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Bureau Veritas


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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 Boston Borough Council

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 ages³, with a total estimated healthcare cost to the NHS and social care of £157 million in 2017⁴.

Boston's Air Quality issues stem from a high use of private vehicles for short and frequent trips within Boston and the major road networks. As with previous years, private motor vehicles trips that start and end in Boston account for nearly 50% of Boston's work commutes. The major arterial roads that run through Boston, including John Adams Way, Spilsby Road, Spalding Road and Sleaford Road are where these journeys are predominantly made causing peak period congestions.

Boston Borough Council (BBC) currently has two designated Air Quality Management Areas (AQMAs), one located at Haven Bridge (https://uk-air.defra.gov.uk/aqma/local-authorities?la_id=27) declared in 2001 and the Bargate Bridge Area, which was designated in 2005 and was revoked on 1st February 2023. Nonetheless, reporting for the Bargate Bridge Area is still included in this report for the year 2022.

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

The two AQMA had been declared in relation to exceedances of the AQS annual mean objectives of $40 \mu\text{g}/\text{m}^3$ for NO_2 , largely due to traffic emissions from private vehicles along major arterial roads, which all connect to form the main transportation network within the region. These high-capacity roads pass by residential areas where exposure is at its highest, thus raising public health concerns.

To outline the actions to be taken to improve air quality within the local authority, Boston Borough Council revised its Air Quality Action Plan and introduced a new Air Quality Action Plan (AQAP) in 2020. This ASR also includes updates to measures introduced as a result of the action plan.

Since the implementation of various measures to minimise the level of NO_2 concentrations within the AQMA's there has been an overall reduction in NO_2 concentration within the Bargate Bridge AQMA. In recent years, NO_2 concentrations have consistently fallen below the AQS annual mean objective of $40 \mu\text{g}/\text{m}^3$. It is considered that this is a result of a combination of the measures within the AQAP and the improvements in vehicle engines and fuels. As the AQO has been achieved for the last 4 years at the AQMA, BBC have revoked the Bargate Bridge AQMA effective 1st February 2023.

Overall, during 2022, the annual NO_2 concentrations were slightly higher than what recorded in the previous two years, most likely due to the removal of COVID-19 restriction measures.

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 Plan⁵ sets out actions that will drive continued improvements to air quality and to meet the new national interim and long-term $\text{PM}_{2.5}$ targets. The National Air Quality Strategy, due to be published in 2023, will provide more information on local authorities' responsibilities to work towards these new targets and

⁵ Defra. Environmental Improvement Plan 2023, January 2023

reduce PM_{2.5} in their areas. The Road to Zero⁶ 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.

The South East Lincolnshire Local Plan embeds pollution control and climate change policies with regards to planning/development in the Boston Transport Plan (2016-2036) contains specific transport policies which looks to promote sustainable transport. These include a Cycling strategy, Local Bus Strategy, Electrical Vehicle Strategy, Passenger Rail Strategy, Freight Strategy, Walking Strategy and the Local Transport Plan 5.

Boston Borough Council is not a heavily industrialised area in terms of industrial process and combustion emissions. Where such emissions do occur these are from permitted activities with strict emission limits. The major source of PM_{2.5} in Boston is likely to be transport related which ties in with Boston's AQAP in terms of NO₂.

A number of measures has been implemented in the course of 2022, these include:

- Development of lead progress for Phase 2 of the Provision of Outer Distributor Road;
- Review and refresh of the Boston Transport Strategy via the introduction of a new list of priorities. A full review is due in 2026. A new Levelling Up Funding (LUF) has been secured by Lincolnshire County Council (LCC) that will allow the Marsh Lane Roundabout to be upgraded to improve traffic flows and better freight access to industrial estate to start Mid-May 2023.
- A more complete review of the taxi licensing policy as part of the Taxi licensing conditions.
- Lincolnshire County Council (LCC) is leading a project with five other local authorities in the Midlands with funding from Government to increase EV charging points and infrastructure to promote Low Emissions Transport.
- Lincolnshire County Council (LCC) continue to review bus provision access across the county in line with the Bus Service Improvement Plan (BSIP) with a current £2 fee for a single trip being implemented with all bus companies in the county.

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

- Boston Borough Council (BBC) is looking into phase in Electric or ULEV in pool car fleet to replace existing.
- Lincolnshire County Council (LCC) has undertaken a county wide study in relation to HGV stop over outside of urban areas.

Conclusions and Priorities

During 2022, only one exceedance of the NO₂ annual mean objective was observed within the Haven Bridge AQMA. Only one other site was within 10% of the annual mean air quality objective. This one exceedance demonstrates the continual improvement in NO₂ concentrations within Boston Borough Council. This consistent decline is not considered to be solely as a result of COVID-19 with most sites NO₂ concentrations decreasing since 2018.

In recent years the levels of NO₂ within the Bargate Bridge AQMA have fallen and there is now consistent compliance with the AQS annual mean objective of 40 µg/m³. As a result of the consistent compliance with the annual mean objective, the Council have revoked the Bargate Bridge AQMA effective 1st February 2023.

The measures within the AQAP and this ASR continue to focus on key priorities such as;

- Improve traffic flows and networks within Boston;
- Assessments of air quality and dust control standards to be implemented for new developments and construction sites;
- Encouragement of increased rail use, both for freight and passenger rail.
- Promoting low emission transport including electric vehicles and cycling

Local Engagement and How to get Involved

As transport is the main source of air pollution within Boston Borough Council, a good way for the public to contribute to improving air quality is to look less polluting travel options.

The following are suggested alternatives to private travel that are given within the AQAP measures that would contribute to improving the air quality within the Borough:

- Encouragement of electric vehicle use – The Lincolnshire County Council (LCC) are increasing electric charging points across the Borough thanks to funding from the Government;

- Use of public transport – Facility improvements and investigations into the feasibility of the provision of lower emission buses and taxis are being carried out. Additionally, a £2 fee for single bus journey is being implemented across all bus companies. This will help reduce pollutant concentrations through the reduction in the number of private vehicles and congestion; and
- Walk or cycle if your journey allows - A school education scheme with Lincolnshire County Council (LCC) through DEFRA grant involves lessons for children, discouraging idling around schools and promote walking and cycling further. A county wide website will be designed to provide information to the public in Lincolnshire with input from public health at LCC, Highways and lower tier authorities.

Local Responsibilities and Commitment

This ASR was prepared by Bureau Veritas on behalf of the Environmental Health Department of Boston Borough Council with the support and agreement of the following officers and departments:

Nick Davis – Principal Environmental Health Officer – Boston Borough Council

Tony Gray – Environmental Health Manager – Boston Borough Council

Christian Allen – Assistant Director – Regulatory

In addition, air quality is a standing item on the agenda of the Boston Transport Strategy Board who meet approximately 6 times per annum to discuss transport issues within Boston. This board is made of key officers and councillors across both Boston Borough Council and Lincolnshire County Council. The work of this board feeds into the ASR reporting and officers on this board have contributed in updating key actions within the AQAP. The AQAP was developed through a working group of officers from across key departments within Boston BC, Lincolnshire County Council, Public Health. Consultation was undertaken with the public and the developed AQAP was approved by council committee and cabinet.

If you have any comments on this ASR please send them to Nick Davis at:

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Table of Contents

Executive Summary: Air Quality in Our Area	i
Air Quality in Boston Borough Council	i
Actions to Improve Air Quality	ii
Conclusions and Priorities	iv
Local Engagement and How to get Involved.....	iv
Local Responsibilities and Commitment	v
1 Local Air Quality Management	1
2 Actions to Improve Air Quality	2
Air Quality Management Areas.....	2
Progress and Impact of Measures to address Air Quality in Boston Borough Council.....	5
PM _{2.5} – Local Authority Approach to Reducing Emissions and/or Concentrations	18
3 Air Quality Monitoring Data and Comparison with Air Quality Objectives and National Compliance	20
Summary of Monitoring Undertaken	20
3.1.1 Automatic Monitoring Sites.....	20
3.1.2 Nitrogen Dioxide (NO ₂).....	20
Appendix A: Monitoring Results	22
Appendix B: Full Monthly Diffusion Tube Results for 2022	29
Appendix C: Supporting Technical Information / Air Quality Monitoring Data QA/QC	30
New or Changed Sources Identified Within Boston Borough Council During 2022	30
Additional Air Quality Works Undertaken by Boston Borough Council During 2022	30
QA/QC of Diffusion Tube Monitoring	31
Diffusion Tube Annualisation	31
Diffusion Tube Bias Adjustment Factors	31
NO ₂ Fall-off with Distance from the Road.....	32
Appendix D: Map(s) of Monitoring Locations and AQMAs	34
Appendix E: Summary of Air Quality Objectives in England	38
Glossary of Terms	39
References	40

Figures

Figure A.1 – Trends in Annual Mean NO ₂ Concentrations.....	26
Figure D.1 – Map of Non-Automatic Monitoring Site.....	35

Tables

Table 2.1 – Declared Air Quality Management Areas.....	3
Table 2.2 – Progress on Measures to Improve Air Quality.....	8
Table A.1 – Details of Non-Automatic Monitoring Sites.....	22
Table B.1 – NO ₂ 2022 Diffusion Tube Results (µg/m ³).....	29
Table C.1 – Annualisation Summary (concentrations presented in µg/m ³).....	31
Table C.2 – Bias Adjustment Factor.....	32
Table C.4 – NO ₂ Fall off With Distance Calculations (concentrations presented in µg/m ³).....	32
Table E.1 – Air Quality Objectives in England.....	38

1 Local Air Quality Management

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

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

2 Actions to Improve Air Quality

Air Quality Management Areas

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

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

- Nitrogen Dioxide (NO₂) annual mean.

Boston Borough Council have revoked the Bargate Bridge AQMA effective 1st February 2023 due to the levels of NO₂ within this AQMA having fallen consistently over the last four years and there is now consistent compliance with the AQS annual mean objective of 40 µg/m³. This will be reflected in the ASR for Boston Borough Council for 2023.

Table 2.1 – Declared Air Quality Management Areas

AQMA Name	Date of Declaration	Pollutants and Air Quality Objectives	One Line Description	Is air quality in the AQMA influenced by roads controlled by Highways England?	Level of Exceedance: Declaration	Level of Exceedance: Current Year	Number of Years Compliant with Air Quality Objective	Name and Date of AQAP Publication	Web Link to AQAP
AQMA 1 - Haven Bridge	10/09/2001	NO ₂ Annual Mean	The AQMA follows the A16 trunk road through the centre of town encompassing properties on either side. It extends from Queen Street roundabout through to the intersection of John Adams Way and Main Ridge East.	NO	44.7 µg/m ³	42.1 µg/m ³	Not compliant	Boston Borough Council, Air Quality Action Plan 2020	https://www.boston.gov.uk/media/22285/Air-Quality-Action-Plan-2020/pdf/Air_Quality_Action_Plan_2020.pdf?m=638135563101570000
AQMA 2 - Bargate Bridge	01/03/2005	NO ₂ Annual Mean	An area from Bargate roundabout extending east in to the top part of Spilsby Road and incorporating the junctions of Freiston Road and Willoughby Road, Boston.	NO	42.9 µg/m ³	29.8 µg/m ³	4 years*	Boston Borough Council, Air Quality Action Plan 2020	https://www.boston.gov.uk/media/22285/Air-Quality-Action-Plan-2020/pdf/Air_Quality_Action_Plan_2020.pdf?m=638135563101570000

*inclusive of 2020 and 2021 which cannot be considered for revocation based on altered traffic flows as a result of the COVID-19 Pandemic

Boston Borough Council confirm the information on UK-Air regarding their AQMA(s) is up to date.

Boston Borough Council confirm that all current AQAPs have been submitted to Defra.

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

Defra's appraisal of last year's ASR concluded

1. The Council have provided a good, detailed discussion on NO₂ trends within the borough as well as the status and future of the two AQMAs. The council have provided sound justification for retaining the Haven Bridge AQMA (to ensure that concentrations remain below the AQO) and for intending to revoke the Bargate Bridge AQMA (for consistent compliance with the AQO).

Within the 2023 ASR, the monitoring data continues to demonstrate that the AQOs are met at Bargate Bridge AQMA and as such the AQMA can be revoked. This was actioned by Boston Borough Council and the AQMA was revoked effective 1st February 2023, which will be reflected in next year's ASR.

2. The Council have presented NO₂ trends for monitoring locations both inside the AQMAs and outside of the AQMAs. This is extremely useful as it allows the reader to easily understand trends relating to NO₂ within the borough. This approach to data/trend presentation is encouraged for future reports.

The 2023 ASR has continued to take this approach.

3. There are two tables which are both labelled 'Table 2.1'. For future reports, these tables should be given different table numbers to minimise confusion for the reader.

This was amended in the 2023 ASR.

4. In future reports, it would be good to have a section where planning applications are discussed and assessed, and whether they would have an impact on AQMA's.

This has been addressed in Appendix C for new applications recorded during the 2022 reporting year.

Boston Borough Council has taken forward a number of direct measures during the current reporting year of 2023 in pursuit of improving local air quality. Details of all measures completed, in progress or planned are set out in Table 2.2. 20 measures are included within Table 2.2, with the type of measure and the progress Boston Borough Council have made during the reporting year of 2022 presented. Where there have been, or continue to be, barriers restricting the implementation of the measure, these are also presented within Table 2.2.

More detail on these measures can be found in their respective Action Plans, Boston Air Quality Action Plan 2020. Key completed measures are:

- Phase 1 of Boston Distributor Road completed as part of Quadrant development scheme linking A16 with B1397. New spur formed at one end of phase two allowing development lead progress on trying to develop phase 2.
- points are now routinely required on planning applications for new residential and commercial developments as per new building regulations (Part S came into force on 23rd June 2022)
- Taxy licensing policy review to promote low emissions vehicles.
- Lincolnshire County Council (LCC) is leading a project with five other local authorities in the Midlands with funding from Government to increase EV charging points and infrastructure to promote Low Emissions Transport.
- Lincolnshire County Council (LCC) continue to review bus provision access across the county in line with the Bus Service Improvement Plan (BSIP) with a current £2 fee for a single trip being implemented with all bus companies in the county.
- Boston Borough Council (BBC) is looking into phase in Electric or ULEV in pool car fleet to replace existing.
- A refresh of the Boston Transport Strategy was completed in Spring 2022.

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

- Upgrade of Marsh Lane roundabout to improve traffic flows and freight traffic access to the industrial estate.
- Increase local authority controlled EV charging points as part of Local Transport Plan V. Lincolnshire County Council is leading a project with other five local authorities to increase EV charging points and infrastructure with funding from the government.
- Replace council fleet vehicles with low emission equivalent, including street sweeper, e=seven (7) refuse collection vehicles and tractors to be Euro 6 compliant.

Boston Borough Council worked to implement these measures in partnership with the following stakeholders during 2022:

- Lincolnshire County Council
- WSP

- East Midland Rail

Boston Borough Council anticipates that the measures stated above and in Table 2.2 will help to achieve compliance in AQMA 1 – Haven Bridge and continue to keep and further reduce pollutant concentrations below the AQO in AQMA 2 – Bargate Bridge

Table 2.2 – Progress on Measures to Improve Air Quality

Measure No.	Measure	Category	Classification	Year Measure Introduced in AQAP	Estimated / Actual Completion Date	Organisations Involved	Funding Source	Defra AQ Grant Funding	Funding Status	Estimated Cost of Measure	Measure Status	Reduction in Pollutant / Emission from Measure	Key Performance Indicator	Progress to Date	Comments / Barriers to Implementation
1	Provision of Outer Distributor Road	Transport Planning and Infrastructure	Other	2018	2032	Lincolnshire County Council	DfT, Midlands Direct, LCC, Private sector	NO	Partially Funded	> £10 million	Implementation	Significantly reduce levels of HGV's achievement of annual target mean <40microgrammes/m3	Traffic count/non-automated monitoring	Phase 1 of Boston Distributor Road completed as part of Quadrant development scheme linking A16 with B1397. Feasibility study of Quadrant stage 2 including link from B1397 to A52 has been undertaken by LCC with AMEY Consultants. A report has been compiled and shared with Boston Transport Strategy Members. New spur formed at one end of phase two allowing development lead progress on trying to develop phase 2.	Full distributor road scheme (bypass) requires support and funding of Midlands direct - not currently on their radar. DfT will not fund feasibility study directly despite local MP approach costs of which are otherwise prohibitive for LCC/BBC. Current phase 1 a delivered by private sector development
2	Improve Traffic Flows	Traffic Management	Strategic highway improvements, Re-prioritising Road space away from cars, including Access management, Selective vehicle priority, bus priority, high vehicle occupancy lane	2019	2024	Lincolnshire County Council	Lincolnshire County Council	NO	Partially Funded	£100k - £500k	Planning	Significant	Traffic count/non-automated monitoring	Review and refresh of Boston Transport Strategy completed in Spring 2022 and a new list of priorities has been completed. A full review of the strategy is due to take place in 2026. LUF Levelling Up Funding has been secured by Lincolnshire County Council and Marsh Lane roundabout will be upgraded to improve traffic flows and better freight access to industrial estate to start Mid-May 2023.	

Measure No.	Measure	Category	Classification	Year Measure Introduced in AQAP	Estimated / Actual Completion Date	Organisations Involved	Funding Source	Defra AQ Grant Funding	Funding Status	Estimated Cost of Measure	Measure Status	Reduction in Pollutant / Emission from Measure	Key Performance Indicator	Progress to Date	Comments / Barriers to Implementation
3	Emission Standards for Taxis	Promoting Low Emission Transport	Taxi Licensing conditions	2019	2021	Boston Borough Council	Boston Borough Council	NO	Funded	< £10k	Implementation	Minor	NO ₂ levels around taxi ranks	Internal meetings taken place with Licensing team and agreement reached on implementation-delay caused by CV19 and to form part of fuller review of taxi licensing policy.	Part of full review of taxi licensing policy and therefore will need to go through council committee procedures which should be completed this year. Vast majority of licensed vehicles either Euro 6, hybrid or electric already.
4	Encourage the use of electric vehicles by providing public charging points	Promoting Low Emission Transport	Procuring alternative Refuelling infrastructure to promote Low Emission Vehicles, EV recharging, Gas fuel recharging	2019	2023	Boston Borough Council Lincolnshire County Council OLEV	External Grant funding	NO	Partially Funded	£50k - £100k	Implementation	Minor	Measure usage of local authority controlled EV points	23 EV charging points installed with major car parks operated by Boston BC with OLEV funding. Additional charging points for 8 other car park locations being considered under central Government grant scheme. Numerous Ev charging points achieved at commercial development through development control processes. WSP consultancy has been commissioned by LCC to develop a strategy to accelerate ULEV take up, assessing electric vehicle infrastructure requirement across the county and identify barriers which may slow the transition to electric vehicles. Boston BC met with WSP to input into the study the findings of which are expected late 2021. EV charging is a priority in the new Local Transport Plan V completed in	Major reliance on grant funding to install EV infrastructure. Poor grid capacity out of main town centre inhibitor to rapid charging.

Measure No.	Measure	Category	Classification	Year Measure Introduced in AQAP	Estimated / Actual Completion Date	Organisations Involved	Funding Source	Defra AQ Grant Funding	Funding Status	Estimated Cost of Measure	Measure Status	Reduction in Pollutant / Emission from Measure	Key Performance Indicator	Progress to Date	Comments / Barriers to Implementation
														2022. . Lincolnshire County Council is leading a project with 5 other local authorities in the Midlands with funding from Government to increase EV charging points and infrastructure.	
5	Encourage electric charging facilities in new build homes and commercial premises through the development process	Promoting Low Emission Transport	Procuring alternative Refuelling infrastructure to promote Low Emission Vehicles, EV recharging, Gas fuel recharging	2019	2023	Boston Borough Council	Boston Borough Council	NO	Funded	< £10k	Implementation	Minor	Monitor via planning enforcement of conditions requiring EV charging	Air Quality and mitigations now fully embedded in planning process via local plan and additional guidance to developers produced by Boston BC. Requirements for AQ mitigations, including the provision of EV charging now routinely required on planning applications for new residential and commercial developments. New Building Regulations - Part S comes into force as of 23 June 2022 requiring charging points under Building regs. Lincolnshire County Council is leading a project with 5 other local authorities in the Midlands with funding from Government to increase EV charging points and infrastructure.	
6	Into town bus service - increase patronage/service provision	Alternatives to private vehicle use	Other	2019	2022	Lincolnshire county Council	Lincolnshire County Council	NO	Not Funded	£100k - £500k	Planning	Moderate	Increase public transport use	Boston Transport Strategy Group to look at review of into town bus services in terms of timings and routes including if they can extend to main	Covid pandemic has severely affected passenger numbers and therefore most routes and bus operators have had to be support by LCC/CG just to survive. Needs

Measure No.	Measure	Category	Classification	Year Measure Introduced in AQAP	Estimated / Actual Completion Date	Organisations Involved	Funding Source	Defra AQ Grant Funding	Funding Status	Estimated Cost of Measure	Measure Status	Reduction in Pollutant / Emission from Measure	Key Performance Indicator	Progress to Date	Comments / Barriers to Implementation	
															employment areas. All bus stops now include code than can be texted to get real time next bus information. A new Bus Services Improvement Plan (BSIP) has been completed in 2021. LCC continue to review bus provision across the county in line with the BSIP. Currently £2 a single trip has been implemented with all bus companies in the county for single journeys.	support and cooperation of bus operators.
7	Investigate the provision of cleaner buses for into town services (other bus routes)	Alternatives to private vehicle use	Other	2019	2024	Lincolnshire County Council /WSP consultancy	Lincolnshire County Council/Grant Funding for CG	NO	Not Funded	£1 million - £10 million	Planning	Minor	Low emission bus procurement/routes	WSP commissioned by LCC to look at whether certain bus routes across Lincolnshire lend themselves to alternatively fuelled buses. Included within the 30 routes shortlisted for study include 10 that service Boston including the 'into town' services. Major local bus provider in Boston part of study and actively involved. A new Bus Services Improvement Plan (BSIP) has been completed in 2021 and work continues by LCC Transport Services to look at electric buses and use of alternative fuels with the major operators.	Needs cooperation of existing bus operators and likely external funding sources to move to alternative fuels. Covid pandemic has severely affected passenger numbers and therefore most routes and bus operators have had to be support by LCC/CG just to survive.	
8	Request air quality assessments for developments that are likely to	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	2019	2020	Boston Borough Council	Boston BC	NO	Funded	< £10k	Completed	Minor	Obtain the additional AQ information and report on any impacts in ASR	Requirements embedded in South Lincolnshire Local Plan - Air		

Measure No.	Measure	Category	Classification	Year Measure Introduced in AQAP	Estimated / Actual Completion Date	Organisations Involved	Funding Source	Defra AQ Grant Funding	Funding Status	Estimated Cost of Measure	Measure Status	Reduction in Pollutant / Emission from Measure	Key Performance Indicator	Progress to Date	Comments / Barriers to Implementation	
	have significant impact on air quality														Quality guidance based around national guidance produced for developer and provided on website.	
9	Investigate reduced car parking charges for EV/Hybrid vehicles in LA car parks and priority parking for such vehicles	Promoting Low Emission Transport	Priority parking for LEV's	2019	2020	Boston Borough Council	Boston BC	NO	Not Funded	£100k - £500k	Aborted	Minor	N/A		New EV charging point provided with dedicated space for EV only. EV charging is a priority in the new Local Transport Plan V completed in 2022. Lincolnshire County Council is leading a project with 5 other local authorities in the Midlands with funding from Government to increase EV charging points and infrastructure	Loss of vital revenue to local authority through loss of car parking income.
10	Promote cycling and walking as an alternative to cars	Promoting Travel Alternatives	Promotion of cycling	2019	2023	Lincolnshire County Council/Boston Borough Council	Lincolnshire County Council	NO	Partially Funded	£100k - £500k	Implementation	Minor	Increase numbers of participants / traffic counts		The Boston Transport Strategy proposes a number of measures to promote cycling. A refresh of Boston Transport Strategy was completed in Spring 2022. A further full review of the strategy is due in 2026. A new Cycling and Walking Plan has also been completed by LCC. In addition, all schools in the Boston area now have an approved School Travel Plans to encourage walking, cycling and bus use. New active travel scheme on London Road, Marsh Lane & Wyberton Low Road linking	

Measure No.	Measure	Category	Classification	Year Measure Introduced in AQAP	Estimated / Actual Completion Date	Organisations Involved	Funding Source	Defra AQ Grant Funding	Funding Status	Estimated Cost of Measure	Measure Status	Reduction in Pollutant / Emission from Measure	Key Performance Indicator	Progress to Date	Comments / Barriers to Implementation
															and building on existing provision. Funded through the levelling up fund. Undertaking a school education scheme with LCC through DEFRA grant. Involves lessons for children, monitoring which it is hope will discourage idling around schools and promote walking and cycling further.
11	Encourage low emission vehicles in the wider community	Promoting Low Emission Transport	Other	2019	2023	Boston Borough Council	Boston Borough Council	NO	Funded	£10k - 50k	Implementation	Moderate	Traffic counts/non automated monitoring		Actively requires EV charging through planning process. Provision of EV charging in council car parks. Promotes EV and ULEV's on its website with links to GO ULTRA LOW and OLEV grant funding schemes. New Building Regulations - Part S came into force as of 23 June 2022 requiring charging points under Building regs. BBC looking to phase in Electric of ULEV in pool car fleet to replace existing.
12	Implement standards for dust and emissions from large construction sites	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	2019	2021	Boston Borough Council	Boston Borough Council	NO	Funded	< £10k	Completed	Minor	Number of complaints regarding construction/demolition activities		Construction management plans now routinely requested for larger developments both residential and commercial. These must include dust control measures. Construction Management Plans

Measure No.	Measure	Category	Classification	Year Measure Introduced in AQAP	Estimated / Actual Completion Date	Organisations Involved	Funding Source	Defra AQ Grant Funding	Funding Status	Estimated Cost of Measure	Measure Status	Reduction in Pollutant / Emission from Measure	Key Performance Indicator	Progress to Date	Comments / Barriers to Implementation	
															conditioned as part of planning consent process. Guidance to developers produced and available on council's website. Also request method statements for demotion notices through Building Control. Complaints (very few) promptly investigated.	
13	Promote travel plans for new developments	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	2019	2019	Boston Borough Council/Lincolnshire County Council	Boston Borough Council	NO	Funded	< £10k	Completed	Minor	Air Quality assessments, conclusions, and data	Travel plans now routinely requested for larger developments both residential and commercial.		
14	Liaise with EA in respect of industrial emissions from permitted sites to ensure AQMAS considered when setting emission standards	Environmental Permits	Measures to reduce pollution through IPPC Permits going beyond BAT	2019	2019	Boston Borough Council	Boston Borough Council	NO	Funded	< £10k	Completed	Negligible	100% response rate to consultations received	Environmental Health at BBC acts as a statutory consultee on all Part A1 permit applications, MCPD applications and certain permitted waste operations made to the agency. BBC ensures all appropriate screening has taken place with regards to emissions to air and that no detriment to current AQMA's. Stricter emission targets requested in such event.		
15	Promote green waste services and discourage use of bonfires for disposal of waste at domestic and commercial sites	Public Information	Via the Internet	2019	2019	Boston Borough Council	Boston Borough Council	NO	Funded	< £10k	Completed	Negligible	tonnage green waste collected/formal actions on waste related burning	Regularly publicity around the garden waste collection service - this year 12k signed up for garden waste collections. A proportion of this waste would have been burned on garden fires causing localised nuisance and	Support Boston BC climate change agenda	

Measure No.	Measure	Category	Classification	Year Measure Introduced in AQAP	Estimated / Actual Completion Date	Organisations Involved	Funding Source	Defra AQ Grant Funding	Funding Status	Estimated Cost of Measure	Measure Status	Reduction in Pollutant / Emission from Measure	Key Performance Indicator	Progress to Date	Comments / Barriers to Implementation	
															contributing to poor air quality. Robust enforcement of complaints regarding burning and promotion of greener alternatives for disposal of green wastes	
16	Investigate the use of council procurement procedures as a tool to encourage greener transport services	Promoting Low Emission Plant	Other Policy	2019	2023	Boston Borough Council	Boston Borough Council	NO	Partially Funded	£500k - £1 million	Implementation	Negligible	Number of low emission vehicles procured		Council is small and therefore fleet vehicle numbers small however this year replace street sweeper, 7 refuse collection vehicles and tractor all of which are Euro 6 compliant. More work to be done in respect of this measure.	Additional costs of procurement
17	Provision of AQ information to the public	Public Information	Via the Internet	2019	2024	Boston Borough Council	Boston Borough Council	NO	Funded	< £10k	Implementation	Negligible	Webpage views		Implemented in part with dedicated webpages on AQ and transport related issues. As part of AQ grant to LCC relating to a schools project it is anticipated a county wide website will be designed to provide information to the public on Lincolnshire. Will be undertaken within input of public health at LCC, Highways and lower tier authorities.	Look to rationalise all AQ information to one page
18	Work with operators to increase the use of rail freight/shipping and passenger services	Alternatives to private vehicle use	Other	2019	2024	Lincolnshire County Council/Boston Borough Council/East Midlands Rail	Boston Borough Council/Lincolnshire Country Council/Port of Boston/Network Rail	NO	Partially Funded	> £10 million	Planning	Moderate	Rail passenger figures / Tonnage of freight moved by rail		As part of the council's town fund bid which has been successful East Midlands rail has proposed station enhancements to supplement the town funds intent to a transport interchange and rail to town centre cycle routes. Work continues with	

Measure No.	Measure	Category	Classification	Year Measure Introduced in AQAP	Estimated / Actual Completion Date	Organisations Involved	Funding Source	Defra AQ Grant Funding	Funding Status	Estimated Cost of Measure	Measure Status	Reduction in Pollutant / Emission from Measure	Key Performance Indicator	Progress to Date	Comments / Barriers to Implementation	
															LCC Economic development Team, Port of Boston, Network Rail regarding a new link access to port and to encourage more rail freight through the port. This would also reduce significant rail/road crossing down time at a number of rail crossings which lead to congestion in the Haven Bridge AQMA. Port of Boston currently moving 225 000 tonnes a year of freight by train which is equivalent to 18000 HGV's a year all of which would pass through Haven Bridge AQMA.	
19	Workplace lift sharing scheme	Promoting Travel Alternatives	Workplace Travel Planning	2019	2023	Lincolnshire County Council Public Health/Boston Borough Council	Boston Borough Council	NO	Not Funded	< £10k	Aborted	Negligible	Number of car users/levels of revenue from parking		Liaison with Public Health at LCC commenced but has not progressed at this time due to Covid 19 - car sharing did not lend itself to car sharing during pandemic. There are national schemes that could be promoted in future across Boston and wider Lincolnshire - may be revisited in future.	Currently aborted but may revisit during life of AQAP.
20	Promote good fleet management, fuel efficiency and new technologies with local LGV/HGV business operators	Promoting Low Emission Transport	Other	2019	2022	Boston Borough Council	Boston Borough Council	NO	Funded	< £10k	Implementation	Negligible			Promotion of the Energy Savings Trust free guidance and assistance to fleet operators and eco driving schemes. Circular letter and information sent out to local fleet operators in September	No realistic options for low emission zones due to one major bridge crossing of river Haven that divides town north to south. All main routes cross this bridge no alternative routes available. Therefore,

Measure No.	Measure	Category	Classification	Year Measure Introduced in AQAP	Estimated / Actual Completion Date	Organisations Involved	Funding Source	Defra AQ Grant Funding	Funding Status	Estimated Cost of Measure	Measure Status	Reduction in Pollutant / Emission from Measure	Key Performance Indicator	Progress to Date	Comments / Barriers to Implementation
														<p>2020 - positive response by some larger operators who advised they would be following up with energy saving trust to see their offer.</p> <p>LCC undertaken county study in relation to HGV stop over outside of urban areas.</p>	<p>limited to promotion of good fleet management.</p>

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.

The current Defra 2022 background maps for Boston Borough Council (2018 based⁷) show that all background concentrations of PM_{2.5} are well below the annual mean objective for PM_{2.5}. The highest concentration is 9.3µg/m³ within the 1km x 1km grid square with the centroid grid reference of 532500, 343500.

The Public Health Outcomes Framework data tool⁸ compiled by Public Health England (PHE) quantifies the mortality burden of PM_{2.5} within England on a county and local authority scale. The 2021 fraction of mortality attributable to PM_{2.5} pollution across England is 5.5%. Boston is slightly lower at 5.4%, while the East Midlands region average is 5.6.

In order to promote cycling and walking as an alternative to cars the Lincolnshire County Council (LC) are in the process of undertaking a school education scheme through DEFRA grant which involves lessons for children, monitoring outside schools to discourage idling and promote walking and cycling further. As part of the initiative a website to provide information to the public will also be developed with input from public health at LCC and lower tier authorities.

Boston Borough Council is not a heavily industrialised area in terms of industrial process and combustion emissions. Where such emissions do occur these are from permitted activities with strict emission limits. The major source of PM_{2.5} in Boston is likely to be

⁷ Defra Background Mapping Data for local authorities (2018-based), available online at:

<http://fingertips.phe.org.uk/data/laqm-background-maps?year=2018>

⁸ <https://fingertips.phe.org.uk/profile/public-health-outcomes-framework/data#page/1/gid/1000043/pat/6/par/E12000004/ati/301/are/E07000136/yrr/3/cid/4/tbm/1>

transport related which ties in with Boston's AQAP in terms of NO_2 . Therefore, the majority of measures tackle road traffic source emissions to address $\text{PM}_{2.5}$, these include:

- Provision of Outer Distributor Roads to reduce levels of HGV's and a county wide study in relation to HGV stopovers outside urban areas.
- Upgrade of Marsh Lane roundabout to improve traffic flows and freight access to industrial estate from May 2023.
- Encourage use of Electric Vehicles by providing public charging points and infrastructure via a project lead by Lincolnshire County Council (LCC) and five other local authorities.
- Phase in of Electric Vehicles and Ultra Low Electric Vehicles in pool car fleet for Boston Borough Council (BBC).
- Promote cycling and walking through Boston Transport Strategy and through a school education scheme.
- Implementing dust standards for large construction sites, and many other additional measures. Most measures to improve $\text{PM}_{2.5}$ will be through the Lincolnshire County Council as well as Boston Borough Council

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

This section sets out the monitoring undertaken within 2022 by Boston Borough Council 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 Non-Automatic Monitoring Sites

Boston Borough Council undertook automatic (continuous) monitoring at 15 sites during 2022. Table A.1 in Appendix A shows the details of the automatic monitoring 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 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.

3.1.2 Nitrogen Dioxide (NO₂)

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

For diffusion tubes, the full 2022 dataset of monthly mean values is provided in Appendix B. Note that the concentration data presented in Table B.1 includes distance corrected values, only where relevant.

During 2022 only monitoring site 1 (located within Haven Bridge AQMA) exceeded the annual mean objective for NO₂. Monitoring location 3 is also located within the Haven Bridge AQMA and monitored an annual mean concentration within 10% of the annual mean objective. None of the other 13 sites monitored annual mean concentrations within 10% of the annual mean objective. As there have been no exceedances of the NO₂ annual mean objective within the Bargate Bridge AQMA for 4 years, Boston Borough Council have revoked the AQMA, effective 1st February 2023, this will be reflected in the 2023 ASR for Boston Borough Council. However, monitoring was continued within the Bargate Bridge AQMA for 2022. 1-hour NO₂ mean concentrations were not measured, however no exceedances were predicted as the annual mean concentrations are all below

Appendix A: Monitoring Results

Table A.1 – Details of Non-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?	Distance to Relevant Exposure (m)	Distance to Kerb of Nearest Road (m)	Co-located with Continuous Analyser?	Inlet Height (m)
1	Adjacent to air quality monitoring station, North side of Haven Bridge Road	Roadside	532575	343696	NO ₂	Haven Bridge	0.0	1.5	NO	3.0
3	Adjacent to 68 Liquorpond Street	Roadside	532470	343736	NO ₂	Haven Bridge	0.1	0.5	NO	3.0
4	Adjacent to 18 Queen Street	Roadside	532331	343848	NO ₂	Haven Bridge	0.1	1.5	NO	3.0
5	John Adams Way intersection with Haven Bridge	Roadside	532859	343760	NO ₂	Haven Bridge	3.5	2.2	NO	3.0
8	Bargate Roundabout	Roadside	533112	344476	NO ₂	Bargate	0.0	2.0	NO	3.0
9	Roadside adjacent to 30 Spilsby Road	Roadside	533251	344642	NO ₂	Bargate	0.0	2.0	NO	3.0
12	Junction of New Asda Road and Sleaford Road, Boston.	Roadside	532168	343987	NO ₂	No	0.0	2.3	NO	3.0
14	Roadside adjacent to 20 Spilsby Road	Roadside	533226	344624	NO ₂	Bargate	4.0	2.0	NO	3.0
16	Entrance to South Quay Car Park	Roadside	532855	343719	NO ₂	No	0.0	2.0	NO	3.0
17	Opposite 4-6 South End, Boston	Roadside	532877	343690	NO ₂	No	16.0	2.0	NO	3.0
18	ATS Roundabout, London Road, Boston	Roadside	532600	342737	NO ₂	No	8.9	1.5	NO	3.0

Site 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)	Distance to Kerb of Nearest Road (m)	Co-located with Continuous Analyser?	Inlet Height (m)
19	Opposite 55 London Road, Boston	Roadside	532630	342760	NO ₂	No	8.0	1.5	NO	3.0
20	Kerbside, Haven Bridge	Roadside	532744	343719	NO ₂	No	3.0	2.0	NO	3.0
21	36 Sleaford Road, Boston	Roadside	532024	344060	NO ₂	No	0.0	2.0	NO	3.0
22	Adjacent to 94 Liquorpond Street	Roadside	532547	343697	NO ₂	Haven Bridge	0.1	8.0	NO	2.3

Notes:

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

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

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2022 (%) ⁽²⁾	2018	2019	2020	2021	2022
1	532575	343696	Roadside	100.0	100.0	42.4	49.2	42.1	44.6	42.1
3	532470	343736	Roadside	100.0	100.0	48.3	46.5	35.2	39.3	37.6
4	532331	343848	Roadside	100.0	100.0	39.4	39.8	29.4	33.4	32.5
5	532859	343760	Roadside	92.3	92.3	34.7	34.8	27.6	27.4	28.3
8	533112	344476	Roadside	100.0	100.0	32.5	31.3	25.3	27.4	27.2
9	533251	344642	Roadside	100.0	100.0	39.4	37.0	29.9	31.9	29.8
12	532168	343987	Roadside	100.0	100.0	31.8	28.9	20.4	26.4	22.7
14	533226	344624	Roadside	100.0	100.0	37.8	35.8	27.2	28.9	27.7
16	532855	343719	Roadside	100.0	100.0	-	30.1	24.8	26.4	25.0
17	532877	343690	Roadside	92.3	92.3	-	30.5	24.2	26.4	22.5
18	532600	342737	Roadside	100.0	100.0	-	33.8	28.3	29.0	28.1
19	532630	342760	Roadside	90.4	90.4	-	27.5	22.9	22.6	22.5
20	532744	343719	Roadside	92.3	92.3	46.3	41.6	34.0	37.6	35.3
21	532024	344060	Roadside	100.0	100.0	30.0	29.0	23.7	24.7	23.0
22	532547	343697	Roadside	67.3	67.3	-	35.9	26.6	28.2	28.7

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/m³.

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

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

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

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

- (1) Data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.
- (2) Data capture for the full calendar year (e.g. if monitoring was carried out for 6 months, the maximum data capture for the full calendar year is 50%).

Figure A.1 – Trends in Annual Mean NO₂ Concentrations

Figure A.1 – NO₂ Annual Mean Monitoring Trends within Haven Bridge AQMA

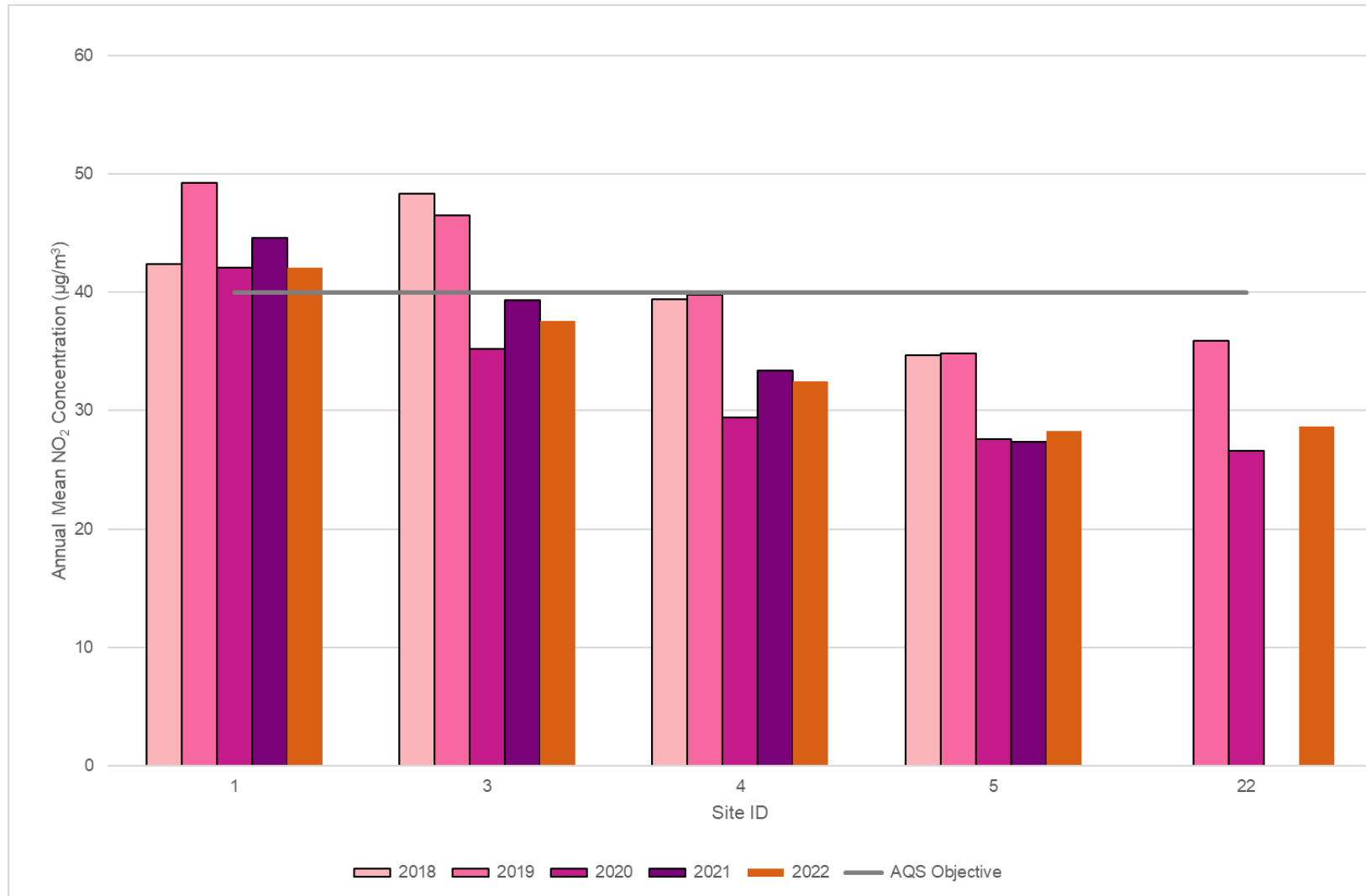


Figure A.2 – NO₂ Annual Mean Monitoring Trends within Bargate Bridge AQMA

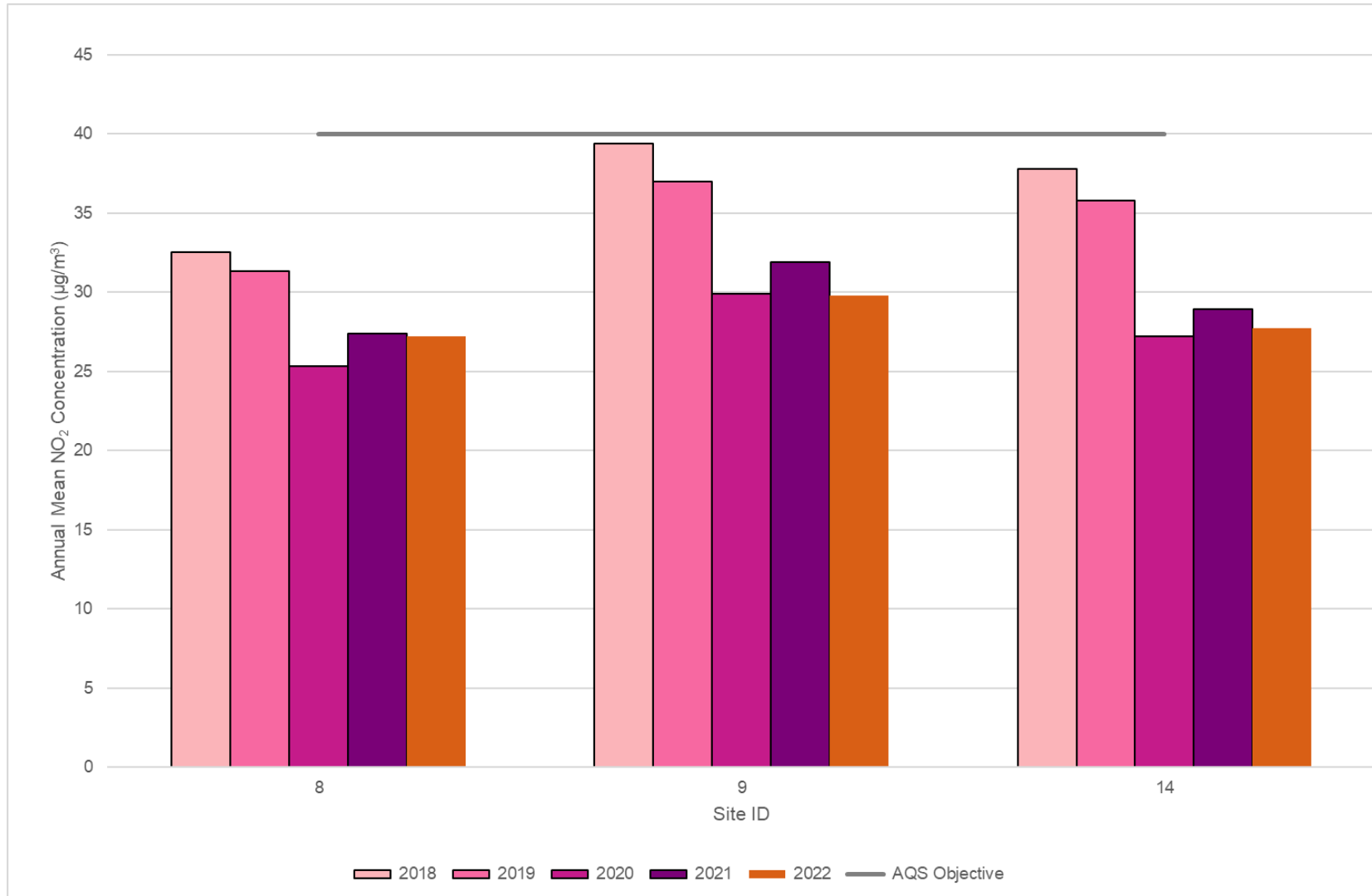
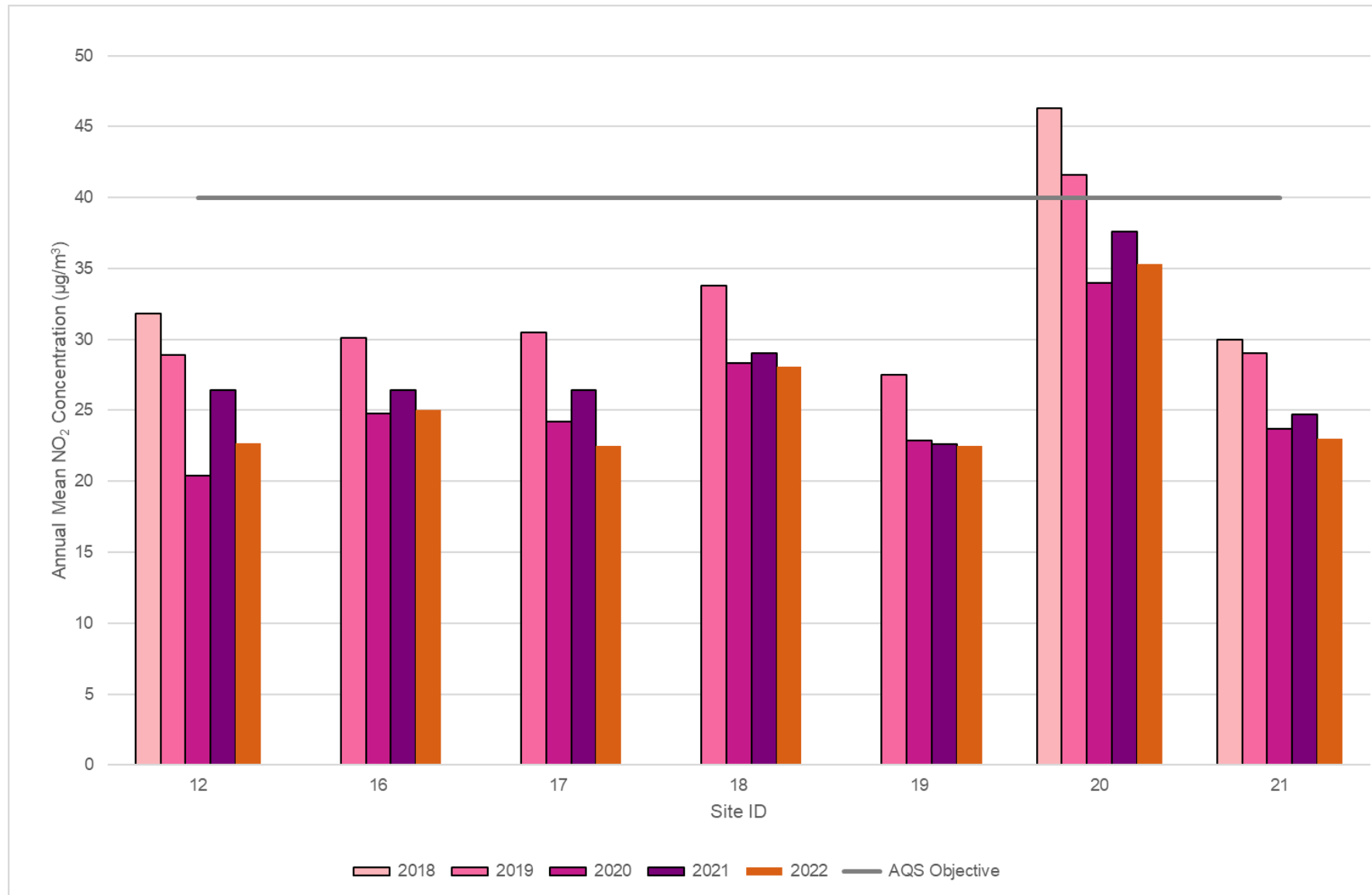


Figure A.3 – NO₂ Annual Mean Monitoring Trends at Monitoring Locations Outside of AQMA



Appendix B: Full Monthly Diffusion Tube Results for 2022

Table B.1 – NO₂ 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
1	532575	343696	64.0	51.2	51.3	47.5	47.1	48.5	52.3	51.3	49.4	45.8	52.4	47.8	50.7	42.1		
3	532470	343736	55.5	40.2	46.9	43.2	44.1	43.4	41.9	39.5	45.0	43.3	47.4	52.6	45.3	37.6	36.7	Predicted concentration at Receptor within 10% of the AQS objective.
4	532331	343848	40.3	30.7	56.1	39.4	32.9	34.6	40.8	38.4	38.2	37.4	40.4	40.4	39.1	32.5		
5	532859	343760	44.9	32.6	35.4	32.7	32.5		31.4	31.6	31.4	30.8	33.5	37.7	34.0	28.3		
8	533112	344476	40.0	31.7	35.5	30.7	32.0	30.2	32.5	29.3	30.0	32.1	34.9	34.0	32.7	27.2		
9	533251	344642	51.0	36.9	36.3	31.6	30.7	32.8	26.4	31.2	34.3	38.5	41.3	40.2	35.9	29.8		
12	532168	343987	32.4	18.9	38.1	29.7	20.7	19.9	27.0	31.1	30.2	22.2	25.2	32.2	27.3	22.7		
14	533226	344624	44.7	30.0	35.2	30.3	31.9	30.3	25.1	31.3	32.3	33.8	37.3	38.3	33.4	27.7		
16	532855	343719	40.5	22.4	37.3	26.5	27.8	24.7	26.1	30.1	31.8	28.4	31.2	35.1	30.2	25.0		
17	532877	343690	40.2	26.6	34.1	25.8	21.4	20.6		25.2	27.7	23.2	23.2	30.4	27.1	22.5		
18	532600	342737	51.0	38.5	29.0	25.7	31.4	35.9	30.4	29.4	27.6	32.8	35.6	39.6	33.9	28.1		
19	532630	342760	38.8	31.1	25.0		23.5	25.3	22.6	22.6	25.0	26.8	29.1	28.4	27.1	22.5		
20	532744	343719	44.6		52.2	50.6	36.7	33.9	37.9	47.9	45.4	34.3	38.8	45.4	42.5	35.3		
21	532024	344060	34.7	24.0	34.2	30.3	25.0	24.7	26.0	26.7	23.9	25.0	28.3	29.8	27.7	23.0		
22	532547	343697				30.7		29.1	30.3	26.6	32.7	32.0	38.6	38.7	32.3	28.7		

- All erroneous data has been removed from the NO₂ diffusion tube dataset presented in Table B.1.
- Annualisation has been conducted where data capture is <75% and >25% in line with LAQM.TG22.
- Local bias adjustment factor used.
- National bias adjustment factor used.
- Where applicable, data has been distance corrected for relevant exposure in the final column.
- Boston County Council confirm that all 2022 diffusion tube data has been uploaded to the Diffusion Tube Data Entry System.

Notes:

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

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

See Appendix C for details on bias adjustment and annualisation.

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

New or Changed Sources Identified Within Boston Borough Council During 2022

Boston Borough Council have not identified any new or future local developments and industrial processes with significantly increased emissions of >30% and new biomass installations above 50 kW which may have an impact upon air quality.

Two (2) poultry units with associated infrastructure have been erected but the screening tool does not indicate issues for air quality impact. The planning application can be seen at <https://www.boston.gov.uk/planning-application-search> using the planning application reference B/21/0512.

Additional Air Quality Works Undertaken by Boston Borough Council During 2022

Boston Borough Council has developed of numerous measures during 2022. These include;

- Development of lead progress for Phase 2 of the Provision of Outer Distributor Road;
- Review and refresh of the Boston Transport Strategy via the introduction of a new list of priorities. A full review is due in 2026. A new Levelling Up Funding (LUF) has been secured by Lincolnshire County Council (LCC) that will allow the Marsh Lane Roundabout to be upgraded to improve traffic flows and better freight access to industrial estate to start Mid-May 2023.
- A more complete review of the taxi licensing policy as part of the Taxi licensing conditions.
- Lincolnshire County Council (LCC) is leading a project with five other local authorities in the Midlands with funding from Government to increase EV charging points and infrastructure to promote Low Emissions Transport.

- Lincolnshire County Council (LCC) continue to review bus provision access across the county in line with the Bus Service Improvement Plan (BSIP) with a current £2 fee for a single trip being implemented with all bus companies in the county.
- Boston Borough Council (BBC) is looking into phasing in Electric or ULEV in pool car fleet to replace existing vehicles.
- Lincolnshire County Council (LCC) has undertaken a county wide study in relation to HGV stop over outside of urban areas.

QA/QC of Diffusion Tube Monitoring

Gradko International Ltd supply and analyse Boston Borough Council’s diffusion tubes. The tubes were prepared using the 20% TEA in water preparation method. During 2022, Boston Borough Council’s diffusion tube monitoring was carried out for all months in accordance with the 2022 Diffusion Tube Monitoring Calendar.

Diffusion Tube Annualisation

One non-automatic monitoring (diffusion tube) site recorded data capture of <75% therefore requiring annualisation. Annualisation was undertaken using an average annualisation factor, calculated using background concentrations from the three closest AURN sites to Boston Borough Council. Raw diffusion tube data was then annualised using the average annualization factor to provide annual annualised mean concentrations. An annualization summary is provided in Table C.1.

Table C.1 – Annualisation Summary (concentrations presented in $\mu\text{g}/\text{m}^3$)

Site ID	Annualisati on Factor Nottingham Centre	Annualisati on Factor Leicester University	Annualisati on Factor Immingham Woodlands Avenue	Average Annualisati on Factor	Raw Data Simple Annual Mean ($\mu\text{g}/\text{m}^3$)	Annualised Data Simple Annual Mean ($\mu\text{g}/\text{m}^3$)
22	1.0799	1.0555	1.0770	1.0708	32.3	34.6

Diffusion Tube Bias Adjustment Factors

The diffusion tube data presented within the 2023 ASR have been corrected for bias using an adjustment factor. Bias represents the overall tendency of the diffusion tubes to under or over-read relative to the reference chemiluminescence analyser. LAQM.TG22 provides guidance with regard to the application of a bias adjustment factor to correct diffusion tube

monitoring. Triplicate co-location studies can be used to determine a local bias factor based on the comparison of diffusion tube results with data taken from NO_x/NO₂ continuous analysers. Alternatively, the national database of diffusion tube co-location surveys provides bias factors for the relevant laboratory and preparation method.

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

Table C.2 – Bias Adjustment Factor

Monitoring Year	Local or National	If National, Version of National Spreadsheet	Adjustment Factor
2022	National	03/23	0.83
2021	National	04/22	0.84
2020	National	03/21	0.81
2019	National	09/20	0.92
2018	National	06/19	0.93

NO₂ Fall-off with Distance from the Road

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

Monitoring site 3 was included in the fall off with distance calculator.

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

Site ID	Distance (m): Monitoring Site to Kerb	Distance (m): Receptor to Kerb	Monitored Concentration (Annualised and Bias Adjusted)	Background Concentration	Concentration Predicted at Receptor	Comments
3	0.5	0.6	37.6	12.1	36.7	Predicted concentration at Receptor within 10% of the AQS objective.

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

Figure D.1 – Map of Non-Automatic Monitoring Site: Haven Bridge AQMA

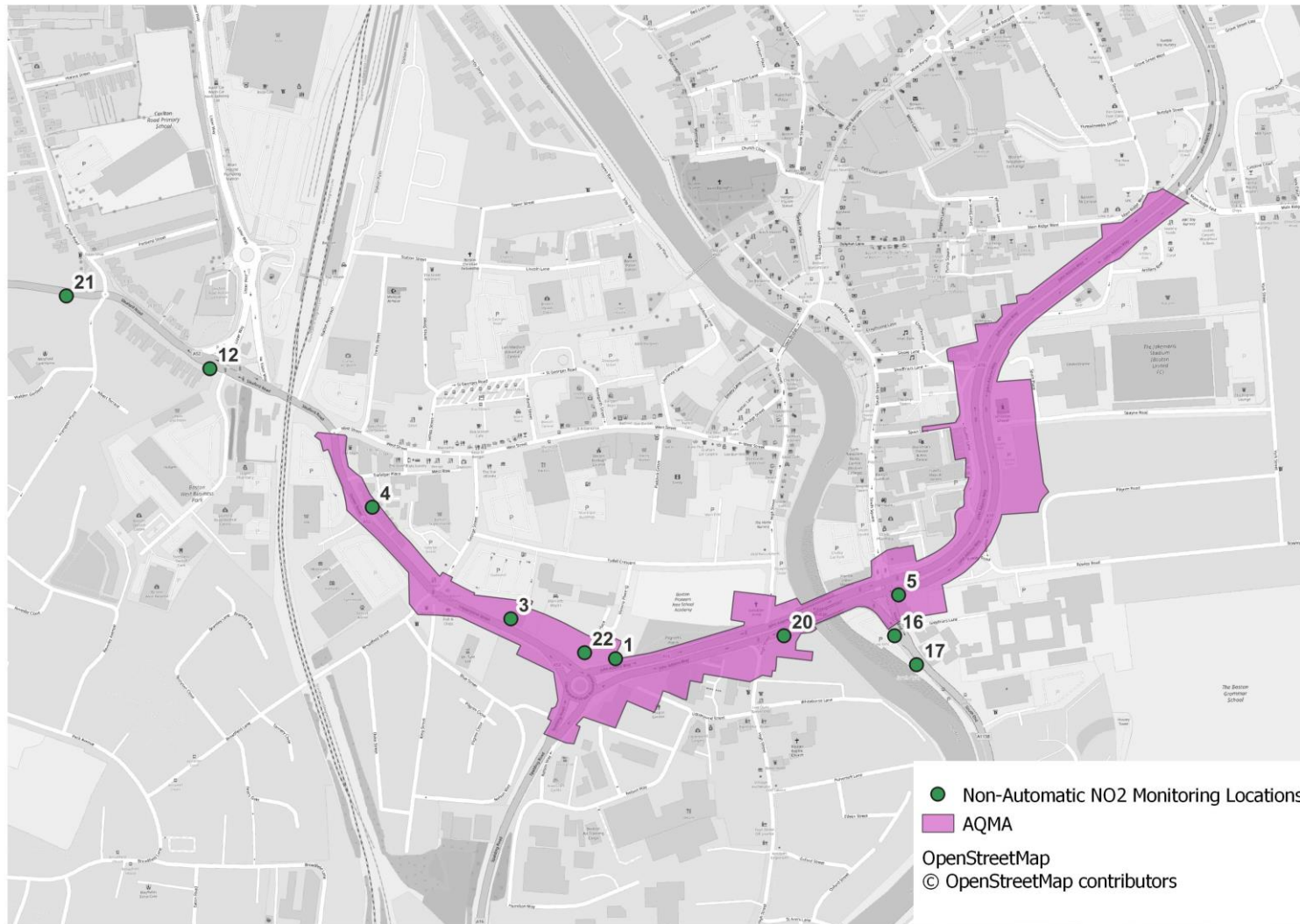


Figure D.2 – Map of Non-Automatic Monitoring Site: Bargate Bridge AQMA



Figure D.3 – Map of Non-Automatic Monitoring Site: Boston South



Appendix E: Summary of Air Quality Objectives in England

Table E.1 – Air Quality Objectives in England⁹

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

⁹ The units are in microgrammes of pollutant per cubic metre of air (µg/m³).

Glossary of Terms

Abbreviation	Description
AQAP	Air Quality Action Plan - A detailed description of measures, outcomes, achievement dates and implementation methods, showing how the local authority intends to achieve air quality limit values'
AQMA	Air Quality Management Area – An area where air pollutant concentrations exceed / are likely to exceed the relevant air quality objectives. AQMAs are declared for specific pollutants and objectives
AQO	Air Quality Objective
ASR	Annual Status Report
BBC	Boston Borough Council
BSIP	Bus Service Improvement Plan
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
LCC	Lincolnshire County Council
LUF	Levelling Up Funding
NO ₂	Nitrogen Dioxide
NO _x	Nitrogen Oxides
PM ₁₀	Airborne particulate matter with an aerodynamic diameter of 10µm or less
PM _{2.5}	Airborne particulate matter with an aerodynamic diameter of 2.5µm or less
QA/QC	Quality Assurance and Quality Control
SO ₂	Sulphur Dioxide
ULEV	Ultra Low Electric Vehicle

References

- Local Air Quality Management Technical Guidance LAQM.TG22. August 2022.
Published by Defra in partnership with the Scottish Government, Welsh Assembly Government and Department of the Environment Northern Ireland.
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- Boston Borough Council 2022 Annual Status Report.
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- Boston Borough Council 2019 Annual Status Report.
- Boston Borough Council 2020 Air Quality Action Plan.
- Boston Borough Council Annual Status Report Defra Appraisal. June 2022