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Annual Status Report 2020

Bureau Veritas

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Document Control Sheet

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2020 Air Quality Annual Status Report (ASR)

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

July 2020

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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 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 billion[3].

Boston's air quality issues derive primarily from the usage of private vehicles for short frequent journeys within Boston. For example, as detailed in the Boston Transport Strategy (2016-2036), 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 (Sleaford Road, John Adams Way, Spalding Road and Splisby Road), causing peak period congestion. Currently Boston Borough Council ('the Council') has two designated Air Quality Management Areas (AQMAs), these are located at Haven Bridge and Bargate Bridge. Both AQMAs have been declared in relation to exceedances of the AQS annual mean objective of 40µg/m^3 for NO_2, largely due to traffic emissions from traffic along Sleaford Road, John Adams Way, Spalding Road and Splisby Road, which connect to form the main transportation network within the Borough.

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 boundary maps are presented in Appendix D: Maps of Monitoring Locations and AQMAs

An update to the previous 2010 AQAP was drafted by the Council during 2019/2020 and approved by Defra in June 2020. The draft AQAP can be found on the Council's website[6] and a final draft will be published following the Council's addition of targeted measures in response to 2020 AQAP appraisal comments. The AQAP measures focus

[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

on improving air quality within both the existing AQMAs and across the Borough. The 2018 Detailed Modelling Assessment informed the development of the updated AQAP via dispersion modelling, identifying areas of concern and where the Council must focus air quality improvements and monitoring regimes. The Council's established steering group, consisting of internal lead officers across a number of relevant departments and representatives from Lincolnshire County Council. Regular meetings will remain in place in order to develop and continually engage across local authorities surrounding air quality issues.

During 2019, the Council monitored NO_2 at 16 sites via a network of roadside located diffusion tubes. The 2018 diffusion tube monitoring sites DT6, DT7, DT10 and DT15 were removed and four new sites were installed for the 2019 reporting period at South End and along the London Road approach to the A16 (sites DT16, DT17, DT18, & DT19). DT18 and DT19 were placed by Spalding roundabout and DT16 and DT17 were placed in South End on the approach to the junction with Haven Bridge. DT16, DT17, DT18 & DT19 are situated outside of the declared AQMAs, at locations identified within the 2018 modelling assessment to be in exceedance of the AQS annual mean NO_2 40µg/m^3 objective. In addition, a new diffusion tube site (DT22) was installed from March 2019 onwards at a location 8 meters from the edge of the Liquorpond roundabout within the Haven Bridge AQMA. DT22 replaced DT2 and was installed 100m west of the original location, in response to the new location indicating one of the highest modelled exceedances within the 2018 modelling assessment in addition to being within close proximity to a higher number of relevant receptors than the DT2 location, within the Haven Bridge AQMA.

During 2019, 3 sites (DT1, DT3, DT20) recorded NO_2 annual mean concentrations in excess of 40µg/m^3, and 2 sites (DT4, DT8) reported concentrations to be within 10% of the AQS objective (above 36µg/m^3). Following the fall-off with distance correction calculation[4] (where relevant), 2 monitoring sites (DT1, DT3) continued to exceed the AQS NO_2 annual mean objective and DT4 continued to report an annual mean concentration within 10% of the AQS objective. All monitoring locations that monitored exceedances or were found to be close to exceedance, before distance correction was applied, are located within the Haven Bridge AQMA.

[4] https://laqm.defra.gov.uk/tools-monitoring-data/no2-falloff.html

For the monitoring locations that have not undergone relocation during 2018/19, there is a largely downward trend observed at 7 sites (DT3, DT8, DT9, DT12, DT14, DT20 & DT21) with an increase in comparison to 2018 concentrations at 3 sites (DT1, DT4 & DT5). DT1 reported the highest increase of 6.8µg/m^3 in 2019 NO_2 annual mean concentration, when compared to 2018, and evidently reported the highest concentration within Boston in 2019 (49.2µg/m^3). DT1 is located at the edge of the Liquorpond roundabout, 1.5m from the kerb, and is subject to high volumes of queuing traffic. No monitoring sites outside of the declared AQMA boundaries reported concentrations to exceed 36µg/m^3 – with DT18 reporting the highest concentration (33.8µg/m^3). Annual mean NO_2 concentrations recorded outside of the declared AQMAs in Boston remain well below the AQS objective limit.

In accordance with Defra LAQM.TG(16)[5] the 2019 results indicate that an exceedance of the 1-hour mean objective is unlikely to have occurred at any site within 2019 as no concentrations reported 60µg/m^3 or above.

Following a review of the 2019 monitoring data, the Council intend to maintain the current boundary of the Haven Bridge AQMA. The Council will however consider revocation of the Bargate AQMA in response to recent years' monitoring data trends. This will be put before the Council's Cabinet later this year.

Actions to Improve Air Quality

The AQAP for Boston Borough Council is the key document in support of improvements to air quality within the Borough. The measures set out within the 2020 updated AQAP have been developed to achieve compliance with the NO_2 annual mean AQS objective. In order to continually review and progress the measures, the Council meet regularly with lead officers and representatives from Lincolnshire County Council at both an officer and political level. The draft AQAP (approved June 2020) will be further updated before publishing as a final draft, in line with Defra's appraisal comments surrounding targeted measures in relation to the Boston Bypass development (measure 1).

In recognition of the importance that transport plays, the Council, in partnership with Lincolnshire County Council, has released a Boston Transport Strategy (2016-2036) that builds upon the improvements delivered since the last Strategy was published in

[5] https://laqm.defra.gov.uk/documents/LAQM-TG16-February-18-v1.pdf

2006 - 'The Transport Strategy for Boston 2006 – 2021 and beyond'. The strategy focuses on a sustainable transport network which supports the growth of Boston and helps to improve air quality. A key objective of this new strategy is to deliver elements of the Boston Bypass, 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. The new road links intend to 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, EV infrastructure, 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 2019 designed at improving local air quality:

- Installation of a number of publicly accessible electric vehicle charging points in Boston, including at 5 car parks across the Borough and the Geoff Moulder leisure centre, and;
- Continued promotion of cycling as a travel alternative with a proposal made to improve the Council's current cycling infrastructure;
- The requirement to provide EV charging on many commercial and housing development through planning.

Conclusions and Priorities

During 2019, the Council successfully developed their updated AQAP and the draft was subsequently accepted by Defra in June 2020, awaiting final publication by the Council. The Council plan to continue to develop the new AQAP, based on comments deriving from the appraisal document, where additional targeted measures will be sought to help support air quality improvements during the progression of the Boston Bypass development (Measure 1).

During 2019, before distance correction was applied, 3 monitoring locations recorded NO_2 annual mean concentrations to be above the NO_2 annual mean AQS objective of 40µg/m^3, and 2 monitoring locations reported concentrations to be within 10% of the annual mean objective. All monitoring sites either in exceedance or within 10% of the annual mean objective are located within the Haven Bridge AQMA. Following the application of the fall-off with distance correction, 2 monitoring locations remained within exceedance (DT1 – 49.2µg/m^3 & DT3 – 46.5µg/m^3) and 1 site (DT4 – 39.8µg/m^3) remained within 10% of the AQS objective.

In comparison to 2018, there is a continued downward trend observed in 2019 for 7 diffusion tubes; 3 are located within the Bargate Bridge AQMA, 2 are within the Haven Bridge AQMA and 2 are located outside of the AQMAs. There is a slight increase in comparison to 2018 concentrations at 3 locations, all within the Haven Bridge AQMA. The greatest increase in comparison to 2018 monitoring data was reported at DT1 (8µg/m^3). DT1 reported the highest NO_2 annual mean concentration within Boston in 2019 (49.2g/m^3) and is located at the edge of the Liquorpond roundabout (within the Haven Bridge AQMA). Annual mean NO_2 concentrations recorded outside of the declared AQMAs in Boston remain well below the AQS objective limit, with DT18 reporting the highest concentration outside of an AQMA in 2019 (33.8µg/m^3).

In accordance with Defra LAQM.TG(16)[5], the results indicate that an exceedance of the 1-hour mean objective is unlikely to have occurred at any site within 2019 as no concentrations were reported at 60µg/m^3 or above.

Due to the continued exceedances recorded within the AQMA, together with the results of the 2018 modelled data, the Haven Bridge AQMA is to remain in place. Following the application of distance correction, there are no 2019 exceedances or concentrations within 10% of the AQS objective within the Bargate Bridge AQMA, with the last exceedance within the AQMA reported in 2017 – DT9 (43.6µg/m^3), which then reported 38.7µg/m^3 following distance correction. The Council therefore propose to consider revocation of the Bargate AQMA.

Boston Borough Council intend to concentrate efforts on the development of the 2020 AQAP measures and continued actions in relation to the Haven Bridge AQMA to achieve a continuous reduction in NO_2 concentrations.

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 local community to help improve air quality in the area would be to seek alternatives to the way they usually travel. In July 2019 the Council organised a free cycling roadshow, aimed at promoting cycling within the area including a free cycle clinic offering maintenance and repairs for local residents.

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

- Encouragement of electric vehicle use – An increase of electric charging points across the Borough;
- Use of public transport – facility improvements and investigate the feasibility of the provision of lower emission buses, which will help reduce pollutant concentrations through the reduction in the number of private vehicles and congestion;
- Walk or cycle if your journey allows – Improvements to cycling infrastructure and promotion of alternative travel across the Borough. From choosing to walk or cycle, the number of vehicles is reduced and also there is the added benefit of keeping fit and healthy;
- Car/lift sharing schemes– 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.

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1 Local Air Quality Management

This report provides an overview of air quality in Boston Borough Council during 2019. 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 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 the two AQMAs, Haven Bridge and Bargate Bridge 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 see full list at https://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.

In 2019, the Council continued to work on the draft update to the existing AQAP, which was previously updated in 2010. The AQAP focused on the Haven Bridge (declared 2001) and Bargate Bridge (declared 2005) AQMAs. The draft plan was accepted by Defra in June 2020[6] however Defra has encouraged the Council to develop further targeted measures in relation to the proposed long term outer distributor road improvements and LGVs in order to fall more in line with AQAP timescales. The Council will therefore review the approved draft AQAP in response to Defra's appraisal comments before publishing a final document.

As a result of the 2020 Covid-19 global pandemic, the proposed measures documented within the AQAP Draft, have been updated within Table 2.2 as far as is reasonably practicable. The Council will therefore include both updated measures in response to the 2020 AQAP appraisal recommendations alongside a more detailed progress update within next year's ASR.

In support of the AQAP update, as discussed within last year's ASR, a Detailed Modelling Assessment was completed to help develop and focus the draft AQAP measures. The three discrete areas of modelled exceedance relative to the NO_2 annual mean AQS objective limit are as follows:

[6] https://www.mybostonuk.com/wp-content/uploads/2020/02/Boston-Borough-Council-AQAP_Draft_v2.0.pdf

- A Continuous stretch spanning Sleaford Road, Liquorpond Street, John Adams Way and South End covering parts of Haven Bridge AQMA;
- Spilsby Road approach to Wide Bargate covering Bargate Bridge AQMA; and
- A continuous stretch of the A16 – Spalding Road spanning north and south of the South Forty Foot Drain.

The conclusions from the modelling assessment recommended to declare either one AQMA within Boston, combining all areas of identified exceedance (and the two current AQMAs), covering the main arterial highway network within Boston or to declare three discrete AQMAs covering the three located areas of exceedance individually. The Council proposed additional monitoring at the modelled exceedance locations to help inform any amendment to the existing AQMA boundaries.

In preparation of the 2019 reporting period and in response to the modelled exceedance locations, the 2018 diffusion tube monitoring DT6, DT7, DT10 and DT15 were relocated to sites located along the London Road approach to the A16 (relocated sites DT16, DT17, DT18, & DT19). DT18 and DT19 were placed by Spalding roundabout and diffusion tube sites 16 and 17 were placed along the A1138. DT16 and DT17 are two areas outside of a declared AQMA boundary, identified within the 2018 modelling assessment to be in exceedance of the AQS annual mean NO_2 objective limit. In addition, diffusion tube site 22 replaced DT2 from March 2019 and was relocated 100m west of the original location to a site 8 meters from the edge of the Liquorpond roundabout in response to the location indicating one of the highest modelled exceedances within the 2018 modelling assessment, close to a number of relevant receptors, within the Haven Bridge AQMA.

Following the 2019 diffusion tube results, the Council propose to keep the Haven Bridge AQMA in place due to the continued exceedances and aim to review the designation of the Bargate Bridge AQMA, which has not reported an exceedance at a monitoring location since 2017. Following monitoring no exceedances were reported beyond the current AQMA boundaries.

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)	No	44.7	µg/m^3	49.2	µg/m^3	Boston Borough Council, Air Quality Action Plan (draft)	2020*	https://www.mybostonuk.com/wp-content/uploads/2020/02/Boston-Borough-Council-AQAP_Draft_v2.0.pdf
AQMA 2 - Bargate Bridge	01/03/2005	NO_2 Annual Mean	Boston	Key roundabout for the A16 and A1137	No	42.9	µg/m^3	31.3	µg/m^3	Boston Borough Council, Air Quality Action Plan (draft)	2020*	https://www.mybostonuk.com/wp-content/uploads/2020/02/Boston-Borough-Council-AQAP_Draft_v2.0.pdf

**Draft AQAP available on Council's website. Draft approved June 2020; to be updated in line with AQAP appraisal comments ahead of final draft publication*

☒ **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 the Council should include the proposed update to the AQAP together with a discussion of the 2020 measures within this year's ASR. The appraisal further requested that mitigation measures for $PM_{2.5}$ should be considered within the 2020 ASR, and the AQMA reference for Haven Bridge within the Report Submission Website (RSW) is consistent with the 2020 ASR. The Council has actioned each of the appraisal comments, with the current 2020 AQAP measures updated as far as is reasonably practicable in Table 2.2, in light of restrictions related to the ongoing 2020 Covid-19 pandemic.

Boston Borough Council have taken forward a number of direct measures during the current reporting year of 2019, 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 Council's Local Air Quality Management – Air Quality Action Plan (Joint AQAP draft update 2020), the Boston Transport Strategy (2016-2036) and Local Plan. In March 2019, the new Local Plan developed in collaboration with South Holland District Council and LCC was adopted.

Key measures which have been progressed in line with the 2020 AQAP draft update include:

- Installation of a number of publicly accessible electric vehicle charging points in Boston, including at 5 car parks across the Borough and the Geoff Moulder leisure centre, and;
- Promotion of cycling as a travel alternative, with a proposal made to improve cycling infrastructure, the July 2019 free cycling roadshow and the progression of initiatives such as free cycle training and preparation of cycle promotions across local schools (Bikeability).
- Provision of EV charging at new housing and commercial developments across the district.

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

- Release of a final draft of the 2020 approved AQAP draft, to include additional and updated measures in line with the 2020 appraisal comments;
- Seek funding opportunities for a feasibility study for further phases of the Boston Distributor road;
- Investigate emission standards for taxis to reduce instances of vehicle idling, and;
- Continuation of cycling promotion across the Borough.

Boston Borough Council priorities for the coming year are therefore:

- Finalise the approved 2020 AQAP;
- Look at the feasibility of providing a cleaner bus fleet, with improvements to public transport facilities;
- Progress the Construction of the Boston Distributor Road;
- Encourage walking and cycling routes and progress cycling infrastructure improvements;
- Look to provide green infrastructure through the planning process and implement dust and emission standards from large construction sites.

The principal challenges and barriers to implementation that BBC anticipates facing are:

- Funding: The majority of the actions within the 2020 AQAP update require funding. Delivery of the Boston Distributor Road as detailed in the Boston Transport Strategy 2016-36, for example, is reliant upon developer contributions and highway infrastructure funding. It is estimated that the road will cost around £100 million[7];
- Co-operation: The delivery of specific measures as detailed in the 2020 draft AQAP can fall under the responsibility of multiple government bodies and/or private enterprises. An example of this would be road and cycling infrastructure improvements, 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

[7] https://www.bostonstandard.co.uk/news/politics/government-announce-backing-long-awaited-boston-bypass-1319676

Boston Distributor Road is dependent on support from DfT, Regional Authorities such as Midlands Connect and the private sector. Both Boston Borough Council and Lincolnshire County Council will continue to explore opportunities for funding a feasibility study for the Boston Distributor Road beyond phase 1 (Quadrant Development).

- In Boston, both of the existing AQMAs are in areas where the air quality is influenced by roads controlled by Lincolnshire County Council and therefore collaboration must be sought to help address air quality within these areas. The Council continue to strengthen communication with the surrounding local authorities and infrastructure operators, with a view of improving regional air quality in line with both the updated measures and the Boston Transport Strategy (2016-36), with support of the Lincolnshire Local Transport Plan.

Progress on measures has been slower than expected in light of the 2020 global pandemic and it is expected that a detailed update will be provided within next year's ASR, together with the development of the current 2020 AQAP measures in line with the comments received from Defra following the AQAP's approval in June 2020. The Council also recognise that regular review and measure development is required for future years in order to achieve compliance, particularly in relation to actions surrounding the long term distributor road project, with the aim to help enable the eventual revocation of the Haven Bridge AQMA. Following the Council's ongoing commitment to air quality improvements and following the continued downward concentrations within the area, the Bargate Bridge AQMA is to be considered for revocation over the next year.

Table 2.2 – Progress on Measures to Improve Air Quality

Measure Success Rating: Most Likely to Achieve Reasonable to Achieve Challenging to Achieve

Measure No.	Measure	EU Category	EU Classification	Date Measure Introduced	Organisations involved	Funding Source	Key Performance Indicator	Reduction in Pollutant / Emission from Measure	Progress to Date	Estimated / Actual Completion Date	Comments / Barriers to implementation
1	Provision of the Outer Distributor Road for Boston	Traffic Management	Strategic highway improvements	2019	LCC / BBC	Developers & highway infrastructure funding	Traffic counts, non-automatic NO_2 monitoring	Significantly reduce levels of Heavy Good Vehicles, achievement of annual target mean. <40µg/m^3	Phase 1 Quadrant housing and retail development under construction	Expected completion to exceed the 2036 local plan end year, however the majority of works are expected to take place within the local plan period	Targeted measures to be introduced associated with this during 2020/2021
2	Improved traffic flows (Junction Improvements)	Traffic Management	Strategic highway improvements	2019	LCC / BBC	Developers & highway infrastructure funding	Traffic counts, non-automatic NO_2 monitoring	Significantly reduce levels of Heavy Good Vehicles, achievement of annual target mean. <40µg/m^3	"During the development of the AQAP LCC Highways advised, they were undertaking modelling/feasibility studies on 9 locations in Boston with the view of improving traffic flows. In terms of these 9 highway improvements identified, 3 were taken forward to feasibility and additional modelling has taken place on all the proposed schemes. None of the schemes identified make significant improvements in the traffic flows in the town and LCC have subsequently advised these will not be progressed.		
3	Investigate setting emission standards for taxis & anti-idling on taxi ranks	Policy Guidance and Development Control	Regional Groups Co-ordinating programmes to develop Area wide Strategies to reduce emissions and improve air quality	2019	LCC / BBC	N/A	NO_2 annual results near to taxi ranks/ junctions	Significantly reduce levels of passenger vehicles, achievement of annual target mean. <40µg/m^3	Meeting with Licensing & Land Charges Manager, Fiona White, on 29th July 2020	Initiate review of taxi licensing policy 2020	Improved standards for older taxis and encourage shift to greener less polluting vehicles. Will require a taxi licensing policy change and would require any new standards imposed as a result to have a reasonably long lead in time to allow operators a reasonable time to replace vehicles
4	Encourage the use of electrical 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	LCC / BBC	BBC/LCC	Measure utilisation of points	Reduce levels of passenger vehicles, achievement of annual target mean. <40µg/m^3	"Increasing the number of accessible charging points will clearly promote Boston as a place that is actively encouraging alternative vehicle technologies to improve its air quality and the wider environmental impact. Also by making, the town of Boston more accessible to electric vehicle owners there is an opportunity to make our shopping areas, parks and attractions a destination of choice.	Initial Boston Boost project completed March 2020. To continue measure as part of the scheme extension	Extension and development of the scheme subject to take/use of existing Boston Boost project installations and future external funding opportunities. Capacity on grid for rapid charging points in particular - Western Power
5	Encourage Electric charging point to be installed in new build	Promoting Low Emission Transport	Procuring alternative Refuelling infrastructure to promote Low	2019	LCC / BBC	BBC/LCC	Monitor uptake per development	Reduce levels of passenger vehicles, achievement of annual target mean. <40µg/m^3, consider impact on	Air Quality statement or assessments now required as part of applications checklist for all planning applications	Air Quality guidance to developer to be completed by mid-2020. Continuation of installation of electric	Government currently considering amendments to Building Regulations to require all new build residential and commercial

Measure No.	Measure	EU Category	EU Classification	Date Measure Introduced	Organisations involved	Funding Source	Key Performance Indicator	Reduction in Pollutant / Emission from Measure	Progress to Date	Estimated / Actual Completion Date	Comments / Barriers to implementation
	homes and commercial premises through development process		Emission Vehicles, EV recharging, Gas fuel recharging					development and if likely to improve receptor emissions with reference to AQA	dealt with by Boston Borough Councils Development Control function. Environmental Health routinely requesting provision of electrical charging points on new residential/commercial developments where appropriate and conditions attached to consents for such provisions. List of such examples attached as appendix.	charging points through the planning process - ongoing	property to install electric charging points subject to certain qualifying conditions may accelerate provision. BBC/LCC support this measure. Capacity on existing grid network - Western Power may be an inhibitor.
6	Into Town Bus Service - increase patronage/service provision	Transport Planning and Infrastructure	Bus route improvements	2019	LCC / BBC	BBC/LCC	Monitor passenger numbers	Increase public transport use	3 Cross town circular loops every 30 minutes. Passenger numbers approx. 23000 per month. Contact made with Anita Ruffle at LCC requesting information on potential expansion of service routes, real-time information at bus stops and bus shelters on routes.	Ongoing -look to encourage operator to extend routes / provide new routes where opportunities arise	Will require cooperation and potential investment from local bus operators
7	Investigate the provision of Cleaner Buses for Into to Town Bus Services (other bus services)	Vehicle Fleet Efficiency	Promoting Low Emission Public Transport	2019	LCC / BBC	BBC/LCC	Quantify low-emission bus procurement	Reduce levels of passenger vehicles, achievement of annual target mean. <40µg/m^3, increase efficiency of public transport fleet	Contact made with Anita Ruffle at LCC requesting information on this measure.	Further work required - explore opportunities to help fund measures through DEFRA air quality grant scheme	External funding will be required to support local bus operators to replace vehicles -links also to provision 17 where service procurement may be used as a driver to upgrade/retrofit vehicles to reduce emissions
8	Request Air Quality Assessments for proposed developments that are likely to have a significant impact on local air quality	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	2019	LCC / BBC	N/A	Obtain the additional concentrations of developments using the AQA data and report on any impacts in ASR	Control of existing and newly introduced receptor exposure	Air Quality assessments required for all non-domestic curtilage applications. Air quality draft guidance as part of South East Lincolnshire Local Plan based around national guidance. Environmental Health will and does request through planning such assessments. Environmental Health also regularly contacted by scheme developers over air quality where potential significant AQ impacts where pre-application discussion can look at developing scheme with in built mitigations.	New planning validation checklists approved by BCC as of January 2019. Further air quality guidance to developer to be completed by mid-2020.	Varied standards of information received by applicants - this will be improved by better guidance to applicants.
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	LCC / BBC	BBC	Monitor low emission vehicles using car parks, employ enforcement on other vehicles parked in priority spaces.	Reduce levels of diesel/petrol vehicles, achievement of annual target mean. <40µg/m^3	As a result of COVID 19 all car parking charges were reduced to zero in council operated can parks to July 4th. Subsequently this has been extended as a result of the Strategic Alliance with ELDC. Whilst this may be seen	Further work required	Potential loss of revenue which could be used to support/contribute to other schemes with environmental benefits

Measure No.	Measure	EU Category	EU Classification	Date Measure Introduced	Organisations involved	Funding Source	Key Performance Indicator	Reduction in Pollutant / Emission from Measure	Progress to Date	Estimated / Actual Completion Date	Comments / Barriers to implementation
									as helpful in terms of supporting businesses in the town which may be operating under difficult trading conditions this may discourage the use of greener forms of transport.		
10	Promotion of Cycling and Walking as an alternative to cars	Promoting Travel Alternatives	Promotion of cycling	2019	LCC / BBC	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.	Proposal made under the Towns Fund scheme by LCC Highways to improve cycling infrastructure and connectivity in the town. The proposal includes the following:	-	Boston Community Health Walks delivers 12 health walks a week. There are 800 attendances a month
11	Encourage the uptake of low emission vehicles (wider community)	Promoting Low Emission Transport	Other	2019	LCC / BBC	N/A	Traffic counts, non-automatic NO_2 monitoring	Reduce levels of diesel/petrol vehicles, achievement of annual target mean. <40µg/m^3	"Boston Borough Council provides information on its website regarding the benefits of choosing electric vehicles and links to Go Ultra Low website. Continued use of the planning system to increase the availability of charging point infrastructure. The council promotes electric vehicles on its website with links to GO ULTRA LOW and OLEV grant schemes. This is not however prominent on the councils site and a dedicated page to this and other greener forms of transport needs to be pursued and made prominent. To discuss with senior management and IT.	Ongoing throughout life of plan	Public perception of electric vehicles in terms of costs, charging availability etc.
12	Implement standards for control of dust from and emission from large construction site	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	2019	LCC / BBC	N/A	Number of complaints regarding dust relating to construction/demolition activities	Record number of dust mitigation requirements implemented per site	Through the planning process construction, management plans are routinely requested and as part of this plan issues such as controlling dust from construction and traffic are considered.	Measures routinely requested for larger developments to submit management schemes for approval and conditioned through planning	-
13	Promotion of travel plans for new developments	Transport Planning and Infrastructure	Other	2019	LCC / BBC	N/A	Air Quality Assessment conclusions and data	Ongoing development control	Ongoing	-	-
14	Liaise with Environment Agency in respect of industrial emission from permitted site to ensure AQMA considered when setting	Promoting Low Emission Plant	Emission control equipment for small and medium sized stationary combustion sources / replacement of combustion sources	2019	EA / BBC	EA/BBC	Stack emissions	Ensure industrial emissions are monitored	Environmental Health act as a statutory consultee on Part A(1) permit applications, MCPD applications and certain permitted waste operations made to the Environment Agency. Environmental Health continues to ensure AQMA's considered and request stricter emission	Ongoing - ensure Environment Agency implement appropriate emission standards for combustion processes covered by Medium Combustion Plant Directive (MCPD) especially where these are in or may impact AQMAs	LA statutory consultees on applications for Part A and MCPD permits affecting AQMAs and therefore opportunity exists to influence permit conditions in relation to NOx

Measure No.	Measure	EU Category	EU Classification	Date Measure Introduced	Organisations involved	Funding Source	Key Performance Indicator	Reduction in Pollutant / Emission from Measure	Progress to Date	Estimated / Actual Completion Date	Comments / Barriers to implementation
	emission standards								standards where appropriate.		
15	Promote green waste collection services & discourage the use of bonfires for disposal of waste at domestic and commercial sites	Public Information	Other	2019	BBC	BBC	Level of recycling	Statutory Nuisance enforcement ongoing.	Statutory Nuisance enforcement ongoing. Recycling of green waste at 52%	-	-
16	Investigate the use of council procurement procedures as a tool to encourage greener transport services	Vehicle Fleet Efficiency	Fleet efficiency and recognition schemes	2019	LCC / BBC	BBC	Number of low emission vehicles procured	Annual mean reduction achieved. <40µg/m^3	Ongoing	Encourage through procurement processes at BBC & LCC opportunities for improvement in service supplier fleet vehicles including those owned and operated by the councils	Funding availability
17	Provision of air quality information to public, schools to allow healthier choices	Public Information	Via other mechanisms	2019	LCC / BBC	BBC	Monitor number of schools reached, number of schemes employed	Increase awareness and significantly reduce levels of passenger vehicles, achievement of annual target mean. <40µg/m^3	Dedicated webpages to transport/AQ issues all in one prominent place could help fulfil at least part of this measures objective. To discuss with senior management and IT.	Ongoing - fresh campaign to directly target school traffic to encourage shift to more sustainable transport as alternative to the motor vehicles to be undertaken	-
18	Work with operators to increase the use of rail freight/ shipping freight and passenger services	Freight and Delivery Management	Other	2019	LCC / BBC Rail network	BBC/LCC	Rail passenger and freight counts	Annual mean reduction achieved. <40µg/m^3	As part of Boston's Town Fund bid East Midland rail has made a number of proposals relating to rail to other transport connectivity including – station enhancements, transport interchanged and rail to town centre cycle routes – see appendices	Port of Boston already utilise rail freight services for imported steel. Ongoing exploration of opportunity for other businesses. Potential PE21 development project - part of the objectives of project to enhance connectivity between sustainable transport options including Boston railway station	Initial freight rail scheme abandoned from previous AQAP however to be reconsidered - may be additional opportunities for freight in particular.
19	Workplace Parking Levy/Lift Sharing Schemes	Promoting Travel Alternatives	Workplace Travel Planning	2019	BBC	Local Businesses/BBC	Numbers of car users/levels of revenue from car parking	Reduce levels of passenger vehicles, achievement of annual target mean. <40µg/m^3	Sean Johnson of Public Health at LCC is interested in trying to set up a scheme with BBC although this has not progressed at this time due to COVID crisis and social distancing does not lend itself to car sharing. There exist already a national scheme liftshare.co.uk which could be publicised across all local authorities and beyond via councils websites – this links to measure 11 – dedicated webpages to transport/AQ issue.	Further work required	Workplace parking levy unlikely to be popular with businesses, wider public and politically

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 Borough, as efforts are being concentrated on monitoring NO_2 levels in line with established AQMAs. However, as primary emissions of both NO_2 and particulates predominately originate from the same source, measures which attempt to reduce NO_2 levels within Boston will simultaneously reduce levels of PM_{10} and $PM_{2.5}$.

The current Defra 2019 background maps for Boston (2017 based)[8] show that all background concentrations of $PM_{2.5}$ are far below the annual mean AQS target value for $PM_{2.5}$. The highest concentration is predicted to be 9.1µg/m^3 within the 1 x 1km grid square 533500, 342500. This grid square is located south of The River Haven, and is predominantly populated with industrial estates.

The Public Health Outcomes Framework data tool[9] compiled by Public Heath England quantifies the mortality burden of $PM_{2.5}$ within England on a county and local authority scale. The 2018 fraction of mortality attributable to $PM_{2.5}$ pollution in Boston is 5.1%, slightly above the East of England average of 4.9% and below the national average of 5.2%.

The Council has identified key measures within the 2020 AQAP update in relation to the reduction of vehicle emissions, such as particulates, which have already been undertaken following the adoption of the local plan[10] and the development of a transport strategy for Boston (Boston Transport Strategy 2016-2036)[11].

[8] Defra Background Mapping data for local authorities (2017-based), available online at https://uk-air.defra.gov.uk/data/laqm-background-maps?year=2017
[9] Public Health Outcomes Framework, Public Health England. data tool available online at https://fingertips.phe.org.uk/profile/public-health-outcomes-framework/data#page/3/gid/1000043/pat/6/par/E12000004/ati/101/are/E07000136/iid/30101/age/230/sex/4/cid/4/page-options/car-do-0
[10] http://www.southeastlincslocalplan.org/adopted-plan/
[11] https://www.lincolnshire.gov.uk/transport-and-roads/strategy-and-policy/boston-transport-strategy/52681.article

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 does not undertake any Automatic monitoring.

3.1.2 Non-Automatic Monitoring Sites

Boston Borough Council undertook non- automatic (passive) monitoring of NO_2 at 16 roadside sites during 2019.

The 2018 diffusion tube sites (DT6, DT7, DT10 and DT15) were removed and four new sites were established along the London Road approach to the A16 at the end of 2018, in preparation for the Council's revised 2019 monitoring regime. New sites DT18 and DT19 were located at the Spalding roundabout and DT16 & DT17 were placed along the A1138. The Council's monitoring strategy review was in response to the 2018 Detailed Modelling Assessment findings which identified these areas outside of a declared AQMA boundary to be in exceedance of the AQS annual mean NO_2 objective limit. DT22 commenced monitoring from March 2019, replacing monitoring location DT2, also as part of the Council's strategy review in response to the 2018 assessment's identified exceedance areas.

Maps identifying the location of the monitoring sites are provided in Appendix D: Maps of Monitoring Locations and AQMAs.

Further details on Quality Assurance/Quality Control (QA/QC) for the diffusion tubes, including bias adjustments, annualisation and 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[12], "annualisation" (where the data capture falls below 75%), and distance correction[13]. Further details on adjustments are provided in Appendix C.

[12] https://laqm.defra.gov.uk/bias-adjustment-factors/bias-adjustment.html
[13] Fall-off with distance correction criteria is provided in paragraph 7.77, LAQM.TG(16)

3.2.1 Nitrogen Dioxide (NO_2)

Table A.2 in Appendix A compares the ratified and adjusted monitored NO_2 annual mean concentrations for the past 5 years with the air quality objective of 40µg/m^3. Note that the concentration data presented in Table A.2 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 2019 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.

Data capture for one diffusion tube (DT22) was below 75% in 2019 (66.7%) and therefore annualisation (short to long term adjustment) was completed for the concentration at this location. As diffusion tube site DT22 replaced DT2 from March 2019, DT2 only held 1 month's data capture (8.3% for 2019). DT2 is therefore not included within the Council's 2019 monitoring data as, according to TG(16)[5] there must be a minimum of 3 month's data capture for annualisation to be completed.

Results for 2019 have been bias adjusted using a national bias adjustment factor of 0.92. Full details of the bias adjustment and QA/QC procedure are provided in Appendix C: Supporting Technical Information / Air Quality Monitoring Data QA/QC

During 2019, before distance correction was applied, 3 sites recorded NO_2 annual mean concentrations to be above the NO_2 annual mean AQS objective of 40µg/m^3, and 2 monitoring locations reported concentrations to be within 10% of the annual mean objective (36µg/m^3 and above). All monitoring sites reporting 2019 concentrations to be either in exceedance or within 10% of the annual mean objective are located within the Haven Bridge AQMA. Following the application of the fall-off with distance correction calculation to the monitoring sites not already located at relevant exposure (DT9, DT14 & DT20), 2 monitoring locations remained within exceedance (DT1 – 49.2µg/m^3 & DT3 – 46.5µg/m^3) and 1 site (DT4 – 39.8µg/m^3) remained within 10% of the AQS objective. Full details of the distance correction calculations are provided in Figure C.2.

For the diffusion tubes that have been present for a number of years, there is a largely downward trend apparent for 7 diffusion tubes (DT3, DT8, DT9, DT12, DT14, DT20 & DT21) with a slight increase in comparison to 2018 concentrations at DT1, DT4 & DT5.

The highest increase in comparison to 2018 monitoring data was DT1 of 8µg/m^3. It is noted that DT1's neighbouring diffusion tube (DT22) reports below the AQS objective, however is close to within 10% in 2019 (35.9µg/m^3). Both DT1 and DT22 are located at sites of relevant exposure, however DT22 is situated 8m from the roundabout's edge, beyond a grassed area, whereas DT1 is located 1.5m from the kerb. DT1 reported the highest NO_2 annual mean concentration within Boston in 2019 (49.2g/m^3), and is located at the edge of the Liquorpond roundabout where reduced speed and queueing vehicles are prevalent.

In accordance with Defra LAQM.TG(16)[5], the 2019 results indicate that an exceedance of the 1-hour mean objective is unlikely to have occurred at any site as no concentrations reported 60µg/m^3 or above.

Due to the continual exceedance recorded at DT1, and DT3, it is recommended that the Haven Bridge AQMA remains. Following the application of distance correction, there are no 2019 exceedances or concentrations within 10% of the AQO within the Bargate Bridge AQMA, with the last exceedance within the AQMA reported in 2017 – DT9 (43.6µg/m^3), which fell to 38.7µg/m^3 following distance correction. It may therefore be reasonable to consider revocation of the Bargate AQMA in response to recent years' monitoring data trends.

During 2019, monitoring of NO_2 was undertaken at 6 sites outside of the declared AQMAs. No monitoring sites outside of the declared AQMA boundaries reported concentrations to exceed 36µg/m^3 – with DT18 reporting the highest concentration (33.8µg/m^3). Annual mean NO_2 concentrations recorded outside of the declared AQMAs in Boston remain well below the AQS objective limit.

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?	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 new air quality monitoring station, North side of Haven Bridge Road	Roadside	532575	343696	NO_2	Haven Bridge	0	1.5	NO	3
2*	Opposite former air quality monitoring station, North side of Haven Bridge Road	Roadside	532656	343716	NO_2	Haven Bridge	0	0.5	NO	3
3	Adjacent to 68 Liquorpond Street	Roadside	532470	343736	NO_2	Haven Bridge	0.1	0.5	NO	3
4	Adjacent to 18 Queen Street	Roadside	532331	343848	NO_2	Haven Bridge	0.1	1.5	NO	3
5	John Adams Way intersection with Haven Bridge	Roadside	532859	343760	NO_2	Haven Bridge	3.5	2.2	NO	3
16	Entrance to South Quay Car Park	Roadside	532855	343719	NO_2	No	0	2	NO	3
17	Opposite 4-6 South End, Boston	Roadside	532877	343690	NO_2	No	0	2	NO	3

Site ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	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)
8	Bargate Roundabout	Roadside	533112	344476	NO_2	Bargate Bridge	0	2.3	NO	3
9	Roadside adjacent to 30 Spilsby Road	Roadside	533251	344642	NO_2	Bargate Bridge	4	2	NO	3
18	ATS Roundabout, London Road, Boston	Roadside	532600	342737	NO_2	No	0	2	NO	3
20	Kerbside, Haven Bridge	Roadside	532744	343719	NO_2	No	16	2	NO	3
12	Junction of New Asda Road and Sleaford Road, Boston.	Roadside	532168	343987	NO_2	No	8.9	1.5	NO	3
21	36 Sleaford Road, Boston	Roadside	532024	344060	NO_2	No	8	1.5	NO	3
14	Roadside adjacent to 20 Spilsby Road	Roadside	533226	344624	NO_2	Bargate Bridge	3	2	NO	3
19	Opposite 55 London Road, Boston	Roadside	532630	342760	NO_2	No	0	2	NO	3
22	Adjacent to 94 Liquorpond Street	Roadside	532544	343702	NO_2	Haven Bridge	0.1	8	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.

** Site 2 was decommissioned in January 2019.*

Table A.2 – Annual Mean NO_2 Monitoring Results

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2019 (%) (2)	NO_2 Annual Mean Concentration (µg/m^3) (3) (4)				
							2015	2016	2017	2018	2019
1	532575	343696	Roadside	Diffusion Tube	91.7%	91.7%	**49.7**	**45.8**	**49.4**	**42.4**	**49.2**
2	532656	343716	Roadside	Diffusion Tube	100.0%	8.3%	**50.1**	37.5	**44.5**	**44.5**	-*
3	532470	343736	Roadside	Diffusion Tube	100.0%	100.0%	**46.0**	**46.2**	**53.2**	**48.3**	**46.5**
4	532331	343848	Roadside	Diffusion Tube	100.0%	100.0%	36.4	38.6	38.0	39.4	39.8
5	532859	343760	Roadside	Diffusion Tube	91.7%	91.7%	34.9	34.6	36.8	34.7	34.8
16	532855	343719	Roadside	Diffusion Tube	100.0%	100.0%	-	-	-	-	30.1
17	532877	343690	Roadside	Diffusion Tube	83.3%	83.3%	-	-	-	-	30.5
8	533112	344476	Roadside	Diffusion Tube	100.0%	100.0%	31.1	31.1	31.3	32.5	31.3
9	533251	344642	Roadside	Diffusion Tube	100.0%	100.0%	**44.2**	**41.5**	**43.6**	39.4	37.0
18	532600	342737	Roadside	Diffusion Tube	100.0%	100.0%	-	-	-	-	33.8
20	532744	343719	Roadside	Diffusion Tube	100.0%	100.0%	-	-	-	**46.3**	**41.6**
12	532168	343987	Roadside	Diffusion Tube	100.0%	100.0%	28.6	26.8	27.6	31.8	28.9
21	532024	344060	Roadside	Diffusion Tube	100.0%	100.0%	-	-	-	30.0	29.0
14	533226	344624	Roadside	Diffusion Tube	100.0%	100.0%	36.6	36.7	37.1	37.8	35.8

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2019 (%) (2)	NO_2 Annual Mean Concentration ($\mu g/m^3$) (3) (4)				
							2015	2016	2017	2018	2019
19	532630	342760	Roadside	Diffusion Tube	100.0%	100.0%	-	-	-	-	27.5
22	532544	343702	Roadside	Diffusion Tube	70.0%	66.7%	-	-	-	-	35.9

☒ **Diffusion tube data has been bias corrected**

☒ **Annualisation has been conducted where data capture is <75%**

☒ **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 adjustment**

Notes:

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

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

(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.

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

** Site 2 decommissioned in January 2019 and, as such, did not present a sufficient data capture for annualisation (8.3% - January 2019 only)*

Figure A.1– Trends in Annual Mean NO_2 Concentrations – Haven Bridge AQMA

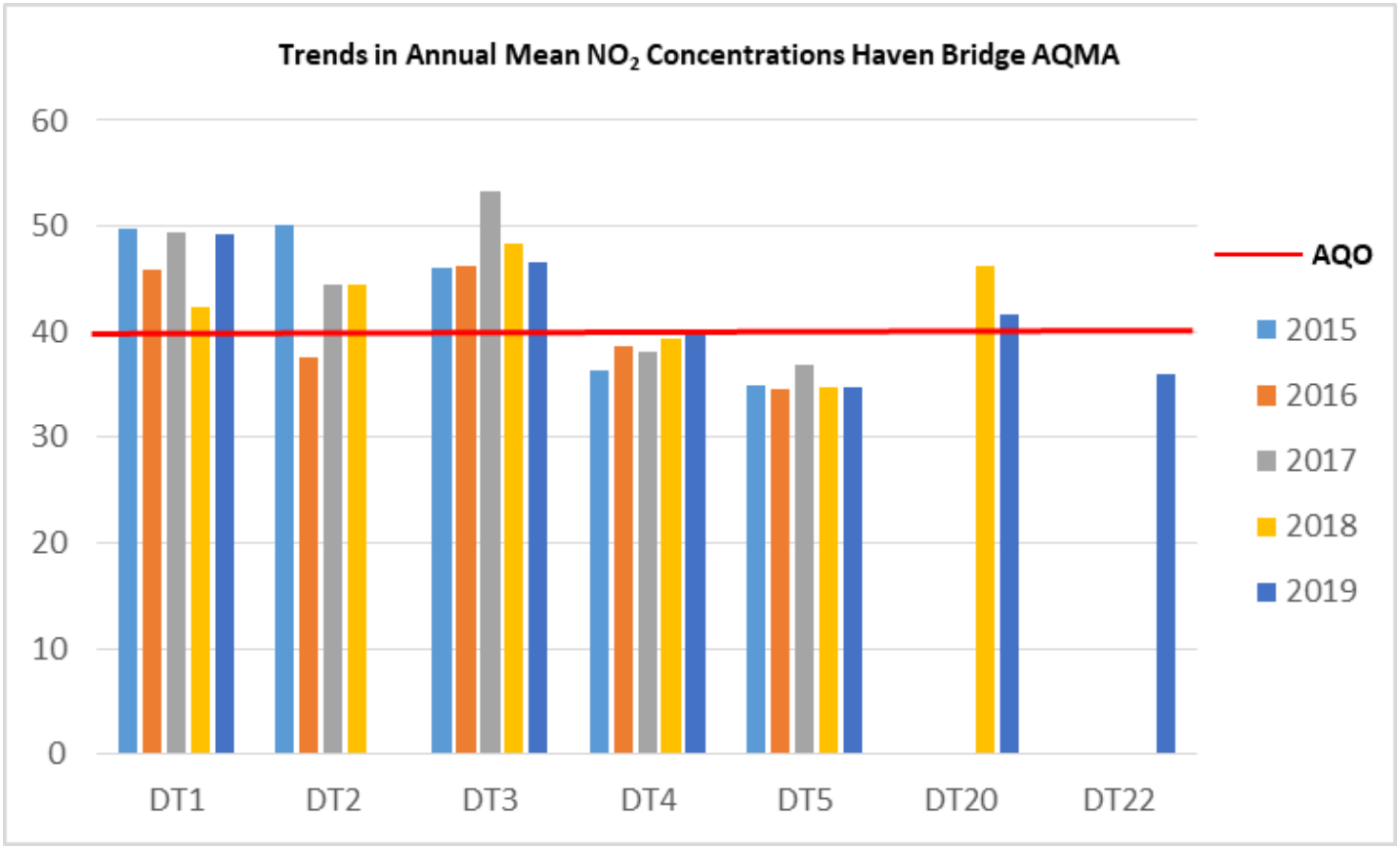


Figure A.2- Trends in Annual Mean NO_2 Concentrations Bargate Bridge AQMA

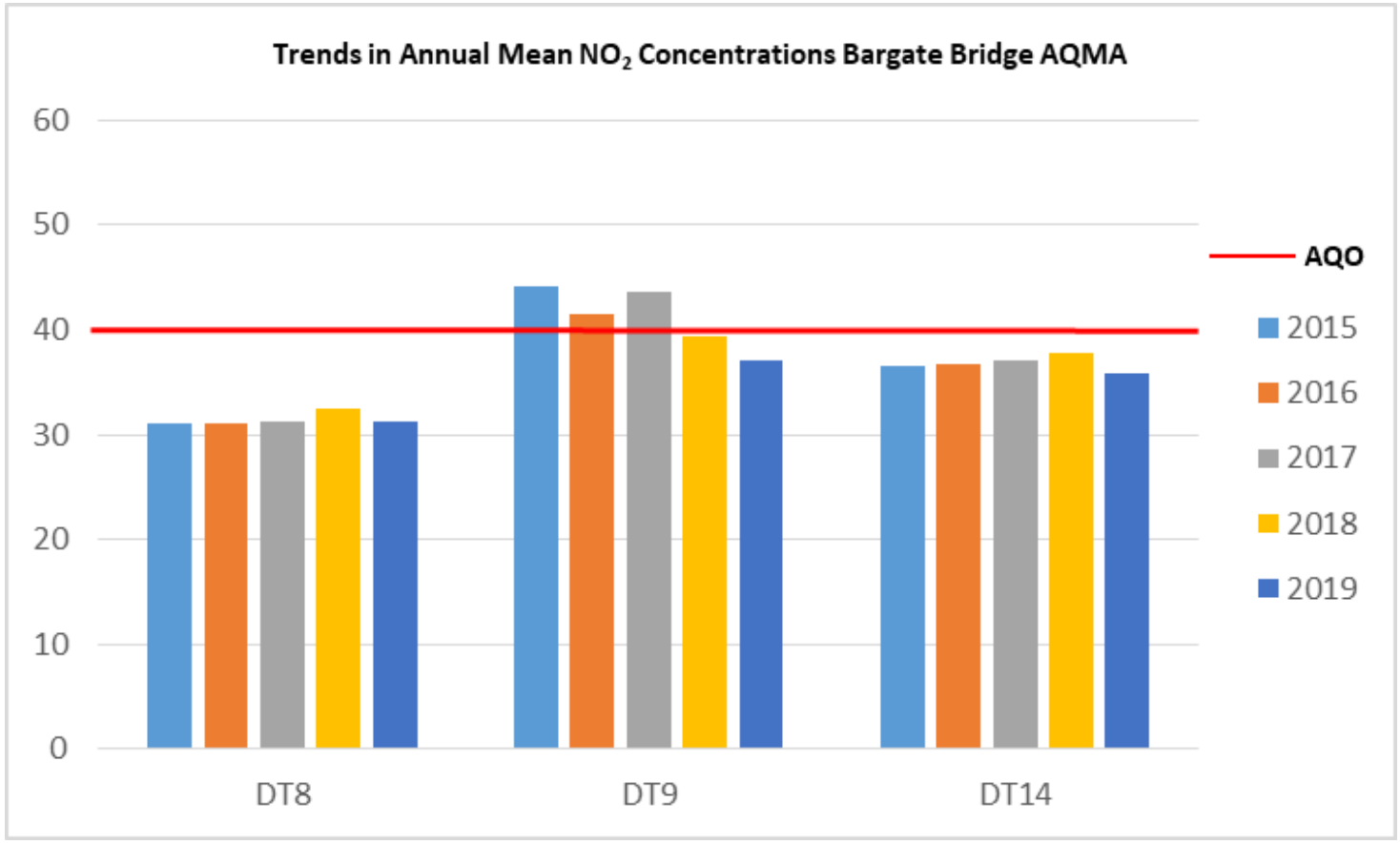
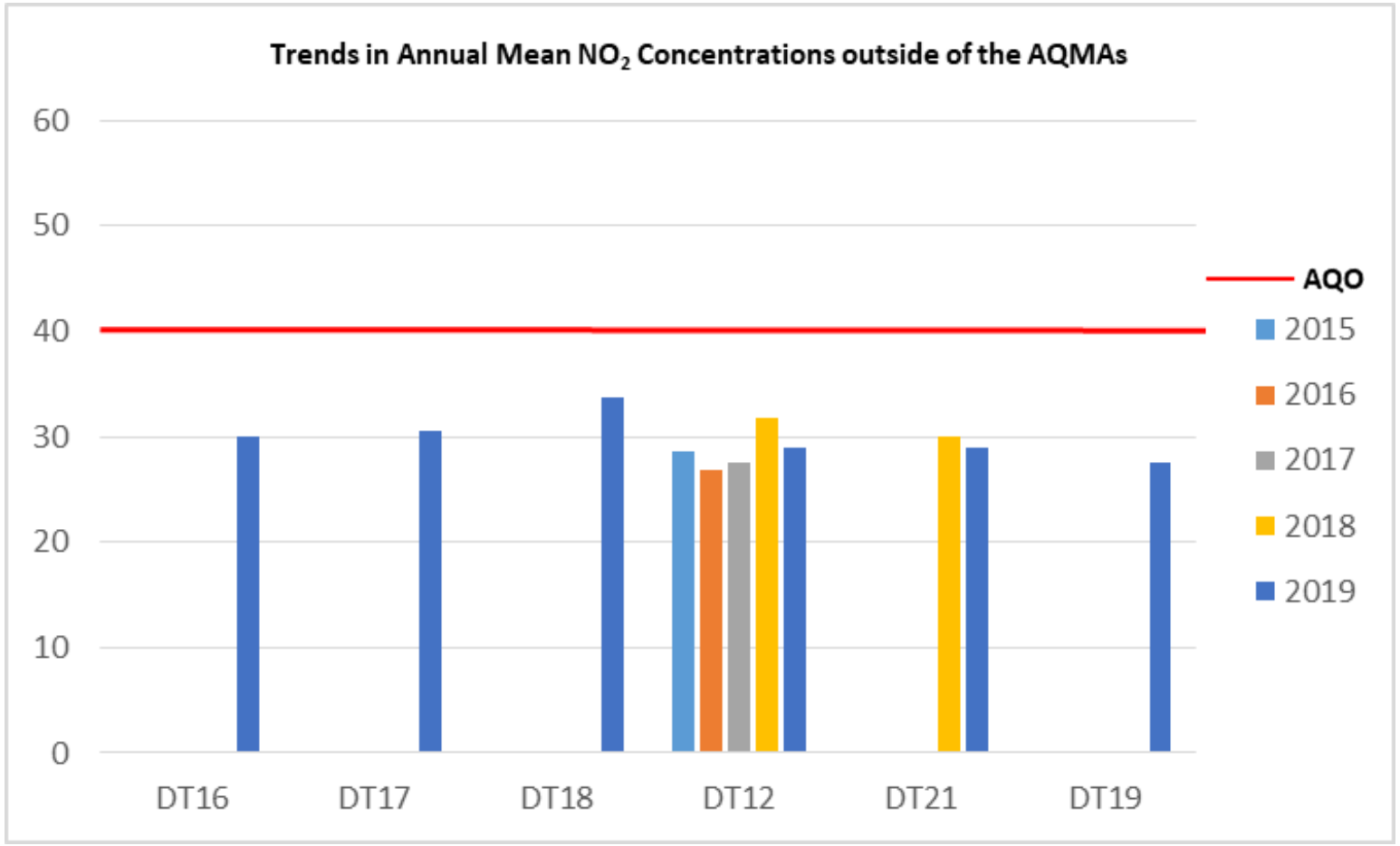


Figure A.3 - Trends in Annual Mean NO_2 Concentrations outside of the AQMAs



Appendix B: Full Monthly Diffusion Tube Results for 2019

Table B.1 - NO_2 Monthly Diffusion Tube Results - 2019

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	NO_2 Mean Concentrations ($\mu g/m^3$)														
															Annual Mean		
			Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Raw Data	Bias Adjusted (0.92) and Annualised (1)	Distance Corrected to Nearest Exposure (2)
1	532575	343696	**64.4**	**46.7**	**59.6**	**42.8**	**53.5**	**47.4**	**52.5**	**59.6**	**61.5**	**54.0**	**-**	**45.8**	**53.4**	**49.2**	
2	532656	343716	37.5	-	-	-	-	-	-	-	-	-	-	-	-	34.5	
3	532470	343736	**53.6**	**53.4**	**50.7**	**41.8**	**50.9**	**48.4**	**49.8**	**43.4**	**54.2**	**52.7**	**63.8**	**43.6**	**50.5**	**46.5**	
4	532331	343848	**47.8**	**44.9**	32.9	**62.3**	**44.7**	36.8	39.4	35.6	39.6	**43.8**	**53.6**	37.6	**43.3**	39.8	
5	532859	343760	**47.9**	**42.1**	-	32.9	37.3	31.8	35.8	33.1	**40.2**	**41.0**	**40.9**	33.1	37.8	34.8	
16	532855	343719	**43.9**	33.7	32.6	29.5	28.8	29.5	28.0	24.5	32.8	32.9	**46.4**	30.3	32.7	30.1	
17	532877	343690	**44.8**	39.0	33.8	31.0	30.1	28.5	-	20.6	-	31.9	**43.2**	28.6	33.2	30.5	
8	533112	344476	38.5	37.4	28.9	34.4	31.1	33.0	33.0	34.7	34.0	35.7	37.0	31.0	34.1	31.3	
9	533251	344642	**47.8**	**51.5**	**40.4**	34.8	33.8	34.9	37.3	**40.0**	**40.8**	38.6	38.9	**44.2**	**40.3**	37.0	30.9
18	532600	342737	**47.4**	**44.7**	39.8	25.1	28.4	31.7	35.8	39.3	37.0	36.7	**44.5**	30.6	36.8	33.8	
20	532744	343719	39.5	39.8	**44.6**	**58.6**	**49.8**	**43.0**	**46.5**	**45.0**	37.7	**42.4**	**57.6**	38.2	**45.2**	**41.6**	27.1
12	532168	343987	**43.1**	31.2	29.9	**42.2**	29.3	26.8	27.3	22.3	30.0	28.3	**41.1**	25.2	31.4	28.9	
21	532024	344060	38.2	32.3	27.8	39.9	29.5	25.7	29.9	27.0	30.1	30.6	39.7	27.9	31.6	29.0	
14	533226	344624	**49.5**	**45.6**	38.3	36.1	33.2	37.1	35.0	36.4	36.4	39.7	**42.9**	36.6	38.9	35.8	31.0
19	532630	342760	39.8	32.9	31.4	22.8	24.0	26.3	26.7	28.6	30.6	29.0	37.4	29.5	29.9	27.5	

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	NO_2 Mean Concentrations ($\mu g/m^3$)														
			Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean		
															Raw Data	Bias Adjusted (0.92) and Annualised (1)	Distance Corrected to Nearest Exposure (2)
22	532544	343702	-	-	**41.1**	37.9	33.0	-	-	32.1	36.4	32.9	**45.8**	-	37.0	35.9	

☒ **National bias adjustment factor used**

☒ **Annualisation has been conducted where data capture is <75%**

☒ **Where applicable, data has been distance corrected for relevant exposure in the final column**

Notes:

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

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

(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 0.92 for the year 2019 (based on 30 studies) has been derived from the national bias adjustment spreadsheet[14] and is shown below in Figure C.1.

Figure C.1 – National Bias Adjustment Factor 2019 for Boston Borough Council

National Diffusion Tube Bias Adjustment Factor Spreadsheet — Spreadsheet Version Number: 06/20

Follow the steps below **in the correct order** to show the results of **relevant** co-location studies
Data only apply to tubes exposed monthly and are not suitable for correcting individual short-term monitoring periods
Whenever presenting adjusted data, you should state the adjustment factor used and the version of the spreadsheet
This spreadhseet will be updated every few months: the factors may therefore be subject to change. This should not discourage their immediate use.

This spreadsheet will be updated at the end of September 2020
LAQM Helpdesk Website

The LAQM Helpdesk is operated on behalf of Defra and the Devolved Administrations by Bureau Veritas, in conjunction with contract partners AECOM and the National Physical Laboratory.

Spreadsheet maintained by the National Physical Laboratory. Original compiled by Air Quality Consultants Ltd.

Step 1:	Step 2:	Step 3:	Step 4:								
Select the Laboratory that Analyses Your Tubes from the Drop-Down List	Select a Preparation Method from the Drop-Down List	Select a Year from the Drop-Down List	Where there is only one study for a chosen combination, you should use the adjustment factor shown with caution. Where there is more than one study, use the overall factor[3] shown in blue at the foot of the final column.								
If a laboratory is not shown, we have no data for this laboratory.	If a preparation method is not shown, we have no data for this method at this laboratory.	If a year is not shown, we have no data[2]	If you have your own co-location study then see footnote[4]. If uncertain what to do then contact the Local Air Quality Management Helpdesk at LAQMHelpdesk@bureauveritas.com or 0800 0327953								
Analysed By[1]	Method	Year[2]	Site Type	Local Authority	Length of Study (months)	Diffusion Tube Mean Conc. (Dm) (µg/m^3)	Automatic Monitor Mean Conc. (Cm) (µg/m^3)	Bias (B)	Tube Precision[4]	Bias Adjustment Factor (A) (Cm/Dm)
Gradko	20% TEA in water	2019		Overall Factor[3] (30 studies)				Use		0.92

Discussion of Choice of Factor to Use

The Council has not operated any co-located monitoring locations in the Borough since the decommissioning of the automatic monitoring site in the Haven Bridge AQMA in 2011, therefore a national bias adjustment factor has been used. Table C.1 identifies the national bias adjustment factors used for Boston's diffusion tube data over the last five years.

Table C.1 – National Bias Adjustment Factors 2015 - 2019

Year	National Bias Adjustment Factor
2019	0.92
2018	0.93
2017	0.89
2016	0.92
2015	0.91

[14] National Diffusion Tube Bias Adjustment Factor Spreadsheet, version 06/20 published in June 2020.

QA/QC of Diffusion Tube Monitoring

Gradko International Ltd (Gradko) is a UKAS accredited laboratory and participates in the AIR-PT Scheme (a continuation of the Workplace Analysis Scheme for Proficiency (WASP) for NO_2 tube analysis and the Annual Field Inter-Comparison Exercise. These provide strict performance criteria for participating laboratories to meet, thereby ensuring NO_2 concentrations are reported to a high level of accuracy. The lab follows the procedures set out in the Harmonisation Practical Guidance.

In the 2019 AIR-PT results, AIR-PT AR030 (January to February 2019), AIR PT AR031 (April to May 2019), AIR PT AR033 (July to August 2019) and AIR PT AR034 (September to November 2019), Gradko scored an average of 93.8%. The percentage score reflects the results deemed to be satisfactory based upon the z-score of < ±2.

Short-term to Long-term Data Adjustment

Diffusion tube data capture for 2019 was greater than 75% at all the monitoring locations except for DT22. The data for DT22 has been annualised according to the method set out in LAQM TG(16) box 7.9 using the Defra Annualisation Tool[15]. Details of the annualisation have been provided in Table C.1.

Table C.1 - Annualisation of DT22

Site	Annualisation Factor Leicester University	Annualisation Factor Wicken Fen	Annualisation Factor Nottingham Centre	Average Annualisation Factor	Raw Data Simple Annual Mean (µg/m^3)	Annualised Data Simple Annual Mean (µg/m^3)	Bias Adjusted (0.92) µg/m^3
DT22	1.0309	1.0840	1.0452	1.0534	37.0	39.0	35.9

Fall-off With Distance Correction

In accordance with Defra's TG(16), distance correction calculations, using the NO_2 fall-off with distance calculator, was performed at DT9, DT14 & DT20 to estimate the NO_2 concentration at the nearest locations representative of relevant exposure, as annual mean NO_2 concentrations recorded at these sites in 2019 were greater than 36µg/m^3. Distance correction calculations was completed using the 2019 (2017 reference year) Defra background mapped concentrations for each monitoring location's relevant 1km x 1km grid square. The details for the NO_2 fall-off distance correction calculation for DT9, DT14 & DT20 are shown in Figure C.2.

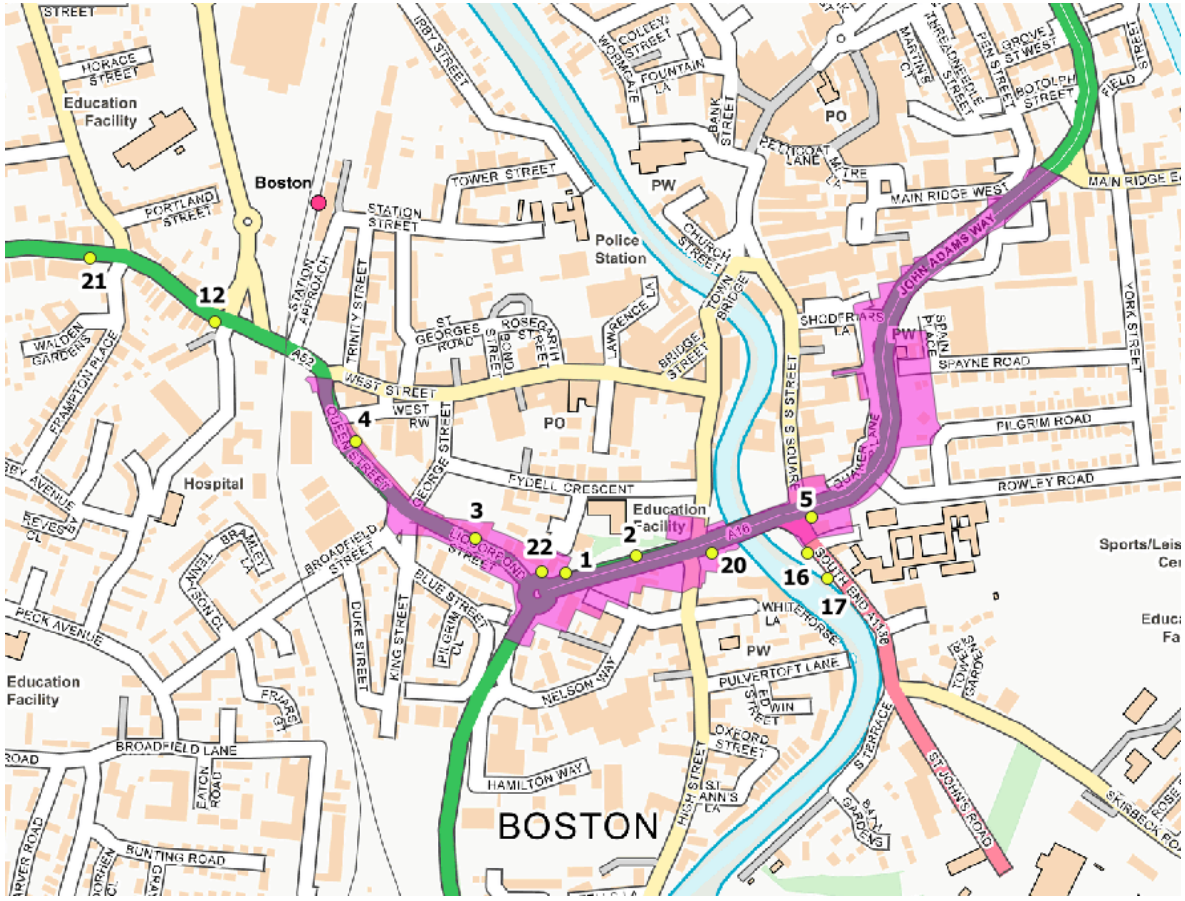
[15] https://laqm.defra.gov.uk/tools-monitoring-data/annualisation.html

Figure C.2 - Fall off Distance Correction Calculations for Sites 9, 14 & 20

Site Name/ID	Distance (m)		NO_2 Annual Mean Concentration ($\mu g/m^3$)		
	Monitoring Site to Kerb	Receptor to Kerb	Background	Monitored at Site	Predicted at Receptor
DT9	2.0	6.0	13.2	37.0	30.9
DT14	2.0	5.0	13.2	35.8	31.0
DT20	2.0	18.0	13.4	41.6	27.1

Appendix D: Maps of Monitoring Locations and AQMAs

Figure D.1 - Diffusion Tube Locations - Haven Bridge AQMA



Legend

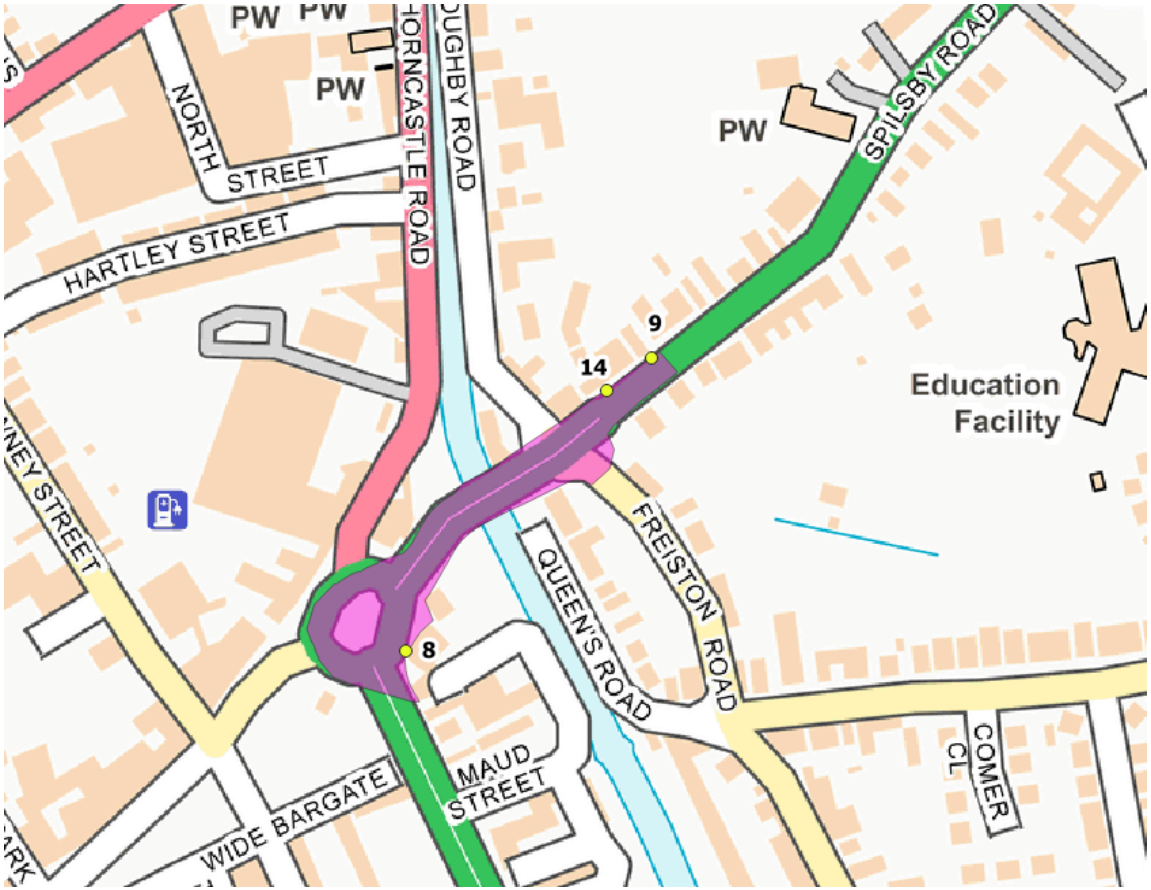
AQMA Boundary

Diffusion Tube

Air Quality
Bureau Veritas
5th Floor
66 Prescott Street
London, E1 8HG

Location Boston Borough Council	
Title Diffusion Tube Locations - Haven Bridge AQMA	
By JD	**Approved** HS
Scale Not To Scale	**Job Ref** 8419927
Date July 2020	**Figure No.** D.1

Figure D.2 – Diffusion Tube Locations – Bargate Bridge AQMA



Legend

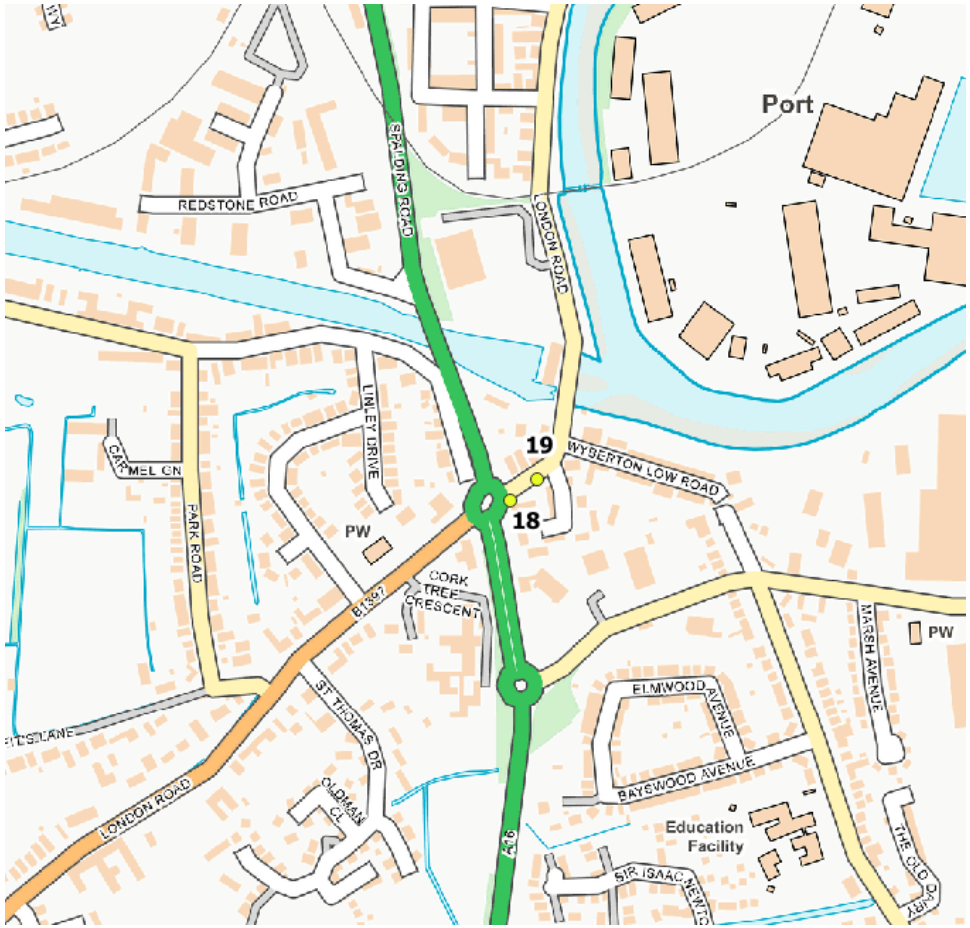
AQMA Boundary

Diffusion Tube

Air Quality
Bureau Veritas
5th Floor
66 Prescott Street
London, E1 8HG

Location	
Boston Borough Council	
Title	
Diffusion Tube Locations - Bargate Bridge AQMA	
By	**Approved**
JD	HS
Scale	**Job Ref**
Not To Scale	8419927
Date	**Figure No.**
July 2020	D.2

Figure D 3 - Diffusion Tube Locations – Boston South



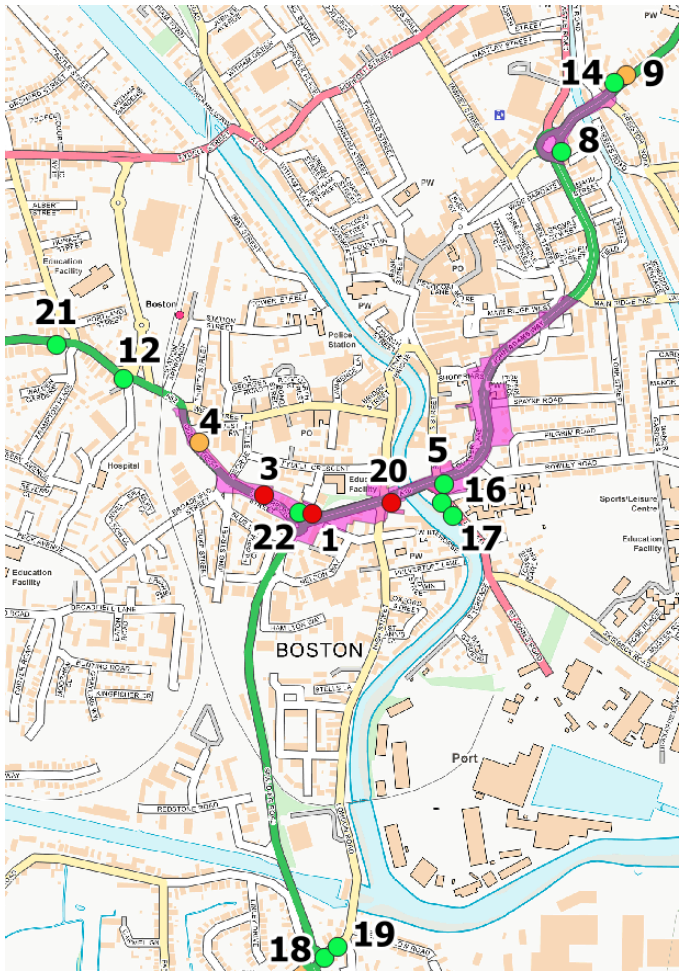
Legend

Diffusion Tube

Air Quality
Bureau Veritas
5th Floor
66 Prescott Street
London, E1 8HG

Location Boston Borough Council	
Title Diffusion Tube Locations – Boston South	
By JD	**Approved** HS
Scale Not To Scale	**Job Ref** 8419927
Date July 2020	**Figure No.** D.3

Figure D.4 – Diffusion Tube Monitored Concentrations within Boston Borough Council



Legend

AQMA Boundary

Diffusion Tubes

- <36µg/m³
- 36 – 40µg/m³
- >40µg/m³

Air Quality
Bureau Veritas
5th Floor
66 Prescott Street
London, E1 8HG

Location

Boston Borough Council

Title

Diffusion Tube Monitored Concentrations within Boston Borough Council

By	Approved
JD	HS
Scale	**Job Ref**
Not To Scale	8419927
Date	**Figure No.**
July 2020	D.4

Appendix E: Summary of Air Quality Objectives in England

Table E.1 – Air Quality Objectives in England

Pollutant	Air Quality Objective[16]	
	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

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

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.
- NO_2 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 06/20 published in June 2020.
- AIR-PT-Rounds 30 to 34 (Jan 2019 - Nov 2019)
- Boston Borough Council 2019 Annual Status Report.
- Boston Borough Council 2006 Local Air Quality Management – Air Quality Action Plan.
- Boston Transport Strategy (2016-2036).
- Boston Borough Council 2020 Draft Air Quality Action Plan.
- The Boston Standard, November 2019; *"Government announce backing for long-awaited Boston Bypass."* https://www.bostonstandard.co.uk/news/politics/government-announce-backing-long-awaited-boston-bypass-1319676