2021 Air Quality Annual Status Report (ASR)

In fulfilment of Part IV of the Environment Act 1995

Local Air Quality Management

April 2022

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Please note, this report has not been appraised by DEFRA.

Executive Summary: Air Quality in Our Area

Air Quality in Babergh and Mid Suffolk

Air pollution is associated with several 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 ages[3], with a total estimated healthcare cost to the NHS and social care of £157 million in 2017[4].

The Babergh and Mid Suffolk districts are predominantly rural, with a few small market towns. Most of the non-residential area is used for agricultural activity.

Industrial activity in the districts is light in nature with very few large industrial processes. As such, industry has relatively little impact on air quality. No new sources of significant industrial emissions began operation in 2020. Planning applications for industrial uses, such as combustion engines associated with standby electricity generators and a large distribution warehouse were assessed, but no significant emissions were predicted.

The main transport routes within the districts are the railway between London and Norwich, and the A12, A14 and A140 roads; none of which have previously been found to be of significance to air quality. No significant changes have been made to transport routes within either district during 2020.

Within the Babergh and Mid Suffolk districts, the main air pollutant of concern is Nitrogen dioxide. The primary source of Nitrogen dioxide within the districts is emissions from road

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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, July 2020

[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

transport. Monitoring is conducted to measure concentrations of Nitrogen dioxide. This monitoring has shown that within specific areas of Cross Street, Sudbury (within the Babergh district), concentrations of Nitrogen dioxide have been higher than the health based annual mean air quality objective. As a result of the exceedances of the annual mean objective for Nitrogen dioxide, an Air Quality Management Area (AQMA) was designated in 2008 for a section of Cross Street, Sudbury. Further information about the AQMA can be found at

https://uk-air.defra.gov.uk/aqma/details?aqma_ref=635. This is the only AQMA within the Babergh district, and there are no AQMAs within the Mid Suffolk district.

The exceedances of the objective at locations on Cross Street are because of emissions from road transport, local highways design and local topography. In January 2020, two sets of on-street parking bays were removed from Cross Street, under an Experimental Traffic Regulation Order (TRO), which was the principle action of the Air Quality Action Plan. This meant that traffic could flow freely in both lanes, rather than being forced into one lane to overtake the vehicles parked in the bays. The photographs below show the difference.

Photograph 1: Traffic passes the parking bays by entering the northbound lane

Photograph 2: Without the bays, traffic no longer needs to enter the northbound lane

Traffic travelling southbound no longer has to enter the northbound lane. Furthermore, vehicles do not have to queue to pass parked vehicles, with the associated braking, idling, and accelerating. These were all matters that were thought to be leading to elevated Nitrogen dioxide concentrations at properties on the west of Cross Street.

The intention was for the Experimental TRO to be in place for 18 months, during which the results for the 2020 calendar year would be analysed and this would influence whether the TRO is made permanent. However, due to the Covid-19 pandemic, traffic flows were lower than usual during 2020. Therefore, although Nitrogen dioxide concentrations have fallen on Cross Street during 2020, it is not possible to quantify the impact of the lower traffic volumes compared to the removal of the on-street parking bays. This is discussed further in Appendix F.

During 2020, there were no exceedances of the objective in the Babergh or Mid Suffolk districts. The three highest annual mean results were at the three locations that have previously exceeded the objective. However, there was a significant reduction in concentration in 2020. This brings the mean at these three locations down to a similar concentration to the mean of the other monitoring locations within the AQMA. These

results indicate that due to removing the on-street parking bays, the Nitrogen dioxide concentrations on the two sides of Cross Street are much more similar.

The AQMA must remain in force until further data is gathered to show the impact of removing the on-street parking bays and the longer-term traffic flows. It will not be amended in any way now.

In 2019, in response to increased traffic being monitored through the village of Sproughton (within the Babergh district), the Council expanded its Nitrogen dioxide diffusion tube monitoring to assess the air quality in the vicinity of the 'Wild Man Junction' (B1113 Lorraine Way and Lower Street, Sproughton). Monitoring commenced in June 2019 and stopped in May 2020. The data from the seven months of 2019 showed that Nitrogen dioxide concentrations were below the annual mean objective. This has continued to be the case in 2020. The results are significantly below the objective, and most of the monitoring period was before the Covid-19 pandemic led to reduced traffic flows. Therefore, it can be concluded that the objective is not exceeded in this location and further monitoring is not required.

At other monitoring locations within the Babergh district but outside the AQMA, results over the last five years have shown a gradual reduction, and then a more significant reduction between 2019 and 2020. No exceedances of the objective were recorded outside the AQMA in 2020.

Monitoring in the Mid Suffolk district has not historically shown exceedances of the objective at relevant exposure, (for example residential properties, schools, hospitals, care homes), and there are no designated AQMAs. This remains true for 2020. The monitoring locations show average reductions of Nitrogen dioxide concentrations of 23% between 2019 and 2020.

It appears that the results in Babergh and Mid Suffolk are in line with national trends, as they have been heavily influenced by the reduced traffic flows during 2020. Appendix F provides more details about the impact of the Covid-19 pandemic on air quality.

In addition to the above monitoring, Babergh and Mid Suffolk District Councils are working with Suffolk County Council to implement a range of policies and strategies that have a

positive impact on air quality. This includes actions within Suffolk County Council's Transport Strategy relating to sustainable planning developments[5].

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 Strategy[6] sets out the case for action, with goals even more ambitious than EU requirements to reduce exposure to harmful pollutants. The Road to Zero[7] 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 AQMAs are designated due to elevated concentrations heavily influenced by transport emissions.

The key action during 2020 has been the implementation of the Experimental TRO on Cross Street, Sudbury, to reduce emissions in the AQMA. This was the main action in the Air Quality Action Plan (AQAP) that was predicted to reduce concentrations of Nitrogen dioxide. The Experimental TRO involved Officers from Babergh District Council and Suffolk County Council. Through this process, it has been learned that several factors must be co-ordinated to remove the parking bays in practice as well as on paper. For example, the road markings could not be amended until part way through January 2020, hence the impact will be assessed from February 2020. The process was an example of successful partnership working.

Babergh and Mid Suffolk District Councils continue to request Electric Vehicle charging points through the planning process for commercial and residential applications. These are now being delivered in new developments. The Councils installed one more double charger in one of their public car parks in 2020.

[5] Suffolk Local Transport Plan 2011 – 2031, Suffolk County Council

[6] Defra. Clean Air Strategy, 2019

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

Officers from the Environmental Protection Team have delivered presentations to primary schools relating to improving local air quality. These were well received, with encouraging input from the children.

Planning has begun for switching the Councils' refuse fleet to a biodiesel, Hydrotreated Vegetable Oil. This has significantly lower emissions of Nitrogen oxides and particulates than traditional fuel. The aim is to complete this switch in 2021.

The Councils declared a 'climate emergency' in 2019 and have started work to meet the objective of making the Councils carbon neutral by 2030. Many of the measures have the co-benefit of bringing about improvements in air quality.

Conclusions and Priorities

The significant trend is a reduction in measured Nitrogen dioxide across all diffusion tube locations. There were no exceedances of the objective at the monitoring locations in the Babergh or Mid Suffolk districts in 2020. However, as this is only the first year without exceedances in the AQMA, it is not appropriate to consider revoking it. Monitoring will continue in the same way in 2021, with no proposed changes to diffusion tube locations. It is hoped that a more definitive conclusion will be able to be drawn about the impact of removing the on-street parking bays in the AQMA compared to the reduction in traffic during 2020.

The priority for next year is assessing the impact of the Experimental TRO with the hope of making it permanent. Making the Experimental TRO permanent will require further effective work with Officers from Suffolk County Council. The AQAP will be updated once these conclusions have been made.

Local Engagement and How to get Involved

Proactive local engagement has been limited because of staff resources and the Covid-19 pandemic. However, Officers from the Environmental Protection Team have run air quality sessions at local primary schools, and Modeshift STARS - a national sustainable and active travel scheme, run here by Suffolk County Council - has positive interest at many schools.

As an individual there are many actions that you can take to improve the air quality and reduce air pollution. This will improve the quality of life for everyone, including you and your family. Below are a few suggestions of how to get involved:

- Use your car less. Try to walk, cycle, and use the bus or train. Cars are particularly polluting over short journeys, so aim to cut these out first.
- Reduce emissions from your car by ensuring it is regularly serviced and well maintained, you only carry the weight you need, and you drive in a gentle, steady manner.
- Consider purchasing an electric vehicle; the costs are always reducing, and the technology and infrastructure are now supporting this significant change in vehicle technology.
- When buying a traditional fuel vehicle consider the most fuel-efficient petrol vehicle and use cleaner alternative fuels where possible.
- Encourage your employer, school, or college to set up a Green Travel Plan.
- Car share, to reduce emissions and save money. Please see www.suffolkcarshare.com for details of a Suffolk wide scheme.
- Avoid having bonfires. If you do choose to have a fire, only burn dry garden waste, and avoid burning on days that already have high pollution levels.
- Avoid burning solid fuel. If you do choose to burn solid fuel, always ensure the appliance is well maintained and fuel is clean and dry.

For further information about how you can get involved, please see:

www.babergh.gov.uk/environment/air-quality/

www.midsuffolk.gov.uk/environment/air-quality/

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1 Local Air Quality Management

This report provides an overview of air quality in Babergh and Mid Suffolk during 2020. Babergh District Council and Mid Suffolk District Council are two constitutionally separate local authorities with a shared officer structure. As such, this report is the combined Annual Status Report (ASR) for both districts. 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 ASR is an annual requirement showing the strategies employed by Babergh and Mid Suffolk District Councils 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

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 the AQMA declared by Babergh District Council can be found in Table 2.1. Appendix D: Maps of Monitoring Locations and AQMAs provides maps of the AQMA and of the air quality monitoring locations in relation to the AQMA. The air quality objective pertinent to the current AQMA designation is the Nitrogen dioxide (NO_2) annual mean.

Mid Suffolk District Council currently does not have any declared AQMAs.

Table 2.1 – Declared Air Quality Management Areas

AQMA Name	Date of Declaration	Pollutants and Air Quality Objectives	One Line Description	Is air quality in the AQMA influenced by roads controlled by Highways England?	Level of Exceedance: Declaration	Level of Exceedance: Current Year	Name and Date of AQAP Publication	Web Link to AQAP
Cross Street, Sudbury	Declared November 2008	NO2 Annual Mean	An area encompassing properties on Cross Street, with 5 and 90 at the northern boundary and 50 Cross Street and the junction with Church Street at the southern boundary.	NO	64.0 µg/m3	No exceedance. Highest concentration 32.8 µg/m3	Air Quality Action Plan: Babergh District Council - Cross Street, Sudbury AQMA, October 2011	Visit the AQAP for Cross Street, Sudbury AQMA https://www.babergh.gov.uk/assets/Environment/Air-Quality-Action-Plan.pdf

☒ **Babergh District Council confirm the information on UK-Air regarding their AQMA is up to date.**

☒ **Babergh District Council confirm that all current AQAPs have been submitted to Defra.**

Progress and Impact of Measures to address Air Quality in Babergh and Mid Suffolk

Last year's ASR was appraised by Defra, with the following comments (summarised) and how they are addressed in this report, where relevant –

- QA/QC procedures were carried out appropriately with mainly sufficient evidence.
- Annualisation has been performed as necessary but cannot be verified as the data and calculations used were not included – *addressed this year by use of DTDPT*.
- Distance correction has been performed with evidence provided.
- The report provides a good outline of the progress on measures to address air quality.
- The AQAP is out of date – *comments made below*.
- The conclusions reached are acceptable for all sources and pollutants.

Babergh and Mid Suffolk District Councils have taken forward several direct measures during the current reporting year of 2020 in pursuit of improving local air quality. Details of all measures completed, in progress or planned are set out in Table 2.2. Eleven measures are included within Table 2.2, with the type of measure and the progress Babergh and Mid Suffolk have made during the reporting year of 2020 presented. The first measure focuses on the AQMA, and others are related to the districts overall. Where there have been, or continue to be, barriers restricting the implementation of the measure, these are also presented within Table 2.2.

More detail on these measures can be found in the AQAP for the AQMA, the Carbon Reduction Management Plan, the Sustainable Travel Action Plan, and the Suffolk Local Transport Plan. Measure 1 is an action from the AQAP. As this has been implemented and may be sufficient to result in emissions not exceeding the objective, other actions from the AQAP have not been addressed. Therefore, information on other actions from the AQAP that has been submitted in previous ASR's is not repeated here.

Key completed measures are:

- The Experimental Traffic Regulation Order (TRO) within the AQMA on Cross Street, Sudbury was implemented in January 2020. This will be in place for 18 months. The first 6 months were a public consultation period, with no responses received.

- A double Electric Vehicle (EV) charging point was installed in a car park owned by Mid Suffolk District Council, adding to the number of charging points that have been installed by the Councils to expand the network.
- Air quality sessions were run at primary schools in early 2020 but have been restricted since then due to the Covid-19 pandemic and staff resources.
- Planning applications that may have an adverse impact on air quality have been assessed and mitigation recommended where necessary.
- The Suffolk Air Quality Group (SAQG, which the Councils are a member of) continued to meet, via Teams, to share knowledge and liaise with other bodies such as Public Health. It is likely that the Teams format will continue as it eliminates travel emissions and time. Anti-idling material produced by the SAQG is still circulated to primary school Junior Road Safety Officers, who may choose to educate their peers on this topic.

Babergh and Mid Suffolk District Councils expect the following measures to be completed over the course of the next reporting year:

- Monitoring of NO_2 concentrations within the Cross Street AQMA using diffusion tubes to assess the impact of the Experimental TRO once traffic flows return to pre pandemic levels.
- In conjunction with Suffolk County Council Highways Department, determining whether the Experimental TRO should be made permanent.
- Starting to revise the AQAP in light of the results of the Experimental TRO and whether this is made permanent.
- Continuing the project to run the Councils' refuse fleets on Hydrotreated Vegetable Oil (HVO).

Babergh District Council anticipates that the measures stated above and in Table 2.2 will achieve compliance with the objectives in the Cross Street, Sudbury AQMA. They will also lead to improvements in the air quality in other locations in the Babergh district and throughout the Mid Suffolk district. Therefore, the measures above are the priorities for the coming year as they focus on the AQMA. Regarding the refuse fleet project, this is a priority as it is a defined project with the potential for significant reductions in emissions.

The principal challenges and barriers to implementation that Babergh and Mid Suffolk District Councils anticipate facing are the legal processes involved in making the Experimental TRO permanent. There have been reduced traffic flows during this

experimental period which will have affected the results, so it may be difficult to justify a permanent Order.

Progress on the following measures has been slower than expected:

- Engagement with local schools has been slower due to the Covid-19 pandemic and staff resources.
- Proactive work regarding Particulate Matter emissions due to staff resources and changed priorities during the Covid-19 pandemic.
- Installation of EV charging points due to financial resources available.
- Engagement with businesses, particularly via the Environmental Permitting regime, has been limited by the Covid-19 pandemic.

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	Remove on-street parking bays within AQMA	Traffic Management	Other	2020	2021	SCC, BDC	SCC, BDC	NO	Funded	< £10k	Implementation	Maximum predicted reduction 9.7µg/m3 NO2	Measured concentration of NO2 within AQMA	Experimental Traffic Regulation Order was made January 2020 for 18 months	
2	Suffolk Guidance for Parking requires electric vehicle charging points	Policy Guidance and Development Control	Other policy	2019		SCC	Developers	NO	Not Funded		Implementation	Reduced vehicle emissions as encourages use of EV	Number of charging points and use of EV	Not possible to quantify impact of this specific policy	Guidance was implemented before 2019, but was last revised then. Ongoing action.
3	Suffolk car share	Alternatives to private vehicle use	Car & lift sharing schemes			SCC, Suffolk Climate Change Partnership - BDC and MSDC are members	SCC, Suffolk Climate Change Partnership - BDC and MSDC are members	NO	Funded	< £10k	Implementation	Reduced vehicle emissions	Number of participants in scheme	Over 3,000 members	Suffolk wide scheme, not possible to quantify benefit in one district. Unknown start date. Ongoing action.
4	Installation of EV charging points	Promoting Low Emission Transport	Procuring alternative Refuelling infrastructure to promote Low Emission Vehicles, EV recharging, Gas fuel recharging	2017		LA	LA funds, Community Infrastructure Levy	NO	Partially Funded	£10k - 50k	Implementation	Reduced vehicle emissions as encourages use of EV	Number of points installed and their use	Seven points installed by the Councils including one rapid charger	LA funds and access to grants limit number of charging points
5	Responding to planning consultations regarding air quality impacts	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance			LA	LA	NO	Funded	£10k – 50k	Implementation	Potentially prevent unacceptable emissions or health effects	Number of consultations responded to within timeframe	Just over 100 planning consultations were responded to regarding air quality in 2020	An ongoing action, hence no dates
6	Councils' Green Travel Plan still available for those not working from home	Promoting Travel Alternatives	Workplace Travel Planning	2017		LA (SCC travel plan)	LA	NO	Funded	£10k - 50k	Implementation	Reduced vehicle emissions as alternative travel is encouraged	Use of alternative travel	Limited use due to Covid-19 pandemic, mainly home working, nationally discouraged from using public transport	Suffolk wide scheme, not possible to quantify benefit in one district. Ongoing.

7	The Suffolk Air Quality Group shares knowledge and liaises with other bodies	Policy Guidance and Development Control	Regional Groups Co-ordinating programmes to develop Area wide Strategies to reduce emissions and improve air quality			LA across Suffolk, SCC, Public Health, Health Protection Agency	LA	NO	Funded	< £10k	Implementation	Reduced emissions, improved awareness of air quality	Development of policies, strategies, projects	Continued good links, knowledge sharing, improved links with Public Health	Staff resources limit school engagement. An ongoing activity, hence no dates.
8	Officers at both Councils were increasingly working from home pre Covid-19	Promoting Travel Alternatives	Encourage / Facilitate home-working	2015		LA		NO			Implementation	Reduced vehicle emissions from reduced journeys	Number of officers working from home	Pre Covid-19, most officers whose jobs allows it worked from home on occasions. Now the vast majority do all the time.	Situation may change over time depending on the Covid-19 pandemic. Ongoing.
9	Council websites encourage car sharing, walking, cycling, promotes effective burning	Public Information	Via the Internet			LA	LA	NO	Funded	< £10k	Implementation	Reduced vehicle emissions, reduced emissions from burning		Cannot quantify	Council website is unlikely to be where people would search for such information
10	Council pool cars are EV	Promoting Low Emission Transport	Company Vehicle Procurement - Prioritising uptake of low emission vehicles	2017	2019	LA	LA	NO	Funded	£100k - £500k	Completed	Reduced vehicle emissions	Miles driven in EV	All pool cars are electric	
11	Council refuse fleet is to run on HVO	Promoting Low Emission Transport	Company Vehicle Procurement - Prioritising uptake of low emission vehicles	2020	2021	LA	LA	NO	Partially Funded	£100k - £500k	Planning	TBC later into planning phase	TBC later into planning phase	Initial research and approval in principle of the switch	

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

As detailed in 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.

Babergh and Mid Suffolk District Councils are taking the following measures to address reducing $PM_{2.5}$:

- The SAQG has continued to engage with Suffolk County Council Public Health regarding $PM_{2.5}$. The Joint Strategic Needs Assessment now includes a chapter on Air Quality in Suffolk[8], drawing attention to $PM_{2.5}$ to a wider audience.
- Residents are encouraged to use the green waste collection service or household waste recycling centres rather than burning garden waste.
- The Environmental Protection Team recommends planning conditions regarding the control of $PM_{2.5}$, for example by compliance with a construction management plan.
- The air quality sessions run at schools educated the children on the health risks of indoor burning and the impact it has on indoor air quality.
- The Councils' Carbon Reduction Management Plan was approved in July 2020, and some measures reduce PM emissions, in addition to carbon.
- The Sustainability Officers installed a double EV charger in a Council owned car park in Eye (in the Mid Suffolk district) in 2020. Providing EV charging points encourages the uptake of EV's and reduces PM emissions from traditional fuel vehicles.
- The principle of creating a joint Sustainable Travel Action Plan was approved by both Councils in 2020. This will reduce PM emissions from traditional fuel vehicles.

[8] Joint Strategic Needs Assessment, www.healthysuffolk.org.uk/jsna/state-of-suffolk-report/sos19-how-we-sustain-suffolk

Within the Babergh and Mid Suffolk districts, the fraction of mortality attributable to particulate air pollution is 5.6% for both districts[9]. This is very similar to the average figure for the East of England Region (5.8%), and the same as the England average of 5.6%[9]. Please note, this data has been calculated by a new method, and previous years data are therefore different from the figures reported in the ASR at that time.

All measures taken that reduce $PM_{2.5}$ have links to the Public Health Outcomes Framework, as they reduce the percentage of all-cause adult mortality attributable to anthropogenic particulate air pollution, which is measured as $PM_{2.5}$.

There are not any smoke control areas in the Babergh or Mid Suffolk districts, and monitoring does not occur for PM_{10} or $PM_{2.5}$.

[9] Public Health Outcomes Framework, Health Protection, https://fingertips.phe.org.uk/profile/public-health-outcomes-framework

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

This section sets out the monitoring undertaken within 2020 by Babergh and Mid Suffolk District Councils and how it compares with the relevant air quality objectives. In addition, monitoring results are presented for a five-year period between 2016 and 2020 to allow monitoring trends to be identified and discussed.

Summary of Monitoring Undertaken

3.1.1 Automatic Monitoring Sites

Babergh and Mid Suffolk District Councils do not operate any automatic monitoring sites in the districts.

3.1.2 Non-Automatic Monitoring Sites

Babergh and Mid Suffolk District Councils undertook non-automatic (passive) monitoring of NO_2 at 17 sites during 2020: 15 within the Babergh district and 2 within the Mid Suffolk district. Table A.2 in Appendix A presents the details of the non-automatic sites.

Maps showing the location of the monitoring sites are provided in Appendix D. Further details on Quality Assurance/Quality Control (QA/QC) for the diffusion tubes, including bias adjustments and annualisation 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 (NO_2)

Table A.4 in Appendix A compares the ratified and adjusted monitored NO_2 annual mean concentrations for the past five years with the air quality objective of 40µg/m^3. Note that the concentration data presented represents the concentration at the location of the

monitoring site, following the application of bias adjustment and annualisation, as required (i.e. the values are exclusive of any consideration to fall-off with distance adjustment).

For diffusion tubes, the full 2020 dataset of monthly mean values is provided in Appendix B. It has not been necessary to distance correct any results, as only one location is not at relevant exposure, and the bias adjusted mean was below 36µg/m^3. At many monitoring locations, including all sites in the AQMA, two diffusion tubes are positioned close to each other to improve the accuracy of the results. The monthly results are presented with the highest result first for each monitoring location e.g. BDC 1a, and then the lower result e.g. BDC 1b, then the mean average e.g. BDC 1 mean.

The annual mean has not exceeded 60µg/m^3 at any monitoring location. Therefore, it is not considered likely that there will be an exceedance of the 1 hour mean objective at any location.

There were no exceedances of the air quality objective in 2020. Concentrations of NO_2 have reduced both within and outside of the AQMA. The reduction at some locations within the AQMA is thought to be due to the impact of the Experimental TRO, allowing traffic to flow freely along both sides of the road. There will also be an impact of reduced traffic flows during 2020 across all monitoring locations.

Figure A.1 shows the annual mean NO_2 concentration over the last five years at monitoring locations that exceeded the objective in 2019. It was thought that this was due to the effect of the on street parking bays, which are no longer in place. None of these locations exceeded the objective in 2020. Significant reductions of 16.4µg/m^3, 14.5µg/m^3 and 15.5µg/m^3 have been measured between 2019 and 2020 at these locations.

Figure A.2 shows the annual mean NO_2 concentration over the last five years at monitoring locations within the Babergh district that did not exceed the objective in 2019. None of these locations exceeded the objective in 2020. There is a maximum reduction of 8µg/m^3 (at BDC 6) between 2019 and 2020 at these locations. Monitoring locations BDC 14 and BDC 15 are not included in this figure as monitoring has only been conducted here for portions of two years and has now ceased.

Figure A.3 shows the annual mean NO_2 concentration over the last five years at all monitoring locations within the AQMA. All these locations are covered by figures A.1 or A.2, but figure A.3 draws together all data within the AQMA. The more significant reductions between 2019 and 2020 are at the locations that the Experimental TRO was expected to have a positive impact on. It is thought appropriate to maintain the current

boundary of the AQMA. If exceedances recur with increased traffic flows in the next few years, it will be important to address the area of Cross Street as a whole rather than just the locations showing an exceedance.

Figure A.4 shows the annual mean NO_2 concentration over the last five years at monitoring locations within the Mid Suffolk district. One of the locations (MSDC 1) is at a busy crossroad in a town and the other (MSDC 2) is close to the A14 for reference purposes. Both show a reduction between 2016 and 2020. However, it is more significant between 2019 and 2020 than between any other years, at 6.4µg/m^3 and 5.3µg/m^3.

There will not be changes to the AQMA until further data has been gathered. The monitoring locations will remain the same in Sudbury in 2021. It is hoped that the Experimental TRO will be made permanent in mid-2021, and the impact of this will continue to be assessed.

The two monitoring locations in Sproughton have shown that the objective is not exceeded at this location, despite increases in traffic over recent years. Monitoring ceased part way through 2020.

The monitoring locations in Mid Suffolk remain appropriate and will continue in 2021.

No new monitoring locations will be added in 2021.

3.1.4 Particulate Matter (PM_{10})

Babergh and Mid Suffolk District Councils do not monitor for this pollutant.

3.1.5 Particulate Matter ($PM_{2.5}$)

Babergh and Mid Suffolk District Councils do not monitor for this pollutant.

3.1.6 Sulphur Dioxide (SO_2)

Babergh and Mid Suffolk District Councils do not monitor for this pollutant.

Appendix A: Monitoring Results

Table A.1 – Details of Automatic Monitoring Sites

Babergh and Mid Suffolk District Councils do not undertake any automatic monitoring.

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)
BDC 1a, BDC 1b	9 Cross Street, Sudbury	Roadside	586848	241133	NO2	Yes - Cross Street	0.0	1.7	No	2.3
BDC 2a, BDC 2b	17 Cross Street, Sudbury	Roadside	586836	241089	NO2	Yes - Cross Street	0.0	2.1	No	2.3
BDC 3a, BDC 3b	30 Cross Street, Sudbury	Roadside	586808	241015	NO2	Yes - Cross Street	0.0	1.4	No	2.3
BDC 4a, BDC 4b	36 Cross Street, Sudbury	Roadside	586790	240944	NO2	No	0.0	1.5	No	2.3
BDC 5a, BDC 5b	58 Cross Street, Sudbury	Roadside	586798	241010	NO2	Yes - Cross Street	0.0	1.9	No	2.3
BDC 6a, BDC 6b	70 Cross Street, Sudbury	Roadside	586818	241068	NO2	Yes - Cross Street	0.0	1.5	No	2.3
BDC 7a, BDC 7b	78 Cross Street, Sudbury	Roadside	586829	241104	NO2	Yes - Cross Street	0.0	1.3	No	2.3
BDC 8a, BDC 8b	82 Cross Street, Sudbury	Roadside	586835	241123	NO2	Yes - Cross Street	0.0	1.6	No	2.2
BDC 9a, BDC 9b	87 Cross Street, Sudbury	Roadside	586842	241148	NO2	Yes - Cross Street	0.0	1.1	No	2.3
BDC 10	5 Ballingdon Street, Sudbury	Roadside	586721	240879	NO2	No	0.0	3.6	No	2.3
BDC 11	54 Church Street, Sudbury	Roadside	586930	241058	NO2	No	0.0	1.7	No	2.6
BDC 12	7 Gainsborough Street, Sudbury	Roadside	587253	241256	NO2	No	0.0	2.8	No	2.5
BDC 13	31 Friars Street, Sudbury	Roadside	587257	241110	NO2	No	0.0	2.9	No	2.3
BDC 14a, BDC 14b	1 High Street, Sproughton	Roadside	612257	244946	NO2	No	0.0	1.4	No	2.5
BDC 15a, BDC 15b	12 Lower Street, Sproughton	Roadside	612302	244922	NO2	No	0.0	1.4	No	2.5
MSDC 1a, MSDC 1b	Station Road West, Stowmarket	Roadside	604972	258745	NO2	No	0.0	2.2	No	2.3
MSDC 2	Cottage Farmhouse, Stowmarket	Roadside	606049	259307	NO2	No	4.0	15.7	No	1.9

Notes:

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

(2) N/A if not applicable.

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

Babergh and Mid Suffolk District Councils do not undertake any automatic monitoring.

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

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2020 (%) (2)	2016	2017	2018	2019	2020
BDC 1a, BDC 1b	586848	241133	Roadside	100	100.0	32.0	30.2	31.0	28.1	24.8
BDC 2a, BDC 2b	586836	241089	Roadside	100	100.0	32.8	30.7	30.3	28.7	27.1
BDC 3a, BDC 3b	586808	241015	Roadside	100	100.0	39.9	37.0	37.7	34.8	28.7
BDC 4a, BDC 4b	586790	240944	Roadside	100	100.0	30.7	28.8	30.6	29.4	22.0
BDC 5a, BDC 5b	586798	241010	Roadside	100	100.0	**40.9**	**41.3**	38.1	36.0	30.4
BDC 6a, BDC 6b	586818	241068	Roadside	100	100.0	36.7	34.5	34.0	31.2	23.2
BDC 7a, BDC 7b	586829	241104	Roadside	82.7	82.7	**53.7**	**52.7**	**51.4**	**47.5**	31.1
BDC 8a, BDC 8b	586835	241123	Roadside	90.7	90.7	**54.8**	**55.1**	**49.7**	**47.3**	32.8
BDC 9a, BDC 9b	586842	241148	Roadside	100	100.0	**52.7**	**54.5**	**46.3**	**47.0**	31.5
BDC 10	586721	240879	Roadside	100	100.0	33.4	30.6	29.4	27.6	23.7
BDC 11	586930	241058	Roadside	100	100.0	24.3	24.4	22.2	22.4	14.7
BDC 12	587253	241256	Roadside	82.4	82.4	31.5	31.3	29.8	28.0	22.5
BDC 13	587257	241110	Roadside	100	100.0	18.7	18.0	18.0	18.8	14.6
BDC 14a, BDC 14b	612257	244946	Roadside	100	40.4				31.7	22.2
BDC 15a, BDC 15b	612302	244922	Roadside	100	40.4				26.5	17.6
MSDC 1a, MSDC 1b	604972	258745	Roadside	100	100.0	36.1	35.8	30.8	31.2	24.8
MSDC 2	606049	259307	Roadside	100	100.0	24.2	22.2	22.2	21.4	16.1

☒ **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 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**.

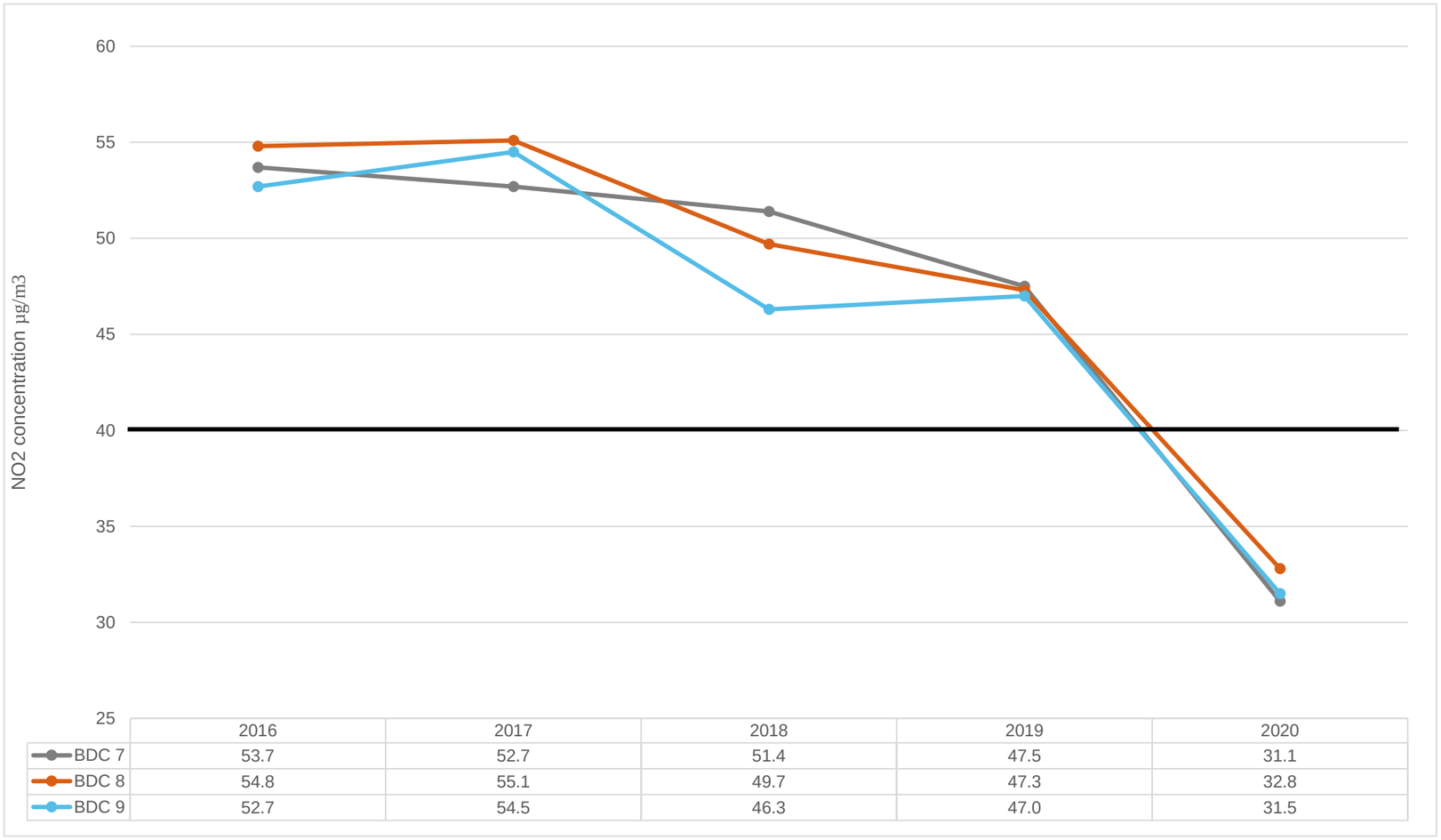
Means for diffusion tubes have been corrected for bias. All means have been "annualised" as per LAQM.TG16 if valid data capture for the full calendar year is less than 75%. See Appendix C for details.

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.

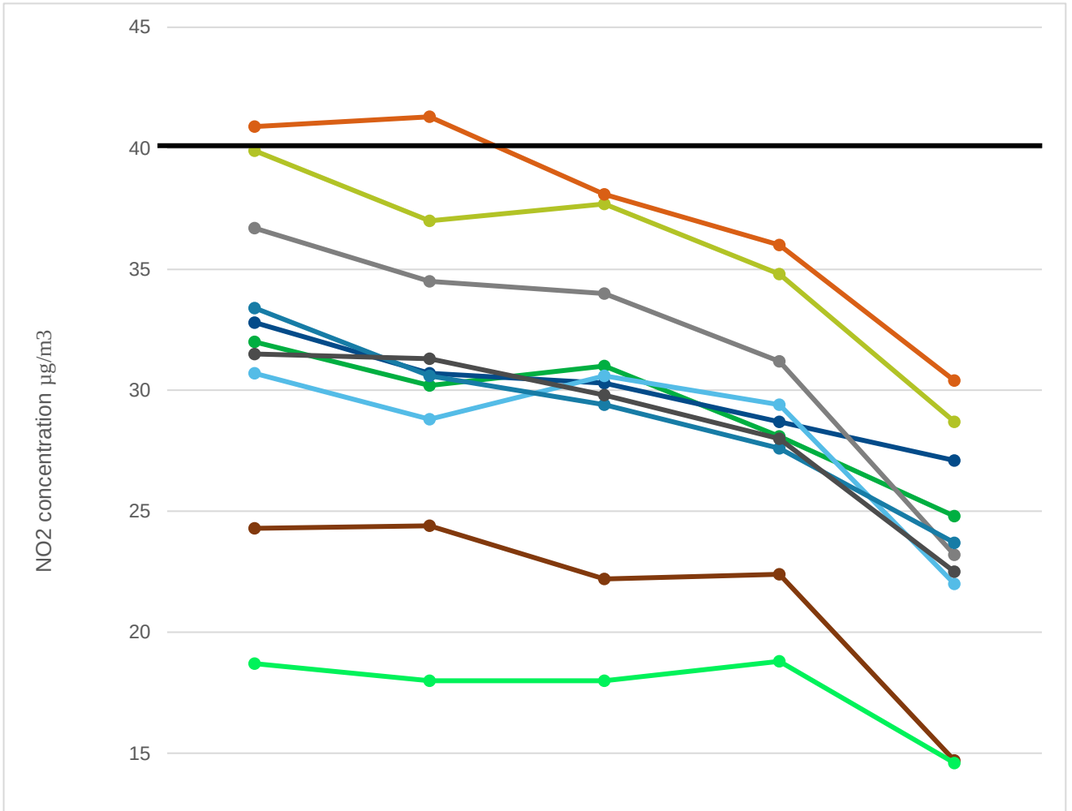
(2) Data capture for the full calendar year (e.g. if monitoring was carried out for 6 months, the maximum data capture for the full calendar year is 50%).

Figure A.1 – Trends in Annual Mean NO_2 Concentrations for Monitoring Locations in the Babergh district that Exceeded the Objective in 2019



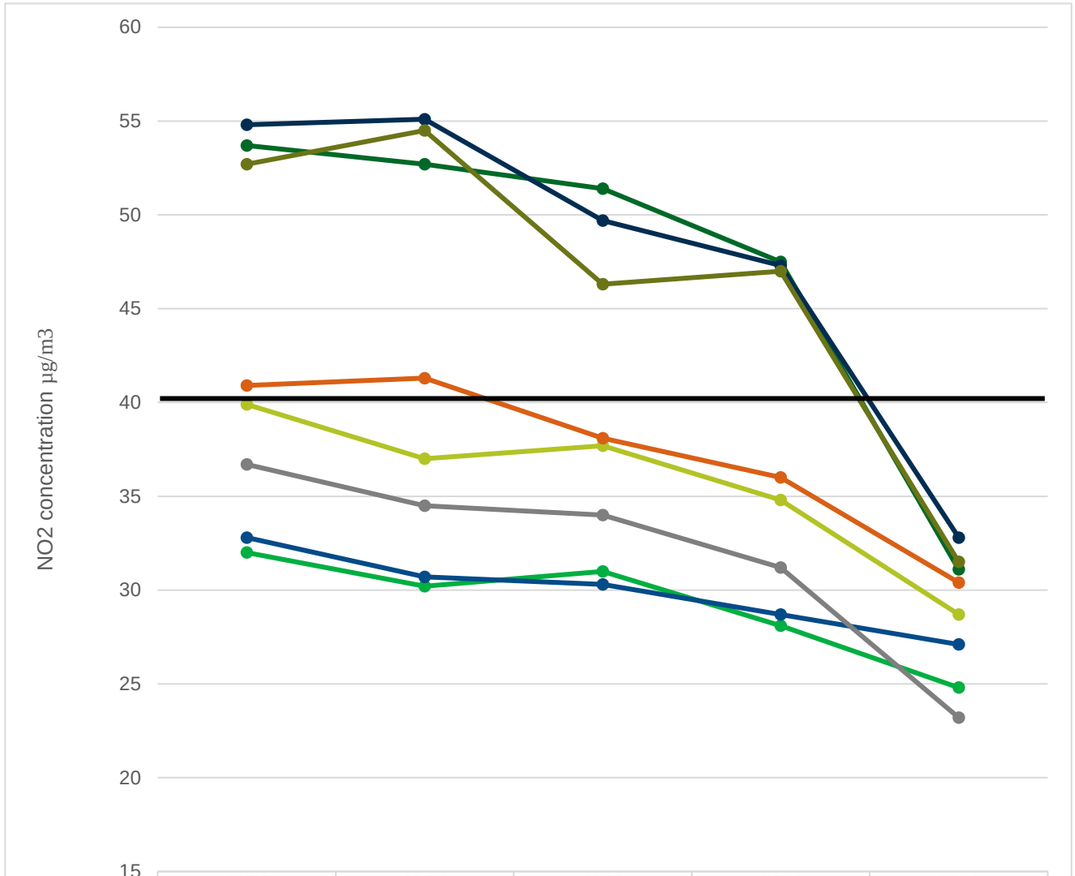
	2016	2017	2018	2019	2020
BDC 7	53.7	52.7	51.4	47.5	31.1
BDC 8	54.8	55.1	49.7	47.3	32.8
BDC 9	52.7	54.5	46.3	47.0	31.5

Figure A.2 – Trends in Annual Mean NO_2 Concentrations for Monitoring Locations in the Babergh district that did not Exceed the Objective in 2019



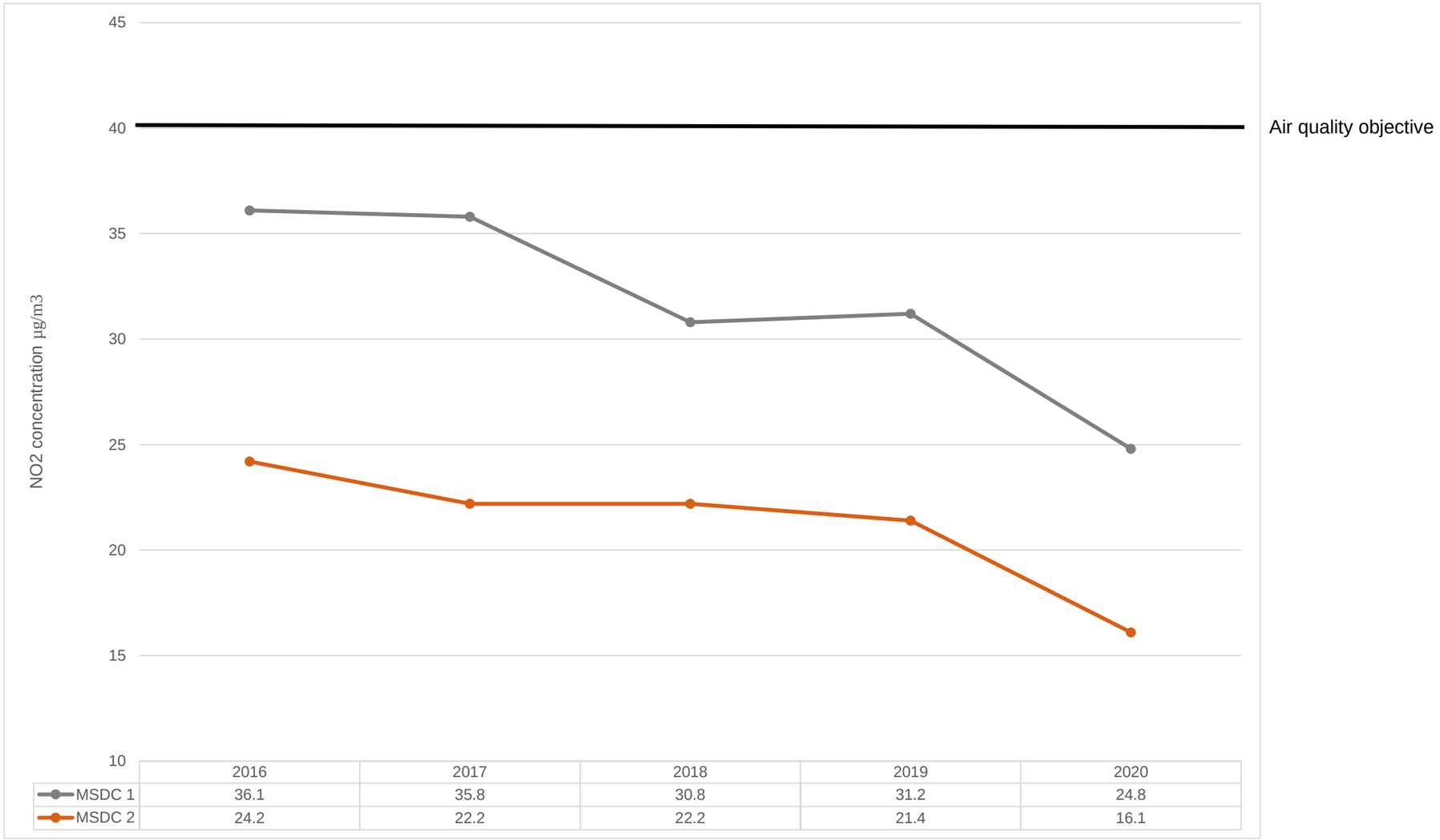
	2016	2017	2018	2019	2020
BDC 1	32	30.2	31	28.1	24.8
BDC 2	32.8	30.7	30.3	28.7	27.1
BDC 3	39.9	37	37.7	34.8	28.7
BDC 4	30.7	28.8	30.6	29.4	22.0
BDC 5	40.9	41.3	38.1	36.0	30.4
BDC 6	36.7	34.5	34	31.2	23.2
BDC 10	33.4	30.6	29.4	27.6	23.7
BDC 11	24.3	24.4	22.2	22.4	14.7
BDC 12	31.5	31.3	29.8	28.0	22.5
BDC 13	18.7	18	18	18.8	14.6

Figure A.3 – Trends in Annual Mean NO_2 Concentrations for Monitoring Locations within the AQMA



	2016	2017	2018	2019	2020
BDC 1	32	30.2	31	28.1	24.8
BDC 2	32.8	30.7	30.3	28.7	27.1
BDC 3	39.9	37	37.7	34.8	28.7
BDC 5	40.9	41.3	38.1	36.0	30.4
BDC 6	36.7	34.5	34	31.2	23.2
BDC 7	53.7	52.7	51.4	47.5	31.1
BDC 8	54.8	55.1	49.7	47.3	32.8
BDC 9	52.7	54.5	46.3	47.0	31.5

Figure A.4 – Trends in Annual Mean NO_2 Concentrations for Monitoring Locations in the Mid Suffolk district



	2016	2017	2018	2019	2020
MSDC 1	36.1	35.8	30.8	31.2	24.8
MSDC 2	24.2	22.2	22.2	21.4	16.1

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

Babergh and Mid Suffolk District Councils do not undertake any automatic monitoring.

Table A.6 – Annual Mean PM_{10} Monitoring Results (µg/m^3)

Babergh and Mid Suffolk District Councils do not undertake any automatic monitoring.

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

Babergh and Mid Suffolk District Councils do not undertake any automatic monitoring.

Table A.8 – Annual Mean $PM_{2.5}$ Monitoring Results (µg/m^3)

Babergh and Mid Suffolk District Councils do not undertake any automatic monitoring.

Table A.9 – SO_2 2020 Monitoring Results, Number of Relevant Instances

Babergh and Mid Suffolk District Councils do not undertake any automatic monitoring.

Appendix B: Full Monthly Diffusion Tube Results for 2020

Table B.1 – NO_2 2020 Diffusion Tube Results (µg/m^3)

DT ID	X OS Grid Ref Easting	Y OS Grid Ref Northing	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean: Raw Data	Annual Mean: Annualised and Bias Adjusted (0.76)	Annual Mean: Distance Corrected to Nearest Exposure	Comment
BDC 1a	586848	241133	38.7	33.9	27.6	27.7	26.8	34.1	25.4	38.7	37.1	36.1	42.8	36.1	-	-	-	Duplicate Site with BDC 1a and BDC 1b - Annual data provided for BDC 1b only
BDC 1b	586848	241133	38.4	31.8	27.2	26.0	26.1	33.6	25.2	33.6	32.5	34.4	35.8	33.3	32.6	24.8	-	Duplicate Site with BDC 1a and BDC 1b - Annual data provided for BDC 1b only
BDC 2a	586836	241089	42.5	32.3	31.8	29.2	30.5	37.8	31.6	42.3	39.9	38.3	41.5	37.2	-	-	-	Duplicate Site with BDC 2a and BDC 2b - Annual data provided for BDC 2b only
BDC 2b	586836	241089	39.2	31.8	31.5	28.9	29.0	37.2	31.0	41.7	36.7	37.9		36.0	35.7	27.1	-	Duplicate Site with BDC 2a and BDC 2b - Annual data provided for BDC 2b only
BDC 3a	586808	241015	43.9	39.1	39.1	31.8	31.9	41.5	31.6	48.5	37.2	40.4	42.9	38.0	-	-	-	Duplicate Site with BDC 3a and BDC 3b - Annual data provided for BDC 3b only
BDC 3b	586808	241015	38.3	37.1	32.1	30.5	31.7	36.7	31.4	48.3	37.1	39.8	40.7	37.4	37.8	28.7	-	Duplicate Site with BDC 3a and BDC 3b - Annual data provided for BDC 3b only
BDC 4a	586790	240944	41.0	32.2	25.7	19.5	19.0	27.7	20.2	37.5	29.9	32.6	37.5	34.5	-	-	-	Duplicate Site with BDC 4a and BDC 4b - Annual data provided for BDC 4b only
BDC 4b	586790	240944	40.1	31.1	20.9	18.7	16.4	27.3	18.5	36.2	27.8	30.6	35.6	34.1	28.9	22.0	-	Duplicate Site with BDC 4a and BDC 4b - Annual data provided for BDC 4b only
BDC 5a	586798	241010	50.4	42.6	38.9	27.6	34.6	37.8	38.9	48.2	47.8	43.4	46.5	39.8	-	-	-	Duplicate Site with BDC 5a and BDC 5b - Annual data provided for BDC 5b only
BDC 5b	586798	241010	48.3	38.1	36.2	25.5	32.3	37.1	36.4	41.1	44.7	41.8	42.9	38.4	40.0	30.4	-	Duplicate Site with BDC 5a and BDC 5b - Annual data provided for BDC 5b only
BDC 6a	586818	241068	36.8	28.8	28.7	23.7	25.9	32.2	28.5	40.8	33.7	29.7	35.4	32.4	-	-	-	Duplicate Site with BDC 6a and BDC 6b - Annual data provided for BDC 6b only
BDC 6b	586818	241068	36.4	26.2	27.9	21.4	25.8	31.4	25.9	38.3	31.9	29.4	32.6	30.3	30.6	23.2	-	Duplicate Site with BDC 6a and BDC 6b - Annual data provided for BDC 6b only
BDC 7a	586829	241104	59.9	40.9	35.9	27.8	36.1	41.3	45.1	54.1	46.3			39.2	-	-	-	Duplicate Site with BDC 7a and BDC 7b - Annual data provided for BDC 7b only
BDC 7b	586829	241104	50.4	37.6	35.2	26.9	34.7	39.6	39.3	49.9	44.1			34.8	41.0	31.1	-	Duplicate Site with BDC 7a and BDC 7b - Annual data provided for BDC 7b only
BDC 8a	586835	241123	54.1	53.2	37.6		38.8	40.2	43.5	51.5	46.3	44.4	46.6	47.5	-	-	-	Duplicate Site with BDC 8a and BDC 8b - Annual data provided for BDC 8b only
BDC 8b	586835	241123	53.4	44.2	33.7		33.1	38.8	39.7	45.6	44.1	41.4	44.8	27.9	43.2	32.8	-	Duplicate Site with BDC 8a and BDC 8b - Annual data provided for BDC 8b only
BDC 9a	586842	241148	62.1	48.3	37.1	28.9	34.8	39.0	46.0	43.6	43.1	47.8	47.4	42.6	-	-	-	Duplicate Site with BDC 9a and BDC 9b - Annual data provided for BDC 9b only
BDC 9b	586842	241148	52.9	46.8	36.1	28.2	32.1	36.4	39.5	38.8	33.5	45.1	44.8	39.6	41.4	31.5	-	Duplicate Site with BDC 9a and BDC 9b - Annual data provided for BDC 9b only
BDC 10	586721	240879	46.8	37.2	28.6	19.3	20.6	29.6	24.0	34.4	30.6	32.8	37.1	32.5	31.1	23.7	-	
BDC 11	586930	241058	31.9	26.3	17.1	10.1	9.6	11.5	11.6	19.4	19.5	24.8	26.7	23.1	19.3	14.7	-	
BDC 12	587253	241256	44.3	38.3	27.6	20.6	22.9			32.7	28.2	35.0	24.1	22.5	29.6	22.5	-	
BDC 13	587257	241110	24.9	20.9	15.8	13.0	10.2	13.8	9.1	18.3	16.2	17.5	36.9	34.2	19.2	14.6	-	
BDC 14a	612257	244946	39.9	33.2	26.4	26.8	22.0								-	-	-	Duplicate Site with BDC 14a and BDC 14b - Annual data provided for BDC 14b only
BDC 14b	612257	244946	38.6	29.7	26.0	23.8	22.0								28.8	22.2	-	Duplicate Site with BDC 14a and BDC 14b - Annual data provided for BDC 14b only
BDC 15a	612302	244922	36.0	29.3	23.5	17.2	16.3								-	-	-	Duplicate Site with BDC 15a and BDC 15b - Annual data provided for BDC 15b only

DT ID	X OS Grid Ref Easting	Y OS Grid Ref Northing	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean: Raw Data	Annual Mean: Annualised and Bias Adjusted (0.76)	Annual Mean: Distance Corrected to Nearest Exposure	Comment
BDC 15b	612302	244922	30.1	24.9	20.7	16.9	14.5								22.9	17.6	-	Duplicate Site with BDC 15a and BDC 15b - Annual data provided for BDC 15b only
MSDC 1a	604972	258745	47.8	35.3	35.7	24.6	26.9	24.8	29.0	32.8	39.9	34.0	35.3	38.2	-	-	-	Duplicate Site with MSDC 1a and MSDC 1b - Annual data provided for MSDC 1b only
MSDC 1b	604972	258745	47.5	31.9	27.9	21.2	24.2	27.3	27.5	31.2	39.0	30.6	35.3	36.8	32.7	24.8	-	Duplicate Site with MSDC 1a and MSDC 1b - Annual data provided for MSDC 1b only
MSDC 2	606049	259307	26.2	17.8	20.6	21.7	19.6	23.2	14.0	22.2	23.6	19.2	25.4	21.4	21.2	16.1	-	

☒ **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.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.**

☒ **Babergh and Mid Suffolk District Councils confirm that all 2020 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 Babergh and Mid Suffolk District Councils During 2020

Babergh and Mid Suffolk District Councils have not identified any significant new sources relating to air quality within the reporting year of 2020.

Additional Air Quality Works Undertaken by Babergh and Mid Suffolk District Councils During 2020

Although the key action from the AQAP has been implemented during 2020, it is not necessary to conduct any additional works associated with this. The impact will continue to be monitored through the routine diffusion tube monitoring programme, rather than through detailed assessments or modelling.

QA/QC of Diffusion Tube Monitoring

Diffusion tubes are supplied and analysed by Socotec Didcot. The preparation method is 50% TEA in acetone. The analysis of diffusion tube samples to determine the amount of Nitrogen dioxide present on the tube is within the scope of Socotec's UKAS schedule. The samples are analysed in accordance with Socotec's standard operating procedure, which meets the guidelines set out in DEFRA's 'Diffusion Tubes for Ambient NO_2 Monitoring: Practical Guidance'. In the AIR-PT inter-comparison scheme for comparing spiked Nitrogen dioxide diffusion tubes, Socotec is ranked as a 'satisfactory' laboratory. Regarding precision results, Socotec, 50% TEA in acetone obtained good results for all 24 studies in 2020. The diffusion tubes were changed in line with the 2020 monitoring calendar.

Diffusion Tube Annualisation

Data was collected from most monitoring locations for all twelve months. There were three locations where data was collected for ten or eleven months, but as this data capture is

greater than 75% it does not require annualising. The data from the two locations in Sproughton (BDC 14 and BDC 15) does though require annualising as there was less than 75% data capture. Table C.2 provides details of the calculation method.

Diffusion Tube Bias Adjustment Factors

The diffusion tube data presented within the 2020 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/NO_2 continuous analysers. Alternatively, the national database of diffusion tube co-location surveys provides bias factors for the relevant laboratory and preparation method.

Babergh and Mid Suffolk District Councils have applied a national bias adjustment factor of 0.76 to the 2020 monitoring data. A summary of bias adjustment factors used by Babergh and Mid Suffolk District Councils over the past five years is presented in Table C.1. The Councils do not conduct automatic monitoring so there are no collocation studies, and the national factor has been used rather than a local factor. For 2020, national spreadsheet version 06/21 has been used, which included 24 studies to derive the bias factor.

Table C.1 – Bias Adjustment Factor

Year	Local or National	If National, Version of National Spreadsheet	Adjustment Factor
2020	National	06/21	0.76
2019	National	09/20	0.75
2018	National	3/19	0.76
2017	National	3/18	0.77
2016	National	6/17	0.78

NO_2 Fall-off with Distance from the Road

Wherever possible, local authorities should ensure that monitoring locations are representative of exposure. However, where this is not possible, the NO_2 concentration at the nearest location relevant for exposure should be estimated using the Diffusion Tube

Data Processing Tool/NO_2 fall-off with distance calculator available on the LAQM Support website.

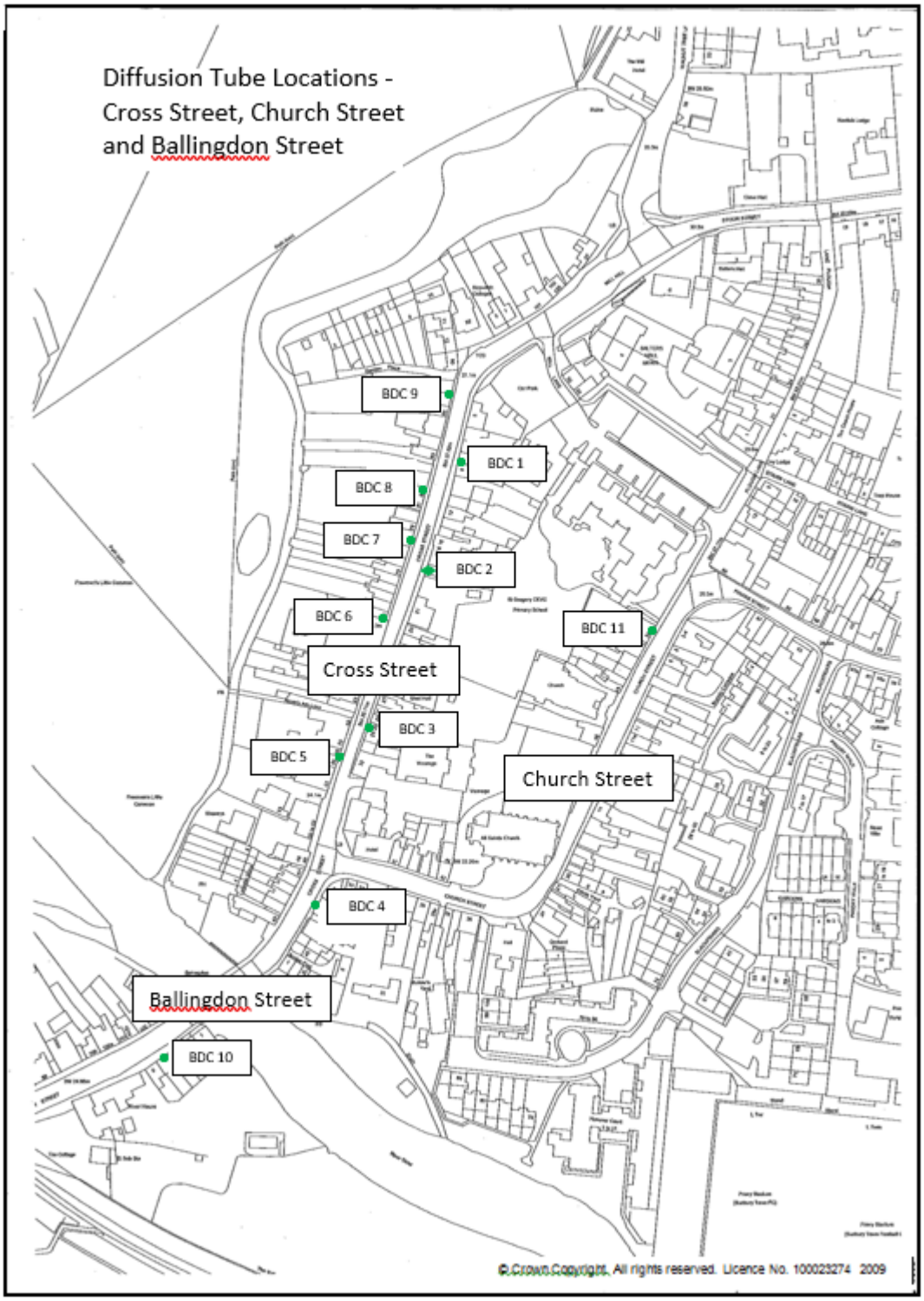
There is only one monitoring location that is not at relevant exposure. However, distance correction should only be considered where the annual mean concentration is greater than 36µg/m^3 and the monitoring is not located at a point of relevant exposure. The annual mean at this location was 16.1µg/m^3, hence no diffusion tube NO_2 monitoring locations within Babergh and Mid Suffolk District Councils required distance correction during 2020.

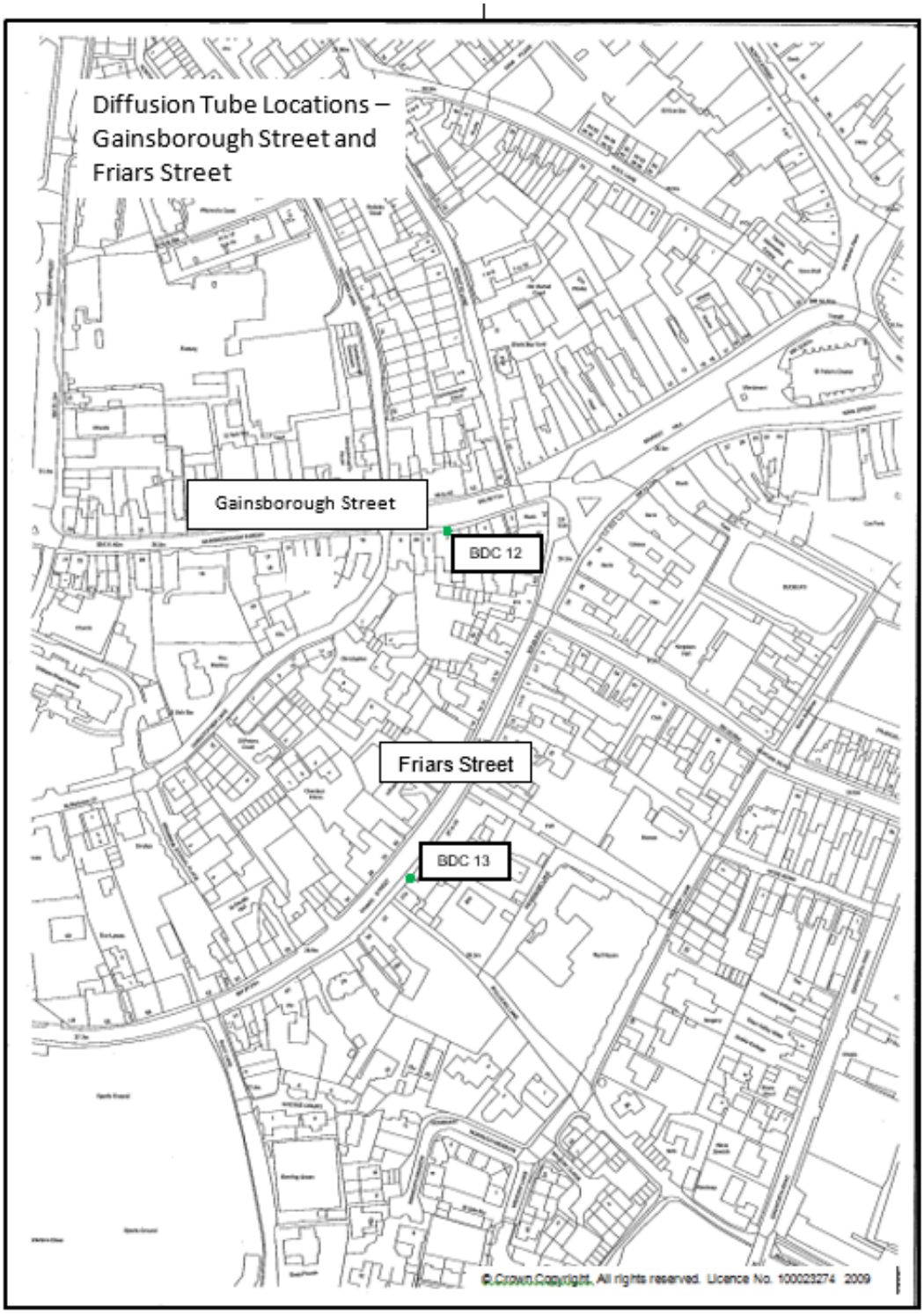
Table C.2 – Annualisation Summary (concentrations presented in µg/m^3)

Site ID	Annualisation Factor St Osyth	Annualisation Factor Wicken Fen	Annualisation Factor	Annualisation Factor	Average Annualisation Factor	Raw Data Annual Mean	Annualised Annual Mean	Comments
BDC 14a	1.0812	0.9421	-	-	1.0116	-	-	Duplicate Site with BDC 14a and BDC 14b - Annual data provided for BDC 14b only
BDC 14b	1.0812	0.9421	-	-	1.0116	28.8	29.2	Duplicate Site with BDC 14a and BDC 14b - Annual data provided for BDC 14b only
BDC 15a	1.0812	0.9421	-	-	1.0116	-	-	Duplicate Site with BDC 15a and BDC 15b - Annual data provided for BDC 15b only
BDC 15b	1.0812	0.9421	-	-	1.0116	22.9	23.2	Duplicate Site with BDC 15a and BDC 15b - Annual data provided for BDC 15b only

Appendix D: Maps of Monitoring Locations and AQMAs

Within the Babergh District




Diffusion Tube Locations – Gainsborough Street and Friars Street
Gainsborough Street
BDC 12
Friars Street
BDC 13
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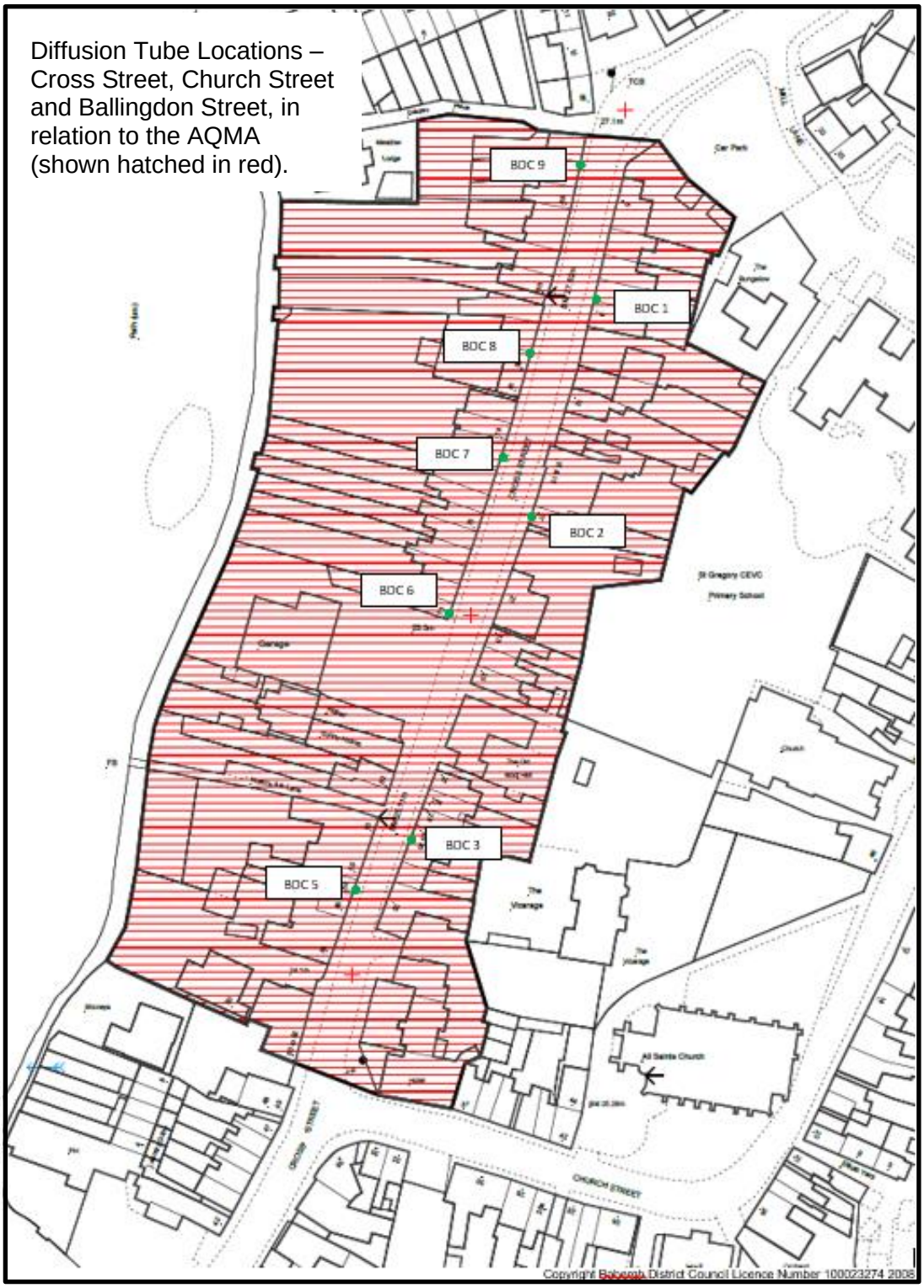

Diffusion Tube Locations – Cross Street, Church Street and Ballingdon Street, in relation to the AQMA (shown hatched in red).


Diffusion Tube Locations - Sproughton
Allotment Gardens
Lower Street
BDC 15
BDC 14
High Street
The Wild Man (PH)
Forge House
TCB
Almshouses
Hall
El Sub Sta
Cottage
Cottage
Booth Cottage
GP
BURSTALL LANE
BEECH CLOSE
RANSOME
Track
B 1113
13.4m
14.6m
7.3m
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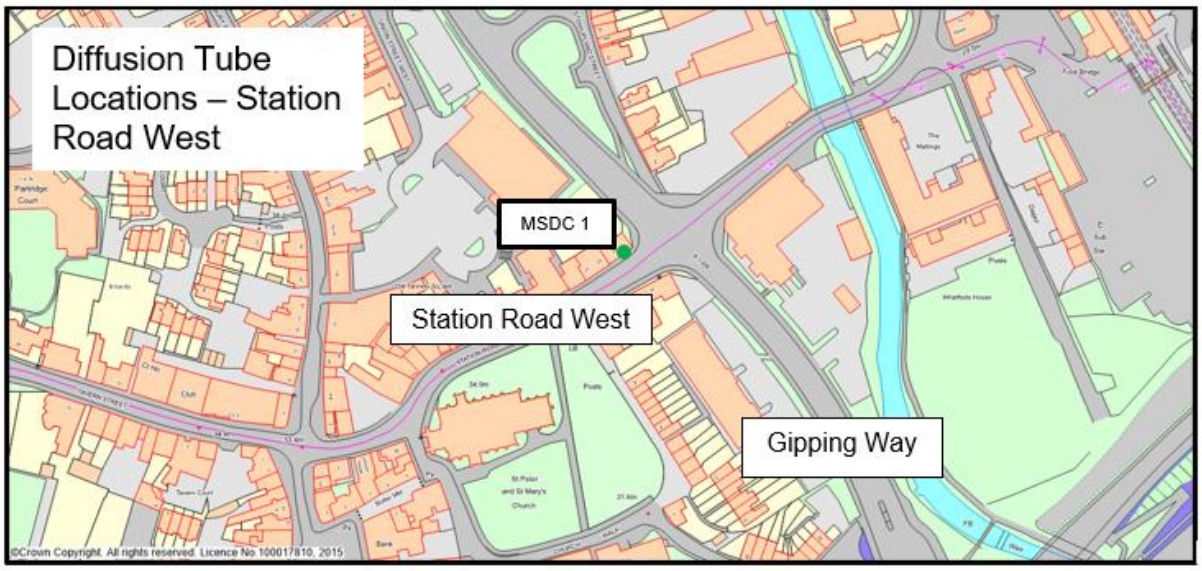
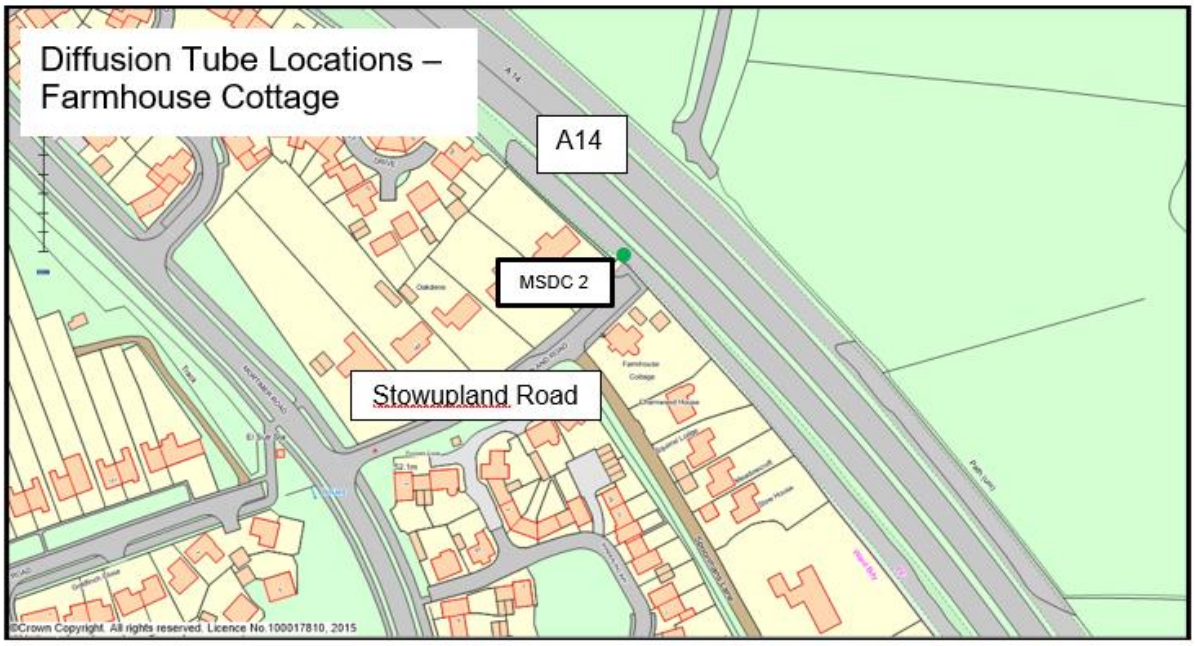
Within the Mid Suffolk district





Appendix E: Summary of Air Quality Objectives in England

Table E.1 – Air Quality Objectives in England[10]

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

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

Appendix F: Impact of COVID-19 upon LAQM

COVID-19 has had a significant impact on society. Inevitably, COVID-19 has also had an impact on the environment, with implications to air quality at local, regional and national scales.

COVID-19 has presented various challenges for Local Authorities with respect to undertaking their statutory LAQM duties in the 2021 reporting year. Recognising this, Defra provided various advice updates throughout 2020 to English authorities, particularly concerning the potential disruption to air quality monitoring programmes, implementation of AQAPs and LAQM statutory reporting requirements. Defra has also issued supplementary guidance for LAQM reporting in 2021 to assist local authorities in preparing their 2021 ASR. Where applicable, this advice has been followed.

Despite the challenges that the pandemic has given rise to, the events of 2020 have also provided Local Authorities with an opportunity to quantify the air quality impacts associated with wide-scale and extreme intervention, most notably in relation to emissions of air pollutants arising from road traffic. The vast majority (>95%) of AQMAs declared within the UK are related to road traffic emissions, where attainment of the annual mean objective for Nitrogen dioxide is considered unlikely. On 23rd March 2020, the UK Government released official guidance advising all members of public to stay at home, with work-related travel only permitted when absolutely necessary. During this initial national lockdown (and to a lesser extent other national and regional lockdowns that followed), marked reductions in vehicle traffic were observed; Department for Transport data[11] suggests reductions in vehicle traffic of up to 70% were experienced across the UK by mid-April, relative to pre-pandemic levels.

This reduction in travel in turn gave rise to a change of air pollutant emissions associated with road traffic, i.e. nitrous oxides (NO_x), and exhaust and non-exhaust particulates (PM). The Air Quality Expert Group (AQEG)[12] has estimated that during the initial lockdown period in 2020, within urbanised areas of the UK reductions in Nitrogen dioxide annual mean concentrations were between 20 and 30% relative to pre-pandemic levels, which

[11] Prime Minister's Office, COVID-19 briefing on the 31st of May 2020

[12] Air Quality Expert Group, Estimation of changes in air pollution emissions, concentrations and exposure during the COVID-19 outbreak in the UK, June 2020

represents an absolute reduction of between 10 to 20µg/m^3 if expressed relative to annual mean averages. During this period, changes in $PM_{2.5}$ concentrations were less marked than those of NO_2. $PM_{2.5}$ concentrations are affected by both local sources and the transport of pollution from wider regions, often from well beyond the UK. Through analysis of AURN monitoring data for 2018-2020, AQEG have detailed that $PM_{2.5}$ concentrations during the initial lockdown period are of the order 2 to 5µg/m^3 lower relative to those that would be expected under business-as-usual conditions.

As restrictions are gradually lifted, the challenge is to understand how these air quality improvements can benefit the long-term health of the population.

Impacts of COVID-19 on Air Quality within Babergh and Mid Suffolk District Councils

The main impact of COVID-19 on air quality is associated with reductions in traffic flows, as is the case nationally. This has led to lower Nitrogen dioxide concentrations being monitored, for example in the table below. It is not relevant to include monitoring locations in Cross Street, Sudbury in this table as they have been affected by a change in road layout as well as reduced traffic flows.

Location	Annual mean, bias adjusted, 2019 (µg/m^3)	Annual mean, bias adjusted, 2020 (µg/m^3)	% Reduction between 2019 and 2020
7 Gainsborough St (BDC 12)	28.0	22.5	20
31 Friars St (BDC 13)	18.8	14.6	22
Stowmarket crossroads (MSDC 1)	31.2	24.8	21
A14 background (MSDC 2)	21.4	16.1	25

With regard to the AQMA, COVID-19 had a significant impact on assessing the benefit of the key action that was implemented. The intention was for the Experimental TRO to be in place for 18 months, during which the results for the 2020 calendar year would be analysed and this would influence whether the TRO is made permanent. However, due to

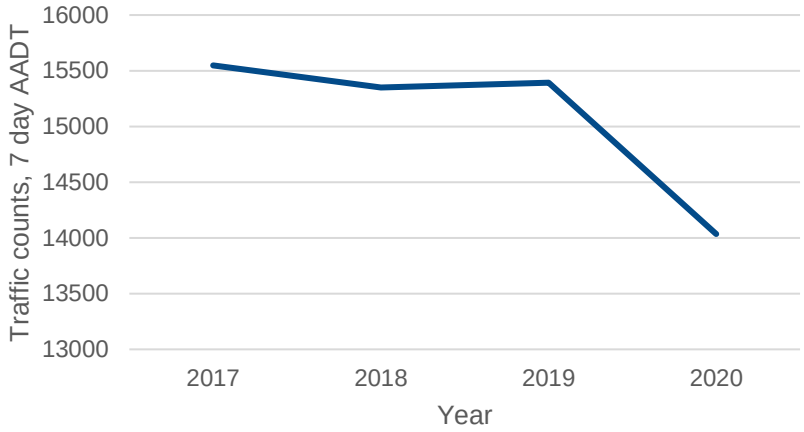
the COVID-19 pandemic, traffic flows were lower than usual during 2020. Traffic counts at a site close to the AQMA are as below, with a clear reduction between 2019 and 2020 –

2017 – 15,548

2018 – 15,350

2019 – 15,393

2020 – 14,035



(All figures are measured 7-day Annual Average Daily Traffic, Ballingdon Street, Sudbury, obtained from Suffolk County Council's traffic monitoring programme).

These reduced traffic flows will have an impact on the diffusion tube results in and around the AQMA. Therefore, although Nitrogen dioxide concentrations have fallen on Cross Street during 2020, it is not possible to quantify the impact of the lower traffic volumes compared to the removal of the on-street parking bays.

Opportunities Presented by COVID-19 upon LAQM within Babergh and Mid Suffolk District Councils

No LAQM related opportunities have arisen as a consequence of COVID-19 within the Babergh and Mid Suffolk Districts. However, diverting staff resources to other priorities also reduced the ability to investigate potential opportunities.

Challenges and Constraints Imposed by COVID-19 upon LAQM within Babergh and Mid Suffolk District Councils

There are a small number of challenges or constraints relating to LAQM that have arisen during 2020 as a consequence of COVID-19 within the Babergh and Mid Suffolk Districts.

- There were fewer co-location studies feeding into the national bias adjustment factor in 2020 (24 studies) than in 2019 (42 studies). This is thought to have a **large impact** as there is the potential for there to be a greater degree of uncertainty associated with the resultant annual mean NO_2 concentrations in 2020 than in

previous years. However, in 2018 there were 30 studies, so the 2020 figure is not entirely dis-similar.

- The key measure from the AQAP has been implemented in 2020, but the change in traffic flows due to COVID-19 has affected the assessment of this measure. When traffic flows return to pre-pandemic levels, or settle out at a new 'normal' level, the true impact of removing the on street parking bays can be assessed. This factor is assessed as having a **medium impact.**
- It was possible to change the diffusion tubes in line with the Defra calendar, so this did not constrain the results, and has **no impact.**

Table F 1 – Impact Matrix

Category	Impact Rating: None	Impact Rating: Small	Impact Rating: Medium	Impact Rating: Large
Automatic Monitoring – Data Capture (%)	More than 75% data capture	50 to 75% data capture	25 to 50% data capture	Less than 25% data capture
Automatic Monitoring – QA/QC Regime	Adherence to requirements as defined in LAQM.TG16	Routine calibrations taken place frequently but not to normal regime. Audits undertaken alongside service and maintenance programmes	Routine calibrations taken place infrequently and service and maintenance regimes adhered to. No audit achieved	Routine calibrations not undertaken within extended period (e.g. 3 to 4 months). Interruption to service and maintenance regime and no audit achieved
Passive Monitoring – Data Capture (%)	More than 75% data capture	50 to 75% data capture	25 to 50% data capture	Less than 25% data capture
Passive Monitoring – Bias Adjustment Factor	Bias adjustment undertaken as normal	<25% impact on normal number of available bias adjustment colocation studies (2020 vs 2019)	25-50% impact on normal number of available bias adjustment studies (2020 vs 2019)	>50% impact on normal number of available bias adjustment studies (2020 vs 2019) and/or applied bias adjustment factor studies not considered representative of local regime
Passive Monitoring – Adherence to Changeover Dates	Defra diffusion tube exposure calendar adhered to	Tubes left out for two exposure periods	Tubes left out for three exposure periods	Tubes left out for more than three exposure periods
Passive Monitoring – Storage of Tubes	Tubes stored in accordance with laboratory guidance and analysed promptly.	Tubes stored for longer than normal but adhering to laboratory guidance	Tubes unable to be stored according to be laboratory guidance but analysed prior to expiry date	Tubes stored for so long that they were unable to be analysed prior to expiry date. Data unable to be used
AQAP – Measure Implementation	Unaffected	Short delay (<6 months) in development of a new AQAP, but is on-going	Long delay (>6 months) in development of a new AQAP, but is on-going	No progression in development of a new AQAP
AQAP – New AQAP Development	Unaffected	Short delay (<6 months) in development of a new AQAP, but is on-going	Long delay (>6 months) in development of a new AQAP, but is on-going	No progression in development of a new AQAP

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
BDC	Babergh District Council
Defra	Department for Environment, Food and Rural Affairs
EU	European Union
HVO	Hydrotreated Vegetable Oil
LAQM	Local Air Quality Management
MSDC	Mid Suffolk District Council
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
SAQG	Suffolk Air Quality Group
SCC	Suffolk County Council
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.