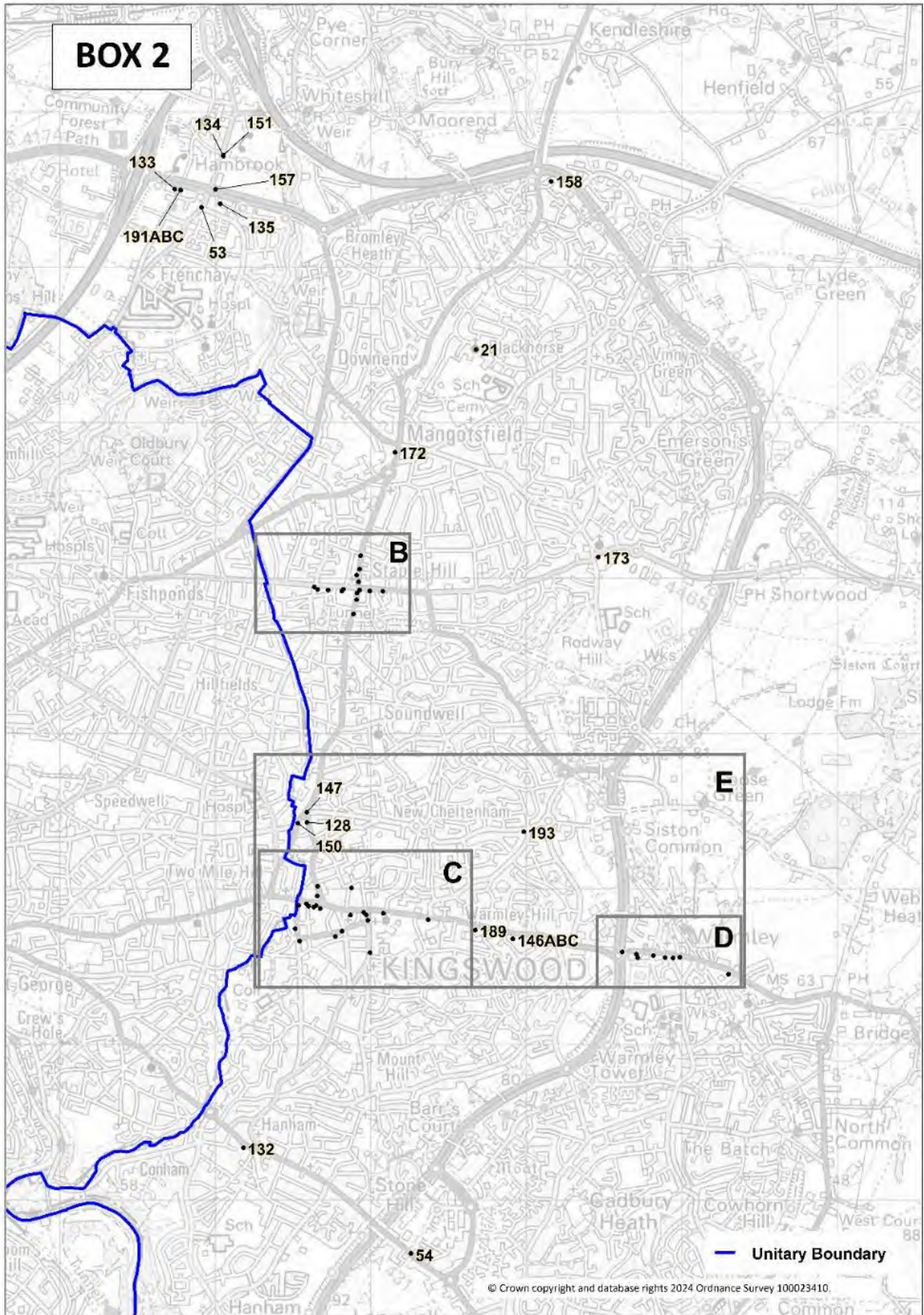


Figure D.12 – Diffusion Tube Sites in Staple Hill (Box B Figure D.11)

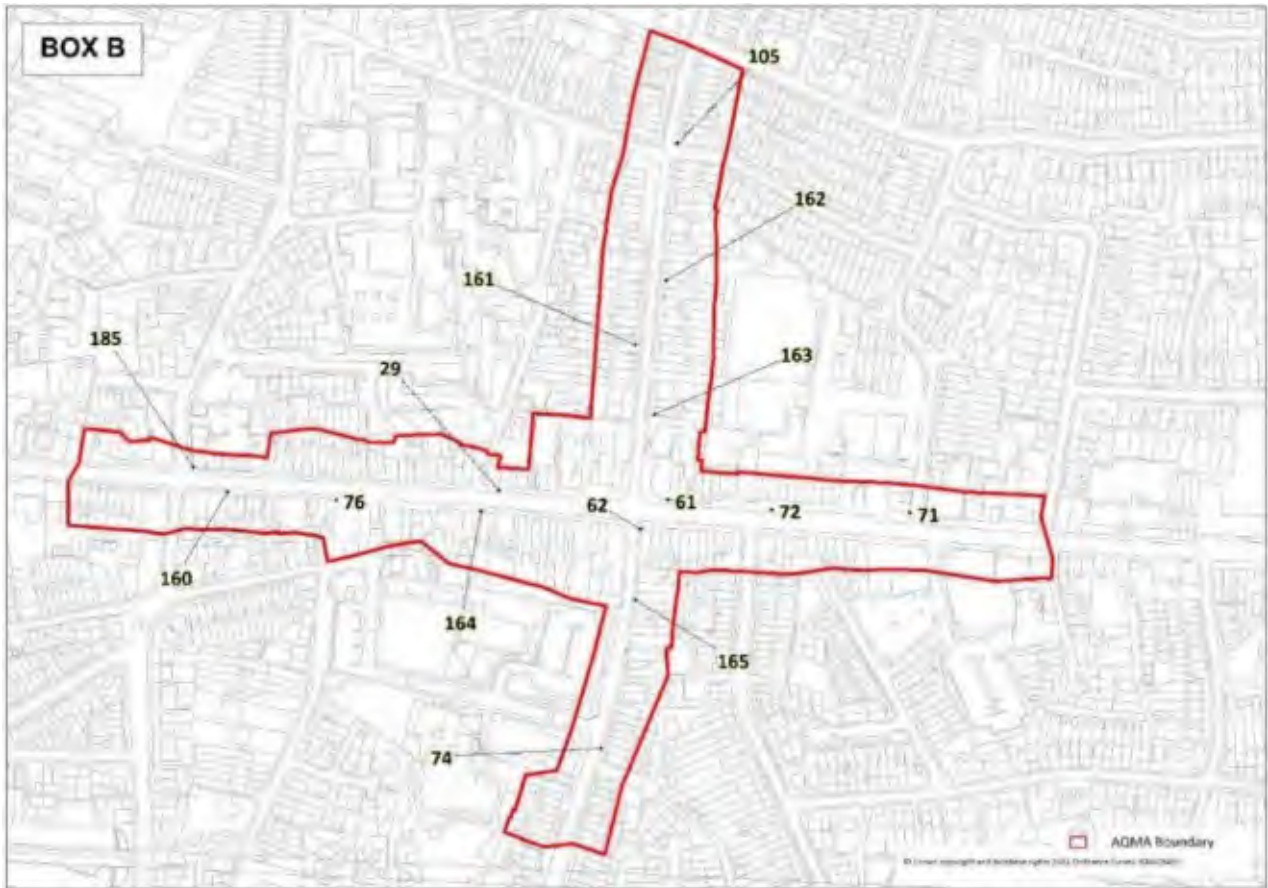


Figure D.13 – Diffusion Tube Sites in Kingswood (Box C Figure D.11)

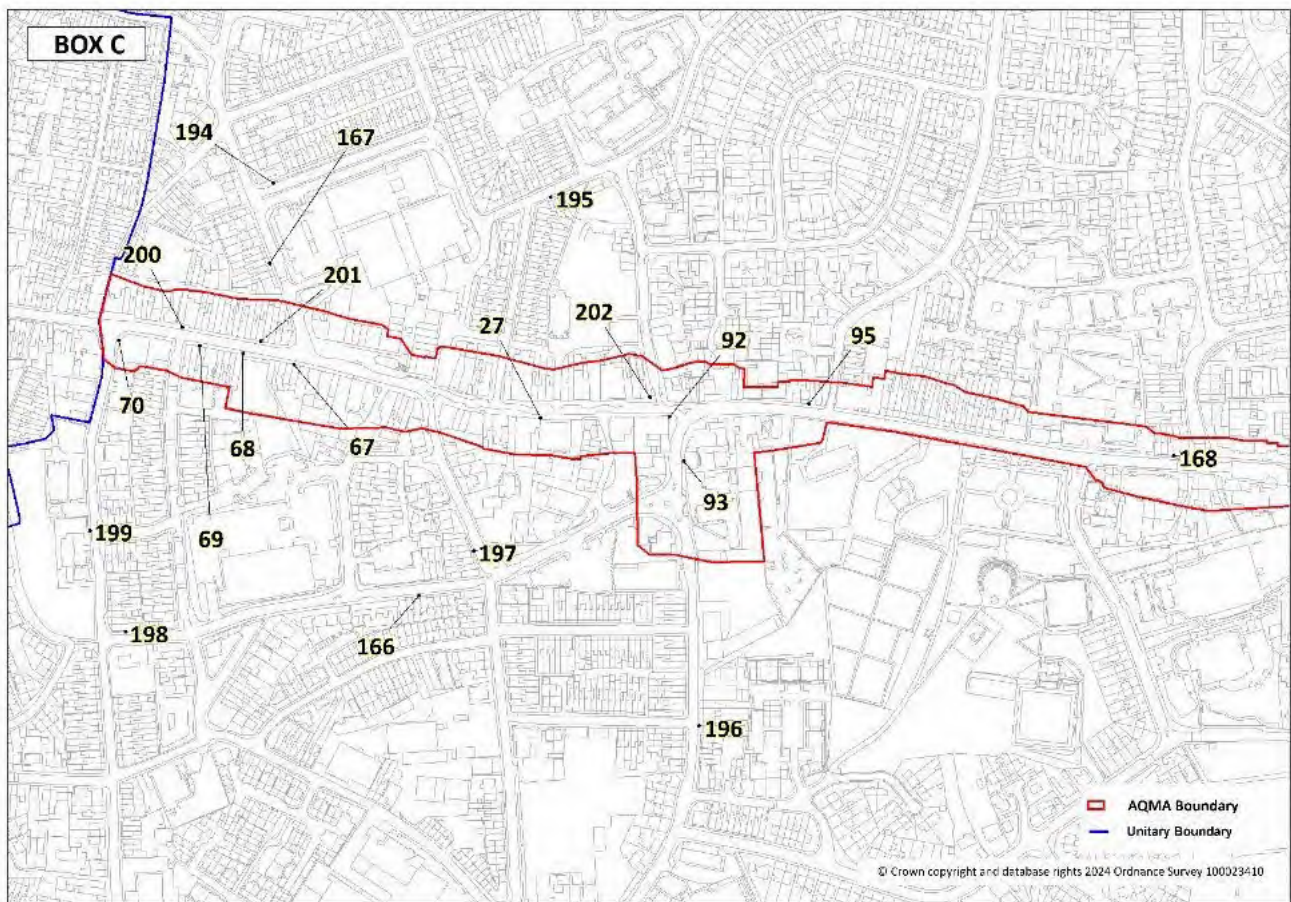


Figure D.14 – Diffusion Tube Sites in Warmley (Box D Figure D.11)

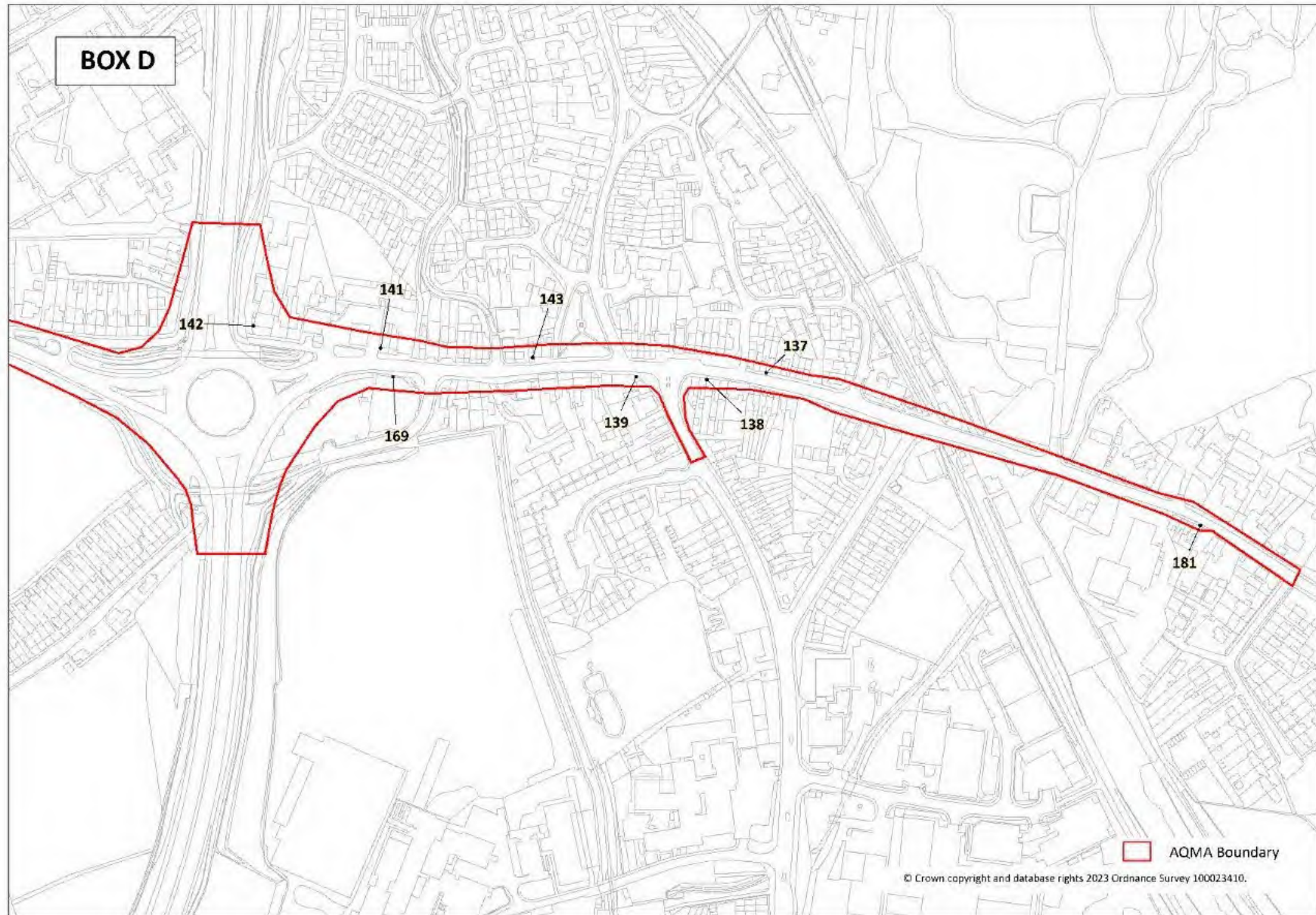


Figure D.15 – Diffusion Tube Sites in Kingswood & Warmley (Box E Figure D.11)

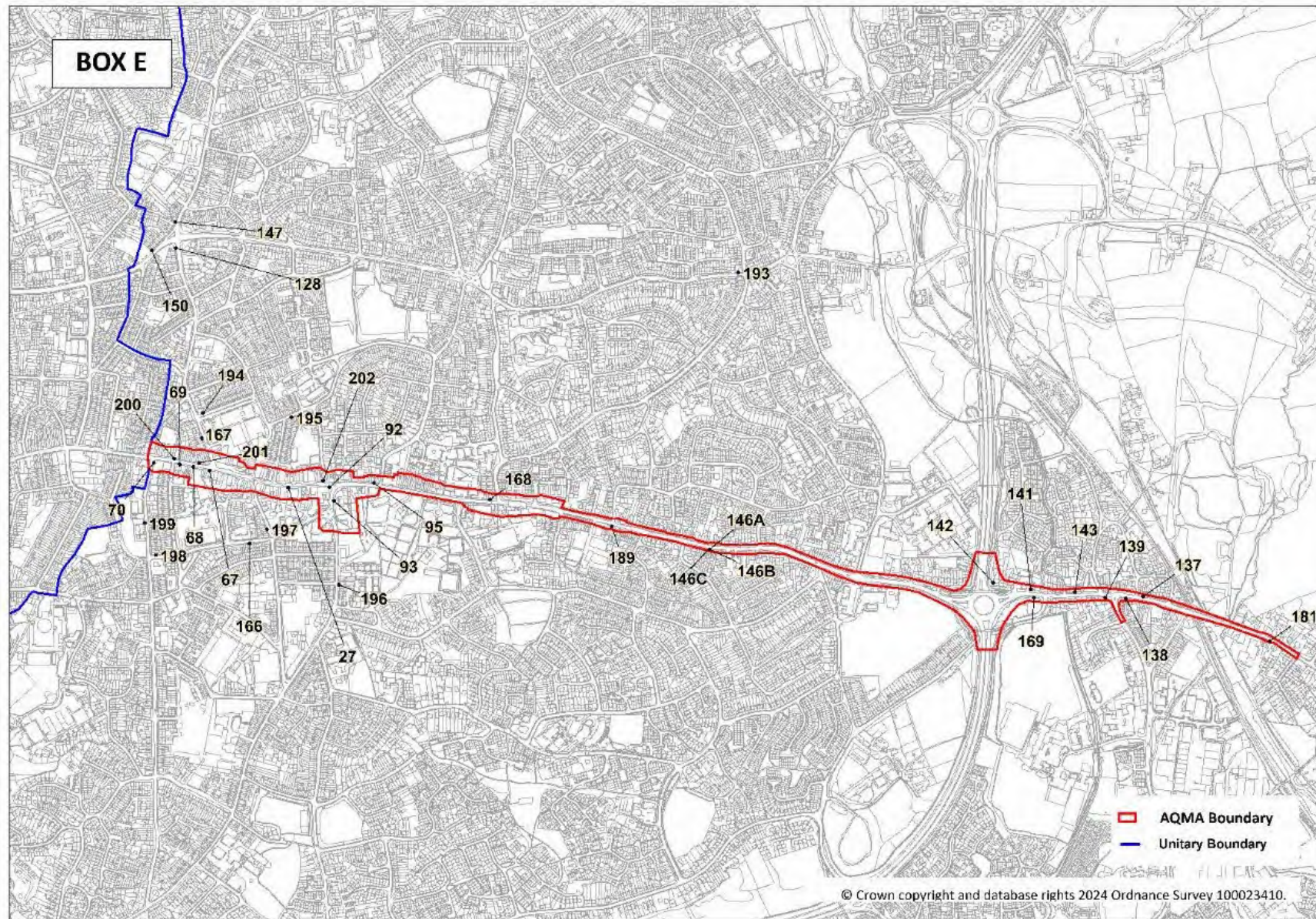


Figure D.16 – Diffusion Tube Sites in Yate & Chipping Sodbury (Box 3 Figure D.8)



Figure D.17 – Diffusion Tube Sites in Winterbourne & Coalpit Heath (Box 4 Figure D.8)



Figure D.18 – Diffusion Tube Sites in Thornbury (Box 5 Figure D.8)



Figure D.19 – Diffusion Tube Sites in Severn Beach and Pilning (Box 6 Figure D.8)

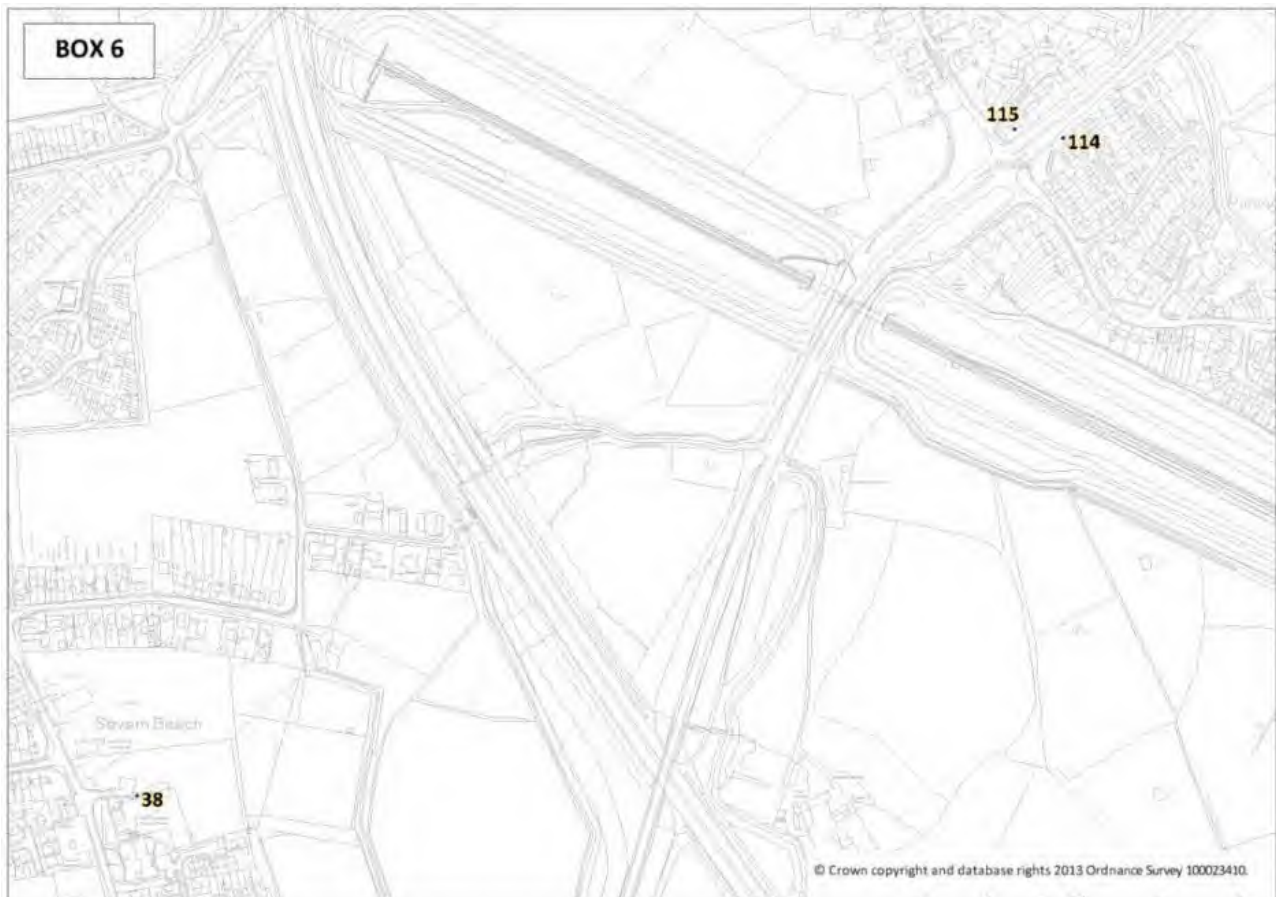


Figure D.20 – Diffusion Tube Site in Wickwar (Box 7 Figure D.8)

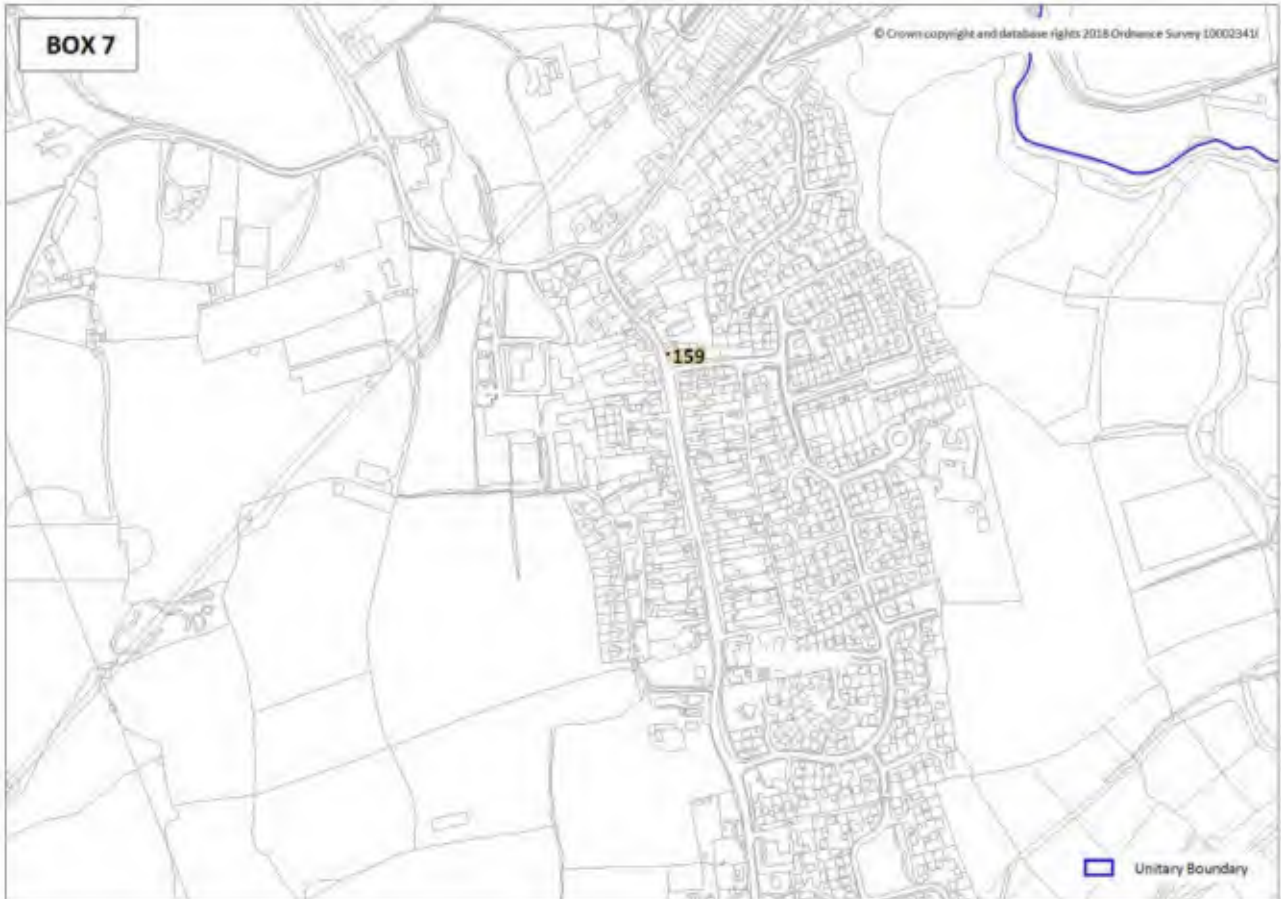


Figure D.21 – Diffusion Tube Site in Charfield (Box 8 Figure D.8)



Figure D.22 – Diffusion Tube Site in Wick (Box 9 Figure D.8)



Appendix E: Summary of Air Quality Objectives in England

Table E.1 – Air Quality Objectives in England⁹²

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

⁹² The units are in microgrammes of pollutant per cubic metre of air (µg/m³).

Appendix F: Ozone Monitoring

Ozone at ground level is a secondary pollutant formed by the photochemical reaction of pollutants, such as nitrogen oxides (NO_x) from vehicle and industry emissions and volatile organic compounds (VOCs) emitted by vehicles, solvents and industry, with sunlight. It is one of the major constituents of photochemical smog. Reductions in NO_x emissions and any resultant reduction in nitrogen dioxide (NO₂) levels are invariably accompanied by an increase in ozone levels. This is of concern due to the health impacts of ozone⁹³ and because ozone is also a greenhouse gas in the lower atmosphere.

South Gloucestershire Council monitored Ozone (O₃) concentrations at automatic monitoring site (SG2) in Stoke Gifford on the A4174 Ring Road near Coldharbour Lane and UWE during 2023. The Council has previously monitored ozone at a more rural monitoring site in Badminton from 1998 until early 2015 when the site ceased operation.

The transboundary nature of ozone is recognised in the Government's UK Air Quality Strategy⁹⁴. Consequently, the objective for ozone is not included in the Local Air Quality Management regime. However, the ozone objective (100 µg/m³, measured as a running 8-hour mean, not to be exceeded more than ten times a year) is a guide for the reporting of locally monitored ozone concentrations.

Table F.1 presents the ratified and adjusted monitored O₃ annual mean concentrations and Table F.2 compares the ratified continuous monitored O₃ daily maximum running 8-hour mean concentrations with the ozone objective.

In 2023, the annual mean ozone concentration was 51.3 µg/m³. During 2023, there were 9 days when the maximum running 8-hour mean objective of 100 µg/m³ was exceeded, compared to 22 days during 2022. All 9 days were between 1st April and 30th September when ozone concentrations are likely to be at their highest. As the allowance is 10 days, this objective was not exceeded. The maximum running 8-hour mean was 140 µg/m³.

Table A.1 in Appendix A shows the details of the automatic monitoring site and maps showing its location are provided in Appendix D. The automatic monitoring results for

⁹³ [Ozone \(O₃\) - GOV.UK \(www.gov.uk\)](https://www.gov.uk)

⁹⁴ [Air Quality Strategy Vol 1 \(publishing.service.gov.uk\)](https://publishing.service.gov.uk)

South Gloucestershire Council are presented on the [Air Quality in the United Kingdom \(ukairquality.net\)](https://ukairquality.net) website.

Table F.1 – Annual Mean O₃ Monitoring Results (µg/m³)

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2023 (%) ⁽²⁾	2021	2022	2023
SG2 Stoke Gifford A4174 Coldharbour Lane	362384	178562	Roadside	97.6	97.6	49.0	51	51.3

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/m³.

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%).

Table F.2 – Air Quality Objectives in England 8-Hour Mean O₃ Monitoring Results, Number of O₃ Daily Maximum Running 8-Hour Means > 100 µg/m³

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2023 (%) ⁽²⁾	2021	2022	2023
SG2 Stoke Gifford A4174 Coldharbour Lane	362384	178562	Roadside	97.6	97.6	3	22	9

Notes:

Results are presented as the number of running 8-hour periods where daily mean concentrations greater than 100µg/m³ have been recorded during the monitoring period. There is an annual allowance of 10 days. The ozone standard is not set in regulations.

Exceedances of the Ozone guideline objective of 100 µg/m³ (not to be exceeded more than 10 times/year) are shown in **bold**.

(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%).

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
AURN	Automatic Urban and Rural Network (National monitoring network)
BAF	Bias Adjustment Factor
BAM	Beta Attenuation Monitor (for Particulate Matter measurement)
CAZ	Clean Air Zone
CBTF	Clean Bus Technology Fund
CO ₂	Carbon Dioxide
Defra	Department for Environment, Food and Rural Affairs
DfT	Department for Transport
DPH	Director of Public Health
DT	Diffusion Tube
EU	European Union
EV	Electric Vehicle
Exceedance	A period of time where the concentration of a pollutant is greater than the appropriate air quality objective
JAQU	Joint Air Quality Unit between Defra and Department for Transport
JLTP	Joint Local Transport Plan
JSNA	Joint Strategic Needs Assessment
LAQM	Local Air Quality Management
LAQM.PG22	Local Air Quality Management Policy Guidance 2022
LAQM.TG22	Local Air Quality Management Technical Guidance 2022
LCWIP	Local Cycling and Walking Infrastructure Plan
LSO	Local Site Operator

Abbreviation	Description
LSTF	Local Sustainable Transport Fund
LTCP	Local Transport Capital Programme
NO ₂	Nitrogen Dioxide
NO _x	Nitrogen Oxides
O ₃	Ozone
OHID	Office for Health Improvement and Disparities
OLEV	Office for Low Emission Vehicles
PHIP	(South Gloucestershire) Population Health Intelligence Portal
PHOF	Public Health Outcomes Framework
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
SGC/SGDC	South Gloucestershire Council/ South Gloucestershire District Council
SO ₂	Sulphur Dioxide
STTY	Sustainable Travel Transition Year (DfT funding)
µg/m ³	Microgrammes per cubic metre
UKAS	United Kingdom Accreditation Service
UTC	Urban Traffic Control
VOC	Volatile Organic Compounds
WECA	West of England Combined Authority

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