2023 Air Quality Annual Status Report (ASR)

In fulfilment of Part IV of the Environment Act 1995 Local Air Quality Management, as amended by the Environment Act 2021

Date: June, 2023

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Executive Summary: Air Quality in Our Area

Air Quality in Wealden

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

The mortality burden of air pollution within the UK is equivalent to 29,000 to 43,000 deaths at typical ages[3], with a total estimated healthcare cost to the NHS and social care of £157 million in 2017[4].

The District of Wealden is the largest district in East Sussex, and one of the most rural districts in England. Road traffic is the dominant source of air pollution in the area, the major routes being the A22, the A26, the A267, the A259, the A27 and the A272. The main pollutants of concern with respect to road traffic are nitrogen dioxide (NO_2) and particulate matter (PM_{10} and $PM_{2.5}$). Currently, there are no areas in Wealden where members of the public are exposed to concentrations of these pollutants in excess of the UK Air Quality Strategy (AQS) objectives.

Wealden District Council (WDC) manages local air quality in close collaboration with East Sussex County Council (ESCC) (which contributed to monitoring until 2014) and the Sussex Air Quality Partnership (Sussex Air). The partnership provides assistance to members and information to the public via its website with recent air quality data, news updates, educational resources, links and other services such as airAlert.

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

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

[3] Defra. Air quality appraisal: damage cost guidance, January 2023

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

In previous years, local monitoring has identified high concentrations of NO_2 at three roadside locations (A267 East of Cross in Hand (W7), West of Boship Roundabout (W8) and Forest Row High Street (W10)). In March 2017 the A267 East of Cross in Hand (W7) monitoring location was changed, due to difficulty with access and it not being a representative site, with the monitor moved along the road nearer to residential properties. In more recent years (2018 – 2022), concentrations at all these locations achieved the UK air quality objective for annual mean NO_2, with concentrations lower than 40 µg/m^3.

Two new locations for monitoring NO_2 were introduced in 2022, High Street Wadhurst (W15) and Styles Lane Wadhurst (W16). In 2022, the annual mean NO_2 concentration observed at W15 was 15.1 µg/m^3 and at W16 was 6.8 µg/m^3, both well below the annual mean AQS NO_2 objective.

In WDC, NO_2 concentrations were measured at Lullington Heath continuous monitoring site. In 2022, data capture for the Lullington Heath site was much improved compared to 2021 (96% in 2022 compared to 19% in 2021). PM_{10} and $PM_{2.5}$, concentrations were also measured for the first time at this site. The PM_{10} and $PM_{2.5}$ analysers were installed in June 2022 and subsequently the data was annualised as per the method set out in the Technical Guidance LAQM.TG22. Both PM_{10} and $PM_{2.5}$ levels were significantly below annual mean AQS objectives and lower than the continuous monitoring sites located in the neighbouring Eastbourne.

As in other suburban and rural areas of East Sussex, ozone (O_3) is of considerable concern. The Isfield O_3 monitoring site was decommissioned at the end of 2020, therefore O_3 is now only monitored at Lullington Heath. Annual average O_3 concentrations at Lullington Heath have increased since 2011. The number of days with high ozone concentrations (above the 8-hour objective) has also increased with exceedances of the 8-hour objective in each year from 2018 to 2022. Comparing 2021 and 2022 data for Lullington Heath, an increase in both O_3 annual mean concentration and O_3 8-hour exceedances was observed.

Sulphur dioxide (SO_2) is also measured at the Lullington Heath station. However, in recent years there have been no exceedances of any of the three AQS objectives (15-minute, 1-hour and 24-hour).

Two-thirds of the Wealden district is designated as the High Weald and Sussex Downs Areas of Outstanding Natural Beauty (AONB) with 34 other conservation areas. The impact of traffic-related air pollution on some of these areas has been assessed in past years. This involved monitoring the impact of traffic on the Ashdown Forest Special

Protection Area (SPA) and Special Area of Conservation (SAC). More recently, there has been the introduction of tariffs for new developments to reduce the impact of cumulative development upon the Ashdown Forest SPA/SAC.

Actions to Improve Air Quality

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

The Environmental Improvement Plan[5] sets out actions that will drive continued improvements to air quality and to meet the new national interim and long-term $PM_{2.5}$ targets. The National Air Quality Strategy, published in 2023, will provide more information on local authorities' responsibilities to work towards these new targets and reduce $PM_{2.5}$ in their areas. The Road to Zero[6] details the approach to reduce exhaust emissions from road transport through a number of mechanisms; this is extremely important given that the majority of Air Quality Management Areas (AQMAs) are designated due to elevated concentrations heavily influenced by transport emissions.

WDC is helping the public to avoid the worst effects of O_3 pollution by informing the public of pollution events through the airAlert pollution warning service using the O_3 monitoring data obtained from Lullington Heath. This service is provided and maintained through the Sussex Air partnership.

WDC contributes to the Air Quality and Emissions Mitigation Guidance for Sussex. The guidance supports the principles of the Sussex Air Quality Partnership to improve air quality across Sussex and encourage emissions reductions to improve the environment and health of the population. Other actions being implemented to improve public health include promoting active modes of transport like walking, cycling and using public transport, as well as car clubs and car sharing.

In 2022, WDC had constructive discussions around planning policy to ensure air quality mitigation requirements are integrated as policy into the future Local Plan. The Council

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

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

increased the use of the Air Quality Guidance produced by Sussex Air to apply conditions to major planning applications. This has ensured that air quality mitigation cost calculations have been undertaken and measures to improve air quality are starting to get integrated into major developments. Two additional diffusion tubes sites were installed in Wadhurst in 2022, an area in the north of the district where existing coverage was light. WDC will continue to review the diffusion tube monitoring locations in future reporting years to try to identify whether there are other key areas of relevant exposure where there may be exceedances so the appropriate measures can be adopted accordingly.

Conclusions and Priorities

This ASR confirms that concentrations within Wealden continue to be well within the NO_2 annual mean AQS objective at relevant locations. No significant changes in emissions sources within the Council's area have been identified in the last year.

The priorities for the coming year will be to continue monitoring in the area and continue to implement measures to increase sustainable travel options and improve transport infrastructure. WDC will continue to review monitoring locations based on trends in pollutant concentrations. The Council will ensure assessment and mitigation measures for new developments, particularly those allocated around the main urban centres. The Council will continue discussions around planning policy to ensure that air quality mitigation requirements become policy in the new Local Plan and continue work with Sussex Air and other Local Authorities.

The main challenge for air quality management in Wealden is balancing the expected population growth in the district with conservation of the natural habitats that constitute most of the district's territory. WDC will address this challenge by managing a sustainable level of development to reduce the impact of cumulative development on conservation areas such as the Ashdown Forest SPA / SAC. There are also challenges associated with increasing traffic as a result of development in the district.

WDC will continue to promote active travel such as walking, cycling. Furthermore, WDC will continue to monitor car usage post COVID-19, as people continue to undertake forms of smart and hybrid working. These initiatives will be encouraged and promoted through the Sussex Air website.

Local Engagement and How to get Involved

Everyone concerned about air quality in Wealden and the rest of Sussex can find real-time information on pollution levels on the Sussex Air website sussex-air.net, and sign up for advance warnings with the airAlert service at airalert.info. Warnings are provided by text or voice message, email, or using an Android or iOS app. The service is also available to schools and is a great way to get everyone engaged in thinking about the importance of air quality. The reduction in using cars to travel to work, further home working and increasing walking and cycling are all encouraged.

Local Responsibilities and Commitment

This ASR was prepared by the Pollution Control Department of WDC.

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1 Local Air Quality Management

This report provides an overview of air quality in WDC during 2022. It fulfils the requirements of Local Air Quality Management (LAQM) as set out in Part IV of the Environment Act (1995), as amended by the Environment Act (2021), and the relevant Policy and Technical Guidance documents.

The LAQM process places an obligation on all local authorities to regularly review and assess air quality in their areas, and to determine whether or not the air quality objectives are likely to be achieved. Where an exceedance is considered likely the local authority must declare an Air Quality Management Area (AQMA) and prepare an Air Quality Action Plan (AQAP) setting out the measures it intends to put in place in order to achieve and maintain the objectives and the dates by which each measure will be carried out. This Annual Status Report (ASR) is an annual requirement showing the strategies employed by WDC 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~~Table E.1~~.

Form

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.

Wealden currently does not have any declared AQMAs. Therefore, no formal AQAP has been set up and implemented for the district.

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	Name and Date of AQAP Publication	Web Link to AQAP
WDC has no declared AQMAs.								

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

☒ **WDC confirm that all current AQAPs have been submitted to Defra.**

2.2 Progress and Impact of Measures to address Air Quality in WDC

Defra's appraisal of last year's ASR concluded the report as well structured with the following comments:

1. *All relevant objectives for NO_2, PM_{10}, $PM_{2.5}$ and SO_2 were complied with at all monitoring locations within 2021.*
2. *Ozone concentrations at the automatic monitoring site LL1 exceeded the permitted number of exceedance of days of the running 8-hour mean objective in 2021, although there was a decrease in both the number of exceedance days and annual mean concentrations compared to 2020.*
3. *Regarding ozone, automatic sites LL1 and EB1 are listed as monitoring this pollutant in Table A.1. However, ozone results are presented in Tables A.10 and A.11 for LL1 and AR2 (a different site decommissioned in 2020). If trends and concentrations are being presented/discussed for site AR2 then site details should be included within Table A.1, and if site EB1 is listed in Table A.1 then it would be beneficial to present/discuss the ozone trends at this site as well.* **This has been taken into account for this report. The details for Site AR2 have now been included within Table A.1. Whilst EB1 has been used to show trends where WDC previously hasn't had any monitoring for PM_{10} and $PM_{2.5}$. The monitor belongs to a different local authority outside WDC. Therefore, where sufficient data is available for sites within WDC, trends have not been presented for EB1. This is the case for ozone in 2022.**
4. *Sufficient detail is included on the QA/QC procedures for both the automatic analysers and the NO_2 diffusion tubes, however it would be beneficial to include discussion around why the data capture has been so low at site LL1 during both 2021 and 2020.* **Data capture was low due to technical issues with the monitor. It has been much improved during 2022 (96.1%).**
5. *Two new diffusion tubes monitoring locations were added to the council's network during 2021. This is welcomed, however it would be beneficial to include a discussion around why these locations were chosen. In addition, some of the existing diffusion tube monitoring locations have monitored results well below the annual mean NO_2 objective for the past several years (for example sites W3 and W9). It may therefore be beneficial for the council to review and consider whether monitoring should continue in these locations.* **The council have added two further tubes in 2022 along with clear justification of the reasoning**

behind the decision. WDC annually review their monitoring regime but are limited within financial constraints.

6. *The council have used the latest reporting template in production of their 2022 ASR. However, the 'Valid Data Capture for Monitoring Period' has not been entered correctly in Table A.5. In addition, in Table A.9, the relevant percentile should have been provided in relation to the 15- minute SO_2 objective, as data capture was less than 85%.* **This has been taken into account in this ASR.**
7. *Though there are no AQMAs within the district, a good level of detail and discussion is provided around measures to reduce and manage air quality.*
8. *Discussion surrounding the commentary provided in the appraisal report of the 2021 ASR is provided. This is encouraged to continue in future reporting years.*
9. *The report includes detailed discussion of the measures the council are taking to address $PM_{2.5}$. Links are provided and discussed in regard to the Public Health Outcomes Framework and fraction of mortality attributable to $PM_{2.5}$ emissions. Comparisons to the regional and national average is included. This is welcomed and is encouraged to be included in all future reports.*
10. *The continual collaborative approach that Wealden District Council is taking with East Sussex County Council and Sussex Air is commended.*
11. *A detailed map showing monitoring locations is presented. This is welcomed.*
12. *Overall, the report is detailed, thorough and satisfies the criteria of relevant standards. The Council should continue their good work.*

This ASR provides the same level of detail as the previous report with updated information. At the time of submitting the ASR, the latest national bias adjustment bias factor (03/23) has been used.

WDC will continue to carry out measures during the current reporting year of 2022 in pursuit of improving local air quality.

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	Air Quality and Emissions Mitigation Guidance for Sussex	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	2014	2014	Sussex Air Quality Partnership	-	-	-	-	Completed	N/A	N/A	Completed - Guidance published	Under review by the partnership.
2	Air Quality Strategic Plan 2010	Policy Guidance and Development Control	Regional Groups Co-ordinating programmes to develop Area wide Strategies to reduce emissions and improve air quality	2010	2010	Sussex Air Quality Partnership	-	-	-	-	Completed	N/A	N/A	Completed - Plan published and currently implemented	None.
3	Sussex Air website	Public Information	Via the Internet	2012	2012 - Ongoing	Sussex Air Quality Partnership	-	-	-	-	Implementation	N/A	N/A	The website is online and reporting on monitored pollution levels	Under review by the partnership.
4	airAlert	Public Information	Via other mechanisms	2011	2011 - Ongoing	Sussex Air Quality Partnership	-	-	-	-	Implementation	N/A	921 registered subscribers, 70 from Wealden District	The service is running and the number of subscribers increasing every year	None.
5	Energise Network	Promoting Low Emission Transport	Procuring alternative Refuelling infrastructure to promote Low Emission Vehicles, EV recharging, Gas fuel recharging	2014	2014 - Ongoing	Sussex Air Quality Partnership	-	-	-	-	Implementation	N/A	5 charging points installed in Wealden District	The service is running and several charging points are available in Wealden District	None.
6	Suitable Accessible Natural Green Space (SANGS) guidelines	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	2013	2013	WDC	-	-	-	-	Completed	N/A	N/A	Guideline document to help identify SANGS sites published.	None.
7	Nitrogen Reduction Guidance	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	2013	2013	WDC	-	-	-	-	Completed	N/A	N/A	Guidance note published for small scale developments on reducing traffic impacts on Ashdown Forest.	None.
8	Ashdown Forest Monitoring	Other	Other	2017	2017	WDC	-	-	-	-	Completed	N/A	N/A	Monitoring started 2014	None.

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
9	Publicly available advice on sustainability	Public Information	Via the Internet	2017	2017 - ongoing	WDC	-	-	-	-	Completed	N/A	N/A	The website is online and fully available	None.
10	Encouraging home working using IT solutions	Promoting Travel Alternatives	Encourage / Facilitate home-working	2017	2017 - ongoing	WDC	-	-	-	-	Completed	N/A	N/A	IT solutions in place for staff wishing to home-work	None.
11	Employee tax incentive scheme for purchasing bikes	Promoting Travel Alternatives	Promotion of cycling	2017	2017 - ongoing	WDC	-	-	-	-	Implementation	N/A	N/A	-	None.
12	Car sharing for employees and associated priority staff parking	Promoting Travel Alternatives	Workplace Travel Planning	2017	2017 - ongoing	WDC	-	-	-	-	Implementation	N/A	N/A	-	None.
13	Implementation of ESCC Local Transport Plan 3	Traffic Management	Strategic highway improvements, Re-prioritising road space away from cars, including Access management, Selective vehicle priority, bus priority, high vehicle occupancy lane	2016	2016 - ongoing	East Sussex County Council & WDC	-	-	-	-	Implementation	N/A	N/A	-	Under review
14	Bus route improvements in Wealden via Local Transport Plan 3	Transport Planning and Infrastructure	Bus route improvements	2016	2016 - ongoing	East Sussex County Council & WDC	-	-	-	-	Implementation	N/A	N/A	-	Under review
15	Cycle network improvements in Wealden via Local Transport Plan 3	Transport Planning and Infrastructure	Cycle network	2016	2016 - ongoing	East Sussex County Council & WDC	-	-	-	-	Implementation	N/A	N/A	-	Under review
16	Public transport improvements in Wealden via Local Transport Plan 3	Transport Planning and Infrastructure	Public transport improvements-interchanges stations and services	2016	2016 - ongoing	East Sussex County Council & WDC	-	-	-	-	Implementation	N/A	N/A	-	Under review

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
17	Introduction of tariffs for new developments to reduce the impact of cumulative development upon the Ashdown Forest SPA/SAC	Policy Guidance and Development Control	Other policy	2018	2018-Ongoing	WDC	-	-	-	-	Implementation	N/A	N/A	Ongoing	None
18	Commitment to a sustainable procurement strategy	Policy Guidance and Development Control	Sustainable Procurement Guidance	2014	2014-2017	WDC	-	-	-	-	Completed	N/A	N/A	WDC encourages key suppliers to demonstrate an awareness of sustainability issues and to promote practices that are consistence with their policies.	None
19	Promote health activities and encourage public to participate	Public Information	Via Other	2018	2018-Ongoing	WDC	-	-	-	-	Implementation	N/A	N/A	Introduced various 'Healthy Wealden' activities to encourage use of the Cuckoo Trail in 2018	None
20	Ensuring air quality mitigation is policy in the new local plan	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	-	Ongoing	WDC	-	-	-	-	Implementation	N/A	N/A	-	None
21	Use of Sussex Air Guidance and incorporation of planning conditions on major plans	Policy Guidance and Development Control	Other policy	-	Ongoing	WDC	-	-	-	-	Implementation	N/A	N/A	-	None
22	Support and involvement with Sussex Air and it's initiatives	Policy Guidance and Development Control	Regional Groups Co-ordinating programmes to develop Area wide Strategies to reduce emissions and improve air quality	-	Ongoing	WDC	-	-	-	-	Implementation	N/A	N/A	-	None

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

As detailed in Policy Guidance LAQM.PG22 (Chapter 8), local authorities are expected to work towards reducing emissions and/or concentrations of $PM_{2.5}$ (particulate matter with an aerodynamic diameter of 2.5µm or less). There is clear evidence that $PM_{2.5}$ has a significant impact on human health, including premature mortality, allergic reactions, and cardiovascular diseases.

WDC currently undertakes $PM_{2.5}$ monitoring at the Lullington Heath AURN monitoring site. Concentrations monitored at this location indicate that $PM_{2.5}$ levels are significantly below annual mean AQS objectives.

WDC is taking the following measures to address $PM_{2.5}$:

- Supporting the Energise Network of electric vehicle charging points, together with the Sussex Air Quality Partnership;
- Requiring the assessment of $PM_{2.5}$ as part of Air Quality Assessments for planning applications.

Although there are no new specific measures targeting $PM_{2.5}$ currently, it is expected that the combination of actions and that are currently in force or coming into force will help to bring about a reduction in $PM_{2.5}$. However, discussions are being held with Public Health and other Local Authorities as part of Sussex Air to devise policies that will specifically target the reduction in $PM_{2.5}$. Any links measures have to the Public Health Outcomes Framework (available at https://fingertips.phe.org.uk/profile/public-health-outcomes-framework) will be considered.

The latest information from the Public Health Outcomes Framework stated that, in 2021, the fraction of mortality attributable to particulate air pollution in WDC was 4.7%, which is lower than the regional (5.4%) and national averages (5.5%).

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

This section sets out the monitoring undertaken within 2022 by WDC and how it compares with the relevant air quality objectives. In addition, monitoring results are presented for a five-year period between 2018 and 2022 to allow monitoring trends to be identified and discussed.

3.1 Summary of Monitoring Undertaken

3.1.1 Automatic Monitoring Sites

WDC undertook automatic (continuous) monitoring at one site during 2022. This was Lullington Heath (for nitrogen dioxide (NO_2), sulphur dioxide (SO_2), Particulate matter (PM_{10} and $PM_{2.5}$) and O_3). Both PM_{10} and $PM_{2.5}$ analysers were installed in June 2022 and consequently the data was annualised in accordance with the method set out in Technical Guidance LAQM.TG22. This report also includes the results from two sites in the neighbouring Eastbourne District: Devonshire Park and Holly Place for means of comparison. Table A.1~~Table A.1~~ in Appendix A shows the details of the automatic monitoring sites.

Lullington Heath and Eastbourne Holly Place are part of the Automatic Urban and Rural Network (AURN), managed by the Environment Agency. National monitoring results are available at https://uk-air.defra.gov.uk/.

Devonshire Park is part of the Sussex Air Quality Monitoring Network (SAQMN), managed on behalf of Sussex Air by the London Environmental Research Group. Regional monitoring results are available at www.sussex-air.net.

Maps showing the locations 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

WDC undertook non-automatic (i.e. passive) monitoring of NO_2 at 16 sites during 2022. Table A.2~~Table A.2~~ in Appendix A presents the details of the non-automatic sites.

Data capture for 2022 was generally very good. Two new locations for monitoring NO_2 were introduced in 2022, High Street Wadhurst (W15) and Styles Lane Wadhurst (W16). Data capture was 100% at both these locations. One monitoring location: Uckfield Town Centre (W4) required annualisation due to the loss of diffusion tubes during several months of the year.

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

3.2 Individual Pollutants

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

3.2.1 Nitrogen Dioxide (NO_2)

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

For diffusion tubes, the full 2022 dataset of monthly mean values is provided in Appendix B. No distance correction has been applied as all concentrations were below 36 µg/m^3.

The results in Table A.3~~Table A.3~~ and Table A.4~~Table A.4~~ indicate that the annual mean NO_2 concentrations at all monitoring sites were well within the AQS objective (40 µg/m^3) in 2022. The highest annual mean NO_2 concentration was measured at Uckfield Town Centre (W4; 26.2 µg/m^3).

Table A.5~~Table A.5~~ in Appendix A compares the ratified continuous monitored NO_2 hourly mean concentrations for the past five years with the AQS objective of 200µg/m^3, not to be exceeded more than 18 times per year. None of the automatic monitoring sites exceeded the 200 µg/m^3 hourly standard on any occasion in 2022, nor in any year since 2015. The

results indicate that the 1-hour NO_2 AQS objective is unlikely to be exceeded at any location in the district.

Diffusion tubes do not provide hourly measurements of NO_2; however, the Defra Technical Guidance states that where annual mean NO_2 concentrations measured by diffusion tubes exceed 60 µg/m^3 there is a likelihood that the 1-hour AQS objective may be exceeded. All of the annual mean NO_2 concentrations at diffusion tube monitoring locations between 2015 and 2022, inclusive, were well below 60 µg/m^3 and so the 1-hour AQS objective is very unlikely to have been exceeded.

Figure A.1~~Figure A.1~~ shows the trend in NO_2 concentrations monitored at the Lullington Heath, Devonshire Park and Holly Place automatic monitoring stations. The results indicate there was a gradual downward trend in NO_2 concentrations over the time period shown, with a sharper decrease at these locations in 2020 that was likely to have been influenced by the reduction of traffic due to the COVID-19 pandemic. In 2022, there was a decrease in NO_2 concentrations at Devonshire Park relative to 2021. Concentrations have been well below the annual mean AQS objective of 40 µg/m^3 in all years.

Figure A.2~~Figure A.2~~ shows the trend in annual mean NO_2 concentrations measured at non-automatic (diffusion tube) sites. All sites show decreasing concentrations since 2018. In 2020 the impact of the COVID-19 pandemic likely caused concentrations to be lower than might have been expected following the trends observed. In 2022, there was a small increase in NO_2 concentrations at 7 diffusion tube sites, whilst the remaining sites showed small decreases in NO_2 concentrations. All sites recorded NO_2 concentrations in 2022 below 2019 levels.

Annual mean NO_2 concentrations at W8 (A22 W of Boship roundabout), were within 10% of the annual mean AQS objective in 2016. However, the 2022 concentration at this location was the lowest in the past five years. At other roadside sites, there has been some year-to-year variability, with a decreasing trend in concentrations in the last couple of years.

3.2.2 Particulate Matter (PM_{10})

PM_{10} monitoring was undertaken at Lullington Heath for the first time in 2022. The analyser was installed in June 2022 so data capture for the year was low (58.2%). The data was annualised as per the methodology set out in Technical Guidance LAQM.TG22. Concentrations monitored at two urban background sites in the neighbouring Eastbourne (Devonshire Park and Holly Place) are also provided for indicative purposes.

Table A.6~~Table A.6~~ in Appendix A compares the ratified and adjusted monitored PM_{10} annual mean concentrations for the past five years with the AQS objective of 40µg/m^3. The results indicate that annual mean PM_{10} concentrations were well below the AQS objective between 2018 and 2022.

Figure A.3~~Figure A.3~~ shows the trend in annual mean PM_{10} concentrations. PM_{10} concentrations had shown a downward trend since 2018 at Devonshire Park but increased slightly in 2022. PM_{10} concentrations at Holly Place also increased slightly in 2022 compared to 2021. Concentrations have remained consistently well below the annual mean AQS objective.

Table A.7~~Table A.7~~ in Appendix A compares the ratified continuous monitored PM_{10} daily mean concentrations for the past five years with the AQS objective of 50µg/m^3, not to be exceeded more than 35 times per year. These results show that both Eastbourne sites achieved the daily mean PM_{10} AQS objective every year from 2018 to 2022.
Figure A.4~~Figure A.4~~ shows the trend in number of exceedances of the daily mean PM_{10} AQS objective. The number of days which exceeded the AQS objective has decreased at both sites since 2012 (0 days in 2022).

3.2.3 Particulate Matter ($PM_{2.5}$)

$PM_{2.5}$ monitoring was undertaken at Lullington Heath for the first time in 2022. The analyser was installed in June 2022 so data capture for the year was low (58.2%). The data was annualised as per the methodology set out in Technical Guidance LAQM.TG22. Concentrations monitored at the Holly Place urban background site in Eastbourne are also provided for indicative purposes.

Table A.8~~Table A.8~~ in Appendix A presents the ratified and adjusted monitored $PM_{2.5}$ annual mean concentrations for the past five years. Between 2018 and 2022, the measured concentrations have been below the AQS objective of 20 µg/m^3.

Figure A.5~~Figure A.5~~ shows the trend in annual mean $PM_{2.5}$ concentrations. Since 2009, there has been a varying trend shown across the results. Levels have slightly increased during 2022 but are still considerably lower than 2019-pre COVID-19 pandemic.

3.2.4 Sulphur Dioxide (SO_2)

Table A.9~~Table A.9~~ in Appendix A compares the ratified continuously monitored SO_2 concentrations for 2021 at the Lullington Heath rural site with the AQS objectives for SO_2.

There have been no exceedances in 2022 of any of the three AQS objectives for SO_2 (15-minute, 1-hour or 24-hour).

3.2.5 Ozone (O_3)

The Isfield Ozone monitoring site was decommissioned at the end of 2020 due to Sussex Air funding ending. In 2022, the monitoring data for O_3 concentrations were recorded at only the Lullington Heath site but historical data from Isfield is included to provide a means of comparison.

Table A.10 in Appendix A presents the ratified continuous monitored annual mean O_3 concentrations at the Isfield and Lullington Heath rural sites. Between 2016 and 2020, the annual mean concentrations monitored at Isfield were between 45.2 µg/m^3 and 53.2 µg/m^3. Between 2018 and 2022, annual mean concentrations have been between 58.3µg/m^3 and 65.4 µg/m^3 at the Lullington Heath station. There is no annual mean AQS objective or target value for annual mean O_3 concentrations.

Figure A.6~~Figure A.6~~ shows the trend in annual mean O_3 concentrations at the two monitoring stations. There was no clear trend in the results for Isfield between 2011 and 2020. There was a general upward trend observed at Lullington Heath between 2016 and 2020. Concentrations decreased in 2021, however in 2022, there was an increase in annual mean O_3 concentrations.

Table A.11~~Table A.11~~ in Appendix A compares the ratified continuous monitored O_3 running 8-hour mean concentrations for the past 5 years with the AQS objective of 100 µg/m^3, not to be exceeded on more than 10 days per year. The monitoring results show that the Isfield station exceeded the O_3 AQS objective every year from 2018 to 2020, except for 2019 (7 days). The Lullington Heath station has measured days exceeding the AQS objective in 2019 (10 days), 2020 (39 days) and 2021 (15 days). In 2022, the number of days exceeding the O_3 running 8- hour mean was 30 for Lullington Heath.

Figure A.7~~Figure A.7~~ shows the trend in the number of days exceeding the O_3 AQS objective between 2011 and 2022. The Isfield site shows a varying trend with sharp increases in 2013, 2017 and 2020. The Lullington Heath site shows an overall decreasing trend between 2011 and 2016 and an increase between 2016 and 2018. The number of days exceeding the AQS objective from 2018 to 2019 decreased for both sites but increased sharply in 2020. In 2022, the number of days exceeding the AQS objective at Lullington Heath increased again after declining in 2021.

Appendix A: Monitoring Results

Table A.1 – Details of Automatic Monitoring Sites

Site ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Monitoring Technique	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Inlet Height (m)
LL1	Lullington Heath AURN	Rural	553800	101600	NO_2; SO_2; O_3; PM_{10}; $PM_{2.5}$	No	Chemiluminiscence; UV Fluorescence; UV Absorption; FIDAS	> 1000	> 1000	3
EB1	Eastbourne - Devonshire Park	Urban Background	561180	98360	NO_2; PM_{10}; O_3	No	Chemiluminiscence; FDMS; UV Absorption	40	10	1.5
EB3	Holly Place AURN	Urban Background	560085	103118	NO_2; PM_{10}; $PM_{2.5}$	No	Chemiluminiscence; FIDAS	10	10	4
AR2*	Wealden – Isfield	Rural	544890	117380	O_3	No	UV Absorption	60	20	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.

* Isfield automatic monitoring site (AR2) was decommissioned at the end of 2020. Historical data is included in this ASR to provide a means of comparison with regards to long term monitoring trends.

Table A.2 – Details of Non-Automatic Monitoring Sites

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube Co-located with a Continuous Analyser?	Tube Height (m)
W1	Crowborough Background	Urban Background	552591	130667	NO_2	No	7.5	2.0	No	0.0
W2	Crowborough Town Centre	Roadside	551626	131090	NO_2	No	7.5	2.0	No	2.5
W3	Uckfield Background	Urban Background	547828	121954	NO_2	No	15.0	1.0	No	2.5
W4	Uckfield Town Centre	Roadside	547250	120977	NO_2	No	7.5	2.0	No	2.5
W5	Eastbourne Road, Polegate	Roadside	558079	104481	NO_2	No	13.0	1.0	No	2.0
W6	London Road, Hailsham	Roadside	558845	109783	NO_2	No	0.5	1.0	No	2.5
W7	A265 Nursery Way Heathfield	Roadside	557503	121318	NO_2	No	7.5	1.0	No	2.0
W8	A22 W of Boship roundabout	Roadside	556933	111165	NO_2	No	8.0	2.0	No	2.0
W9	Forest Row Riverside	Urban Background	542336	135324	NO_2	No	5.0	0.1	No	2.0
W10	Forest Row A22	Kerbside	542464	135279	NO_2	No	1.0	2.0	No	2.0
W11	Hailsham - Lower Horsebridge	Roadside	558024	111237	NO_2	No	0.5	1.0	No	2.0
W12	Hailsham A295 car park	Roadside	558892	109272	NO_2	No	8.5	1.0	No	2.5

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube Co-located with a Continuous Analyser?	Tube Height (m)
W13	Stone Cross B2104 Red Lion Pub	Roadside	561558	104356	NO_2	No	16.5	1.0	No	2.5
W14	Stone Cross - Dittons Road	Roadside	560501	104629	NO_2	No	24.5	1.0	No	2.5
W15	High Street Wadhurst	Roadside	564050	131792	NO_2	No	1.0	1.0	No	2.5
W16	Styles Lane Wadhurst	Urban Background	563788	131694	NO_2	No	1.0	1.0	No	2.5

Notes:

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

(2) N/A if not applicable.

Table A.3 – Annual Mean NO_2 Monitoring Results: Automatic Monitoring (µg/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 2022 (%) (2)	2018	2019	2020	2021	2022
LL1	553855	101740	Rural	96.2	96.2	7.6	7.4	6.1	-	7.1
EB1	561180	98360	Urban Background	88.1	88.1	14.5	15.0	10.7	13.3	12.9
EB3	560085	103118	Urban Background	81.1	81.1	10.7	10.8	8.8	9.4	11.8

☒ **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.**

Notes:

The annual mean concentrations are presented as µg/m³.

Exceedances of the NO_2 annual mean objective of 40µg/m³ are shown in **bold**.

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

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

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

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

Table A.4 – Annual Mean NO_2 Monitoring Results: Non-Automatic Monitoring (µg/m³)

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2022 (%) (2)	2018	2019	2020	2021	2022
W1	552591	130667	Urban Background	100	100.0	13.9	12.0	9.2	15.7	9.3
W2	551626	131090	Roadside	92.3	92.3	23.6	21.9	14.1	10.3	15.3
W3	547828	121954	Urban Background	100	100.0	14.9	13.4	12.1	11.2	10.1
W4	547250	120977	Roadside	67.3	67.3	36.7	33.6	23.0	25.0	26.2
W5	558079	104481	Roadside	100	100.0	32.6	27.9	19.9	22.4	23.7
W6	558845	109783	Roadside	100	100.0	27.1	24.0	16.9	19.2	20.4
W7	557503	121318	Roadside	82.7	82.7	20.8	19.1	13.4	13.4	12.4
W8	556933	111165	Roadside	100	100.0	34.2	33.2	25.1	24.3	21.9
W9	542336	135324	Urban Background	100	100.0	12.6	9.5	6.9	7.3	7.3
W10	542464	135279	Kerbside	92.3	92.3	34.6	28.6	23.7	24.1	23.9
W11	558024	111237	Roadside	100	100.0			11.1	12.7	13.0
W12	558892	109272	Roadside	100	100.0			17.7	22.0	19.8
W13	561558	104356	Roadside	84.6	84.6				22.9	23.3

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2022 (%) (2)	2018	2019	2020	2021	2022
W14	560501	104629	Roadside	100	100.0				17.8	19.6
W15	564050	131792	Roadside	100	100.0					15.1
W16	563788	131694	Urban Background	100	100.0					6.8

☒ **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 measured at Automatic Monitoring Sites

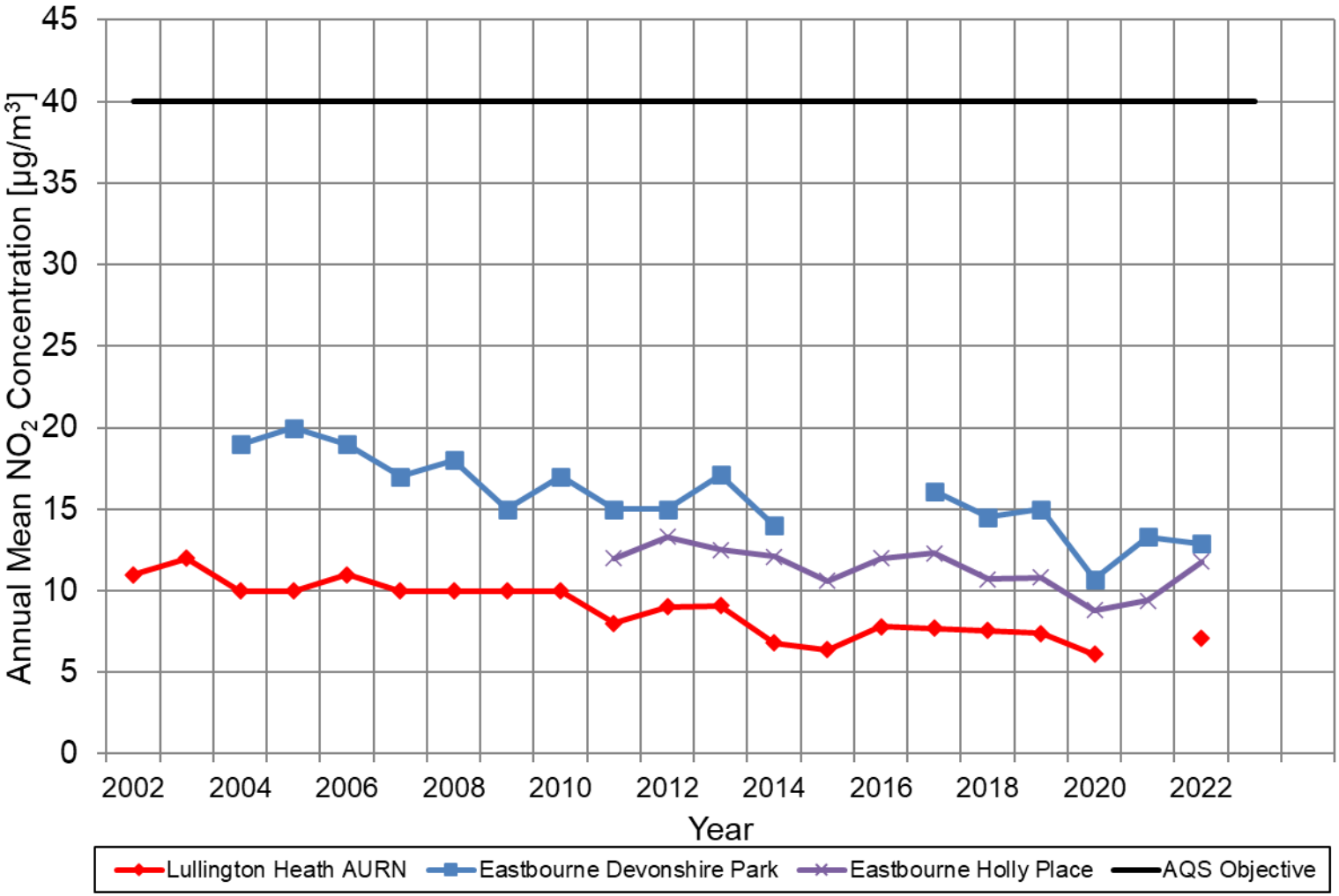


Figure A.2 – Trends in Annual Mean NO_2 Concentrations measured at Diffusion Tube Monitoring Sites

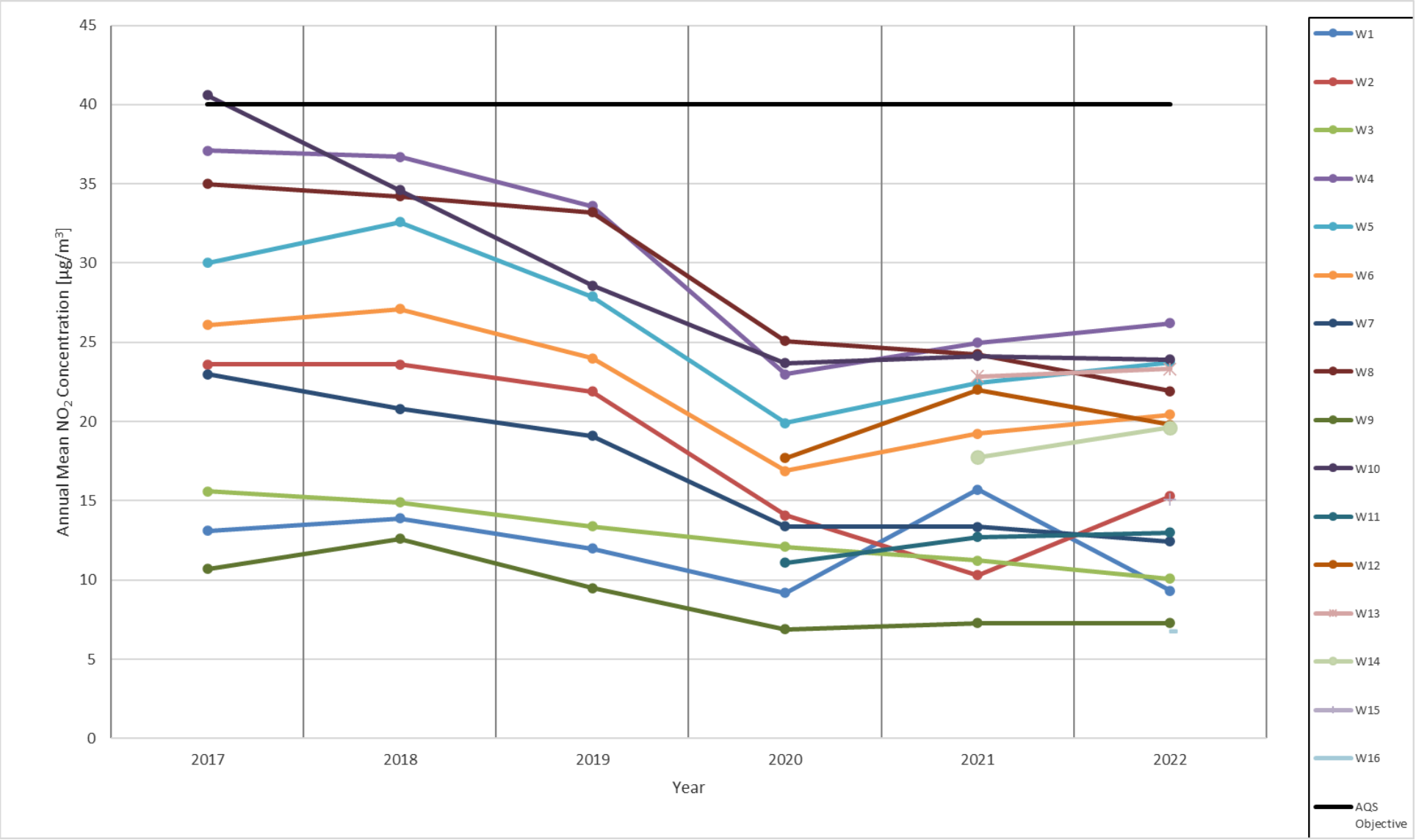


Table A.5 – 1-Hour Mean NO_2 Monitoring Results, Number of 1-Hour Means > 200µg/m^3

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2022 (%) (2)	2018	2019	2020	2021	2022
LL1	553855	101740	Rural	96.2	96.2	0	0	0 (38.2)	0 (35.4)	0
EB1	561180	98360	Urban Background	88.1	88.1	0	0	0	0	0
EB3	560085	103118	Urban Background	81.1	81.1	0 (59.8)	0	0 (58.4)	0	0 (55.3)

Notes:

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

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

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

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

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

Table A.6 – Annual Mean PM_{10} Monitoring Results (µg/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 2022 (%) (2)	2018	2019	2020	2021	2022
LL1	553855	101740	Rural	100	58.2	-	-	-	-	12.3
EB1	561180	98360	Urban Background	100	100	18.5	17.2	17.5	17.3	19.3
EB3	560085	103118	Urban Background	96.7	96.7	-	15.5	14.5	13.2	14.6

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

Notes:

The annual mean concentrations are presented as µg/m³.

Exceedances of the PM_{10} annual mean objective of 40µg/m³ are shown in **bold**.

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

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

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

Figure A.3 – Trends in Annual Mean PM_{10} Concentrations

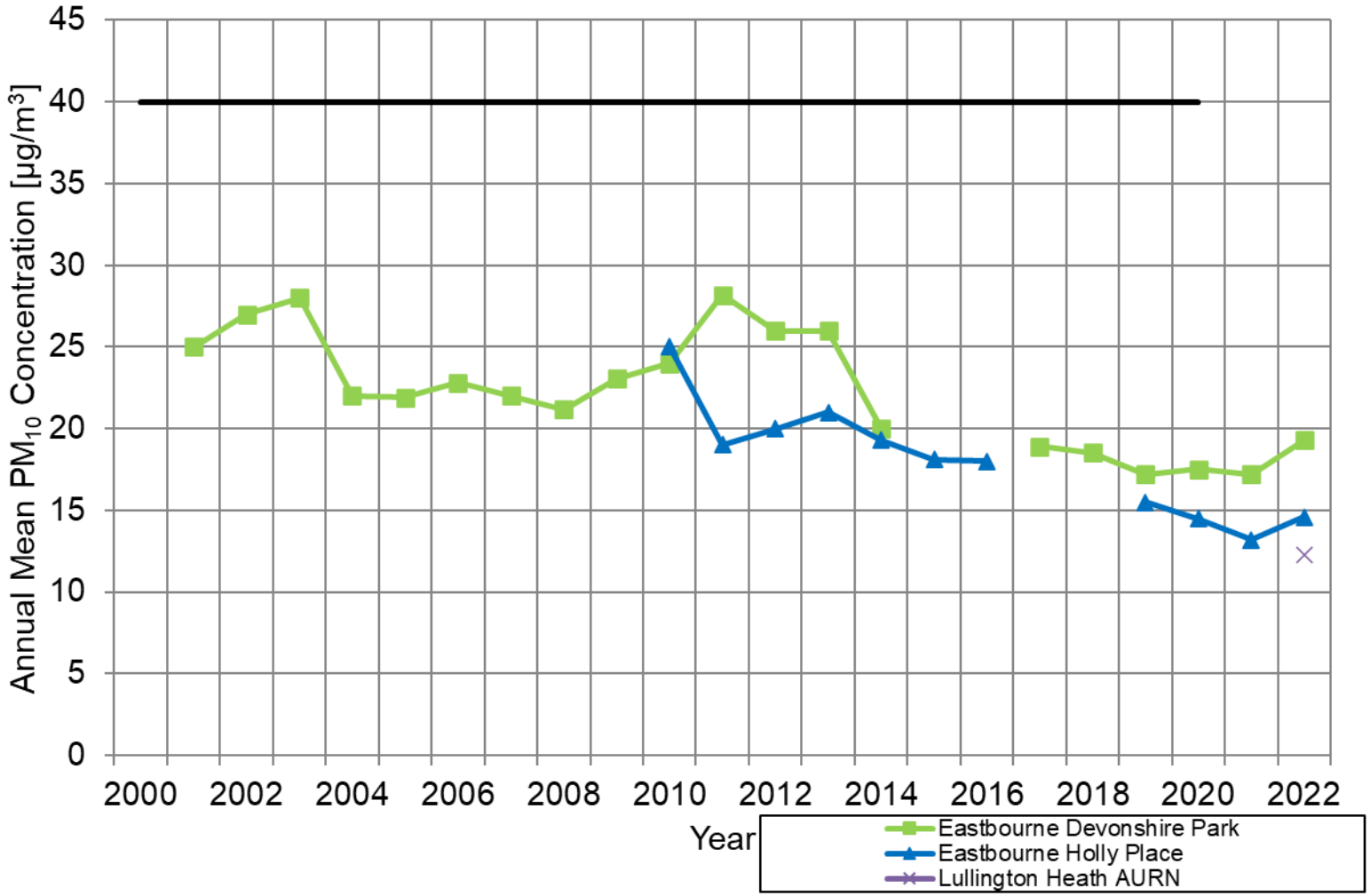


Table A.7 – 24-Hour Mean PM_{10} Monitoring Results, Number of PM_{10} 24-Hour Means > 50µg/m³

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2022 (%) (2)	2018	2019	2020	2021	2022
LL1	553855	101740	Rural	100	58.2	-	-	-	-	0
EB1	561180	98360	Urban Background	100	100	2	1	1	0	0
EB3	560085	103118	Urban Background	96.7	96.7	**-**	0	0	1	0

Notes:

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

Exceedances of the PM_{10} 24-hour mean objective (50µg/m³ not to be exceeded more than 35 times/year) are shown in **bold**.

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

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

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

Figure A.4 – Trends in Number of 24-Hour Mean PM_{10} Results > 50µg/m³

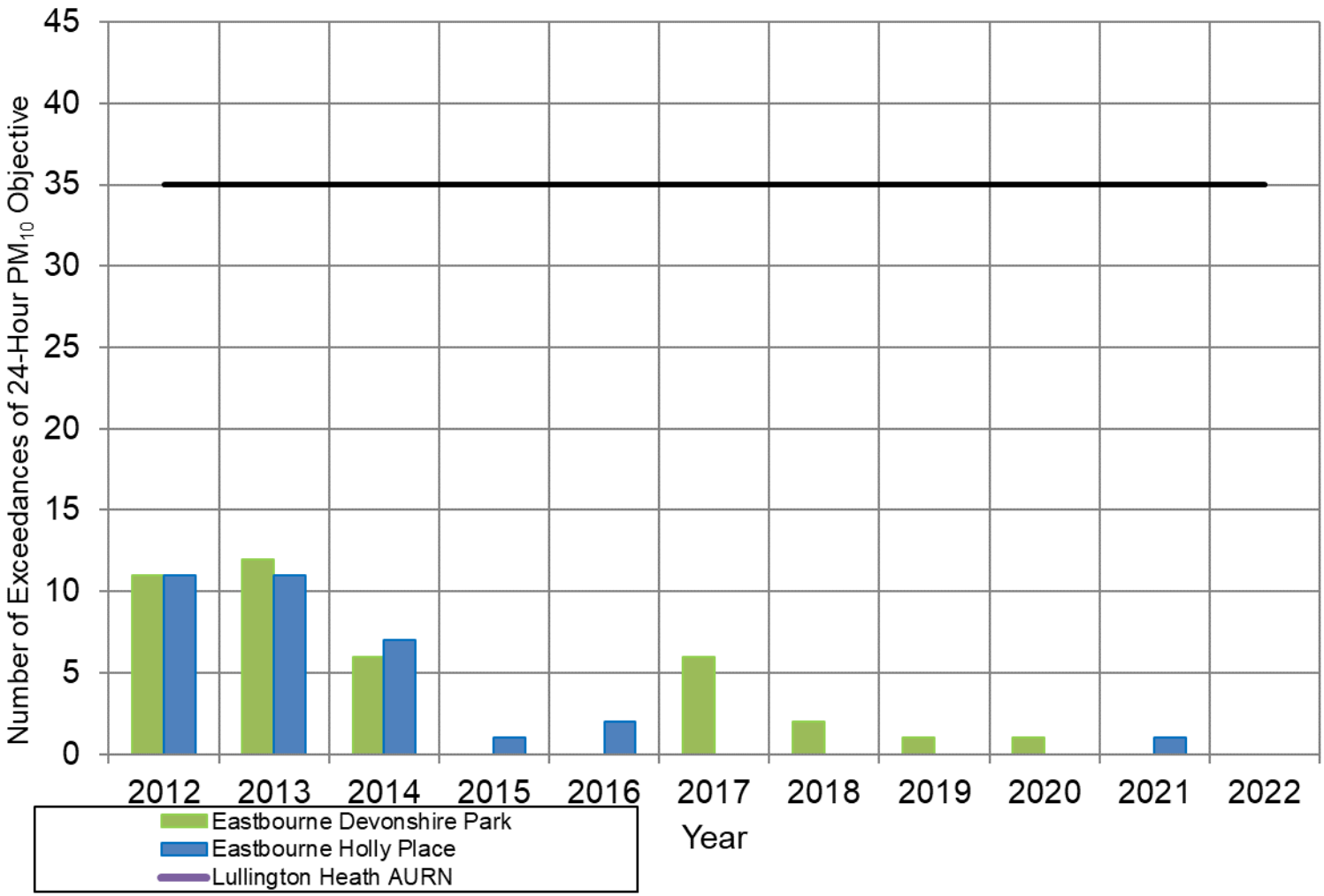


Table A.8 – Annual Mean $PM_{2.5}$ Monitoring Results (µg/m³)

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2022 (%) (2)	2018	2019	2020	2021	2022
LL1	553855	101740	Rural	100	58.2	-	-	-	-	7.6
EB3	560085	103118	Urban Background	96.7	96.7	12.7	10.5	8.7	8.4	8.9

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

Notes:

The annual mean concentrations are presented as µg/m³.

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

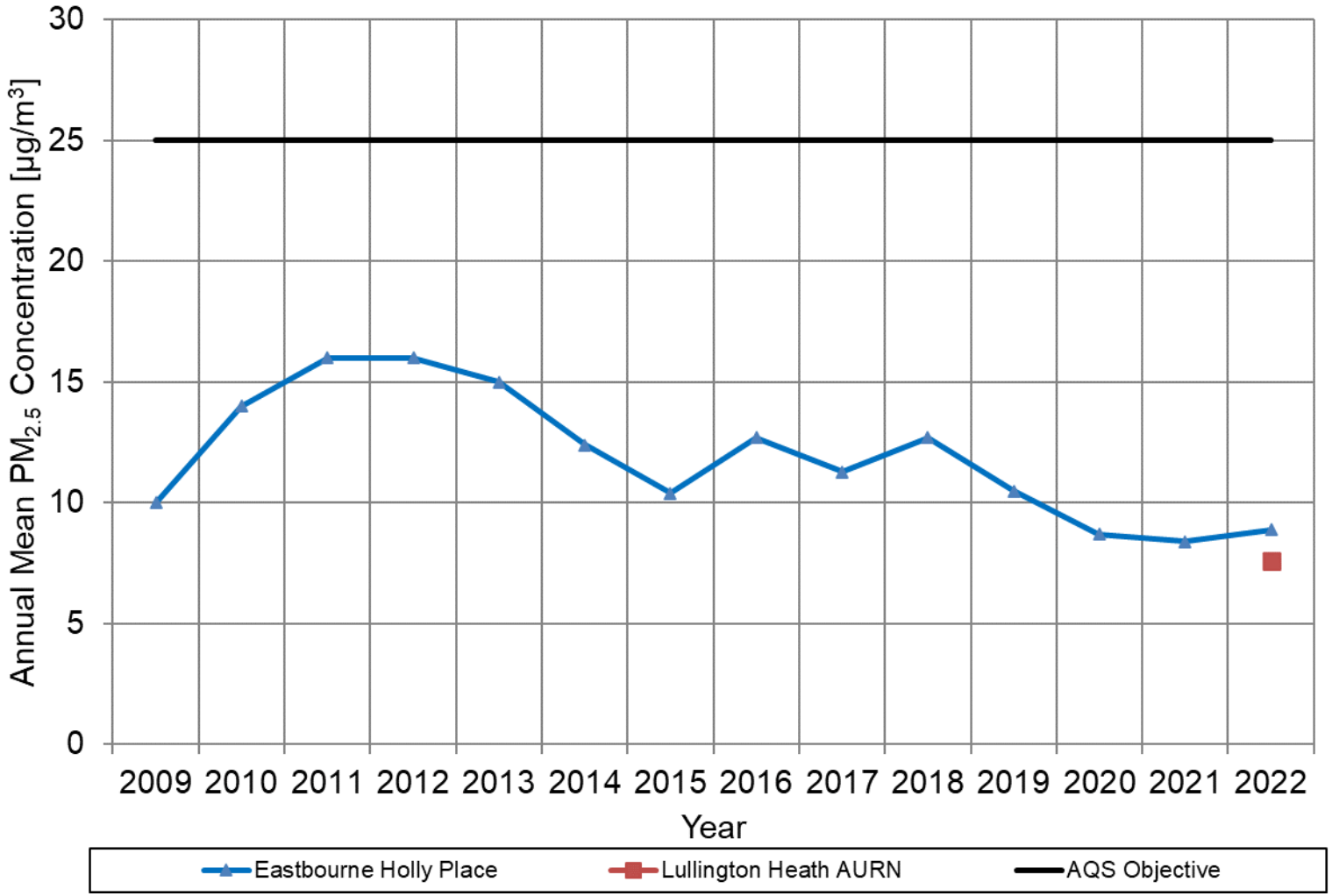


Table A.9 – SO_2 2022 Monitoring Results, Number of Relevant Instances

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2022 (%) (2)	Number of 15-minute Means > 266µg/m³	Number of 1-hour Means > 350µg/m³	Number of 24-hour Means > 125µg/m³
LL1	553855	101740	Rural	84.9	84.9	0 (8.5)	0 (7.6)	0 (7.2)

Notes:

Results are presented as the number of instances where monitored concentrations are greater than the objective concentration.

Exceedances of the SO_2 objectives are shown in **bold** (15-min mean = 35 allowed a year, 1-hour mean = 24 allowed a year, 24-hour mean = 3 allowed a year).

If the period of valid data is less than 85%, the relevant percentiles are 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.10 – Annual Mean O_3 2022 Monitoring Results (µg/m^3)

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2021 (%) (2)	2018	2019	2020	2021	2022
AR2	553855	101740	Rural	-	-	53.2	45.2	52.1	-	-
LL1	544890	117380	Rural	95.5	95.5	61.1	61.4	65.4	58.3	61.6

Notes:

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

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

(3) Isfield automatic monitoring site (AR2) was decommissioned at the end of 2020.

Figure A.6 – Trends in Annual Mean O_3 Concentrations

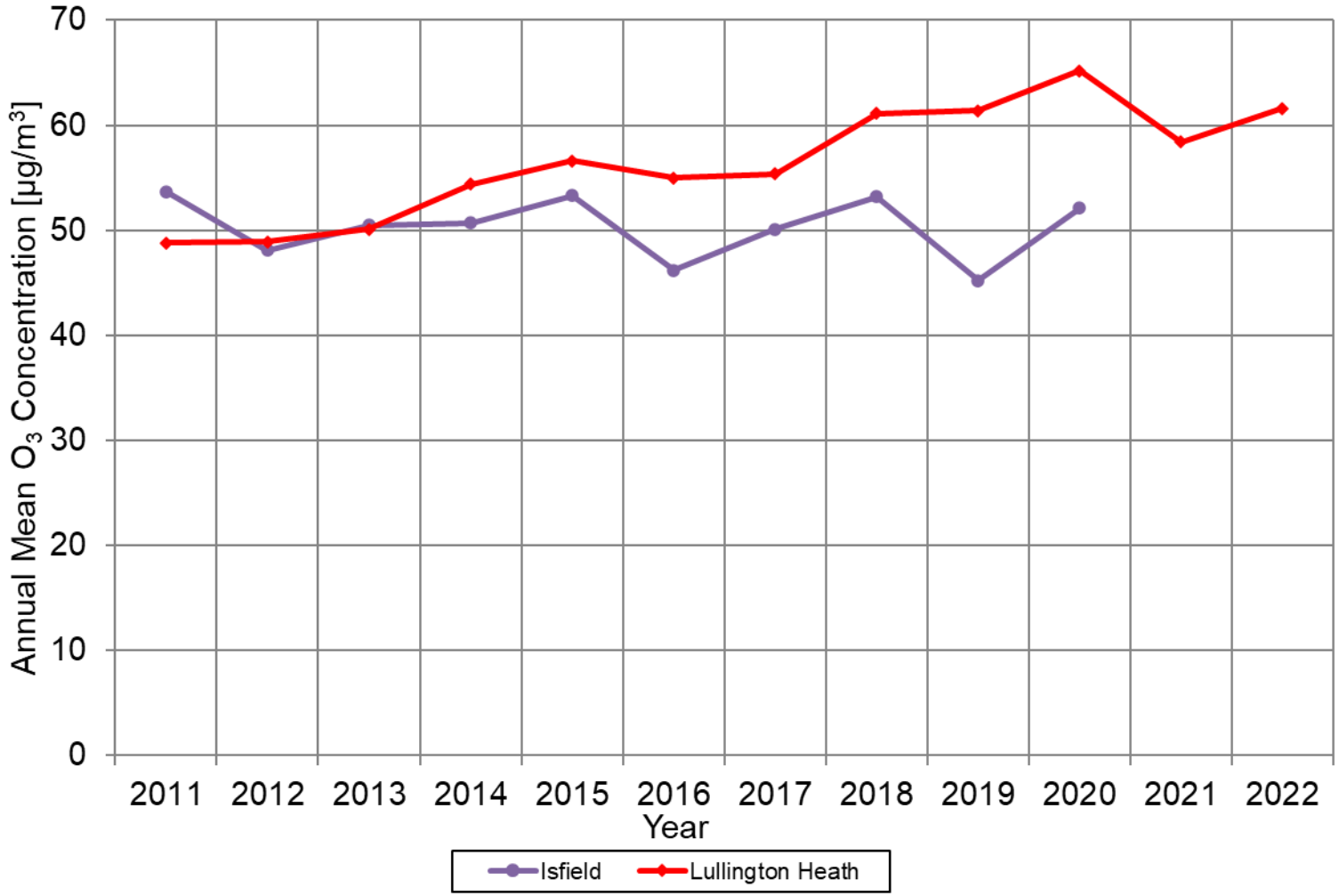


Table A.11 – Running 8-Hour Mean O_3 2022 Monitoring Results

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)	2018	2019	2020	2021	2022
AR2	553855	101740	Rural	-	-	**19**	7	**21**	**-**	**-**
LL1	544890	117380	Rural	89.8	89.8	**13**	**10**	**39**	**15**	**30**

Notes:

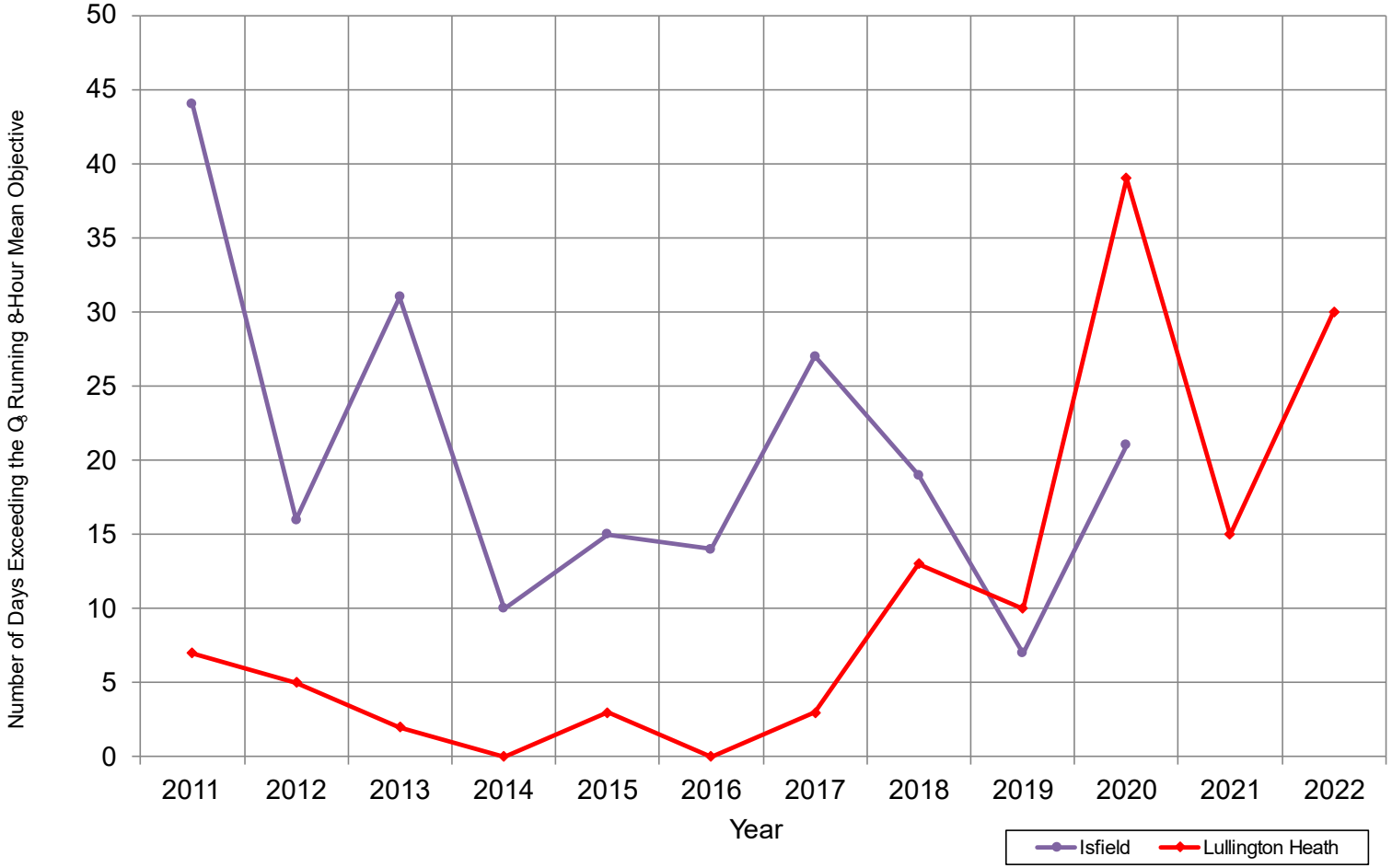
Exceedances of the O_3 running 8-hour mean AQS objective (100 µg/m^3 not to be exceeded more than 10 days/year) are shown in **bold**.

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

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

(3) Isfield automatic monitoring site (AR2) was decommissioned at the end of 2020.

Figure A.7 – Trends in Number of Days Exceeding the Running 8-Hour Mean O_3 AQS Objective



Appendix B: Full Monthly Diffusion Tube Results for 2022

Table B.1 – NO_2 2022 Diffusion Tube Results (µg/m³)

DT ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean: Raw Data	Annual Mean: Annualised and Bias Adjusted (0.83)	Annual Mean: Distance Corrected to Nearest Exposure	Comment
W1	552591	130667	16.2	10.9	14.0	10.0	8.1	6.9	8.1	8.7	9.9	10.3	13.3	18.7	11.3	9.3	-	
W2	551626	131090	26.9		20.3	16.8	14.4	14.2	15.9	15.6	15.8	17.5	19.7	25.4	18.4	15.3	-	
W3	547828	121954	20.5	11.8	13.5	10.7	8.1	7.7	7.6	8.9	11.6	10.9	14.7	19.8	12.2	10.1	-	
W4	547250	120977		35.0	29.0	29.1	29.9			28.7	35.9		35.4	36.2	32.4	26.2	-	
W5	558079	104481	39.0	21.6	32.3	26.9	27.2	24.1	27.9	27.2	29.1	26.9	28.3	32.5	28.6	23.7	-	
W6	558845	109783	31.9	20.4	31.2	23.0	19.3	19.4	23.1	22.2	24.9	23.8	25.9	30.4	24.6	20.4	-	
W7	557503	121318	25.0	16.0	18.8	14.6	12.0	10.5	12.6	12.1	13.8	14.4			15.0	12.4	-	
W8	556933	111165	36.8	26.1	29.7	26.1	23.7	23.1	28.3	28.8	31.1	25.8	28.1	9.4	26.4	21.9	-	
W9	542336	135324	12.6	8.0	11.3	8.3	6.2	5.5	6.5	7.3	8.2	7.6	9.6	14.3	8.8	7.3	-	
W10	542464	135279	36.3	32.3		21.8	25.7	27.0	26.5	23.3	29.8	29.0	33.0	32.4	28.8	23.9	-	
W11	558024	111237	21.6	16.3	18.7	13.5	11.3	10.3	13.0	14.4	16.7	13.6	16.6	22.0	15.7	13.0	-	
W12	558892	109272	34.6	24.4	24.1	22.1	21.5	19.8	19.0	20.4	22.9	23.6	26.0	27.9	23.9	19.8	-	
W13	561558	104356	38.9	22.6	34.3	23.5	22.6	20.5	21.7	24.3		39.7		33.1	28.1	23.3	-	
W14	560501	104629	31.7	20.9	26.5	21.1	20.4	18.6	22.8	23.1	24.5	22.2	24.1	28.4	23.7	19.6	-	
W15	564050	131792	28.3	14.1	22.6	16.5	14.0	13.3	15.3	18.0	19.5	16.1	16.5	24.2	18.2	15.1	-	
W16	563788	131694	12.8	7.1	10.5	8.0	6.3	5.0	6.7	6.8	7.9	6.2	6.7	14.1	8.2	6.8	-	

☒ **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.**

☒ **WDC confirm that all 2022 diffusion tube data has been uploaded to the Diffusion Tube Data Entry System.**

Notes:

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

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

See Appendix C for details on bias adjustment and annualisation.

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

New or Changed Sources Identified Within WDC During 2022

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

Additional Air Quality Works Undertaken by WDC During 2022

WDC has not completed any additional works within the reporting year of 2022 year relating to the development of action plan measures or the declaration, amendment or revocation of an AQMA.

QA/QC of Diffusion Tube Monitoring

AIR is an independent analytical proficiency-testing (PT) scheme, operated by LGC Standards and supported by the Health and Safety Laboratory (HSL). AIR PT is a new scheme, started in April 2014, which combines two long running PT schemes: LGC Standards STACKS PT scheme and HSL Workplace Analysis Scheme for Proficiency (WASP) PT scheme.

Defra and the Devolved Administrations advise that diffusion tubes used for Local Air Quality Management should be obtained from laboratories that have demonstrated satisfactory performance in the AIR PT scheme.

WDC used Gradko International for the supply and analysis of diffusion tubes, with a 20% triethanolamine (TEA) in water preparation.

The percentage of results submitted by Gradko International Ltd that were subsequently determined to be satisfactory was 100% for AIR-PT Round AR050 (May – June 2022). These scores should be taken into account when interpreting the data.

All monitoring has been completed in adherence with the 2022 Diffusion Tube Monitoring Calendar.

Diffusion Tube Annualisation

In 2022, there was one diffusion tube monitoring location that required annualisation, W4 (Uckfield Town Centre) which had a data capture of 67.3%. The details of the calculations are presented in Table C.1.

All the other diffusion tube monitoring locations within WDC recorded data capture of at least 75%, therefore it was not required to annualise any monitoring data. In addition, any sites with a data capture below 25% do not require annualisation.

Table C.1 – Diffusion Tube Annualisation Summary (concentrations presented in µg/m^3)

Site ID	Annualisation Factor EB Devonshire Park	Annualisation Factor Brighton Preston Park	Average Annualisation Factor	Raw Data Annual Mean	Annualised Annual Mean
W4	0.9508	0.9988	0.9748	32.4	31.6

Diffusion Tube Bias Adjustment Factors

The diffusion tube data presented within the 2022 ASR have been corrected for bias using an adjustment factor. Bias represents the overall tendency of the diffusion tubes to under or over-read relative to the reference chemiluminescence analyser. LAQM.TG22 provides guidance with regard to the application of a bias adjustment factor to correct diffusion tube monitoring. Triplicate co-location studies can be used to determine a local bias factor based on the comparison of diffusion tube results with data taken from NO_x/NO_2 continuous analysers. Alternatively, the national database of diffusion tube co-location surveys provides bias factors for the relevant laboratory and preparation method.

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

WDC does not carry out a co-location study with diffusion tubes and an automatic continuous analyser, and so it is necessary to use the national database of bias adjustment factors (version 03/23, 27 studies).

Table C.2 – Bias Adjustment Factor

Monitoring Year	Local or National	If National, Version of National Spreadsheet	Adjustment Factor
2022	National	03/23	0.83
2021	National	03/22	0.84
2020	National	03/21	0.81
2019	National	03/20	0.93
2018	National	03/19	0.93

Figure C.1 – National Diffusion Tube Bias Adjustment Factor for WDC (Gradko)

National Diffusion Tube Bias Adjustment Factor Spreadsheet — Spreadsheet Version Number: 03/23

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 spreadhseet 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 2023
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: Select the Laboratory that Analyses Your Tubes from the Drop-Down List — If a laboratory is not shown, we have no data for this laboratory.

Step 2: Select a Preparation Method from the Drop-Down List — If a preparation method is not shown, we have no data for this method at this laboratory.

Step 3: Select a Year from the Drop-Down List — If a year is not shown, we have no data[2]

Step 4: 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 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 make your selection, choose [All] from the pop-up list)	Year[5] (To make 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[6]	Bias Adjustment Factor (A) (Cm/Dm)
Gradko	20% TEA in water	2022	R	Blackburn With Darwen Bc	12	26	19	35.0%	G	**0.74**
Gradko	20% TEA in water	2022	R	Gedling Borough Council	12	31	26	19.9%	G	**0.83**
Gradko	20% TEA in water	2022	R	Ards And North Down Borough Council	12	33	22	49.4%	G	**0.67**
Gradko	20% TEA in water	2022	R	Bath & North East Somerset	12	30	25	19.0%	G	**0.84**
Gradko	20% TEA in water	2022	R	Birmingham City Council	11	32	24	36.8%	G	**0.73**
Gradko	20% TEA in water	2022	UB	East Devon District Council	12	8	7	23.6%	G	**0.81**
Gradko	20% TEA in water	2022	R	Gateshead Council	11	23	20	14.2%	G	**0.88**
Gradko	20% TEA in water	2022	R	Gateshead Council	12	23	21	12.7%	G	**0.89**
Gradko	20% TEA in water	2022	R	Gateshead Council	12	25	23	10.1%	G	**0.91**
Gradko	20% TEA in water	2022	R	Gateshead Council	11	30	23	29.0%	G	**0.77**
Gradko	20% TEA in water	2022	R	Gateshead Council	9	31	36	-14.0%	G	**1.16**
Gradko	20% TEA in Water	2022	R	Lisburn & Castlereagh City Council	12	24	19	23.7%	G	**0.81**
Gradko	20% TEA in Water	2022	R	Monmouthshire County Council	12	35	28	23.8%	G	**0.81**
Gradko	20% TEA in water	2022	KS	Marylebone Road Intercomparison	12	52	42	22.8%	G	**0.81**
Gradko	20% TEA in Water	2022	UB	Plymouth City Council	12	18	18	3.2%	G	**0.97**
Gradko	20% TEA in water	2022	UC	Belfast City Council	12	26	20	30.7%	G	**0.76**
Gradko	20% TEA in water	2022	R	Belfast City Council	12	47	36	28.1%	G	**0.78**
Gradko	20% TEA in water	2022	R	Belfast City Council	12	25	22	14.0%	G	**0.88**
Gradko	20% TEA in water	2022	R	Belfast City Council	12	36	28	29.0%	G	**0.78**
Gradko	20% TEA in water	2022	R	Brighton & Hove City Council	10	37	23	62.8%	G	**0.61**
Gradko	20% TEA in water	2022	UB	Hertsmere Borough Council	12	16	15	7.1%	G	**0.93**
Gradko	20% TEA in water	2022	R	Southampton City Council	12	36	28	30.6%	G	**0.77**
Gradko	20% TEA in water	2022	UC	Southampton City Council	12	28	24	15.4%	G	**0.87**
Gradko	20% TEA in water	2022	R	Southampton City Council	12	34	31	8.4%	G	**0.92**
Gradko	20% TEA in water	2022	R	Worcestershire	11	13	12	4.2%	G	**0.96**
Gradko	20% TEA in water	2022	R	Lancaster City Council	13	34	27	25.8%	G	**0.79**
Gradko	20% TEA in water	2022	R	Lancaster City Council	12	28	24	15.2%	G	**0.87**
Gradko	20% TEA in water	2022		**Overall Factor[3] (27 studies)**				**Use**		**0.83**

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~~Table B.1~~.

QA/QC of Automatic Monitoring

As previously described in Section 3.1, monitoring stations within East Sussex are part of the SAQMN and, therefore, measurements made at these sites are traceable to national standards and operational procedures defined for the regional network. AURN sites such as Lullington Heath and Holly Place are managed by Defra contractors and data collected at these sites are traceable to the UK AURN national standards.

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

The PM_{10} data from the FDMS and FIDAS continuous analysers at Eastbourne Devonshire Park (EB1) and Eastbourne Holly Park (EB3) measure gravimetric-equivalent PM_{10} concentrations, and therefore no additional adjustment has been necessary.

Automatic Monitoring Annualisation

In 2022, both PM_{10} and $PM_{2.5}$ analysers at Lullington Heath (LL1) were installed in June and therefore required annualisation as both monitors only had a data capture of 58.2%. The sites used and details of calculation are presented in Table C.3 and Table C.4.

Table C.3 – Automatic Monitoring Annualisation Summary PM_{10} (concentrations presented in µg/m^3)

Site ID	Annualisation Factor EB Devonshire Park	Annualisation Factor EB Holly Place	Average Annualisation Factor	Raw Data Annual Mean	Annualised Annual Mean
W4	1.1168	1.1301	1.1234	10.9	12.3

Table C.4 – Automatic Monitoring Annualisation Summary $PM_{2.5}$ (concentrations presented in µg/m^3)

Site ID	Annualisation Factor EB Holly Place	Annualisation Factor Brighton Preston Park	Average Annualisation Factor	Raw Data Annual Mean	Annualised Annual Mean
W4	1.2374	1.2111	1.2242	6.20	7.62

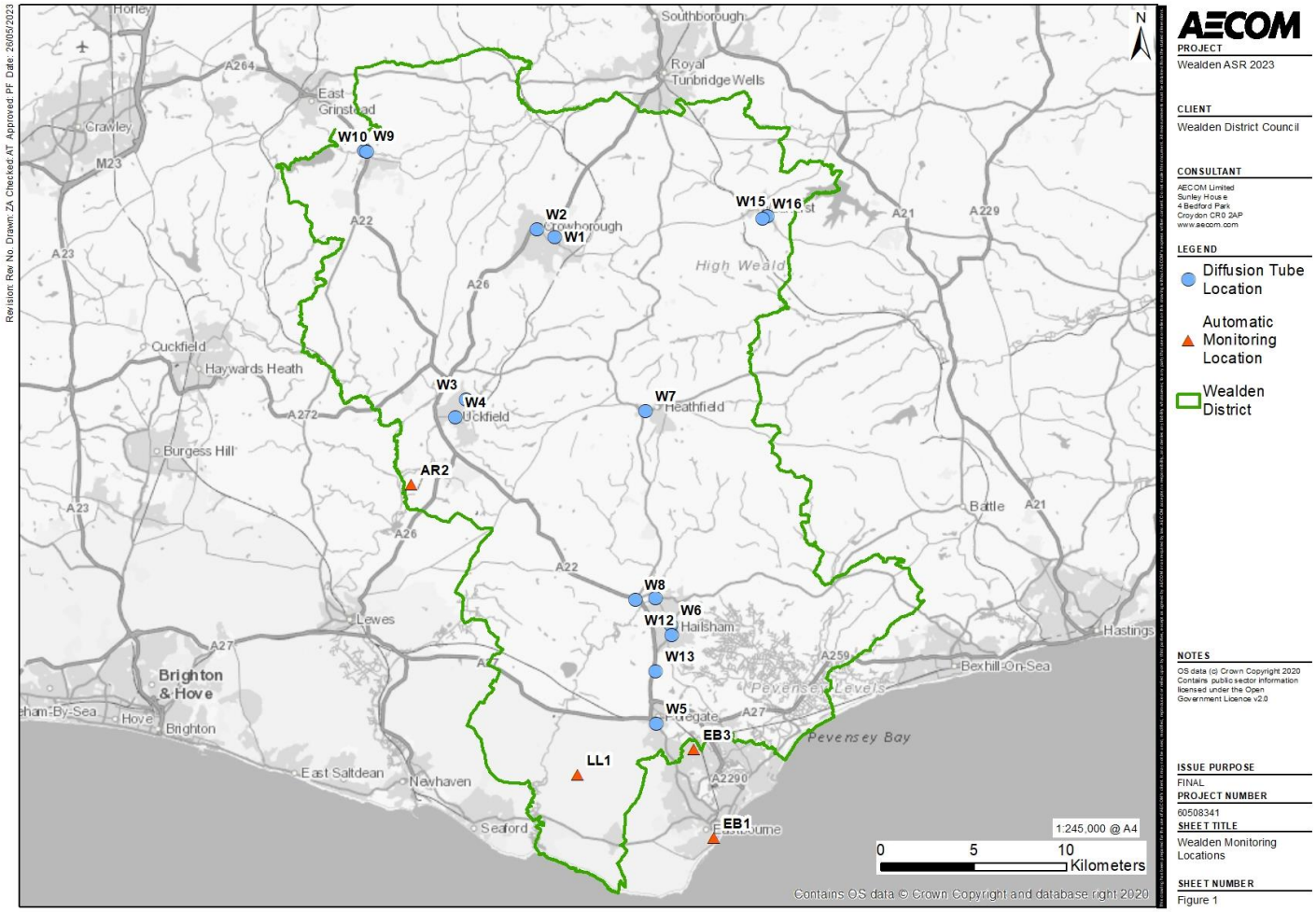
NO_2 Fall-off with Distance from the Road

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

No NO_2 monitoring locations within WDC required distance correction during 2022, as all concentrations were less than 36 µg/m^3.

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

Figure D.1 – Map of Monitoring Sites



Appendix E: Summary of Air Quality Objectives in England

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

Pollutant	Air Quality Objective: Concentration	Air Quality Objective: Measured as
Nitrogen Dioxide (NO_2)	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

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

Glossary of Terms

Abbreviation	Description
AONB	Area of Outstanding Natural Beauty
AQAP	Air Quality Action Plan - A detailed description of measures, outcomes, achievement dates and implementation methods, showing how the local authority intends to achieve air quality limit values'
AQMA	Air Quality Management Area – An area where air pollutant concentrations exceed / are likely to exceed the relevant air quality objectives. AQMAs are declared for specific pollutants and objectives
ASR	Annual Status Report
AURN	Automatic Urban and Rural Network
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
O_3	Ozone
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
SAC	Special Area of Conservation
SAQMN	Sussex Air Quality Monitoring Network
SO_2	Sulphur Dioxide
SPA	Special Protection Area

References

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- LGC (2019) Summary of Laboratory Performance in AIR NO2 Proficiency Testing Scheme (January 2019 – June 2022) Available at: WASP – Annual Performance Criteria for NO2 Diffusion Tubes (defra.gov.uk)