



***Boston Borough Council
Annual Status Report 2018***

Bureau Veritas





June 2018

Move Forward with Confidence



**BUREAU
VERITAS**

Document Control Sheet

Issue/Revision	Issue 1	Issue 2
Remarks	Draft	Final
Date	June 2018	June 2018
Submitted to	John Chapman	John Chapman
Prepared by	Ben Turner Assistant Consultant	Ben Turner Assistant Consultant
Signature		
Approved by	Hannah Smith Senior Consultant	Hannah Smith Senior Consultant
Signature		
Project number	6473976	6473976

Disclaimer

This Report was completed by Bureau Veritas on the basis of a defined programme of work and terms and conditions agreed with the Client. Bureau Veritas' confirms that in preparing this Report it has exercised all reasonable skill and care taking into account the project objectives, the agreed scope of works, prevailing site conditions and the degree of manpower and resources allocated to the project.

Bureau Veritas accepts no responsibility to any parties whatsoever, following the issue of the Report, for any matters arising outside the agreed scope of the works.

This Report is issued in confidence to the Client and Bureau Veritas has no responsibility to any third parties to whom this Report may be circulated, in part or in full, and any such parties rely on the contents of the report solely at their own risk.

Unless specifically assigned or transferred within the terms of the agreement, the consultant asserts and retains all Copyright, and other Intellectual Property Rights, in and over the Report and its contents.

Any questions or matters arising from this Report should be addressed in the first instance to the report author



2018 Air Quality Annual Status Report (ASR)

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

June 2018

Local Authority Officer	John Chapman
Department	Environmental and Health
Address	Municipal Buildings, West Street, Boston, PE21 8QR
Telephone	01205 314200
E-mail	John.chapman@boston.gov.uk
Report Reference number	ASR 2018
Date	June 2018

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 and older people, and those with heart and lung conditions. There is also often a strong correlation with equalities issues, because areas with poor air quality are also often the less affluent areas^{1,2}.

The annual health cost to society of the impacts of particulate matter alone in the UK is estimated to be around £16 billion³.

As a whole, Boston's air quality issues derive from high modal use of private vehicles for making short frequent journeys within Boston. For example, nearly half of travel to work journeys start and end within Boston, and half of these journeys are made by private motor vehicles predominantly along major arterial roads, causing peak period congestion. As a result, Boston Borough Council currently has two designated Air Quality Management Areas (AQMAs) at Haven Bridge and at Bargate Bridge. Both have been declared in relation to exceedances of the AQS annual mean objective for NO₂, largely due to traffic emissions from private vehicles along the A16 and A52 which both run through/around Boston, carrying with them the main volume of traffic within the District. However, these high-capacity roads run past residential areas where exposure of receptors is at its greatest, thus raising public health concerns.

The two AQMAs can be seen online at https://uk-air.defra.gov.uk/aqma/local-authorities?la_id=27, details of the AQMAs are provided in Table 2.1 and a boundary map presented in Figure D.1 - Non-Automatic Monitoring Sites and AQMAs Within Boston.

An AQAP was completed in 2006 and was subsequently updated in 2010, within the AQAP measures are outlined to be completed in order to pursue of the annual mean objective for NO₂ thus improving air quality within the AQMAs and therefore the District as a whole. Boston Borough Council are currently in the process of updating the AQAP.

¹ Environmental equity, air quality, socioeconomic status and respiratory health, 2010

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

³ Defra. Abatement cost guidance for valuing changes in air quality, May 2013

Boston Borough Council

Monitoring of NO₂ is completed within Boston using a network of passive diffusion tubes. There are currently 15 separate monitoring locations within the network, 13 of these locations are roadside sites and the remaining 2 are urban background sites.

During 2017, four sites recorded NO₂ annual mean concentrations to be over 40µg/m³. However, once distance correction was applied, the concentration reported at the point of exposure for Site 9 fell below 40µg/m³. The three remaining exceeding sites were all located within AQMA 1 Haven Bridge.

Site 4 and 14, which are also located within the declared AQMAs, have remained compliant since 2015. This achievement reflect the Councils continued commitment and work towards improving Boston's air quality.

When comparing the 15 locations where monitoring has been completed in 2017 there has been an increase in NO₂ concentrations at 13 sites and a decrease in NO₂ concentrations at two sites.

Large increments in annual mean NO₂ concentrations were observed within AQMA 1 Haven Bridge in comparison to 2016 monitoring results. For instance, Site 2 which is located along John Adams Way within AQMA 1 Haven Bridge reported an exceedance of the NO₂ annual mean AQS objective for the first time since 2015, where concentrations increased by 6.9µg/m³ in comparison to 2016. Similarly, Site 3 reported a 7µg/m³ increment in NO₂ annual mean concentrations. Overall in AQMA 1 Haven Bridge, four out of five monitoring sites experienced an increase in NO₂ annual mean concentrations

In comparison to 2013, NO₂ annual mean concentrations have decreased at 12 sites over a five year period, with the largest decrement observed at Site 2.

The highest recorded mean annual NO₂ concentration was 53.2µg/m³, at Site 3, located along a stretch of the A52 where queues may be common. This indicates that an exceedance of the 1-hour mean objective is unlikely to occur at these sites throughout 2017.

Actions to Improve Air Quality

The AQAP for Boston Borough Council is the main action to drive a reduction in air pollution within the Borough. The measures set out within the AQAP have been developed as actions to help Boston work towards achieving compliance with the

NO₂ annual mean AQS objective. However, Boston Borough Council are currently in the process of updating the AQAP.

In recognition of the importance that transport plays, Boston Borough Council, in partnership with Lincolnshire County Council, has released a new Boston Transport Strategy (2016-2036) that builds upon the improvements delivered since the last Strategy was published in 2006 - 'The Transport Strategy for Boston 2006 – 2021 and beyond'. The strategy focuses on aligning the two disciplines together to deliver a sustainable transport network which supports the growth of Boston and helps to improve air quality. A key objective of this new strategy (Boston Transport Strategy (2016-2036) is to work with Lincolnshire County Council and developers to deliver elements of the Boston Distributor road which in the long term will provide a western link road between the A16 in the south of the town and the A16 in the north, and serve new developments to the west of Boston, easing reliance on inner city arterial roads for journeys made beyond Boston. In parallel, objectives concentrate on providing alternative forms of transport, investing in walking, cycling and public transport infrastructure to promote a modal shift away from private vehicles for short journeys made within Boston.

Overall, the strategy includes a high level of consideration in relation to the reconfiguration of roads, sustainable transport plans and modes of transport, alternative modes of transport to private vehicles and to overall reduce the impact of the transport system on air quality within the local area.

In addition, a number of actions have been completed within the Borough during 2017 designed at improving local air quality:

- Active Lincolnshire have developed a new walking app which uses GPS mapping technologies to promote walking within Lincolnshire to help its residents lead active lifestyles;
- Boston Cycling Roadshow organised for the 27th July 2018 to promote cycling as an alternative form of transport; and
- Boston Borough Council have undertaken site visits to a number of car parks within the area to review the suitability of installing electric vehicle charging points for public use. Each electric vehicle charging point shall be capable of charging two vehicles at the same time and shall be accompanied by an

online payment system for users. A modelled version of the proposed electric vehicle charging point is provided below (Figure 1).

Figure 1 - Proposed Electric Vehicle Charging Point



Conclusions and Priorities

Within the jurisdiction of Boston Borough Council, NO₂ annual mean levels in 2017 increased at the majority of sites compared to 2016, with large increments observed within AQMA 1 Haven Bridge. However, over a five period concentrations at these locations have decreased with large reductions observed within key areas. This long

term progress reflects the continual commitment and progress made by the Boston Borough Council to improve local air quality with the aim to revoke the declared AQMAs.

Exceedances of the annual mean NO₂ AQS objective were solely located within AQMA 1 Haven Bridge, demonstrating the challenge Boston Borough Council faces with localisation of air quality hotspots in line with wider improvements to air quality across the borough. Both AQMAs are located on the main arterial routes serving the town so improvements are dependent on delivery of AQAP measures focussing on transport, such as the Boston Distributer Road.

Overall, the main priority for Boston Borough Council is to concentrate efforts within Haven Bridge AQMA to ensure compliance or at least a reduction in NO₂ concentrations, and to continue the progress made at Bargate Bridge AQMA, with the aim of revocation in the coming years.

The following actions are considered to be key priorities in ensuring reductions continue:

- Update the AQAP;
- Monitor localisation of exceedances and consider the need to relocate or increase the amount of monitoring stations within AQMA 1 over the coming years, as air quality consistently improves across the Borough;
- Secure infrastructure funding to construct the Boston Distributer Road in order to ease capacity on other arterial roads;
- Implement the new Boston Transport Strategy (2016-2036);
- Cooperate with all the Boroughs within Lincolnshire to implement The Lincolnshire Local Travel Plan, which aims to reduce the impact of transport on local air quality. The plan was developed by engaging with a wide range of people, community groups and organisations; and
- Consider relocating monitoring sites to areas representative of exposure.

Local Engagement and How to get Involved

As the main source of air pollution within Boston Borough Council arises from transport sources, a way for the public to get involved with helping to improve air quality within the area would be to look at alternatives to the way they usually travel.

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:

- Use of public transport – The use of the bus facilities, which in turn reduces pollutant concentration through the number of vehicles and reducing congestion;
- Walk or cycle if your journey allows – From choosing to walk or cycle for your journey the number of vehicles is reduced and also there is the added benefit of keeping fit and healthy.
- Car/lift sharing – Where a number of individuals are making similar journeys, such as travelling to work or to school car sharing reduces the number of vehicles on the road and therefore the amount of emissions being released. This can be promoted via travel plans through the workplace and within schools; and
- Alternative fuel / more efficient vehicles – Choosing a vehicle that meets the specific needs of the owner, fully electric, hybrid fuel and more fuel efficient cars are available and all have different levels benefits by reducing the amount of emissions being released.

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	v
1 Local Air Quality Management	1
2 Actions to Improve Air Quality	2
2.1 Air Quality Management Areas.....	2
2.2 Progress and Impact of Measures to address Air Quality in Boston Borough Council	4
2.3 PM _{2.5} – Local Authority Approach to Reducing Emissions and/or Concentrations.....	15
3 Air Quality Monitoring Data and Comparison with Air Quality Objectives and National Compliance	16
3.1 Summary of Monitoring Undertaken	16
3.1.1 Automatic Monitoring Sites	16
3.1.2 Non-Automatic Monitoring Sites.....	16
3.2 Individual Pollutants	16
3.2.1 Nitrogen Dioxide (NO ₂).....	16
Appendix A: Monitoring Results	19
Appendix B: Full Monthly Diffusion Tube Results for 2017	26
Appendix C: Supporting Technical Information / Air Quality Monitoring Data QA/QC	29
Appendix D: Maps of Monitoring Locations and AQMAs	34
Appendix E: Summary of Air Quality Objectives in England	35
Glossary of Terms	36
References	37

List of Tables

Table 2.1 – Declared Air Quality Management Areas.....3
 Table 2.2 – Progress on Measures to Improve Air Quality8
 Table A.1 – Details of Non-Automatic Monitoring Sites 19
 Table A.2 – Annual Mean NO₂ Monitoring Results.....21
 Table B.1 – NO₂ Monthly Diffusion Tube Results - 201727
 Table C.1 - Annualisation of Data from Nearby Continuous Monitoring Sites30
 Table C.2 Annualisation for Site 330
 Table C.3 – Fall off with Distance Correction of Relevant Sites Exceeding and Near
 Exceeding the NO₂ Annual Mean AQS Objective30
 Table E.1 – Air Quality Objectives in England35

List of Figures

Figure 1 - Proposed Electric Vehicle Charging Point..... iv
 Figure A.1 Trends in Annual Mean NO₂ Concentrations at Non-Automatic Monitoring
 Locations (2016 – 2017)23
 Figure A.2 - Trends in Annual Mean NO₂ Concentrations at Diffusion Tube Locations
 in AQMA 1 over a 5 Year Period.....24
 Figure A.3 - Trends in Annual Mean NO₂ Concentrations at Diffusion Tube Locations
 in AQMA 2 over a 5 Year Period.....25
 Figure A.4 - Trends in Annual Mean NO₂ Concentrations at Non-Automatic
 Monitoring Locations over a 5 Year Period26
 Figure C.1 - Fall off Distance Correction of Site 5 near Exceeding the NO₂ Annual
 Mean Objective (2017)31
 Figure C.2 - Fall off Distance Correction of Site 9 Exceeding the NO₂ Annual Mean
 Objective (2017)31
 Figure C.3 - Fall off Distance Correction of Site 14 near Exceeding the NO₂ Annual
 Mean Objective (2017)31

1 Local Air Quality Management

This report provides an overview of air quality in Boston Borough Council during 2017. It fulfils the requirements of Local Air Quality Management (LAQM) as set out in Part IV of the Environment Act (1995) and the relevant Policy and Technical Guidance documents.

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

The statutory air quality objectives applicable to LAQM in England can be found in Table E.1 in Appendix E.

2 Actions to Improve Air Quality

2.1 Air Quality Management Areas

Air Quality Management Areas (AQMAs) are declared when there is an exceedance or likely exceedance of an air quality objective. After declaration, the authority must prepare an Air Quality Action Plan (AQAP) within 12-18 months setting out measures it intends to put in place in pursuit of compliance with the objectives.

A summary of AQMAs declared by Boston Borough Council can be found in Table 2.1. Further information related to declared or revoked AQMAs, including maps of AQMA boundaries are available online at https://uk-air.defra.gov.uk/aqma/local-authorities?la_id=27, the full list of AQMAs is available at <http://uk-air.defra.gov.uk/aqma/list>. Alternatively, see Appendix D: Maps of Monitoring Locations and AQMAs, which provides for a map of air quality monitoring locations in relation to the AQMAs.

We propose to keep the current two designated AQMAs in Boston Borough Council (see monitoring section) and to review the NO₂ monitoring network surrounding these AQMAs.

Table 2.1 – Declared Air Quality Management Areas

AQMA Name	Date of Declaration	Pollutants and Air Quality Objectives	City / Town	One Line Description	Is air quality in the AQMA influenced by roads controlled by Highways England?	Level of Exceedance (maximum monitored/modelled concentration at a location of relevant exposure)				Action Plan		
						At Declaration		Now		Name	Date of Publication	Link
AQMA 1 - Haven Bridge	10/09/2001	NO ₂ Annual Mean	Boston	A major highway consisting of John Adams Way (A16), Queen Street and Liquorpond Street (A52).	YES	44.7	µg/m ³	53.2	µg/m ³	Boston Borough Council, Air Quality Action Plan	2006	http://aqma.defra.gov.uk/action-plans/BostonBC%20AQAP%202006.pdf
AQMA 2 - Bargate Bridge	01/03/2005	NO ₂ Annual Mean	Boston	Key roundabout for the A16 and A1137.	YES	42.9	µg/m ³	43.6	µg/m ³	Boston Borough Council, Air Quality Action Plan	2006	http://aqma.defra.gov.uk/action-plans/BostonBC%20AQAP%202006.pdf

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

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

Defra's appraisal of last year's ASR confirmed that exceedances of air quality objectives only occurred within both designated AQMAs, Haven Bridge (2) and Bargate Bridge (1). However after corrections were applied, relevant exposure at the locations of receptors within Bargate Bridge AQMA weren't found to breach the AQS. Nevertheless, as monitoring at Haven Bridge AQMA has been reported to breach air quality objectives consistently (even after corrections were applied), efforts should be concentrated within this AQMA to eliminate the risk, and to undertake supplementary monitoring in areas with residential receptors present to increase accuracy and monitor exposure effectively.

We are addressing concerns surrounding the relevance of the AQAP, as Boston Borough Council are currently updating the AQAP, which will incorporate new and revised measures to lower pollutant concentrations within the designated AQMAs and also across the whole Borough and discuss the suitability of current monitoring sites, and whether there are any new sites that should be considered as recommended.

We agree with the points raised regarding consistency of compliance at Bargate Bridge AQMA in relation to a potential revoke, and as a result will continue to use diffusion tube monitoring at all available locations within the AQMA and will be open to supplementary monitoring if required to ensure progress is monitored.

Boston Borough Council have taken forward a number of direct measures during the current reporting year of 2017 in pursuit of improving local air quality. Details of all measures completed, in progress or planned are set out in Table 2.2.

More detail on these measures can be found in the Boston Borough Council, Local Air Quality Management – Air Quality Action Plan (Joint AQAP update 2010), the Boston Transport Strategy (2016-2036) and Local Plan. The new Local Plan jointly with South Holland District Council and Lincolnshire County Council has now been submitted to the Secretary of State for approval and is set to be adopted in 2018.

Key measures which have already been undertaken include:

- Development of a transport strategy for Boston (Boston Transport Strategy 2016-2036);

- Appointment of a senior office responsible for transport related issues within Boston Borough Council; and
- Production of a Council Sustainable Travel Plan.

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

- Release of an updated AQAP;
- Investigation of inland waterways as complementary distribution methods for freight;
- Construction of the Boston Distributor road which will ease reliance on inner city arterial roads for journeys made beyond Boston; and
- Expansion of the Community Travel Zone.

Boston Borough Council priorities for the coming year are:

- Update the AQAP;
- Construction of the Boston Distributor road;
- Encourage walking and cycling routes for new developments; and
- Discourage developments within the town-centre.

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

- Funding: The majority of the actions mentioned above require funding to implement successfully. In particular, delivery of the Boston Distributor Road as detailed in the Boston Transport Strategy 2016-36 is reliant upon developer contributions and highway infrastructure funding. Therefore, Boston Borough Council and Lincolnshire Country Council must utilise all options available for funding, prioritise measures and be cost effective to ensure our actions outlined in the AQAP are delivered.
- Conflicts with disciplines: On occasion, measures which address air quality can negatively impact other disciplines; such as business and commerce, causing delays. Therefore, when a conflict arises, Boston Borough Council will exploit the use of consultation groups to help address multidisciplinary concerns in an

attempt to deliver cross-channel benefit. Boston Borough Council will also proactively consider potential conflicts and combine disciplines when developing strategies to help minimize these barriers and utilise benefits from each discipline. Both of these techniques have been explored during the formation of the Boston Transport Strategy 2016-36, where steering groups with key stakeholders were used to align air quality with transport to deliver multidisciplinary benefits.

- **Cooperation:** Sometimes, delivery of specific measures can fall under the responsibility of multiple government bodies and/or private enterprises. An example of this would be road infrastructure, where in some cases a network is controlled by several groups who all need to participate to deliver effective change. In Boston, delivery of the Boston Distributer Road is dependent on support from the private sector and requires regional authority oversight which can cause delays. To tackle this, Boston Borough Council will work together on the feasibility of delivering elements of the Boston Distributer Road and associated projects that cannot be brought forward by the private sector alone.
- **Influence:** In Boston, both declared AQMAs are in areas where the air quality is influenced by roads controlled by Highways England meaning sometimes our actions alone will not help address air quality within these areas. In these situations it can be incredibly tough to deliver our pledged measures, as they can cross multiple boundaries of different interest groups. In light of this, Boston Borough Council has acknowledged this influence and have made a focussed effort to strengthen ties with the surrounding local authorities and infrastructure operators, such as Highways England, with a view of improving regional air quality – a shared goal, with the release of the Boston Transport Strategy (2016-36) and support of the Lincolnshire Local Transport Plan.

Progress on the following measures has been slower than expected due to:

- In some cases funding has caused issues with delivery. As funding is the main tool to implement change, if the supply is cut off or reduced, this can cause stagnation in delivery. For instance, a multi storey car park was proposed as part of implementing controlling zones in attempt to dissuade the use of private

Boston Borough Council

vehicles within Boston town centre, however funding provided from developer ceased midway through the project causing delays to delivery.

- As Boston Borough Council are midway through updating their AQAP, emphasis on completing some measures listed in the 2006 AQAP has diminished due to the risk that these may be ineffective and outdated and could potentially waste resources. Nonetheless, Boston Borough Council will still complete its obligations in helping to improve air quality within the area, as projects which are expected to be included in the revised AQAP will still be progressed.

Boston Borough Council anticipates that the measures stated above and in Table 2.2 will achieve compliance in AQMA 1 Haven Bridge and AQMA 2 Bargate Bridge.

Table 2.2 – Progress on Measures to Improve Air Quality

Measure No.	Measure	EU Category	EU Classification	Organisations involved and Funding Source	Planning Phase	Implementation Phase	Key Performance Indicator	Reduction in Pollutant / Emission from Measure	Progress to Date	Estimated / Actual Completion Date	Comments / Barriers to implementation
AQAP 1	Building of the Boston Docks Link Road	Traffic Management	Strategic highway improvements	LCC / BBC	The scheme has been abandoned	-	Traffic counts, non-automatic NO ₂ monitoring	Reduction of 2µg/m ³ per year	within Boston Transport Strategy 2016-2036	-	Scheme not being pursued
AQAP 2	Provision of the Outer Distributor Road for Boston	Traffic Management	Strategic highway improvements	LCC / BBC	The Boston Transport Strategy considers the Distributor Road as a longer term aspiration	South East Lincolnshire Local Plan 2011-2036	Traffic counts, non-automatic NO ₂ monitoring	Significantly reduce levels of Heavy Good Vehicles, achievement of annual target mean. <40 µg/m ³	Phase 1 Quadrant housing and retail development under construction	LCC Local Transport Plan Future Delivery to be agreed	Boston Transport Strategy 2016-2036
AQAP 3	Development of a Transport Strategy for Boston	Policy Guidance and Development	Air Quality Planning and Policy Guidance	LCC / BBC	Completed	South East Lincolnshire Local Plan 2011-2036	Traffic counts, non-automatic NO ₂ monitoring	Annual mean reduction achieved <40 µg/m ³	Boston Transport Strategy 2016-2036	Project/funding stream required to progress	AQAP Update commenced April 2018
AQAP 4	Expansion of the Community Travel Zone	Promoting Travel Alternatives	Promotion of walking and cycling	LCC	Schemes to encourage walking and cycling implemented	A Non-Motorised User study for the town has been completed. This has identified several prospective walking and cycling schemes which are currently being prioritised for deliver as funding become available.	Traffic counts, non-automatic NO ₂ monitoring	General public accepting change and raise awareness on different forms of sustainable transport.	Boston Community Health Walks delivers 12 health walks a week. There are 800 attendances a month	Enhanced cycling and walking facilities in Boston have been approved and are going ahead such as the Spa Trail connect and Black Sluice Path	-

Boston Borough Council

Measure No.	Measure	EU Category	EU Classification	Organisations involved and Funding Source	Planning Phase	Implementation Phase	Key Performance Indicator	Reduction in Pollutant / Emission from Measure	Progress to Date	Estimated / Actual Completion Date	Comments / Barriers to implementation
AQAP 7	Provision of Liquid Petroleum Gas (LPG) pumps at filling station	Promoting Low Emission Transport	Procuring alternative Refuelling infrastructure to promote Low Emission Vehicles, EV recharging, Gas fuel recharging	BBC	No policy in Plan		Non-automatic NO ₂ monitoring	Annual mean reduction achieved <40 µg/m ³	South East Lincolnshire Local Plan 2011-2036	National Air Quality Strategy	Not included in Plan
AQAP 9	Park & Ride Schemes for applicability to Boston	Alternatives to private vehicle use	Bus based Park & Ride	LCC	The Boston Transport Strategy does not support the merits of a Park & Ride for Boston. However, the adopted Boston Transport Strategy does propose other improvements to public transport	The new 'IntoTown' town bus service was introduced in 2008. As well as more frequent service using low floor buses, this has included improvements to bus stops and timetable information, together with real time information. The service has seen a threefold increase in patronage since its introduction.		Annual mean reduction achieved <40 µg/m ³	3 cross town loops every 30 minutes Operate Mon-Sat 0700-1900 passengers has risen over 300% and now carrying 24,000/month	South East Lincolnshire Local Plan 2011-2036 Scheme abandoned	
AQAP 10	Development of a rail-freight interchange through the Local Plan	Freight and Delivery Management	Other	LCC / SHDC			-	Annual mean reduction achieved. <40 µg/m ³	South East Lincolnshire Local Plan 2011-2036	Scheme abandoned	No developer

Boston Borough Council

Measure No.	Measure	EU Category	EU Classification	Organisations involved and Funding Source	Planning Phase	Implementation Phase	Key Performance Indicator	Reduction in Pollutant / Emission from Measure	Progress to Date	Estimated / Actual Completion Date	Comments / Barriers to implementation
AQAP 11	Designate a senior officer responsibility for transport-related issues within BBC	Policy Guidance and Development Control	Other policy	BBC	South East Lincolnshire Local Plan 2011-2036	Chief Executive Phil Drury representing BBC on Boston Transport Strategy	-	Annual mean reduction achieved <40 µg/m ³	Complete	Complete	Boston Transport Strategy 2016-2036
AQAP 12	Controlled Parking Zone (CPZ) Framework	Traffic Management	UTC, Congestion management, traffic reduction	LCC / BBC	Feasibility study carried out.	Civil Parking Enforcement has been introduced	-	Annual mean reduction achieved. <40 µg/m ³	Additional signage to direct drivers to most appropriate car parks. New pricing charges introduced.	-	A multi-storey car park was proposed, but the developer pulled out on funding.
AQAP 13	Encouraging walking and cycling routes for new development	Transport Planning and Infrastructure	Cycle network	LCC / BBC	South East Lincolnshire Local Plan 2011-2036	An ongoing objective when considering planning applications for new development, to achieve adequate facilities within the developments	Traffic counts at major roads	Annual mean reduction achieved. <40 µg/m ³	Implementation started 2010/2011, examples are Sleaford Road cycleway, Toucan crossing at Bargate Bridge.	Ongoing	-

Boston Borough Council

Measure No.	Measure	EU Category	EU Classification	Organisations involved and Funding Source	Planning Phase	Implementation Phase	Key Performance Indicator	Reduction in Pollutant / Emission from Measure	Progress to Date	Estimated / Actual Completion Date	Comments / Barriers to implementation
AQAP 14	Discouraging development within the town-centre than places an emphasis on private vehicle use over public transport.	Promoting Travel Alternatives	Other	BBC	South East Lincolnshire Local Plan 2011-2036	This is an ongoing objective when considering planning applications for new development, to achieve adequate facilities within the developments and linkages to existing networks.	-	Annual mean reduction achieved. <40 µg/m ³	South East Lincolnshire Local Plan 2011-2036	Ongoing	-
AQAP 15	Request detailed air quality assessments for proposed development that is likely to have a significant impact on local air quality	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	BBC	South East Lincolnshire Local Plan 2011-2036	Air quality assessments are required of developers where a significant impact is likely.	-	-	Ongoing development control	Ongoing	-
AQAP 16	Use of Planning Conditions or S106 Agreements	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	BBC	South East Lincolnshire Local Plan 2011-2036	These tools are used where appropriate and according to the scale of the problem.	-	-	South East Lincolnshire Local Plan 2011-2036	Ongoing	-

Boston Borough Council

Measure No.	Measure	EU Category	EU Classification	Organisations involved and Funding Source	Planning Phase	Implementation Phase	Key Performance Indicator	Reduction in Pollutant / Emission from Measure	Progress to Date	Estimated / Actual Completion Date	Comments / Barriers to implementation
AQAP 18	Production of a Council Sustainable Travel Plan	Promoting Travel Alternatives	Workplace Travel Planning	BBC	The County Council is working in partnership with Boston Borough Council to implement a Travel Plan for the Municipal Buildings in Boston (which are also sublet to the East Lincolnshire Primary Care Trust and the County Council's Divisional staff).	A staff survey was carried out in March 2004 which identified employees travel patterns and a Travel Plan was adopted in the summer of 2005	-	-	Smarter Driving Courses commencing 2010/2011. Adopted Carbon Management Plan 2010 -2014	Complete	
AQAP 19	Promotion of Sustainable Travel Plans for large employers (more than 500 employees)	Promoting Travel Alternatives	Workplace Travel Planning	BBC	South East Lincolnshire Local Plan 2011-2036	These tools are used where appropriate and according to the scale of the problem.	Number of employers that joins the programme	-	Two children's centres in the Borough have submitted travel plans to LCC	Ongoing	-

Boston Borough Council

Measure No.	Measure	EU Category	EU Classification	Organisations involved and Funding Source	Planning Phase	Implementation Phase	Key Performance Indicator	Reduction in Pollutant / Emission from Measure	Progress to Date	Estimated / Actual Completion Date	Comments / Barriers to implementation
AQAP 20	Promotion of walking as a healthy alternative to car use for short journeys within the town-centre	Promoting Travel Alternatives	Promotion of walking	BBC	Promotion of walking has been delivered through the LTP through Safe Routes to School and Community Travel Zones in Boston	The Boston Transport Strategy proposes a number of measures to promote walking. In addition, all schools in the Boston area now have an approved School Travel Plans to encourage walking, cycling and bus use.	Increase in number of participants/partners. Traffic counts on major roads	-	Boston Community Health Walks delivers 12 health walks a week. There are 800 attendances a month	Ongoing	Boston Walking Scheme has received NHS Lincolnshire Award 2010
AQAP 22	Investigation of inland waterways as complementary distribution methods for freight	Promoting Travel Alternatives	Promote use of rail and inland waterways	BBC	South East Lincolnshire Local Plan 2011-2036	Outline planning permission has been granted for the construction of a tidal barrage and a lock link to encourage greater use of the River Witham and to provide a navigable link to the South Forty Foot Drain. This will ultimately link to the R. Welland, R. Nene and R. Ouse, known as the Fens Waterway Link.	Non-automatic NO ₂ monitoring	-	Lock link completed. Barrier position finalised. Boston Barrier construction commenced Jan 2018	Completion 2020	-

Boston Borough Council

Measure No.	Measure	EU Category	EU Classification	Organisations involved and Funding Source	Planning Phase	Implementation Phase	Key Performance Indicator	Reduction in Pollutant / Emission from Measure	Progress to Date	Estimated / Actual Completion Date	Comments / Barriers to implementation
AQAP 23	Discourage use of bonfires for disposal of waste	Policy Guidance and Development Control	Regional Groups Co-ordinating programmes to develop Area wide Strategies to reduce emissions and improve air quality	BBC	Statutory Nuisance enforcement ongoing.	Statutory Nuisance enforcement ongoing. Recycling of green waste at 52%	-	-	Statutory nuisance enforcement ongoing. Garden Waste collection throughout the Borough	Ongoing	-
AQAP 24	Maintenance of current monitoring stations and networks	Promoting Low Emission Plant	Other	BBC	Haven Bridge continuous monitoring station ceased. Non-automatic NO ₂ monitoring across the council	Haven Bridge continuous monitoring station closed due to lack of funds.	Non-automatic NO ₂ monitoring	Annual mean reduction achieved. <40 µg/m ³	15 Diffusion tube sites	Ongoing	-

2.3 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.

Currently there is no monitoring of PM_{2.5} completed within the jurisdiction of Boston Borough Council, as efforts are being concentrated on monitoring NO₂ levels in line with established AQMAs. However, as both NO₂ and particulates originate from the same source, measures which attempt to reduce NO₂ levels within Boston will simultaneously reduce levels of PM₁₀ and PM_{2.5}.

The current Defra 2017 background maps for Boston (2015 based)⁴ show that all background concentrations of PM_{2.5} are far below the 2020 annual mean AQS objective for PM_{2.5}. The highest concentration is predicted to be 12.0µg/m³ within the 1 x 1km grid square with the centroid grid reference of 538500, 345500. This grid square is located north of Butterwick where the A52 is present - a common contributor to poor air quality within Boston.

The Public Health Outcomes Framework data tool⁵ compiled by Public Health England quantifies the mortality burden of PM_{2.5} within England on a county and local authority scale. The 2016 fraction of mortality attributable to PM_{2.5} pollution in Boston is 5.3%, which is equal to the national average of 5.3%, and below the East Midland's average of 5.7%.

LAQM.TG(16) Table A.1 Action toolbox presents a list of measures that can be implemented to help reduce concentrations of PM_{2.5}.

Where required Boston Borough Council will review any proposed actions to be implemented with the Public Health team to consider the potential impact of the actions and whether any further action is required.

⁴ Defra Background Mapping data for local authorities (2015-based), available online at <https://uk-air.defra.gov.uk/data/laqm-background-maps?year=2015>

⁵ Public Health Outcomes Framework, Public Health England. data tool available online at <http://www.phoutcomes.info/public-health-outcomes-framework#page/0/gid/1000043/pat/6/par/E12000009/ati/102/are/E06000028>

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

3.1 Summary of Monitoring Undertaken

3.1.1 Automatic Monitoring Sites

Boston Borough Council did not undertake any automatic (continuous) monitoring during 2016.

3.1.2 Non-Automatic Monitoring Sites

Boston Borough Council undertook non- automatic (passive) monitoring of NO₂ at 15 sites during 2017. Table A.1 in Appendix A shows the details of the 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” and distance correction. Further details on adjustments are provided in Appendix C.

3.2.1 Nitrogen Dioxide (NO₂)

Table A.2 in Appendix A compares the ratified and adjusted monitored NO₂ annual mean concentrations for the past 5 years with the air quality objective of 40µg/m³.

For diffusion tubes, the full 2017 dataset of monthly mean values is provided in Appendix B.

Data capture for one diffusion tube (Site 3) was below 75% and therefore annualisation (short to long term adjustment) was completed for the concentration at this location.

Results for 2017 have been bias adjusted using a national bias adjustment factor of 0.89. Full details of the bias adjustment and QA/QC procedure are provided in Appendix C: Supporting Technical Information / Air Quality Monitoring Data QA/QC.

Table B.1 below provides a summary of measured annual mean concentrations (annualised and bias adjusted) that were recorded for 2017. During 2017 there were seven locations with the annual mean concentration above $36\mu\text{g}/\text{m}^3$. They are:

- Site 1 – North side of Haven Bridge Road
- Site 2 - North side of Haven Bridge Road
- Site 3 – Adjacent to 68 Liquorpond Street
- Site 4 - 18 Queen Street
- Site 5 - John Adams Way intersection with Haven Bridge
- Site 9 - Roadside adjacent to 30 Spilsby Road
- Site14 - Roadside adjacent to 20 Spilsby Road

Four of these seven locations have observed to exceed the AQS annual mean objective for NO_2 . These four sites are named as follows:

- Site 1 - North side of Haven Bridge Road
- Site 2 - North side of Haven Bridge Road
- Site 3 - Adjacent to 68 Liquorpond Street
- Site 9 - Roadside adjacent to 30 Spilsby Road

All exceedances of the AQS annual mean objective for NO_2 reported within 2017 were within both AQMAs, with Site 1, 2 and 3 located within AQMA 1 Haven Bridge and Site 9 within AQMA 2 Bargate Bridge. In order for the results to be representative of relevant exposure, the NO_2 fall-off with distance calculator was used to estimate the NO_2 concentration for the diffusion tube locations with non-relevant exposures where annual mean NO_2 was greater than $36\mu\text{g}/\text{m}^3$. However, the calculator was not required for Sites 1, 2, 3 and 4 as the positioning of the receptors in respect to the diffusion tubes was deemed to already be representative of relevant exposure. The NO_2 fall-off with distance correction calculations have therefore been carried out for Site 5, 9 and 14 shown in Table C.3 – Fall off with Distance Correction of Relevant Sites Exceeding and Near Exceeding the NO_2 Annual Mean AQS Objective, Figure C.1, Figure C.2 and Figure C.3, which resulted in Site 9 being reported as compliant ($38.7\mu\text{g}/\text{m}^3$). After calculations only Sites 1, 2

and 3 were recorded to be over $40\mu\text{g}/\text{m}^3$ meaning all 2017 exceedances of the AQS annual mean objective for NO_2 were solely located within AQMA 1 Haven Bridge.

Large increments in annual mean NO_2 concentrations were observed within AQMA 1 Haven Bridge in comparison to 2016 monitoring results (Figure A.1). For instance, Site 2 which is located along John Adams Way within AQMA 1 Haven Bridge reported an exceedance of the NO_2 annual mean AQS objective for the first time since 2015, where concentrations increased by $6.9\mu\text{g}/\text{m}^3$ in comparison to 2016. Similarly, Site 3 reported a $7\mu\text{g}/\text{m}^3$ increment in NO_2 annual mean concentrations. Overall in AQMA 1 Haven Bridge, four out of five monitoring sites experienced an increase in NO_2 annual mean concentrations (Figure A.2). Similarly, all monitoring sites in AQMA 2 Bargate Bridge experienced an increase in NO_2 annual mean concentrations (Figure A.3).

In comparison to 2013, NO_2 annual mean concentrations have decreased at 12 sites over a five year period, with the largest decrement observed at Site 2 reflecting the continual commitment and progress made by the Boston Borough Council to improve local air quality with the aim to revoke the declared AQMAs (Figure A.4).

Defra guidance states that exceedances of the NO_2 1-hour objective are unlikely to occur where the annual mean concentration is below $60\mu\text{g}/\text{m}^3$. The highest recorded mean annual NO_2 concentration was $53.2\mu\text{g}/\text{m}^3$ at Site 3. This indicates that an exceedance of the 1-hour mean objective is unlikely to occur at these sites throughout 2017.

Appendix A: Monitoring Results

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

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA?	Distance to Relevant Exposure (m) ⁽¹⁾	Distance to kerb of nearest road (m) ⁽²⁾	Tube collocated with a Continuous Analyser?	Height (m)
1	Adjacent to former AQMS, North side of Haven Bridge Road	Roadside	532575	343696	NO ₂	Y	0	1.5	N	3
2	Opposite former AQMS, North side of Haven Bridge Road	Roadside	532656	343716	NO ₂	Y	N/A	0.5	N	3
3	Adjacent to 68 Liquorpond Street	Roadside	532470	343736	NO ₂	Y	0.1	0.5	N	3
4	Adjacent to 18 Queen Street	Roadside	532331	343848	NO ₂	Y	0.1	1.5	N	3
5	John Adams Way intersection with Haven Bridge	Roadside	532859	343760	NO ₂	Y	3.5	2.2	N	3
6	Adjacent to 37 Spayne Road	Urban Background	533124	343939	NO ₂	N	6.8	2.7	N	3

7	29 Manor Gardens	Urban Background	533324	344044	NO ₂	N	10	26.8	N	3
8	Bargate Roundabout	Roadside	533112	344476	NO ₂	Y	N/A	2.3	N	3
9	Roadside adjacent to 30 Spilsby Road	Roadside	533251	344642	NO ₂	Y	4	2	N	3
10	Façade of 23 Spilsby Road	Roadside	533312	344665	NO ₂	N	0	5	N	3
11	41 Spilsby Road	Roadside	533368	344728	NO ₂	N	8.5	0.3	N	3
12	Junction of New Asda Road and Sleaford Road	Roadside	532168	343987	NO ₂	N	8.9	1.5	N	3
13	Façade of 42 Spilsby Road	Roadside	533287	344675	NO ₂	N	0	7	N	3
14	Roadside adjacent to 20 Spilsby Road	Roadside	533226	344624	NO ₂	Y	3	2	N	3
15	Façade of 32 Spilsby Road	Roadside	533253	344653	NO ₂	Y	0.1	10	N	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

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2017 (%) ⁽²⁾	NO ₂ Annual Mean Concentration (µg/m ³) ⁽³⁾				
					2013	2014	2015	2016	2017
1	Roadside	Diffusion Tube	91.7	91.7	50.5	51.7	49.7	45.8	49.4
2	Roadside	Diffusion Tube	66.7	66.7	54.6	53.7	50.1	37.5	44.5
3	Roadside	Diffusion Tube	41.7	41.7	49.2	45.3	46	46.2	53.2
4	Roadside	Diffusion Tube	100	100	42.5	40.2	36.4	38.6	38.0
5	Roadside	Diffusion Tube	100	100	38.7	36.1	34.9	34.6	36.8
6	Urban Background	Diffusion Tube	91.7	91.7	18.5	17	17.1	17.8	18.6
7	Urban Background	Diffusion Tube	100	100	17.7	15.9	16.3	17.0	17.9
8	Roadside	Diffusion Tube	100	100	33.1	34.2	31.1	31.1	31.3
9	Roadside	Diffusion Tube	100	100	44.1	46.6	44.2	41.5	43.6
10	Roadside	Diffusion Tube	100	100	31	31.7	28.5	28.2	27.7
11	Roadside	Diffusion Tube	91.7	91.7	37.4	36.3	33	30.6	31.8
12	Roadside	Diffusion Tube	100	100	34.6	30.7	28.6	26.8	27.6
13	Roadside	Diffusion Tube	100	100	24.1	23.3	22	21.7	22.1
14	Roadside	Diffusion Tube	100	100	41.1	41.6	36.6	36.7	37.1
15	Roadside	Diffusion Tube	100	100	24.7	25.2	21.4	21.8	22.5

Diffusion tube data has been bias corrected

Annualisation has been conducted where data capture is <75%

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**.

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

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

(3) Means for diffusion tubes have been corrected for bias. All means have been “annualised” as per Boxes 7.9 and 7.10 in LAQM.TG16 if valid data capture for the full calendar year is less than 75%. See Appendix C for details.

Figure A.1 Trends in Annual Mean NO₂ Concentrations at Non-Automatic Monitoring Locations (2016 – 2017)

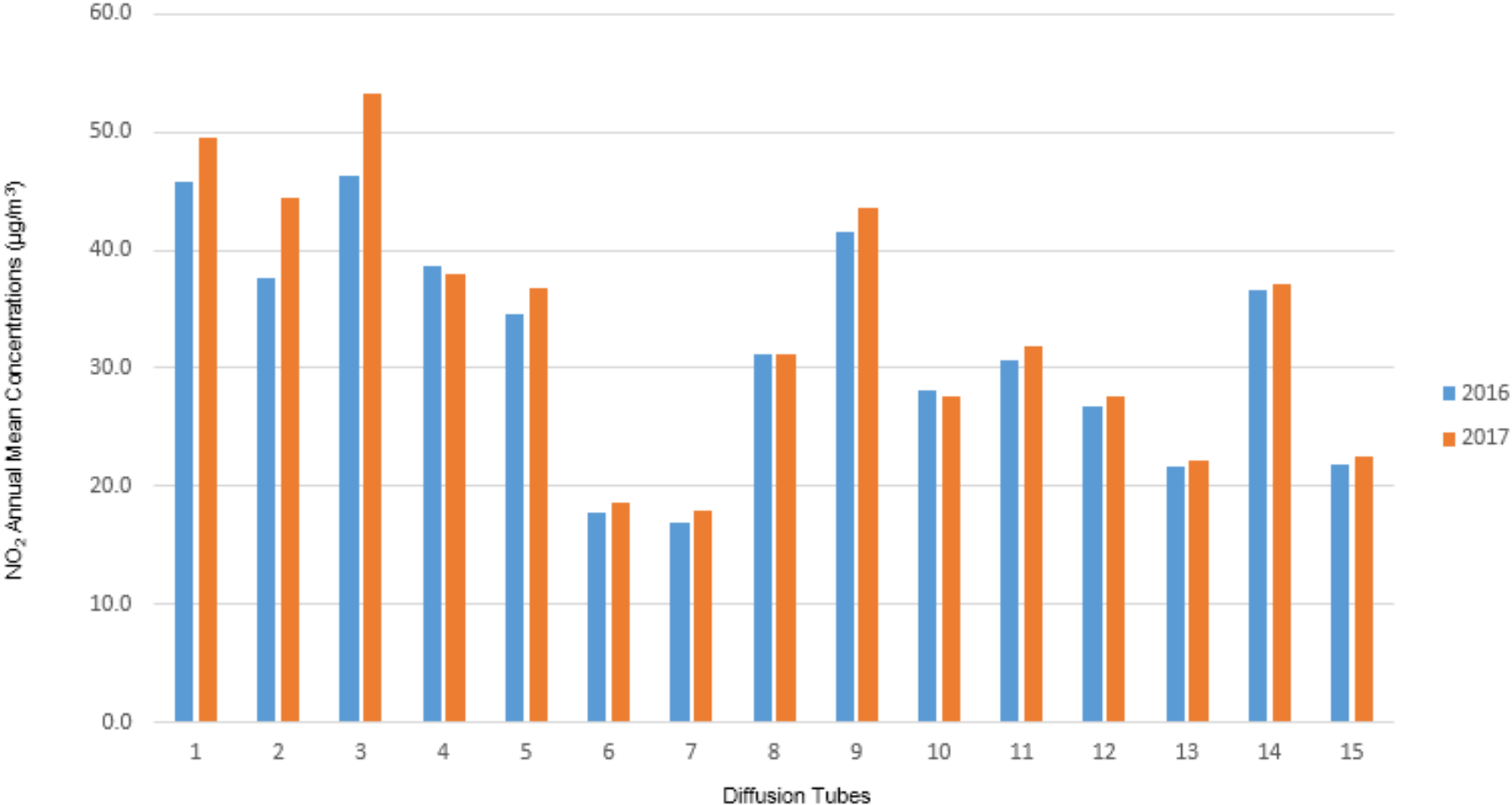


Figure A.2 - Trends in Annual Mean NO₂ Concentrations at Diffusion Tube Locations in AQMA 1 over a 5 Year Period

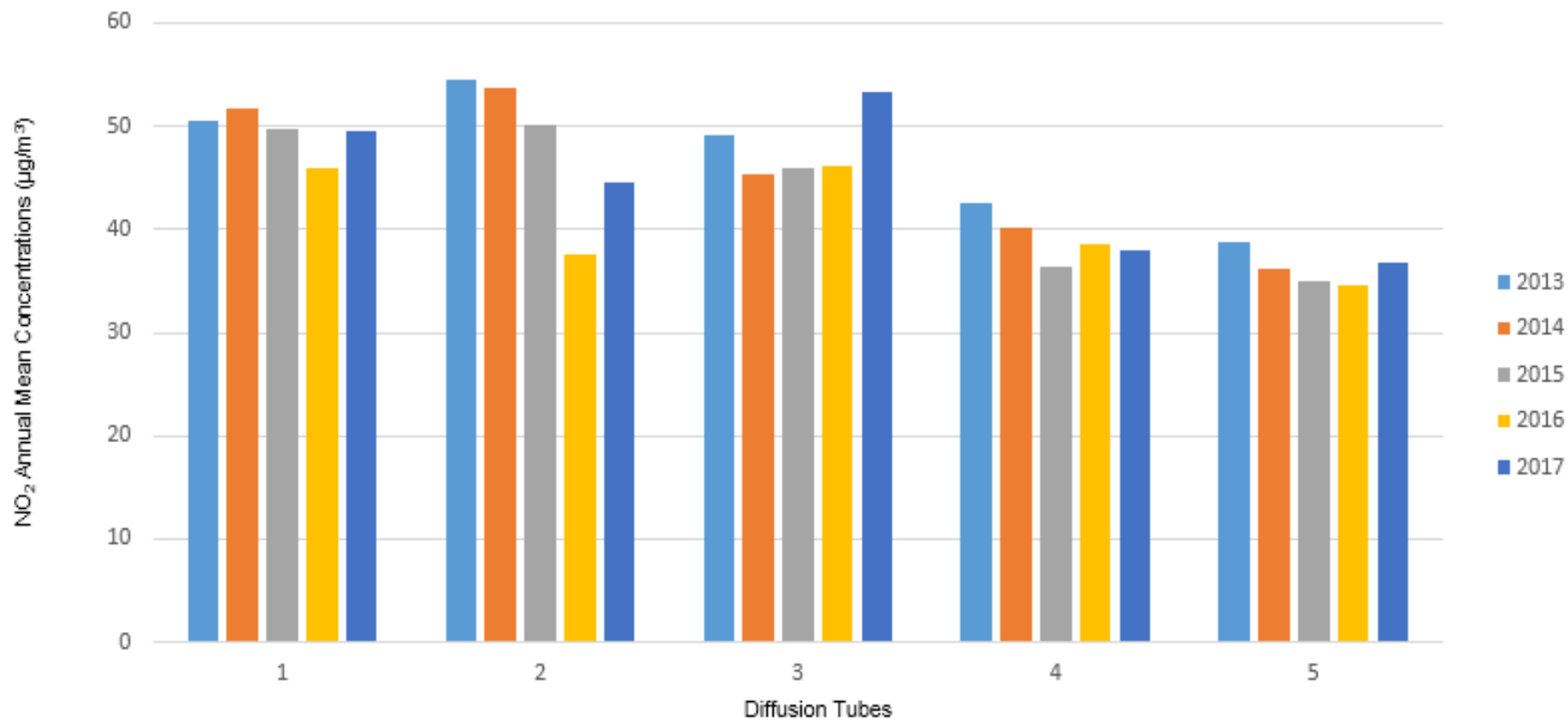


Figure A.3 - Trends in Annual Mean NO₂ Concentrations at Diffusion Tube Locations in AQMA 2 over a 5 Year Period

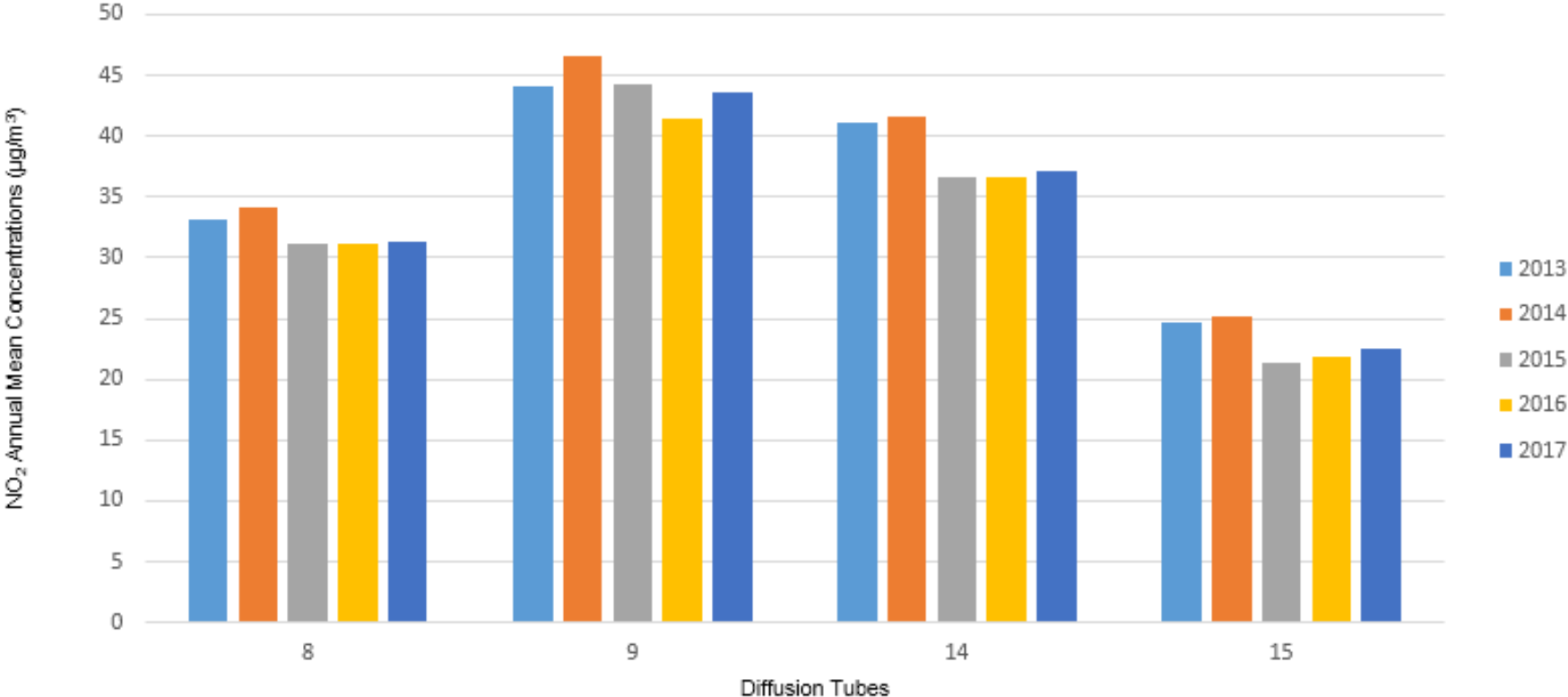
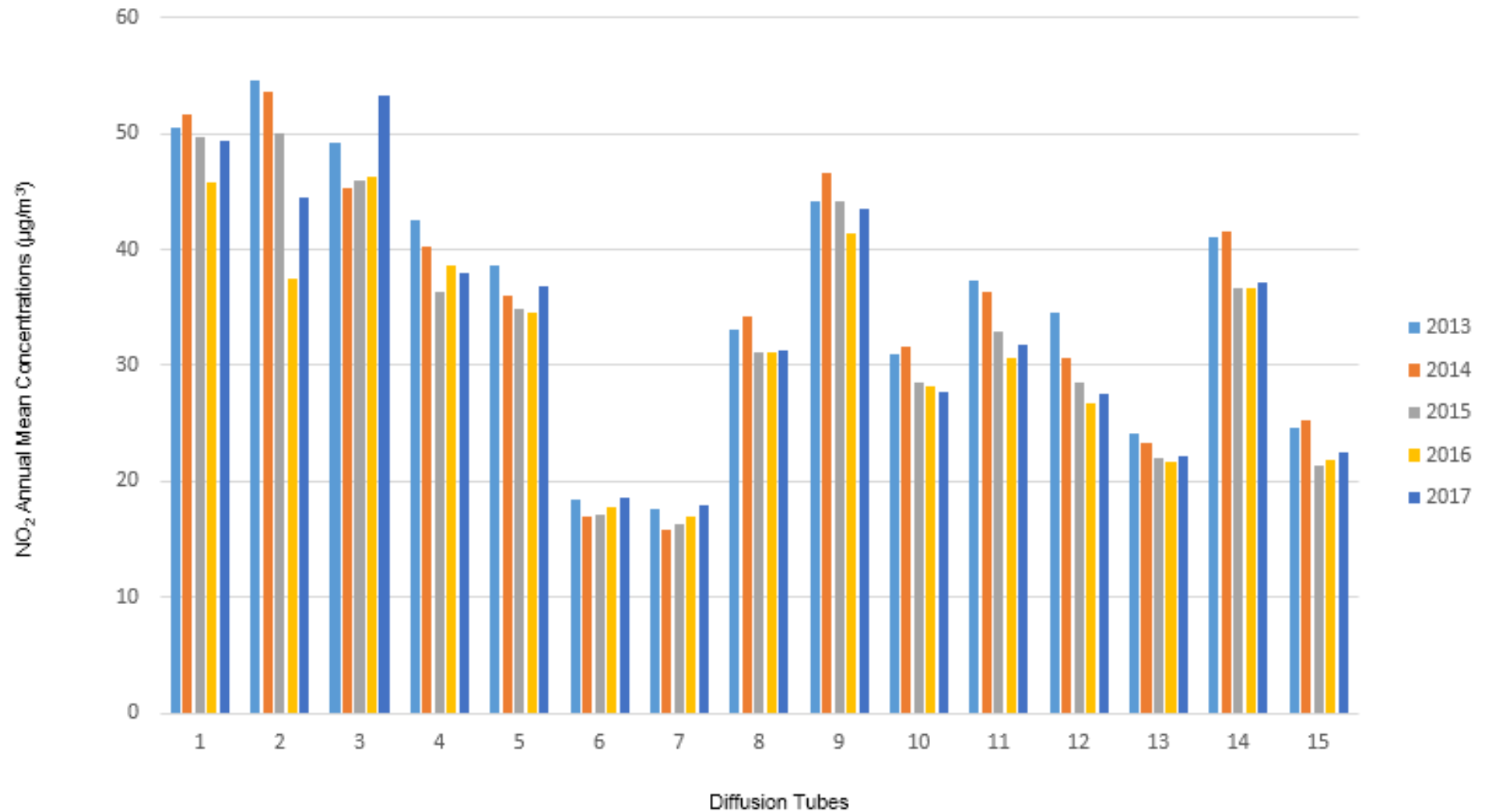


Figure A.4 - Trends in Annual Mean NO₂ Concentrations at Non-Automatic Monitoring Locations over a 5 Year Period



Appendix B: Full Monthly Diffusion Tube Results for 2017

Table B.1 – NO₂ Monthly Diffusion Tube Results - 2017

Site ID	NO ₂ Mean Concentrations (µg/m ³)												Annual Mean		
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Raw Data	Bias Adjusted (0.89) and Annualised ⁽¹⁾	Distance Corrected to Nearest Exposure ⁽²⁾
1	72.6	55.0	58.2	57.8	54.0	55.7	42.4	N/R	53.4	55.5	44.5	62.0	55.6	49.4	-
2	49.6	50.6	47.0	52.7	47.4	49.5	N/R	47.6	N/R	38.5	72.5	44.1	50.0	44.5	-
3	71.5	57.1	47.4	64.9	45.8	46.8	44.5	64.4	N/R	N/R	N/R	N/R	55.3	53.2	-
4	61.1	N/R	48.6	41.9	47.4	38.9	33.2	35.5	40.1	35.6	47	40.8	42.7	38.0	-
5	60.8	44.5	33.4	43.6	35	N/R	30.6	33.2	37.1	41.1	54.4	N/R	41.4	36.8	34.3
6	32.9	25.6	21	18.8	14.2	14.9	12.8	15.7	17.8	19.9	29.8	27.7	20.9	18.6	-
7	31.9	23.5	21.5	16.1	12.3	11.3	N/R	14.2	16.8	18.9	31.7	23.6	20.2	17.9	-
8	43.9	39.3	36.8	34	34	34.3	30.2	32.6	27.7	33.6	38.3	36.9	35.1	31.3	-
9	61.3	58.2	N/R	45.9	39.7	46.6	39.2	47.4	46.8	45.9	52.5	55.2	49.0	43.6	38.7
10	37.2	35.7	34.6	27.1	27.8	26.1	27.3	29.2	29.4	30.8	34.5	33.3	31.1	27.7	-
11	31.8	39.1	31.6	34.8	32.2	36.5	29.1	32.2	33.2	37.8	48.1	42.4	35.7	31.8	-
12	39.8	32.4	30.2	34.7	30.4	26.9	25	25.2	29.5	26.7	40.6	31.1	31.0	27.6	-
13	34.3	29.7	26.9	20.3	21.6	19.9	19.4	20.8	20.9	25.3	30	29.1	24.9	22.1	-
14	49.5	46.9	N/R	37.9	42.5	35.9	35.5	38	36.7	38.1	52.6	45.5	41.7	37.1	36.4
15	40.7	27.7	26.8	20.5	21.9	17.8	18.9	20.7	22.1	23.4	31.4	31.2	25.3	22.5	-

- Local bias adjustment factor used
- National bias adjustment factor used
- Annualisation has been conducted where data capture is <75%
- Where applicable, data has been distance corrected for relevant exposure

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**.

(1) See Appendix C for details on bias adjustment and annualisation.

(2) Distance corrected to nearest relevant public exposure.

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

Diffusion Tube Bias Adjustment Factors

The diffusion tubes are supplied and analysed by Gradko utilising the 20% triethanolamine (TEA) in water preparation method. A bias adjustment of 0.89 for the year 2017 (based on 34 studies) has been derived from the national bias adjustment calculator⁶.

Discussion of Choice of Factor to Use

Historically the Council has used a local bias adjustment factor based on results from the diffusion tube co-located with the automatic air quality monitoring site that was installed within the Haven Bridge AQMA. However the site was decommissioned at the end of 2011 and therefore the national bias adjustment factor has been applied to the monitoring results since 2012.

QA/QC of Diffusion Tube Monitoring

Gradko International Ltd (Gradko) is a UKAS accredited laboratory and participates in the AIR-PT Scheme² (a continuation of the Workplace Analysis Scheme for Proficiency (WASP) for NO₂ tube analysis and the Annual Field Inter-Comparison Exercise. These provide strict performance criteria for participating laboratories to meet, thereby ensuring NO₂ concentrations are reported to a high level of accuracy. The lab follows the procedures set out in the Harmonisation Practical Guidance.

In the 2017 AIR-PT results, AIR-PT AR018 (January to February 2017), AIR PT AR019 (April to May 2017), AIR PT AR021 (July to August 2017) and AIR PT AR022 (September to October 2017), Gradko scored 100%. The percentage score reflects the results deemed to be satisfactory based upon the z-score of $< \pm 2$.

Short-term to Long-term Data Adjustment

Diffusion tube data capture for 2017 was greater than 75% at all the monitoring locations except for Site 3. The data for Site 3 has been annualised according to the method set out in LAQM TG(16) box 7.9. Details of the annualisation have been provided in Table C.1 and Table C.2.

⁶ National Diffusion Tube Bias Adjustment Factor Spreadsheet, version 03/18 published in March 2018.

Table C.1 - Annualisation of Data from Nearby Continuous Monitoring Sites

Site 3				
Site	Site Type	Annual Mean (µg/m ³)	Period Mean (µg/m ³)	Ratio Annual Mean / Period Mean
Leicester University	Urban Background	25.83	24.06	1.074
Nottingham Centre	Urban Background	29.58	27.98	1.057
Market Harborough	Rural Background	9.55	8.60	1.111
Average Ratio				1.081

Table C.2 Annualisation for Site 3

Site	Uncorrected Diffusion Tube Mean (µg/m ³)	Leicester University AF	Nottingham Centre AF	Market Harborough AF	Average AF	Annualised Data Average µg/m ³	Bias Adjusted (0.89) µg/m ³
3	55.3	1.074	1.057	1.111	1.081	59.8	53.2


Fall-off Distance Correction of Sites Exceeding the NO₂ Annual Mean Objective

The NO₂ fall-off with distance calculator was used for sites 5, 9 and 14 to estimate the NO₂ concentration at the nearest locations representative of relevant exposure, as annual mean NO₂ concentrations recorded at these sites in 2017 were greater than 36 µg/m³. The details for the NO₂ fall-off distance correction calculation for sites 5, 9 and 14 are shown in Table C.3 – Fall off with Distance Correction of Relevant Sites Exceeding and Near Exceeding the NO₂ Annual Mean AQS Objective and Figure C.1, Figure C.2 and Figure C.3.

Table C.3 – Fall off with Distance Correction of Relevant Sites Exceeding and Near Exceeding the NO₂ Annual Mean AQS Objective

Site ID	Site Type	Within AQMA	Distance to Relevant Exposure (m)	Distance to Kerb of Nearest Road (m)	2017 Annual Mean Concentration (µg/m ³)	Distance Corrected 2017 Annual Mean Concentration (µg/m ³)
5	Roadside	No	3.5	2.2	36.8	34.3
9	Roadside	Yes	4	2	43.6	38.7
14	Roadside	Yes	3	2	37.1	36.4


Figure C.1 - Fall off Distance Correction of Site 5 near Exceeding the NO₂ Annual Mean Objective (2017)



Enter data into the pink cells

Step 1	How far from the KERB was your measurement made (in metres)?	2.2	metres
Step 2	How far from the KERB is your receptor (in metres)?	3.5	metres
Step 3	What is the local annual mean background NO ₂ concentration (in µg/m ³)?	14.7	µg/m ³
Step 4	What is your measured annual mean NO ₂ concentration (in µg/m ³)?	36.8	µg/m ³
Result	The predicted annual mean NO ₂ concentration (in µg/m ³) at your receptor	34.3	µg/m ³


Figure C.2 - Fall off Distance Correction of Site 9 Exceeding the NO₂ Annual Mean Objective (2017)



Enter data into the pink cells

Step 1	How far from the KERB was your measurement made (in metres)?	2	metres
Step 2	How far from the KERB is your receptor (in metres)?	4	metres
Step 3	What is the local annual mean background NO ₂ concentration (in µg/m ³)?	13.6	µg/m ³
Step 4	What is your measured annual mean NO ₂ concentration (in µg/m ³)?	43.6	µg/m ³
Result	The predicted annual mean NO ₂ concentration (in µg/m ³) at your receptor	38.7	µg/m ³

Figure C.3 - Fall off Distance Correction of Site 14 near Exceeding the NO₂ Annual Mean Objective (2017)



Enter data into the pink cells

Step 1	How far from the KERB was your measurement made (in metres)?	2.2	metres
Step 2	How far from the KERB is your receptor (in metres)?	2.5	metres
Step 3	What is the local annual mean background NO ₂ concentration (in µg/m ³)?	13.6	µg/m ³
Step 4	What is your measured annual mean NO ₂ concentration (in µg/m ³)?	37.1	µg/m ³
Result	The predicted annual mean NO ₂ concentration (in µg/m ³) at your receptor	36.4	µg/m ³

Planning Permissions

B/16/0141

This planning application is located at land off Sibsey Road and Wainfleet Road, Boston, proposed construction of 66 dwellings, new vehicular access and estate road plus associated garages and infrastructure. No air quality assessment is required as part of the submission.

B/16/0380

This planning application is located on land north of Middlegate Road (west), Frampton, Boston, proposed construction of 195 dwellings, except access reserved with public open space and drainage infrastructure. An air quality assessment was required and confirmed pollutants of concern (NO₂ and PM₁₀) to be well below the annual mean AQS objectives as a result of the proposed development, therefore the site was considered to be suitable.

B/17/0171

This planning application is located on land north of west of Boston Road, Kirton, Boston, proposed construction of 91 dwellings and associated infrastructure and works (resulting in a total development of 180 dwellings, 40 dwellings above that already approved for the site). No air quality assessment is required as part of the submission.

B/15/0264

This planning application is located on land either side of the A16, south of Tytton Lane East, Wyberton, Boston, Lincolnshire, for the construction of Phase One 91 and Phase Two 56 one and two bed apartments and two, three, four and five bed houses. No air quality assessment is required as part of the submission.

B/16/0106

This planning application is located on land north of Puritan Way, Boston, for the construction of 86 dwellings plus roads, public open space and associated works. No air quality assessment is required as part of the submission.

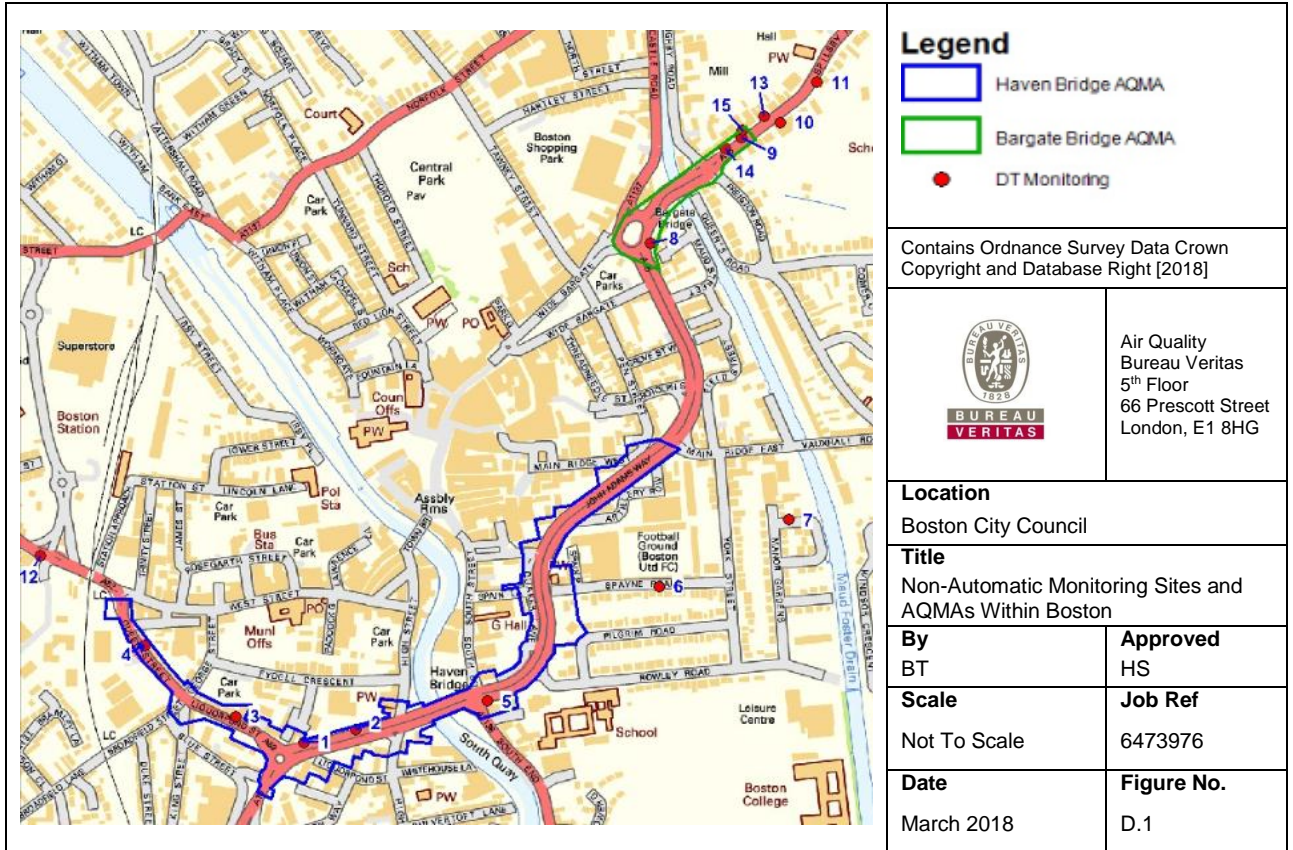
EPR/UP3131DF

This environmental permit relates to the operation of a waste co-incineration plant designed to produce electricity using gasification at Riverside Industrial Estate in Boston at National Grid Reference TF 34078 42128. An air quality assessment was

required and confirmed activities undertaken at the plant were unlikely to give rise to significant pollution, concluding negligible predictions.

Appendix D: Maps of Monitoring Locations and AQMAs

Figure D.1 - Non-Automatic Monitoring Sites and AQMAs Within Boston



Appendix E: Summary of Air Quality Objectives in England

Table E.1 – Air Quality Objectives in England

Pollutant	Air Quality Objective ⁷	
	Concentration	Measured as
Nitrogen Dioxide (NO ₂)	200 µg/m ³ not to be exceeded more than 18 times a year	1-hour mean
	40 µg/m ³	Annual mean
Particulate Matter (PM ₁₀)	50 µg/m ³ , not to be exceeded more than 35 times a year	24-hour mean
	40 µg/m ³	Annual mean
Sulphur Dioxide (SO ₂)	350 µg/m ³ , not to be exceeded more than 24 times a year	1-hour mean
	125 µg/m ³ , not to be exceeded more than 3 times a year	24-hour mean
	266 µg/m ³ , not to be exceeded more than 35 times a year	15-minute mean

⁷ The units are in microgrammes of pollutant per cubic metre of air (µg/m³).

Glossary of Terms

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

References

- Local Air Quality Management Technical Guidance LAQM.TG(16). February 2018. 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.PG(16). May 2016. Published by Defra in partnership with the Scottish Government, Welsh Assembly Government and Department of the Environment Northern Ireland.
- NO₂ Fall off With Distance Tool, available at <http://laqm.defra.gov.uk/tools-monitoring-data/no2-falloff.html>
- National Diffusion Tube Bias Adjustment Factor Spreadsheet, version 03/18 published in March 2018.
- <https://laqm.defra.gov.uk/diffusion-tubes/qa-qc-framework.html> (AIR-PT Rounds 13-14, Apr 2016-Feb2018)
- Boston Borough Council 2016 Annual Status Assessment.
- Boston Borough Council 2006 Local Air Quality Management – Air Quality Action Plan.
- Boston Transport Strategy (2016-2036).