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: June 2024

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Executive Summary: Air Quality in Our Area

Air Quality in Waverley Borough Council

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 year[1].

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 pollution[2].

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 $PM_{2.5}$)	Particulate matter is everything in the air that is not a gas. 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. PM_{10} refers to particles under 10 micrometres. Fine particulate matter or $PM_{2.5}$ are particles under 2.5 micrometres.

[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

Waverley is situated in the south-western corner of Surrey, the Borough is largely rural with four main populations centres: Farnham, Godalming, Haslemere and Cranleigh. Air quality within the Borough is generally good, but there are hotspots of pollution caused by elevated levels of nitrogen dioxide. Road traffic has been recognised as the major pollution source for nitrogen dioxide with the greatest effects in the largest population centres within the Borough.

Two main trunk roads cross Waverley; the A31 Guildford to Bere Regis (Dorset) and the A3 London to Portsmouth dual carriageways. The latter includes the Hindhead Tunnel which opened in August 2011 in order to relieve serious congestion on the A3 route in Hindhead.

Previous air quality assessments have concluded that concentrations of carbon monoxide, benzene, 1-3 butadiene, lead, sulphur dioxide (SO_2) and particulates (PM_{10}) are compliant with UK Air Quality Objectives (AQOs). However, concentrations of nitrogen dioxide (NO_2) have been found to exceed the annual mean AQO at various locations within the Borough.

Waverley Borough Council (WBC) declared three Air Quality Management Areas (AQMAs) in 2005 in Farnham, Godalming and Hindhead. The 2005 Order was varied in 2007 when the Farnham AQMA was extended. The AQMAs were all directly attributed to exceedances of the annual mean AQO for NO_2 due to traffic congestion. The AQMA in Hindhead was subsequently revoked in 2015 after completion of the Hindhead Tunnel project. Further information about the AQMAs in Waverley can be found at: https://uk-air.defra.gov.uk/aqma/local-authorities?la_id=299

Additionally, fine particulate pollution ($PM_{2.5}$) is a concern across the Borough given health impacts, although there is no local AQO for $PM_{2.5}$. Domestic sources make the largest contribution to primary local emissions. Other important sources include non-exhaust road traffic and the industry, agriculture and commercial sectors.

In 2023, most locations (50 out of 51 measuring NO_2 by diffusion tube in both 2022 and 2023), the NO_2 concentrations measured were lower than those measured in 2022. The only site which measured an increase in 2023 compared to 2022 was WBC45 (Windrush House Horsham Road) where the annual mean concentration increased from 21 µg m^{-3} to 21.2 µg m^{-3}. As with 2022, the largest measured concentration occurred for WBC9 (29/30 The Borough) where the 2023 concentration was 32 µg m^{-3}, although this was a decrease from 35.6 µg m^{-3} in 2022.

The NO_2 annual mean concentration was below the 40 µg m^{-3} annual mean AQO within both AQMAs and all locations across the Borough.

In 2023, the annual mean NO_2 concentrations measured by the automatic analysers in Farnham (South Street) and Godalming (Ockford Road 2) were 18 and 19 µg m^{-3} respectively, significantly below the annual mean objective concentration. This is a decrease from the 2022 annual mean NO_2 concentrations which were 20 µg m^{-3} at both monitoring locations. At the national level, the annual mean concentration of NO_2 at the roadside in 2023 were 21.8 µg m^{-3} which is their lowest point in the timeseries[3]. The annual means measured at Farnham and Godalming in 2023 are therefore below this concentration whilst they follow the same trend observed at the national level, decreasing from the 2022 measured concentrations. There were also no exceedances of the hourly NO_2 mean objective at either site.

The PM_{10} annual mean concentration measured in Farnham in 2023 was 16 µg m^{-3}, which is an increase from 14 µg m^{-3} in 2022, however this is significantly below the annual mean AQO of 40 µg m^{-3}. The annual mean concentration in 2023 at Farnham is comparable to the national annual mean of 15.6 µg m^{-3} in 2023 for roadside sites[4]. There were also no exceedances of the short-term AQOs.

Actions to Improve Air Quality

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

The Environmental Improvement Plan[5] sets out actions that will drive continued improvements to air quality and to meet the new national interim and long-term targets for fine particulate matter ($PM_{2.5}$), the pollutant of most harmful to human health. The Air Quality Strategy[6] provides more information on local authorities' responsibilities to work towards these new targets and reduce fine particulate matter in their areas.

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[3] Defra. National statistics. Nitrogen Dioxide (NO2), April 2024.

[4] Defra. National statistics. Particulate Matter (PM10/PM2.5), April 2024.

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

[6] Defra. Air Quality Strategy – Framework for Local Authority Delivery, August 2023

The Road to Zero[7] 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 AQMAs are designated due to elevated concentrations heavily influenced by transport emissions.

An updated Air Quality Action Plan (AQAP) to reduce nitrogen dioxide in the Farnham and Godalming AQMAs was adopted in May 2023. We are working closely with Surrey County Council (SCC) and others, and plan to:

- Support the Town Centre changes within the Farnham Infrastructure Programme
- Support and implement the Farnham Town Centre Local Cycling and Walking Improvement Plan (LCWIP)
- Encourage Electric Vehicles in Farnham and Godalming through EV infrastructure improvements, including the uptake of EV taxis and buses.
- Provide a consistent process for air quality assessments for developments likely to impact on air quality, including committed development within and outside Waverley.

To complement the AQAP, and to consider measures more widely across Waverley, in May 2023, we adopted a Clean Air Strategy (CAS) to reduce nitrogen dioxide and fine particulates across the Borough. In addition to our own commitments as a council, the strategy encourages collaboration and outlines actions which all of us can take. By developing a clean air strategy, the council seeks to: demonstrate leadership in improving air quality, work collaboratively with partners to improve air quality within the borough, and support and enable behaviour change to improve air quality directly.

WBC will continue to take steps towards implementing measures to improve air quality. We also work jointly with others through the Waverley Air Quality Steering Group, Farnham Infrastructure Board, Surrey Air Alliance (SAA), and internally within WBC. We encourage everyone to take responsibility for improving the quality of the air we breathe.

By acting together to reduce emissions of nitrogen dioxide and fine particulates we can improve air quality across the borough.

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

Conclusions and Priorities

At the vast majority of monitoring sites, measured levels of NO_2 across Waverley in 2023 were below those measured in 2022 with an average decrease across all sites of 10.5%. The highest annual mean concentration measured in Waverley was comfortably below the AQO.

Monitoring should continue to check annual mean NO_2 levels against the AQO in the next few years and ensure the ongoing measures in the AQAP and CAS are achieving success. The need for the AQMA in Godalming and AQMA in Farnham should be reviewed.

Key completed measures in 2023 were:

- New Air Quality Action Plan and Clean Air Strategy adopted in May 2023.
- Work undertaken in Farnham as part of the Farnham Infrastructure Programme.
- Supported various programmes to improve provision of EVCPs in Waverley.
- WBC, in partnership with SCC (and through the Surrey Air Alliance (SAA) as a founder supporter), participated in the first Clean Air Night Campaign on Wednesday 24 January 2024, Clean Air Night | Global Action Plan (actionforcleanair.org.uk).

- Work to progress the Defra funded project to provide low-cost trials of EV taxis to promote their uptake.
- Through the SAA we worked with Surrey Heartlands Integrated Care Board (ICB) to support the implementation of a paediatric toolkit for parents and schools, including promoting the Schools' Air Quality Monitoring for Health and Education project, SAMHE.
- Working with SCC and Town and Parish Councils, and local active travel groups, to develop Local Cycle and Walking Infrastructure Plans (LCWIPs) for Farnham and Waverley.
- Initiatives encouraging active travel in schools were taken forward by SCC working with the SAA, including Improving road safety outside schools, Promoting School Travel

Plans through Modeshift Stars, Bikeability Training, Feet First Walking Training, School Crossing Patrols, Eco-Schools, and Lets Go Zero.

- In September 2023 Surrey Connect, an on demand bus service, was launched in Farnham and Cranleigh to make it easier to access public transport in those areas.
- Actions contributed towards meeting the Council's Carbon Neutrality Action Plan.

WBC priorities for 2024 are:

- Work with the Farnham Board to take actions forward to improve air quality in Farnham.
- Support ongoing projects to install EV charging points in Waverley.
- Work to take forward the Defra grant funded project across Surrey to provide low-cost trials of EV taxis to promote their uptake.
- Undertake work to investigate the feasibility of LEZs within Waverley, including completing ANPR surveys in Farnham and Godalming
- Through the SAA continue to work with Surrey Heartlands ICB to promote the parents and schools' paediatric asthma toolkits, including supporting schools who have registered with SAMHE.
- Progress the LCWIPs for Farnham and Waverley and support ongoing work on the Guildford-Godalming Greenway and Godalming Greenway Gateway.
- Through the SAA work with SCC and schools on measures to encourage active travel and reduce air pollution.
- Through SCC and WBC's Sustainability Team promote active travel and the uptake of public transport.
- Continue to implement actions presented in the 2023 AQAP and CAS.
- Continue to monitor air quality across Waverley and in the Farnham and Godalming AQMAs.
- Review the need for the Farnham AQMA and Godalming AQMA.
- Take actions contributing to towards meeting the Council's Carbon Neutral Action Plan.

Local Engagement and How to get Involved

WBC consulted stakeholders and the Public on an updated AQAP and Clean Air Strategy for Waverley in 2022 and early 2023.

We encourage everyone to take responsibility for improving the quality of the air we breathe. The Clean Air Strategy identified priority actions. In addition to our own commitments as a council there is a template which could be used by organisations, or individuals, to adopt specific actions of their own. Examples of actions which could be taken are included within WBC's commitments in Section 6 of the Clean Air Strategy. Other information on improving local air quality can be found on our website: Waverley Borough Council - How you can help improve air quality.

Information is also provided on Air Pollution Alerts, Waverley Borough Council - air pollution alerts.

WBC works with others on the Farnham Board, and liaised with Town and Parish Councils, and other local stakeholder groups to consult with them about various neighbourhood plans and policies to protect air quality, and other local concerns.

WBC actively works with SCC and the SAA to help develop and take forward projects (liaising with the local stakeholders) on raising awareness about and actions to improve air quality, such as schools travel planning, EV taxi project and solid fuel burning.

Local Responsibilities and Commitment

This ASR was prepared by the Regulatory Services of Waverley Borough Council with the support and agreement of the following officers and departments:

Environmental Health Manager (Environmental Protection)

Environmental Health Officer (Air Quality)

Team Leader Local Plans and Planning Policy

Sustainable Transport Policy Officer

Sustainability Projects Officer

Surrey Air Alliance (partners from other local authorities in Surrey including SCC's Public Health, Transport, Greener Futures and Trading Standards)

This ASR has been approved by:

Assistant Director of Regulatory Services.

This ASR has not been signed off by a Director of Public Health. However, on behalf of the Surrey County Council Director of Public Health, the Public Health team work closely with

Surrey Air Alliance including District and Borough Council partners responsible for submitting Annual Statement Reports (ASR) on air quality within their area; to develop initiatives, air quality action plans, and implement actions to improve air quality across the county of Surrey, through collaboration and consultation.

If you have any comments on this ASR, please send them to Environmental Health at:

Waverley Borough Council, Council Offices, The Burys, Godalming, Surrey, GU7 1HR

Telephone: 01483 523393

Email: Environmentalhealth@waverley.gov.uk

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1 Local Air Quality Management

This report provides an overview of air quality in Waverley Brough Council 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 Waverley Brough Council to improve air quality and any progress that has been made.

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

2 Actions to Improve Air Quality

2.1 Air Quality Management Areas

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

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

- NO_2 annual mean

Table 2.1 – Declared Air Quality Management Areas

AQMA Name	Date of Declaration	Pollutants and Air Quality Objectives	One Line Description	Is air quality in the AQMA influenced by roads controlled by Highways England?	Level of Exceedance: Declaration	Level of Exceedance: Current Year	Number of Years Compliant with Air Quality Objective	Name and Date of AQAP Publication	Web Link to AQAP
Waverley AQMA No. 1 - Farnham	Declared 08/07/2005 (order amended 23/08/2007)	NO2 Annual Mean	An area encompassing parts Farnham town centre	No	Not known	31.7 (WBC51)	5	Waverley Borough Council Air Quality Action Plan, May 2023	Waverley Borough Council - Air Quality Action Plan and Clean Air Strategy
Waverley AQMA No. 2 - Godalming	Declared 08/07/2005 (order amended 23/08/2007)	NO2 Annual Mean	An area encompassing parts of Ockford Road and Flambard Way in Godalming	No	Not known	21.8 (WBC33)	5	Waverley Borough Council Air Quality Action Plan, May 2023	Waverley Borough Council - Air Quality Action Plan and Clean Air Strategy

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

☒ **Waverley Brough Council confirm that all current AQAPs have been submitted to Defra.**

2.2 Progress and Impact of Measures to address Air Quality in Waverley Borough Council

Defra's appraisal of last year's ASR concluded:

The report is well structured, detailed, and provides the information specified in the Guidance. The following comments are designed to help inform future reports:

1. *The Council have robust QA/QC procedures, which were applied appropriately and accurately to the 2022 automatic and non-automatic monitoring data.*
2. *Thirty-six measures to improve air quality have been presented in the report, including traffic management measures (e.g., infrastructure to support the use of electric and hybrid vehicles, urban traffic control systems, etc.), promotion of travel alternatives and low emission transport. The progress of those measures has been well discussed.*
3. *The updated AQAP (2023-2028) has been published and the column "Name and Date of AQAP publication" on Table 2.1 needs to be updated.*
4. *All graphs and maps are well presented and are clear to read. The Council have also provided a detailed discussion of the trends.*
5. *The number of years compliant with the AQO needs to be included to Table 2.1.*
6. *Comments from last year's ASR have been mentioned and addressed, which is welcomed.*
7. *The Council have discussed the health outcomes attributable to particulate air pollution. A line graph was also included showing the fraction of mortality in Waverley between 2018 and 2021, which is welcomed.*
8. *Actions to improve $PM_{2.5}$ have not been discussed. It is correctly anticipated that most measures detailed in Table 2.2 are likely to result in an improvement of $PM_{2.5}$. It is very encouraging that the Clean Air Strategy, adopted in March 2023, identifies priority actions to reduce PM and NO_2 across Waverley. An update on the progress is expected in next year's ASR.*
9. *Annual mean PM_{10} concentrations in Table A.6 (i.e., 16 µg/m^3 and 14 µg/m^3 for 2021 and 2022, respectively) are shown in bold. Only exceedances of the annual mean objective of 40 µg/m^3 should be highlighted in bold.*
10. *Defra recommends that Directors of Public Health approve draft ASRs. Sign off is not a requirement, however collaboration and consultation with those who have responsibility for Public Health is expected to increase support for measures to improve air quality, with co-benefits for all. Please bear this in mind for the next annual reporting process.*

11. *On page 23, the ASR is called "2022 ASR" instead of "2023 ASR".*
12. *WBC have applied a national bias adjustment factor of 0.76. A combined local bias adjustment factor of 0.71 was also calculated. WBC included a screenshot of the national bias adjustment spreadsheet, which is welcomed and it is encouraged that this continues with future ASRs.*
13. *It would be beneficial if the Council could provide additional information regarding the reasons behind choosing the new site location (WBC57).*

With regards to each of these points:

Point 1: We continued with the same QA/QC procedures in 2023 which are documented in this report.

Point 2: In 2023, we published an updated AQAP for both AQMA areas, along with a Clean Air Strategy for Waverley, which was agreed by Council in March 2023. The measures to improve air quality in Waverley AQMA areas, taken from the updated AQAP, are presented in the 2024 ASR. Wider actions to improve air quality across the entire borough are also presented in Appendix C.

Point 3: We have updated the column in Table 2.1 "Name and Date of AQAP Publication" to reflect the latest AQAP publication in May 2023.

Point 4: Graphs and analysis have been included in the 2024 ASR.

Point 5: We have updated Table 2.1 to include the number of known years compliant with the AQO.

Point 6: As with last year, we have mentioned and addressed the comments from the 2023 ASR.

Point 7: We have provided an updated graph in the 2024 ASR.

Point 8: We have provided an update on our progress in the 2024 ASR.

Point 9: Annual mean PM_{10} concentrations in 2023 were below the AQO and we have updated Table A.6 to ensure these results, along with those from 2021 and 2022, are not highlighted in bold.

Point 10: The Director of Public Health has not approved the draft ASR. We work closely with Public Health on the SAA, and we provide assurance on actions to improve air quality at Surrey Health Protection Board meetings. Public Health regularly engage with us on actions and are satisfied with progress. We work collaboratively with Public Health.

Point 11: We will ensure the 2024 ASR is correctly referenced throughout.

Point 12: We have included a screenshot of the 2023 local bias adjustment factor calculated using the Diffusion Tube Data Processing Tool v.4 2024 and presented in the 2024 ASR.

Point 13: As outlined on Page 31 of the 2023 ASR, the new site, WBC57 (5, Ewhurst Road), was introduced in 2022 to supplement the existing monitoring tube in Cranleigh High Street at a place of relevant public exposure.

Additionally, Defra made the following comments on the ASR 2023, and a priority before drafting the ASR 2025 will be to review the need for the AQMA in Farnham and the AQMA in Godalming.

The revocation of an AQMA should be considered following three consecutive years of compliance with the relevant objective as evidenced through monitoring. Where there have been no exceedances for the past five years, local authorities must proceed with plans to revoke the AQMA. The LAQM Technical Guidance 2022 is clear in this respect:

"There should not be any declared AQMAs for which compliance with the relevant objective has been achieved for a consecutive five-year period." (Point 3.57, page 50).

Please be aware that unless a likely exceedance has been identified in the area, Defra will not appraise AQAPs for AQMAs that have been in compliance for five years. Local Authorities will instead be advised to revoke the AQMA.

AQMAs should identify areas where air quality objectives are not being met or are likely to be at risk of not meeting them. Keeping AQMAs in place longer than required risks diluting their meaning and impacting public trust in LAQM.

Local authorities that do not have an AQMA should continue to monitor for exceedances and should still have a local air quality strategy in place to ensure air quality remains a high-profile issue, thereby enabling a quick response should there be any deterioration in condition.

Waverley Borough Council has taken forward a number of direct measures during the current reporting year of 2023 in pursuit of improving local air quality. Details of all measures completed, in progress or planned are set out in Table 2.2. Six measures are included within Table 2.2, with the type of measure and the progress Waverley Borough Council have made during the reporting year of 2023 presented. These measures, as outlined in the 2023 AQAP, target improving air quality in the Farnham and Godalming AQMAs. Additional actions outlined in the CAS and aimed at improving air quality across

the whole of Waverley, can be found in Appendix C whilst some of the key measures are also highlighted below. Where there have been, or continue to be, barriers restricting the implementation of the measure, these are also presented within Table 2.2.

More detail on these measures can be found in their respective Action Plans and Clean Air Strategies.

Key completed measures are:

- An Updated Air Quality Action Plan and Clean Air Strategy was adopted in May 2023

- Actions to take forward the Farnham Infrastructure Programme (FIP)/town centre changes. A summary of the FIP actions is detailed on SCC's website. Updates on progress are detailed in minutes of FIP Board Meetings, including applications for funding.

- Supported various programmes to improve the provision of EVCP's in Waverley.

- Waverley Borough Council, as part of the SAA (a founder supporter) took part in Global Action Plan's First Clean Air Night Campaign on Wednesday 24 January 2024. Clean Air Night | Global Action Plan (actionforcleanair.org.uk). Additionally, in September 2023 a second consortium (including SCC and District and Borough Councils) application was submitted; led by Hertfordshire County Council (HCC), for DEFRA air quality grant funding to support Global Action Plan's Clean Air Night campaign in January 2025. The submission followed the unsuccessful application in 2022, to support Global Action Plan's Clean Air Night campaign in January 2024. In February 2024 DEFRA notified HCC that while the application scored higher than the previous application, the bid was unsuccessful on this occasion. The plan is to support the 2025 campaign; however, this is unlikely to be to the extent planned in the consortium grant bid.

- Work to progress the Defra funded project to provide low-cost trials of EV taxis to promote their uptake. Defra confirmed at the end of March 2023 they agreed the revised project. Unfortunately, the original grant to be provided by Surrey County Council's (SCC) Greener Futures Team to help match fund the project was no longer available. Defra confirmed we could not use any grant funds awarded to pay

SCC's revenue costs. Fortunately, SCC's Public Health Team secured a £25k Public Health grant to help provide match funding to take the project forward. However, the Greener Futures Team were not able to undertake the work needed to administer the project including drafting the required legal contracts and procurement work within this budget. Guildford Borough Council agreed to take on this work within the £25k budget which meant we had secured all the funding needed to take this project forward. The project team (which includes officers from Waverley) have drafted details of the contracts and procurement specifications needed. They are with Guildford Borough Council's legal/procurement team to take forward. It is intended the grants will be awarded Autumn 2024 for completion of trials Autumn 2025.

- Working with Surrey Heartlands ICB, as part of the SAA, to support the implementation of the paediatric toolkit for parents and schools, Asthma friendly school | Healthy Surrey. As part of this work, we promoted the Schools' Air Quality Monitoring for Health and Education project SAMHE. We invited every school in Waverley to register as a SAMHE school and receive a free indoor air quality monitor linked to an interactive Web App, enabling teachers and pupils to view and investigate data on classroom air quality. This initiative was also promoted in SCC's schools bulletin, which goes to all schools in Waverley. This is a citizen science project looking at how poor indoor air quality impacts on pupils' health and attention levels. The air quality monitor measures carbon dioxide (CO2), total volatile organic compounds (TVOCs), particulate matter (PM), temperature and relative humidity. The monitor sends this data to the SAMHE Web App via WiFi. Additionally, we offered support to schools in Waverley to get them online and using the air quality monitor. We were keen to find out how indoor is affected by outdoor air quality, however, only a few schools in Waverley have taken up this initiative.

- WBC have been working with SCC and Town and Parish Councils, and local active travel groups, to develop Local Cycle and Walking Infrastructure Plans (LCWIPs) for Farnham and Waverley. Adoption of the Farnham and Waverley LCWIPs are a priority for the Council.

- Initiatives encouraging active travel in schools were taken forward by SCC working with the SAA, including Improving road safety outside schools, Promoting School Travel Plans through Modeshift Stars, Bikeability Training, Feet First Walking Training, School Crossing Patrols, Eco-Schools, and Lets Go Zero.

- In September 2023 Surrey Connect, an on demand bus service, was launched in Farnham and Cranleigh to make it easier to access public transport in those areas.

- Actions contributed towards meeting the Council's Carbon Neutral Action Plan.

Waverley Borough Council expects the following measures to be completed over the course of the next reporting year:

- Work with the Farnham Board to take actions forward to improve air quality in Farnham.
- Support ongoing projects to install EV charging points in Waverley.
- Work to take forward the Defra grant funded project across Surrey to provide low-cost trials of EV taxis to promote their uptake.
- Undertake work to investigate the feasibility of LEZs within Waverley, including completing ANPR surveys in Farnham and Godalming
- Through the SAA continue to work with Surrey Heartlands ICB to promote the parents and schools' paediatric asthma toolkits, including supporting schools who have registered with SAMHE.
- Progress the LCWIPs for Farnham and Waverley and support ongoing work on the Guildford-Godalming Greenway and Godalming Greenway Gateway.
- Through the SAA work with SCC and schools on measures to encourage active travel and reduce air pollution.
- Through SCC and WBC's Sustainability Team promote active travel and the uptake of public transport.

Waverley Borough Council's priorities for the coming year are:

- Continue to implement measures set out in the 2023 AQAP and CAS.
- Continue to monitor air quality across Waverley and in the Farnham and Godalming AQMAs
- Review the need for the AQMA in Farnham and AQMA in Godalming.
- Continue to take actions contributing towards the Council's Carbon Neutral Action Plan.
- Future reporting to incorporate a 'RAG' rating of progress made in respect of specific elements of the AQAP and Clean Air Strategy following member input through the Executive Working Group on Climate Change.

Waverley Borough Council worked to implement these measures in partnership with the following stakeholders during 2023:

- Surrey County Council (SCC)
- Farnham Town Council
- Godalming Town Council
- Surrey Air Alliance (SAA)

The principal challenges and barriers to implementation that Waverley Borough Council anticipates facing are:

- Resource issues with all organisations.
- Funding to undertake actions.
- Officer time for implementation of measures.

Progress on measures detailed in the AQAP and CAS has been slower than expected due to limited staff resources to be able to take actions forward.

Waverley Borough Council anticipates that the measures stated above and in Table 2.2 will continue to ensure compliance with the annual AQO for nitrogen dioxide in Waverley AQMA 1 – Farnham and Waverley AQMA 2 - Godalming.

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
1	Farnham Infrastructure Programme: Town Centre Changes	Traffic Management	UTC, Congestion Management, Traffic reduction	2023	2025	Surrey County Council, Farnham Town Council, Waverley Borough Council	SCC and external funding pots	No	Not funded	Depends on which option is taken forward	Planning	Achievement/ maintenance of air quality objective compliance	Measured Concentration at Diffusion Tube Locations within AQMA	Consultation concluded October 2022, see FIP Board meeting minutes for updates. Made representations numbers of times for an AQA	Air Quality Assessment still to be undertaken. Agreement between different tiers of Government, multiple approval processes, Funding, Officer time for implementation.
2	Waverley Borough Council Clean Air Strategy	Policy Guidance and Development Control	Low Emissions Strategy	2023	2028	Waverley Borough Council with partners, SCC, Parish Councils, etc	Within existing budgets	Some projects may be eligible for funding	Partially Funded	£10k - 50k	Implementation	Aimed at emissions reductions across Waverley. Will tie in with targets announced by Defra	Achievement of targets to be announced by Defra.	Waverley CAS adopted May 2023. Updates on measures in CAS provided in Appendix	Resource issues with all organisations, as most of actions are not statutory
3	Encouragement of Electric Vehicles in Farnham and Godalming through EV infrastructure improvements, including the uptake of EV taxis and buses.	Promoting Low Emission Transport	Procuring alternative Refuelling infrastructure to promote Low Emission Vehicles, EV recharging, Gas fuel recharging	2023	Ongoing through period of AQAP	Surrey County Council, Farnham Town Council, Waverley Borough Council	SCC OLEV	No	Partially Funded	£100k - £500k	Implementation	Achievement/ maintenance of air quality objective compliance	Use of chargers, increase in proportion of EVs in the fleet in Farnham	**Farnham** Public EV Charging in Riverside Car Park 3 x 6CPs, and Brightwells x 18CPs Ultra-rapid charges to be installed in Lower Hart Car Park and St James Car Park in 2024. **Godalming** Public EV Charging in Crown Court carpark x 2CPs, The Burys x 3CPs, Catteshall Lane x 6CPs and Station Rd Farncombe x 4CPs EV charge points to be installed in Croft Road Car Park in 2024. **Uptake of EV Taxis** WBC drafted tender and contracts for EV taxi project, with GBC and SBC to take forward in consultation with WBC	Funding, officer time for implementation.

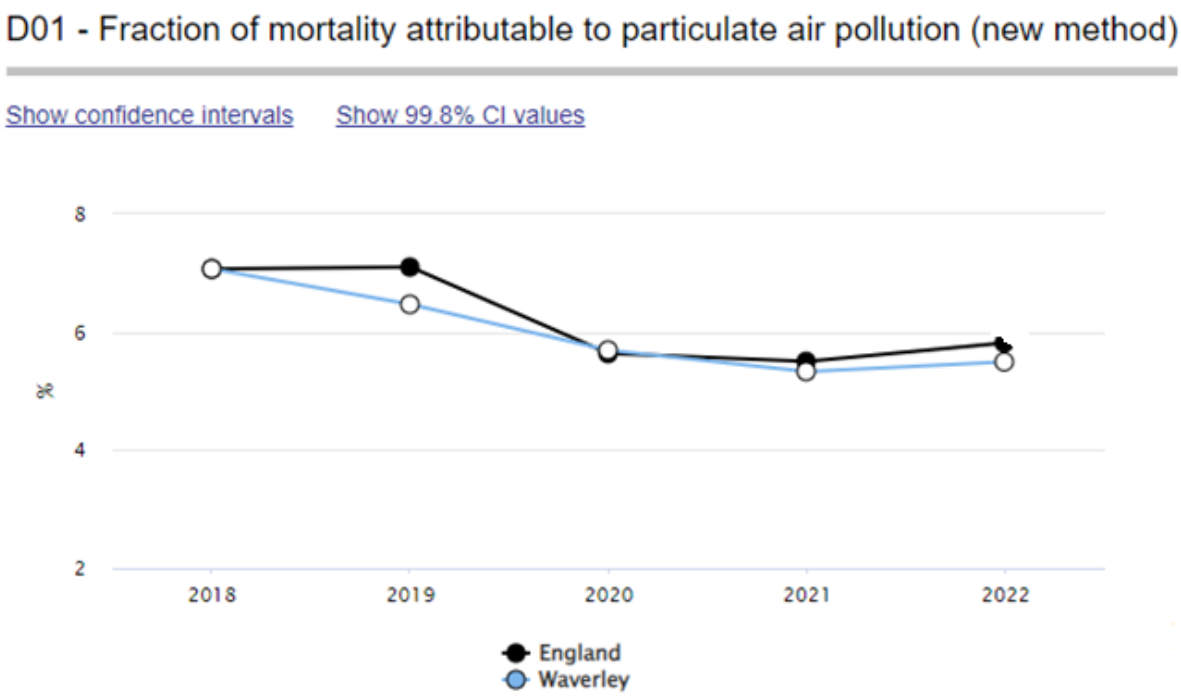
Measure No.	Measure Title	Category	Classification	Year Measure Introduced in AQAP	Estimated / Actual Completion Date	Organisations Involved	Funding Source	Defra AQ Grant Funding	Funding Status	Estimated Cost of Measure	Measure Status	Reduction in Pollutant / Emission from Measure	Key Performance Indicator	Progress to Date	Comments / Barriers to Implementation
4	Farnham Infrastructure Programme: Implementing outcomes of 'quick wins' project	Freight and Delivery Management	Route Management Plans/ Strategic routing strategy for HGV's	2022	2022	Surrey County Council, Farnham Town Council, Waverley Borough Council	SCC	No	Funded	£10k - 50k	Completed	Achievement/ maintenance of air quality objective compliance	Measured Concentration at Diffusion Tube Locations within AQMA, increase in Active Travel	Completed	Current concerns are (a) enforcement and (b) whether such restrictions should and could be implemented elsewhere in the area
5	Consistent process for Air quality assessments for developments likely to impact on air quality, including committed development within and outside Waverley	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	Ongoing	Ongoing	WBC and neighbouring authorities	Within existing budgets	No	Not Funded	Not explicitly costed as mainly staff time	Currently air quality assessments are requested as well as mitigation where required. This measure will ensure consistency in the process.	Long term targets for reduction in emissions in line with Defra targets	Number of planning applications reviewed and commented on	Ongoing	The process of assessment will ensure that cumulative impacts are incorporated where possible. Collaborative working across boroughs will take applications in neighbouring authorities into account
6	Farnham Local Cycling and Walking Infrastructure Plan (LCWIP)	Promoting Travel Alternatives	Promotion of cycling, Promotion of walking	2023	2033	Surrey County Council, Farnham Town Council, Waverley Borough Council	DfT	No	Funded	Cost is depend ant on what will be adopted	Planning	Achievement/ maintenance of air quality objective compliance	Increase in Active Travel, Measured Concentration at Diffusion Tube Locations within AQMA	Funding sources identified. Farnham (and broader Waverley) LCWIPs adopted 2024	Dependent upon which schemes will be submitted by SCC as part of Active Travel England funding tranches

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

As detailed in Policy Guidance LAQM.PG22 (Chapter 8) and the Air Quality Strategy[8], 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 smaller than 2.5 micrometres) has a significant impact on human health, including premature mortality, allergic reactions, and cardiovascular diseases.

The most recent available data from Public Health England's Public Health Outcomes Framework[9] show that the fraction of total mortality which is attributable to particulate air pollution in Waverley Borough Council was 5.5% in 2022 and just below England as a whole (5.8%)

Figure 2.1 – Fraction of total mortality attributable to particulate air pollution in Waverley (blue line) versus England as a whole (black line)



[8] Defra. Air Quality Strategy – Framework for Local Authority Delivery, August 2023

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

Note, The method for calculating the fraction of mortality attributable to particulate air pollution was updated in 2022.

As highlighted in the 2023 AQAP and CAS, Waverley Borough Council is taking the following measures to address $PM_{2.5}$:

- Avoid burning solid fuel and having bonfires.
- Raising public awareness of air quality issues and how to reduce effects, for example supporting events such as Clean Air Day and Clean Air Night, and promoting them to local communities through communication campaigns.
- Promote walking and cycling.

Waverley Borough Council also acknowledges Defra's Environmental Targets for $PM_{2.5}$[10]

- Annual Mean Concentration target – 10 µg m^{-3} to be achieved by 2040.
- Population Exposure Reduction Target – 35% reduction (on 2018 baseline) by 2040

The Government expects local authorities will need to take actions in support of the new targets.

A source apportionment study[11] carried out by CERC, on behalf of Waverley Borough Council showed that emissions from traffic (mostly non exhaust emissions), 'other emissions', and background sources, contributed 20 %, 10 % and 70 %, respectively, to the total $PM_{2.5}$ concentration for a location in High Street, Godalming. This indicates that $PM_{2.5}$ is dominated by sources outside the local authority area. The measures detailed above will inevitably help reduce emissions of $PM_{2.5}$.

A Clean Air Strategy for Waverley was adopted in May 2023. It identified the origin of primary $PM_{2.5}$ across Waverley: Domestic sources 50.8%, Industry / agriculture / commercial 38.8%, road transport (non-exhaust) 8.5%, and road transport (exhaust 1.8%). The strategy identifies priority actions to reduce particulates and nitrogen dioxide across Waverley. WBC have committed to taking actions and a template has been provided which can be used by organisations, or individuals to adopt specific actions of their own. WBC will report on progress in future ASRs.

Additionally, Waverley Borough Council, in partnership with SCC (and through the SAA), participated in the first Clean Air Night Campaign on Wednesday 24 January 2024. This

[10] Air Quality Targets – Detailed Evidence Report, Defra May 2022

[11] Further_interpretation_of_air_quality_modelled_in_Waverley_from_CERC___March_2020.pdf

raised public awareness about solid fuel burning, air quality impacts and promoting/enforcing changes to rules in supplying and buying solid fuel.

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

This section sets out the monitoring undertaken within 2023 by Waverley Borough 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

Waverley Borough Council undertook automatic (continuous) monitoring at two sites during 2023. Table A.1 in Appendix A shows the details of the automatic monitoring sites. NB. Local authorities do not have to report annually on the following pollutants: 1,3 butadiene, benzene, carbon monoxide and lead, unless local circumstances indicate there is a problem. The Air Quality England page presents automatic monitoring results for Waverley Borough Council with automatic monitoring results also available through the UK-Air website[12]. For consistency with Air Quality England, the site code for Godalming Ockford Road 2 has been updated in the 2024 ASR to WA001, as shown in the first column of Table A.1. The site code in previous ASR's is God 8. The site name, location, type and pollutants measured remain unchanged.

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

3.1.2 Non-Automatic Monitoring Sites

Waverley Borough Council undertook non-automatic (i.e. passive) monitoring of NO_2 at 51 sites during 2023. Table A.2 in Appendix A presents the details of the non-automatic sites.

[12] Locally-managed automatic monitoring - Defra, UK

Maps showing the location of the monitoring sites are provided in Appendix D. A web page showing the diffusion tubes locations are also available from the Waverley Air Quality Web Site. Further details on Quality Assurance/Quality Control (QA/QC) for the diffusion tubes, including bias adjustments and any other adjustments applied (e.g. annualisation and/or distance correction), are included in Appendix C.

3.2 Individual Pollutants

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

3.2.1 Nitrogen Dioxide (NO_2)

Table A.3 and Table A.4 in Appendix A compare the ratified and adjusted monitored NO_2 annual mean concentrations for the past five years with the air quality objective of 40µg/m^3. Note that the concentration data presented represents the concentration at the location of the monitoring site, following the application of bias adjustment and annualisation, as required (i.e. the values are exclusive of any consideration to fall-off with distance adjustment).

Figure A.1 presents NO_2 annual mean concentrations for the automatic (continuous) monitoring sites between years 2019 and 2023 with the air quality objective of 40 µg m^{-3}.

Figures A.2 to A.7 presents NO_2 annual mean concentrations for all sites in Waverley between years 2019 to 2023 with the air quality objective of 40 µg m^{-3}.

Figures A.2 and A.3 present the annual mean NO_2 concentrations in the Farnham and Godalming AQMAs respectively, Figures A.4 and A.5 present the annual mean concentrations in Farnham and Godalming outside their respective AQMAs. Figures A.6 and A.7 present the annual mean NO_2 concentrations in Haslemere and the locations outside Farnham, Godalming and Haslemere.

In 2023, the annual mean NO_2 concentrations measured by the automatic (continuous) analysers in Farnham (South Street) and Godalming (Ockford Road 2) were 18 and 19 µg m^{-3} respectively, significantly below the annual objective concentration. There were also no exceedances of the hourly NO_2 mean objective at either site.

In the Farnham AQMA, the largest annual mean NO_2 concentration (32 µg m^{-3}) measured was at site WBC9 (29/30 The Borough) but this site is not representative of relevant public exposure. The highest concentration at a location relevant for public exposure was measured (31.7 µg m^{-3}) at WBC51 (25 The Borough (1st floor)), a decrease on the concentration measured in 2022 (34.4 µg m^{-3}).

In Farnham the largest annual mean concentration (26 µg m^{-3}) outside the AQMA was measured at WBC15b (4 – 5 Station Hill).

In the Godalming AQMA, the largest annual mean NO_2 concentration (21.8 µg m^{-3}) was measured at WBC33 (20 Ockford Road). This was a decrease of 2.2 µg m^{-3} compared to the annual mean measured in 2022 (24 µg m^{-3}). Outside the AQMA the largest annual mean concentration in Godalming (29.4 µg m^{-3}) was measured at site WBC31 (92 Ockford Road).

In Cranleigh, the largest annual mean concentration (22.5 µg m^{-3}) was measured at WBC57 (5 Ewhurst Road). This site started in 2022 to supplement the existing monitoring tube in Cranleigh High Street, and the 2023 measured concentrations represents a decrease of 2.1 µg m^{-3} than that measured in 2022 (24.6 µg m^{-3}).

In Haslemere, the largest annual mean concentration (25.7 µg m^{-3}) was measured at WBC25b (66 Lower Street).

As with 2022, for the areas outside Farnham, Godalming and Haslemere, the largest (27.8 µg m^{-3}) annual mean concentration in 2023 was measured at WBC4c (Junction at Upper Hale).

The lowest annual mean measured concentration across all sites in 2023 (10.5 µg m^{-3}) was measured at WBC7 (4 Cherry Tree Close).

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

Table A.5 in Appendix A compares the ratified continuous monitored NO_2 hourly mean concentrations for the past five years with the air quality objective of 200µg/m^3, not to be exceeded more than 18 times per year. There were no exceedances of the 200 µg m^{-3} hourly value in 2023.

3.2.2 Particulate Matter (PM_{10})

Table A.6 in Appendix A: Monitoring Results compares the ratified and adjusted monitored PM_{10} annual mean concentrations for the past three years at South Street with the air quality objective of 40µg/m^3. PM_{10} annual mean concentration in 2023 was 16 µg m^{-3} which is a small increase from 14 µg m^{-3} in 2022, however this is still significantly below the annual objective concentration of 40 µg m^{-3}.

Table A.7 in Appendix A compares the ratified continuous monitored PM_{10} daily mean concentrations for the past three years with the air quality objective of 50µg/m^3, not to be exceeded more than 35 times per year. Figure A.8 presents PM_{10} annual mean concentrations for the automatic (continuous) monitoring site at Farnham (South Street) between years 2021 and 2023 with the air quality objective of 40 µg m^{-3}.

There were no exceedances of the short-term air quality objectives.

3.2.3 Particulate Matter ($PM_{2.5}$)

As there is no $PM_{2.5}$ monitoring in Waverley Borough Council, we have followed Defra's technical guidance[13] to estimate $PM_{2.5}$ concentration from the measured PM_{10} concentration. In accordance with the Technical Guidance (Defra, 2022, Box 7.7) a nationally derived PM_{Coarse} concentration[14] of 5.9 µg m^{-3} was subtracted from the measured PM_{10} concentrations measured at South Street (15.7 µg m^{-3} to 1 decimal place) to provide $PM_{2.5}$ concentration estimate of 9.8 µg m^{-3}.

[13] https://laqm.defra.gov.uk/wp-content/uploads/2022/08/LAQM-TG22-August-22-v1.0.pdf

[14] https://laqm.defra.gov.uk/air-quality/air-quality-assessment/estimating-pm2-5-from-pm10-measurements/

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)
WA001	Godalming Ockford Road	Roadside	496711	143705	NO2	YES (AQMA 2)	Chemiluminescent	8	2.5	1.7
WA004	South St, Farnham	Roadside	484166	146862	NO2; PM10	YES (AQMA 1)	Chemiluminescent/BAM	43.9	4.7	1.8

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) Site ID Godalming Ockford Road updated to 'WA001' which provides consistency with the Air Quality England site code https://www.airqualityengland.co.uk/site/latest?site_id=WA001 (listed as God 8 in previous ASR's).

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)
WBC1	53 Badshot Lea Road	Roadside	486500	148692	NO2	NO	0.0	1.4	NO	2.1
WBC2	148 Farnborough Road	Roadside	484793	149500	NO2	NO	0.0	3.4	NO	2.0
WBC3b	103 Upper Hale	Roadside	483909	149028	NO2	NO	0.0	3.1	NO	1.7
WBC4c	Upper Hale Crossroads	Roadside	484959	148386	NO2	NO	7.0	0.3	NO	2.0
WBC5	10 Guildford Road	Roadside	484809	147325	NO2	NO	0.0	3.5	NO	2.2
WBC6	6 St Marys Place	Roadside	484465	147253	NO2	AQMA1	0.0	2.2	NO	2.1
WBC7	4 Cherry Tree Close	Roadside	484114	147065	NO2	AQMA1	0.0	6.3	NO	1.9
WBC9	29/30 The Borough	Roadside	484040	146912	NO2	AQMA1	0.0	1.0	NO	2.2
WBC10	112 West Street	Roadside	483841	146810	NO2	AQMA1	0.0	2.2	NO	2.1
WBC11	77 West Street	Roadside	483549	146673	NO2	NO	0.0	1.6	NO	2.0
WBC12	21 Downing Street	Roadside	483951	146761	NO2	AQMA1	0.0	1.5	NO	2.1
WBC13	8 Union Road	Roadside	484184	146760	NO2	AQMA1	0.0	2.0	NO	2.1
WBC14	7 Bridge Square	Roadside	484130	146513	NO2	NO	0.0	1.5	NO	2.1
WBC15b	4 – 5 Station Hill	Roadside	484394	146609	NO2	NO	0.0	1.7	NO	2.0
WBC17	Opp. Polycarps School Waverley Lane	Kerbside	484735	146541	NO2	NO	16.0	0.5	NO	1.9
WBC19	11 Wrecclesham Road	Roadside	482776	145674	NO2	NO	0.0	3.0	NO	1.9
WBC20	18 The Street	Kerbside	482646	145087	NO2	NO	0.0	0.8	NO	2.1
WBC23	7 Exchange House	Roadside	488776	135693	NO2	NO	0.0	3.8	NO	2.1
WBC24	54 Wey Hill	Roadside	489244	132850	NO2	NO	0.0	5.8	NO	2.1
WBC25b	66 Lower Street	Roadside	490192	132908	NO2	NO	0.0	3.3	NO	2.0
WBC26	51 High Street	Kerbside	490599	133101	NO2	NO	0.0	0.7	NO	2.1
WBC27	13 Petworth Road	Roadside	490543	132754	NO2	NO	0.0	2.6	NO	2.1
WBC28	Colporter Cottage A283	Roadside	496067	135318	NO2	NO	0.0	1.0	NO	1.8
WBC29	Red Rose Cottage A283	Roadside	494751	139812	NO2	NO	0.0	1.6	NO	2.2
WBC30	4 Ridgeway Cottage Portsmouth Road	Roadside	494448	142342	NO2	NO	0.0	8.4	NO	2.2
WBC31	92 Ockford Rd	Roadside	496464	143458	NO2	NO	0.0	4.0	NO	2.1
WBC32	70 Ockford Road	Roadside	496498	143508	NO2	AQMA2	0.0	7.0	NO	1.7
WBC33	20 Ockford road	Roadside	496639	143643	NO2	AQMA2	0.0	3.2	NO	2.0
WBC34A, WBC34B, WBC34C	Co-located with WA001 automatic monitor (Flambard Way)	Roadside	496711	143705	NO2	AQMA2	8.0	2.5	YES	1.7
WBC35	20 Holloway Hill	Roadside	496767	143659	NO2	NO	0.0	5.2	NO	2.0
WBC36	Station Rd (Dominoes)	Roadside	496777	143750	NO2	NO	0.0	5.3	YES	2.2
WBC37	12 Queen Street	Roadside	497156	143745	NO2	NO	0.0	6.5	YES	2.2
WBC38	Brighton Road	Roadside	497390	143435	NO2	NO	2.0	4.5	YES	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)
WBC39	Edison House Flambard Way	Roadside	497314	143854	NO2	NO	0.0	3.8	NO	2.0
WBC40	44 Bridge Street (Wey Gallery)	Roadside	497234	143911	NO2	NO	0.0	2.6	NO	2.1
WBC41	Major Minors Nursery Bridge Street	Roadside	497412	144239	NO2	NO	0.0	1.5	NO	1.9
WBC43	5A Farncombe Street	Roadside	497602	145017	NO2	NO	0.0	6.0	NO	2.1
WBC44	44 Meadrow	Roadside	497801	144568	NO2	NO	0.0	2.4	NO	2.0
WBC45	Windrush House Horsham Road	Roadside	500898	144818	NO2	NO	0.0	2.0	NO	2.0
WBC46	Cranleigh Bathrooms High Street	Roadside	505795	139054	NO2	NO	0.0	5.1	NO	1.9
WBC47	Carters Cottage Horsham Road	Roadside	504045	135425	NO2	NO	0.0	14.2	NO	2.0
WBC48	45A Station Hill	Roadside	484464	146584	NO2	NO	0.0	2.6	NO	2.2
WBC49	Elmsleigh Dentist Station Hill (1st Floor)	Roadside	484402	146606	NO2	NO	0.0	1.5	NO	3.5
WBC50b	29/30 The Borough (1st Floor)	Roadside	484034	146908	NO2	AQMA1	0.0	1.0	NO	4.0
WBC51	25 The Borough (1st floor)	Roadside	484066	146931	NO2	AQMA1	0.0	1.0	NO	3.0
WBC52	2 Frensham Road	Roadside	484379	145596	NO2	NO	0.0	1.0	NO	1.0
WBC53	Waverley Lane nursery	Roadside	484501	146552	NO2	NO	5.0	0.3	NO	2.0
WBC54	The Wells, Lower Street	Roadside	490271	132913	NO2	NO	0.0	0.5	NO	2.0
WBC55	86 Ockford Road	Roadside	496476	143473	NO2	NO	0.0	0.5	NO	1.0
WBC56A, WBC56B, WBC56C	Co-located WA004 automatic monitor (South Street carpark)	Roadside	484166	146862	NO2	AQMA1	43.9	4.7	YES	1.8
WBC 57	5 Ewhurst Road	Roadside	506112	139054	NO2	NO	0	1	NO	2

Notes:

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

(2) N/A if not applicable.

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

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2023 (%) (2)	2019	2020	2021	2022	2023
WA001	496711	143705	Roadside	97.93	97.93	24	17	18	20	19
WA004	484166	146862	Roadside	98.23	98.23			21	20	18

☒ **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 NO_2 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/m^3.

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

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

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

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

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

Table A.4 – Annual Mean NO_2 Monitoring Results: Non-Automatic Monitoring (µg/m^3)

Diffusion Tube ID	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
WBC1	53 Badshot Lea Road	486500	148692	Roadside	92.3	92.3	21.6	19.5	20.9	19.5	17.7
WBC2	148 Farnborough Road	484793	149500	Roadside	100	100.0	25.3	21.5	20.2	20.5	17.7
WBC3b	103 Upper Hale	483909	149028	Roadside	100	100.0	30.3	24.1	21.3	21.3	18.4
WBC4c	Upper Hale Crossroads	484959	148386	Roadside	100	100.0		31.3	35.1	31.6	27.8
WBC5	10 Guildford Road	484809	147325	Roadside	75	75.0	18.9	15.2	14.3	14.7	11.8
WBC6	6 St Marys Place	484465	147253	Roadside	100	100.0	30.1	22.3	23.3	23.1	20.0
WBC7	4 Cherry Tree Close	484114	147065	Roadside	100	100.0	16.4	14.0	12.6	12.9	10.5
WBC9	29/30 The Borough	484040	146912	Roadside	100	100.0	**49.2**	33.6	34.1	35.6	32.0
WBC10	112 West Street	483841	146810	Roadside	100	100.0	33.5	25.8	24.8	24.7	21.8
WBC11	77 West Street	483549	146673	Roadside	92.3	92.3	29.8	22.7	22.7	23.1	16.8
WBC12	21 Downing Street	483951	146761	Roadside	82.7	82.7	35.8	26.6	24.8	25.3	23.3
WBC13	8 Union Road	484184	146760	Roadside	100	100.0	34.7	27.5	26.8	26.8	24.9
WBC14	7 Bridge Square	484130	146513	Roadside	90.4	90.4	30.9	23.0	22.8	22.7	22.4
WBC15	4 – 5 Station Hill	484394	146609	Roadside	100	100.0	39.4	32.9	30.2	29.9	26.0
WBC17	Opp. Polycarps School Waverley Lane	484735	146541	Kerbside	100	100.0	18.2	14.7	13.3	12.8	11.2
WBC19	11 Wrecclesham Road	482776	145674	Roadside	100	100.0	27.1	21.4	21.5	20.9	17.9
WBC20	18 The Street	482646	145087	Kerbside	100	100.0	34.0	27.8	27.3	26.7	22.7
WBC23	7 Exchange House	488776	135693	Roadside	100	100.0	29.9	22.3	23.9	22.4	19.5
WBC24	54 Wey Hill	489244	132850	Roadside	92.3	92.3	22.9	19.4	17.7	17.6	16.5
WBC25b	66 Lower Street	490192	132908	Roadside	100	100.0	35.2	29.0	27.0	27.4	25.7
WBC26	51 High Street	490599	133101	Kerbside	100	100.0	26.7	23.5	22.3	22.7	19.2
WBC27	13 Petworth Road	490543	132754	Roadside	92.3	92.3	27.7	24.2	23.0	22.0	20.2
WBC28	Colporter Cottage A283	496067	135318	Roadside	100	100.0	21.4	18.7	17.8	17.3	15.0
WBC29	Red Rose Cottage A283	494751	139812	Roadside	92.3	92.3	31.8	27.2	28.0	24.8	21.1
WBC30	4 Ridgeway Cottage Portsmouth Road	494448	142342	Roadside	92.3	92.3	21.8	18.6	18.5	16.8	14.3
WBC31	92 Ockford Rd	496464	143458	Roadside	82.7	82.7	**40.7**	32.9	33.7	31.3	29.4
WBC32	70 Ockford Road	496498	143508	Roadside	100	100.0	27.7	23.9	20.6	21.4	18.5
WBC33	20 Ockford road	496639	143643	Roadside	84.6	84.6	33.5	26.5	24.9	24.0	21.8

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
WBC34A, WBC34B, WBC34C	Co-located with WA001 automatic monitor (Flambard Way)	496711	143705	Roadside	100	100.0	27.1	22.5	21.7	22.1	19.7
WBC35	20 Holloway Hill	496767	143659	Roadside	100	100.0	27.7	18.5	16.0	15.7	15.1
WBC36	Station Rd (Dominoes)	496777	143750	Roadside	100	100.0	26.5	19.4	19.4	18.9	18.5
WBC37	12 Queen Street	497156	143745	Roadside	92.3	92.3	21.0	14.4	14.1	14.1	13.6
WBC38	Brighton Road	497390	143435	Roadside	100	100.0	26.4	14.8	14.7	14.3	12.4
WBC39	Edison House Flambard Way	497314	143854	Roadside	84.6	84.6	18.5	19.0	18.5	20.6	19.4
WBC40	44 Bridge Street (Wey Gallery)	497234	143911	Roadside	100	100.0	19.1	17.2	15.3	15.5	14.5
WBC41	Major Minors Nursery Bridge Street	497412	144239	Roadside	100	100.0	24.5	24.1	26.4	22.1	20.3
WBC43	5A Farncombe Street	497602	145017	Roadside	90.4	90.4	19.4	16.9	16.1	15.2	13.4
WBC44	44 Meadrow	497801	144568	Roadside	100	100.0	29.9	27.0	28.0	24.7	22.1
WBC45	Windrush House Horsham Road	500898	144818	Roadside	92.3	92.3	19.2	20.9	20.3	21.0	21.2
WBC46	Cranleigh Bathrooms High Street	505795	139054	Roadside	100	100.0	34.2	22.4	21.2	19.9	19.0
WBC47	Carters Cottage Horsham Road	504045	135425	Roadside	100	100.0	27.0	13.0	13.5	14.2	11.9
WBC48	45A Station Hill	484464	146584	Roadside	90.4	90.4	26.5	27.0	24.3	23.7	21.8
WBC49	Elmsleigh Dentist Station Hill (1st Floor)	484402	146606	Roadside	92.3	92.3	16.2	28.2	26.4	25.4	22.7
WBC50b	29/30 The Borough (1st Floor)	484034	146908	Roadside	100	100.0	31.8	27.1	28.2	26.9	25.3
WBC51	25 The Borough (1st floor)	484066	146931	Roadside	100	100.0	32.2		34.1	34.4	31.7
WBC52	2 Frensham Road	484379	145596	Roadside	100	100.0	35.9	16.1	18.2	16.6	14.6
WBC53	Waverley Lane nursery	484501	146552	Roadside	100	100.0		18.2	19.9	16.8	14.3
WBC54	The Wells, Lower Street	490271	132913	Roadside	100	100.0		24.2	23.2	21.8	20.5
WBC55	86 Ockford Road	496476	143473	Roadside	100	100.0		29.8	27.5	28.2	24.5
WBC56A, WBC56B, WBC56C	Co-located WA0004 automatic monitor (South Street carpark)	484166	146862	Roadside	100	100.0			21.2	20.9	18.7
WBC 57	5 Ewhurst Road	506112	139054	Roadside	84.6	84.6				24.6	22.5

☒ **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 µg/m^3.

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

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

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

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

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

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

Figure A.1 – Trends in Annual Mean NO_2 Concentrations (Automatic Monitoring)

Figure A.2 – Trends in Annual Mean NO2: AQMA1 Farnham (Diffusion Tubes)

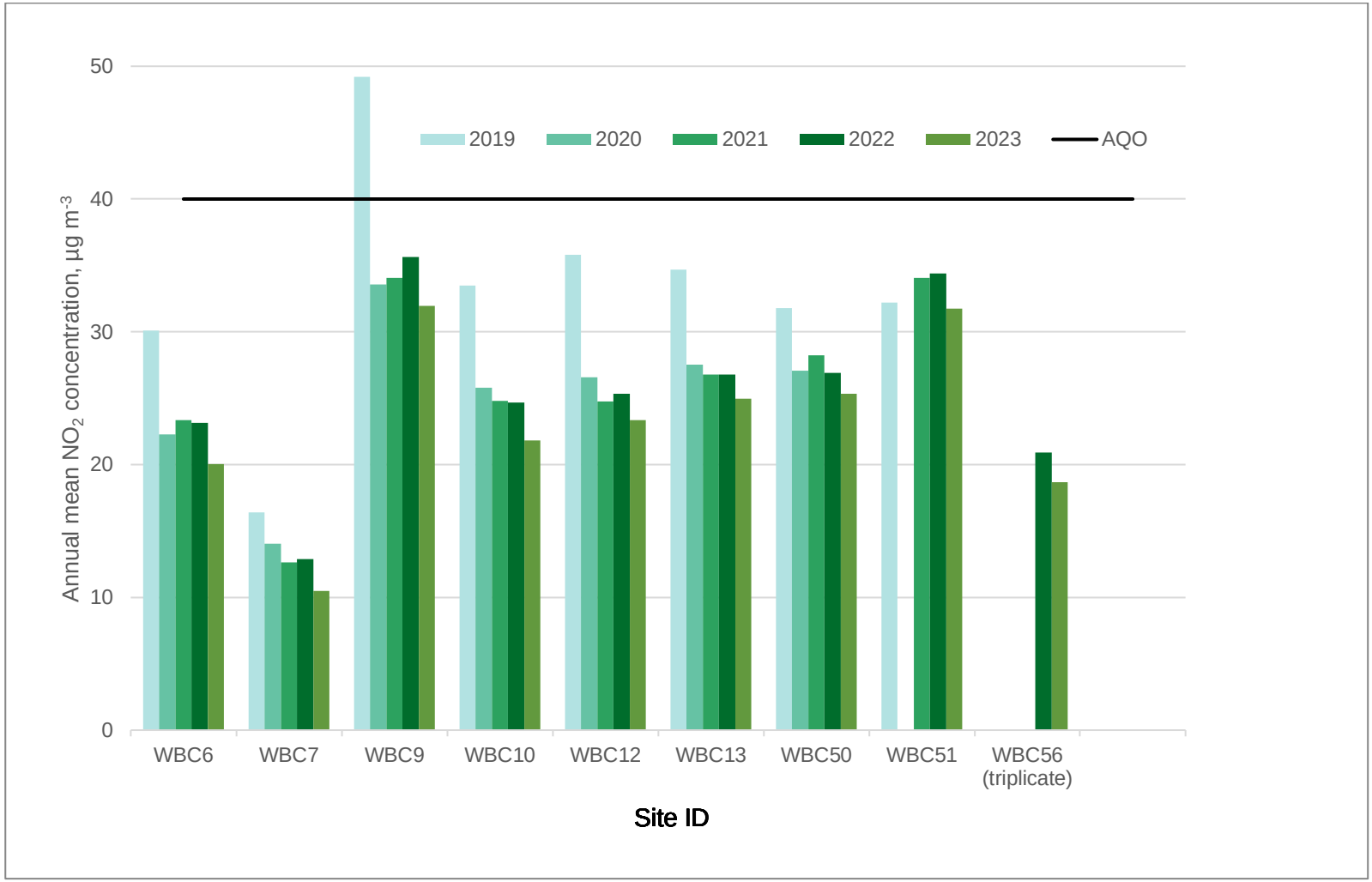


Figure A.3 – Trends in Annual Mean NO_2: AQMA2 Godalming (Diffusion Tubes)

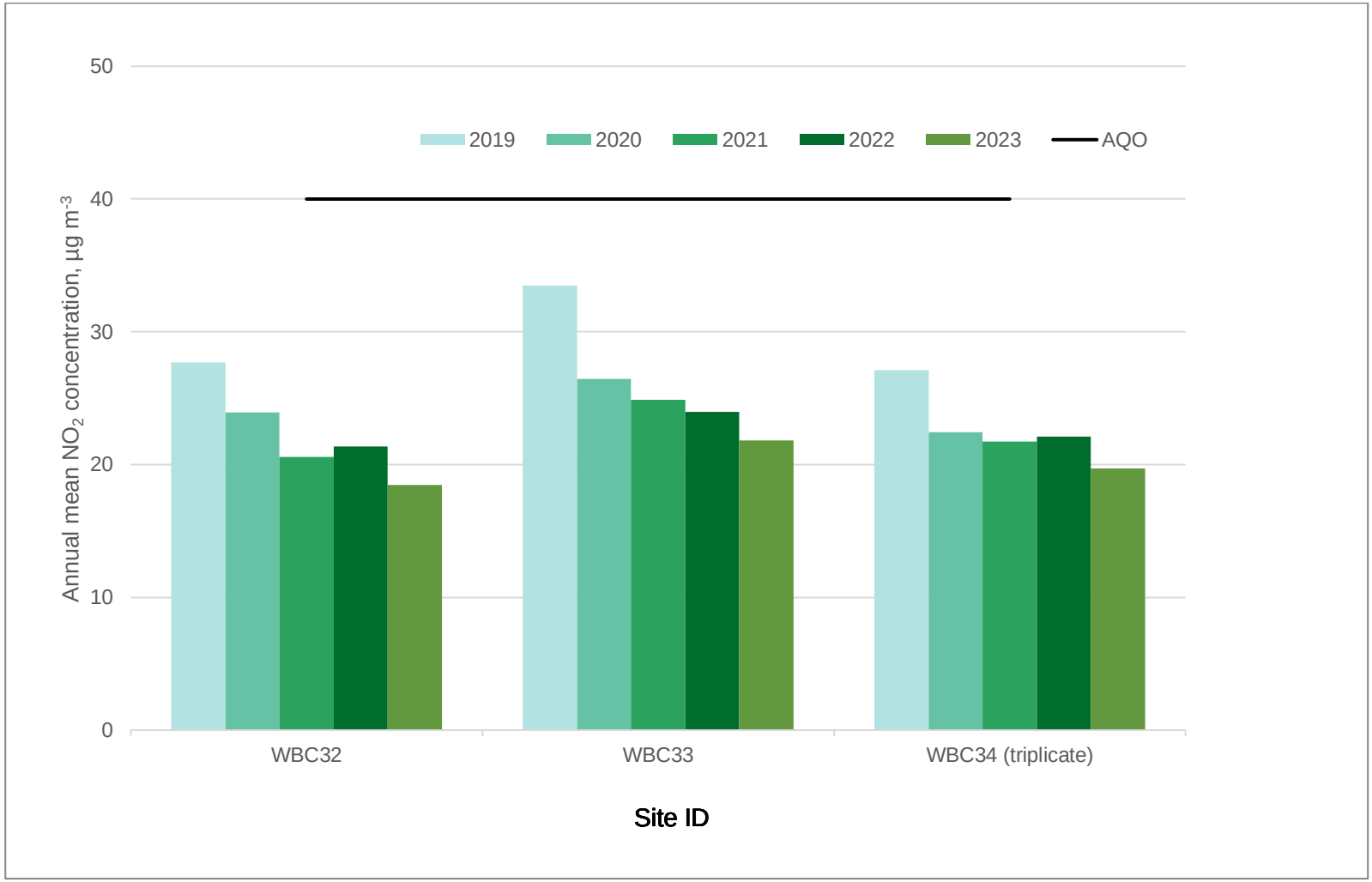


Figure A.4 – Trends in Annual Mean NO_2: Farnham outside AQMA (Diffusion Tubes)

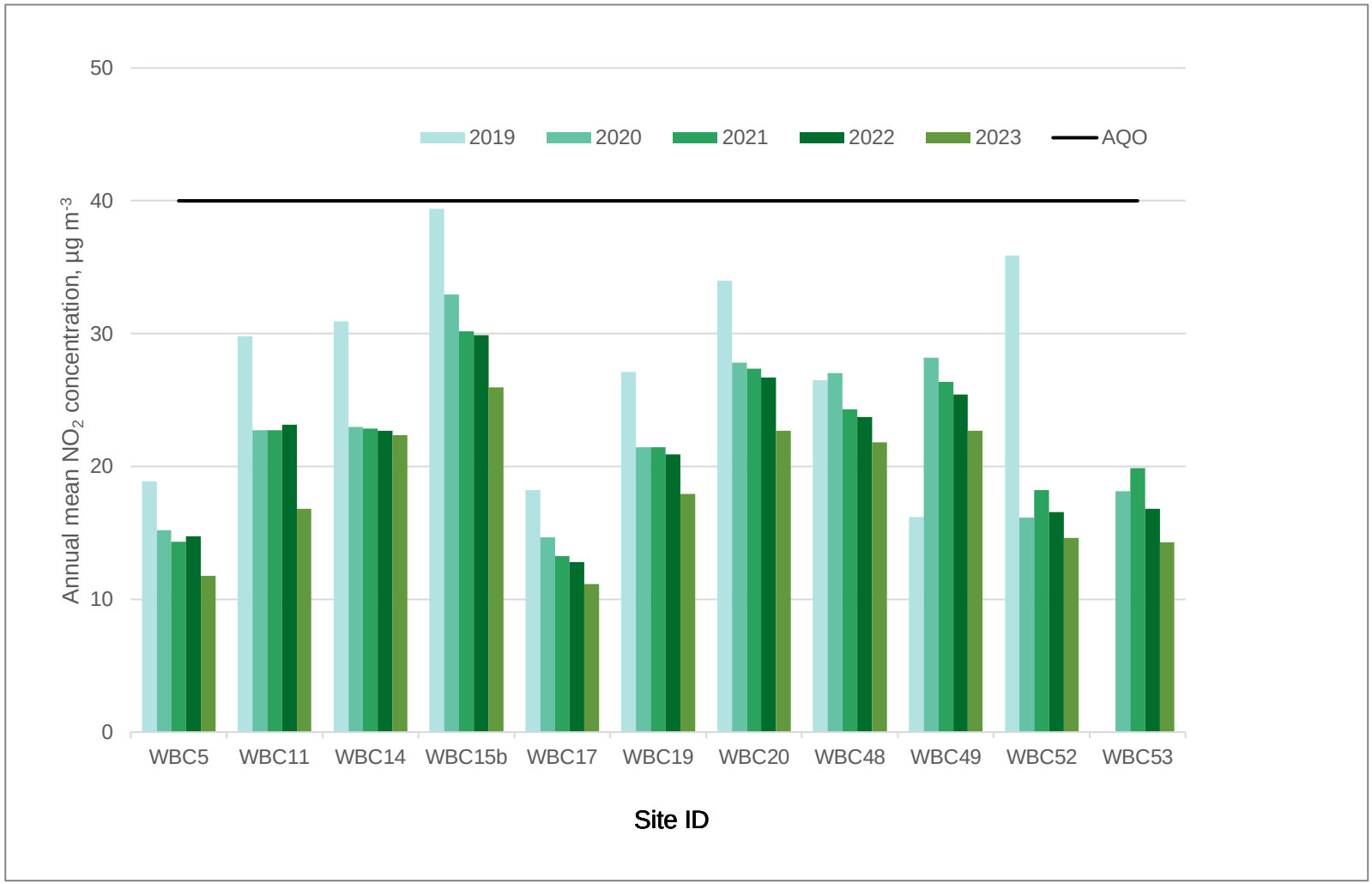


Figure A.5 – Trends in Annual Mean NO_2: Godalming outside AQMA (Diffusion Tubes)

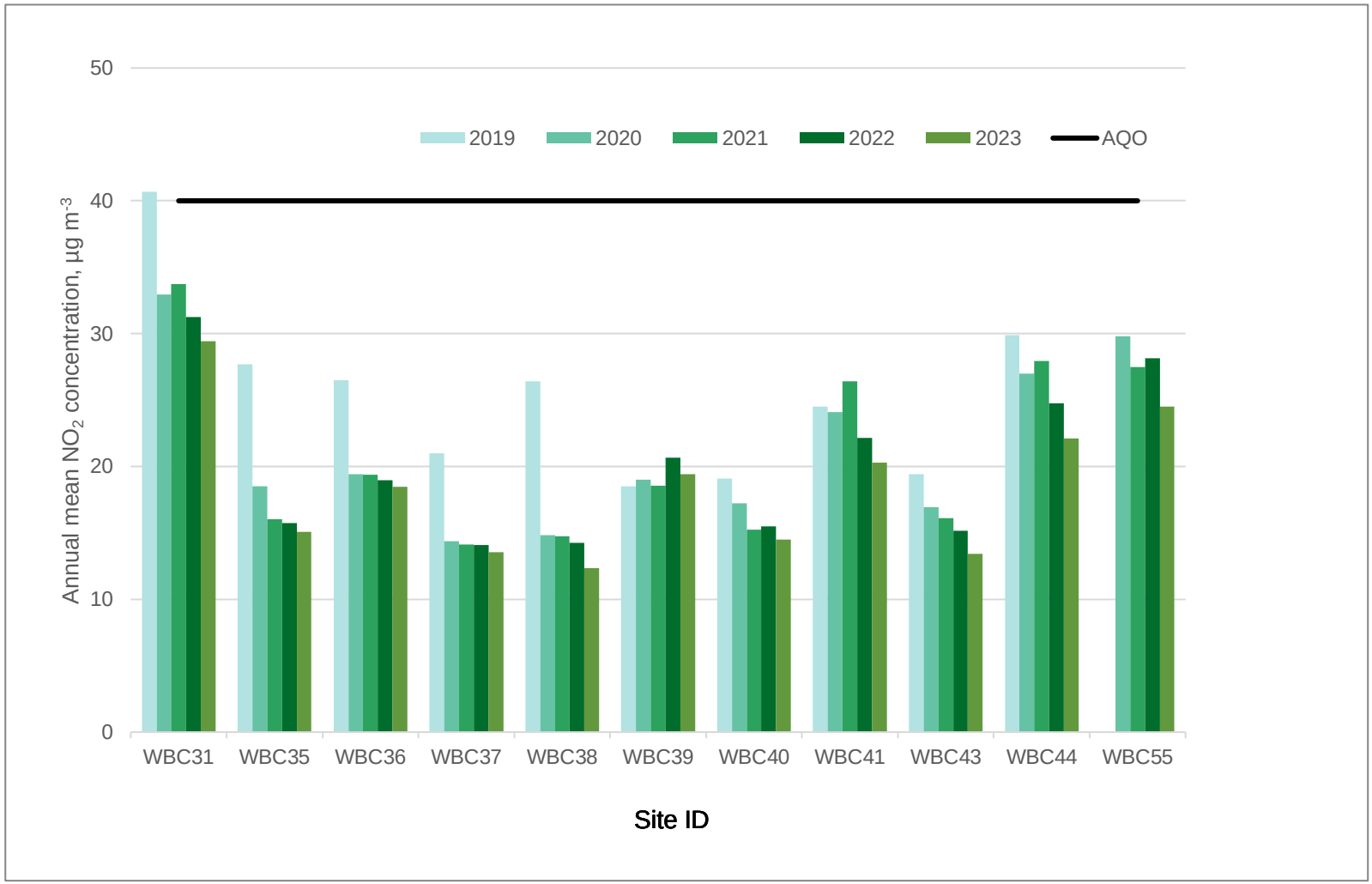


Figure A.6 – Trends in Annual Mean NO_2: Haslemere (Diffusion Tubes)

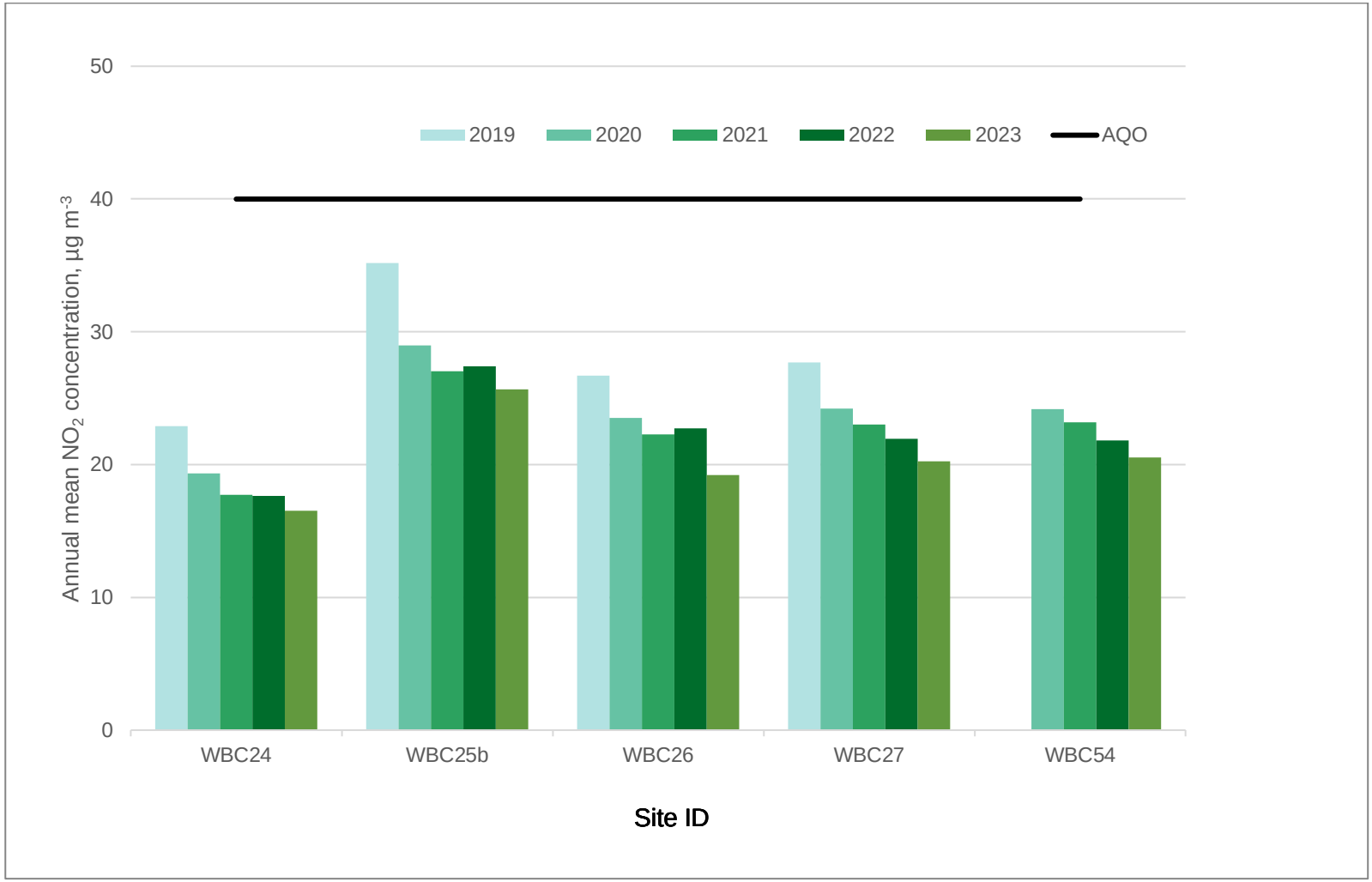


Figure A.7 – Trends in Annual Mean NO_2: Remaining locations - mostly rural (Diffusion Tubes)

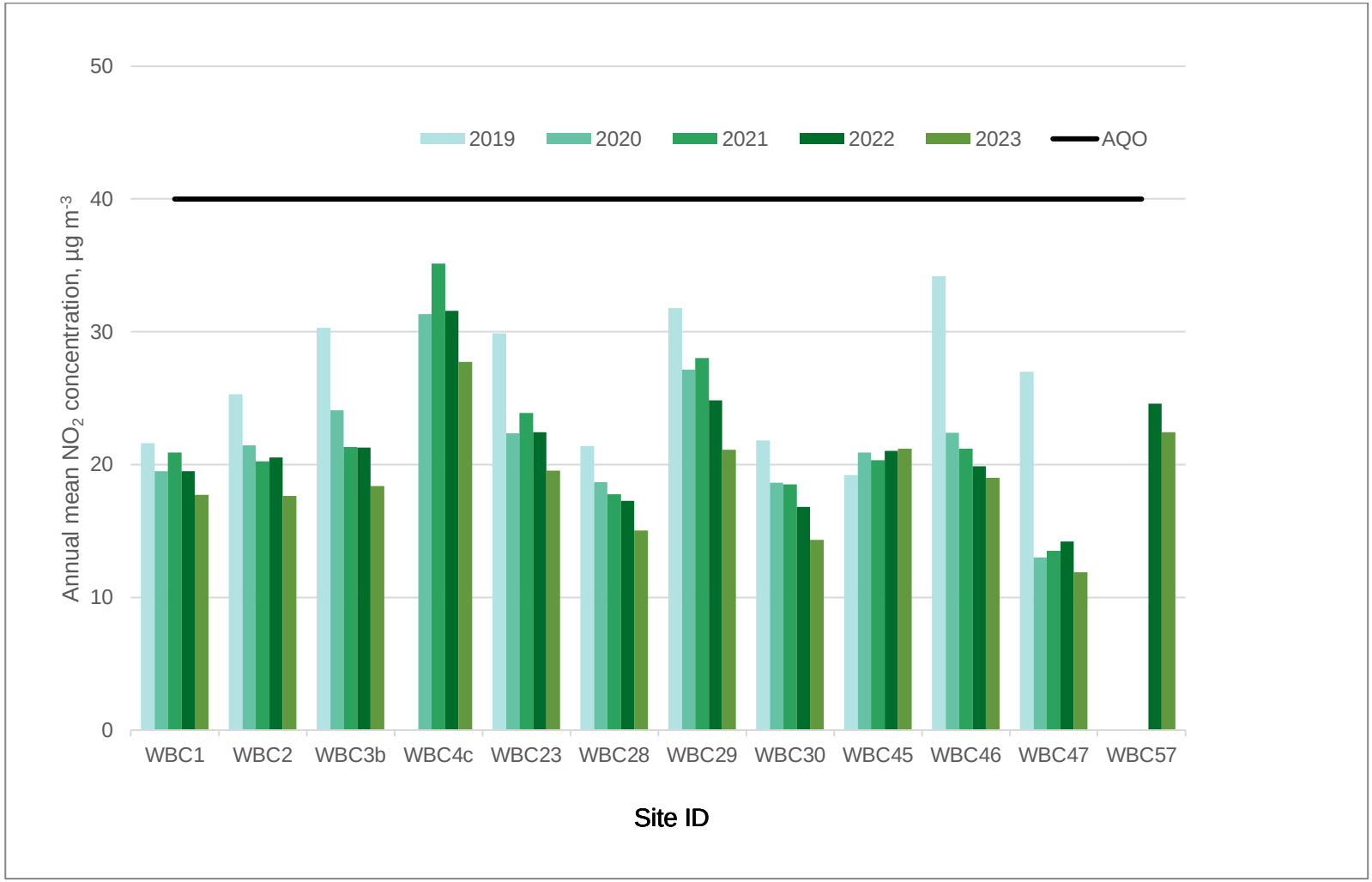


Table A.5 – 1-Hour Mean NO_2 Monitoring Results, Number of 1-Hour Means > 200µg/m^3

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2023 (%) (2)	2019	2020	2021	2022	2023
WA001	496711	143705	Roadside	97.93	97.93	0	0	0	0	0
WA004	484166	146862	Roadside	98.23	98.23			0	0	0

Notes:

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

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

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

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

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

Table A.6 – Annual Mean PM_{10} Monitoring Results ($\mu g/m^3$)

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2023 (%) (2)	2019	2020	2021	2022	2023
WA004	484166	146862	Roadside	95.5	95.5			16	14	16

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

Notes:

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

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

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

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

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

Figure A.8 – Trends in Annual Mean PM_{10} Concentrations

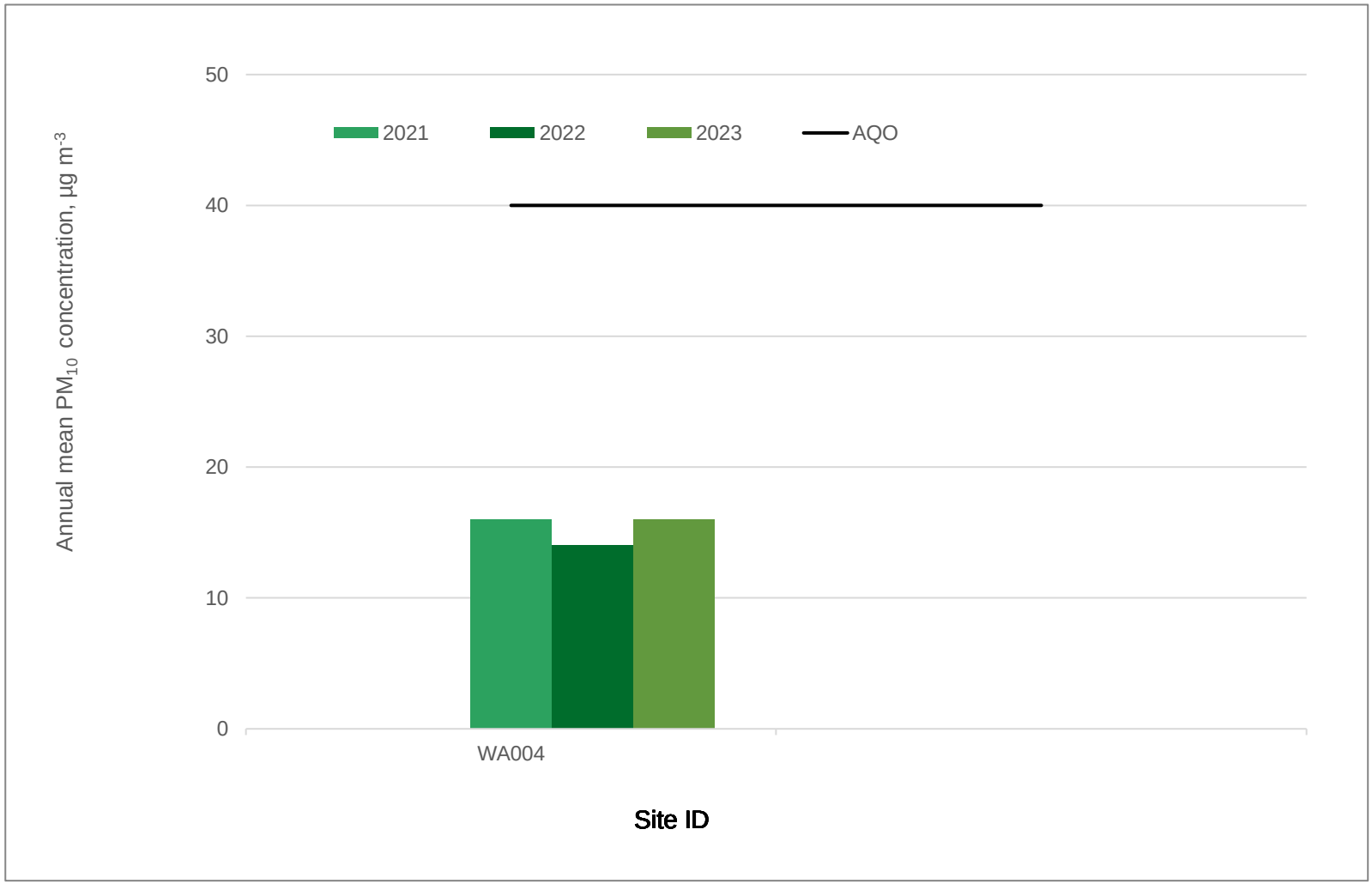


Table A.7 – 24-Hour Mean PM_{10} Monitoring Results, Number of PM_{10} 24-Hour Means > 50µg/m^3

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2023 (%) (2)	2019	2020	2021	2022	2023
WA004	484166	146862	Roadside	95.5	95.5			0	0	0

Notes:

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

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

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

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

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

Appendix B: Full Monthly Diffusion Tube Results for 2023

Table B.1 – NO_2 2023 Diffusion Tube Results ($\mu g/m^3$)

DT ID	Site Name	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 0.77	Annual Mean: Distance Corrected to Nearest Exposure	Comment
WBC1	53 Badshot Lea Road	486500	148692	29.7	29.9	25.8		24.8	23.7	15.1	15.1	27.5	24.7	20.6	16.4	23.0	17.7	-	
WBC2	148 Farnborough Road	484793	149500	31.8	29.7	20.7	27.3	26.6	24.6	16.3	19.2	26.4	17.1	24.7	10.7	22.9	17.7	-	
WBC3b	103 Upper Hale	483909	149028	31.4	17.4	25.3	22.8	17.4	25.2	21.9	18.5	31.1	28.6	26.3	20.4	23.9	18.4	-	
WBC4c	Upper Hale Crossroads	484959	148386	42.0	41.7	40.2	35.9	36.3	35.0	31.4	28.9	43.1	33.1	38.2	26.7	36.0	27.8	-	
WBC5	10 Guildford Road	484809	147325	17.5		16.6	17.3	16.1			11.1	18.7	17.8	10.3	12.0	15.3	11.8	-	
WBC6	6 St Marys Place	484465	147253	29.7	30.6	25.9	28.2	24.1	25.7	20.7	19.3	35.1	28.1	23.7	21.3	26.0	20.0	-	
WBC7	4 Cherry Tree Close	484114	147065	18.4	17.3	14.6	13.1	11.3	11.2	8.6	10.5	17.2	16.6	12.6	11.9	13.6	10.5	-	
WBC9	29/30 The Borough	484040	146912	48.1	43.3	47.2	47.0	40.5	39.0	32.5	37.7	48.4	45.2	39.4	29.7	41.5	32.0	-	
WBC10	112 West Street	483841	146810	37.0	33.3	27.2	29.0	30.3	27.8	20.1	21.3	29.4	30.9	28.7	24.8	28.3	21.8	-	
WBC11	77 West Street	483549	146673	27.7		17.1	19.0	22.6	23.6	15.4	18.8	28.0	26.1	21.1	20.5	21.8	16.8	-	
WBC12	21 Downing Street	483951	146761	38.0	35.6	35.0	32.4	28.0	24.1	23.2	25.1	36.9			24.8	30.3	23.3	-	
WBC13	8 Union Road	484184	146760	39.4	34.3	32.5	35.3	37.0	29.2	24.4	29.6	35.8	33.1	30.8	27.4	32.4	24.9	-	
WBC14	7 Bridge Square	484130	146513	35.5	31.1	32.5	30.6	24.0	26.2	21.2		36.1	33.5	28.1	20.8	29.1	22.4	-	
WBC15	4 – 5 Station Hill	484394	146609	40.6	21.6	34.1	40.3	43.0	43.6	24.4	29.1	32.8	30.2	37.8	27.1	33.7	26.0	-	
WBC17	Opp. Polycarps School Waverley Lane	484735	146541	21.9	19.2	14.7	13.9	13.1	12.0	9.3	9.5	16.8	14.7	17.1	11.8	14.5	11.2	-	
WBC19	11 Wrecclesham Road	482776	145674	25.4	26.3	26.7	23.4	28.1	24.1	14.3	18.8	29.5	23.8	25.7	13.5	23.3	17.9	-	
WBC20	18 The Street	482646	145087	38.9	36.0	27.9	30.4	32.9	24.4	22.1	25.9	35.9	31.7	26.9	20.6	29.5	22.7	-	
WBC23	7 Exchange House	488776	135693	29.3	26.6	25.7	29.8	29.2	29.1	22.9	23.0	33.3	24.1	16.0	15.5	25.4	19.5	-	
WBC24	54 Wey Hill	489244	132850	28.3	27.6	21.7	21.6	23.5	18.4	16.6	17.7	24.8	24.0	12.1		21.5	16.5	-	
WBC25b	66 Lower Street	490192	132908	35.5	39.6	35.5	34.0	24.5	33.6	32.3	28.8	39.3	38.1	32.1	26.5	33.3	25.7	-	
WBC26	51 High Street	490599	133101	33.8	34.3	25.8	20.3	24.0	24.2	25.3	21.3	29.0	25.5	19.1	16.9	25.0	19.2	-	
WBC27	13 Petworth Road	490543	132754	36.5	33.6	26.2	24.9	22.6	21.6		22.2	30.9	19.9	27.1	23.6	26.3	20.2	-	
WBC28	Colporter Cottage A283	496067	135318	23.4	15.3	22.0	23.6	23.7	22.3	13.9	15.2	24.3	20.8	16.9	12.9	19.5	15.0	-	
WBC29	Red Rose Cottage A283	494751	139812	38.2		28.5	28.0	25.8	22.5	23.8	22.8	29.2	29.0	30.9	23.0	27.4	21.1	-	
WBC30	4 Ridgeway Cottage Portsmouth Road	494448	142342	18.8		22.7	21.1	21.0	19.1	14.1	15.7	21.2	13.1	21.1	16.9	18.6	14.3	-	
WBC31	92 Ockford Rd	496464	143458	44.2	42.6	37.7	40.5	39.1	36.5	31.4	31.7	46.0			32.6	38.2	29.4	-	
WBC32	70 Ockford Road	496498	143508	35.2	33.7	27.1	23.3	21.4	19.5	22.0	20.9	27.3	24.8	10.3	22.4	24.0	18.5	-	
WBC33	20 Ockford road	496639	143643	40.2	31.9	31.8	29.6	29.0	25.4	19.1	17.6	31.5		27.4		28.4	21.8	-	

DT ID	Site Name	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 0.77	Annual Mean: Distance Corrected to Nearest Exposure	Comment
WBC34A	Co-located with WA001 automatic monitor (Flambard Way)	496711	143705	39.6		25.1	22.5	23.3	20.8	16.9	17.5	28.9	27.8	25.4	22.8	-	-	-	Triplicate Site with WBC34A, WBC34B and WBC34C - Annual data provided for WBC34C only
WBC34B	Co-located with WA001 automatic monitor (Flambard Way)	496711	143705	38.3	33.8	25.9	23.0	23.9	18.0	17.3	18.2	29.2	28.7	25.4	24.9	-	-	-	Triplicate Site with WBC34A, WBC34B and WBC34C - Annual data provided for WBC34C only
WBC34C	Co-located with WA001 automatic monitor (Flambard Way)	496711	143705	38.0	34.1	26.3	23.8	24.7	19.7	17.3	18.6	27.5	27.5	30.3	20.1	25.5	19.7	-	Triplicate Site with WBC34A, WBC34B and WBC34C – Annual data provided for WBC34C only
WBC35	20 Holloway Hill	496767	143659	30.9	27.5	21.4	17.5	17.3	15.3	12.4	14.4	24.5	21.9	19.4	12.5	19.6	15.1	-	
WBC36	Station Rd (Dominoes)	496777	143750	32.6	32.9	25.1	23.6	23.0	21.2	14.8	16.9	27.2	26.3	26.4	18.0	24.0	18.5	-	
WBC37	12 Queen Street	497156	143745	28.1	25.2	17.4	15.9	17.7	13.5	10.4	11.0	16.1	16.2	22.3		17.6	13.6	-	
WBC38	Brighton Road	497390	143435	22.5	17.5	17.2	15.6	14.7	11.5	11.4	10.9	17.4	17.0	20.3	16.6	16.1	12.4	-	
WBC39	Edison House Flambard Way	497314	143854	28.7	30.1	29.4	34.7		24.4	14.5	17.1	27.4	25.1	20.8		25.2	19.4	-	
WBC40	44 Bridge Street (Wey Gallery)	497234	143911	29.2	25.3	19.2	16.3	19.3	16.2	13.1	11.2	18.5	19.7	22.2	15.7	18.8	14.5	-	
WBC41	Major Minors Nursery Bridge Street	497412	144239	31.2	35.0	30.8	29.7	30.6	26.7	15.9	19.1	29.3	28.9	22.9	16.0	26.3	20.3	-	
WBC43	5A Farncombe Street	497602	145017	27.6	27.0	18.6	16.3	14.4	13.2	13.4	11.6	15.1	19.4		15.0	17.4	13.4	-	
WBC44	44 Meadrow	497801	144568	41.9	31.3	34.6	25.0	25.1	23.4	24.1	21.8	31.2	31.3	31.0	24.0	28.7	22.1	-	
WBC45	Windrush House Horsham Road	500898	144818	35.1	59.5	27.6	24.1		22.0	18.5	20.3	27.7	27.2	23.7	17.1	27.5	21.2	-	
WBC46	Cranleigh Bathrooms High Street	505795	139054	36.9	25.2	24.5	21.9	18.6	17.1	21.1	20.2	37.6	26.4	26.2	20.6	24.7	19.0	-	
WBC47	Carters Cottage Horsham Road	504045	135425	17.6	15.5	13.7	16.0	17.6	15.3	9.2	14.4	19.4	19.4	16.7	10.5	15.4	11.9	-	
WBC48	45A Station Hill	484464	146584	34.2	36.0	26.9	28.0	26.9	27.6	23.1	23.2	33.8	32.9		18.9	28.3	21.8	-	
WBC49	Elmsleigh Dentist Station Hill (1st Floor)	484402	146606	33.6	27.1	28.5	31.1	33.1	30.3	23.8	26.1	33.7	29.8	26.8		29.4	22.7	-	
WBC50b	29/30 The Borough (1st Floor)	484034	146908	38.7	30.1	36.2	21.5	35.8	33.9	27.8	28.9	39.7	39.2	34.3	28.6	32.9	25.3	-	
WBC51	25 The Borough (1st floor)	484066	146931	43.9	48.1	43.0	43.3	36.2	35.7	37.4	35.2	51.2	47.8	40.4	32.4	41.2	31.7	-	
WBC52	2 Frensham Road	484379	145596	28.3	22.9	18.2	20.7	23.0	18.4	10.5	13.9	21.0	17.0	20.8	13.2	19.0	14.6	-	
WBC53	Waverley Lane nursery	484501	146552	30.1	21.6	18.7	18.7	17.2	12.7	13.0	15.2	21.9	20.5	22.3	11.1	18.6	14.3	-	
WBC54	The Wells, Lower Street	490271	132913	35.7	21.3	27.5	25.1	24.4	22.7	16.2	20.3	31.9	35.3	33.1	26.3	26.7	20.5	-	
WBC55	86 Ockford Road	496476	143473	35.7	40.6	35.5	34.1	33.1	28.0	25.9	26.7	37.2	29.4	31.1	24.4	31.8	24.5	-	
WBC56A	Co-located WA0004 automatic	484166	146862	32.8	28.7	25.5	22.8	24.1	20.4	16.3	15.6	28.3	26.2	27.6	21.4	-	-	-	Triplicate Site with WBC56A, WBC56B and WBC56C -

DT ID	Site Name	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 0.77	Annual Mean: Distance Corrected to Nearest Exposure	Comment
	monitor (South Street carpark)																		Annual data provided for WBC56C only
WBC56B	Co-located WA0004 automatic monitor (South Street carpark)	484166	146862	34.5		25.8	23.8	20.4	20.8	17.2	18.0	27.1	24.8	26.7	23.6	-	-	-	Triplicate Site with WBC56A, WBC56B and WBC56C - Annual data provided for WBC56C only
WBC56C	Co-located WA0004 automatic monitor (South Street carpark)	484166	146862	31.1	26.9	25.3	23.7	23.4		18.3	18.2	29.3	24.4	28.7	23.4	24.3	18.7	-	Triplicate Site with WBC56A, WBC56B and WBC56C - Annual data provided for WBC56C only
WBC 57	5 Ewhurst Road	506112	139054	36.5	30.1	29.8		23.8	26.2	25.5	23.6	32.7	33.9	29.5		29.2	22.5	-	

☒ **All erroneous data has been removed from the NO_2 diffusion tube dataset presented in Table B.1**

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

☐ **Local bias adjustment factor used**

☒ **National bias adjustment factor used**

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

☒ **Waverley Borough Council confirm that all 2023 diffusion tube data has been uploaded to the Diffusion Tube Data Entry System**

Notes:

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

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

See Appendix C for details on bias adjustment and annualisation.

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

New or Changed Sources Identified Within Waverley Borough Council During 2023

Waverley Borough Council has not identified any new sources relating to air quality within the reporting year of 2023. However, we continue to keep a watching brief on the following developments.

Dunsfold Park Garden Village – Planning consent was granted for 1800 new homes, new school, new community centre, expanded business park and supporting infrastructure. The consent is live but no development likely to impact on local air quality has taken place yet.

Brightwell's Yard – Development will make the area a hub for leisure and evening entertainment, with a cinema, restaurants, 25 retail units and 239 homes in the centre of Farnham. Parts of the development have been completed but construction activities continue. We will continue to monitor air quality in Farnham to check any impacts from this development.

Farnham Infrastructure Programme (FIP) – Please refer to Section 2.2 for information about this programme. Some actions have been completed and others will be taken forward. The FIP has committed to modelling air quality prior to making changes, and we will continue to monitor air quality in Farnham to check impacts of changes.

Additional Air Quality Works Undertaken by Waverley Borough Council During 2023

In addition to the AQAP measures outlined in Table 2.2, Waverley Borough Council also outlined a number of actions aimed at improving air quality more widely across the Borough in the Clean Air Strategy published in May 2023. An update of these actions provided in March 2024 is provided in Table C.1.

Table C.1 – Clean Air Strategy Actions with Updates to March 2024

Priority Actions	Category	WBC Commitments Adopted May 2023				
		Action	Who will deliver it?	Key Performance Measure	Timescale	Progress March 2024
Leadership in Improving Air Quality						
Reduce car journeys and commuting	Transport	L1. Reduce car journeys for commuting by Waverley staff by 60% consistent with the work done on the 'Where Work Happens' project by 2025 and promote low and zero emission transport including active transport	Organisational Development	Numbers of staff commuting. Numbers of staff using zero emission transport as reported in the Carbon Neutrality Action Plan	2025	393 FTE employees deliver the Council's core functions and services. An average of 125 staff now travel into the Burys each day. A reduction of journeys for commuting by Waverley staff by 69%. Home working supported through Hybrid working contracts. Increase in use of electric and hybrid vehicles (both staff owned and council pool cars) reducing business mile emissions by 35% from the baseline figure. Salary sacrifice offered for bikes to work through Cyclescheme.co.uk
Increase numbers of low or zero emission vehicles	Transport	L2. Develop a plan to reduce emissions from travel by converting the WBC fleet to 100% zero emissions including contractor vehicles through the procurement process	Environmental Services	Proportion of WBC Fleet being zero emission as reported in the Carbon Neutrality Action Plan	2025 onwards	Two fully electric Vauxhall Combo vans purchased by Environmental Services for environmental enforcement and monitoring staff use.
Increase numbers of low or zero emission vehicles	Transport	L3 We will continue to work with taxi drivers to reduce emissions from this sector. Subject to Defra approval this will entail delivering a Defra grant funded project across Surrey to engage with taxi drivers and	Regulatory Services	Proportion of licenses for low and zero emission taxis	End of 2024	Gained Defra approval for a revised scheme. WBC drafted tender and contracts for EV taxi project, with GBC and SBC to take forward in consultation with WBC

Priority Actions	Category	WBC Commitments Adopted May 2023				
		Action	**Who will deliver it?**	**Key Performance Measure**	**Timescale**	**Progress March 2024**
		increase the proportions of low and zero emission taxis, supported by the taxi licensing process				
Improve energy efficiency of buildings	Energy	L4 We will reduce NOx and PM emissions from council housing building stock, through the Asset Management Strategy, which will present a decarbonisation path for existing council housing stock	Organisational Development Housing Services Commercial Services, Assets and Property	Energy use in council housing building stock as reported in the Carbon Neutrality Action Plan	Throughout the lifetime of this strategy	Asset Management Strategy proposal for the development of a Waverley Standard to incorporate Decent Homes Standard and Future Homes Standard. Pilot project will include the installation of 30 Air Source Heat Pumps. Old boilers to be replaced with new hydrogen ready gas boilers. Investigate alternatives. Action Plan to retrofit to net zero by 2030. Further energy study to improve performance of housing assets. EV chargers to be introduced to refurbishment projects.
Use renewable energy where possible	Energy	L5 We will support ongoing work within WBC regarding renewable energy generation projects and facilitating community power generation in the borough	Organisational Development	Renewable energy use within Waverley as reported in the Carbon Neutrality Action Plan	Throughout the lifetime of this strategy	Implementing solar PV on Leisure Centres. Carrying out proposals for solar canopy over car park with feasibility studies for others in the borough. Investigating the potential of solar PV installation on: • Senior living schemes. • Pay and display machines in car parks. • Leased commercial sites. • Solar Farm
Encourage new developments to adopt best practice to improve air quality across Waverley	Strategies and Policy Guidance	L6 We will support the implementation of the Climate Change and Sustainability Supplementary Planning Document, including supporting approaches to	Planning Development Organisational Development	Implementation of the SPD	End of 2024	SPD adopted in 2022. Strengthening the sustainability policies in the upgrade of Local Plan Part 1, particularly Energy efficiency; renewable energy; sustainable transport; climate change risks and adaptation; land use change. Reviewing transport assessment/travel plans for larger development applications.

Priority Actions	Category	WBC Commitments Adopted May 2023				
		Action	**Who will deliver it?**	**Key Performance Measure**	**Timescale**	**Progress March 2024**
		reduce energy use in new developments and encouraging sustainable forms of transport will also reduce local air pollutant emissions				
Challenge business as usual for actions to improve air quality	Air Quality Evidence Base	L7 We will undertake further work to investigate the feasibility of Low Emission Zones within Waverley, and what form these could take (this is likely to entail a less formal approach than those implemented under the Clean Air Zone Framework, and may entail joint working more widely across Surrey)	Regulatory Services	Production of feasibility study into LEZs	2023-2024	Appointed contractor to undertake the study. ANPR surveys undertaken in Farnham and Godalming in March.
Work with the council to facilitate monitoring and modelling of air quality	Air Quality Evidence Base	L8 We will continue to deliver the statutory requirements of the LAQM process, including annual reporting to Defra, and air quality monitoring and modelling to provide the evidence base for those reports. This includes an update of the Air	Regulatory Services	Annual submission of Annual Status Report to Defra and Air Quality Action Plan	2023 for AQAP, ongoing annual reporting	Ongoing. Monitored air quality in WBC's area last year. ASR submitted to Defra at the end of September 2023. Approved in November 2023. Growth bid for Surrey wide modelling to be submitted Autumn 2024.

Priority Actions	Category	WBC Commitments Adopted May 2023				
		Action	**Who will deliver it?**	**Key Performance Measure**	**Timescale**	**Progress March 2024**
		Quality Action Plan due in 2023				
Buy sustainably	Strategies and Policy Guidance	L9 We will ensure sustainable procurement practices throughout the council as part of the Council's Procurement Strategy	Finance	Adoption of the WBC Sustainable Procurement Strategy	2023	Ongoing.
Avoid burning solid fuel and having bonfires	Energy	L10 We will consider with partner agencies, alternative ways to manage waste produced from land management, other than burning, where possible.	Environmental Services	Reduction in numbers of council bonfires	End of 2024	Burning on WBC countryside land minimised and only when unavoidable due to ground conditions, access or other considerations.
Use renewable energy where possible	Energy	L11 We will not support commercial exploration or extraction of fossil fuels, which may in the future undergo combustion	Regeneration and Planning Policy		Throughout the lifetime of this strategy	Ongoing. Council challenged the Loxley Well application process.
Reduce exposure to air pollutants	Planning and Infrastructure	L12 We will look for appropriate opportunities to implement green infrastructure either within new developments, or more widely such as at schools.	Environmental Services Regeneration and Planning Policy	Implementation of green infrastructure	2024-2027	New leisure centre in Cranleigh to be built to Passivhaus standards, 60-70% reduction in carbon emissions against standard build. Energy statement and SAP requirements through planning process. Local Cycling and Walking Infrastructure Plans (LCWIPs) are referenced when development Transport Statements and Travel Plans are assessed

Priority Actions	Category	WBC Commitments Adopted May 2023				
		Action	Who will deliver it?	Key Performance Measure	Timescale	Progress March 2024
Work Collaboratively to improve Air Quality						
Support other organisations to improve air quality	Transport, Strategies and Policy Guidance	C1 We will work with Surrey County Council on delivering LTP4 to reduce the volume of traffic on our roads and encourage a radical transformation of transport infrastructure in favour of active transport. This will also include improvements to public transport, freight and delivery management and increase in low and zero emission vehicles, and park and ride facilities if appropriate,	Regeneration and Planning Policy	Work undertaken in support of LTP4	Throughout the lifetime of this strategy	In September 2023 Surrey Connect, an on demand bus service, was launched in Farnham and Cranleigh to make it easier to access public transport in those areas.
Support other organisations to improve air quality	Raise public awareness	C2 We will encourage collaborative working with Parish and Town Councils across Waverley to enable actions to be undertaken by residents in a coordinated way.	Regulatory Services	Measures committed to by Town and Parish Councils	Throughout the lifetime of this strategy	Publish a template for adoption of actions to improve air quality on WBC's website.
Promote walking and cycling	Transport	C3 We will work with SCC to deliver a Greenway network, connecting the main	Organisational Development	Delivery of the Greenway network	2023-2025	Godalming Greenway Gateway public consultation completed. Final route and design procurements agreed. CIL and UKSPF funding secured, and other funding opportunities identified.

Priority Actions	Category	WBC Commitments Adopted May 2023				
		Action	**Who will deliver it?**	**Key Performance Measure**	**Timescale**	**Progress March 2024**
		centres across the borough.				WBC supported SCC on detailed design of Guildford Godalming Greenway, leading to SCC securing National Highways funding for Phase 1 construction. MoU signed with SCC for design and costing of the Hale Trail Greenway in Farnham Park.
Support other organisations to improve air quality	Air Quality Evidence Base	C4 We will continue to work with the Surrey Air Alliance and identify opportunities for projects to either enhance the evidence base on which decisions are made, or implement measures to improve air quality.	Regulatory Services	Air quality projects implemented across Surrey	Throughout the lifetime of this strategy	Ongoing
Support other organisations to improve air quality	Public Health	C5 We will work collaboratively with SCC Public Health for example undertaking information dissemination on air quality through doctors' surgeries.	Regulatory Services	Air Quality Projects delivered with Public Health	Throughout the lifetime of this strategy	Ongoing work with Surrey Heartlands on the asthma accredited schools' scheme. Promotion of SAHME to investigate indoor air quality in schools. Also supporting schools in WBC to get online and use the indoor monitor.
Encourage new developments to adopt best practice to improve air quality across Waverley	Planning and Infrastructure	C6 We will work across WBC to ensure air quality is fully considered within planning policy, and within planning applications, to ensure that air quality is	Regulatory Services Regeneration and Planning Policy Panning Development	Planning guidance for new developments and air quality	Throughout the lifetime of this strategy	Ongoing

Priority Actions	Category	WBC Commitments Adopted May 2023				
		Action	**Who will deliver it?**	**Key Performance Measure**	**Timescale**	**Progress March 2024**
		maintained, and where possible improved. We will encourage best practice design measures through guidance provided to developers and will set appropriate planning conditions for mitigation where required				
Ensure that infrastructure is in place to reduce the need to travel	Planning and Infrastructure	C7 We will support extensive rollout of fibre broadband and 5G mobile coverage in order to reduce the need to travel	Regeneration and Planning Policy Assets and Property	Proportion of borough covered by 5G	2024-2027	No update available.
Support the delivery of the Waverley Carbon Neutrality Action Plan	Transport, Energy, Planning and Infrastructure	C8 We will support work being undertaken on the Waverley carbon neutrality action plan, particularly in relation to active travel and energy generation	Organisational Development Regulatory Services	Regular reports to the Carbon Emergency Board	Throughout the lifetime of this strategy	Climate Emergency Officers Group with established. Zurich producing CNAP Risk Register for WBC. CNAP Reviewed annually and reported to Climate Change EWG and Executive Top ten emitters identified and to be treated as priority projects
Increase numbers of low or zero emission vehicles	Transport	C9 Support the installation of on street EV chargers to encourage residents and taxi drivers to switch to electric vehicles in line with the WBC Electric Vehicle Strategy.	Organisational Development Regulatory Services	Numbers of EV chargers in place	Throughout the lifetime of this strategy	Ultra-rapid charges to be installed in Lower Hart Car Park and St James car parks in Farnham and Croft Road car park in Godalming in 2024. Working with SCC to install on-street EV chargers across Surrey. Phase 2 – 32 EV chargers being installed at Brightwells, South Street Godalming, Chestnut Avenue, Station Lane, Croft Road, Queens Street, Haslemere Leisure Centre. Lower Hart to be installed in 2024.

Priority Actions	Category	WBC Commitments Adopted May 2023				
		Action	**Who will deliver it?**	**Key Performance Measure**	**Timescale**	**Progress March 2024**
						Phase 3 rollout underway for other Waverley Car Parks. Monitoring chargers in Burys to establish if more are needed to accommodate the increase in EV pool vehicles.
Influence others to improve air quality	Strategies and Policy Guidance	C10 We will work to influence national legislation by lobbying the national Government and responding to relevant consultations on air quality	Regulatory Services	Timely responses to consultations and surveys	Throughout the lifetime of this strategy	WBC is a consultee for Gatwick North and Future Airspace Strategy Implementation consultations.
Support and Enable Behaviour Change						
Avoid burning solid fuel and having bonfires	Raise Public Awareness	B1 We will continue to work through the Surrey Air Alliance with SCC's Trading Standards to develop a project to raise awareness about solid fuel burning air quality impacts and promoting/enforcing changes to rules in supplying/buying solid fuel	Regulatory Services Communications and Customer Services	Implementation of a project about solid fuel burning	2024	The Surrey Air Alliance supported the first Clean Air Night Campaign on Wed 24 January 2024. They were an official supporter and SCC Public Health contributed to this campaign. WBC took part.
Avoid burning solid fuel and having bonfires	Raise Public Awareness	B2 We will continue to encourage people not to have bonfires. Longer term we will investigate bylaws for bonfires	Regulatory Services Communications and Customer Services	Campaigns undertaken	Throughout the lifetime of this strategy	WBC do not encourage bonfires, as promoted on our website.

Priority Actions	Category	WBC Commitments Adopted May 2023				
		Action	**Who will deliver it?**	**Key Performance Measure**	**Timescale**	**Progress March 2024**
Raise awareness of air quality issues and how to reduce effects	Raise Public Awareness	B3 We will support events such as Clean Air Day and work to engage with local communities to raise awareness of measures they and individuals can take to reduce air pollution	Regulatory Services Communications and Customer Services	Input into Clean Air Day	Throughout the lifetime of this strategy	WBC Comms campaign to support Clean Air Day last Thurs 20 June 2024.
Promote walking and cycling	Transport	B4 We will adopt Local Cycling and Walking Infrastructure Plans for Farnham and Waverley	Organisational Development	Adoption of LCWIPs	2024-2026	Funding sources identified. Farnham specific and broader Waverley LCWIPs to be adopted 2024. Agreement to be reached with SCC on updated Farnham LCWIP to remove inconsistencies with the wider-Waverley LCWIP. LCWIPs for Farnham and rest of Waverley are being taken through committee for adoption into planning policy in 24/25.
Raise awareness of air quality issues and how to reduce effects	Raise Public Awareness	B5 We will provide tailored, clear, accurate and consistent messages about the benefits of good air quality, utilising the Waverley Borough Council website as a platform to inform residents	Regulatory Services Communications and Customer Services	Annual review of our air quality web pages with updates if needed	Throughout the lifetime of this strategy	Ongoing review of website to make sure it is up to date.
Raise awareness of air quality issues and how to reduce effects	Raise Public Awareness	B6 Carbon Neutrality Action Plan is setting up a Citizens Assembly to encourage public participation in shaping the climate emergency agenda – we will investigate the feasibility of using this	Organisational Development Regulatory Services Communications and Customer Services	Use of Citizens Assembly for participation	2023-2024	Alternatives to traditional Citizen Assembly being considered, potential to use Commonplace platform.

Priority Actions	Category	WBC Commitments Adopted May 2023				
		Action	**Who will deliver it?**	**Key Performance Measure**	**Timescale**	**Progress March 2024**
		mechanism to raise awareness on air quality.				
Raise awareness of air quality issues and how to reduce effects	Raise Public Awareness, Transport	B7 We will work with SCC to tackle vehicle idling emissions at key locations such as on Station Hill in Farnham, other level crossings and outside schools	Regulatory Services	Anti-idling signs implemented	2023-2024	Proposal put forward for monitoring outside 4 schools, subject to funding.
Raise awareness of air quality issues and how to reduce effects	Raise Public Awareness, Public Health	B8 Through the SAA we will continue to work with Surrey Heartlands Clinical Commissioning Group to contribute to a project looking at links between paediatric asthma and AQMAs to help inform and take forward a paediatric asthma care bundle	Regulatory Services	Implementation of asthma care bundle	2023-2024	Work is ongoing, Surrey Heartlands have funding for this project to the end of the school year 2023/2024.
Raise awareness of air quality issues and how to reduce effects	Raise Public Awareness, Transport	B9 We will work with SCC to support the eco-school's initiative (including promoting active travel, Mode Shift Stars, Bikeability training, walking training, and an understanding of impacts on air quality).	Regulatory Services	Number of schools signed up to the Eco-school's initiative	2023-2025	Promotion of SAHME to investigate indoor air quality in schools. Also supporting schools in WBC to get online and use the indoor monitor.

Priority Actions	Category	WBC Commitments Adopted May 2023				
		Action	**Who will deliver it?**	**Key Performance Measure**	**Timescale**	**Progress March 2024**
Promote walking and cycling	Transport	B10 We will work with schools to identify and remove barriers to active travel	Regulatory Services	Levels of active travel within schools which have had interventions	2024-2026	Started a pilot project on provision of cycling and scooter storage at schools.

QA/QC of Diffusion Tube Monitoring

This section provides detail regarding aspects of non-automatic monitoring using diffusion tubes.

Diffusion tube supplier

Waverley Borough Council's diffusion tubes are supplied and analysed by SOCOTEC Didcot utilising the 50% triethanolamine (TEA) in acetone preparation method.

SOCOTEC participate in the AIR-PT analysis scheme[15]. This is an independent analytical proficiency-testing scheme, operated by LGC Standards and supported by the Health and Safety Laboratory (HSL). Defra and the Devolved Administrations advise that diffusion tubes used for LAQM should be obtained from laboratories that have demonstrated satisfactory performance in the AIR NO_2 PT scheme. For those reporting periods in 2023 for which SOCOTEC reported results, all results were considered satisfactory (based on z-scores less than or equal to 2). The laboratory performance for SOCOTEC from September 2021 to October 2023 is summarised here, WASP – Annual Performance Criteria for NO2 Diffusion Tubes (defra.gov.uk)

[15] https://laqm.defra.gov.uk/wp-content/uploads/2023/11/LAQM-NO2-Performance-data_Up-to-Oct-2023_V1_Final.pdf

Diffusion Tube Calendar

The diffusion tube calendar used with Waverley is provided below. This did not deviate significantly from the 2023 Diffusion Tube Monitoring Calendar.

Month	Tube On	Tube Off
Jan	04/01/2023	01/02/2023
Feb	01/02/2023	28/02/2023
Mar	28/02/2023	04/04/2023
Apr	04/04/2023	03/05/2023
May	03/05/2023	30/05/2023
Jun	30/05/2023	03/07/2023
Jul	03/07/2023	01/08/2023
Aug	01/08/2023	04/09/2023
Sep	04/09/2023	04/10/2023
Oct	04/10/2023	01/11/2023
Nov	01/11/2023	05/12/2023
Dec	05/12/2023	03/01/2024

Diffusion Tube Annualisation

No sites required annualisation in 2023.

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

Waverley Borough Council have applied a national bias adjustment factor of 0.77 to the 2023 monitoring data. This provided a more conservative approach compared to the combined local factor (0.75). A summary of bias adjustment factors used by Waverley Borough Council over the past five years is presented in **Error! Reference source not found.**.

Table C.2 – Bias Adjustment Factors for Previous Five Years

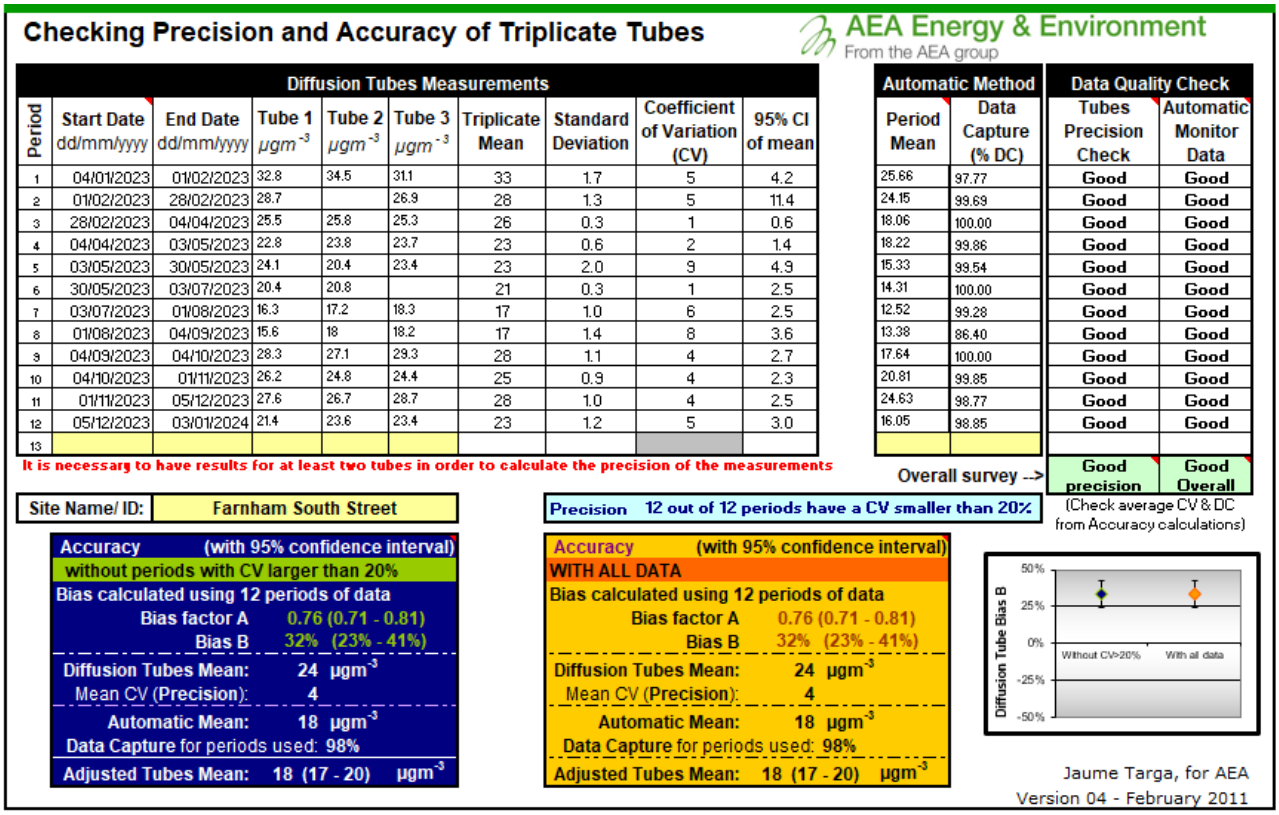
Monitoring Year	Local or National	If National, Version of National Spreadsheet	Adjustment Factor
2023	National	03/24	0.77
2022	National	03/23	0.76
2021	National	03/22	0.78
2020	Local (Farnham)	-	0.80
2019	Local (Farnham)	-	0.78

Table C.3 – Local Bias Adjustment Calculation

	Local Bias Adjustment Input 1 Farnham South Street	Local Bias Adjustment Input 2 Godalming
Periods used to calculate bias	12	12
Bias Factor A	0.76 (0.71 - 0.81)	0.74 (0.69 - 0.78)
Bias Factor B	32% (23% - 41%)	36% (27% - 44%)
Diffusion Tube Mean (µg m^{-3})	24.3	25.5
Mean CV (Precision)	4.5%	4.1%
Automatic Mean (µg m^{-3})	18.4	18.8
Data Capture	98%	98%
Adjusted Tube Mean (µg m^{-3})	18 (17 - 20)	19 (18 - 20)

Local bias adjustment factors of 0.76 and 0.74 were determined for Farnham South Street and Godalming Ockford Road 2 respectively using the Diffusion Tube Data Processing Tool v4.0. These factors are presented in **Error! Reference source not found.**3. Combining these according to LAQM.TG22 provides a combined local factor of 0.75. For completeness and to show full results, the calculation of a local bias adjustments for Farnham and Godalming was also carried out using the Diffusion Tube Precision Accuracy Bias Spreadsheet and these results are presented in Figures C.1 and Figure C.2 respectively.

Figure C.1 – Local Diffusion Tube Precision Accuracy Bias Spreadsheet – Farnham



Checking Precision and Accuracy of Triplicate Tubes

AEA Energy & Environment
From the AEA group

Diffusion Tubes Measurements

Period	Start Date dd/mm/yyyy	End Date dd/mm/yyyy	Tube 1 µgm^{-3}	Tube 2 µgm^{-3}	Tube 3 µgm^{-3}	Triplicate Mean	Standard Deviation	Coefficient of Variation (CV)	95% CI of mean
1	04/01/2023	01/02/2023	32.8	34.5	31.1	33	1.7	5	4.2
2	01/02/2023	28/02/2023	28.7		26.9	28	1.3	5	11.4
3	28/02/2023	04/04/2023	25.5	25.8	25.3	26	0.3	1	0.6
4	04/04/2023	03/05/2023	22.8	23.8	23.7	23	0.6	2	1.4
5	03/05/2023	30/05/2023	24.1	20.4	23.4	23	2.0	9	4.9
6	30/05/2023	03/07/2023	20.4	20.8		21	0.3	1	2.5
7	03/07/2023	01/08/2023	16.3	17.2	18.3	17	1.0	6	2.5
8	01/08/2023	04/09/2023	15.6	18	18.2	17	1.4	8	3.6
9	04/09/2023	04/10/2023	28.3	27.1	29.3	28	1.1	4	2.7
10	04/10/2023	01/11/2023	26.2	24.8	24.4	25	0.9	4	2.3
11	01/11/2023	05/12/2023	27.6	26.7	28.7	28	1.0	4	2.5
12	05/12/2023	03/01/2024	21.4	23.6	23.4	23	1.2	5	3.0
13									

It is necessary to have results for at least two tubes in order to calculate the precision of the measurements

Automatic Method		Data Quality Check	
Period Mean	Data Capture (% DC)	Tubes Precision Check	Automatic Monitor Data
25.66	97.77	Good	Good
24.15	99.69	Good	Good
18.06	100.00	Good	Good
18.22	99.86	Good	Good
15.33	99.54	Good	Good
14.31	100.00	Good	Good
12.52	99.28	Good	Good
13.38	86.40	Good	Good
17.64	100.00	Good	Good
20.81	99.85	Good	Good
24.63	98.77	Good	Good
16.05	98.85	Good	Good
Overall survey -->		Good precision	Good Overall

(Check average CV & DC from Accuracy calculations)

Site Name/ ID: Farnham South Street

Precision: 12 out of 12 periods have a CV smaller than 20%

Accuracy (with 95% confidence interval) without periods with CV larger than 20%
Bias calculated using 12 periods of data
Bias factor A: 0.76 (0.71 - 0.81)
Bias B: 32% (23% - 41%)
Diffusion Tubes Mean: 24 µgm^{-3}
Mean CV (Precision): 4
Automatic Mean: 18 µgm^{-3}
Data Capture for periods used: 98%
Adjusted Tubes Mean: 18 (17 - 20) µgm^{-3}

Accuracy (with 95% confidence interval) WITH ALL DATA
Bias calculated using 12 periods of data
Bias factor A: 0.76 (0.71 - 0.81)
Bias B: 32% (23% - 41%)
Diffusion Tubes Mean: 24 µgm^{-3}
Mean CV (Precision): 4
Automatic Mean: 18 µgm^{-3}
Data Capture for periods used: 98%
Adjusted Tubes Mean: 18 (17 - 20) µgm^{-3}

Jaume Targa, for AEA
Version 04 - February 2011

Figure C.2 – Local Diffusion Tube Precision Accuracy Bias Spreadsheet – Godalming

Checking Precision and Accuracy of Triplicate Tubes

AEA Energy & Environment
From the AEA group

Diffusion Tubes Measurements

Period	Start Date dd/mm/yyyy	End Date dd/mm/yyyy	Tube 1 µgm^{-3}	Tube 2 µgm^{-3}	Tube 3 µgm^{-3}	Triplicate Mean	Standard Deviation	Coefficient of Variation (CV)	95% CI of mean	Automatic Method: Period Mean	Automatic Method: Data Capture (% DC)	Data Quality Check: Tubes Precision Check	Data Quality Check: Automatic Monitor Data
1	04/01/2023	01/02/2023	39.6	38.3	38	39	0.9	2	2.1	27.64	100.00	Good	Good
2	01/02/2023	28/02/2023		33.8	34.1	34	0.2	1	1.9	27.78	100.00	Good	Good
3	28/02/2023	04/04/2023	25.1	25.9	26.3	26	0.6	2	1.5	18.71	100.00	Good	Good
4	04/04/2023	03/05/2023	22.5	23	23.8	23	0.7	3	1.6	17.07	99.86	Good	Good
5	03/05/2023	30/05/2023	23.3	23.9	24.7	24	0.7	3	1.7	16.37	99.69	Good	Good
6	30/05/2023	03/07/2023	20.8	18	19.7	20	1.4	7	3.5	15.02	98.65	Good	Good
7	03/07/2023	01/08/2023	16.9	17.3	17.3	17	0.2	1	0.6	10.98	99.86	Good	Good
8	01/08/2023	04/09/2023	17.5	18.2	18.6	18	0.6	3	1.4	12.52	95.59	Good	Good
9	04/09/2023	04/10/2023	28.9	29.2	27.5	29	0.9	3	2.3	18.70	95.56	Good	Good
10	04/10/2023	01/11/2023	27.8	28.7	27.5	28	0.6	2	1.6	19.94	86.01	Good	Good
11	01/11/2023	05/12/2023	25.4	25.4	30.3	27	2.8	10	7.0	24.84	99.63	Good	Good
12	05/12/2023	03/01/2024	22.8	20.1	24.9	23	2.4	11	6.0	16.09	96.12	Good	Good
13													

It is necessary to have results for at least two tubes in order to calculate the precision of the measurements

Overall survey --> Good precision | Good Overall

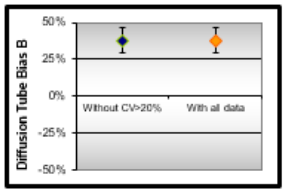
(Check average CV & DC from Accuracy calculations)

Site Name/ ID: Godalming Ockford Road 2

Precision: 12 out of 12 periods have a CV smaller than 20%

Accuracy (with 95% confidence interval) without periods with CV larger than 20%	
Bias calculated using 12 periods of data	
Bias factor A	0.74 (0.69 - 0.78)
Bias B	36% (27% - 44%)
Diffusion Tubes Mean:	26 µgm^{-3}
Mean CV (Precision):	4
Automatic Mean:	19 µgm^{-3}
Data Capture for periods used:	98%
Adjusted Tubes Mean:	19 (18 - 20) µgm^{-3}

Accuracy (with 95% confidence interval) WITH ALL DATA	
Bias calculated using 12 periods of data	
Bias factor A	0.74 (0.69 - 0.78)
Bias B	36% (27% - 44%)
Diffusion Tubes Mean:	26 µgm^{-3}
Mean CV (Precision):	4
Automatic Mean:	19 µgm^{-3}
Data Capture for periods used:	98%
Adjusted Tubes Mean:	19 (18 - 20) µgm^{-3}



Jaume Targa, for AEA
Version 04 - February 2011

National bias adjustment

The national database of diffusion tube co-location surveys provides bias factors for the relevant laboratory and preparation method. A bias adjustment of 0.77 for the year 2023 (based on 28 studies) has been derived from the national bias adjustment spreadsheet (v03_24). A screenshot of the spreadsheet for SOCOTEC is shown in **Error! Reference source not found.**

Figure C.3 – National Bias Adjustment Spreadsheets

National Diffusion Tube Bias Adjustment Factor Spreadsheet — Spreadsheet Version Number: 03/24

Follow the steps below **in the correct order** to show the results of **relevant** co-location studies
Data only apply to tubes exposed monthly and are not suitable for correcting individual short-term monitoring periods
Whenever presenting adjusted data, you should state the adjustment factor used and the version of the spreadsheet
This spreadsheet will be updated every few months: the factors may therefore be subject to change. This should not discourage their immediate use.

This spreadsheet will be updated at the end of June 2024
LAQM Helpdesk Website

The LAQM Helpdesk is operated on behalf of Defra and the Devolved Administrations by Bureau Veritas, in conjunction with contract partners AECOM and the National Physical Laboratory.

Spreadsheet maintained by the National Physical Laboratory. Original compiled by Air Quality Consultants Ltd.

Step 1:	Step 2:	Step 3:	Step 4:
Select the Laboratory that Analyses Your Tubes from the Drop-Down List	Select a Preparation Method from the Drop-Down List	Select a Year from the Drop-Down List	Where there is only one study for a chosen combination, you should use the adjustment factor shown with caution. Where there is more than one study, use the overall factor[3] shown in blue at the foot of the final column.
If a laboratory is not shown, we have no data for this laboratory.	If a preparation method is not shown, we have no data for this method at this laboratory.	If a year is not shown, we have no data[2]	If you have your own co-location study then see footnote[4]. If uncertain what to do then contact the Local Air Quality Management Helpdesk at LAQMHelpdesk@bureauveritas.com or 0800 0327953

Analysed By[1]	Method (To update your selection, choose (All) from the pop-up list)	Year[2] (To update your selection, choose (All))	Site Type	Local Authority	Length of Study (months)	Diffusion Tube Mean Conc. (Dm) (µg/m³)	Automatic Monitor Mean Conc. (Cm) (µg/m³)	Bias (B)	Tube Precision[4]	Bias Adjustment Factor (A) (Cm/Dm)
SOCOTEC Didcot	50% TEA in acetone	2023	UB	City Of York Council	11	15	12	27.3%	G	**0.78**
SOCOTEC Didcot	50% TEA in acetone	2023	R	City Of York Council	11	22	17	26.8%	G	**0.79**
SOCOTEC Didcot	50% TEA in acetone	2023	R	City Of York Council	9	22	17	33.7%	G	**0.75**
SOCOTEC Didcot	50% TEA in acetone	2023	R	City Of York Council	10	31	25	26.1%	G	**0.79**
SOCOTEC Didcot	50% TEA in acetone	2023	UB	Gravesham Borough Council	12	19	15	25.6%	G	**0.80**
SOCOTEC Didcot	50% TEA in acetone	2023	UB	Gravesham Borough Council	12	23	19	18.4%	G	**0.84**
SOCOTEC Didcot	50% TEA in acetone	2023	R	Ipswich Borough Council	9	26	20	33.0%	G	**0.75**
SOCOTEC Didcot	50% TEA in acetone	2023	R	Ipswich Borough Council	12	36	27	34.3%	G	**0.74**
SOCOTEC Didcot	50% TEA in acetone	2023	R	North East Lincolnshire Council	12	43	26	61.9%	G	**0.62**
SOCOTEC Didcot	50% TEA in acetone	2023	UB	North East Lincolnshire Council	10	13	10	29.1%	G	**0.77**
SOCOTEC Didcot	50% TEA in acetone	2023	R	North East Lincolnshire Council	11	24	21	18.0%	G	**0.85**
SOCOTEC Didcot	50% TEA in acetone	2023	R	Cardiff Council / Shared Regulatory Services	11	41	34	22.2%	G	**0.82**
SOCOTEC Didcot	50% TEA in acetone	2023	UB	Torfaen County Borough Council	11	12	9	43.9%	G	**0.70**
SOCOTEC Didcot	50% TEA in Acetone	2023	R	East Suffolk Council	12	29	21	38.9%	G	**0.72**
SOCOTEC Didcot	50% TEA in Acetone	2023	R	Wrexham County Borough Council	11	17	14	25.2%	G	**0.80**
SOCOTEC Didcot	50% TEA in Acetone	2023	R	Horsham District Council	12	21	17	23.5%	G	**0.81**
SOCOTEC Didcot	50% TEA in Acetone	2023	R	Horsham District Council	10	25	17	43.5%	G	**0.70**
SOCOTEC Didcot	50% TEA in Acetone	2023	R	Horsham District Council	10	23	24	-5.4%	G	**1.06**
SOCOTEC Didcot	50% TEA in Acetone	2023	UI	North Lincolnshire Council	10	14	11	26.2%	G	**0.79**
SOCOTEC Didcot	50% TEA in acetone	2023	R	Bridgend Council	11	32	27	20.8%	G	**0.83**
SOCOTEC Didcot	50% TEA in acetone	2023	R	Cambridge City Council	12	22	18	24.8%	G	**0.80**
SOCOTEC Didcot	50% TEA in acetone	2023	R	Leeds City Council	10	39	29	32.3%	G	**0.76**
SOCOTEC Didcot	50% TEA in acetone	2023	KS	Leeds City Council	10	30	20	48.9%	G	**0.67**
SOCOTEC Didcot	50% TEA in acetone	2023	R	Leeds City Council	12	25	19	30.0%	G	**0.77**
SOCOTEC Didcot	50% TEA in acetone	2023	UC	Leeds City Council	11	26	19	40.0%	G	**0.71**
SOCOTEC Didcot	50% TEA in acetone	2023	KS	Marylebone Road intercomparison	11	53	38	41.4%	G	**0.71**
SOCOTEC Didcot	50% TEA in acetone	2023	R	Vale Of White Horse District Council	10	22	18	21.2%	G	**0.83**
SOCOTEC Didcot	50% TEA in acetone	2023	UB	Wirral Council	11	15	13	16.7%	G	**0.86**
SOCOTEC Didcot	50% TEA in acetone	2023		**Overall Factor[3] (28 studies)**				**Use**		**0.77**

NO_2 Fall-off with Distance from the Road

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

No diffusion tube NO_2 monitoring locations within Waverley Borough Council required distance correction during 2023.

QA/QC of Automatic Monitoring

Ricardo provides data management and local site operator (LSO) duties for the automatic monitoring sites within Waverley. The instrumentation is calibrated every four weeks and full site audits and services are carried out every six months. The calibration certificates are provided at the end of the Appendix. The QA/QC is accredited to ISO 17025. All data

are ratified to all LAQM reporting requirements and the data provided in the 2024 are ratified. Live and historic data are available through Air Quality England.

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

PM_{10} is monitored using a Met One PM10 Unheated BAM 1020. A slope correction factor of 0.833 is applied to the data.

There is no $PM_{2.5}$ monitoring within Waverley Borough Council although an estimation of $PM_{2.5}$ derived from the measured PM_{10} concentrations at Farnham South Street is provided in section 3.2.3.

Automatic Monitoring Annualisation

Annualisation was not required.

NO_2 Fall-off with Distance from the Road

Wherever possible, monitoring locations are representative of exposure. However, where this is not possible, the NO_2 concentration at the nearest location relevant for exposure has been estimated using the NO_2 fall-off with distance calculator available on the LAQM Support website. Where appropriate, automatic annual mean NO_2 concentrations corrected for distance are presented in Table A.3.

No automatic NO_2 monitoring locations within Waverley Borough Council required distance correction during 2022.

Certificates of Calibration

Farnham, South Street (May 2023)

0401

CERTIFICATE OF CALIBRATION

Ricardo Energy and Environment, Gemini Building, Fermi Avenue Harwell, Didcot, Oxfordshire OX11 0QR. Telephone 01235 753692

Approved Signatories:

☐	S. Eaton	☐	B Stacey
☐	D Hector	☐	S Stratton
☐	N Rand	☐	S Telfer
☐	B Davies	☐	S Gray
☑	D Lane	☐	T Green
☐	S Copsey		

Signed:

Date of issue: 08 Jun 23

Certificate Number: 6334

Customer Name and Address:

Waverley Borough Council
Council Offices
The Burys
Godalming
Surrey
GU7 1HR

Description: Calibration factors for the air monitoring station at Farnham South Street

Ricardo Energy & Environment ID: ED12292115/May 2023

The reported expanded uncertainties are based on a standard uncertainty multiplied by a coverage factor k=2 providing a level of confidence of approximately 95% The uncertainty evaluation has been carried out in accordance with UKAS requirements.

This certificate is issued in accordance with the laboratory accreditation requirements of the United Kingdom Accreditation Service. It provides traceability of measurement to the SI system of units and/or to units of measurement realised at the National Physical Laboratory or other recognised national metrology institutes. This certificate may not be reproduced other than in full, except with the prior written approval of the issuing laboratory

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BN43 5FG

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08229264

VAT Registration No.
GB 212 8365 24

ee.ricardo.com

CERTIFICATE OF CALIBRATION

0401

Date of issue: 08 Jun 23

Certificate Number: 6334

Ricardo Energy & Environment ID: ED12292115/May 2023

Farnham South Street
Date of audit: 29 May 2023

Species	Analyser Serial no	Zero Response[1]	Zero uncertainty nmol/mol	Calibration Factor[2]	Factor uncertainty %	Converter efficiency (%)[3]	Converter uncertainty (%)
NOx	1056	7.4	2.6	1.1225	3.6618	98.8 (153ppb)	3.1
NO	1056	1.7	2.6	1.1181	3.7242	98.1 (122ppb)	3.0

Farnham South Street
Date of audit: 29 May 2023

	Species	Analyser Serial no	Parameter	Specified Value	Measured Value	Deviation %	Uncertainty %
BAM	PM_{10}	H2500	Total Flow[4]	16.67	17.53	5.1	2.25

0401

CERTIFICATE OF CALIBRATION

Date of issue: 08 Jun 23

Certificate Number: 6334

Ricardo Energy & Environment ID: ED12292115/May 2023

The gaseous ambient analysers listed above have been tested for zero response, calibration factor, linearity and converter efficiency (NOx analysers) by documented methods. The factors have been calculated using certified gas standards. The particulate analysers listed above have been tested for sample flow rates and k0(where appropriate) by documented methods. Note that the test results are valid on the day of test only, as analyser drift over time cannot be quantified. All results for gaseous species are reported in concentration units of nmol/mol or µmol/mol.

[1] The zero response is the zero reading on the data logging system of the analyser when audit zero gas was introduced to the analysers under test.

[2] The calibration factor is the multiplying factor required to scale the reading on the data logging system of the analyser into reported concentration units (nmol/mol for NO, NOx, SO2, O3 and µmol/mol for CO). It should be used in conjunction with the zero response. A corrected concentration is calculated using the following equation:

Concentration = F(Output - Zero Response)
Where F = Calibration Factor provided on this certificate
Output = Reading on the data logging system of the analyser
Zero Response = Zero Response provided on this certificate

[3] Converter eff. is the measured efficiency of the NO2 to NO converter within the oxides of nitrogen analyser under test.

[4] The measured main flow rate (where this is applicable) is the flow rate through the sensor unit of the TEOM particulate analyser under test. The measured aux flow rate (where this is applicable) is the flow rate through the bypass tubing of the TEOM particulate analyser under test. The measured total flow rate is the total flow rate through the particulate analyser under test. Units of flow are $l.min^{-1}$, reported at prevailing ambient conditions unless otherwise specified. Where flow rates are highlighted in bold, it indicates that measurements were not made at the analyser sample inlet. These measurements therefore may not accurately reflect analyser performance in normal operation.

The calibration results shaded are those that fall within our scope of accreditation, all other results on this certificate are not UKAS accredited, but have been included for completeness.

Farnham, South Street (November 2023)

CERTIFICATE OF CALIBRATION

Ricardo Energy and Environment, Gemini Building, Fermi Avenue Harwell, Didcot, Oxfordshire OX11 0QR. Telephone 01235 753692

0401

Approved Signatories:

☐	S. Eaton	☐	B Stacey
☐	S Copsey	☐	S Stratton
☐	N Rand	☐	S Telfer
☐	B Davies	☐	S Gray
☑	D Lane	☐	T Green

Signed:

Date of issue: 11 Dec 23

Certificate Number: 6574

Customer Name and Address:

Waverley Borough Council
Council Offices
The Burys
Godalming
Surrey
GU7 1HR

Description: Calibration factors for the air monitoring station at Farnham South Street

Ricardo Energy & Environment ID: ED12292115/November 2023

The reported expanded uncertainties are based on a standard uncertainty multiplied by a coverage factor k=2 providing a level of confidence of approximately 95% The uncertainty evaluation has been carried out in accordance with UKAS requirements.

This certificate is issued in accordance with the laboratory accreditation requirements of the United Kingdom Accreditation S ervice. It provides traceability of measurement to the SI system of units and/or to units of measurement realised at the National Physic al Laboratory or other recognised national metrology institutes. This certificate may not be reproduced other than in full, exce pt with the prior written approval of the issuing laboratory

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CERTIFICATE OF CALIBRATION

Date of issue: 11 Dec 23

Certificate Number: 6574

Ricardo Energy & Environment ID: ED12292115/November 2023

Farnham South Street
Date of audit: 30 Nov 2023

Species	Analyser Serial no	Zero Response[1]	Zero uncertainty nmol/mol	Calibration Factor[2]	Factor uncertainty %	Converter efficiency (%)[3]	Converter uncertainty (%)
NOx	1056	0.2	2.5	1.0167	3.5	100.1 (250ppb)	2.0
NO	1056	2.6	2.5	1.0266	3.5	98.6 (167ppb)	2.0

Farnham South Street
Date of audit: 30 Nov 2023

	Species	Analyser Serial no	Parameter	Specified Value	Measured Value	Deviation %	Uncertainty %
BAM	PM_{10}	H25000	Total Flow[4]	16.67	14.00	-16.0	2.25

CERTIFICATE OF CALIBRATION

Date of issue: 11 Dec 23

Certificate Number: 6574

Ricardo Energy & Environment ID: ED12292115/November 2023

The gaseous ambient analysers listed above have been tested for zero response, calibration factor, linearity and converter efficiency (NOx analysers) by documented methods. The factors have been calculated using certified gas standards. The particulate analysers listed above have been tested for sample flow rates and k0(where appropriate) by documented methods. Note that the test results are valid on the day of test only, as analyser drift over time cannot be quantified. All results for gaseous species are reported in concentration units of nmol/mol or µmol/mol.

[1] The zero response is the zero reading on the data logging system of the analyser when audit zero gas was introduced to the analysers under test.

[2] The calibration factor is the multiplying factor required to scale the reading on the data logging system of the analyser into reported concentration units (nmol/mol for NO, NOx, SO_2, O_3 and µmol/mol for CO). It should be used in conjunction with the zero response. A corrected concentration is calculated using the following equation:

Concentration = F(Output - Zero Response)
Where F = Calibration Factor provided on this certificate
Output = Reading on the data logging system of the analyser
Zero Response = Zero Response provided on this certificate

[3] Converter eff. is the measured efficiency of the NO_2 to NO converter within the oxides of nitrogen analyser under test.

[4] The measured main flow rate (where this is applicable) is the flow rate through the sensor unit of the TEOM particulate analyser under test. The measured aux flow rate (where this is applicable) is the flow rate through the bypass tubing of the TEOM particulate analyser under test. The measured total flow rate is the total flow rate through the particulate analyser under test. Units of flow are $l.min^{-1}$, reported at prevailing ambient conditions unless otherwise specified. Where flow rates are highlighted in bold, it indicates that measurements were not made at the analyser sample inlet. These measurements therefore may not accurately reflect analyser performance in normal operation.

The calibration results shaded are those that fall within our scope of accreditation, all other results on this certificate are not UKAS accredited, but have been included for completeness.

End of certificate

Godalming, Ockford Road 2 (May 2023)

0401

CERTIFICATE OF CALIBRATION

Ricardo Energy and Environment, Gemini Building, Fermi Avenue Harwell, Didcot, Oxfordshire OX11 0QR. Telephone 01235 753692

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Approved Signatories:

☐	S. Eaton	☐	B Stacey
☐	D Hector	☐	S Stratton
☐	N Rand	☐	S Telfer
☐	B Davies	☐	S Gray
☑	D Lane	☐	T Green
☐	S Copsey		

Signed:

Date of issue: 08 Jun 23

Certificate Number: 6335

Customer Name and Address:

Waverley Borough Council
Council Offices
The Burys
Godalming
Surrey
GU7 1HR

Description: Calibration factors for the air monitoring station at Godalming Ockford Road 2

Ricardo Energy & Environment ID: ED12292115/May 2023

The reported expanded uncertainties are based on a standard uncertainty multiplied by a coverage factor k=2 providing a level of confidence of approximately 95% The uncertainty evaluation has been carried out in accordance with UKAS requirements.

This certificate is issued in accordance with the laboratory accreditation requirements of the United Kingdom Accreditation Service. It provides traceability of measurement to the SI system of units and/or to units of measurement realised at the National Physical Laboratory or other recognised national metrology institutes. This certificate may not be reproduced other than in full, except with the prior written approval of the issuing laboratory

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VAT Registration No.
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CERTIFICATE OF CALIBRATION

0401

Date of issue: 08 Jun 23

Certificate Number: 6335

Ricardo Energy & Environment ID: ED12292115/May 2023

Godalming Ockford Road 2
Date of audit: 29 May 2023

Species	Analyser Serial no	Zero Response[1]	Zero uncertainty nmol/mol	Calibration Factor[2]	Factor uncertainty %	Converter efficiency (%)[3]	Converter uncertainty (%)
NOx	2125	3.7	2.6	1.1077	3.5781	98.4 (168ppb)	1.7
NO	2125	1.3	2.6	1.0960	3.6197	100.8 (105ppb)	1.7

CERTIFICATE OF CALIBRATION

0401

Date of issue: 08 Jun 23

Certificate Number: 6335

Ricardo Energy & Environment ID: ED12292115/May 2023

The gaseous ambient analysers listed above have been tested for zero response, calibration factor, linearity and converter efficiency (NOx analysers) by documented methods. The factors have been calculated using certified gas standards. Note that the test results are valid on the day of test only, as analyser drift over time cannot be quantified. All results for gaseous species are reported in concentration units of nmol/mol or µmol/mol.

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Concentration = F(Output - Zero Response)
Where F = Calibration Factor provided on this certificate
Output = Reading on the data logging system of the analyser
Zero Response = Zero Response provided on this certificate

[3] Converter eff. is the measured efficiency of the NO2 to NO converter within the oxides of nitrogen analyser under test.

The calibration results shaded are those that fall within our scope of accreditation, all other results on this certificate are not UKAS accredited, but have been included for completeness.

Godalming, Ockford Road 2 (November 2023)

CERTIFICATE OF CALIBRATION

Ricardo Energy and Environment, Gemini Building, Fermi Avenue Harwell, Didcot, Oxfordshire OX11 0QR. Telephone 01235 753692

0401

Approved Signatories:

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☐	S Copsey	☐	S Stratton
☐	N Rand	☐	S Telfer
☐	B Davies	☐	S Gray
☑	D Lane	☐	T Green

Signed:

Date of issue: 11 Dec 23

Certificate Number: 6575

Customer Name and Address:

Waverley Borough Council
Council Offices
The Burys
Godalming
Surrey
GU7 1HR

Description: Calibration factors for the air monitoring station at Godalming Ockford Road 2

Ricardo Energy & Environment ID: ED12292115/November 2023

The reported expanded uncertainties are based on a standard uncertainty multiplied by a coverage factor k=2 providing a level of confidence of approximately 95% The uncertainty evaluation has been carried out in accordance with UKAS requirements.

This certificate is issued in accordance with the laboratory accreditation requirements of the United Kingdom Accreditation S ervice. It provides traceability of measurement to the SI system of units and/or to units of measurement realised at the National Physic al Laboratory or other recognised national metrology institutes. This certificate may not be reproduced other than in full, exce pt with the prior written approval of the issuing laboratory

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CERTIFICATE OF CALIBRATION

Date of issue: 11 Dec 23

Certificate Number: 6575

Ricardo Energy & Environment ID: ED12292115/November 2023

Godalming Ockford Road 2
Date of audit: 30 Nov 2023

Species	Analyser Serial no	Zero Response[1]	Zero uncertainty nmol/mol	Calibration Factor[2]	Factor uncertainty %	Converter efficiency (%)[3]	Converter uncertainty (%)
NOx	2125	0.0	2.6	1.1438	3.5	99.2 (256ppb)	0.8
NO	2125	0.1	2.6	1.1004	3.5	100.2 (168ppb)	0.8

CERTIFICATE OF CALIBRATION

Date of issue: 11 Dec 23

Certificate Number: 6575

Ricardo Energy & Environment ID: ED12292115/November 2023

The gaseous ambient analysers listed above have been tested for zero response, calibration factor, linearity and converter efficiency (NOx analysers) by documented methods. The factors have been calculated using certified gas standards. Note that the test results are valid on the day of test only, as analyser drift over time cannot be quantified. All results for gaseous species are reported in concentration units of nmol/mol or µmol/mol.

[1] The zero response is the zero reading on the data logging system of the analyser when audit zero gas was introduced to the analysers under test.

[2] The calibration factor is the multiplying factor required to scale the reading on the data logging system of the analyser into reported concentration units (nmol/mol for NO, NOx, SO_2, O_3 and µmol/mol for CO). It should be used in conjunction with the zero response. A corrected concentration is calculated using the following equation:

Concentration = F(Output - Zero Response)
Where F = Calibration Factor provided on this certificate
Output = Reading on the data logging system of the analyser
Zero Response = Zero Response provided on this certificate

[3] Converter eff. is the measured efficiency of the NO_2 to NO converter within the oxides of nitrogen analyser under test.

The calibration results shaded are those that fall within our scope of accreditation, all other results on this certificate are not UKAS accredited, but have been included for completeness.

End of certificate

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

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

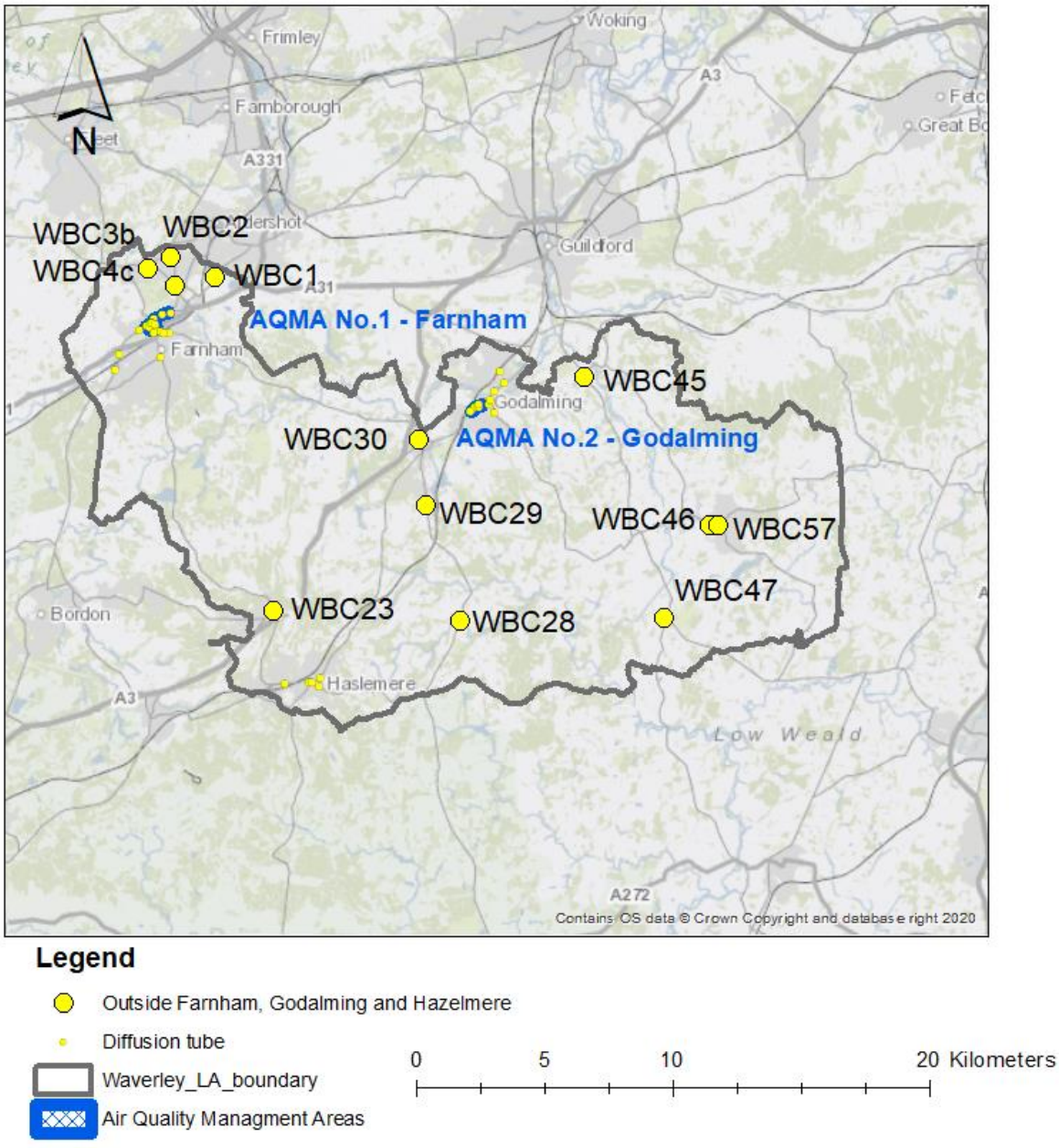


Figure D.2 – Map showing Farnham AQMA and location of automatic analyser (WA004) and diffusion tubes

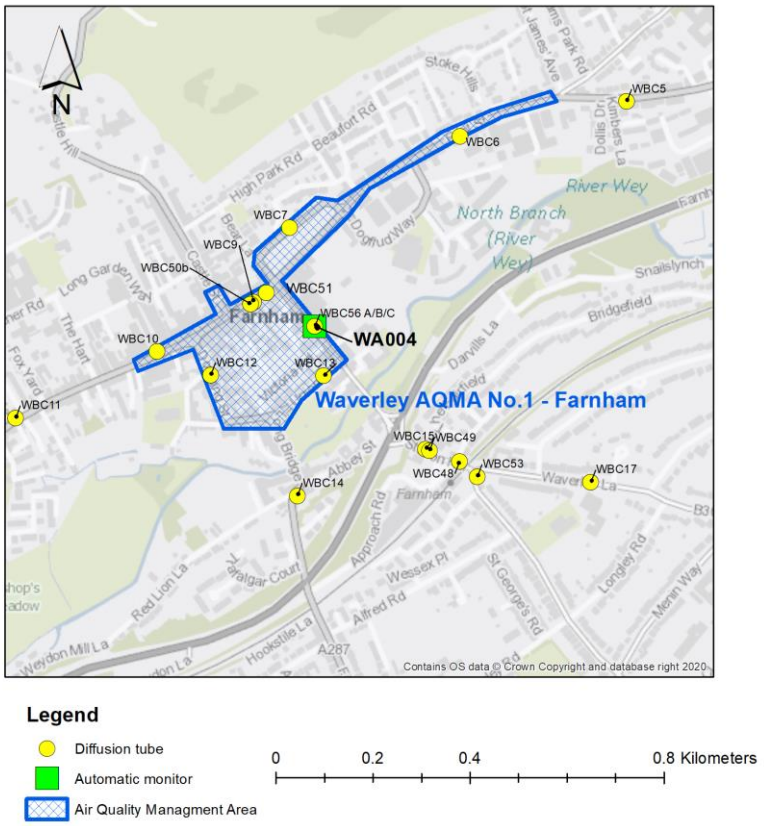


Figure D.3 – Map showing Godalming AQMA and location of automatic analyser (WA001) and diffusion tubes

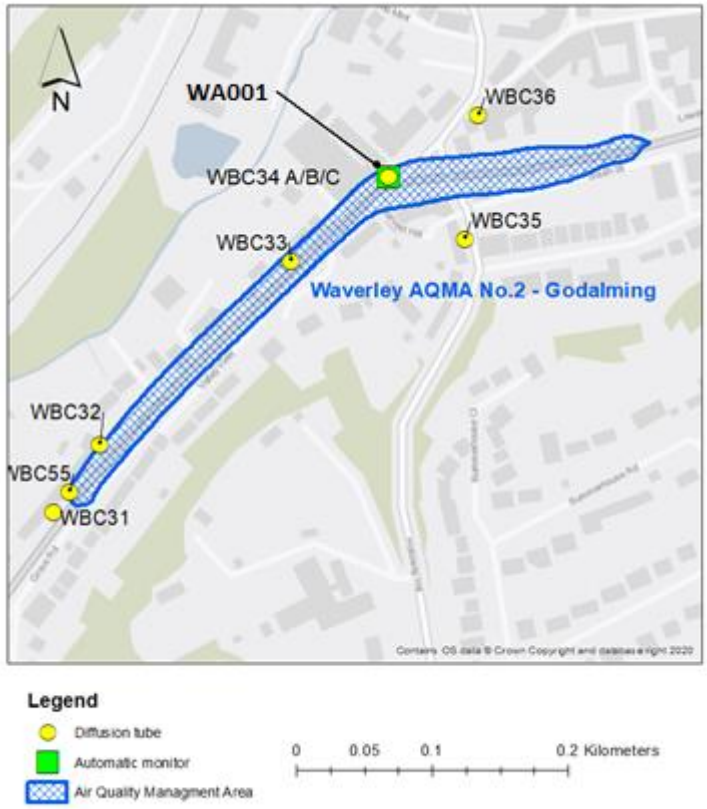


Figure D.4 – Map showing location of diffusion tubes in Farnham

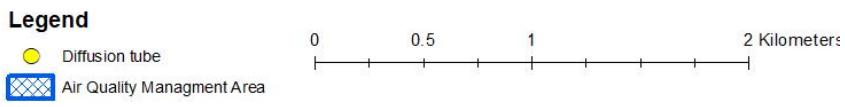


Figure D.5 – Map showing location of diffusion tubes in Godalming and Farncombe

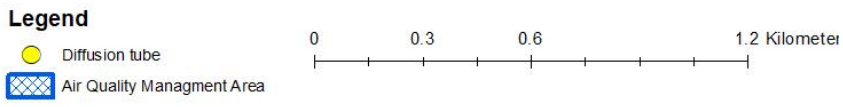


Figure D.6 – Map showing location of diffusion tubes in Haslemere

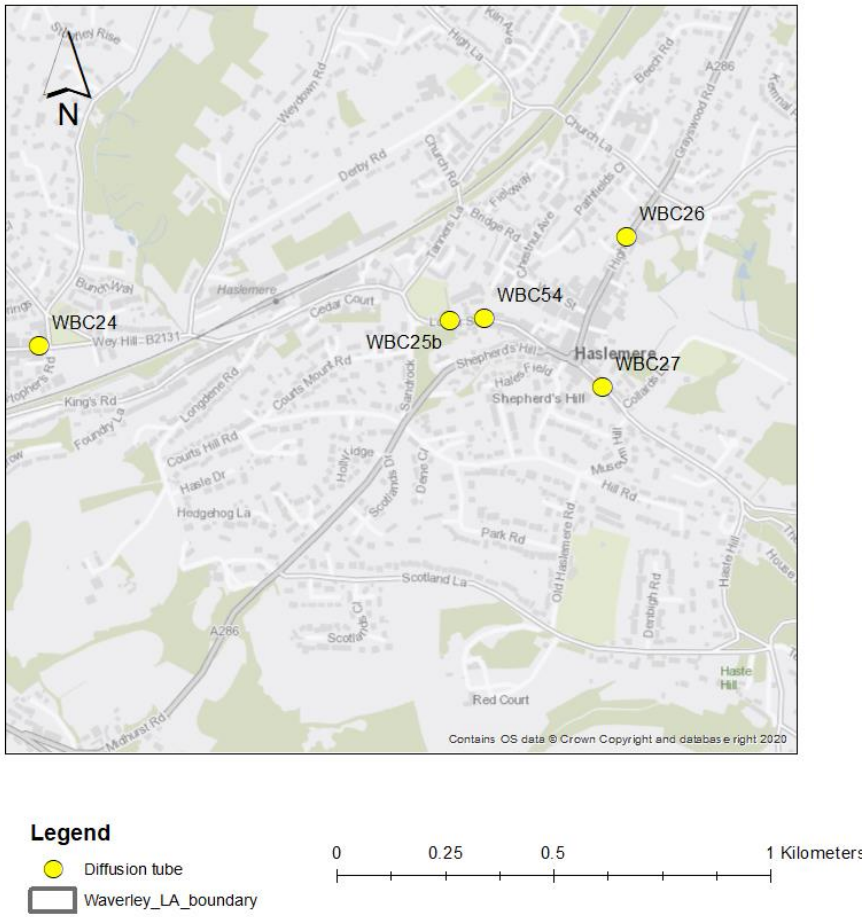
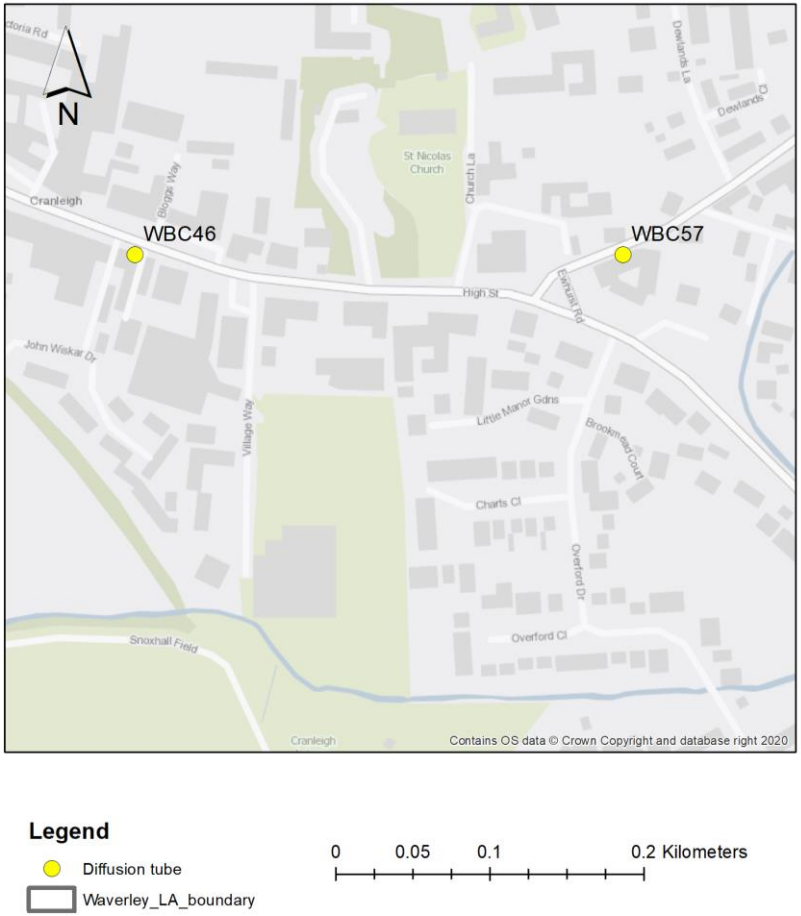


Figure D.7– Map showing location of diffusion tubes in Cranleigh



Appendix E: Summary of Air Quality Objectives in England

Table E.1 – Air Quality Objectives in England[16]

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

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

Glossary of Terms

Abbreviation	Description
AQAP	Air Quality Action Plan - A detailed description of measures, outcomes, achievement dates and implementation methods, showing how the local authority intends to achieve air quality limit values'
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
CAS	Clean Air Strategy
Defra	Department for Environment, Food and Rural Affairs
DMRB	Design Manual for Roads and Bridges – Air quality screening tool produced by National Highways
EU	European Union
FDMS	Filter Dynamics Measurement System
LAQM	Local Air Quality Management
NO_2	Nitrogen Dioxide
NO_x	Nitrogen Oxides
PM_{10}	Airborne particulate matter with an aerodynamic diameter of 10µm or less
$PM_{2.5}$	Airborne particulate matter with an aerodynamic diameter of 2.5µm or less
QA/QC	Quality Assurance and Quality Control
SO_2	Sulphur Dioxide

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