



2022 Air Quality Annual Status Report (ASR)

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

Date: June, 2022

Information	WBC Details
Local Authority Officer	Tara Stevenson
Department	Environmental Health
Address	Woking Borough Council, Civic Office, Gloucester Square, Woking, Surrey
Telephone	GU21 6YL
E-mail	01483 743436
Report Reference Number	tara.stevenson@woking.gov.uk
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Executive Summary: Air Quality in Our Area

Air Quality in Woking

Air pollution is associated with a number of adverse health impacts. It is recognised as a contributing factor in the onset of heart disease and cancer. Additionally, air pollution particularly affects the most vulnerable in society: children, the elderly, and those with existing heart and lung conditions. There is also often a strong correlation with equalities issues because areas with poor air quality are also often less affluent areas^{1,2}.

The mortality burden of air pollution within the UK is equivalent to 28,000 to 36,000 deaths at typical ages³, with a total estimated healthcare cost to the NHS and social care of £157 million in 2017⁴.

Woking Borough Council (WBC) has completed all past rounds of Review and Assessment. This Annual Status Report (ASR) considers all new monitoring data and assesses the data against the Air Quality Strategy Objectives (AQOs). It also considers any changes that may have an impact on air quality. Progress on measures to improve air quality are identified, as well as WBC's approach to reducing emissions and/or concentrations of fine particulates (PM_{2.5}), which has increased focus in the ASR as a result of emerging evidence of the health impacts.

All areas within WBC saw an increase in annual average concentrations levels of nitrogen dioxide (NO₂) during 2021 when compared to 2020 readings, but a decrease if compared to 2019 levels. The reported increases in annual average concentrations of NO₂ during 2021 when compared to 2020 levels can be attributed to the national lockdown that occurred in 2020 due to the COVID-19 pandemic. However, the concentrations are lower if

¹ Public Health England. Air Quality: A Briefing for Directors of Public Health, 2017

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

³ Defra. Air quality appraisal: damage cost guidance, July 2021

⁴ Public Health England. Estimation of costs to the NHS and social care due to the health impacts of air pollution: summary report, May 2018

compared to 2019 levels. This could be attributed to a range of measures adopted by WBC to improve air quality.

This year's monitoring data is considered to be more representative of relevant exposure, now that COVID-19 lockdown restrictions have been lifted. However, there is still an element of uncertainty around whether traffic flow is back to pre-pandemic levels with more companies opting for hybrid working and people continuing to work from home as the 'new normal'.

NO₂ monitoring has been able to continue throughout 2021 except for during the month of February, due to Covid-19 surge testing being carried out in Woking at the time. This has impacted the results gathered for January since the diffusion tubes were not changed within the monitoring duration times recommended by Defra. This data has therefore been excluded from any annual average NO₂ concentration calculations but is reported in Table B.1. Three new diffusion tubes have been added to WBC's Air Quality monitoring programme to closely monitor and assess the impact of the diversion route as a result of Town Centre works and road closures, which have been re-routed along Triggs Lane and Wych Hill.

All areas within WBC saw a decrease in annual average concentrations of NO₂ during 2021 when compared to 2019 readings. The largest reduction when compared to 2019 levels was recorded at AH6, on Anchor Hill, where the concentration decreased from 37.2 µg/m³ to 23.1 µg/m³.

This 2022 ASR determined that monitoring and analysis of concentrations at all locations included in the monitoring programme should continue, with specific consideration on Anchor Hill and Guildford Road.

Actions to Improve Air Quality

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

The 2019 Clean Air Strategy⁵ sets out the case for action, with goals to reduce exposure to harmful pollutants. The Road to Zero⁶ sets out the approach to reduce exhaust emissions from road transport through a number of mechanisms; this is extremely important given that the majority of Air Quality Management Areas (AQMAs) are designated due to elevated concentrations heavily influenced by transport emissions.

The Environment Act 2021⁷ establishes a legally binding duty on government to bring forward at least two new air quality targets in secondary legislation by 31 October 2022. This duty sits within the environmental targets framework outlined in the Environment Act (Part 1). The proposed air quality targets, relating to PM_{2.5}⁸, are:

- Annual Mean Concentration Target ('concentration target') - a maximum concentration of 10µg/m³ to be met across England by 2040
- Population Exposure Reduction Target ('exposure target') - a 35% reduction in population exposure by 2040 (compared to a base year of 2018).

WBC has declared two AQMAs at Anchor Hill and Guildford Road as a result of exceedance of the annual mean NO₂ AQO. Although monitoring results indicate that the NO₂ AQO are not exceeded at relevant locations in the AQMAs, these remain the main priority locations for improving air quality.

Surrey Air Alliance (SAA) is a multi-disciplinary group of officers within Surrey, who collaboratively look into Air Quality Issues, and deliver projects and initiatives locally to improve Air Quality. WBC continues to be an active member of this group and its delivery of the SAA work plan. The Council contributes to support with the engagement of the taxi community in promoting the Electric Vehicle (EV) project for taxi drivers.

In addition, it has been agreed that subject to resources, local authorities in Surrey hope to work together to repeat for 2024 the Air Quality modelling project by Cambridge Environmental Research Consultants (CERC), previously completed in 2019, which

⁵ Defra. Clean Air Strategy, 2019

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

⁷ <https://www.legislation.gov.uk/ukpga/2021/30/contents/enacted>

⁸ [https://uk-air.defra.gov.uk/library/air-quality-targets#:~:text=The%20Environment%20Act%202021%20establishes,Environment%20Act%20\(Part%201\).](https://uk-air.defra.gov.uk/library/air-quality-targets#:~:text=The%20Environment%20Act%202021%20establishes,Environment%20Act%20(Part%201).)

established a baseline of key pollutants (NO₂, PM₁₀, PM_{2.5}). The interactive contour maps of modelled pollutant concentrations have continued to be modelled on the Surrey County Council (SCC) website in 2021:

<https://surreycc.maps.arcgis.com/apps/webappviewer/index.html?id=43910ffb100248ed972115b7a9b49d20>

In 2020, the SAA applied for a DEFRA 2020/21 Air Quality Grant to fund a project to encourage a greater uptake of Electric Vehicles as Taxi's across 7 eligible Boroughs and Districts in Surrey. Taxis were selected as the target vehicles given the high mileage and multiple trips the vehicles make within Surreys Air Quality Management Areas and also the nature of the journeys which take the vehicles into areas frequented by the members of our communities who are most sensitive to air pollution such as to hospitals and care facilities and schools. In March 2021, the project was awarded £256.686 from the Defra AQ Grant Fund. Following attempts to find a supplier and to begin procurement in 2021 it became clear that the prolonged impact of the pandemic on the taxi trade made the project unviable as it had been originally configured, and no vehicle supplier could be found. The project was reconfigured to accommodate longer vehicle trials based on feedback from the taxi trade and potential vehicle suppliers. Defra have asked for a legal opinion on State Aid regarding the reconfigured project and for a formal summary of the changes, the documents are currently under legal review before being submitted to Defra for approval for the project to continue.

WBC, along with SCC and SAA are working to deliver and help facilitate a range of schools programmes and initiatives to raise awareness about Air Quality and change behaviours to reduce emissions to air.

A number of Living Walls have been installed in Woking over the past few years. In 2021, a new wall was erected on the Dukes Court development and the start of the Victoria Square wall commenced. These planting schemes have been strategically placed to lower pollutant concentrations by acting as a shield and mitigating the effects of traffic, industry and power producing by filtering Particulate Matter and absorbing gaseous pollutants.

Since 2016, when the Woking Integrated Transport Project was established, the Council have achieved much to improve the highway network and create a safer environment for cyclists and pedestrians within Woking town centre. A full list of these completed improvements can be found on our website and listed in more detail in Table 2.2:

<https://www.woking.gov.uk/major-developments/woking-integrated-transport-project/what-we-have-achieved>

Some further actions undertaken include the following:

- Works to Lockfield Drive at the junction with Victoria Way, involving the widening of the carriageway, adaption of the junction, resurfacing and creating a combined pedestrian and cycle path and installation of new soft landscaping on Chertsey Road.
- Forward Plan for Woking includes Victoria Arch capacity improvements, Woking Station redevelopments and bus corridor improvements.
- 13 new bus shelters are being installed by SCC as part of Woking's sustainable Transport Package, to improve accessibility and attractiveness of the bus network.
- WBC has rolled out the installation of new EV charging points across the Borough, including 70 new charging points in the newly refurbished Shoppers Car Park as part of the Victoria Place development, which opened in March 2022. In total, there are now 6 charging points in Victoria Way, 78 in the Shoppers Car Park and 3 in Brewery Road.
- The My Town Shop initiative was introduced in Woking in the summer of 2021, which saw delivery drivers make a switch to e-bikes for making their deliveries.
- The WBC Renewable Energy Plan was adopted on 17 June 2021

Conclusions and Priorities

The priorities for WBC following this ASR are as follows:

- Continue monitoring of NO₂ at locations of relevant exposure to confirm if concentrations remain below the annual mean AQO; and in the Anchor Hill and Guildford Road AQMAs until a clear long-term reduction in concentration can be demonstrated.
- With the cost of fuel, road taxes and the general cost of living rising rapidly, consideration should be given to switching to low and ultra low emission vehicles, especially EVs which have lower overall costs for refuelling and road tax.
- Air Quality has improved and will continue to improve owing to National Policy decisions. WBC will continue to implement the actions from the National Clean Air Strategy 2019 and the Road to Zero Strategy on reducing exhaust emissions from transport.

- More recently WBC have been involved in discussions and consultations surrounding The Environment Act 2021, which will establish a legally binding duty to set a target on fine PM (PM_{2.5}), in addition to a long-term target on Air Quality by the acts 31 October 2022 deadline. The overarching responsibility for this Act will sit with National government, but Local Authorities will also have an important role to play.
- Feedback into the National Air Quality Strategy for England, Wales, NI and Scotland (revised strategy will be published in 2023).

Local Engagement and How to get Involved

WBC residents can play their part by taking simple measures to reduce emissions and improve Air Quality in your area. For instance; taking shorter trips, choosing to walk or cycle over driving and by using public transport, or car sharing.

Other measures that can be taken:

- 1) Purchasing a low emissions vehicle, with the help of grant aid:
<https://www.gov.uk/plug-in-car-van-grants>
- 2) Following guidance on the use of domestic burning: https://uk-air.defra.gov.uk/assets/documents/reports/cat09/1901291307_Ready_to_Burn_Web.pdf
- 3) Reporting bonfires: <https://woking.gov.uk/environmental-services/pollution/smoke-and-bonfires>
- 4) Signing up to Planet Woking to keep up to date with all the latest news:
<https://planetwoking.co.uk/>
- 5) Take part in local projects and initiatives, including getting involved in Clean Air Day campaigns.
- 6) Comment on planning applications and voicing any air quality impact concerns you may have.
- 7) Play your part to tackle climate change by using renewable energy, through switching to solar panels/ wind turbines etc. and upgrading boilers to the newest and more efficient gas condensing boilers with the lowest NO_x & Carbon Emissions.

The following sources of information are available on WBC's website for improving air quality in the borough and seeking further information:

- List of AQMAs in the borough: <https://www.woking.gov.uk/airquality>
- The Air Quality Action Plan for the Anchor Hill AQMA:
<https://www.woking.gov.uk/sites/default/files/documents/environmentalservices/Woking%20Borough%20Council%20AQAP%20Anchor%20Hill.pdf>
- The Air Quality Action Plan for the Guildford Road AQMA:
[https://www.woking.gov.uk/sites/default/files/documents/environmentalservices/WBC Guildford%20Rd AQAP%20final%20report.pdf](https://www.woking.gov.uk/sites/default/files/documents/environmentalservices/WBC%20Guildford%20Rd%20AQAP%20final%20report.pdf)

airAlert is a service warning local residents who have respiratory problems when the air pollution in Woking is going to be high. This is a subscription service which is free to Woking residents and enables individuals who suffer from asthma, COPD, emphysema or other respiratory illnesses, can sign up to in order to receive either an email, text message or voicemail giving an advanced warning of high pollution levels:

<http://airalert.info/Surrey/Default.aspx>



Other additional information

- Healthy Surrey provides some useful links and tips on steps you can take to improve air quality for you and your family. See here:
<https://www.healthysurrey.org.uk/community-health/air-quality>
- SCC's Low Emissions Transport Strategy, which sets out Surrey's ambition to work with partners to reduce polluting emissions from transport in the County for the benefit of everyone who lives or works in Surrey. See here:
<https://www.surreycc.gov.uk/roads-and-transport/policies-plans-consultations/transport-plan/surrey-transport-plan-strategies/low-emissions-transport-strategy>
- SCC's EV Strategy, which outlines a pathway that enables the council to help support individuals who wish to make the switch from conventional vehicles to EVs, encourages EV uptake amongst residents and provides a source of information to help coordinate an integrated approach across Surrey and the foundations to ensure that we are able to apply for funding to support a publicly accessible charging network:
https://www.surreycc.gov.uk/_data/assets/pdf_file/0008/189107/Electric-Vehicle-Strategy_p1.pdf

Local Responsibilities and Commitment

This ASR was prepared by the Environmental Health Department of Woking Borough Council.

This ASR has been approved by:

Environmental Health Manager, Emma Bourne, emma.bourne@woking.gov.uk

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

If you have any comments on this ASR please send them to Tara Stevenson at:

Address: Woking Borough Council, Civic Office, Gloucester Square, Woking, Surrey GU21 6YL

Telephone: 01483 743436

Email: tara.stevenson@woking.gov.uk

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1 Local Air Quality Management

This report provides an overview of air quality in Woking Borough Council (WBC) during 2021. It fulfils the requirements of Local Air Quality Management (LAQM) as set out in Part IV of the Environment Act (1995) and the relevant Policy and Technical Guidance documents.

The LAQM process places an obligation on all local authorities to regularly review and assess air quality in their areas, and to determine whether or not the air quality objectives are likely to be achieved. Where an exceedance is considered likely the local authority must declare an Air Quality Management Area (AQMA) and prepare an Air Quality Action Plan (AQAP) setting out the measures it intends to put in place in pursuit of the objectives. This Annual Status Report (ASR) is an annual requirement showing the strategies employed by WBC to improve air quality and any progress that has been made.

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

2 Actions to Improve Air Quality

Air Quality Management Areas

Air Quality Management Areas (AQMAs) are declared when there is an exceedance or likely exceedance of an air quality objective. After declaration, the authority should prepare an AQAP within 12 months setting out measures it intends to put in place in pursuit of compliance with the objectives.

A summary of AQMAs declared by WBC can be found in Table 2.1. The table presents a description of the two AQMAs that are currently designated within WBC. '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 is the NO₂ annual mean.

WBC has declared two AQMAs. These are the Anchor Hill AQMA and the Guildford Road AQMA (a section of Guildford Road and South of the Constitution Hill Junction). Both have been declared as a result of exceedances of the annual mean NO₂ AQO. WBC are continuing to monitor air quality within both the Anchor Hill AQMA and the Guildford Road AQMA and do not propose to revoke either AQMAs until permanent improvements in air quality are reported. Further details of these AQMAs are available at https://uk-air.defra.gov.uk/aqma/local-authorities?la_id=317

2.1.1 Anchor Hill AQMA

A detailed assessment was undertaken to establish if there was any likelihood of any national objective level being breached⁹. A review of all monitoring data at the location representative of the Anchor Hill AQMA was undertaken. This demonstrated that there was a breach of the annual NO₂ objective in 2019 at two locations on Anchor Hill and one borderline objective exceedance of 40µg m⁻³. It also highlighted that the results from 2020 were not truly representative, as COVID-19 will have had an impact on the improved concentrations during this year.

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NO₂ monitoring has been able to continue throughout 2021 (except for the month of February 2021 due to the Council's involvement in Covid-19 surge testing at this time), despite being in a National Lockdown, Officers were able to continue administering the NO₂ monitoring programme, whilst complying with Government guidance, of lone working and working in the outdoors.

The Detailed Assessment of air quality on Anchor Hill published in 2012 identified predicted exceedances of the annual mean NO₂ AQO at the façade of properties at the top of Anchor Hill. Contour plots showed that concentrations at the three main housing blocks at the top of Anchor Hill exceeded the AQO or were within 10% of the AQO. Due to the historical trend of high pollution levels at this location and the modelled exceedances it was recommended that WBC declared an Air Quality Management Area (AQMA) as a result of exceedances of the annual mean NO₂ AQO at Anchor Hill.

Based on the results of the Anchor Hill Further Assessment in January 2015¹⁰ it was recommended that the AQMA should remain in place as both monitoring and modelling results show that although in some places the AQO was being achieved, concentrations in other places were above the AQO.

An AQAP was produced for the Anchor Hill AQMA in July 2015¹¹. The plan determined that the upgrade of traffic signals at the Anchor Hill junction is likely to improve traffic flow and reduce NO₂ concentrations so that the annual mean AQO is no longer exceeded in the AQMA. The progress towards compliance is currently being tracked using monitoring data collected by WBC and being reported in the ASRs. It is recommended that the AQMA will be revoked when monitoring results from three consecutive years show no exceedances of the AQO, so that a permanent improvement in air quality can be demonstrated.

NO₂ levels complied with the AQO at every Anchor Hill monitoring site in 2017, 2018, 2019, 2020 and 2021 as shown in this report. However, in 2018 and 2019 the highest

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<https://www.woking.gov.uk/sites/default/files/documents/environmentalservices/furtherassessmentforanchorhill/aqma.pdf>

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<https://www.woking.gov.uk/sites/default/files/documents/environmentalservices/Woking%20Borough%20Council%20AQAP%20Anchor%20Hill.pdf>

concentrations within the AQMA were 39 µg/m³ and 38 µg/m³ which is just below the annual mean AQO. Another factor important to note is that COVID-19 will have had an impact on the reduction of the annual average NO₂ concentrations at all monitoring sites during 2019 and 2020. Following guidance provided by Defra¹² consideration of the revocation of AQMAs in WBC will not be based upon compliance being achieved in 2020. It is therefore recommended that the AQMA is maintained until a clear long-term reduction in concentration can be demonstrated.

A review of monitoring data from the 2021 Annual Status Report for Woking highlighted that concentrations of NO₂ within the designated area of the Anchor Hill AQMA had dropped in recent years, evidencing improvement in 2017 and compliance in 2018, 2020 and 2021. This is likely as a result of the Junction upgrade to Microprocessor Optimised Vehicle Activation (MOVA) in 2015/16.

No major development is proposed in the area and therefore it is not expected that transport numbers will change significantly in future years. National data suggests that vehicle numbers will increase incrementally over future years however due to improvements in emission standards for vehicles entering the market these improvements are expected to compensate for increased traffic numbers. It is not expected that any significant increases in air pollutant are likely in future. However, the Air Quality Action Plan for the Anchor Hill AQMA concludes that the AQMA designation can only be revoked after demonstrating no breach of the annual NO₂ objective for three consecutive years. It is therefore recommended that the AQMA remains until concentrations are comfortably below the AQO for a third year running, and the Local Authority would propose that the AQMA be revoked at the end of 2022, on the proviso objectives are not exceeded.

2.1.2 Guildford Road AQMA

Exceedances of the annual mean AQO for NO₂ were recorded between 2012 and 2015 at diffusion tubes located on Guildford Road. Additional monitoring in the area around Guildford Road commenced in 2014 and recorded exceedances of the AQO at five locations in 2015. A Detailed Assessment was carried out in November 2016 for the

¹² <https://laqm.defra.gov.uk/documents/LAQM-TG16-April-21-v1.pdf>

junction between Guildford Road, Constitution Hill and Mount Hermon Road¹³. This assessment indicated that concentrations at some receptor locations with relevant exposure were exceeding the AQO because of road traffic emissions around Guildford Road. It was recommended that an AQMA should be declared on Guildford Road. Further monitoring was recommended around the junctions where Guildford Road meets York Road and Station Approach to confirm if the NO₂ annual mean AQO is exceeded where there is relevant exposure. Consequently, the Guildford Road AQMA was declared in May 2017.

The Local Highways team has advised that the particularly high NO₂ concentrations monitored in the Guildford Road area in 2015 were likely to be due to roadworks in the Town Centre causing diversions in the area, which resulted in increased traffic along Guildford Road. WBC have confirmed that there is likely to be increased development occurring in the Town Centre over the next few years and therefore concentrations around Guildford Road are likely to vary but remain high during times of traffic diversion. Three new diffusion tubes have been added to the Council's Air Quality monitoring programme to closely monitor and assess the impact of these diversion routes as a result of Town Centre works and road closures, which have been re-routed along Triggs Lane and Wych Hill.

Annual mean NO₂ concentrations in Guildford Road AQMA were exceeding the AQO in 2016, 2017, 2018 and 2019. However, when concentrations were calculated at the nearest locations of relevant exposure, all concentrations were below the annual mean AQO. Concentrations at all diffusion tubes in Guildford Road AQMA decreased in 2020 and were compliant with the annual mean AQO, however as there were still exceedances of the annual mean AQO (before distance correction) and COVID-19 will have had an impact on the improved concentrations during 2020, it is recommended that the AQMA remains until concentrations are comfortably below the AQO.

An increase in traffic into the Town Centre via the Guildford Road route is anticipated over the next few years due to a diversion route being implemented for the Victoria Arch

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<https://www.woking.gov.uk/sites/default/files/documents/environmentalservices/detailedassessmentforguildfordroad.pdf>

Widening scheme. It is therefore recommended that the AQMA designation be kept in place, so that the impact of the diversion can be closely monitored and assessed.

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 National Highways?	Level of Exceedance: Declaration	Level of Exceedance: Current Year	Name and Date of AQAP Publication	Web Link to AQAP
AQMA for Anchor Hill	01/02/2014	NO ₂ Annual Mean	A small area covering a 4-way junction at the top of a steep hill.	NO	41.5	28.4	Anchor Hill Air Quality Action Plan 2015	https://www.woking.gov.uk/sites/default/files/documents/environmentalservices/Woking%20Borough%20Council%20AQAP%20Anchor%20Hill.pdf
Guildford Road AQMA	15/05/2017	NO ₂ Annual Mean	AQMA incorporates a small section of Guildford Road to the south of Constitution Hill junction and to the north of the Junction with Ashdown Close.	NO	42.2 (modelled)	34.1	Guildford Road AQMA Air Quality Action Plan 2017	https://www.woking.gov.uk/sites/default/files/documents/environmentalservices/WBC_Guildford%20Rd_AQAP%20final%20report.pdf

WBC confirm the information on UK-Air regarding their AQMA(s) is up to date

WBC confirm that all current AQAPs have been submitted to Defra

Progress and Impact of Measures to address Air Quality in WBC

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

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

- Robust and accurate QA/QC procedures were applied. The method for calculating the bias adjustment factor was reported and detail on the version of national bias adjustment factor spreadsheet was included, but the Council should include a screen capture depicting the appropriate factor should be included.
- The Council has included discussion and review of its AQMAs and monitoring strategy, informed due to the extensive monitoring network. The identification of which measures have been achieved and which are expected to be achieved in the coming year is welcomed. The Council acknowledge the influence of COVID-19 on air quality in the area.
- Comments from last year's ASR have not been mentioned so it is not clear which of these comments the Council have addressed. The Council is encouraged to include comments and their response in all future reports.
- The report does not draw links to the Public Health Outcomes Frameworks or fraction of mortality attributable to PM2.5 emissions. The Council are encouraged to provide a comparison between Woking Borough and England as a whole and a comparison between Woking Borough and neighbouring authorities.
- Some sections of the tables would benefit from more information, such as including details on the progress of measures and funding in Table 2.2, and information about which AQMA the tubes are in in Table A.1.
- COVID-19 impacts have been discussed in Appendix F and we welcome the detailed information provided by the Council surrounding impacts of the pandemic on air quality.
- The Council have provided clear maps of the diffusion tube monitoring network and AQMAs; trends are clearly presented and a comparison with air quality objectives is provided.

Overall, the report is detailed, concise and mostly satisfies the criteria of the relevant reporting standard. The Council should continue their good work

The council has thoroughly read, and taken on board, the feedback from Defra in the 2021 ASR. WBC has addressed all areas of improvements and captured the additional information required by Defra in this report.

WBC has taken forward a number of direct measures during the current reporting year of 2021 in pursuit of improving local air quality. Measures are included within Table 2.2, with the type of measure and the progress WBC have made during the reporting year of 2021 presented. Where there have been, or continue to be, barriers restricting the implementation of the measure, these are also presented within Table 2.2.

More detail on these measures can be found within WBCs Action Plans: Anchor Hill AQAP¹⁴ and Guildford Road AQAP¹⁵, as well as in the Surrey Transport Plan: Air Quality Strategy¹⁶.

In 2019 the SAA commissioned a detailed dispersion modelling and sources apportionment¹⁷ study by CERC. The model was commissioned to identify sources of key pollutants and help develop targeted measures to reduce pollution from the relevant sources.

Key completed measures are:

- Installation of a Microprocessor Optimised Vehicle Actuation (MOVA) system in August 2016 at the junction between Anchor Hill and High Street. This measure is expected to have had an impact on NO₂ levels from road traffic in the Anchor Hill AQMA.
- Infrastructure to support the use of hybrid/electric vehicles.
- Surrey-wide public awareness campaign of air quality from Domestic Wood Burning.

¹⁴<https://www.woking.gov.uk/sites/default/files/documents/environmentalservices/Woking%20Borough%20Council%20AQAP%20Anchor%20Hill.pdf>

¹⁵https://www.woking.gov.uk/sites/default/files/documents/environmentalservices/WBC_Guildford%20Rd_AQAP%20final%20report.pdf

¹⁶ Surrey County Council. Surrey Transport Plan Air Quality Strategy, January 2016.

¹⁷ CERC, 2019. Detailed air quality modelling and source apportionment Woking Borough Council. Final report. Prepared for Surrey Local Authorities. [Online]. Available at: https://www.guildford.gov.uk/media/32331/Detailed-air-quality-report/pdf/FM1183_Surrey_CERC_Guildford_19Nov19.pdf?m=637296299125670000

WBC expects the following measures to be completed over the course of the next reporting year:

- Progression of a number of Air Quality projects and initiatives being delivered in schools with the use of the Transformation Grant awarded. This will include signing more schools up to the Green Flag Award, Modeshift STARS programme and progressing with Travel Plans and anti-idling campaigns.
- Project to encourage a greater uptake of Electric Vehicles amongst Taxi Drivers.
- Further development of the Borough's infrastructure, to support the use of hybrid / electric vehicles, including installation of EV on-street charging points in late 2021 as part of the On-Street Electric Vehicle Charging Point (EVCP) pilot project.
- Continuing with promotion of the Clean Air Day campaign in June.
- Surrey wide campaign to advise solid fuel suppliers on new rules for the supply of domestic solid fuels

WBC's priorities for the coming year, subject to available funds, include a prioritised programme of infrastructure improvements for future investment in the Local Walking and Cycling Infrastructure Plan (LWCIP) for Woking and continued work to help deliver Surrey's Electric Vehicle strategy and an On-Street Electric Vehicle Charging Point (EVCP) project. Both programmes are delivered in partnership with Surrey County Council.

WBC has joined the recently convened EV Strategy Forum being led by SCC. The aim of this forum is to work together to deliver a consistent strategy across the county to provide the necessary EV infrastructure for Surrey residents to help meet common climate targets and facilitate a shift to zero emission transport in line with the Government's Road to Zero Strategy which bans the sale of petrol and diesel vehicles from 2030.

Guidance for developers on EV infrastructure can be found within WBC's Climate Change Supplementary Planning Document on page 66 of the linked guidance:

<https://www.woking2027.info/supplementary/climatechangespd/climatechangespd.pdf>

The principal challenges and barriers to implementation that WBC anticipates facing are Staff resource; funding for infrastructure improvements, Funding identified as part of the Woking Integrated Transport Project and electrical grid capacity could be a barrier for any new developments incorporating EV charging infrastructure.

WBC anticipates that the measures stated above and in Table 2.2 will achieve compliance in Anchor Hill AQMA and Guildford Road AQMA.

Whilst the measures stated above and in Table 2.2 will help to contribute towards compliance, WBC anticipates that further additional measures not yet prescribed will be required in subsequent years to achieve compliance and enable the revocation of Anchor Hill AQMA and Guildford Road AQMA.

Table 2.2 – Progress on Measures to Improve Air Quality

Measure No.	Measure	Category	Classification	Year Measure Introduced	Estimated / Actual Completion Year	Organisations Involved	Funding Source	Defra AQ Grant Funding	Funding Status	Estimated Cost of Measure	Measure Status	Reduction in Pollutant / Emission from Measure	Key Performance Indicator	Progress to Date	Comments / Barriers to Implementation
1	Urban Traffic Management and Control (UTMC)	Traffic Management	UTC, Congestion Management, Traffic Reduction	2015	Completed	SCC/ WBC	SCC		received and spent	£35,000	implemented	Y	Restrain or reduce traffic volumes in AQMA	MOVA installed and in operation since August 2016 at the busy junction in the Anchor Hill AQMA.	
2	New and/or improved cycle lane and track.	Transport Planning & Infrastructure	Cycle Network	2008 - 2011	Trial Completed	SCC/ WBC	None	NO	seeking opportunities	n/a	implemented	Y	Restrain or reduce traffic volumes in AQMA	In collaboration with Department for Transport and Woking Borough Council, Surrey County Council completed the Woking town Local Walking and Cycling Infrastructure Plan (LWCIP) in March 2020. If government funding becomes available, the LWCIP will help to identify which measures could be funded to enhance local cycling and walking provision in this area.	Staff resource; funding for infrastructure improvements
3	Upgraded Cycle Track at Goldsworth Park Recreation Ground	Promoting Travel Alternatives	Cycle Network	2021	On-going	WBC	British Cycling/ WBC	NO	received and spent	£120,000	Commenced	Y	Reduce Traffic Volumes, more people taking up cycling	Consultation and design phase complete. Installation of a new hybrid facility underway, with the track due to open on Saturday 24th April 2022. The track has been redesigned to accommodate more abilities and styles of cyclists, to encourage more residents to take up cycling and consequently encourage more active travel amongst Borough residents.	
4	Cycle parking	Transport Planning & Infrastructure	Cycle Network	2008 - 2011	On-going	SCC/ WBC	Development contributions	NO	received and spent	n/a	implemented	Y	Restrain or reduce traffic volumes in AQMA	Various improvements have been made under Cycle Woking 2008 – 2011. In 2015 the Cycle Hub was installed at Woking station providing storage for over 200 cycles and encouraging cycle / rail integration. A new cycle storage compound was implemented at Brookwood station in 2016. These storage facilities have been funded by Department for Transport. Funding was secured by South West Trains together with WBC S106 funding contributions. Approximately 20 cycle stands are to be reinstated around the Town Centre. Additional cycle stands were added to the Town Centre as part of the Victoria Place	None identified

Measure No.	Measure	Category	Classification	Year Measure Introduced	Estimated / Actual Completion Year	Organisations Involved	Funding Source	Defra AQ Grant Funding	Funding Status	Estimated Cost of Measure	Measure Status	Reduction in Pollutant / Emission from Measure	Key Performance Indicator	Progress to Date	Comments / Barriers to Implementation
														development, including cycle stores for The Marches, residential towers.	
5	Cycle infrastructure and storage improvement Chertsey Rd & Chobham Rd	Transport Planning & Infrastructure	Cycle Network	N/a	Completed	WBC/ SCC	Enterprise M3/ SCC	NO	Received and spent	Included in wider costs of the Wokingltip (funded by developer contributions & £11m grant from Enterprise M3 Local Enterprise Partnership	Implemented	Y	Restrain or reduce traffic volumes in AQMA	Work started in 2020 on the resurfacing and creation of combined pedestrian/cycle path and creation of soft landscaping on Chertsey Road. Completion of the pedestrian and cycle footbridge on Chobham Road took place in the early part of 2020, which has created improved connectivity, with a view to encouraging more people to use the footpath for commuting into Woking.	Funding identified as part of the Woking Integrated Transport Project
6	Cycle infrastructure and storage improvement and Highways Improvements-Duke's Court	Transport Planning & Infrastructure	Cycle Network	2021	On-going	WBC		NO	Received and spent	included in the wider project cost of Dukes Plaza				In 2021, WBC continued to deliver on its ambitions of the Woking Integrated Transport Strategy, to improve the Highways network and create a safer environment for cyclists and pedestrians in Woking Town Centre, with the creation of the new public plaza outside Duke's Court, with a green wall and restaurant, complete with a green roof. This scheme was successful in improving signage and pedestrian routes to enhance the visitor experience and provide junction improvements to Maybury Road, Stanley Road and The Broadway Junctions.	
7	Cycle infrastructure and Highways Improvements-Victoria Arch Scheme	Transport Planning & Infrastructure	Traffic reduction	2021	On-going	WBC/ SCC / Network Rail/ Homes England	WBC/ SCC / Network Rail/ Homes England	NO	Committed	Homes England (£95 mil), Network Rail (£10 mil), WBC (£10 mil)		Y	Reduce Traffic Volumes and congestion, improve cycle routes and transport connectivity	Demolition has already begun on the existing buildings located in 'The Triangle' (the pocket of land surrounded by the one way road gyratory system located on the South side of Victoria Arch). This four year project will see the widening of the highway along Guildford Road and Victoria Road, enhance traffic management systems and improve pedestrian and cycle routes to Woking Train Station, the Town Centre and improve join up with other existing off-road routes.	

Measure No.	Measure	Category	Classification	Year Measure Introduced	Estimated / Actual Completion Year	Organisations Involved	Funding Source	Defra AQ Grant Funding	Funding Status	Estimated Cost of Measure	Measure Status	Reduction in Pollutant / Emission from Measure	Key Performance Indicator	Progress to Date	Comments / Barriers to Implementation
8	Infrastructure to support the use of hybrid/electric vehicles	Traffic Management	Other	2021	Completed	SCC / WBC	Enterprise M3 Local Transport Strategy/ SCC	NO	Received and spent	£470,911 split between 3 Surrey Boroughs	Implemented	Y	Reduce tailpipe emissions in AQMA	The Council currently has 87 EV charging points across Town Centre car parks, 70 of which are brand new and have been installed under the car park upgrade for the Victoria Place development. These electric vehicle charging points are in specifically marked bays and the majority offer immediate access to charging on a plug and go basis. WBC has implemented various policies and strategies supportive of this measure in the area. A highlight would be the financial incentive for using a low emission vehicle in the area by applying a 50% discount on car park season tickets for those driving vehicles in band A (any vehicle whose CO ₂ emissions are less than 100 g/km). Successful funding bid to support installation of 80 on street EV charging bays across Guildford, Spelthorne, Woking and Waverley. Woking now has 20 on-street charging points in situ on Church Street East, Oriental Road, Maybury Road, Montgomery Road and Lavender Park Road. This trial is now at the data collection stage in which usage patterns are being analysed to inform policy and design guidelines for a County wide roll out.	Potential barriers identified within the statement
9	EV Charging Points	Traffic Management	Other	2021	2022	WBC/ SCC/ Office for Zero Emission vehicles	Office for Zero Emission vehicles	NO	Received and spent	n/a	Implemented	Y	Reduce tailpipe emissions in AQMA	Progressed work to expand electric vehicle charging infrastructure and funding was successfully secured from Office for Zero Emission vehicles for installation of EV points in new Red Shoppers Car Park.	
10	Encourage EV uptake via the Taxi Licensing Community	Promoting Low Emission Transport	Taxi Licensing conditions	2020	On-going	WBC/ SCC/ Surrey Air Alliance	Defra Air Quality Grant Scheme 2020/21 & LOCASE	YES	Received and pending spend	£256K	Ongoing		Number of EVs added to the taxi fleet following projects and EV trials	The programme goal is to encourage the uptake of EVs amongst Surrey taxi drivers and operators by addressing concerns such as running costs and range anxiety through use of telematic devices and allowing taxi	Awaiting sign off on new project proposals, as initial project scope not viable following

Measure No.	Measure	Category	Classification	Year Measure Introduced	Estimated / Actual Completion Year	Organisations Involved	Funding Source	Defra AQ Grant Funding	Funding Status	Estimated Cost of Measure	Measure Status	Reduction in Pollutant / Emission from Measure	Key Performance Indicator	Progress to Date	Comments / Barriers to Implementation
														drivers to trial an EV taxi for a short period in order to create a 'try before you buy' scenario. The aim of the project is to reduce local air pollution in Surrey by encouraging behavioural change and mode shift from traditionally fuelled taxis and PHVs to the use of electric taxis.	impact from Covid-19.
11	EV Website Pages	Promoting Travel Alternatives	Other	2021-22	On-going	WBC	n/a	n/a	n/a	n/a	Implemented	Y	Improved awareness	A designated webpage has been created on the Woking Borough Council website, which was updated in 2021 to promote the locations of the charging points and provide information to EV users. This page has been added to the Council's website to reflect the growing importance of EV charging infrastructure.	
12	Car Clubs	Alternatives to private vehicle use	Car Clubs	N/a	Ongoing	SCC / WBC	Local authority	n/a	Complete		Ongoing	Y	Restrain or reduce traffic volumes in AQMA	WBC has a car club arrangement with Enterprise Rent A Car Ltd for staff business use, namely the Car Club scheme. The scheme comprises two low emission vehicles available for hires for up to four hours. Enterprise also operates Surrey County Council's car club scheme that is also available for the public. In Woking, there are four cars available in Guildford Road (one car), Goldsworth Road (one car) and at Quadrant Court (two cars).	None identified
13	Electrification of the Council's vehicle Fleet	Alternatives to private vehicle use	Car Clubs	N/a	Ongoing	WBC	N/a	NO	N/a		Implemented	Y	Reduce emissions from vehicles and contribute to the reduction in NO _x concentrations	WBC is committed to reducing business associated mileage and has this year, 2021, added an electric pool car to its fleet, as well as changing its fleet to entirely EV.	

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14	Workplace travel planning	Promoting Travel Alternatives	Personalised Travel Planning	N/a	Ongoing	SCC/ WBC	Local authority N/a	NO	Complete	n/a	On-going initiative	Y	Restrain or reduce traffic volumes in AQMA	The Council has its own Staff Transport Plan including various initiatives to encourage alternative modes of transport to the car. Criteria has been applied to lease cars in order to lower emissions and air pollution associated with this fleet. In October 2018, it was agreed that diesel vehicles will no longer qualify as part of the Council's lease car scheme recognising research and Government policy that finds that diesel cars are more polluting in terms of NO _x and PM. The CO ₂ threshold for lease cars was increased slightly to 135g/km to enable a wider choice of petrol vehicle within the lease car fleet. Environmental standards also apply to cash alternative vehicles. Details are available via WBC's Intranet system for staff. For staff that need to undertake business mileage but do not own a car that fits the Council's environmental criteria, cars can be hired through the car club operated by Enterprise Rent A Car Ltd.	None identified
15	Differential parking charges	Traffic Management	Emission based parking or permit charges	N/a	Ongoing	SCC/ WBC	N/a	No	n/a	Estimated loss of season ticket income approx. £49.2k	On-going	Y	Reduce tailpipe emissions in AQMA	Differential parking charges are applied in WBC. The cost of a season ticket is based on a vehicle's CO ₂ emission rating (determined by the Vehicle Certification Agency). A 50% discount is applied for vehicles that produce the lowest emissions (CO ₂ band A) and a 25% discount for band B vehicles. Those with a band G rating (the highest band) pay a 25% surcharge.	None identified

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16	Encourage boroughs and districts to consider adopting minimum emissions standards or vehicle age restrictions into taxi licensing procedures.	Promoting Low Emission Transport	Taxi Licensing conditions	2014	Ongoing	SCC / WBC	n/a	n/a	n/a	n/a	On-going	Y	Reduce tailpipe emissions in AQMA	<p>With effect from the 4th of January 2014, WBC required all Private Hire Vehicles and non-wheelchair compliant Hackney Carriages to meet the Euro Emissions V Criteria.</p> <p>A new policy has since been introduced which requires all hackney carriage and private hire vehicles to meet ultra low emissions vehicle (ULEV) specifications from 31 March 2021 for licensed saloon vehicles and later for wheelchair accessible vehicles, from 31 March 2026.</p> <p>Currently, a ULEV vehicle is classed as a vehicle which has less than 75 grams of CO2 per kilometre (g/km) from its exhaust pipe.</p> <p>SAA have submitted a bid on 14 Oct 2020 around the promotion of EV Taxis. The bid has been successful and will be match funded using SCC transformation grant and officer time.</p>	None identified
17	AQ initiatives / awareness raising through SAA. Continuing to build on the schools programme to promote behaviour change for improved air quality and more active travel.	Awareness raising / comms	increased awareness of the health impact of poor air quality	2020	Ongoing	SCC/ WBC	SCC	NO	Committed	£20 - 30k	On-going	Y	More students using means of active travel to get to school	<p>Woking Borough Council, along with Surrey County Council and Surrey Air Alliance, are working to deliver and help facilitate a range of schools programmes and initiatives to raise awareness about Air Quality and change behaviours to reduce emissions to air. Since September 2021, Surrey County Council have employed a designated Eco Schools Officer, with the aim of encouraging and promoting the Eco schools agenda in Surrey and increasing the number of Green Flag schools within the County. A range of initiatives were offered to all schools in Surrey as part of this work; including, Modeshift STARS Travel Plans, Bikeability cycle training, Golden Boot/ Green boot Challenge and making Global Action Plan resources</p>	

Measure No.	Measure	Category	Classification	Year Measure Introduced	Estimated / Actual Completion Year	Organisations Involved	Funding Source	Defra AQ Grant Funding	Funding Status	Estimated Cost of Measure	Measure Status	Reduction in Pollutant / Emission from Measure	Key Performance Indicator	Progress to Date	Comments / Barriers to Implementation
														and Anti-Idling Equipment available to loan to schools. In addition, from September 2021, a return to schools/ anti idling campaign was run and packs were delivered shortly after.	
18	Anti-idling campaign in schools	Traffic Management	Traffic reduction	2020	On-going (2021-2022)	SCC/ WBC	SCC Transformation Grant	NO	Not yet committed	£20 - £30k	On-going	Y	Reduction in idling vehicles outside schools and a reduction in complaints on the issue	Some of the Transformation Grant awarded to SCC may also be used to progress anti-idling campaigns with schools, talking areas outside of school grounds with the most traffic.	
19	Improved awareness of AQ from Domestic Wood Burning.	Domestic Wood Burning	Other	2020	2020	SCC/ WBC	internal / officer time / resource contribution	considering applying for Defra funding	Under consideration	TBC	Work in progress		better awareness of the harmful effects of wood burning and better awareness amongst suppliers of the new regulations and what that means for selling/ supplying fuels	Surrey-wide public awareness campaign for the Clean Air Day in Oct/Nov 2020, including a short animation video about domestic burning of solid fuels and wood. Over the last year, Woking Borough Council, in partnership with the Surrey Air Alliance, have worked alongside Surrey County Council's Trading Standards to deliver a surrey wide campaign to advise and monitor solid fuel suppliers about the new rules and regulations for the safe supply of domestic solid fuels outlined in The Air Quality (Domestic Solid Fuels Standards) (England) Regulations 2020. It is the intention to create a designated webpage on the Council website to raise awareness of the harmful effects of burning domestic fuels. The copy for the webpage is in draft form.	
20	AirAlert Subscription	Awareness raising / comms	Other	April 2015	On-going	WBC	WBC	NO	Committed	£958 per annum	on-going subscription and promotion of service	N	monitoring of numbers subscribed	WBC continue to subscribe to the Surrey AirAlert service, to ensure the Borough's residents have access to a free service, which warns local residents who have respiratory problems, such as asthma, COPD or emphysema, when air pollution in Woking is going to be high.	

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21	Green Initiatives to Improve AQ	Policy	Other	2019	On-going	WBC	Various. Woking integrated transport project is funded by developer contributions and a grant of £11m from the Enterprise M3 Local Enterprise Partnership	NO	Spent	included in the wider project cost of Dukes Plaza	On-going		Reduction in pollutant concentrations in the Town	In 2019 Woking's First Living Wall was installed as part of the Albion Square development in the Town Centre. The ivy screens that make up the continuous wall, comprise a mix of species and will help to improve air quality by trapping and capturing pollutants. In 2021 a 25 metre high living wall currently was installed on Dukes Court central core as part of its refurbishment and in 2022 the Living Wall on the facade of the new Shoppers Car Park was completed. In addition, information is held on the Planet Woking website on how to make your own living wall at home. In 2022, WBC will plant 500 saplings in the Borough to support green and sustainable living as part of her majesty Queen's Platinum Jubilee Celebrations.	
22	PM _{2.5} Study	Data Gathering	Other	2024	On-going	SAA/ WBC/ SCC	TBC Under consideration		TBC	TBC	Research/ quotation phase	Y	Improved data gathering to inform local and county wide action	An Air Quality modelling project, carried out by Cambridge Environmental Research Company (CERC), was previously completed in 2019, which established a key baseline of key pollutants (NO ₂ , PM ₁₀ , PM _{2.5}). The intention is to run this study again to assess the current pollutant concentration levels in the County compared to the last. This piece of work will be updated for the year of 2024, subject to resources. The interactive contour maps of modelled pollutant concentrations have continued to be modelled on, and accessed, via the Surrey County Council website.	
23	Post-Covid changes to Air Quality	Data Gathering	Other	2019	On-going	WBC	n/a	n/a	n/a	n/a	On-going	Y	Observations on traffic levels, and continuing to keep abreast of hybrid working arrangements across all of the Surrey Council's	We will continue to capitalise on the changes post covid that residents and commuters have made to their lifestyles, by continuing to promote on foot local travel, travelling at different times of the day etc. Video conferencing has been installed in the Council Offices to enable more remote meetings thereby	

Measure No.	Measure	Category	Classification	Year Measure Introduced	Estimated / Actual Completion Year	Organisations Involved	Funding Source	Defra AQ Grant Funding	Funding Status	Estimated Cost of Measure	Measure Status	Reduction in Pollutant / Emission from Measure	Key Performance Indicator	Progress to Date	Comments / Barriers to Implementation
														avoiding unnecessary travel to meetings where possible.	
24	Diffusion Tube Monitoring	Data Gathering	Other	2021	On-going	WBC	WBC	NO	n/a	Range from £4k- £80k depending on monitor	On-going	Y	Improved data gathering to inform action	The movement of existing monitoring locations has been welcomed, allowing the Council to prioritise other potential areas of higher air pollution. In addition, a costing exercise for automatic monitoring stations or indicative monitors has been explored to investigate the best monitoring solution for the Borough moving forward, demonstrating that the Council is pro-active and dedicated to improving Air Quality.	Research on hold before any changes considered, in light of announcement of National Policy changes due to be implemented 2022 - 2023
25	Embedding AQ into the Planning Process	Policy	Other	2019	On-going	WBC	n/a	n/a	n/a	n/a	On-going	Y	Improved data gathering to inform action	Having declared a climate change and ecological emergency in the summer of 2019, the Council continues to deliver a programme of engagement with local residents and businesses to include them in our Climate Change Action and future climate work under Planet Woking, launched in September 2020. Planet Woking delivers a range of events, campaigns and initiatives to raise awareness. In 2021 this included talks about the Great Outdoors, Home Energy & Water Use, Urban Life & Climate Change. Work is being undertaken on the scoping of the Council's Planning Policy, looking at how it aligns with the Climate Change Emergency Declaration, presented in September 2021. A climate change supplementary planning document (SPD) is being produced as a result and is due to be published in late 2022.	

Measure No.	Measure	Category	Classification	Year Measure Introduced	Estimated / Actual Completion Year	Organisations Involved	Funding Source	Defra AQ Grant Funding	Funding Status	Estimated Cost of Measure	Measure Status	Reduction in Pollutant / Emission from Measure	Key Performance Indicator	Progress to Date	Comments / Barriers to Implementation
26	Air Quality Action Plan (AQAP) Reviews	Policy	Other	2019	On-going	WBC	n/a	n/a	n/a	n/a	On-going	Y	Improved data gathering to inform action	Woking Borough Council continues to take on board feedback from Defra and internal appraisals, and reviews its AQAPs/ monitoring data on a quarterly basis. Comments from last years' Annual Status Report have been addressed.	
27	AQ Objectives outlined in the 'Woking for All 2022 - 2027 Strategy	Policy	Other	2022 - 2027	2027	WBC	n/a	n/a	n/a	n/a	On-going	Y	Reduce tailpipe emissions and improve cycle routes	Under the strategic objectives for creating Greener Communities, we plan to work with partners to develop and incentivise greener travel choices, embed wider carbon reductions and greater biodiversity support in our operations; by delivering a minimum of 70 additional EV charging points in council car parks and contribute to the County programme to trial kerbside EV charging point and continue to work in partnership with Surrey County Council to attract additional funding that will support the delivery of the Local Walking and Cycling Infrastructure Plan.	
28	Deliver the objectives from the Climate Change Strategy	Policy	Other	2019	On-going	WBC/ Climate Change Working Group	n/a	n/a	n/a	n/a	On-going	Y		A climate emergency action plan (CEAP) was drafted and approved by the Climate Change Working Group at its meeting on 3 December 2019 and by Council on 13 February 2020. Some of the objectives of this strategy, which aim to reduce emissions from transport and improve Air Quality, include reducing unnecessary business mileage, seeking charging points for electric bikes, changing the car club fleet to all EV vehicles.	
29	Deliver work programme and initiatives under the umbrella of Planet Woking	Policy	Other	2019	On-going	WBC, Council's Green Infrastructure Team, borough residents and local businesses	n/a	n/a	n/a	n/a	On-going	Y	Improved awareness, profile raising of AQ initiatives promoted by Planet Woking, increase in attendance at events, action being taken off the back of	Funding agreed for a further two years of Planet Woking, the council's climate and biodiversity communications programme, helping residents reduce their carbon footprint and impact on the environment.	

Measure No.	Measure	Category	Classification	Year Measure Introduced	Estimated / Actual Completion Year	Organisations Involved	Funding Source	Defra AQ Grant Funding	Funding Status	Estimated Cost of Measure	Measure Status	Reduction in Pollutant / Emission from Measure	Key Performance Indicator	Progress to Date	Comments / Barriers to Implementation
													events, initiative and campaigns run by Planet Woking to do with AQ.		

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

As detailed in Local Air Quality Management Policy Guidance (LAQM.PG16) (Chapter 7), local authorities are expected to work towards reducing emissions and/or concentrations of PM_{2.5} (particulate matter with an aerodynamic diameter of 2.5µm or less). There is clear evidence that PM_{2.5} has a significant impact on human health, including premature mortality, allergic reactions, and cardiovascular diseases.

WBC does not monitor PM_{2.5}, however a PM_{2.5} dispersion modelling exercise funded by SCC has been carried out to gain a better understanding of the current situation; The modelling exercise was undertaken by Cambridge Environmental Research Consultants (CERC). The dispersion modelling report¹⁷ aimed to find and prioritise actions in local pollution hotspots and the findings demonstrated that the annual mean concentrations are below 25µgm⁻³ in Surrey.

The report also evaluated public health impact of air quality. Areas near major roads have the highest levels of pollution and health impacts.

The results have been published as a map and is hosted on the SCC website here:

<https://surreycc.maps.arcgis.com/apps/webappviewer/index.html?id=43910ffb100248ed972115b7a9b49d20>

Subject to resources local authorities in Surrey hope to work together to remodel air quality for the year of 2024.

Woking Borough Council, in partnership with SAA, are working alongside SCC's Trading Standards to deliver a Surrey-wide campaign to advise and monitor solid fuel suppliers about the new rules and regulations for the safe supply of domestic solid fuels outlined in The Air Quality (Domestic Solid Fuels Standards) (England) Regulations 2020. This year, a project team has been established and Research and Development has been carried out into the scope of the project. The project team have also been exploring available funding streams to aid in the delivery of this piece of work.

WBC does not have PM_{2.5} specific measures, but implementations of traffic reduction measures as detailed in Table 2.2 will have a beneficial impact on PM_{2.5} concentrations across the borough.

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

This section sets out the monitoring undertaken within 2021 by WBC and how it compares with the relevant air quality objectives. In addition, monitoring results are presented for a five-year period between 2017 and 2021 to allow monitoring trends to be identified and discussed.

Summary of Monitoring Undertaken

3.1.1 Automatic Monitoring Sites

WBC does not undertake any automatic (continuous) monitoring.

3.1.2 Non-Automatic Monitoring Sites

WBC undertook non-automatic (i.e. passive) monitoring of NO₂ at 37 sites during 2021. Table A.2 in Appendix A presents the details of the non-automatic sites. Three new diffusion tubes have been added to the WBC's Air Quality monitoring programme to closely monitor and assess the impact of the diversion route as a result of Town Centre works and road closures, which have been re-routed along Triggs Lane and Wych Hill. Maps showing the location of the monitoring sites are provided in Appendix D. Further details on Quality Assurance/Quality Control (QA/QC) for the diffusion tubes, including bias adjustments and any other adjustments applied (e.g. annualisation and/or distance correction), are included in Appendix C.

Individual Pollutants

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

3.1.3 Nitrogen Dioxide (NO₂)

Table A.1 and Table A.2 in Appendix A compare the ratified and adjusted monitored NO₂ annual mean concentrations for the past five years with the air quality objective of 40µg/m³. Note that the concentration data presented represents the concentration at the location of the monitoring site, following the application of bias adjustment and annualisation, as required (i.e. the values are exclusive of any consideration to fall-off with distance adjustment).

For diffusion tubes, the full 2021 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.

NO₂ monitoring has been able to continue throughout 2021 except the month of February due to lockdown and COVID-19 surge testing that was being carried out within WBC at the time. This has impacted the results gathered for January since the diffusion tubes were not changed within the monitoring duration times recommended by Defra. This data has therefore been excluded from any annual average NO₂ concentration calculations, but is reported in Table B.1

All areas within WBC saw an increase in annual average concentrations levels of NO₂ during 2021 when compared to 2020 readings, but a decrease if compared to 2019 levels. The reported increases in annual average concentrations of NO₂ during 2021 when compared to 2020 levels can be attributed to the national lockdown that occurred in 2020 due to the COVID-19 pandemic, where travel restrictions were imposed. However, the concentrations are lower if compared to 2019 levels and this could be attributed to a range of measures adopted by WBC to improve air quality.

3.1.4 Particulate Matter (PM₁₀)

WBC does not undertake any PM₁₀ monitoring.

3.1.5 Particulate Matter (PM_{2.5})

WBC does not undertake any PM_{2.5} monitoring.

3.1.6 Sulphur Dioxide (SO₂)

WBC does not undertake any SO₂ monitoring.

Appendix A: Monitoring Results

Table A.1 – Details of Non-Automatic Monitoring Sites

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) ⁽¹⁾	Distance to kerb of nearest road (m) ⁽²⁾	Tube Co-located with a Continuous Analyser?	Tube Height (m)
BD	Bitterne Drive	Roadside	498025	158949	NO ₂	NO	6.0	2.0	NO	2.5
TW	Tresta Walk	Roadside	498435	159451	NO ₂	NO	9.5	1.5	NO	2.7
AH	Anchor Hill 1	Kerbside	496618	158699	NO ₂	YES	69.0	1.0	NO	2.7
AH2	Anchor Hill 2	Roadside	496615	158696	NO ₂	YES	0.0	5.0	NO	2.4
AH3	Anchor Hill 3	Roadside	496646	158750	NO ₂	NO	0.0	5.0	NO	2.8
AH4	Anchor Hill 4	Roadside	496679	158767	NO ₂	NO	6.0	2.0	NO	2.5
AH5	Anchor Hill 5	Roadside	496594	158698	NO ₂	YES	0.0	5.0	NO	2.6
AH6	Anchor Hill 6	Roadside	496586	158686	NO ₂	NO	0.0	2.0	NO	2.7
LGR	Lower Guildford Rd	Roadside	496601	158668	NO ₂	YES	0.0	3.0	NO	2.6
BR	Bagshot Road	Kerbside	495821	157793	NO ₂	NO	15.0	1.0	NO	2.6
BR1	Bagshot Road	Roadside	495852	157188	NO ₂	NO	21.0	1.5	NO	2.6
GR	Goldsworth Road	Kerbside	499952	158545	NO ₂	NO	6.0	1.0	NO	2.6
YR	York Road	Kerbside	500450	158278	NO ₂	NO	12.0	1.0	NO	2.6
YR1	York Road	Kerbside	500447	158256	NO ₂	NO	18.0	1.0	NO	2.8
LTK	Constitution Hill 1	Kerbside	500437	158120	NO ₂	NO	3.0	1.0	NO	2.5
LT1	Constitution Hill 1	Kerbside	500453	158100	NO ₂	NO	15.0	1.0	NO	2.8
CH	Constitution Hill 4	Roadside	500417	158102	NO ₂	YES	4.0	1.5	NO	2.7
CH2	Constitution Hill 5	Kerbside	500367	158073	NO ₂	YES	12.0	1.0	NO	2.3
CH3	Constitution Hill 6	Roadside	500330	158012	NO ₂	YES	14.0	1.5	NO	2.5
CH4	Constitution Hill 7	Kerbside	500332	157983	NO ₂	NO	17.0	1.0	NO	2.6
RC	Rosebery Crescent	Kerbside	500946	157110	NO ₂	NO	10.0	1.0	NO	-
LD	Lincoln Drive	Kerbside	503244	159659	NO ₂	NO	12.0	1.0	NO	2.7

PR	Dartnell Avenue (previously Parvis Road)	Kerbside	504926	161063	NO ₂	NO	12.0	1.0	NO	2.3
M25	M25	Other	505611	161180	NO ₂	NO	n/a	0.0	NO	2.6
TC	The Cedars	Roadside	506731	161229	NO ₂	NO	24.0	4.0	NO	2.9
CR	Church Road	Kerbside	506401	160504	NO ₂	NO	6.0	1.0	NO	2.5
WL	Woodham Lane	Kerbside	502854	161062	NO ₂	NO	31.0	1.0	NO	2.7
MR	Monument Road	Roadside	501611	159645	NO ₂	NO	4.0	2.0	NO	2.4
MR2	Monument Road	Roadside	501613	159646	NO ₂	NO	18.0	2.0	NO	2.7
OR	Oriental Road	Roadside	501679	159148	NO ₂	NO	26.0	3.0	NO	2.5
VW	Victoria Way	Kerbside	500510	159030	NO ₂	NO	N/a	1.0	NO	2.5
VW2	Victoria Way 2	Roadside	500281	158827	NO ₂	NO	N/a	8.0	NO	2.7
VW3	Victoria Way 3	Roadside	500270	158731	NO ₂	NO	N/a	3.0	NO	2.7
VW4	Victoria Way 4	Roadside	500425	158584	NO ₂	NO	N/a	5.5	NO	2.5
TL	Triggs Lane	Roadside	499555	157846	NO ₂	NO	N/a	1.3	NO	2.3
WH1	Wych Hill 1	Roadside	499624	157664	NO ₂	NO	N/a	1.1	NO	2.2
WH2	Wych Hill 2	Roadside	499029	157667	NO ₂	NO	N/a	2.3	NO	2.5

Notes:

- (1) 0m if the monitoring site is at a location of exposure (e.g. installed on the façade of a residential property).
- (2) N/A if not applicable.

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

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2021 (%) ⁽²⁾	2017	2018	2019	2020	2021
BD	498025	158949	Roadside	84.6	84.6	15.6	16.1	14.4	11.0	12.1
TW	498435	159451	Roadside	84.6	84.6	13.3	16.2	12.7	11.2	11.6
AH	496618	158699	Kerbside	84.6	84.6	34.6	39.0	38.0	28.4	35.3
AH2	496615	158696	Roadside	57.7	57.7	31.6	31.2	30.9*	25.7	30.5
AH3	496646	158750	Roadside	84.6	84.6	22.5	23.9	23.0	18.8	20.6
AH4	496679	158767	Roadside	84.6	84.6	27.3	28.6	22.0	23.0	28.7
AH5	496594	158698	Roadside	84.6	84.6	26.3	31.1	25.7	20.2	22.4
AH6	496586	158686	Roadside	84.6	84.6	29.2	34.0	37.2*	20.1	23.1
LGR	496601	158668	Roadside	84.6	84.6	23.7	27.0	26.7	21.6	20.6
BR	495821	157793	Kerbside	84.6	84.6	24.5	28.5	26.8	24.0	23.3
BR1	495852	157188	Roadside	84.6	84.6	22.8	26.5	21.6	23.0	21.2
GR	499952	158545	Kerbside	84.6	84.6	26.0	26.2	25.1	21.0	22.6
YR	500450	158278	Kerbside	84.6	84.6	23.9	30.0	27.5	22.0	24.6
YR1	500447	158256	Kerbside	84.6	84.6	25.0	31.2	29.5	23.6	24.4
LTK	500437	158120	Kerbside	75.0	75.0	24.3	28.3	28.5	27.9	25.1
LT1	500453	158100	Kerbside	84.6	84.6	33.9	35.0	23.7	15.0	16.1
CH	500417	158102	Roadside	84.6	84.6	36.5	41.8	37.2	26.8	30.2
CH2	500367	158073	Kerbside	84.6	84.6	41.3	43.5	40.0	34.1	38.1
CH3	500330	158012	Roadside	84.6	84.6	41.0	38.6	35.2*	31.7	34.3
CH4	500332	157983	Kerbside	84.6	84.6	37.6	38.5	34.3	28.6	32.0
RC	500946	157110	Kerbside	67.3	67.3	18.0	18.0	15.0	11.9	12.5
LD	503244	159659	Kerbside	84.6	84.6	16.7	22.3	17.9	12.4	13.1
PR	504926	161063	Kerbside	84.6	84.6	22.2	26.5	22.2	18.5	18.5
M25	505611	161180	Other	84.6	84.6	42.2	53.9	46.7	37.0	40.5
TC	506731	161229	Roadside	84.6	84.6	26.3	31.3	26.2	23.8	24.8
CR	506401	160504	Kerbside	75.0	75.0	20.7	22.9	19.6	15.2	17.1
WL	502854	161062	Kerbside	84.6	84.6	23.5	25.0	21.9	18.0	20.3
MR	501611	159645	Roadside	59.6	59.6	31.3	31.6	30.7	23.4	30.6
MR2	501613	159646	Roadside	84.6	84.6	28.0	37.0	28.6	23.4	26.8

OR	501679	159148	Roadside	84.6	84.6	25.2	27.7	22.7	19.9	23.8
VW	500510	159030	Kerbside	75.0	75.0	31.2	35.9	34.9	28.2	28.1
VW2	500281	158827	Roadside	67.3	67.3	18.0	27.9	24.1	19.5	23.2
VW3	500270	158731	Roadside	67.3	67.3	19.8	26.8	27.1	19.8	23.4
VW4	500425	158584	Roadside	84.6	84.6	23.4	32.8	28.0	22.2	24.4
TL	499555	157846	Roadside	100	42.3	-	-	-	-	26.8
WH1	499624	157664	Roadside	100	42.3	-	-	-	-	28.4
WH2	499029	157667	Roadside	100	42.3	-	-	-	-	30.0

Annualisation has been conducted where data capture is <75% and >25% in line with LAQM.TG16

Diffusion tube data has been bias adjusted

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

Notes:

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

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

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

Means for diffusion tubes have been corrected for bias. All means have been “annualised” as per LAQM.TG16 if valid data capture for the full calendar year is less than 75%. See Appendix C for details.

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

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

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

Figure A.1 – Trends in Annual Mean NO₂ Concentrations within Guildford Road AQMA

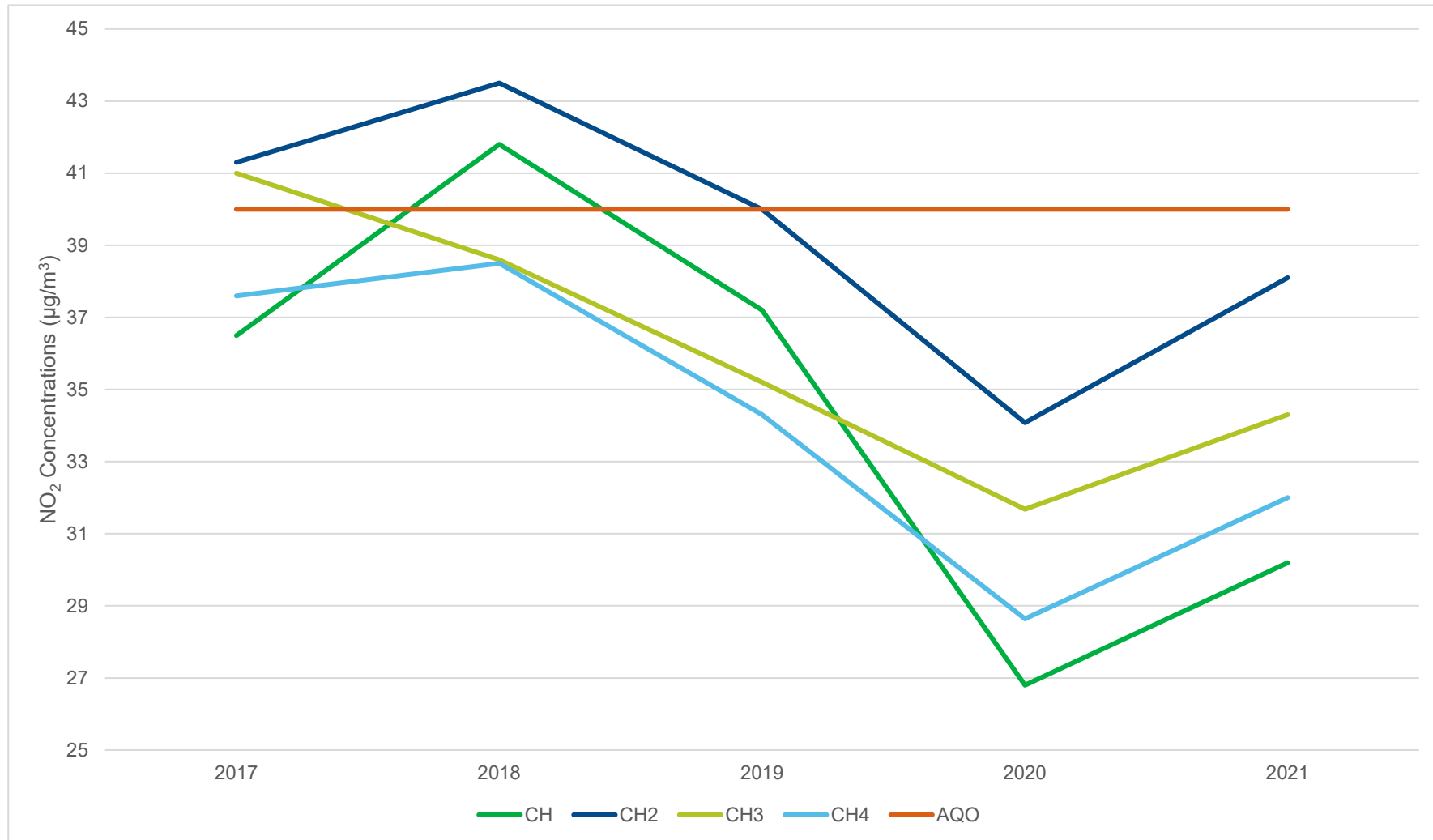
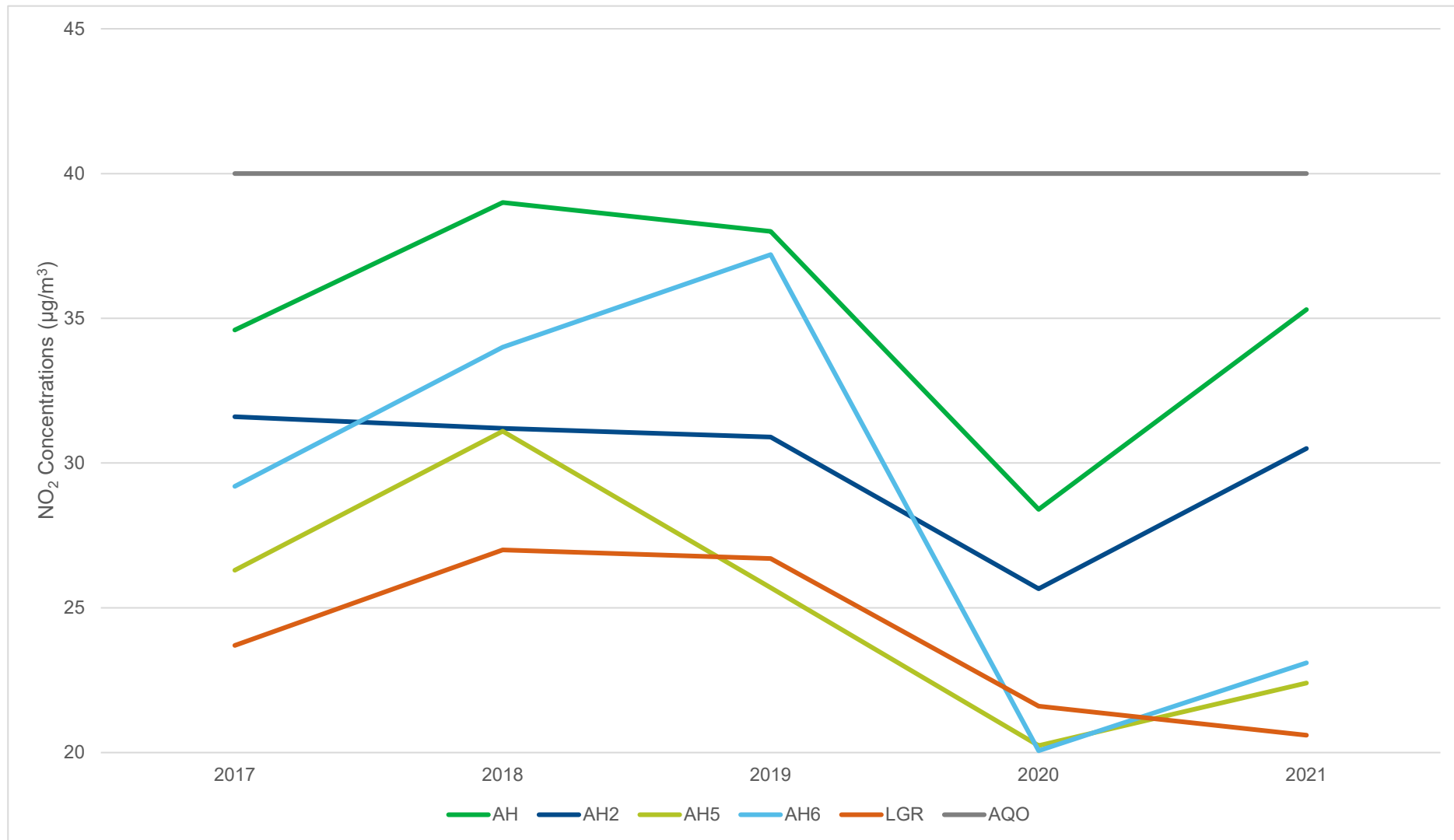


Figure A.2 – Trends in Annual Mean NO₂ Concentrations within Anchor Hill AQMA



Appendix B: Full Monthly Diffusion Tube Results for 2021

Table B.1 – NO₂ 2021 Diffusion Tube Results (µg/m³)

DT ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Easting)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean: Raw Data	Annual Mean: Annualised and Bias Adjusted (0.96)	Annual Mean: Distance Corrected to Nearest Exposure	Comment
BD	498025	158949	15	-	15.0	13.0	10.0	10.0	10.0	10.0	13.0	11.0	17.0	16.0	12.5	12.1	-	
TW	498435	159451	15	-	13.0	11.0	9.0	9.0	10.0	10.0	12.0	12.0	16.0	17.0	12.0	11.6	-	
AH	496618	158699	34	-	32.0	33.0	42.0	30.0	35.0	33.0	47.0	37.0	38.0	38.0	36.4	35.3	-	
AH2	496615	158696	30	-	32.0	-	-	26.0	26.0	17.0	32.0	-	38.0	36.0	29.7	30.5	-	
AH3	496646	158750	19	-	21.0	21.0	19.0	18.0	18.0	16.0	24.0	22.0	29.0	24.0	21.2	20.6	-	
AH4	496679	158767	30	-	33.0	31.0	22.0	28.0	28.0	25.0	32.0	28.0	36.0	33.0	29.6	28.7	-	
AH5	496594	158698	23	-	25.0	27.0	20.0	20.0	20.0	14.0	26.0	24.0	30.0	24.0	23.1	22.4	-	
AH6	496586	158686	26	-	23.0	24.0	21.0	20.0	20.0	20.0	26.0	25.0	29.0	29.0	23.8	23.1	-	
LGR	496601	158668	25	-	21.0	21.0	19.0	22.0	20.0	15.0	27.0	21.0	23.0	23.0	21.2	20.6	-	
BR	495821	157793	31	-	19.0	24.0	21.0	24.0	22.0	20.0	30.0	28.0	25.0	26.0	24.0	23.3	-	
BR1	495852	157188	22	-	23.0	23.0	20.0	21.0	20.0	20.0	24.0	24.0	24.0	20.0	21.9	21.2	-	
GR	499952	158545	27	-	27.0	23.0	21.0	22.0	20.0	18.0	25.0	26.0	26.0	25.0	23.3	22.6	-	
YR	500450	158278	24	-	25.0	24.0	21.0	25.0	24.0	18.0	31.0	26.0	31.0	28.0	25.3	24.6	-	
YR1	500447	158256	33	-	27.0	24.0	24.0	21.0	21.0	16.0	28.0	28.0	33.0	29.0	25.1	24.4	-	
LTK	500437	158120	18	-	28.0	24.0	24.0	25.0	-	18.0	32.0	28.0	33.0	22.0	25.9	25.1	-	
LT1	500453	158100	19	-	17.0	15.0	13.0	13.0	13.0	18.0	18.0	18.0	22.0	19.0	16.6	16.1	-	
CH	500417	158102	27	-	25.0	27.0	30.0	31.0	30.0	23.0	41.0	36.0	35.0	33.0	31.1	30.2	23.8	
CH2	500367	158073	39	-	40.0	41.0	36.0	39.0	35.0	27.0	47.0	38.0	44.0	45.0	39.3	38.1	-	
CH3	500330	158012	35	-	35.0	32.0	33.0	38.0	30.0	24.0	44.0	35.0	47.0	37.0	35.3	34.3	-	
CH4	500332	157983	31	-	31.0	25.0	33.0	39.0	36.0	21.0	43.0	35.0	35.0	33.0	33.0	32.0	-	
RC	500946	157110	15	-	15.0	13.0	-	11.0	10.0	11.0	13.0	-	17.0	11.0	12.5	12.5	-	
LD	503244	159659	16	-	14.0	15.0	12.0	12.0	10.0	11.0	14.0	13.0	18.0	16.0	13.5	13.1	-	
PR	504926	161063	24	-	19.0	18.0	18.0	18.0	18.0	14.0	24.0	20.0	21.0	21.0	19.1	18.5	-	
M25	505611	161180	44	-	35.0	43.0	54.0	41.0	44.0	31.0	49.0	42.0	43.0	36.0	41.8	40.5	-	
TC	506731	161229	27	-	25.0	29.0	25.0	27.0	22.0	18.0	29.0	24.0	33.0	24.0	25.5	24.8	-	
CR	506401	160504	23	-	22.0	-	13.0	18.0	15.0	12.0	19.0	18.0	22.0	20.0	17.7	17.1	-	
WL	502854	161062	31	-	18.0	21.0	19.0	18.0	19.0	15.0	24.0	19.0	29.0	27.0	21.0	20.3	-	
MR	501611	159645	22	-	25.0	n/s	-	33.0	33.0	-	41.0	26.0	29.0	32.0	31.2	30.6	-	
MR2	501613	159646	30	-	31.0	28.0	32.0	23.0	21.0	21.0	30.0	28.0	32.0	31.0	27.6	26.8	-	
OR	501679	159148	26	-	28.0	25.0	20.0	21.0	22.0	16.0	27.0	25.0	29.0	31.0	24.5	23.8	-	
VW	500510	159030	32	-	31.0	-	28.0	26.0	29.0	20.0	35.0	32.0	36.0	24.0	28.9	28.1	-	
VW2	500281	158827	26	-	-	-	19.0	19.0	23.0	15.0	28.0	21.0	25.0	24.0	21.8	23.2	-	
VW3	500270	158731	-	-	-	-	20.0	20.0	20.0	24.0	29.0	20.0	24.0	21.0	22.1	23.4	-	
VW4	500425	158584	26	-	26.0	25.0	22.0	24.0	24.0	16.0	28.0	27.0	33.0	26.0	25.1	24.4	-	
TL	499555	157846	-	-	-	-	-	-	-	16.0	28.0	30.0	39.0	27.0	28.0	26.8	-	
WH1	499624	157664	-	-	-	-	-	-	-	17.0	39.0	31.0	32.0	29.0	29.6	28.4	-	
WH2	499029	157667	-	-	-	-	-	-	-	18.0	35.0	32.0	37.0	34.0	31.4	30.0	-	

- ☒ All erroneous data has been removed from the NO₂ diffusion tube dataset presented in Table B.1 .
- ☒ Annualisation has been conducted where data capture is <75% and >25% in line with LAQM.TG16
- ☒ Local bias adjustment factor used
- ☒ National bias adjustment factor used

- Where applicable, data has been distance corrected for relevant exposure in the final column
- WBC confirm that all 2021 diffusion tube data has been uploaded to the Diffusion Tube Data Entry System

Notes:

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

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

See Appendix C for details on bias adjustment and annualisation.

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

New or Changed Sources Identified Within WBC During 2021

WBC has identified the following development proposals as sources which could have an impact on the local air quality in the area:

- PLAN/2018/0374 - Sheerwater Regeneration. Leisure Centre phase nearing completion, application for discharge of conditions under consideration. Purple Phase nearing completion and Red Phase demolition and preparatory work has started.
- PLAN/2014/0881 -Victoria Place development on-going and finalised during 2021

Additional Air Quality Works Undertaken by WBC During 2021

WBC undertook the following additional works within the reporting year of 2021:

- Demolition has begun on the existing buildings located in 'The Triangle' (the pocket of land surrounded by the one way road gyratory system located on the South side of Victoria Arch). This four year project will see the widening of the highway along Guildford Road and Victoria Road, enhance traffic management systems and improve pedestrian and cycle routes to Woking Train Station, the Town Centre and improve join up with other existing off-road routes.
- Officers from Environmental Health (EH) have this year provided feedback into Woking's Local Development policies and the Local Development Plan Documents 2021 Amendment, to ensure Air Quality information is at the forefront of developers mind and that AQ issues are carefully considered as part of this process.
- WBC will continue to use the planning regime to encourage adoption of good design principles in new developments; i.e. low emission boilers, EV charging points, good spatial planning in line with the EPUK/IAQM Planning for Air Quality Guidance.

QA/QC of Diffusion Tube Monitoring

The diffusion tubes for 2021 were supplied by Lambeth Scientific Services and prepared using a 50% triethanolamine (TEA)/Acetone method.

Diffusion Tube Annualisation

Results were annualised in line with guidance included in Box 7.9 and 7.10 of the LAQM.TG(16) for monitoring sites BR1 and VW3 as data capture was below 75%.

Data from Speltthorne Sunbury Cross, Chilbolton Observatory, Reading New Town and London Hillingdon automatic monitoring stations were used to derive the adjustment factors. All monitors are in background locations and had data capture above 85% in 2021. They were managed by the Automatic Urban and Rural Network (AURN), and ratified data was downloaded from the Air Quality England website¹⁸. Table C.2 details the calculations used to derive the annualisation factors.

Diffusion Tube Bias Adjustment Factors

The diffusion tube data presented within this 2022 ASR have been corrected for bias using an adjustment factor. Bias represents the overall tendency of the diffusion tubes to under or over-read relative to the reference chemiluminescence analyser. LAQM.TG16 provides guidance with regard to the application of a bias adjustment factor to correct diffusion tube monitoring. Triplicate co-location studies can be used to determine a local bias factor based on the comparison of diffusion tube results with data taken from NO_x/NO₂ continuous analysers. Alternatively, the national database of diffusion tube co-location surveys provides bias factors for the relevant laboratory and preparation method.

WBC have applied a national bias adjustment factor of 0.97 to the 2021 monitoring data. A summary of bias adjustment factors used by WBC over the past five years is presented in Table C.1. Figure C.1 presents a screenshot of the National Diffusion Tube Bias Adjustment Factor Spreadsheet.

¹⁸ <https://www.airqualityengland.co.uk/>

Table C.1 – Bias Adjustment Factor

Monitoring Year	Local or National	If National, Version of National Spreadsheet	Adjustment Factor
2021	National	03/22	0.97
2020	National	03/21	0.96
2019	National	09/20	0.85
2018	National	06/19	1.03
2017	National	09/18	0.90

Figure C.1 – National Diffusion Tube Bias Adjustment Factor Spreadsheet

National Diffusion Tube Bias Adjustment Factor Spreadsheet			Spreadsheet Version Number: 03/22							
Follow the steps below in the correct order to show the results of relevant co-location studies			This spreadsheet will be updated at the end of June 2022							
Data only apply to tubes exposed monthly and are not suitable for correcting individual short-term monitoring periods			LAQM Helpdesk Woking							
Whenever presenting adjusted data, you should state the adjustment factor used and the version of the spreadsheet			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.							
This spreadsheet will be updated every few months: the factors may therefore be subject to change. This should not discourage their immediate use.			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* 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*	If you have your own co-location study then see footnote*. If uncertain what to do then contact the Local Air Quality Management Helpdesk at LAQMHelpdesk@bureauveritas.com or 0800 0327953.							
Analysed By [†]	Method [‡]	Year [‡]	Site Type	Local Authority	Length of Study (months)	Diffusion Tube Mean Conc. (Dm) (µg/m ³)	Automatic Monitor Mean Conc. (Cm) (µg/m ³)	Bias (B)	Tube Precision [§]	Bias Adjustment Factor (A) (Cm/Dm)
Lambeth Scientific Services	50% TEA in acetone	2021	R	Elmbridge Borough Council	11	27	26	2.9%	P	0.97
Lambeth Scientific Services	50% TEA in acetone	2021	R	Elmbridge Borough Council	12	27	25	8.7%	G	0.92
Lambeth Scientific Services	50% TEA in acetone	2021	UB	Spelthorne Borough Council	12	19	19	0.9%	G	0.99
Lambeth Scientific Services	50% TEA in acetone	2021	UB	Spelthorne Borough Council	11	23	23	-2.4%	G	1.02
Lambeth Scientific Services	50% TEA in acetone	2021	KS	Marylebone Road Intercomparison	11	46	42	8.2%	G	0.92
Lambeth Scientific Services	50% TEA in acetone	2021	Overall Factor* (5 studies)						Use	0.97

NO₂ Fall-off with Distance from the Road

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

If fall-off-with-distance calculations were required for any non-automatic monitoring sites, a summary of the sites should be provided here and the output data from the LAQM NO₂ fall-off with distance calculator, or output from the Diffusion Tube Data Processing Tool should be presented in Table C.3. Distance correction should be considered at any monitoring site where the annual mean concentration is greater than 36µg/m³ and the

monitoring site is not located at a point of relevant exposure (taking the limitations of the calculator into account).

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

Site ID	Annualisation Factor Spelthorne Sunbury Cross	Annualisation Factor Chilbolton Observatory	Annualisation Factor Reading New Town	Annualisation Factor London Hillingdon	Average Annualisation Factor	Raw Data Annual Mean	Annualised Annual Mean	Comments
AH2	1.0411	1.0705	1.0542	1.0697	1.0589	29.7	31.4	AH2
RC	1.0398	1.0195	0.9976	1.0675	1.0311	12.5	12.9	RC
MR	0.9841	1.0397	1.0250	0.9935	1.0106	31.2	31.5	MR
VW2	1.0347	1.1791	1.1184	1.0450	1.0943	21.8	23.9	VW2
VW3	1.0347	1.1791	1.1184	1.0450	1.0943	22.1	24.2	VW3
TL	0.9403	1.0936	0.9696	0.9437	0.9868	28.0	27.7	TL
WH1	0.9403	1.0936	0.9696	0.9437	0.9868	29.6	29.2	WH1
WH2	0.9403	1.0936	0.9696	0.9437	0.9868	31.4	30.9	WH2

Table C.3 – NO₂ Fall off With Distance Calculations (concentrations presented in $\mu\text{g}/\text{m}^3$)

Site ID	Distance (m): Monitoring Site to Kerb	Distance (m): Receptor to Kerb	Monitored Concentration (Annualised and Bias Adjusted)	Background Concentration	Concentration Predicted at Receptor	Comments
CH2	1.0	13.0	38.1	10.4	23.8	

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

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

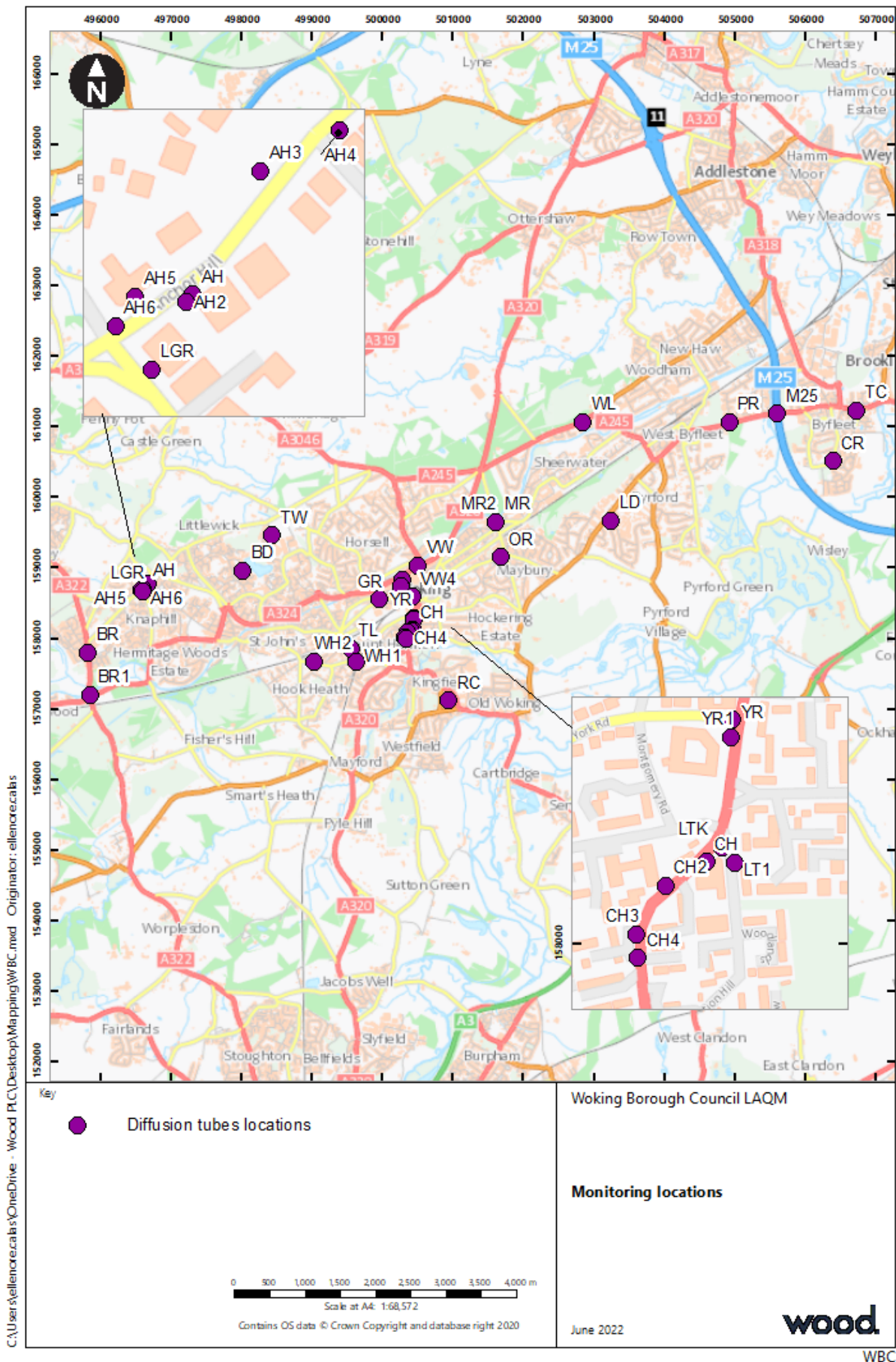


Figure D.2 – Anchor Hill AQMA and diffusion tube monitoring locations

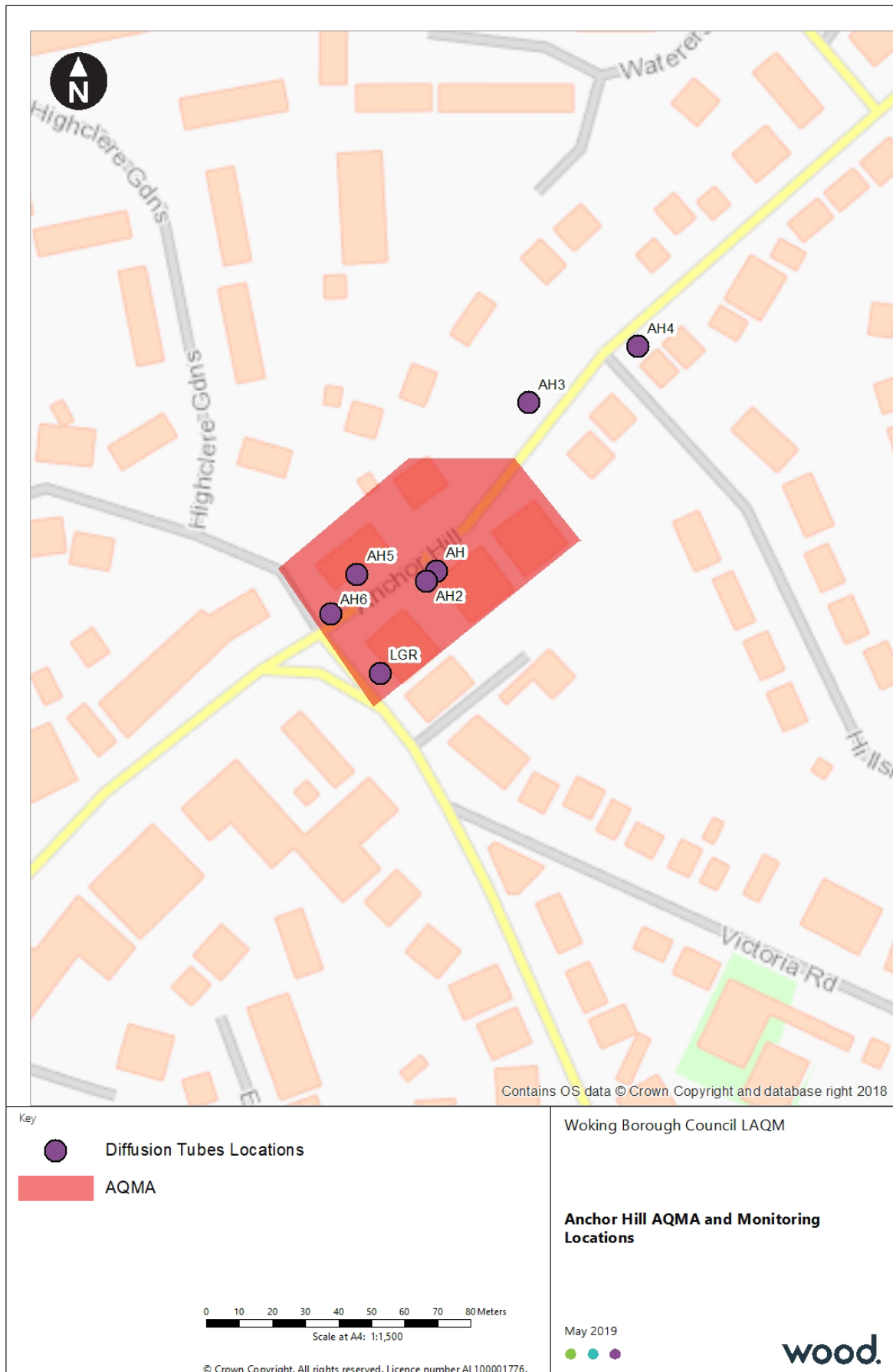


Figure D.3 – Guildford Road AQMA and diffusion tube monitoring locations



Appendix E: Summary of Air Quality Objectives in England

Table E.1 – Air Quality Objectives in England¹⁹

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

¹⁹ The units are in microgrammes of pollutant per cubic metre of air (µg/m³).

Glossary of Terms

Abbreviation	Description
AQAP	Air Quality Action Plan - A detailed description of measures, outcomes, achievement dates and implementation methods, showing how the local authority intends to achieve air quality limit values'
AQMA	Air Quality Management Area – An area where air pollutant concentrations exceed / are likely to exceed the relevant air quality objectives. AQMAs are declared for specific pollutants and objectives
ASR	Annual Status Report
Defra	Department for Environment, Food and Rural Affairs
DMRB	Design Manual for Roads and Bridges – Air quality screening tool produced by National Highways
EU	European Union
FDMS	Filter Dynamics Measurement System
LAQM	Local Air Quality Management
NO ₂	Nitrogen Dioxide
NO _x	Nitrogen Oxides
PM ₁₀	Airborne particulate matter with an aerodynamic diameter of 10µm or less
PM _{2.5}	Airborne particulate matter with an aerodynamic diameter of 2.5µm or less
QA/QC	Quality Assurance and Quality Control
SO ₂	Sulphur Dioxide

References

- Local Air Quality Management Technical Guidance LAQM.TG16. April 2021. Published by Defra in partnership with the Scottish Government, Welsh Assembly Government and Department of the Environment Northern Ireland.
- Local Air Quality Management Policy Guidance LAQM.PG16. May 2016. Published by Defra in partnership with the Scottish Government, Welsh Assembly Government and Department of the Environment Northern Ireland.
- Amec Foster Wheeler Environment & Infrastructure UK Ltd (2015). Air quality further assessment for Woking Borough Council.
- Amec Foster Wheeler Environment & Infrastructure UK Ltd (2015). Woking Borough Council – Anchor Hill AQMA – Air Quality Action Plan.
- Amec Foster Wheeler Environment & Infrastructure UK Ltd (2017). Annual Status Report (ASR) for Woking Borough Council.
- Bureau Veritas. Woking Borough Council Anchor Hill LAQM Detailed Assessment, October 2012.
- CERC. Detailed air quality modelling and source apportionment Woking Borough Council. Final report. Prepared for Surrey Local Authorities, November 2019.
- Defra (2006). Air quality and social deprivation in the UK: an environmental inequalities analysis.
- Defra (2016). Local Air Quality Management Technical Guidance LAQM.TG (16).
- Defra. Clean Air Strategy, 2019
- Defra. Air quality appraisal: damage cost guidance, 2020
- Defra, 2021. COVID-19: Supplementary Guidance. Version 1.0. [Online]. Available from: <https://laqm.defra.gov.uk/documents/Covid-19%20-%20Supplementary%20Guidance%20for%20Local%20Air%20Quality%20Management%20Reporting%20in%202021%20v1.pdf>
- DfT. The Road to Zero: Next steps towards cleaner road transport and delivering our Industrial Strategy, July 2018

- Local Air Quality Management Policy Guidance LAQM.PG16. May 2016. Published by Defra in partnership with the Scottish Government, Welsh Assembly Government and Department of the Environment Northern Ireland.
- Local Air Quality Management Technical Guidance LAQM.TG16. April 2021. Published by Defra in partnership with the Scottish Government, Welsh Assembly Government and Department of the Environment Northern Ireland.
- Public Health England. Air Quality: A Briefing for Directors of Public Health, 2017
- Public Health England. Estimation of costs to the NHS and social care due to the health impacts of air pollution: summary report, May 2018
- Surrey County Council (2011). Surrey transport plan: Air quality strategy.
- Woking Council (2014). Air quality progress report for Woking Council.
- Wood Environment and Infrastructure Solutions UK Limited (2018). Annual Status Report (ASR) for Woking Borough Council.
- Wood Environment and Infrastructure Solutions UK Limited (2019). Annual Status Report (ASR) for Woking Borough Council.
- Wood Environment and Infrastructure Solutions UK Limited (2020). Annual Status Report (ASR) for Woking Borough Council.
- Wood Environment and Infrastructure Solutions UK Limited (2021). Annual Status Report (ASR) for Woking Borough Council.