2021 Air Quality Annual Status Report (ASR)

In fulfilment of Part IV of the Environment Act 1995

Local Air Quality Management

Date: June, 2021

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Executive Summary: Air Quality in Our Area

Air Quality in Ipswich Borough

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

The mortality burden of air pollution within the UK is equivalent to 28,000 to 36,000 deaths at typical ages[3], with a total estimated healthcare cost to the NHS and social care of £157 million in 2017[4].

In order to comply with its duty to review the air quality within its area, Ipswich Borough Council (IBC) monitors nitrogen dioxide (NO_2) levels within the town using two automatic monitors located on St Matthews Street and Chevallier Street and a total of 99 diffusion tubes positioned at 88 carefully selected locations across the borough. Changed and analysed on a monthly basis, the data from the diffusion tubes provides a measure of how nitrogen dioxide levels vary over time and is used to calculate an annual mean concentration at each monitoring location. Once corrected for experimental bias and adjusted to take into account the location of the tubes relative to any likely human exposure, these annual values should not exceed the national air quality objective level of 40µg/m3. In the event that this level is, or is likely, to be exceeded on a consistent basis Local Authorities have a legal duty to declare an Air Quality Management Area (AQMA) encompassing the relevant locations. Both nationally and locally the main source of high levels of nitrogen dioxide is road transport.

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

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

[3] Defra. Air quality appraisal: damage cost guidance, July 2020

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

To date, Ipswich Borough Council has declared a total of five AQMAs, all due to continued exceedance of the annual mean NO_2 objective level:

- *Ipswich AQMA No.1* - Encompassing the land in and around the junction of Norwich Road, Chevallier Street and Valley Road, extending along Chevallier Street to beyond the junction with Waterloo Road (declared 2006; amended 2017);
- *Ipswich AQMA No. 2* - From the junction with Peel Street, extending along Crown Street, St Margarets Street and St Helens Street to the junction with Palmerston Road, and from St Margarets Street extending up Woodbridge Road to just beyond the junction with Argyle Street. (declared 2006; amended 2017);
- *Ipswich AQMA No. 3* - Following the route of the Star Lane / Key Street / College Street gyratory clockwise from the junction with Lower Orwell Street, extending along Star Lane, Grimwade Street, Fore Street, Salthouse Street, Key Street and College Street, terminating at the junction with Bridge Street (declared 2006; amended 2017);
- *Ipswich AQMA No. 4* - Incorporating the Bramford Road / Yarmouth Road / Chevallier Street junction and part of Chevallier Street (declared 2010);
- *Ipswich AQMA No*. 5 - Incorporating the land in or around St. Matthews Street / Norwich Road between the Civic Drive roundabout and Bramford Road (declared 2017).

Further information on the above AQMAs (including maps showing their location and boundaries) is available on Ipswich Borough Council's AQMA webpage on the DEFRA website – https://uk-air.defra.gov.uk/aqma/local-authorities?la_id=133.

Following the amendment of AQMA Nos. 1 to 3 and the declaration of AQMA No. 5 in September 2017, Ipswich Borough Council worked closely with the local Highway Authority, Suffolk County Council and other stakeholders, including Public Health, to develop a new Air Quality Action Plan (AQAP) to address the challenge of poor air quality within the Borough. The AQAP was published in February 2019.

Ipswich Borough Council is a member of the Suffolk Air Quality Management Group which includes all of the Suffolk Local Authorities.

As illustrated by the trend line plots in Figures A.1 – A.6 of mean NO2 concentrations in the vicinity of each of the AQMAs between 2015 and 2019, levels appeared to have remained essentially static with a very marginal downward trajectory. However, during this period average daily traffic flows across Ipswich increased by approximately 3%, indicating some air quality improvements have occurred despite higher traffic volumes. During 2020 the outbreak of COVID-19 and the Government imposed lockdowns undoubtedly had an impact on air quality. As illustrated by the trend line plots in Figures A.1 – A.6 of mean NO_2 concentrations in the vicinity of each of the AQMAs, emissions reduced significantly, with diffusion tube sites experiencing an average reduction in NO_2 concentrations of approximately 23% compared to 2019. This equates to a reduction of around 7µg/m^3 experienced at each diffusion tube site. No exceedances of the annual NO_2 concentration were noted in any of the AQMA's following both local bias adjustment and distance correction in 2020. However, it should be noted that diffusion tubes at both AQMA 2 (tubes 11, 12 and 19 – triplicate) and AQMA 5 (tubes 52 and 64, 65 – duplicate) recorded levels within 10% of the annual mean objective level.

Due to continuing exceedances outside AQMA 3 in previous years at diffusion tube site 30, the Council are looking to amend the boundary of AQMA 3 over the next year. A detailed assessment reviewing the AQMAs was prepared in 2020 and sent to DEFRA for appraisal. DEFRA supported the technical aspects of the assessment, and following a decision at Council Executive, a public consultation on the proposals was launched between February and March 2021. At the time of writing this report, the Council are considering the comments raised from the consultation. An additional report will be taken to Council Executive which details the results of consultation on the recommendations of the 2020 Detailed Assessment. It is hoped the report will go to Council Executive in Summer 2021 together with an updated Air Quality Action Plan to reflect the proposed changes.

Actions to Improve Air Quality

Whilst air quality has improved significantly in recent decades, and will continue to improve due to national policy decisions, there are some areas where local action is needed to improve air quality further.

The 2019 Clean Air Strategy[5] sets out the case for action, with goals even more ambitious than EU requirements to reduce exposure to harmful pollutants. The Road to Zero[6] sets out the approach to reduce exhaust emissions from road transport through a number of mechanisms; this is extremely important given that the majority of Air Quality Management Areas (AQMAs) are designated due to elevated concentrations heavily influenced by transport emissions.

Commitment to a new Air Quality Improvement Budget

The Council are committed to improving air quality within the Borough. In light of this, the Council recently committed £100k of funding, each year, for the next three years to air quality improvement projects. Officers have proposed ideas on how the funding may be directed and are seeking support and guidance from both senior management and Councillors on their views and priorities for expenditure.

Continued commitment to procuring Zero Emission Fleet

At the time of writing this report, the Council have 19 electric cars and 20 small electric vans within the fleet, replacing a proportion of the older diesel vehicles. Seven more electric vans are due to arrive mid-June. In addition, the larger vehicle fleet now includes seven pickups, sixteen tippers, ten refuse collection vehicles, one glass collection vehicle, one road sweeper, and one tail lift vehicle, all of which are Euroclass VI standard. Additional Euroclass VI pickup trucks and vans are due later this year. The total cost of the Councils three-year fleet renewal programme so far is approximately £3,855,911.

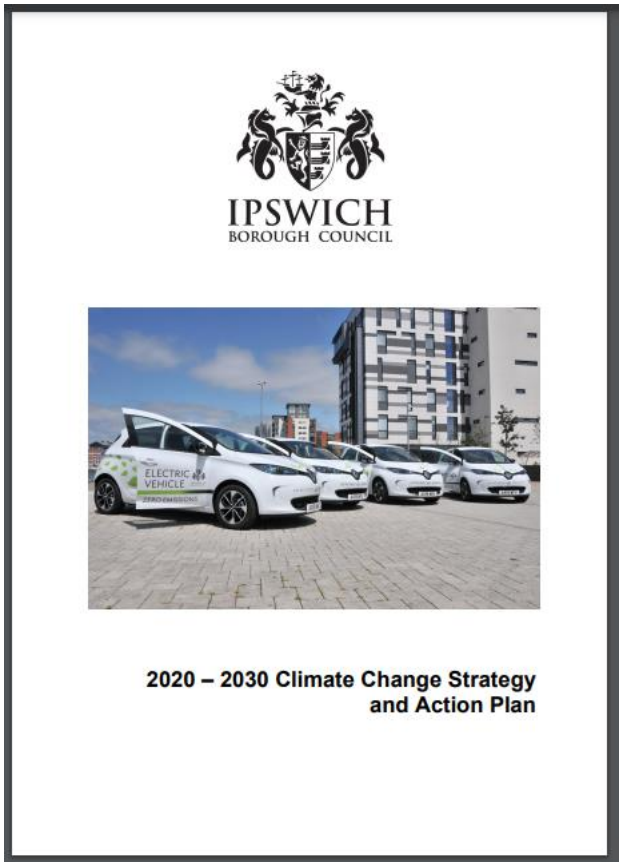
[5] Defra. Clean Air Strategy, 2019

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

Publication of the Ipswich Borough Council 2020-2030 Climate Change Strategy and Action Plan

On 9th July 2019, the Council's Executive Committee declared a Climate Emergency and resolved to start working towards becoming carbon neutral by 2030. The Council published its Climate Change Strategy and Action Plan in 2020 and a copy of the document is available on the Councils Climate Emergency Webpage.

The document acts as the starting point for the development of an ongoing Climate Change Strategy for Ipswich Borough Council and focusses on the Council's proposed approach for tackling climate change. This is a vital strategic task which will ensure the Council has a robust plan for reducing emissions from the Council's own land, buildings, fleet and assets. There are several actions within the strategy that will benefit air quality and will be priorities for the foreseeable future.

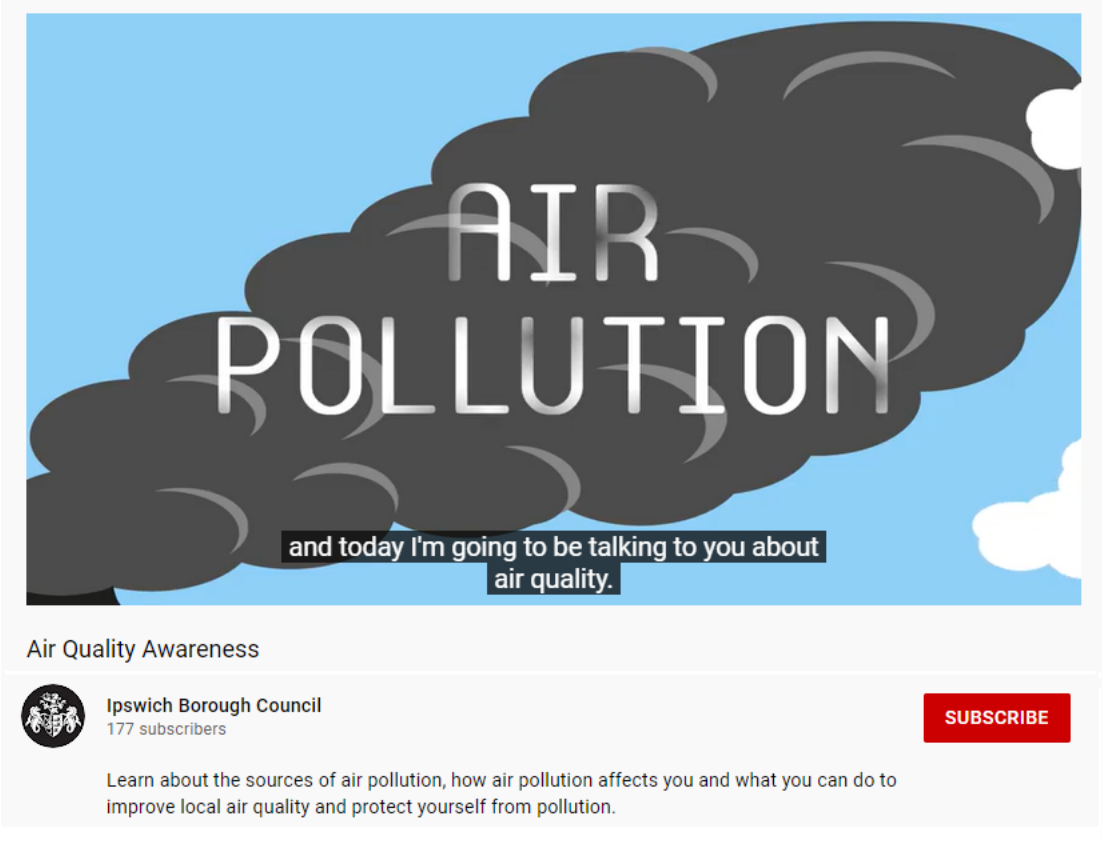


Continued commitment to the Suffolk wide anti-idling campaign

Officers have continued to engage with schools on our Suffolk anti-idling campaign. Unfortunately, due to the COVID-19 pandemic, uptake from schools has been low. Nonetheless, the campaign was reported on in the local media. At the time of writing this report, four schools and a community centre have signed up for anti-idling events in 2021. It is hoped that further events will take place over the next reporting year.

Development of an 'Air Aware' Toolkit

Officers have developed a toolkit aimed at raising awareness of air quality issues. This includes updated information for the Councils website, a 12-week educational programme for schools and a video aimed at school children available on the Councils YouTube channel. The Youtube video was sent to primary schools across Ipswich who played it on National Clean Air Day 2020.



At the time of writing this report the materials, with the exception of the YouTube video, have yet to be published. Senior Officers have requested that messages within the toolkit align with the Councils Climate Change Strategy. It is hoped that the materials will be fully launched in 2021 and reported on in next years ASR submission. Nonetheless, seven primary schools are currently signed up to air quality awareness talks delivered by the Council in 2021.

£25 million in Town Deal Funding

The Council submitted an Ipswich Town Deal Bid to the Government on behalf of the Ipswich Town Deal Board in December 2020. 45 Town Deal awards were announced in March 2021 and Ipswich was awarded £25 million of funding that can be spent on 11 projects that will improve the town. Ipswich received the 4th highest funding amount out of the 45 Town Deal awards.

Two of the projects will be of particular benefit to air quality; the creation of a new pedestrian and cycle bridge to enable a better circular route around the waterfront and the Ipswich Oasis 'Green Trail' which will link the waterfront to the town centre and help to encourage more walking and cycling. More information can be found on the Councils Town Fund Webpage.

Suffolk County Council Local Cycling and Walking Infrastructure Plans

The Ipswich Local Cycling and Walking Infrastructure Plan is now available in draft. Furthermore, the draft Suffolk Local Cycling and Walking Infrastructure Plan is now available. Schemes within the plans will be funded through the Active Travel Fund and the Ipswich Strategic Plan Area (ISPA). Suffolk County Council has been awarded £376,000 in tranche one and £1.685 million in tranche two from the Active Travel Fund. This ranks Suffolk as the highest percentage increase in allocation of grants in England

Conclusions and Priorities

For the third year running the Council opted to analyse this year's data using the locally derived bias adjustment factor. Once bias adjusted using the local factor and distance corrected, the nitrogen dioxide diffusion tube data for 2020 shows that the national air quality objective for mean annual NO_2 concentrations was not exceeded at any of Ipswich Borough Councils monitoring locations. However, three sites recorded concentrations within 10% of the annual mean NO_2 objective level. These sites were located within AQMAs 2 and 5.

The COVID-19 pandemic and associated Government imposed lockdowns and restrictions clearly had a positive impact on reducing NO_2 concentrations. One of the main challenges will be to continue to recover from this pandemic, whilst ensuring that air quality does not deteriorate back to pre-pandemic levels.

The Council has several other key challenges/priorities for addressing air quality over the forthcoming reporting year. These include:

- The spending of the newly allocated air quality budget of £100k, per year, for the next three years. Officers have proposed ideas on how the funding may be directed but are seeking support and guidance from both senior management and Councillors on their views and priorities for expenditure.
- The continued delivery of the Councils 2020-2030 Climate Change Strategy and Action Plan. There are a number of actions within the strategy that will benefit air quality and will be priorities for the foreseeable future.

- The continued growth in housing development and business activity will be a major challenge when addressing air quality in the Borough. Ensuring all developments have suitable measures in place to mitigate against their impacts will be essential in ensuring air quality is maintained and improved in Ipswich.
- At the time of writing this report, the Council are considering comments raised from the consultation relating to the Detailed Assessment carried out in November 2020. The Detailed Assessment proposed the amendment of AQMAs 1 and 3 and the revocation of AQMA 4. A copy of the Detailed Assessment can be found in Appendix G. An additional report is currently being prepared which details the results of consultation. It is anticipated that the report will go to Council Executive in Summer 2021 together with an updated Air Quality Action Plan to reflect the proposed changes. Depending on the outcome of the Council Executive, changes may be made to AQMAs 1, 3 and 4. If the proposals are agreed, the Council will send the updated AQAP to DEFRA for appraisal. One of the Councils priorities will then be to consider any comments DEFRA may have on the updated AQAP, and to continue to work towards implementing the measures in the AQAP.

The Council will continue to monitor air quality across Ipswich as this is essential for informing our air quality work and developing measures that can provide potential improvements.

Local Engagement and How to get Involved

The main source of air pollution in Ipswich is road traffic. We are working to meet the challenge set by the Government for NO_2, PM_{10} and $PM_{2.5}$ targets but it will also require a concerted public effort with each person doing their bit in order to try and increase active travel and reduce the use of the motor vehicle where possible. Below are a few suggestions on how to get involved:

- Try to use your car less. Walking and cycling are much cleaner, cheaper and healthier forms of travel. A map showing cycle routes across Ipswich is available on the Way to go Suffolk Website.
- Use public transport, such as the bus and train.
- If you have to use your car, you can reduce emissions by not idling when parked. You can also reduce emissions from your car by ensuring it is regularly serviced and by driving efficiently.

- Consider purchasing an electric vehicle. The Council is working to improve the local charging infrastructure across Ipswich. Electric vehicles are reducing in cost and technology is improving to make this technology more viable. If you opt to purchase a traditionally fuelled vehicle, consider the most fuel efficient petrol vehicle rather than buying a diesel vehicle. See the Zap Map website for locations of charging points.
- Consider car sharing to reduce emissions and save money. See the Suffolk Car Share website for details.
- Avoid having bonfires. If you do choose to have a fire, only burn dry garden waste and avoid burning on days that already have high pollution levels.
- Avoid burning solid fuel. If you do choose to burn solid fuel, always ensure the appliance is well maintained and fuel is clean and dry

More information on air quality within Ipswich is available on the Ipswich Borough Council Air Quality Management website.

If you have any specific questions or concerns, or if you would like to make suggestions on possible improvements and/or supply additional air quality information, please contact Environmental Health at Ipswich Borough Council on 01473 433115 or environmental.health@ipswich.gov.uk.

If you would like any further information on national air quality, including the latest news, air pollution forecasts, the latest measured levels and a summary, interactive monitoring, and general information about air pollution, consult the Defra website.

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1 Local Air Quality Management

This report provides an overview of air quality in Ipswich Borough during 2020. 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 Ipswich Borough Council to improve air quality and any progress that has been made.

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

2 Actions to Improve Air Quality

2.1 Air Quality Management Areas

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

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

- NO_2 annual mean less than 40µg/m3.

We propose to amend Ipswich AQMA No.1 and Ipswich AQMA No.3. Furthermore, we propose to revoke Ipswich AQMA No.4. The detailed assessment relating to the proposals is provided in Appendix G. DEFRA were consulted on the proposals and gave their approval on the technical aspects of the assessment. Following appraisal by DEFRA, the Detailed Assessment was updated to reflect their comments prior to consultation.

A five-week consultation exercise was undertaken between February/March 2021. The updated Detailed Assessment was resent to DEFRA via the LAQM helpdesk as part of the consultation process. At the time of writing this year's ASR, an Executive report is being prepared for Council Executive which details the results of the consultation and proposed changes to the aforementioned AQMAs. It is anticipated that the report will be taken to Executive in Summer 2021, with the outcome being reported on in the 2022 ASR.

Table 2.1 – Declared Air Quality Management Areas

AQMA Name	Date of Declaration	Pollutants and Air Quality Objectives	One Line Description	Is air quality in the AQMA influenced by roads controlled by Highways England?	Level of Exceedance: Declaration	Level of Exceedance: Current Year	Name and Date of AQAP Publication	Web Link to AQAP
Ipswich AQMA No.1	Declared 11/04/2006 Amended 12/09/2017	NO2 Annual Mean	An area encompassing the land in and around the junction of Norwich Road, Chevallier Street and Valley Road, extending along Chevallier Street to beyond the junction with Waterloo Road.	NO	50µg/m3	32µg/m3	Ipswich Borough Council Air Quality Action Plan 2019-2024	Ipswich Borough Council 2019-2024 AQAP
Ipswich AQMA No.2	Declared 11/04/2006 Amended 12/09/2017	NO2 Annual Mean	An area from the junction with Peel Street, extending along Crown Street, St Margarets Street and St Helens Street to the junction with Palmerston Road, and from St Margarets Street extending up Woodbridge Road to just beyond the junction with Argyle Street.	NO	45µg/m3	37µg/m3	Ipswich Borough Council Air Quality Action Plan 2019-2024	Ipswich Borough Council 2019-2024 AQAP

AQMA Name	Date of Declaration	Pollutants and Air Quality Objectives	One Line Description	Is air quality in the AQMA influenced by roads controlled by Highways England?	Level of Exceedance: Declaration	Level of Exceedance: Current Year	Name and Date of AQAP Publication	Web Link to AQAP
Ipswich AQMA No.3	Declared 11/04/2006 Amended 12/09/2017	NO2 Annual Mean	An area following the route of the Star Lane / Key Street / College Street gyratory clockwise from the junction with Lower Orwell Street, extending along Star Lane, Grimwade Street, Fore Street, Salthouse Street, Key Street and College Street, terminating at the junction with Bridge Street.	NO	50µg/m3	31µg/m3	Ipswich Borough Council Air Quality Action Plan 2019-2024	Ipswich Borough Council 2019-2024 AQAP
Ipswich AQMA No.4	Declared 14/12/2010	NO2 Annual Mean	Incorporating the Bramford Road/Yarmouth Road/Chevallier Street junction and part of Chevallier Street.	NO	55µg/m3	28µg/m3	Ipswich Borough Council Air Quality Action Plan 2019-2024	Ipswich Borough Council 2019-2024 AQAP
Ipswich AQMA No.5	Declared 12/09/2017	NO2 Annual Mean	An area incorporating the land in or around St. Matthews Street / Norwich Road between the Civic Drive roundabout and Bramford Road.	NO	49 µg/m3	39µg/m3	Ipswich Borough Council Air Quality Action Plan 2019-2024	Ipswich Borough Council 2019-2024 AQAP

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

☒ **Ipswich Borough Council confirm that all current AQAPs have been submitted to Defra.**

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

Defra's appraisal of last year's ASR concluded that:

"On the basis of the evidence provided by the local authority the conclusions reached are acceptable for all sources and pollutants. The next step for Ipswich Borough Council is to submit the next Annual Status Report, which is due to be submitted in 2021."

Specific points were raised as follows:

- *'The Council is considering reviewing their AQMA boundaries in light of recent trends in monitoring results; namely extending AQMA No.3 to account for exceedances at site 30. This decision to amend the AQMA boundary is supported.'*

  The Council conducted a Detailed Assessment in 2020 which reports on the proposed amendment to AQMA 3 in addition to the proposed amendment to AQMA 1 and revocation of AQMA 4. DEFRA were consulted on the proposals and gave their approval on the technical aspects of the assessment. Following appraisal by DEFRA, the Detailed Assessment was updated to reflect their comments prior to consultation.

  A five-week consultation exercise was undertaken between February/March 2021. The updated Detailed Assessment was resent to DEFRA via the LAQM helpdesk as part of the consultation process. At the time of writing this year's ASR, an Executive report is being prepared for Council Executive which details the results of the consultation and proposed changes to the aforementioned AQMAs. It is anticipated that the report will be taken to Executive in Summer 2021, with the outcome being reported on in the 2022 ASR.

- *'QA/QC procedures have been applied appropriately, with calculations and justifications provided in the Appendix. We encourage this, and we hope to see this continue to be reported in following ASRs.'*

  The Council have continued to apply QA/QC procedures along with calculations and justifications in this year's ASR.

- '*Some of the monitoring locations continue duplicate or triplicate tubes. The Council could indicate which tubes are in a duplicate or triplicate set, to avoid giving the impression there are more exceedances than are quoted in the text of the report.*'

  The Council has indicated which diffusion tube monitoring locations are part of a duplicate or triplicate set throughout the ASR. For example, Tables A.2 and A.4 group duplicate and triplicate tubes together under the same site location.

Ipswich Borough Council has taken forward a number of direct measures during the current reporting year of 2021 in pursuit of improving local air quality. Details of all measures completed, in progress or planned are set out in Table 2.2. Measures are included within Table 2.2, with the type of measure and the progress Ipswich Borough Council have made during the reporting year of 2021 presented. Where there have been, or continue to be, barriers restricting the implementation of the measure, these are also presented within Table 2.2.

More detail on these measures can be found in the Ipswich Borough Council Air Quality Action Plan 2019 – 2024. Key completed measures are:

- EV charging infrastructure has now been installed at the Council's headquarters to support the delivery of the new fleet. The Council's electric fleet now consists of 19 electric cars and 20 small electric vans. Seven more electric vans are due to arrive mid-June 2021. In addition, the larger vehicle fleet now includes seven pickups, sixteen tippers, ten refuse collection vehicles, one glass collection vehicle, one road sweeper, and one tail lift vehicle, all of which are Euroclass VI standard.
- EV charging infrastructure continues to be installed at the Council's offices and Council owned car parks. See measure 10 in table 2.2. below for further information on the locations and numbers of charging points installed.
- The Suffolk anti-idling campaign has been launched. At the time of writing this report, four schools and a community centre have signed up to events for 2021.
- The Introduction of a Hackney Carriage and Private Hire Licensing Policy 2019 - 2022 which sets standards in relation to vehicle age to help reduce the levels of pollutants emitted from the local taxi fleet.

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

- Low Emissions Strategy SPD which will help to mitigate against air quality issues arising from development.
- The implementation of the Councils emerging Local Plan - Policy DM3 of the Core Strategy and Policies Development Plan Document Review Final Draft specifically relates to air quality. Proposed policy CS20 relates to key transport proposals and sets out measures to mitigate against traffic impacts from planned growth within the Ipswich Strategic Planning Area (ISPA). Submission took place in June 2020. Post-submission, the timetable is in the hands of the Planning Inspectorate. The Local Development Scheme Nov 2020 indicated that the Local Plan would be adopted by mid-2021. This is now likely to be the end of 2021.
- Although not a measure listed in the AQAP, the Council, together with all the other Local Authorities across Suffolk have been working with Suffolk County Council's Transport and Public Health colleagues to prepare an 'Air Quality Profile' report for Suffolk. The report will map, at a district and borough level, local air pollution levels and explore evidence-based interventions that can be undertaken by local authorities, businesses, communities and individuals to improve air quality. The publication of the report was due in 2020, but this has been delayed due to COVID-19. The air quality profile report should be published by the end of 2021.

Ipswich Borough Council's priorities for the coming year are:

- To continue to work towards implementing the measures in the AQAP.
- To continue to monitor air quality across Ipswich as this is essential for informing our air quality work and developing measures that can provide potential improvements.
- To take a report back to Council Executive following on from the public consultation on the 2020 Detailed Assessment. Following an Executive decision, the Council intends to implement any recommendations as appropriate.
- To deliver air quality projects using the £100k of funding allocated by the Council to air quality improvements over the next year.
- To work with officers implementing the Council's Climate Change Strategy to ensure a joined-up approach in tacking both climate change and air quality. There are several actions within the strategy that will benefit air quality and will be priorities for the foreseeable future. A Climate Change Officer working group will shortly be created, made up of officers across the Council, and this will include an air quality representative from the Environmental Protection department.

- To continue to assess and comment on planning applications and major developments in relation to air quality. This is essential in order to ensure future emission reductions within the district, and to reduce the likelihood of additional AQMAs being declared and further deterioration of air quality in existing AQMAs.
- To continue to plan a return to business continuity following the COVID-19 pandemic.

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

- Limitations on the level of dedicated resource available for air quality management activities; and
- Difficulty in obtaining sufficient support to include potentially more intrusive and/or costly interventions to secure significant and necessary improvements in air quality throughout the AQMAs.
- Officers have previously tried to engage with Primary Schools with the air quality campaign being rolled out across Ipswich, particularly those nearest to our AQMAs. Unfortunately, to date, only one school near to an AQMA has expressed an interest in participating. Officers will continue to attempt to engage with schools, but it is anticipated that uptake will be low.

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

- Low Emissions Strategy SPD – Delays have occurred as a result of officers focusing resources on the Local Plan submission. In addition, delays have occurred as a result of officers working through comments received by internal and external partners, in particular in relation to the threshold criteria classifying the scale and type of a development and car parking standards within the IP-ONE area.
- Embedding air quality considerations in the Councils Local Plan – Submission of the Local Plan to the Government for public examination was delayed by the need to carry out further evidence gathering, including air quality modelling, to ensure it reflected the most up to date transport modelling.
- Suffolk County Council have stated that the COVID-19 pandemic has presented a number of challenges for transport related works, this includes the inability to undertake traffic data surveys, public engagement and it has also affected the delivery of schemes. Further details on transport related measures is shown in Table 2.2. below.

Whilst the measures stated above and in Table 2.2 will help to contribute towards compliance, Ipswich Borough Council anticipates that further additional measures not yet prescribed will be required in subsequent years to achieve compliance and enable the revocation of all current AQMAs.

Table 2.2 – Progress on Measures to Improve Air Quality

Measure No.	Measure	Category	Classification	Year Measure Introduced	Estimated / Actual Completion Year	Organisations Involved	Funding Source	Defra AQ Grant Funding	Funding Status	Estimated Cost of Measure	Measure Status	Reduction in Pollutant / Emission from Measure	Key Performance Indicator	Progress to Date	Comments / Barriers to Implementation
1	Low Emissions Strategy SPD	Policy Guidance and Development Control	Low Emissions Strategy	2019	2021	Ipswich Borough Council	Ipswich Borough Council	NO	Funded	Unknown	Planning	Medium	Implementation of SPD	Currently considering comments from public consultation prior to finalising SPD. Estimated publication date 2021.	Exact costs unknown. Costs come from officer time.
2	Support the Local Transport Plan to create a more efficient use of the highway in and around the town, and across Suffolk	Policy Guidance and Development Control	Regional Groups Co-ordinating programmes to develop Area wide Strategies to reduce emissions and improve air quality	2019	2026	Suffolk County Council	Suffolk County Council	NO	Partially Funded	Unknown	Planning	Medium	Development of LTP	SCC will be updating the Local Transport Plan to reflect the Council's and Government's zero carbon ambitions. An evidence base will then be developed to inform the strategic town plans that will follow the overarching policy.	The DfT are due to announce a change in guidance for LTPs with a focus on decarbonisation and the need to include targets. SCC are waiting for this information, which is imminent, before doing any significant work on the LTP to ensure that when it is updated it is fully aligned.
3	Embed air quality considerations in the Councils Local Plan	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	2019	2021	Ipswich Borough Council	Ipswich Borough Council	NO	Funded	Unknown	Planning	Medium	Air quality considerations embedded in Local Plan	Implementation on-going	Submission of the Local Plan to the Government for public examination was delayed by the need to carry out further evidence gathering including air quality modelling – to ensure it reflected the most up to date transport modelling. Submission took place in June 2020. Post-submission, the timetable is in the hands of the Planning Inspectorate. The Local Development Scheme Nov 2020 indicated that the Local Plan would be adopted by mid-2021. This is now likely to be the end of 2021.

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4	Support Suffolk County's development of Local Ipswich Cycling and Walking Infrastructure Plans, and work to improve existing cycle routes	Policy Guidance and Development Control	Regional Groups Co-ordinating programmes to develop Area wide Strategies to reduce emissions and improve air quality	2019	Not known	Suffolk County Council	Suffolk County Council	NO	Partially Funded	Unknown	Implementation	Medium	Implementation of Walking and Cycling Infrastructure Plan	The Ipswich Local Cycling and Walking Infrastructure Plan is now available in draft: https://www.ipswich.gov.uk/sites/www.ipswich.gov.uk/files/scc_lcwip_v9_2020.pdf. The draft Suffolk Local Cycling and Walking Infrastructure Plan is also available: https://www.suffolk.gov.uk/assets/coronavirus/Advice-on-travel/Local-Cycling-and-Walking-Infrastructure-Plan-for-Suffolk.pdf . There has been a delay in completing the plan due to the COVID-19 pandemic. A new data for finalising has not been set by SCC. The schemes will be funded through the Active Travel Fund and the Ipswich Strategic Plan Area (ISPA)	Ipswich area schemes have been developed as part of those identified in the five year rolling programme across Suffolk. Evaluation and analysis of their potential will be via the LCWIP project team meetings. Suffolk County Council has been awarded £376,000 in tranche one and £1.685 million in tranche two from the Active Travel Fund. This ranks Suffolk as the highest percentage increase in allocation of grants in England.

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5	Comment on best practice measures in relation to air quality in planning applications and major developments. Support alternatives to single occupancy car use arising from new developments, through the use of robust travel plans secured through the planning process	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	2019	2024	Ipswich Borough Council	Ipswich Borough Council	NO	Funded	£10k - 50k	Implementation	Medium	100% of relevant planning applications assessed	Ongoing measure - all relevant applications assessed	Air Quality Assessments asked for in line with EPUK/IAQM guidance. Low emissions SPD should support this measure. SCC are able to deliver travel plans to new developments, which helps with a number of factors and ensures consistency of messages regarding active and sustainable travel options across all developments. With workplace sites in 2020, most of the monitoring comes through the Suffolk Travel to Work survey: https://www.healthysuffolk.org.uk/uploads/2021-02-02_Travel_to_Work_Survey_Report_2020.pdf. The only Ipswich site that submitted travel plan monitoring data separately was Fred Olsen who received a Modeshift STARS bronze accreditation: https://www.suffolktoday.co.uk/countywide/schools-and-businesses-scoop-sustainable-travel-awards/. SCC are trying to push the STARS Business accreditation route to workplaces to improve compliance, but this will take time and a fair amount of resource from SCC to achieve.
6	Introduction of taxi emissions standards policy	Promoting Low Emission Transport	Taxi Licensing conditions	2018	2018	Ipswich Borough Council	Ipswich Borough Council	NO	Funded	-	Completed	Low	Reduction in non-Euro 6 Diesel	Completed - New Hackney Carriage and Private Hire Licensing Policy 2019-2022	Policy came into place relating to age of vehicles in 2020. Average age of vehicle licenced by IBC approx. 8 years. In order to be licenced, vehicles must be less than 15 years old. Costs not known for introducing measure.

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7	Work with Ipswich Buses bus fleet to encourage the renewal of their fleet to cleaner i.e. Euro VI or better and/or low emission, hybrid buses, on certain routes	Vehicle Fleet Efficiency	Other	2019	2028	Ipswich Borough Council, Ipswich Buses Limited	Ipswich Buses	NO	Not Funded	Unknown	Implementation	Low	Vehicles that do not at least meet Euro VI emission standards at the time of being life expired after 15 years of use are ideally projected to be renewed. Reduced fleet emissions	13 Euro V buses acquired in 2019. 3 Euro VI buses acquired in 2020 and 5 Euro VI buses expected to join the fleet by September 2021. IBC has signed up to a Quality Bus Partnership with SCC, Ipswich Buses and First on 25 May 2020. A new enhanced partnership (EP) is now being formed in Suffolk as a result of the new National Bus Strategy which could lead to government funding opportunities for retro-fitting Euro VI or newer low or zero emission buses. An EP is a legal agreement with enforceable commitments from the local authorities and bus operators. This should ensure measures are delivered.	This projection may not be feasible given the current economic uncertainty following the impact of Covid but ideally would see the following numbers of vehicles being replaced each year as they reach 15 years old: 2022 x 5 vehicles; 2023 x 7 vehicles; 2024 x 8 vehicles; 2025 x 12 vehicles; 2026 x 12 vehicles; 2027 x 12 vehicles; 2028 x 11 vehicles. Such a plan would depend on shape and size of the bus network following the pandemic along with advances in alternative fuels and available funding for vehicles and associated re-fuelling infrastructure. Due to the Covid outbreak, there is uncertainty across the economy, and particularly regarding high street retail footfall and employment. Given this, it is unlikely that any fleet will be replaced in 2022. SCC has been working with operators and IBC to submit a bid for the All Electric Bus Town Grant. Unfortunately, the bid was unsuccessful but the large amounts of match funding required from the bus operators to acquire vehicles would have been very stretching and possibly undeliverable. The Covid outbreak has made bus services uneconomic to operate which is why Government's CBSSG funding is currently in place, to prop up operators to ensure they can reach break-even and cover all their costs, despite passenger usage having reduced by some 35%. SCC will not be working with operators to submit a Zero Emission Bus Regional Area (ZEBRA) grant due to the requirements of the bid. These have not substantially changed from the Electric Bus Town bid where the requirements were assessed as unaffordable by operators and SCC, largely due to the amount of match funding required. The UK Governments Bus Back Better Policy proposes that 4000 new zero emission buses will be delivered but no detail has been provided yet on how this will be achieved.

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8	Work with other Bus Operators in the town (i.e. First, Norse, Beestons) to encourage the renewal of their fleet to cleaner i.e. Euro VI or better and/or low emission, hybrid buses, on certain routes	Vehicle Fleet Efficiency	Other	2019	2024	Ipswich Borough Council	Bus Operators	NO	Partially Funded	Unknown	Implementation	Low	Reduced fleet emissions	Ongoing. IBC has signed up to a Quality Bus Partnership with SCC, Ipswich Buses and First on 25 May 2020 and have met regularly throughout the last reporting year. However, the recent National Bus Strategy, requires the Council to develop an Enhanced Partnership for Suffolk by April 2022, this will replace the QBP. The QBP work is linked to ISPA and town strategy. First Buses were due several new buses as part of their fleet renewal programme but the impact of the COVID-19 pandemic has put the renewal programme on hold. First have 3 buses that are due retrofits, but the contractor doing them was unable to attend site due to the pandemic. As restrictions are easing it is hoped the retrofits will be completed.	Ongoing measure for lifetime of AQAP. Costs unknown. Air Quality Officers have spoken to operators about not idling vehicles. SCC will not be working with operators to submit a Zero Emission Bus Regional Area (ZEBRA) grant due to the requirements of the bid. These have not substantially changed from the Electric Bus Town bid where the requirements were assessed as unaffordable by operators and SCC, largely due to the amount of match funding required.
9	Procurement of low emission vehicles in Ipswich Borough Council Fleet	Promoting Low Emission Transport	Public Vehicle Procurement -Prioritising uptake of low emission vehicles	2019	2022	Ipswich Borough Council	Ipswich Borough Council, (OLEV part funded via plug in grants)	NO	Funded	£1 million - £10 million	Implementation	Low	Provision of new vehicles	At the time of writing this report, the Council have 19 electric cars and 20 small electric vans within the fleet, replacing a proportion of the older diesel vehicles. Seven more electric vans are due to arrive mid-June. In addition, the larger vehicle fleet now includes seven pickups, sixteen tippers, ten refuse collection vehicles, one glass collection vehicle, one road sweeper, and one tail lift vehicle, all of which are Euroclass VI standard. Additional Euroclass VI pickup trucks and vans are due later this year. The total cost of the Councils three-year fleet renewal programme so far is approximately £3,855,911.	3 year replacement plan for small vehicle fleet to zero emission. Larger vehicles to be euro VI standard

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10	Provision of EV charging points across IBC officers, Crown Street and Elm Street public car parks and investigate the feasibility of additonal charging points across IBC car parks	Promoting Low Emission Transport	Procuring alternative Refuelling infrastructure to promote Low Emission Vehicles, EV recharging, Gas fuel recharging	2019	2019	Ipswich Borough Council	Ipswich Borough Council	NO	Partially Funded	£500k - £1 million	Completed	Low	Provision of 4 charging stations (8 points) at Grafton House. Usage of EV charging points by the public	Number of charging points now installed at the following locations: Grafton House – 26 Gipping House – 8 Christchurch Mansion – 4 Chantry Park – 2 Holywells Park – 2 Crematorium – 1 Gainsborough sports centre – 2 Crown Car Park – 28 Elm St Car Park – 2 rapid chargers Majors Garage – 1 Upper Orwell Street North Car Park - 2. 149 points proposed at Portman Road Car Park with capacity for 298 EV charging spaces - approx. cost £500k	Provision of additional charging points depends on success of usage of current charging points. Crown car park - From 11/08/2018 to 03/06/2021 – there have been 4930 charging sessions using total of 32,134.27kWh. No charging reported to date at Upper Orwell North car park. Elm Street Car Park - since March 2019 there have been 214 charging sessions using total of 4,387.71kWh.
11	Development and implementation of an anti-idling campaign, including where appropriate an enforcement regime	Public Information	Other	2019	2024	Ipswich Borough Council	Ipswich Borough Council	NO	Funded	Unknown	Implementation	Low	Development of campaign materials	Campaign materials produced by the Suffolk Air Quality Working Group. At the time of writing this report, 4 schools and a community centre with a nursery attached have signed up for anti-idling events in 2021.Any drivers that have been approached during events who were idling, switched off engines when requested. The opportunity of training wider IBC departments on air quality/vehicle idling is to be explored (i.e. could other teams that carry out regular patrols also give out anti-idling messages).	COVID-19 has delayed engaging with schools/ organisations to deliver air quality awareness events and further anti-idling campaigns in 2020. Only one school took part in an anti-idling event in 2020. It did however make local news: https://www.ipswichstar.co.uk/news/clean-air-day-cliff-lane-primary-school-ipswich-suffolk-6538312. Now restrictions are easing, more schools are willing to engage. Ongoing campaigns, hence completion date listed for lifetime of current AQAP. Exact costs unknown – will be from officer time and material costs.

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12	Campaign to raise awareness of air quality issues in schools near AQMAs to subsequently influence behavioural change and improve air quality near schools	Public Information	Other	2019	2024	Ipswich Borough Council	Ipswich Borough Council	NO	Funded	Unknown	Implementation	Low	Present information to schools near AQMAs and within the borough.	IBC have produced an 'Air Aware Ipswich' Schools Toolkit. A 12 week programme aimed at raising awareness of air quality issues with school children. This has been adapted from initiatives used in London and Oxford. The toolkit is currently with the design team prior to publication. SCC are launching a school streets policy soon. IBC and SCC to work together on some trial locations in Ipswich (with SCC Behaviour Change Team). All primary schools in Ipswich have been offered air quality workshops. At the time of writing this report, 7 primary schools and a community centre with a nursery attached have signed up for air quality workshops in 2021.	It has been difficult to engage with some schools, possibly due to competing demands they face. Ongoing campaigns, hence completion date listed for lifetime of current AQAP. Costs unknown – will be officer and material costs.
13	Active participation in annual Clean Air Days	Public Information	Other	2019	2024	Ipswich Borough Council	Ipswich Borough Council	NO	Funded	Unknown	Implementation	Low	Participation in annual Clean Air Days	Clean Air Day 2021 is currently being planned at the time of writing this years ASR. 7 primary schools, a nursery and a CCG have signed up to air quality workshops. At the time of writing this report, Suffolk County Council Public Health are looking to finalise the Suffolk Air Quality Profile report and publish on National Clean Air Day.	Ongoing commitment, hence completion date listed for lifetime of current AQAP. Costs unknown – will be officer and material costs

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14	Promote the Councils Green Travel Plan to employees, including use of agile working	Promoting Travel Alternatives	Workplace Travel Planning	2019	2024	Ipswich Borough Council	Ipswich Borough Council	NO	Funded	Unknown	Implementation	Low	Annual promotion of travel plan. Increase in the number of employees walking, cycling or using public transport in the Councils Travel Plan survey	Due to COVID-19 pandemic, office staff were asked to work from home so no promotion of the travel plan has taken place and IBC did not participate in the most recent travel survey as a result. At the time of writing this report, all office based staff are still being asked to work from home. Date for return to the office is unknown, possibly Autumn 2021. Uptake of travel plan offers is currently very low. Some bus tickets are being purchased but hardly any rail season tickets. Any future promotion will likely coincide with staff returning to the office.	In May 2021, the average number of employees working from Grafton House per day was 36. Pre-COVID-19 pandemic, an average of 248 staff were working from Grafton House per day.
15	Investigating the feasibility of promoting air quality messages on non-IBC owned variable message signs around Ipswich (e.g. Bury Road)	Public Information	Other	2019	2024	Ipswich Borough Council, Suffolk County Council	Suffolk County Council	NO	Funded	Unknown	Implementation	Low	Promote messages relating to air quality	The promotion of Walking and Cycling is happening with SCC variable messaging signs which should benefit air quality.	Ongoing use, hence completion date listed for lifetime of current AQAP.
16	Investigate the feasibility of promoting air quality messages on IBC procured variable message signs around Ipswich	Public Information	Other	2019	2024	Ipswich Borough Council	Ipswich Borough Council	NO	Funded	£100k - £500k	Completed	Low	Promote anti-idling messages quarterly	VMS project cost £259,000. VMS due to be installed between July - Sept 2021.	Ongoing promotion of messages once installed, hence completion date listed for lifetime of AQAP.

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17	Explore opportunities to increase Ipswich's Park and Ride scheme, including consideration given to re-opening the Bury Road Park and Ride, and promote current schemes to incentivise people coming into Ipswich town centre to use public transport over private cars	Alternatives to private vehicle use	Bus based Park & Ride	2019	2023	Ipswich Borough Council	Not known at this stage	NO	Not Funded	Unknown	Planning	Low	Increase in Park and Ride uptake	IBC is committed to reopening a park and ride site on Bury Road. A consultant has been engaged to conduct a feasibility study in summer 2021. Solar farms/EV hubs being explored. It is hoped that works will commence in 2022, with completion/works well progressed in 2023. Costs unknown at this stage.	SCC indicate that increasing the use of the Park & Ride scheme, along with other bus patronage, is an objective of the QBP and is identified in the ISPA mitigation strategy. To ensure the financial viability of the Park & Ride services, the existing service would need to increase patronage before additional sites could be viable. Opening the Bury Rd P&R site is included within the ISPA strategy. Barriers to the development of this measure include increasing bus patronage, linked to level and cost of parking in the town.
18	Review (in conjunction with other IBC/ SCC work streams), the traffic management arrangements in the St Matthews St/ Norwich Rd corridor. Maintaining delivery facilities, whilst minimising disruption to traffic flows	Freight and Delivery Management	Quiet & out of hours delivery	2019	Unknown	Suffolk County Council	Suffolk County Council	NO	Not Funded	Unknown	Planning	Low	Reduction in congestion along Norwich Road & St Matthews Street	At the time of last years ASR, a working group was established between SCC and IBC to review the traffic arrangements in the area and regular meetings been taking place to discuss a way forward. A questionnaire was going to be prepared between a local business representative in the area and the working group to establish business views on air quality, loading and parking. Unfortunately, due to the COVID-19 pandemic and businesses being closed, progress has stalled on this measure. Furthermore, SCC do not currently have an officer in post that can help progress this measure. Once an officer is in post, progress with this measure can resume.	Recruitment of an additional behaviour change post within SCC to support the behaviour change measures identified within ISPA has been identified, this is to be funded through the ISPA work. However, to date, no agreement has been reached on LPAs funding the ISPA mitigation work and this recruitment is therefore on hold. This has been in discussion for over a year and a half now. Completion date TBC - depends on measures implemented

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19	Promote the use of South Street (to be renamed Norwich Road Car Park), short term parking bays behind businesses on Norwich Road. Incentivising use of allocated parking and enforcement against unauthorised on street loading/ parking.	Traffic Management	Other	2019	2024	Ipswich Borough Council	Ipswich Borough Council	NO	Funded	Unknown	Implem entation	Low	Reduction in congestion along Norwich Road/St Matthews Street. Number of penalty notices served.	Between 01/07/2020 - 01/06/2021 the following number of PCNs were served along Norwich Road and St Matthews Street: 39 for parking on yellow lines / 82 for parking where a loading restriction is present / 2 for parking on white lines / 6 for parking in a bus stop or stand. 5 PCN's were issued in Norwich Road Shoppers Car Park for overstaying in the free parking bays.	Implementation costs not known.
20	Review opportunities for alterations to traffic management to reduce congestion in AQMAs (including opportunities on Berners Street while still providing a convenient facility for pedestrians)	Traffic Manage ment	Other	2019	Unknown	Suffolk County Council	Suffolk County Council	NO	Not Funded	Unknown	Planning	AQMA No.5 approx. 2% reductio n in NOx	Reduction in congestion on Civic Drive/ St Matthews Street roundabout	Opportunities to alterations to traffic management linked to ISPA mitigation work and town strategy.	No completion date known. Possible mitigation dependant on funding and appropriate support from stakeholders. Likely that funding will be sought as and when opportunity arises, unless suitable funding agreement made available from other sources e.g. Defra or DfT

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21	Consider and explore the feasibility of further measures that would improve air quality within both AQMAs and across the borough, including emissions testing within AQMAs, clean air zones, low emission zones and congestion charging	Promoting Low Emission Transport	Other	2019	2026	Ipswich Borough Council	Not known at this stage - depends on the measures proposed	NO	Not Funded	Unknown	Planning	High (if LEZ/ congestion charging introduced)	-	Following on from the findings of the Air Quality Assessment commissioned by the Ipswich Strategic Planning Area, the Council need to explore how we address the predicted future exceedance within AQMA 2 in both 2026 and 2036 further with SCC. We are now monitoring at this location to ascertain current concentrations. Neither IBC or SCC are intending to implement a low emission zone or congestion charging at this time.	2026 and 2036 for local plan growth across the ISPA areas. Possible mitigation dependant on funding and appropriate support from stakeholders. Indicative costs for delivery of the IPSA mitigation strategy have been provided to all LPAs and formed the basis of the IDP. WSP will be commissioned to undertake this work in the next month (July 2021).
22	Provision of A rated boilers in IBC owned housing stock	Promoting Low Emission Plant	Other Policy	2019	2022	Ipswich Borough Council	Ipswich Borough Council	NO	Funded	Unknown	Implementation	Low	All larger properties are to have low NOx boilers, defined as boilers that meet a dry NOx emission rating of 40mg/kWh	Ongoing installation	
23	Work with the Private Sector Housing team to improve their renovation grant criteria and include air quality considerations	Policy Guidance and Development Control	Other policy	2019	2024	Ipswich Borough Council	Ipswich Borough Council	NO	Not Funded	Unknown	Planning	Low	100% of all grants with air quality implications	Not progressed at this stage. IBC intend on progressing this measure before the next ASR reporting period.	

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24	Development and implementation of campaign to provide information about the impacts of domestic burning and good practice, including wood burners and burning of garden waste	Public Information	Other	2019	2024	Ipswich Borough Council	Ipswich Borough Council	NO	Funded	Unknown	Implementation	Low	Reduction in number of domestic burning complaints received	Information produced on IBC website relating to domestic burning. Bonfire complaint letters also updated with information. 181 smoke complaints received between 01/07/2019 and 30/06/2020. 139 smoke complaints received between 01/07/2020 and 8/06/2021. Further information on domestic burning will be provided as part of the Ipswich 'Air Aware' Campaign - information produced but campaign to be launched.	Costs not known. Unfortunately due to the COVID-19 pandemic, garden waste collections were halted but these have now resumed. Residents were encouraged to compost garden waste or store it until waste collection services and recycling centres were back up and running. Costs unknown, but likely to be officer time and materials.
25	Investigate what other organisations in the town are doing with regards to fleet renewal (e.g. other Local Authorities and large businesses) and whether there are opportunities (and funding) for an accelerated take up of ULEVs in the town	Promoting Low Emission Transport	Public Vehicle Procurement - Prioritising uptake of low emission vehicles	2019	Unknown	Ipswich Borough Council. Other organisations	Depends on organisation as to the funding source	NO	Partially Funded	Unknown	Implementation	Low	-	SCC has been increasing the number of electric vehicles in its fleet, including site inspection vehicles. Matters relating to an EV fleet and increased opportunities for charging are being considered as part of the review of the Suffolk Highways contract. IBC officers have contacted large organisations in the town with regards to their fleet renewal/Clean Air Day and anti-idling (including Willis, Aldi, Greater Anglia, UKPN and Anglia Water). To date, only UKPN are the only organisation to respond - they have an anti-idling policy and would raise awareness of Clean Air Day. IBC officers have been working with the Sustainability lead for the West Suffolk CCG, Ipswich & East Suffolk CCG, North East Essex CCG. They have drafted a Green Action Plan and the IESCCG Clinical Executive have approved it. One of the objectives of this plan is to reduce air pollution impacts. Officers intend to continue to develop links with other organisations in the future.	SCC have previously set up an EV officer group, but there has been a restructure in Transport Strategy and this is something SCC need to follow up on. At this time SCC has not changed its current position with respect to on-street residential parking. Their position can be found here: https://www.suffolk.gov.uk/roads-and-transport/transport-planning/electric-vehicle-charging-policy/. Members of the public who are interested in community on-street charging can request it via this link. This will help SCC identify where more residential charging facilities may be required in the future. Completion date unknown as likely to be an ongoing measure.

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26	Assist the Councils Car Parking Services in the development of their policies and strategies to promote clean travel and improved air quality. Review use of short and long stay car parks	Promoting Low Emission Transport	Other	2019	2024	Ipswich Borough Council	Ipswich Borough Council	NO	Not Funded	Unknown	Planning	Low	-	No changes were made to parking tariffs in 2020-2021 but changes could (but not necessarily will) take place in 2021-2022. Current IBC parking strategy restricts new long term parking in central car parking core to encourage employees to travel to work by sustainable means.	Costs unknown - essentially it is just officer time taken to carry out reviews of the Council's parking tariffs. KPI unknown at this stage.
27	Continue to explore the possibility and apply to DEFRA for grant funding under Air Quality Grant Schemes and any other appropriate funding	Promoting Low Emission Transport	Other	2019	-	Ipswich Borough Council (and Suffolk County Council depending on the nature of the bid)	DEFRA/ other sources of funding	YES	Not Funded	Unknown – depends on grant and match funding required	Planning	Depends on the nature of the works relating to grant funding	-	Deadlines for applications are typically very tight so it is beneficial to have an application drafted for submission when funding is announced. Officers have suggested possible grant application ideas to both senior management and Councillors and are awaiting their views before progressing further. Officers across Suffolk are currently discussing ideas for a Suffolk-wide grant submission.	Will be DEFRA AQ grant funding if a bid is successful

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.

The Suffolk Air Quality Group, of which Ipswich Borough Council is a member, has engaged with Suffolk County Council (SCC) Public Health and Protection to pursue a unified approach to tackling $PM_{2.5}$. This is focused on promoting modal shift away from motor vehicle use towards active means of travel such as walking and cycling.

The Public Health Outcomes Framework (PHOF) is a Public Health England data tool, intended to focus public health action on increasing healthy life expectancy and reducing differences in life expectancy between communities. The PHOF includes an indicator, based on the effect of particulate matter ($PM_{2.5}$) on mortality. According to the public health outcomes framework, the fraction of mortality in those aged over 30 years, attributable to particulate air pollution (measured as $PM_{2.5}$) in 2019 in Ipswich is 5.70%, above the average for England (5.13%), and similar to that of the East of England Region (5.50%). This would suggest that $PM_{2.5}$ concentrations in Ipswich are slightly higher than other areas in the UK[7].

The Council does not currently conduct any real time monitoring for either PM_{10} or $PM_{2.5}$. However, as highlighted in the 2020 ASR, the Council commissioned a study to assess the air quality impact of the proposed aligned local plans for the Ipswich Strategic Planning Area (ISPA). The assessment considered the impacts of the IBC Local Plan without and with Transport Mitigation Measures. The results of the assessment show that, based on the significance criteria taken from the Environmental Protection UK / Institute of Air Quality Management (EPUK/IAQM) guidance '*Land-Use Planning & Development Control:*

[7] Public Health England, Public Health Outcomes Framework, accessed 19/05/2021. Available at: https://fingertips.phe.org.uk/static-reports/public-health-outcomes-framework/at-a-glance/E07000202.html?area-name=Ipswich

Planning For Air Quality'[8], the effects of the Ipswich Local Plan are predicted to be negligible in 2026 and 2036 for PM_{10} and $PM_{2.5}$. This is a positive finding, but the Council will continue to work towards reducing concentrations of particulates. The modal shift to more active & sustainable travel choices, delivered through the ISPA strategy will also contribute to the reduction of particulates. Through reduced vehicle use, tyre and brake dust will lessen. Increased walking and cycling will reduce the need for short journeys in urban areas in and through the AQMAs.

When using the current Defra background mapping resource (base year 2018, assessment year 2020), the maximum predicted background annual mean $PM_{2.5}$ concentration within Ipswich is 11.3µm/m^3. This is below the air quality standard for $PM_{2.5}$ of 25µm/m^3 but above the World Health Organisation (WHO) air quality guideline value of 10µm/m^3.

Ipswich Borough Council anticipates that the measures within the Action Plan, whilst primarily targeted at NO_2, will also contribute toward a reduction in $PM_{2.5}$. Proposals focussing on measures such as supporting the development of the local transport plan, promoting public transport and the staff travel plan will also help to reduce overall vehicle trips, reducing $PM_{2.5}$ emissions both through reductions in fuel usage and brake and tyre wear. Furthermore, assessing planning applications and recommending planning conditions such as compliance with a construction management plan will also help to address $PM_{2.5}$ concentrations. It should be noted that sources of $PM_{2.5}$ extend beyond transport. Ipswich Borough Council continues to enforce statutory controls on combustion emissions from both industrial and domestic sources, which both contribute to $PM_{2.5}$ concentrations.

During the latter part of 2019 and in 2020, the Council, together with all the other Local Authorities across Suffolk worked with Suffolk County Council's Transport and Public Health colleagues to prepare an 'Air Quality Profile' report for Suffolk. The report will map, at a district and borough level, local air pollution levels and explore evidence-based interventions that can be undertaken by local authorities, businesses, communities and individuals to improve air quality. Unfortunately, due to the COVID-19 pandemic and the associated impact on resource, the report was not finalised in 2020. However, at the time

[8] EPUK/IAQM, 2017, Land use Planning & Development Control: Planning for Air Quality. Available at: http://www.iaqm.co.uk/text/guidance/air-quality-planning-guidance.pdf

of writing this ASR, a draft copy of the air quality profile is being finalised. It is anticipated that this will be published in 2021 following sign-off from the Suffolk Director of Public Health. A link to a copy of this report will be included in the 2022 ASR.

We will continue to consult with Suffolk County Council Public Health colleagues and be advised by them, and national guidance, on any relevant measures that will reduce exposure to $PM_{2.5}$.

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

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

3.1 Summary of Monitoring Undertaken

3.1.1 Automatic Monitoring Sites

Ipswich Borough Council undertook automatic (continuous) monitoring at 2 sites during 2020 (IPS3 – Chevallier Street / IPS04 – St Matthews Street). Table A.1 in Appendix A shows the details of the automatic monitoring sites. NB. Local authorities do not have to report annually on the following pollutants: 1,3 butadiene, benzene, carbon monoxide and lead, unless local circumstances indicate there is a problem. The Air Quality England page presents automatic monitoring results on behalf of Ipswich Borough Council, with automatic monitoring results also available through the UK-Air website .

Maps showing the location of the monitoring sites are provided in Appendix D. Further details on how the monitors are calibrated and how the data has been adjusted are included in Appendix C.

3.1.2 Non-Automatic Monitoring Sites

As part of its normal monitoring programme, Ipswich Borough Council undertook non-automatic (i.e. passive) monitoring of NO_2 at 88 sites during 2020. Table A.2 in Appendix A presents the details of the non-automatic sites.

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

In order to further understand pollution levels around the town, seven additional non-automatic monitoring locations were installed in 2020. These locations are at:

- Upper Orwell Street (just outside AQMA. No.2 approximately 20m from the junction with Old Foundry Road, St Margaret's Street and St Helens Street). Location chosen due to becoming aware of new receptors being introduced in the area.
- Northgate Street. Location chosen due to becoming aware of new receptors in the area.
- Stoke Street. Location chosen in order to further understand pollution levels around the town.
- Hadleigh Road (two Locations) and London Road (one location). Locations were chosen as a result of an allocation of housing just outside the Ipswich Borough boundary. This development may impact of pollution levels within the town as the additional traffic generated from the development may travel along the roads into/out of Ipswich. Monitoring levels of pollution now will help to establish a current baseline level.
- Ipswich Hospital. Location chosen in order to further understand pollution levels around the town.

Once bias and distance corrected, none of these new locations were in exceedance of the annual mean NO_2 concentration. Further details can be found in Appendix B. The Council will continue to monitor levels of pollution at these sites in 2021 and report on them in the 2022 ASR.

Additional non-automatic locations were installed in 2021. These locations are at:

- Crown Street at the junction with Northgate Street. Location chosen due to air quality modelling as part of the Council's emerging Local Plan indicating that the air may experience an exceedance of the annual mean objective level in both 2026 and 2036.
- Fore Street. Location chosen to help ensure the Council has appropriately defined the boundary of AQMA 3.

The findings of the additional monitoring will be reported on in the 2022 ASR.

3.2 Individual Pollutants

The air quality monitoring results presented in this section are, where relevant, adjusted for bias, annualisation (where the annual mean data capture is below 75% and greater

than 25%), and distance correction. Further details on adjustments are provided in Appendix C.

3.2.1 Nitrogen Dioxide (NO_2)

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

For diffusion tubes, the full 2020 dataset of monthly mean values is provided in Appendix B. Note that the concentration data presented in Table B.1 includes distance corrected values, only where relevant. There are no annual averages greater than 60µg/m^3 that would indicate an exceedance of the 1-hour mean objective.

Table A.5 in Appendix A compares the ratified continuous monitored NO_2 hourly mean concentrations for the past five years with the air quality objective of 200µg/m^3, not to be exceeded more than 18 times per year.

Looking at the locally bias adjusted and distance corrected data for the non-automatic monitoring locations, there were no exceedances of the annual mean NO_2 concentration. Three sites recorded concentrations within 10% below the annual mean NO_2 objective level, these were;

- 1 site located within AQMA 2. Tubes 11, 12 & 19 – triplicate.
- 2 sites located within AQMA 5. Tube 52 and tubes 64 & 65 – duplicate.

When comparing the 2020 results to the 2019 results generated using the locally derived bias adjustment factor, in 2019 there were exceedances at eight sites and in 2020 there were no exceedances. The exceedances in 2019 were in AQMA 2 (sites 11, 12 & 19 – triplicate and 68), AQMA 5 (sites 49, 52, 53, 64 & 65 – duplicate), outside the boundary of AQMA 3 (site 30) and on the periphery of AQMA 4 (site 18).

Figures A.1 – A.6 shows bias corrected trendline plots for clusters of passive monitoring locations in and around each of the 5 AQMAs. All would appear to indicate that annual mean NO_2 levels remained essentially unchanged between 2013 - 2019, with a marginal downward trajectory when looking at the results analysed via the local bias correction

factor. When looking at the bias corrected data for 2020, annual mean NO_2 concentrations dropped considerably compared to previous years.

3.2.2 Particulate Matter (PM_{10})

Ipswich Borough Council does not monitor for particulate matter (PM_{10}) – historical studies / monitoring have not identified any exceedance of the objective levels.

3.2.3 Particulate Matter ($PM_{2.5}$)

Ipswich Borough Council does not monitor for particulate matter (PM2.5).

3.2.4 Sulphur Dioxide (SO_2)

Ipswich Borough Council does not monitor for Sulphur Dioxide (SO_2) – previous screening work has not suggested that there will be any exceedance of the objective levels.

Appendix A: Monitoring Results

Table A.1 – Details of Automatic Monitoring Sites

Site ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Monitoring Technique	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Inlet Height (m)
IPS3	Chevallier Street	Roadside	615261	245350	NO2	YES. AQMA 1	Chemiluminescent	2.5	2.5	1.5
IPS04	St Matthews Street	Roadside	615870	244858	NO2	NO	Chemiluminescent	12.8	2.9	1.38

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 – Details of Non-Automatic Monitoring Sites

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube Co-located with a Continuous Analyser?	Tube Height (m)
1	Civic Drive	Roadside	615992	244412	NO2	No	18.8	6.0	No	2.6
2	Chevallier Street	Roadside	615144	245245	NO2	Yes - AQMA 4	1.6	2.0	No	2.4
3	Coprolite Street / Duke Street	Kerbside	617070	244039	NO2	No	N/A	0.8	No	2.6
4	Norwich Road	Roadside	615620	245000	NO2	No	0.0	5.7	No	2.4
5	Fore Street	Roadside	616887	244128	NO2	Yes - AQMA 3	0.9	3.3	No	2.4
6	Kings Avenue	Background	617286	244420	NO2	No	N/A	3.8	No	2.5
7	Bramford Road	Roadside	615007	245239	NO2	No	0.0	5.6	No	2.3
8, 9, 10	Bramford Road	Roadside	615125	245209	NO2	No	4.3	2.2	No	2.5
13	Bramford Lane	Roadside	615117	245305	NO2	No	3.3	1.2	No	2.5
14	Chevallier Street	Roadside	615285	245393	NO2	Yes - AQMA 1	0.4	2.5	No	2.2
15	Tavern Street	Background	616282	244643	NO2	No	N/A	N/A	No	2.6
16	Valley Road / Westwood Court	Roadside	615362	245437	NO2	No	2.6	3.1	No	2.5

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube Co-located with a Continuous Analyser?	Tube Height (m)
17	Woodbridge Road	Roadside	616993	244659	NO2	No	2.1	1.8	No	2.5
18	Yarmouth Road	Roadside	615090	245178	NO2	No	0.0	3.2	No	2.2
11, 12, 19	St Margaret's Street / Piper's Court	Roadside	616593	244753	NO2	Yes - AQMA 2	0.0	2.5	No	2.3
20	Fonnereau Road	Roadside	616458	244829	NO2	No	1.8	2.2	No	2.6
21	St Margaret's Plain	Roadside	616494	244807	NO2	Yes - AQMA 2	N/A	2.0	No	2.4
22	St Margaret's Plain / Northgate Street	Roadside	616489	244785	NO2	Yes - AQMA 2	N/A	1.6	No	2.6
23	St Margaret's Green	Roadside	616645	244784	NO2	No	0.0	3.3	No	2.5
24	St Margaret's Street	Roadside	616663	244692	NO2	Yes - AQMA 2	N/A	3.3	No	2.4
25	St Helen's Street	Roadside	616753	244582	NO2	Yes - AQMA 2	1.1	3.0	No	2.5
26	St Helen's Street / Grimwade Street	Roadside	616971	244511	NO2	No	0.0	3.6	No	2.3
27	Argyle Street	Roadside	616965	244546	NO2	Yes - AQMA 2	0.3	1.2	No	2.3
28	Chevallier Street	Roadside	615194	245292	NO2	Yes - AQMA 4	2.6	1.9	No	2.5

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube Co-located with a Continuous Analyser?	Tube Height (m)
29	Fore Hamlet	Roadside	617118	244074	NO2	No	0.0	2.2	No	2.7
30	Fore Street	Roadside	616939	244114	NO2	No	1.4	2.7	No	2.5
31	Star Lane	Roadside	616332	244149	NO2	No	N/A	2.4	No	2.3
32	Spring Road	Roadside	617398	244573	NO2	No	2.9	2.0	No	2.5
33	Key Street	Roadside	616666	244114	NO2	Yes - AQMA 3	0.0	2.0	No	2.5
34	College Street	Roadside	616467	244072	NO2	Yes - AQMA 3	N/A	1.8	No	2.5
35	Cobden Place	Roadside	616746	244696	NO2	No	0.0	1.1	No	2.4
36	Valley Road	Roadside	616820	246158	NO2	No	15.0	2.2	No	2.5
37	Star Lane	Roadside	616845	244252	NO2	No	0.0	1.1	No	2.5
38	Civic Drive	Kerbside	615904	244805	NO2	No	6.3	0.9	No	2.5
39	Star Lane	Kerbside	616712	244228	NO2	Yes - AQMA 3	1.3	0.8	No	2.4
40	Norwich Road	Roadside	615460	245148	NO2	No	5.7	2.8	No	2.4
41	Bramford Road / Norwich Road	Roadside	615564	245010	NO2	No	0.5	1.3	No	2.5

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube Co-located with a Continuous Analyser?	Tube Height (m)
42	Norwich Road	Roadside	615744	244901	NO2	Yes - AQMA 5	0.0	2.3	No	2.5
43	Bramford Road / Yarmouth Road	Roadside	615109	245200	NO2	Yes - AQMA 4	0.6	3.6	No	2.4
44	Bramford Road	Roadside	615052	245237	NO2	No	4.8	1.6	No	2.4
45, 46, 47	Chevallier Street	Roadside	615261	245350	NO2	Yes - AQMA 1	2.5	4.2	Yes	1.2
48	Valley Road	Roadside	615425	245486	NO2	No	7.4	2.6	No	2.7
49	St Matthew's Street	Roadside	615792	244876	NO2	Yes - AQMA 5	0.0	1.9	No	2.6
50	Barrack Lane	Roadside	615773	244890	NO2	Yes - AQMA 5	1.5	1.4	No	2.4
51	St Matthew's Street	Kerbside	615769	244866	NO2	Yes - AQMA 5	4.5	0.9	No	2.6
52	St Matthew's Street	Roadside	615826	244871	NO2	Yes - AQMA 5	0.0	2.2	No	2.5
53	St Matthew's Street	Roadside	615820	244858	NO2	Yes - AQMA 5	0.0	2.2	No	2.3
54	St Matthew's Street Roundabout	Roadside	615893	244855	NO2	No	10.4	1.3	No	2.5
55	Berners Street	Roadside	615917	244898	NO2	No	0.0	2.3	No	2.5
56	Berners Street	Roadside	615931	244911	NO2	No	0.0	1.5	No	2.5

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube Co-located with a Continuous Analyser?	Tube Height (m)
57	Berners Street	Roadside	615941	244981	NO2	No	0.0	8.1	No	2.5
58	Berners Street	Kerbside	615978	245042	NO2	No	7.7	0.5	No	2.5
59	St Matthew's Street Roundabout	Roadside	615926	244837	NO2	No	N/A	2.9	No	2.5
60	Colchester Road	Roadside	617438	246168	NO2	No	14.5	3.1	No	2.4
61	Valley Road	Roadside	616099	246105	NO2	No	19.5	2.4	No	2.5
62	St Matthew's Street	Roadside	615935	244803	NO2	No	2.9	1.8	No	2.6
63	St Matthew's Street	Roadside	615950	244790	NO2	No	0.0	3.3	No	2.4
64, 65	Norwich Road	Roadside	615688	244939	NO2	Yes - AQMA 5	0.4	1.3	No	2.4
66	Woodbridge Road	Roadside	616807	244669	NO2	Yes - AQMA 2	0.0	3.4	No	2.4
67	Blanche Street	Roadside	616890	244676	NO2	No	6.3	1.4	No	2.6
68	Woodbridge Road	Roadside	616905	244657	NO2	Yes - AQMA 2	0.0	3.4	No	2.5
69	Argyle Street	Roadside	616978	244590	NO2	No	0.0	4.8	No	2.5
70	Argyle Street	Roadside	616965	244583	NO2	No	N/A	1.6	No	2.3

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube Co-located with a Continuous Analyser?	Tube Height (m)
71	St Helen's Street	Roadside	617032	244537	NO2	No	0.0	14.5	No	2.5
72	St Helen's Street	Roadside	617123	244535	NO2	Yes - AQMA 2	0.0	1.9	No	2.6
73	Regent Street	Kerbside	617124	244517	NO2	No	0.0	1.0	No	2.6
74	Grimwade Street	Roadside	616953	244443	NO2	No	N/A	2.1	No	2.5
75	Grimwade Street	Roadside	616926	244377	NO2	No	0.0	7.0	No	2.3
76	St Helen's Street	Roadside	616951	244521	NO2	Yes - AQMA 2	0.0	3.0	No	2.5
77	St Helen's Street	Roadside	616902	244542	NO2	No	0.0	4.7	No	2.5
78	Orchard Street	Roadside	616870	244586	NO2	No	1.5	1.4	No	2.6
79	Woodbridge Road	Kerbside	617052	244677	NO2	No	N/A	0.5	No	2.4
80, 81, 82	St Helen's Street	Kerbside	616821	244546	NO2	Yes - AQMA 2	N/A	1.0	No	2.4
83	Bond Street	Roadside	616792	244498	NO2	No	1.6	1.6	No	2.2
84	Carr Street / Major's Corner	Roadside	616702	244601	NO2	No	N/A	4.4	No	2.5
85	Old Foundry Road	Roadside	616681	244623	NO2	No	0.2	1.3	No	2.5

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube Co-located with a Continuous Analyser?	Tube Height (m)
86	Upper Orwell Street	Kerbside	616727	244566	NO2	No	0.0	0.9	No	2.2
87	Northgate Street	Roadside	616481	244725	NO2	No	0.0	1.8	No	2.3
88	Stoke Street	Roadside	616307	243875	NO2	No	0.0	1.8	No	2.5
89	Hadleigh Road	Roadside	614816	244585	NO2	No	4.2	2.8	No	2.5
90	Hadleigh Road	Roadside	614893	244558	NO2	No	0.0	12.1	No	2.4
91	London Road	Roadside	615195	244621	NO2	No	0.0	7.2	No	2.4
92	Ipswich Hospital	Other	619407	244712	NO2	No	0.0	3.3	No	2.4
B1	Crown Street	Kerbside	616279	244807	NO2	Yes - AQMA 2	2.2	0.9	No	2.4
B2	Grove Lane	Roadside	617360	244536	NO2	No	0.0	4.8	No	2.4
B3	Fore Hamlet	Roadside	617363	243887	NO2	No	0.0	7.5	No	2.7
B4	Vernon Street	Roadside	616415	243776	NO2	No	0.0	6.1	No	2.4
B5, B6, B7	St Matthew's Street	Roadside	615870	244858	NO2	No	11.9	4.2	Yes	1.4

Notes:

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

(2) N/A if not applicable.

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

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2020 (%) (2)	2016	2017	2018	2019	2020
IPS3	615261	245350	Roadside	92.0	92.0	**N/A**	29	28	26	20.7
IPS04	615870	244858	Roadside	99.6	99.6	**N/A**	**N/A**	**N/A**	37	26.3

☒ **Annualisation has been conducted where data capture is <75% and >25% in line with LAQM.TG16.**

☒ **Reported concentrations are those at the location of the monitoring site (annualised, as required), i.e. prior to any fall-off with distance correction.**

Notes:

The annual mean concentrations are presented as µg/m^3.

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

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

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

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

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

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

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) [1]	Valid Data Capture 2020 (%) [2]	2016	2017	2018	2019	2020
1	615992	244412	Roadside	100	100.0	24.0	27.0	26.0	24.0	18.5
2	615144	245245	Roadside	100	100.0	39.0	**40.0**	**42.0**	38.0	30.2
3	617070	244039	Kerbside	100	100.0	27.0	26.0	27.0	26.0	19.5
4	615620	245000	Roadside	100	100.0	**N/A**	**N/A**	**N/A**	31.0	24.6
5	616887	244128	Roadside	83.3	83.3	**41.0**	**44.0**	**42.0**	39.0	32.1
6	617286	244420	Background	66.7	66.7	17.0	18.0	17.0	16.0	14.1
7	615007	245239	Roadside	100	100.0	30.0	32.0	31.0	30.0	23.4
8, 9, 10	615125	245209	Roadside	100	100.0	35.0	35.0	34.0	32.0	25.4
13	615117	245305	Roadside	100	100.0	24.0	25.0	24.0	23.0	18.3
14	615285	245393	Roadside	100	100.0	**47.0**	**45.0**	**45.0**	**41.0**	32.1
15	616282	244643	Background	100	100.0	23.0	24.0	26.0	22.0	16.7
16	615362	245437	Roadside	100	100.0	35.0	37.0	35.0	33.0	25.7
17	616993	244659	Roadside	100	100.0	**42.0**	**46.0**	**46.0**	**42.0**	32.9

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) [1]	Valid Data Capture 2020 (%) [2]	2016	2017	2018	2019	2020
18	615090	245178	Roadside	100	100.0	**N/A**	**N/A**	**N/A**	**41.0**	33.5
11, 12, 19	616593	244753	Roadside	100	100.0	**45.0**	**50.0**	**48.0**	**47.0**	37.2
20	616458	244829	Roadside	100	100.0	29.0	34.0	33.0	29.0	21.9
21	616494	244807	Roadside	100	100.0	36.0	37.0	38.0	34.0	25.7
22	616489	244785	Roadside	100	100.0	36.0	36.0	39.0	34.0	23.7
23	616645	244784	Roadside	91.7	91.7	21.0	23.0	21.0	21.0	15.9
24	616663	244692	Roadside	100	100.0	38.0	37.0	**40.0**	38.0	30.4
25	616753	244582	Roadside	100	100.0	36.0	38.0	39.0	36.0	29.6
26	616971	244511	Roadside	100	100.0	30.0	32.0	36.0	34.0	25.4
27	616965	244546	Roadside	100	100.0	39.0	**42.0**	**43.0**	38.0	29.1
28	615194	245292	Roadside	100	100.0	36.0	36.0	38.0	35.0	26.5
29	617118	244074	Roadside	91.7	91.7	32.0	33.0	32.0	31.0	24.1
30	616939	244114	Roadside	100	100.0	**46.0**	**51.0**	**49.0**	**46.0**	34.7
31	616332	244149	Roadside	100	100.0	36.0	**43.0**	**45.0**	**44.0**	33.9

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2020 (%) (2)	2016	2017	2018	2019	2020
32	617398	244573	Roadside	100	100.0	30.0	34.0	31.0	30.0	23.3
33	616666	244114	Roadside	100	100.0	33.0	33.0	34.0	32.0	23.5
34	616467	244072	Roadside	100	100.0	37.0	**40.0**	39.0	33.0	25.0
35	616746	244696	Roadside	100	100.0	24.0	27.0	27.0	26.0	19.7
36	616820	246158	Roadside	100	100.0	30.0	33.0	31.0	31.0	22.9
37	616845	244252	Roadside	100	100.0	**N/A**	**N/A**	**N/A**	31.0	22.5
38	615904	244805	Kerbside	100	100.0	33.0	34.0	35.0	33.0	25.1
39	616712	244228	Kerbside	100	100.0	**N/A**	**N/A**	**N/A**	**41.0**	30.6
40	615460	245148	Roadside	100	100.0	27.0	31.0	30.0	27.0	20.2
41	615564	245010	Roadside	100	100.0	34.0	35.0	37.0	36.0	27.2
42	615744	244901	Roadside	100	100.0	**41.0**	33.0	38.0	37.0	29.1
43	615109	245200	Roadside	100	100.0	37.0	39.0	38.0	36.0	28.9
44	615052	245237	Roadside	100	100.0	37.0	38.0	38.0	34.0	26.2
45, 46, 47	615261	245350	Roadside	100	100.0	27.0	27.0	28.0	26.0	19.9

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) [1]	Valid Data Capture 2020 (%) [2]	2016	2017	2018	2019	2020
48	615425	245486	Roadside	100	100.0	27.0	29.0	27.0	25.0	19.1
49	615792	244876	Roadside	100	100.0	**41.0**	**41.0**	**46.0**	**42.0**	32.0
50	615773	244890	Roadside	91.7	91.7	26.0	28.0	27.0	24.0	19.2
51	615769	244866	Kerbside	91.7	91.7	38.0	37.0	**42.0**	37.0	26.5
52	615826	244871	Roadside	100	100.0	**47.0**	**47.0**	**46.0**	**45.0**	36.5
53	615820	244858	Roadside	100	100.0	**45.0**	**42.0**	**46.0**	**44.0**	33.8
54	615893	244855	Roadside	100	100.0	31.0	36.0	37.0	36.0	27.5
55	615917	244898	Roadside	100	100.0	29.0	28.0	29.0	27.0	20.2
56	615931	244911	Roadside	100	100.0	29.0	29.0	29.0	27.0	20.9
57	615941	244981	Roadside	100	100.0	25.0	27.0	25.0	24.0	17.4
58	615978	245042	Kerbside	91.7	91.7	23.0	25.0	25.0	24.0	17.4
59	615926	244837	Roadside	100	100.0	32.0	33.0	32.0	32.0	24.2
60	617438	246168	Roadside	100	100.0	36.0	31.0	29.0	28.0	20.6
61	616099	246105	Roadside	100	100.0	36.0	**42.0**	**40.0**	38.0	28.4

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2020 (%) (2)	2016	2017	2018	2019	2020
62	615935	244803	Roadside	100	100.0	33.0	37.0	36.0	34.0	26.6
63	615950	244790	Roadside	100	100.0	35.0	37.0	36.0	37.0	27.1
64, 65	615688	244939	Roadside	100	100.0	**50.0**	**56.0**	**55.0**	**51.0**	**40.4**
66	616807	244669	Roadside	100	100.0	35.0	**40.0**	**42.0**	39.0	31.1
67	616890	244676	Roadside	100	100.0	26.0	26.0	28.0	27.0	21.3
68	616905	244657	Roadside	100	100.0	**41.0**	**45.0**	**44.0**	**43.0**	33.2
69	616978	244590	Roadside	91.7	91.7	26.0	26.0	27.0	26.0	20.6
70	616965	244583	Roadside	100	100.0	33.0	36.0	38.0	36.0	25.9
71	617032	244537	Roadside	100	100.0	24.0	24.0	25.0	24.0	17.3
72	617123	244535	Roadside	100	100.0	36.0	38.0	38.0	35.0	26.0
73	617124	244517	Kerbside	100	100.0	23.0	23.0	23.0	22.0	16.1
74	616953	244443	Roadside	91.7	91.7	26.0	27.0	27.0	26.0	20.1
75	616926	244377	Roadside	100	100.0	**N/A**	**N/A**	**N/A**	22.0	16.1
76	616951	244521	Roadside	100	100.0	34.0	36.0	37.0	36.0	28.1

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) [1]	Valid Data Capture 2020 (%) [2]	2016	2017	2018	2019	2020
77	616902	244542	Roadside	100	100.0	28.0	28.0	29.0	26.0	20.3
78	616870	244586	Roadside	100	100.0	25.0	25.0	24.0	23.0	17.6
79	617052	244677	Kerbside	100	100.0	37.0	36.0	36.0	35.0	27.8
80, 81, 82	616821	244546	Kerbside	100	100.0	33.0	36.0	38.0	36.0	27.4
83	616792	244498	Roadside	100	100.0	27.0	29.0	31.0	29.0	21.8
84	616702	244601	Roadside	100	100.0	24.0	25.0	26.0	24.0	18.1
85	616681	244623	Roadside	91.7	91.7	29.0	31.0	32.0	30.0	24.0
86	616727	244566	Kerbside	100	100.0	N/A	N/A	N/A	N/A	20.0
87	616481	244725	Roadside	75.0	75.0	N/A	N/A	N/A	N/A	22.3
88	616307	243875	Roadside	100	100.0	N/A	N/A	N/A	N/A	28.4
89	614816	244585	Roadside	100	100.0	N/A	N/A	N/A	N/A	21.8
90	614893	244558	Roadside	100	100.0	N/A	N/A	N/A	N/A	20.1
91	615195	244621	Roadside	100	100.0	N/A	N/A	N/A	N/A	19.4
92	619407	244712	Other	100	100.0	N/A	N/A	N/A	N/A	12.5

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2020 (%) (2)	2016	2017	2018	2019	2020
B1	616279	244807	Kerbside	100	100.0	**N/A**	**N/A**	**N/A**	**42.0**	30.6
B2	617360	244536	Roadside	100	100.0	**N/A**	**N/A**	**N/A**	32.0	24.3
B3	617363	243887	Roadside	100	100.0	**N/A**	**N/A**	**N/A**	26.0	20.6
B4	616415	243776	Roadside	100	100.0	**N/A**	**N/A**	**N/A**	24.0	17.4
B5, B6, B7	615870	244858	Roadside	100	100.0	**N/A**	**N/A**	**N/A**	**41.0**	26.9

☒ **Annualisation has been conducted where data capture is <75% and >25% in line with LAQM.TG16.**

☒ **Diffusion tube data has been bias adjusted.**

☒ **Reported concentrations are those at the location of the monitoring site (bias adjusted and annualised, as required), i.e. prior to any fall-off with distance correction.**

Notes:

The annual mean concentrations are presented as µg/m^3.

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

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

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

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

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

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

Figure A.1 – Trends in Annual Mean NO_2 Concentrations in AQMA No.1

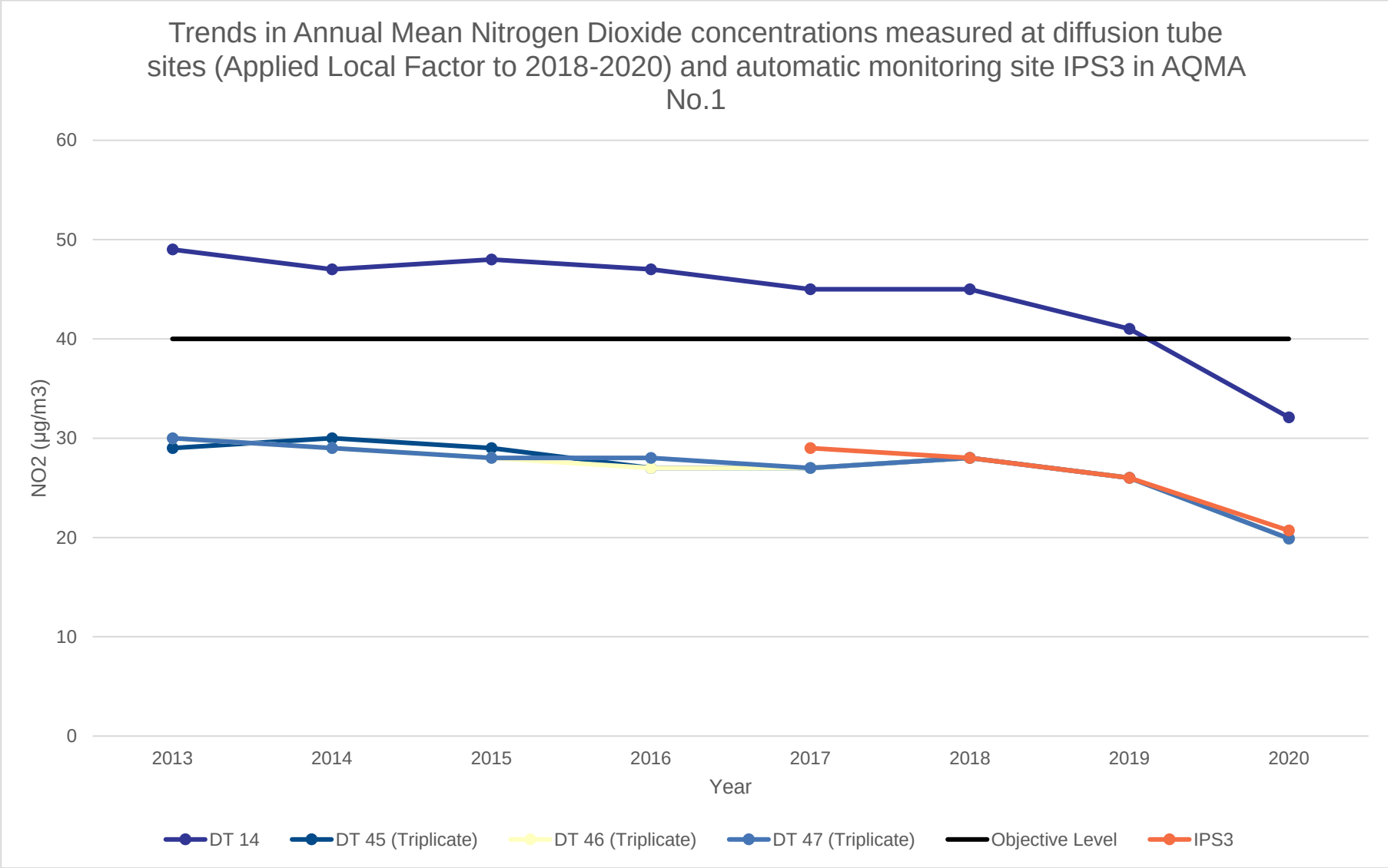


Figure A.2 – Trends in Annual Mean NO_2 Concentrations in AQMA No.2

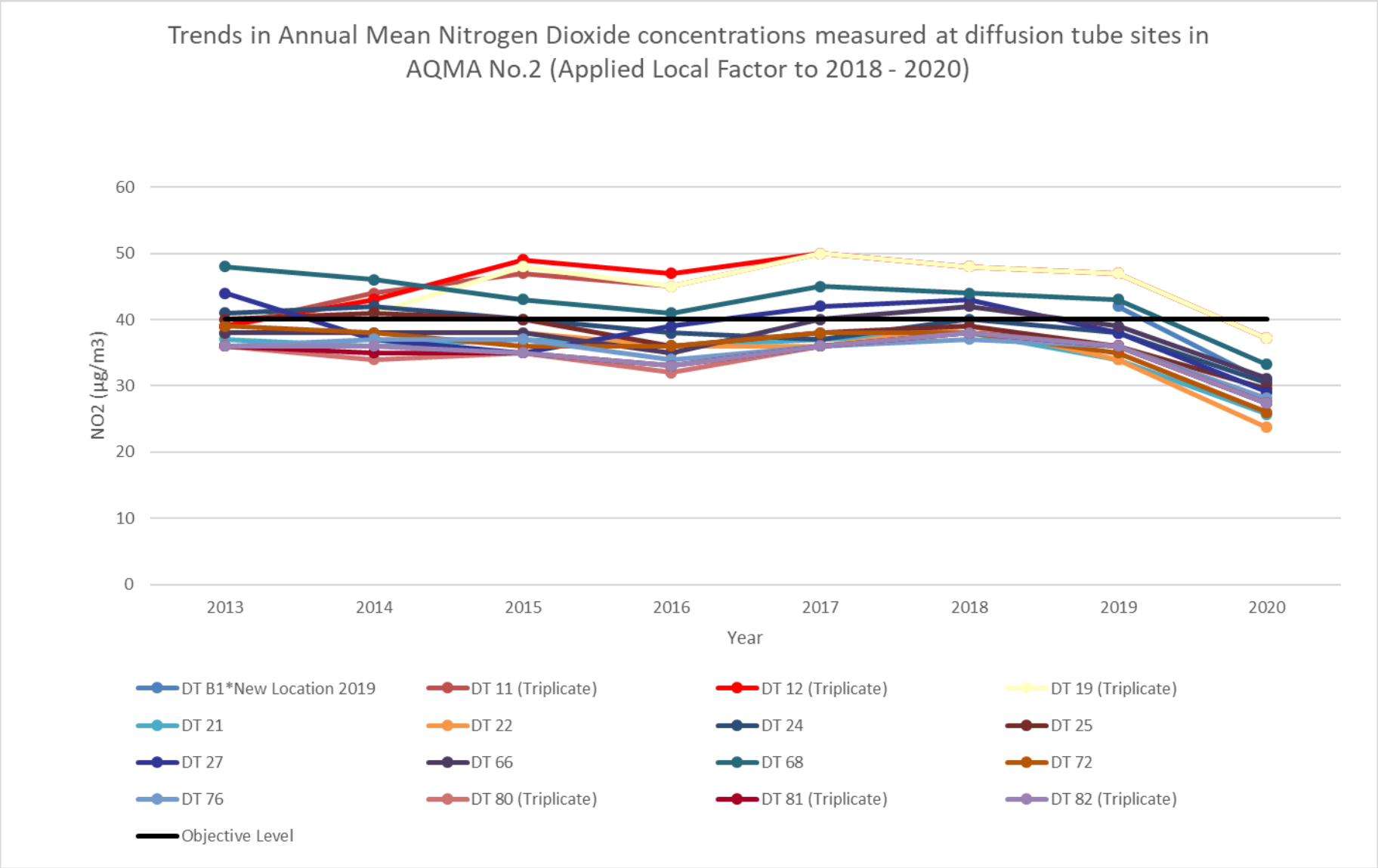


Figure A.3 – Trends in Annual Mean NO_2 Concentrations in AQMA No.3

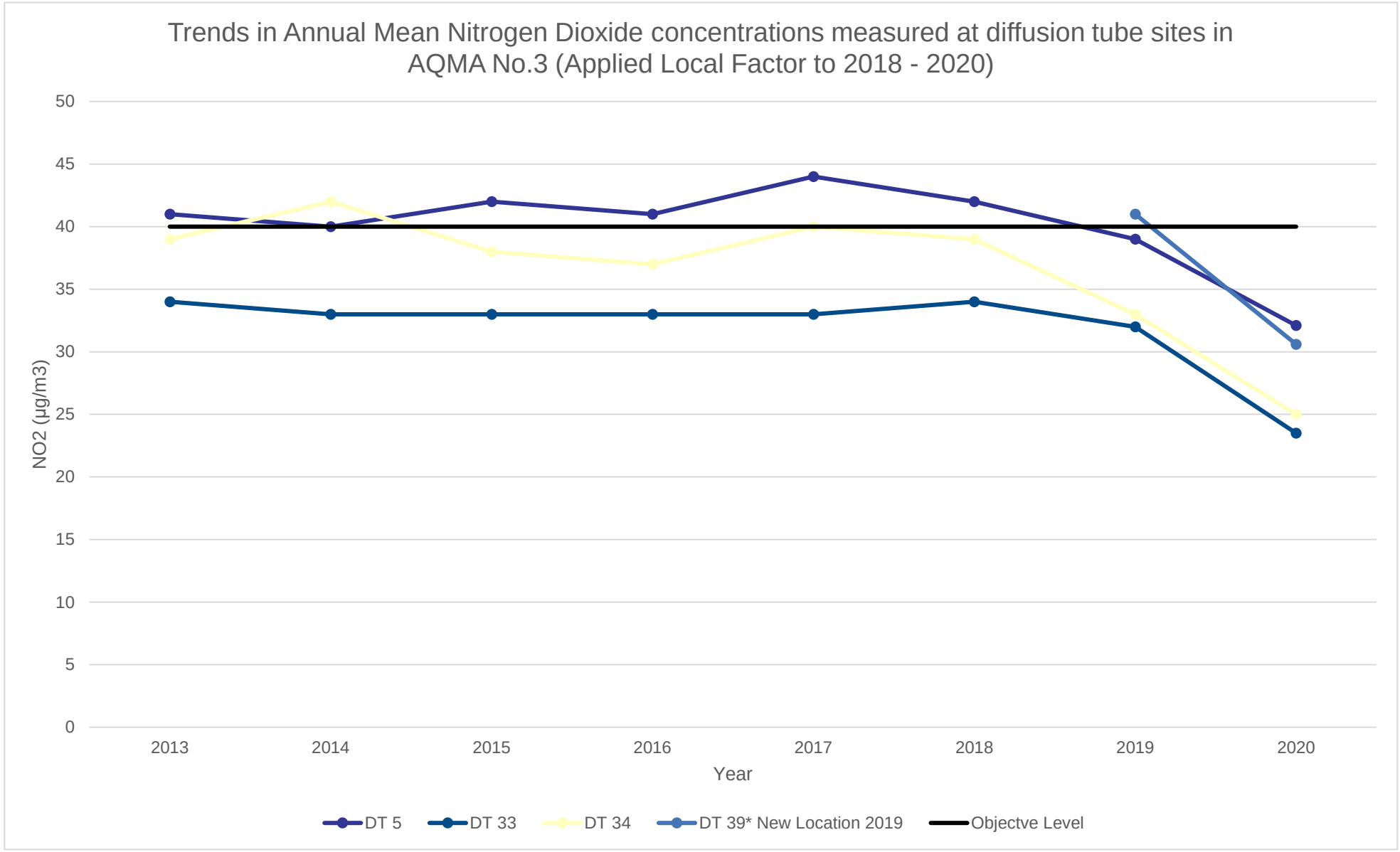


Figure A.4 - Trends in Annual Mean NO_2 Concentrations in AQMA No.4

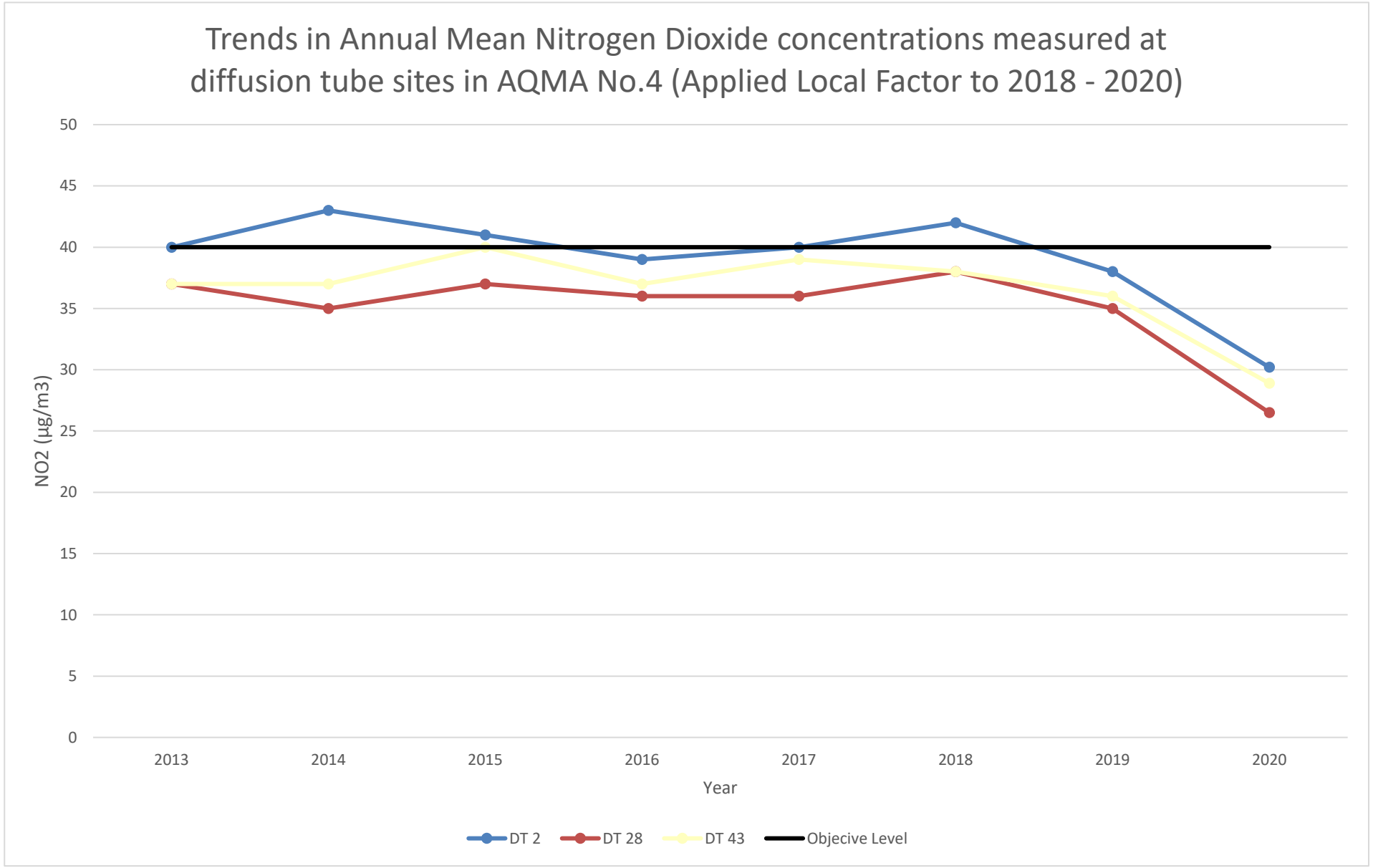


Figure A.5 - Trends in Annual Mean NO_2 Concentrations in AQMA No.5

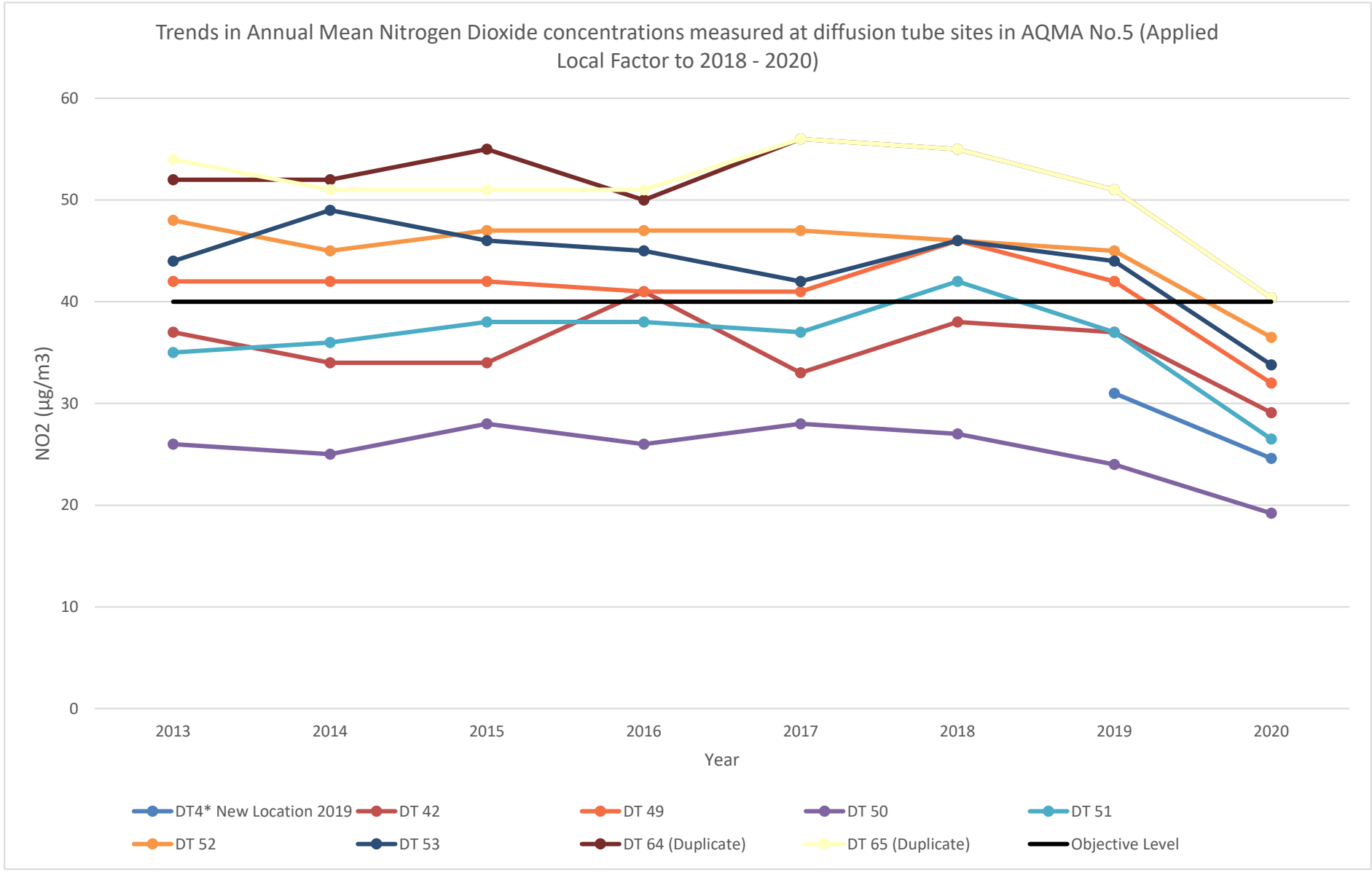


Figure A.6 – Trends in Annual Mean NO_2 Concentrations outside of AQMA sites

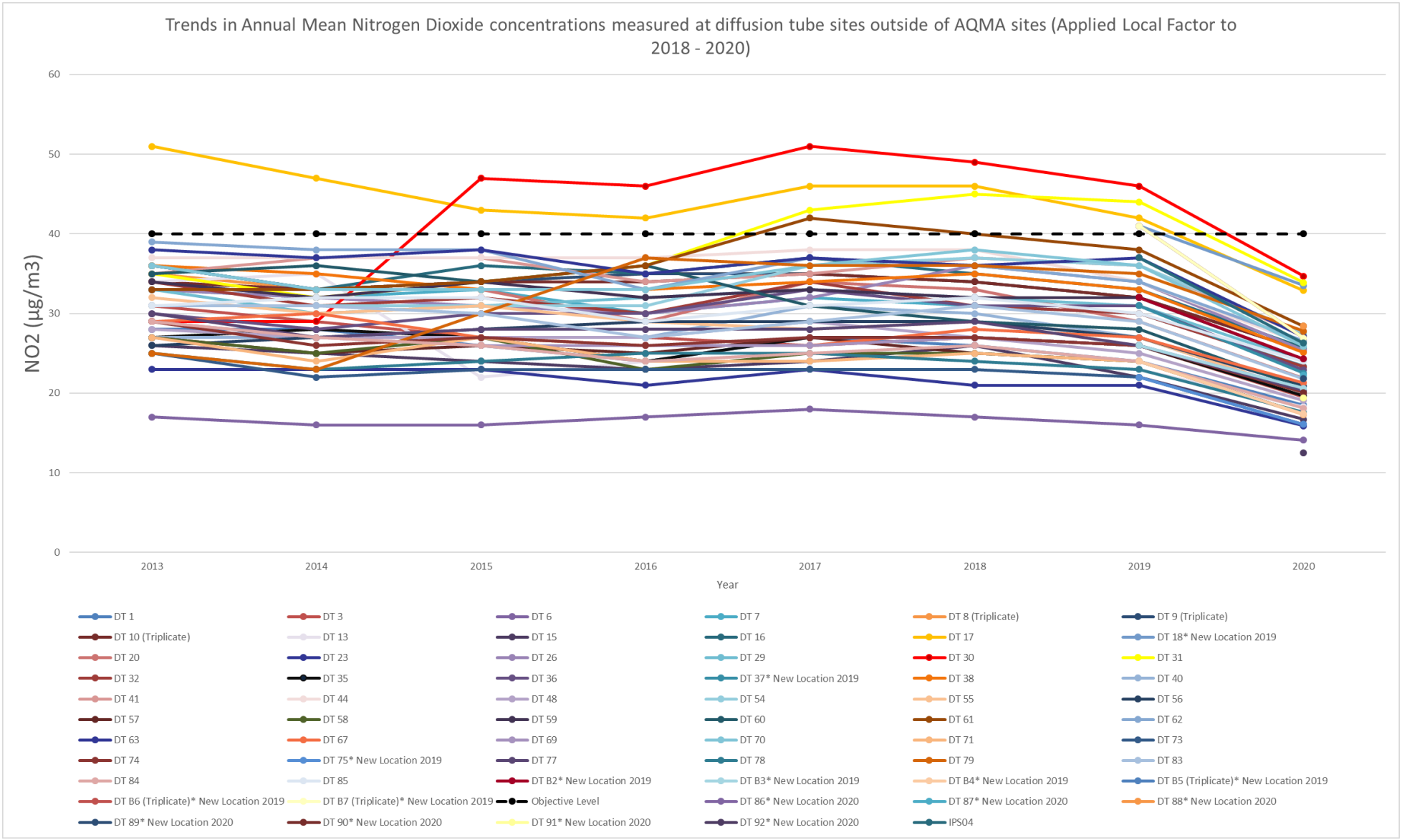


Table A.5 – 1-Hour Mean NO_2 Monitoring Results, Number of 1-Hour Means > 200µg/m^3

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2020 (%) (2)	2016	2017	2018	2019	2020
IPS3	615261	245350	Roadside	92.0	92.0	**N/A**	0	0	0	0
IPS04	615870	244858	Roadside	99.6	99.6	**N/A**	**N/A**	**N/A**	**0(117)**	0

Notes:

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

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

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

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

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

Appendix B: Full Monthly Diffusion Tube Results for 2020

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

DT ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Easting)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean: Raw Data	Annual Mean: Annualised and Bias Adjusted (0.75)	Annual Mean: Distance Corrected to Nearest Exposure	Comment
1	615992	244412	41.9	27.8	23.1	19.6	14.5	17.7	16.7	20.4	28.7	26.8	29.7	28.8	24.6	18.5	16.8	
2	615144	245245	56.0	44.3	37.8	32.5	24.9	42.5	28.5	40.1	41.2	41.6	50.4	42.7	40.2	30.2	28.0	
3	617070	244039	40.8	29.9	24.2	22.0	16.4	18.3	18.3	21.4	27.3	28.7	35.0	29.3	26.0	19.5		
4	615620	245000	37.4	32.4	32.2	32.7	27.0	28.4	23.9	34.9	35.2	33.2	39.2	36.5	32.8	24.6		
5	616887	244128	59.2	42.0			28.9	38.6	34.8	40.4	44.8	44.8	49.9	44.6	42.8	32.1	31.1	
6	617286	244420	23.3	16.0	14.7	16.9	9.5		9.6				51.8	20.7	20.3	14.1		
7	615007	245239	44.0	36.8	27.1	25.3	21.3	24.0	26.5	27.5	32.0	35.1	39.7	35.6	31.2	23.4		
8	615125	245209	40.5	35.1	31.6	32.3	28.9	31.0	27.4	33.3	41.5	32.4	39.0	36.0	-	-		Triplicate Site with 8, 9 and 10 - Annual data provided for 10 only
9	615125	245209	41.6	34.0	33.0	33.4	28.6	30.3	24.8	32.7	38.0	34.5	41.6	35.9	-	-		Triplicate Site with 8, 9 and 10 - Annual data provided for 10 only
10	615125	245209	39.6	31.9	28.7	32.4	31.5	29.4	26.1	33.4	38.1	30.6	41.8	39.7	33.9	25.4	22.4	Triplicate Site with 8, 9 and 10 - Annual data provided for 10 only
11	616593	244753	73.6	58.7	45.2	32.2		21.1	43.2	45.1	57.6	60.3	62.0	62.0	-	-		Triplicate Site with 11, 12 and 19 - Annual data provided for 19 only
12	616593	244753	72.5	54.5	35.7	33.1	29.2	41.6	41.9	51.7	53.3	52.6	65.1	57.7	-	-		Triplicate Site with 11, 12 and 19 - Annual data provided for 19 only
13	615117	245305	35.3	25.1	21.8	18.1	15.6	19.9	15.3	21.5	25.2	28.3	35.7	31.3	24.4	18.3	17.0	
14	615285	245393	61.6	45.3	41.1	29.3	29.7	37.1	37.2	42.1	51.0	45.5	52.7	41.3	42.8	32.1	31.5	
15	616282	244643	39.0	26.9	23.2	17.5	10.3	13.9	13.6	14.7	22.1	22.2	32.7	30.7	22.2	16.7		
16	615362	245437	49.8	41.8	33.1	21.4	18.1	31.7	29.3	35.2	36.6	38.8	38.8	35.2	34.2	25.7	23.8	
17	616993	244659	62.8	49.5	39.1	31.1	29.1	31.9	35.0	42.6	48.4	46.6	59.3	50.9	43.9	32.9	30.0	
18	615090	245178	54.1	40.8	43.3	39.8	36.2	49.0	31.6	51.6	46.6	45.2	50.4	46.8	44.6	33.5		

19	616593	244753	74.1	56.4	38.3	27.0	23.3	42.5	44.9	50.6	54.6		63.0	58.5	48.5	36.4	
20	616458	244829	47.9	37.9	26.1	19.9	10.3	23.0	23.5	26.3	32.2	34.1	35.6	34.1	29.2	21.9	21.2
21	616494	244807	47.9	39.6	30.7	25.3	20.1	29.0	26.8	30.3	39.7	37.8	42.8	41.4	34.3	25.7	
22	616489	244785	47.3	37.2	35.4	22.4	19.2	26.5	21.0	29.8	32.7	33.2	37.3	36.6	31.6	23.7	
23	616645	244784	32.1	20.7	18.3	15.6	10.8	15.9		17.9	21.5	23.1	29.5	28.2	21.2	15.9	
24	616663	244692	60.6	51.3	37.1	25.7	22.2	32.0	32.4	37.9	46.4	49.8	44.6	45.6	40.5	30.4	
25	616753	244582	50.0	44.0	33.7	23.2	24.3	34.5	34.0	39.6	47.6	47.4	48.7	47.3	39.5	29.6	28.6
26	616971	244511	46.6	32.7	30.3	19.3	27.0	30.0	27.5	35.6	41.0	36.4	43.2	37.3	33.9	25.4	
27	616965	244546	56.9	47.3	34.8	28.0	26.3	31.9	29.1	37.1	41.9	42.0	47.4	42.6	38.8	29.1	28.5
28	615194	245292	52.4	39.0	33.9	26.7	25.5	32.2	25.0	34.8	35.8	37.1	40.6	40.4	35.3	26.5	24.1
29	617118	244074	40.1	29.5	31.0	26.4	26.2	27.4	24.2	33.1	43.3	34.2		37.6	32.1	24.1	
30	616939	244114	71.9	58.7	39.7	22.7	24.1	42.0	35.2	46.8	52.0	52.4	58.0	52.4	46.3	34.7	32.8
31	616332	244149	70.1	52.6	39.8	30.3	28.0	35.2	35.4	40.9	51.9	49.5	59.2	49.2	45.2	33.9	
32	617398	244573	47.3	41.9	26.2	19.9	11.4	23.9	23.3	26.0	33.2	38.9	41.9	38.9	31.1	23.3	21.3
33	616666	244114	42.6	32.4	28.6	25.3	21.9	25.1	27.0	32.7	36.0	33.8	41.1	29.1	31.3	23.5	
34	616467	244072	44.1	36.6	31.0	19.4	25.6	27.7	26.8	30.2	37.2	37.8	43.5	40.2	33.3	25.0	
35	616746	244696	39.2	30.8	26.2	16.5	6.8	21.7	19.6	22.2	27.4	29.9	38.6	35.1	26.2	19.7	
36	616820	246158	49.8	31.0	26.8	20.2	17.2	24.6	23.7	26.1	33.3	33.9	41.7	37.6	30.5	22.9	17.3
37	616845	244252	43.8	29.7	28.8	22.6	20.7	23.7	21.7	29.3	34.1	27.7	40.9	36.6	30.0	22.5	
38	615904	244805	43.0	35.0	30.1	26.8	23.4	30.3	24.8	33.9	33.9	37.2	42.8	40.6	33.5	25.1	20.7
39	616712	244228	62.1	43.9	37.1	27.3	17.5	32.8	33.8	38.8	49.6	50.3	50.9	45.1	40.8	30.6	28.0
40	615460	245148	41.0	23.2	27.6	22.2	14.7	20.3	19.4	23.4	29.0	30.0	37.2	34.3	26.9	20.2	18.4
41	615564	245010	50.4	34.4	33.0	25.2	23.5	34.9	31.2	37.3	39.2	41.2	48.2	37.1	36.3	27.2	26.3

42	615744	244901	46.1	31.4	34.9	39.0	32.9	35.6	28.3	42.3	42.2	37.7	46.7	48.5	38.8	29.1	
43	615109	245200	49.7	41.0	33.5	31.0	31.3	34.2	31.0	36.9	41.7	40.6	47.9	42.7	38.5	28.9	28.3
44	615052	245237	46.2	37.3	30.4	24.8	24.3	30.3	28.0	34.4	39.2	35.1	45.2	43.4	34.9	26.2	22.4
45	615261	245350	36.9	25.5	24.5	21.8	19.9	23.6	19.5	25.3	30.7	28.4	36.8	31.8	-	-		Triplicate Site with 45, 46 and 47 - Annual data provided for 47 only
46	615261	245350	36.9	29.0	24.9	21.6	22.4	23.4	18.3	24.7	30.1	27.5	36.9	24.3	-	-		Triplicate Site with 45, 46 and 47 - Annual data provided for 47 only
47	615261	245350	37.3	26.8	23.2	18.6	20.7	24.7	17.9	24.3	29.0	24.1	33.3	31.1	25.9	19.4	19.2	Triplicate Site with 45, 46 and 47 - Annual data provided for 47 only
48	615425	245486	39.1	29.6	23.8	17.9	7.9	20.8	18.8	23.3	27.7	29.5	36.4	30.1	25.4	19.1	17.3	
49	615792	244876	51.3	37.1	36.9	44.1	35.4	43.4	30.3	47.3	48.2	45.2	48.9	44.6	42.7	32.0		
50	615773	244890	40.1	31.7		18.8	10.2	18.1	17.1	21.6	26.1	25.1	38.4	34.3	25.6	19.2	18.5	
51	615769	244866	43.4		32.2	30.8	25.1	30.1	22.5	36.5	40.4	37.2	47.2	43.1	35.3	26.5	22.2	
52	615826	244871	59.2	40.0	44.0	65.7	37.0	38.7	37.4	48.5	51.0	48.9	56.8	56.4	48.6	36.5		
53	615820	244858	68.1	54.4	39.1	29.2	29.6	40.0	39.3	43.5	45.2	47.7	56.5	48.6	45.1	33.8		
54	615893	244855	54.7	40.4	33.1	27.3	20.5	27.1	26.3	30.2	38.9	43.0	51.3	47.3	36.7	27.5	21.5	
55	615917	244898	42.3	32.0	25.7	19.2	16.8	19.7	15.3	22.5	31.4	31.6	37.5	28.5	26.9	20.2		
56	615931	244911	41.8	31.4	27.2	22.2	17.6	20.1	21.8	23.9	31.6	30.4	30.5	36.5	27.9	20.9		
57	615941	244981	37.7	29.0	19.9	14.3	10.8	16.4	15.2	18.6	25.6	26.2	35.9	29.2	23.2	17.4		
58	615978	245042	37.5	26.2	20.9	17.8	13.0	16.7	14.4	18.6	23.5		34.2	32.3	23.2	17.4	15.6	
59	615926	244837	48.5	39.1	29.3	27.1	14.5	24.7	23.9	30.1	35.0	36.8	43.8	34.2	32.3	24.2		
60	617438	246168	45.0	35.4	24.4	21.0	11.1	22.1	17.3	23.3	29.6	30.3	36.8	32.7	27.4	20.6	16.3	
61	616099	246105	56.6	44.4	32.2	28.0	21.8	34.2	30.3	35.5	42.0	39.4	47.3	42.3	37.8	28.4	19.3	
62	615935	244803	53.7	42.8	29.2	24.2	23.0	29.0	26.4	33.4	37.0	42.6	44.2	40.3	35.5	26.6	24.0	
63	615950	244790	53.4	32.1	32.9	26.7	23.8	31.1	29.7	33.3	39.9	38.8	48.0	43.3	36.1	27.1		
64	615688	244939	79.3	67.0	40.7	32.7	36.4	44.1	47.5	50.9	59.0	63.3	62.2	64.4	-	-		Duplicate Site with 64 and 65 - Annual data provided for 65 only

65	615688	244939	77.0	68.8	39.6	27.7	36.5	48.1	46.9	48.0	60.0	64.8	63.9	63.0	53.7	**40.3**	39.1	Duplicate Site with 64 and 65 - Annual data provided for 65 only
66	616807	244669	57.2	48.2	32.5	26.9	26.2	39.6	34.4	42.2	44.1	48.3	51.9	45.7	41.4	31.1		
67	616890	244676	44.0	35.5	17.9	22.9	18.3	26.7	18.6	24.2	29.0	30.8	39.4	33.6	28.4	21.3	19.6	
68	616905	244657	57.3	45.7	38.8	29.7	32.4	40.4	34.8	46.5	50.4	51.1	53.3	50.7	44.3	33.2		
69	616978	244590	38.8	29.2	25.0	24.7		9.0	18.7	24.5	29.6	29.6	36.5	35.5	27.4	20.6		
70	616965	244583	52.7	41.6	26.2	15.5	21.3	25.0	33.5	30.4	38.5	42.8	46.9	39.7	34.5	25.9		
71	617032	244537	34.9	27.7	20.1	11.7	17.2	17.9	16.8	20.3	28.6	25.7	32.4	24.4	23.1	17.3		
72	617123	244535	50.3	34.4	32.9	29.8	25.5	27.1	24.2	29.6	41.0	35.8	44.6	41.4	34.7	26.0		
73	617124	244517	32.8	23.6	20.9	18.2	14.5	15.6	12.5	15.6	23.2	20.5	31.1	28.6	21.4	16.1		
74	616953	244443	37.3	30.3		21.1	17.2	20.8	17.5	23.1	27.6	28.4	34.2	37.4	26.8	20.1		
75	616926	244377	35.3	26.0	21.0	16.1	12.1	14.9	13.1	14.4	23.9	23.4	29.5	26.7	21.4	16.1		
76	616951	244521	52.8	42.2	32.1	28.1	26.7	33.6	29.0	36.3	42.0	39.7	44.7	41.1	37.4	28.1		
77	616902	244542	34.4	25.9	25.0	25.0	19.9	21.7	18.5	25.7	30.8	30.6	36.0	30.9	27.0	20.3		
78	616870	244586	36.0	24.5	22.2	19.2	14.1	16.2	16.1	17.6	24.5	27.1	36.8	28.0	23.5	17.6	17.5	
79	617052	244677	55.2	41.5	26.4	26.4	24.1	30.3	28.8	37.7	41.8	38.3	50.2	44.5	37.1	27.8		
80	616821	244546	50.4	45.6	32.7	27.7	22.6	28.5	27.5	33.5	38.7	46.4	47.6	44.2	-	**-**		Triplicate Site with 80, 81 and 82 - Annual data provided for 82 only
81	616821	244546	52.1	46.2	32.0	24.5	22.5	30.0	28.0	32.4	40.0	43.2	46.5	43.3	-	**-**		Triplicate Site with 80, 81 and 82 - Annual data provided for 82 only
82	616821	244546	53.6	42.6	30.9	23.6	22.7	27.6	28.5	33.8	41.8	45.0	45.8	35.3	35.9	27.0		Triplicate Site with 80, 81 and 82 - Annual data provided for 82 only
83	616792	244498	40.2	29.0	25.6	20.3	17.7	22.6	17.7	30.6	34.8	34.2	42.2	34.3	29.1	21.8	21.0	
84	616702	244601	33.5	23.8	23.3	20.6	17.1	18.4	16.2	22.6	26.8	27.3	33.4	25.7	24.1	18.1		
85	616681	244623	47.0	37.7	29.5	23.5	18.9	25.4	24.3	29.2		37.3	41.4	37.5	32.0	24.0	23.8	
86	616727	244566	36.7	26.2	22.8	22.7	18.2	21.1	16.8	25.7	31.4	29.6	36.5	31.3	26.6	20.0		
87	616481	244725	43.6	31.9		27.2		21.2	16.8		26.7	29.6	37.4	33.2	29.7	22.3		

88	616307	243875	59.9	44.0	33.1	27.2	26.4	28.0	31.2	37.4	45.6	40.9	41.8	39.2	37.9	28.4	
89	614816	244585	44.2	26.3	24.5	22.9	21.3	28.0	17.7	30.0	28.3	31.1	40.9	34.4	29.1	21.8	19.7
90	614893	244558	40.6	27.5	23.4	19.8	18.6	22.6	18.0	23.9	27.1	30.6	38.2	31.4	26.8	20.1	
91	615195	244621	37.4	26.0	22.6	23.1	20.4	21.9	15.1	25.3	25.5	26.9	35.9	30.4	25.9	19.4	
92	619407	244712	26.2	17.3	11.9	13.3	10.6	12.0	9.8	13.7	19.3	17.6	26.3	21.4	16.6	12.5	
B1	616279	244807	57.5	47.4	43.0	27.5	25.2	27.4	30.1	38.2	47.1	49.4	50.6	46.0	40.8	30.6	27.2
B2	617360	244536	47.0	41.2	29.2	25.5	21.0	24.3	24.3	26.4	36.4	36.2	36.7	40.1	32.4	24.3	
B3	617363	243887	38.5	32.5	24.8	19.4	18.0	20.2	21.5	23.7	28.1	32.6	37.4	32.8	27.5	20.6	
B4	616415	243776	27.7	23.9	18.1	19.8	17.0	19.5	16.4	22.1	24.4	23.4	36.6	30.0	23.2	17.4	
B5	615870	244858	47.8	42.2	38.8	27.1	23.7	31.1	26.0	35.1	39.1	41.1	43.5	47.1	-	**-**	
B6	615870	244858	46.2	37.2	21.5	25.0	24.3	31.0	23.1	33.8	41.7	41.9	45.6	46.3	-	**-**	
B7	615870	244858	46.5	41.8	29.3	25.6	22.8	32.1	23.1	34.1	38.6	42.9	44.6	46.9	35.7	26.8	22.2

Triplicate Site with B5, B6 and B7 - Annual data provided for B7 only
Triplicate Site with B5, B6 and B7 - Annual data provided for B7 only

☒ **All erroneous data has been removed from the NO_2 diffusion tube dataset presented in Table B.1.**

☒ **Annualisation has been conducted where data capture is <75% and >25% in line with LAQM.TG16.**

☒ **Local bias adjustment factor used.**

☐ **National bias adjustment factor used.**

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

☒ Ipswich Borough Council **confirm that all 2020 diffusion tube data has been uploaded to the Diffusion Tube Data Entry System.**

Notes:

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

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

See Appendix C for details on bias adjustment and annualisation.

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

New or Changed Sources Identified Within Ipswich Borough During 2020

Ipswich Borough Council has not identified any new sources relating to air quality within the reporting year of 2020 that have not already been assessed and appraised (or are due to be appraised) by the Council as part of the planning application process.

Additional Air Quality Works Undertaken by Ipswich Borough Council During 2020

A detailed assessment was carried out in November 2020 and is attached in Appendix G.

In summary, monitoring data indicates that there is an area outside AQMA No.3 where the annual mean nitrogen dioxide (NO_2) objective level is being exceeded. In addition, there is an area within AQMA 1 that, for several years, has not exceeded the annual mean objective level. Furthermore, once bias and distance correction have been applied, there have been no measured exceedances of the air quality objective for NO_2 concentrations over the last six years (seven years if 2020 data is included) in AQMA 4.

In light of the above, the detailed assessment recommended the following:

- The boundary of AQMA No. 3 is amended (marginally increased).
- The boundary of AQMA No. 1 is amended (decreased).
- AQMA No. 4 is revoked.

It should be noted that as the detailed assessment was carried out during 2020, it is based on data obtained prior to the COVID-19 pandemic. As discussed in section 3 of the ASR above, no exceedances of the annual mean objective level for NO_2 were noted in 2020.

DEFRA were consulted on the proposals and gave their approval on the technical aspects of the assessment. Following appraisal by DEFRA, the Detailed Assessment was updated to reflect their comments prior to consultation.

A five-week consultation exercise was undertaken between February/March 2021. The updated Detailed Assessment was resent to DEFRA via the LAQM helpdesk as part of the consultation process. At the time of writing this year's ASR, an Executive report is being prepared for Council Executive which details the results of the consultation and proposed changes to the aforementioned AQMAs. It is anticipated that the report will be taken to Executive in Summer 2021, with the outcome being reported on in the 2022 ASR.

QA/QC of Diffusion Tube Monitoring

Nitrogen dioxide diffusion tubes are supplied by SOCOTEC, Didcot. The method of preparation is 50% TEA in acetone.

Monitoring has been completed in adherence with the 2020 Diffusion Tube Monitoring Calendar. The exposed tubes are analysed in accordance with SOCOTEC's standard operating procedure which complies with the guidelines set out in DEFRA's *'Diffusion Tubes for Ambient NO2 Monitoring: Practical Guidance'*. The analysis of diffusion tube samples to determine the amount of nitrogen dioxide present on the tubes is within the scope of their UKAS schedule. SOCOTEC participates in the AIR NO_2 PT scheme, the results of which indicate that during 2020 100% of QC samples reported were analysed satisfactorily (AIR PT rounds AR037 and AR039 were cancelled due to the COVID-19 pandemic).

Using the *AEA_DifTPAB_v04.xls* spreadsheet published on the DEFRA LAQM Support website to check the precision of collocated tubes, the results for all collocated monitoring sites within Ipswich were shown to demonstrate "*Good precision"* (see Figure C.1).

A control tube (travel blank) is sent with each month's tubes.

Figure C.1 – Precision and Accuracy of Collocated Diffusion Tubes

a) Bramford Road (Site ID: 8, 9 & 10)

Checking Precision and Accuracy of Triplicate Tubes

AEA Energy & Environment
From the AEA group

Diffusion Tubes Measurements

Period	Start Date dd/mm/yyyy	End Date dd/mm/yyyy	Tube 1 µgm^{-3}	Tube 2 µgm^{-3}	Tube 3 µgm^{-3}	Triplicate Mean	Standard Deviation	Coefficient of Variation (CV)	95% CI of mean
1	09/01/2020	05/02/2020	40.5	41.6	39.6	41	1.0	2	2.5
2	05/02/2020	04/03/2020	35.1	34.0	31.9	34	1.6	5	4.0
3	04/03/2020	31/03/2020	31.6	33.0	28.7	31	2.2	7	5.4
4	31/03/2020	29/04/2020	32.3	33.4	32.4	33	0.6	2	1.5
5	29/04/2020	02/06/2020	28.9	28.6	31.5	30	1.6	5	4.0
6	02/06/2020	30/06/2020	31.0	30.3	29.4	30	0.8	3	2.0
7	30/06/2020	30/07/2020	27.4	24.8	26.1	26	1.3	5	3.2
8	30/07/2020	01/09/2020	33.3	32.7	33.4	33	0.4	1	0.9
9	01/09/2020	29/09/2020	41.5	38.0	38.1	39	2.0	5	4.9
10	29/09/2020	02/11/2020	32.4	34.5	30.6	33	2.0	6	4.8
11	02/11/2020	02/12/2020	39.0	41.6	41.8	41	1.6	4	3.9
12	02/12/2020	06/01/2021	36.0	35.9	39.7	37	2.2	6	5.4
13									

Automatic Method		Data Quality Check	
Period Mean	Data Capture (% DC)	Tubes Precision Check	Automatic Monitor Data
		Good	
		Good	
		Good	
		Good	
		Good	
		Good	
		Good	
		Good	
		Good	
		Good	
		Good	
		Good	
	Overall survey -->	Good precision	

It is necessary to have results for at least two tubes in order to calculate the precision of the measurements

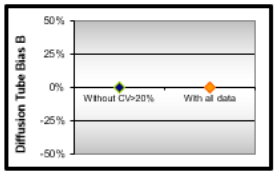
Site Name/ ID: Bramford Road O/S No.122

Precision: 12 out of 12 periods have a CV smaller than 20%

(Check average CV & DC from Accuracy calculations)

Accuracy (with 95% confidence interval) without periods with CV larger than 20%	
Bias calculated using 0 periods of data	
Bias factor A	
Bias B	
Diffusion Tubes Mean:	µgm^{-3}
Mean CV (Precision):	
Automatic Mean:	µgm^{-3}
Data Capture for periods used:	
Adjusted Tubes Mean:	µgm^{-3}

Accuracy (with 95% confidence interval) WITH ALL DATA	
Bias calculated using 0 periods of data	
Bias factor A	
Bias B	
Diffusion Tubes Mean:	µgm^{-3}
Mean CV (Precision):	
Automatic Mean:	µgm^{-3}
Data Capture for periods used:	
Adjusted Tubes Mean:	µgm^{-3}



Jaume Targa, for AEA
Version 04 - February 2011

b) Piper's Court (Site ID: 11, 12 & 19)

Checking Precision and Accuracy of Triplicate Tubes

AEA Energy & Environment
From the AEA group

Diffusion Tubes Measurements

Period	Start Date dd/mm/yyyy	End Date dd/mm/yyyy	Tube 1 µgm^{-3}	Tube 2 µgm^{-3}	Tube 3 µgm^{-3}	Triplicate Mean	Standard Deviation	Coefficient of Variation (CV)	95% CI of mean
1	08/01/2020	05/02/2020	73.6	72.5	74.1	73	0.8	1	2.0
2	05/02/2020	03/03/2020	58.7	54.5	56.4	57	2.1	4	5.2
3	03/03/2020	31/03/2020	45.2	35.7	38.3	40	4.9	12	12.2
4	31/03/2020	27/04/2020	32.2	33.1	27.0	31	3.3	11	8.2
5	27/04/2020	02/06/2020		29.2	23.3	26	4.2	16	37.5
6	02/06/2020	30/06/2020	21.1	41.6	42.5	35	12.1	35	30.1
7	30/06/2020	30/07/2020	43.2	41.9	44.9	43	1.5	3	3.7
8	30/07/2020	01/09/2020	45.1	51.7	50.6	49	3.5	7	8.8
9	01/09/2020	29/09/2020	57.6	53.3	54.6	55	2.2	4	5.5
10	29/09/2020	02/11/2020	60.3	52.6		56	5.4	10	48.9
11	02/11/2020	02/12/2020	62.0	65.1	63.0	63	1.6	2	3.9
12	02/12/2020	06/01/2021	62.0	57.7	58.5	59	2.3	4	5.7
13									

Automatic Method		Data Quality Check	
Period Mean	Data Capture (% DC)	Tubes Precision Check	Automatic Monitor Data
		Good	
		Good	
		Good	
		Good	
		Good	
		Poor Precision	
		Good	
		Good	
		Good	
		Good	
		Good	
		Good	
	Overall survey -->	Good precision	

It is necessary to have results for at least two tubes in order to calculate the precision of the measurements

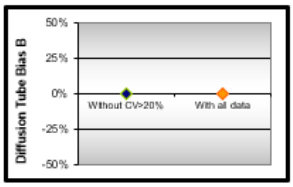
Site Name/ ID: Pipers Court

Precision: 11 out of 12 periods have a CV smaller than 20%

(Check average CV & DC from Accuracy calculations)

Accuracy (with 95% confidence interval) without periods with CV larger than 20%	
Bias calculated using 0 periods of data	
Bias factor A	
Bias B	
Diffusion Tubes Mean:	µgm^{-3}
Mean CV (Precision):	
Automatic Mean:	µgm^{-3}
Data Capture for periods used:	
Adjusted Tubes Mean:	µgm^{-3}

Accuracy (with 95% confidence interval) WITH ALL DATA	
Bias calculated using 0 periods of data	
Bias factor A	
Bias B	
Diffusion Tubes Mean:	µgm^{-3}
Mean CV (Precision):	
Automatic Mean:	µgm^{-3}
Data Capture for periods used:	
Adjusted Tubes Mean:	µgm^{-3}



Jaume Targa, for AEA
Version 04 - February 2011

c) Chevallier Street (Site ID: 45, 46 & 47 co-located with IPS3)

Checking Precision and Accuracy of Triplicate Tubes

AEA Energy & Environment
From the AEA group

Diffusion Tubes Measurements										Automatic Method		Data Quality Check	
Period	Start Date dd/mm/yyyy	End Date dd/mm/yyyy	Tube 1 µgm^{-3}	Tube 2 µgm^{-3}	Tube 3 µgm^{-3}	Triplicate Mean	Standard Deviation	Coefficient of Variation (CV)	95% CI of mean	Period Mean	Data Capture (% DC)	Tubes Precision Check	Automatic Monitor Data
1	09/01/2020	05/02/2020	36.9	36.9	37.3	37	0.2	1	0.6			Good	
2	05/02/2020	04/03/2020	25.5	29.0	26.8	27	1.8	7	4.4			Good	
3	04/03/2020	31/03/2020	24.5	24.9	23.2	24	0.9	4	2.2			Good	
4	31/03/2020	29/04/2020	21.8	21.6	18.6	21	1.8	9	4.5			Good	
5	29/04/2020	02/06/2020	19.9	22.4	20.7	21	1.3	6	3.2			Good	
6	02/06/2020	30/06/2020	23.6	23.4	24.7	24	0.7	3	1.7			Good	
7	30/06/2020	30/07/2020	19.5	18.3	17.9	19	0.8	4	2.1			Good	
8	30/07/2020	01/09/2020	25.3	24.7	24.3	25	0.5	2	1.3			Good	
9	01/09/2020	29/09/2020	30.7	30.1	29.0	30	0.9	3	2.1			Good	
10	29/09/2020	02/11/2020	28.4	27.5	24.1	27	2.3	9	5.6			Good	
11	02/11/2020	02/12/2020	36.8	36.9	33.3	36	2.1	6	5.1			Good	
12	02/12/2020	06/01/2021	31.8	24.3	31.1	29	4.1	14	10.3			Good	
13													
										Overall survey -->		Good	

It is necessary to have results for at least two tubes in order to calculate the precision of the measurements

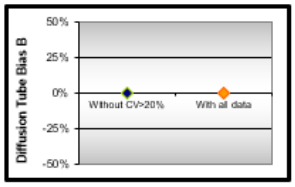
Site Name/ ID:	Chevallier Street

Precision 12 out of 12 periods have a CV smaller than 20%

(Check average CV & DC from Accuracy calculations)

Accuracy (with 95% confidence interval)
without periods with CV larger than 20%
Bias calculated using 0 periods of data
Bias factor A
Bias B
Diffusion Tubes Mean: µgm^{-3}
Mean CV (Precision):
Automatic Mean: µgm^{-3}
Data Capture for periods used:
Adjusted Tubes Mean: µgm^{-3}

Accuracy (with 95% confidence interval)
WITH ALL DATA
Bias calculated using 0 periods of data
Bias factor A
Bias B
Diffusion Tubes Mean: µgm^{-3}
Mean CV (Precision):
Automatic Mean: µgm^{-3}
Data Capture for periods used:
Adjusted Tubes Mean: µgm^{-3}



Jaume Targa, for AEA
Version 04 - February 2011

d) Norwich Road (Site ID: 64 & 65)

Checking Precision and Accuracy of Triplicate Tubes

AEA Energy & Environment
From the AEA group

Diffusion Tubes Measurements										Automatic Method		Data Quality Check	
Period	Start Date dd/mm/yyyy	End Date dd/mm/yyyy	Tube 1 µgm^{-3}	Tube 2 µgm^{-3}	Tube 3 µgm^{-3}	Triplicate Mean	Standard Deviation	Coefficient of Variation (CV)	95% CI of mean	Period Mean	Data Capture (% DC)	Tubes Precision Check	Automatic Monitor Data
1	09/01/2020	05/02/2020	79.3	77.0		78	1.6	2	14.6			Good	
2	05/02/2020	04/03/2020	67.0	68.8		68	1.3	2	11.4			Good	
3	04/03/2020	31/03/2020	40.7	39.6		40	0.8	2	7.0			Good	
4	31/03/2020	29/04/2020	32.7	27.7		30	3.5	12	31.8			Good	
5	29/04/2020	02/06/2020	36.4	36.5		36	0.1	0	0.6			Good	
6	02/06/2020	30/06/2020	44.1	48.1		46	2.8	6	25.4			Good	
7	30/06/2020	30/07/2020	47.5	46.9		47	0.4	1	3.8			Good	
8	30/07/2020	01/09/2020	50.9	48.0		49	2.1	4	18.4			Good	
9	01/09/2020	29/09/2020	59.0	60.0		60	0.7	1	6.4			Good	
10	29/09/2020	02/11/2020	63.3	64.8		64	1.1	2	9.5			Good	
11	02/11/2020	02/12/2020	62.2	63.9		63	1.2	2	10.8			Good	
12	02/12/2020	06/01/2021	64.4	63.0		64	1.0	2	8.9			Good	
13													
										Overall survey -->		Good	

It is necessary to have results for at least two tubes in order to calculate the precision of the measurements

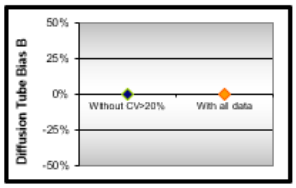
Site Name/ ID:	Norwich Road between Nos. 13&15

Precision 12 out of 12 periods have a CV smaller than 20%

(Check average CV & DC from Accuracy calculations)

Accuracy (with 95% confidence interval)
without periods with CV larger than 20%
Bias calculated using 0 periods of data
Bias factor A
Bias B
Diffusion Tubes Mean: µgm^{-3}
Mean CV (Precision):
Automatic Mean: µgm^{-3}
Data Capture for periods used:
Adjusted Tubes Mean: µgm^{-3}

Accuracy (with 95% confidence interval)
WITH ALL DATA
Bias calculated using 0 periods of data
Bias factor A
Bias B
Diffusion Tubes Mean: µgm^{-3}
Mean CV (Precision):
Automatic Mean: µgm^{-3}
Data Capture for periods used:
Adjusted Tubes Mean: µgm^{-3}



Jaume Targa, for AEA
Version 04 - February 2011

e) St. Helens Street (Site ID: 80, 81 & 82)

Checking Precision and Accuracy of Triplicate Tubes

AEA Energy & Environment
From the AEA group

Diffusion Tubes Measurements										Automatic Method		Data Quality Check	
Period	Start Date dd/mm/yyyy	End Date dd/mm/yyyy	Tube 1 µgm^{-3}	Tube 2 µgm^{-3}	Tube 3 µgm^{-3}	Triplicate Mean	Standard Deviation	Coefficient of Variation (CV)	95% CI of mean	Period Mean	Data Capture (% DC)	Tubes Precision Check	Automatic Monitor Data
1	08/01/2020	05/02/2020	50.4	52.1	53.6	52	1.6	3	4.0			Good	
2	05/02/2020	03/03/2020	45.6	46.2	42.6	45	1.9	4	4.8			Good	
3	03/03/2020	31/03/2020	32.7	32.0	30.9	32	0.9	3	2.3			Good	
4	31/03/2020	27/04/2020	27.7	24.5	23.6	25	2.2	9	5.4			Good	
5	27/04/2020	02/06/2020	22.6	22.5	22.7	23	0.1	0	0.2			Good	
6	02/06/2020	30/06/2020	28.5	30.0	27.6	29	1.2	4	3.0			Good	
7	30/06/2020	30/07/2020	27.5	28.0	28.5	28	0.5	2	1.2			Good	
8	30/07/2020	01/09/2020	33.5	32.4	33.8	33	0.7	2	1.8			Good	
9	01/09/2020	29/09/2020	38.7	40.0	41.8	40	1.6	4	3.9			Good	
10	29/09/2020	04/11/2020	46.4	43.2	45.0	45	1.6	4	4.0			Good	
11	04/11/2020	01/12/2020	47.6	46.5	45.8	47	0.9	2	2.3			Good	
12	01/12/2020	06/01/2021	44.2	43.3	35.3	41	4.9	12	12.2			Good	
13													
										Overall survey -->		Good	

It is necessary to have results for at least two tubes in order to calculate the precision of the measurements

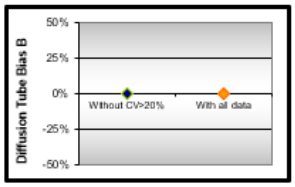
Site Name/ ID:	St Helens Street - County Hall

Precision	12 out of 12 periods have a CV smaller than 20%

(Check average CV & DC from Accuracy calculations)

Accuracy (with 95% confidence interval)
without periods with CV larger than 20%
Bias calculated using 0 periods of data
Bias factor A
Bias B
Diffusion Tubes Mean: µgm^{-3}
Mean CV (Precision):
Automatic Mean: µgm^{-3}
Data Capture for periods used:
Adjusted Tubes Mean: µgm^{-3}

Accuracy (with 95% confidence interval)
WITH ALL DATA
Bias calculated using 0 periods of data
Bias factor A
Bias B
Diffusion Tubes Mean: µgm^{-3}
Mean CV (Precision):
Automatic Mean: µgm^{-3}
Data Capture for periods used:
Adjusted Tubes Mean: µgm^{-3}



Jaume Targa, for AEA
Version 04 - February 2011

f) St. Matthews Street (Site ID: B5, B6 & B7 co-located with IPS04)

Checking Precision and Accuracy of Triplicate Tubes

AEA Energy & Environment
From the AEA group

Diffusion Tubes Measurements										Automatic Method		Data Quality Check	
Period	Start Date dd/mm/yyyy	End Date dd/mm/yyyy	Tube 1 µgm^{-3}	Tube 2 µgm^{-3}	Tube 3 µgm^{-3}	Triplicate Mean	Standard Deviation	Coefficient of Variation (CV)	95% CI of mean	Period Mean	Data Capture (% DC)	Tubes Precision Check	Automatic Monitor Data
1	09/01/2020	05/02/2020	47.8	46.2	46.5	47	0.9	2	2.1			Good	
2	05/02/2020	03/03/2020	42.2	37.2	41.8	40	2.8	7	6.9			Good	
3	03/03/2020	31/03/2020	38.8	21.5	29.3	30	8.7	29	21.5			Poor Precision	
4	31/03/2020	29/04/2020	27.1	25	25.6	26	1.1	4	2.7			Good	
5	29/04/2020	02/06/2020	23.7	24.3	22.8	24	0.8	3	1.9			Good	
6	02/06/2020	30/06/2020	31.1	31.0	32.1	31	0.6	2	1.5			Good	
7	30/06/2020	30/07/2020	26.0	23.1	23.1	24	1.7	7	4.2			Good	
8	30/07/2020	01/09/2020	35.1	33.8	34.1	34	0.7	2	1.7			Good	
9	01/09/2020	29/09/2020	39.1	41.7	38.6	40	1.7	4	4.1			Good	
10	29/09/2020	02/11/2020	41.1	41.9	42.9	42	0.9	2	2.2			Good	
11	02/11/2020	02/12/2020	43.5	45.6	44.6	45	1.1	2	2.6			Good	
12	02/12/2020	06/01/2021	47.1	46.3	46.9	47	0.4	1	1.0			Good	
13													
										Overall survey -->		Good	

It is necessary to have results for at least two tubes in order to calculate the precision of the measurements

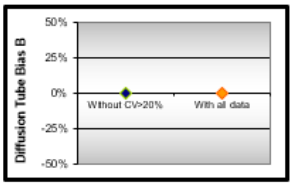
Site Name/ ID:	St Matthews Street

Precision	11 out of 12 periods have a CV smaller than 20%

(Check average CV & DC from Accuracy calculations)

Accuracy (with 95% confidence interval)
without periods with CV larger than 20%
Bias calculated using 0 periods of data
Bias factor A
Bias B
Diffusion Tubes Mean: µgm^{-3}
Mean CV (Precision):
Automatic Mean: µgm^{-3}
Data Capture for periods used:
Adjusted Tubes Mean: µgm^{-3}

Accuracy (with 95% confidence interval)
WITH ALL DATA
Bias calculated using 0 periods of data
Bias factor A
Bias B
Diffusion Tubes Mean: µgm^{-3}
Mean CV (Precision):
Automatic Mean: µgm^{-3}
Data Capture for periods used:
Adjusted Tubes Mean: µgm^{-3}



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Version 04 - February 2011

Diffusion Tube Annualisation

Unfortunately, the Council was only able to obtain 8 months' worth of data for diffusion tube 6 as tubes were found missing upon changeover. As Para 7.190 of LAQM.TG16

states that “for any monitoring sites with fewer than 9 months’ worth of data, it is necessary to perform annualisation”. The data from monitoring site 6 has been annualised in accordance with the procedure detailed in LAQM.TG16 Boxes 7.9 and 7.10.

This adjustment was undertaken using whole year datasets from the following AURN monitoring sites (all within a 50 mile radius of Ipswich and with data capture rates of in excess of 85%):

• Southend-on-Sea (UKA 00409) – Type: Urban Background;
• St Osyth (UKA 00445) – Type: Rural Background; and
• Norwich Lakenfields (UKA 00549) – Type: Urban Background.

The average ratio (Ra) of the annual mean to period mean ratios (R) for these sites was: 0.923265 and is therefore the annualisation factor. The measured period mean concentration (M) for diffusion tube 6 (DT 6) was 20.3µg/m3.

The estimate of the annualised average of DT 6 was therefore DT 6 = M x Ra = 20.3 x 0.923265 = 18.8 µg/m3. A summary of the annualisation is also provided in Table C.2.

Diffusion Tube Bias Adjustment Factors

The diffusion tube data presented within the 2021 ASR have been corrected for bias using an adjustment factor. Bias represents the overall tendency of the diffusion tubes to under or over-read relative to the reference chemiluminescence analyser. LAQM.TG16 provides guidance with regard to the application of a bias adjustment factor to correct diffusion tube monitoring. Triplicate co-location studies can be used to determine a local bias factor based on the comparison of diffusion tube results with data taken from NO_x/NO_2 continuous analysers. Alternatively, the national database of diffusion tube co-location surveys provides bias factors for the relevant laboratory and preparation method.

Following the resumption of automatic air quality monitoring at the Chevallier Street site (IPS3) in December 2016, for the fourth consecutive year it has been possible to compare mean collocated diffusion tube values with data captured by the cheminescence analyser using the AEA_DifPAB_v04.xls spreadsheet to obtain a local bias adjustment factor of 0.75. This is also the first year it has been possible to compare mean collocated diffusion tube values with data captured by the cheminescence analyser at the St Matthews Street site (IPS04). The analyser was commissioned in June 2019, just outside the boundary of AQMA 5. Both co-location sites were used to derive a local bias adjustment factor of 0.75%. Table C.3 below details how the local bias adjustment factor was calculated.

Consulting the *National Diffusion Tube Bias Adjustment Factor Spreadsheet Version 03/21* published on the DEFRA LAQM Support website, for the SOCOTEC, Didcot laboratory; preparation method 50% TEA in acetone; for the year 2020, a bias adjustment figure of 0.77 was obtained based on 22 studies.

Ipswich Borough Council have applied a local bias adjustment factor of 0.75 to the 2020 monitoring data. A summary of bias adjustment factors used by Ipswich Borough Council over the past five years is presented in Table C.1.

The decision to apply the local bias adjustment factor gave consideration to the guidance in Box 7.11 of LAQM.TG16. The reason for the decision was due to:

- This is the fourth year running where the Council has been able to obtain a high data capture rate (92%) of continuous analyser data to benchmark this year's data against.
- The co-located sites have good precision for the diffusion tubes and high quality chemiluminescence results.

To assist with providing transparency to the reader, an example of the bias correction factor being applied to a diffusion tube is shown below.

<u>Example of applying the bias correction to diffusion tube data:</u>

Diffusion tube 38 (Civic Drive) – annual mean 33.5µg/m^3 (average from 12 months of monthly diffusion tube readings).
33.5µg/m^3 x 0.75 = 25.1µg/m^3

Table C.1 – Bias Adjustment Factor

Year	Local or National	If National, Version of National Spreadsheet	Adjustment Factor
2020	Local	-	0.75
2019	Local	-	0.75
2018	Local	-	0.83
2017	National	03/18	0.77
2016	National	03/17	0.77

NO_2 Fall-off with Distance from the Road

Wherever possible, local authorities should ensure that monitoring locations are representative of exposure. However, where this is not possible, the NO_2 concentration at the nearest location relevant for exposure should be estimated using the Diffusion Tube Data Processing Tool/NO_2 fall-off with distance calculator available on the LAQM Support website. Where appropriate, non-automatic annual mean NO_2 concentrations corrected for distance are presented in Table B.1.

Distance correction should be considered at any monitoring site where the annual mean concentration is greater than 36µg/m^3 and the monitoring site is not located at a point of relevant exposure. Once corrected for bias, the only monitoring sites that required distance correction due to being greater than 36µg/m^3 and not located at a point of relevant exposure were sites 64&65 (duplicate). This correction has been undertaken using the *NO_2 Fall-Off with Distance Calculator Version 4.2* available on the Defra LAQM Support website. The outputs are presented in Table C.4.

For thoroughness, distance correction was also applied to all non-automatic monitoring sites not located at a point of relevant exposure.

QA/QC of Automatic Monitoring

The automatic monitors located on Chevallier Street (IPS3) and St Matthews Street (IPS04) are usually subject to fortnightly routine calibration by an Ipswich Borough Council Environmental Health Officer or Technical Officer. However, it should be noted that due to the COVID-19 pandemic in 2020, the automatic analysers were calibrated monthly between March and October 2020, not fortnightly.

The analysers are also serviced and the monitoring site audited biannually by Matts Monitors and Ricardo Energy & Environment respectively. Copies of the Certificate of Calibration issued following the most recent site audits (December 2020) are displayed below (Figures C.2 and C.3).

All automatic monitoring data collected at the Chevallier Street and St Matthews Street sites are managed by Ricardo Energy & Environment using the same quality control procedures utilised by Defra's national air quality network stations. These procedures represent best practice and fully meet the requirements set out in LAQM.TG(16). Ricardo Energy & Environment currently provide UKAS accredited quality control audits and data management services to all Defra national network (AURN) air quality monitoring stations.

All collected data is screened and scaled (based on site calibrations) and the final data sets presented within this report (Figures C.4 and C.5) have benefitted from a full process of data ratification, including thorough additional data quality checks that include site audits and a ratification process that corrects data for instrument sensitivity drift between routine calibrations.

Live and historic monitoring data can be found on the Air Quality England Website.

Figure C.2 – Certificate of Calibration for IPS3

0401

CERTIFICATE OF CALIBRATION

Ricardo Energy and Environment, Gemini Building, Fermi Avenue Harwell, Didcot,

Page 1 of 3

Approved Signatories:

- ☐ S. Eaton
- ☐ D Hector
- ☐ N Rand
- ☐ B Davies
- ☐ B Stacey
- ☐ S Stratton
- ☐ S Telfer
- ☐ S Gray
- ☑ D Lane

Signed:

Date of issue: 18 Dec 20

Certificate Number: 05227

Customer Name and Address:

Ipswich Borough Council
Grafton House
15-17 Russell Road
Ipswich
IP1 2DE

Description: Calibration factors for the air monitoring station at Ipswich Chevallier Street

Ricardo Energy & Environment ID: ED79001143/December 2020

The reported expanded uncertainties are based on a standard uncertainty multiplied by a coverage factor k=2 providing a level of confidence of approximately 95% The uncertainty evaluation has been carried out in accordance with UKAS requirements.

This certificate is issued in accordance with the laboratory accreditation requirements of the United Kingdom Accreditation Service. It provides traceability of measurement to the SI system of units and/or to units of measurement realised at the National Physical Laboratory or other recognised national metrology institutes. This certificate may not be reproduced other than in full, except with the prior written approval of the issuing laboratory

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GB 212 8365 24

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Ipswich Chevallier Street_Cert 05227_Dec 2020 1 of 3

0401

CERTIFICATE OF CALIBRATION

Date of issue: 18 Dec 20

Certificate Number: 05227

Ricardo Energy & Environment ID: ED79001143/December 2020

Ipswich Chevallier Street
Date of audit: 16 Dec 2020

Species	Analyser Serial no	Zero Response[1]	Zero uncertainty ppb	Calibration Factor[2]	Factor uncertainty %	Converter eff. (%)[3]
NOx	CM08050004	-5.3	2.5	0.9727	3.5941	100.0
NO	CM08050004	-5.6	2.5	0.9720	3.5	n/a

0401

CERTIFICATE OF CALIBRATION

Date of issue: 18 Dec 20

Certificate Number: 05227

Ricardo Energy & Environment ID: ED79001143/December 2020

The gaseous ambient analysers listed above have been tested for zero response, calibration factor, linearity and converter efficiency (NOx analysers) by documented methods. The factors have been calculated using certified gas standards. Note that the test results are valid on the day of test only, as analyser drift over time cannot be quantified. All results for gaseous species are given in ppb (parts per billion) mole fractions or ppm (parts per million) mole fractions.

[1] The zero response is the zero reading on the data logging system of the analyser when audit zero gas was introduced to the analysers under test.

[2] The calibration factor is the multiplying factor required to scale the reading on the data logging system of the analyser into reported concentration units (ppb for NO, NOx, SO_2, O_3 and ppm for CO. Where 1ppm = 1000ppb). It should be used in conjunction with the zero response. A corrected concentration is calculated using the following equation:

Concentration = F(Output - Zero Response)
Where F = Calibration Factor provided on this certificate
Output = Reading on the data logging system of the analyser
Zero Response = Zero Response provided on this certificate

[3] Converter eff. is the measured efficiency of the NO_2 to NO converter within the oxides of nitrogen analyser under test.

The calibration results shaded are those that fall within our scope of accreditation, all other results on this certificate are not UKAS accredited, but have been included for completeness.

Figure C.3 – Certificate of Calibration for IPS04

0401

CERTIFICATE OF CALIBRATION

Ricardo Energy and Environment, Gemini Building, Fermi Avenue Harwell, Didcot,

Page 1 of 3

Approved Signatories:

- ☐ S. Eaton
- ☐ D Hector
- ☐ N Rand
- ☐ B Davies
- ☐ B Stacey
- ☐ S Stratton
- ☐ S Telfer
- ☐ S Gray
- ☑ D Lane

Signed:

Date of issue: 18 Dec 20

Certificate Number: 05228

Customer Name and Address:

Ipswich Borough Council
Grafton House
15-17 Russell Road
Ipswich
IP1 2DE

Description: Calibration factors for the air monitoring station at Ipswich St Matthew's Street

Ricardo Energy & Environment ID: ED79001143/December 2020

The reported expanded uncertainties are based on a standard uncertainty multiplied by a coverage factor k=2 providing a level of confidence of approximately 95% The uncertainty evaluation has been carried out in accordance with UKAS requirements.

This certificate is issued in accordance with the laboratory accreditation requirements of the United Kingdom Accreditation Service. It provides traceability of measurement to the SI system of units and/or to units of measurement realised at the National Physical Laboratory or other recognised national metrology institutes. This certificate may not be reproduced other than in full, except with the prior written approval of the issuing laboratory

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Ipswich St Matthews Street_Cert 05228_Dec 2020 1 of 3

0401

CERTIFICATE OF CALIBRATION

Date of issue: 18 Dec 20

Certificate Number: 05228

Ricardo Energy & Environment ID: ED79001143/December 2020

Ipswich St Matthew's Street
Date of audit: 16 Dec 2020

Species	Analyser Serial no	Zero Response[1]	Zero uncertainty ppb	Calibration Factor[2]	Factor uncertainty %	Converter eff. (%)[3]
NOx	2696	2.1	2.5	1.0160	3.5158	99.7
NO	2696	0.2	2.5	1.0122	3.5	n/a

0401

CERTIFICATE OF CALIBRATION

Date of issue: 18 Dec 20

Certificate Number: 05228

Ricardo Energy & Environment ID: ED79001143/December 2020

The gaseous ambient analysers listed above have been tested for zero response, calibration factor, linearity and converter efficiency (NOx analysers) by documented methods. The factors have been calculated using certified gas standards. Note that the test results are valid on the day of test only, as analyser drift over time cannot be quantified. All results for gaseous species are given in ppb (parts per billion) mole fractions or ppm (parts per million) mole fractions.

[1] The zero response is the zero reading on the data logging system of the analyser when audit zero gas was introduced to the analysers under test.

[2] The calibration factor is the multiplying factor required to scale the reading on the data logging system of the analyser into reported concentration units (ppb for NO, NOx, SO_2, O_3 and ppm for CO. Where 1ppm = 1000ppb). It should be used in conjunction with the zero response. A corrected concentration is calculated using the following equation:

Concentration = F(Output - Zero Response)
Where F = Calibration Factor provided on this certificate
Output = Reading on the data logging system of the analyser
Zero Response = Zero Response provided on this certificate

[3] Converter eff. is the measured efficiency of the NO_2 to NO converter within the oxides of nitrogen analyser under test.

The calibration results shaded are those that fall within our scope of accreditation, all other results on this certificate are not UKAS accredited, but have been included for completeness.

Figure C.4 – 2020 Air Pollution Report – Ipswich Chevallier Street (Site ID: IPS3)

Air Pollution Report

1st January to 31st December 2020

Air Quality England

Ipswich Chevallier Street (Site ID: IPS3)

These data have been fully ratified
Only relevant statistics for LAQM are presented in the table. Cells with - indicate no data available or calculated.

Pollutant	NO µg/m³	NO_2 µg/m³	NO_x as NO_2 µg/m³
Number Days Low	-	358	-
Number Days Moderate	-	0	-
Number Days High	-	0	-
Number Days Very High	-	0	-
Max Daily Mean	176	66	335
Annual Max	427	117	751
Annual Mean	15	21	44
99.8th Percentile of hourly mean	-	89	-
98th Percentile of hourly mean	103	59	207
95th Percentile of hourly mean	50	49	124
50th Percentile of hourly mean	8	17	30
% Annual data capture	**91.95**	**91.95**	**91.95**

All gaseous pollutant mass units are at 20°C and 1013mb. Particulate matter concentrations are reported at ambient temperature and pressure. NO_X mass units are NO_X as NO_2 µg m-3

Pollutant	Air Quality Standards regulations 2010	Exceedances	Days
Nitrogen dioxide	Hourly Mean > 200 micrograms per metre cubed	0	0
Nitrogen dioxide	**Annual Mean > 40 micrograms per metre cubed**	**0**	**-**

Annual Graph

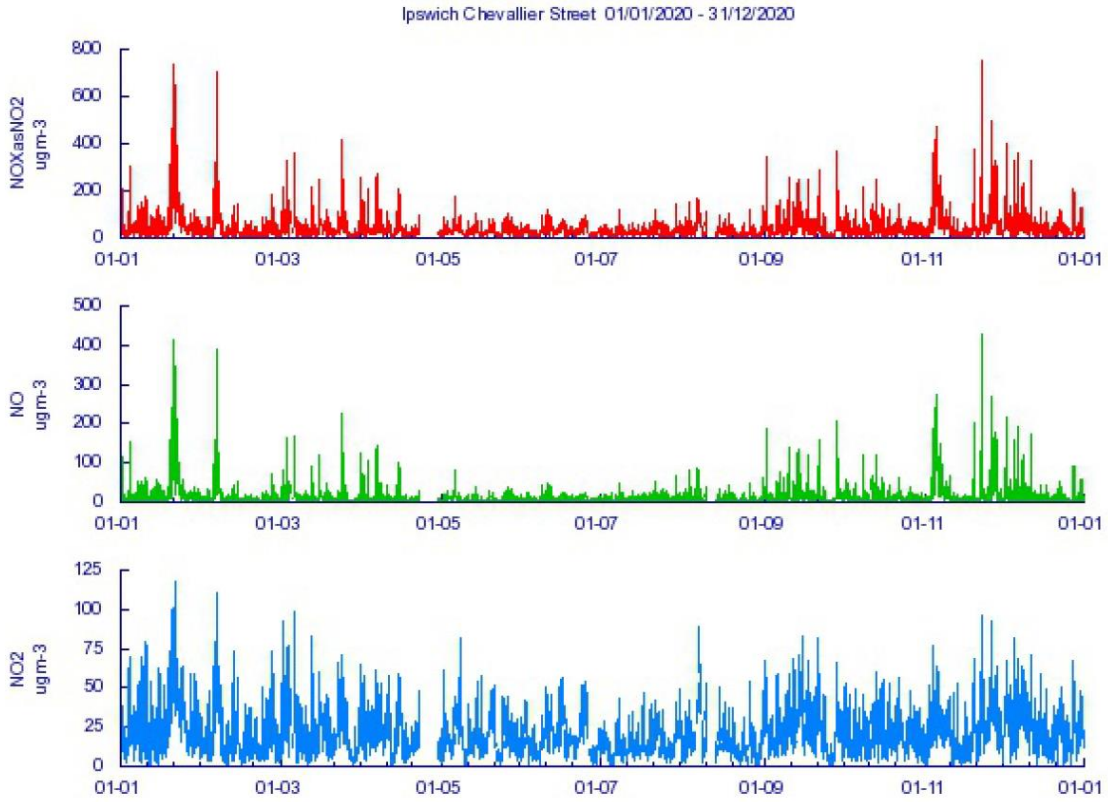


Figure C.5 – 2020 Air Pollution Report – Ipswich St Matthews Street (Site ID: IPS04)

Air Pollution Report

1st January to 31st December 2020

Air Quality England

Ipswich St Matthews Street (Site ID: IPS04)

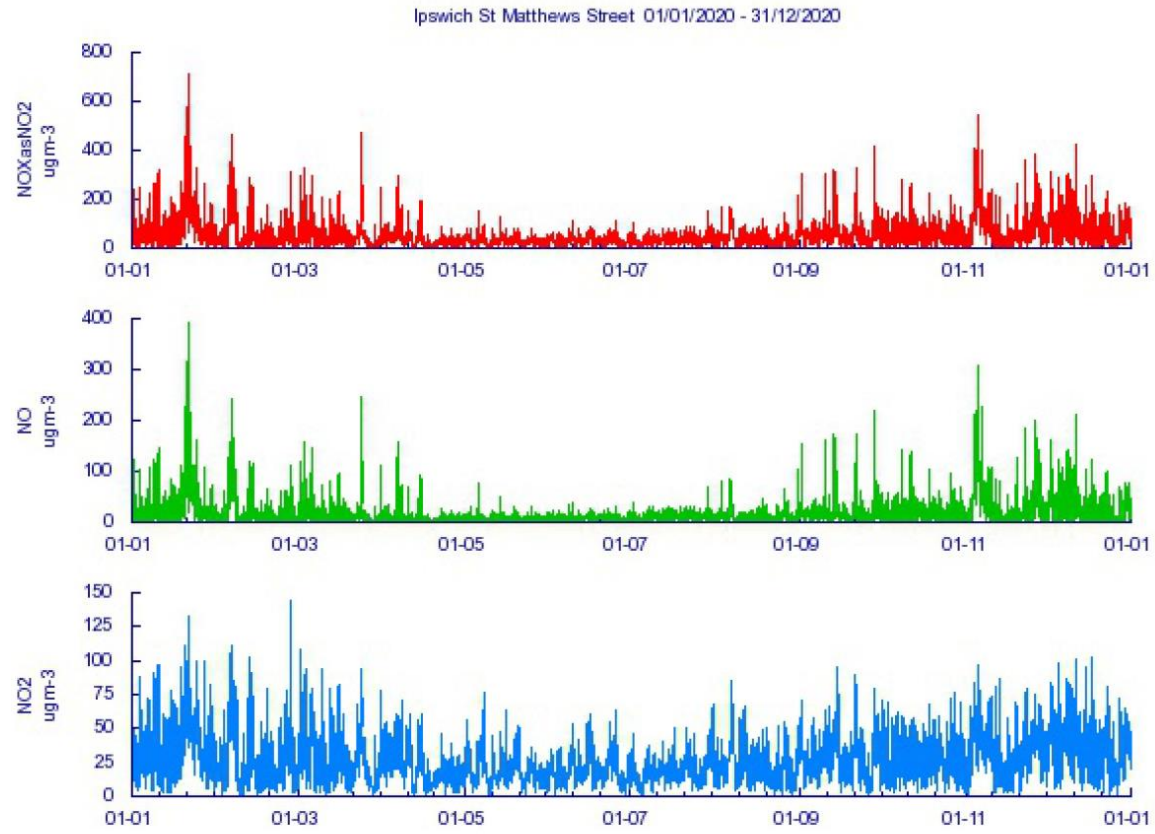
These data have been fully ratified
Only relevant statistics for LAQM are presented in the table. Cells with - indicate no data available or calculated.

Pollutant	NO µg/m³	NO_2 µg/m³	NO_x as NO_2 µg/m³
Number Days Low	-	366	-
Number Days Moderate	-	0	-
Number Days High	-	0	-
Number Days Very High	-	0	-
Max Daily Mean	172	75	336
Annual Max	391	145	711
Annual Mean	20	26	57
99.8th Percentile of hourly mean	-	98	-
98th Percentile of hourly mean	104	72	231
95th Percentile of hourly mean	67	60	160
50th Percentile of hourly mean	12	23	41
% Annual data capture	**99.62**	**99.62**	**99.62**

All gaseous pollutant mass units are at 20°C and 1013mb. Particulate matter concentrations are reported at ambient temperature and pressure. NO_X mass units are NO_X as NO_2 µgm-3

Pollutant	Air Quality Standards regulations 2010	Exceedances	Days
Nitrogen dioxide	Hourly Mean > 200 micrograms per metre cubed	0	0
Nitrogen dioxide	**Annual Mean > 40 micrograms per metre cubed**	**0**	**-**

Annual Graph



Automatic Monitoring Annualisation

All automatic monitoring locations within Ipswich Borough Council recorded data capture of greater than 75% therefore it was not required to annualise any monitoring data. In addition, any sites with a data capture below 25% do not require annualisation.

NO_2 Fall-off with Distance from the Road

No automatic NO_2 monitoring locations within Ipswich Borough Council required distance correction during 2020.

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

Site ID	Annualisation Factor Lakenfields	Annualisation Factor St Osyth	Annualisation Factor Southend	-	Average Annualisation Factor	Raw Data Annual Mean	Annualised Annual Mean	Comments
DT6	0.885714	0.948466	0.935614		0.923265	20.3	18.8	

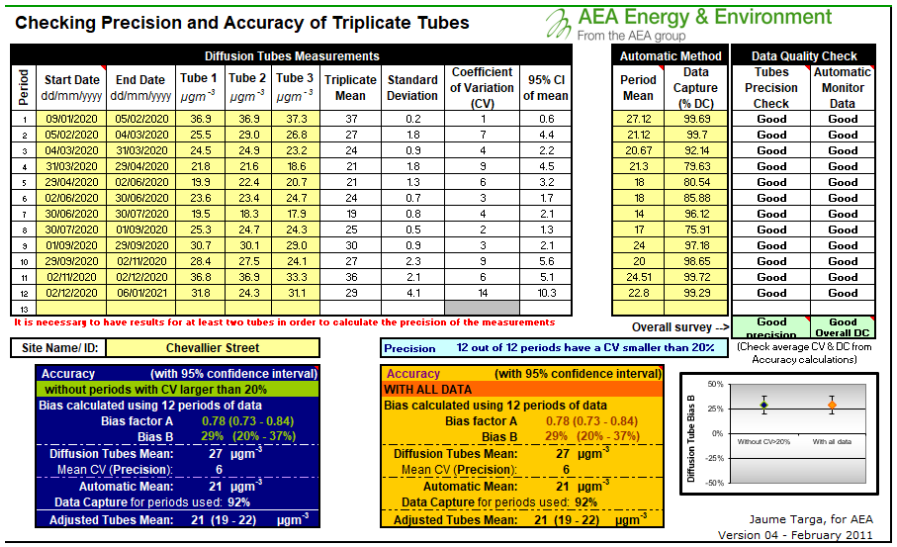
Table C.3 – Local Bias Adjustment Calculation

	Local Bias Adjustment Input 1 (Chevallier Street)	Local Bias Adjustment Input 2 (St Matthews Street)	Local Bias Adjustment Input 3	Local Bias Adjustment Input 4	Local Bias Adjustment Input 5
Periods used to calculate bias	12	11			
Bias Factor A	0.78 (0.73 - 0.83)	0.72 (0.69 – 0.77)			
Bias Factor B	29% (20% - 37%)	38% (30% - 46%)			
Diffusion Tube Mean (µg/m^3)	26.5	36.3			
Mean CV (Precision)	5.5%	3.3%			
Automatic Mean (µg/m^3)	20.6	26.3			
Data Capture	92%	99%			
Adjusted Tube Mean (µg/m^3)	21 (19 – 22)	26 (25 – 28)			

Notes:

A combined local bias adjustment factor of 0.75 has been used to bias adjust the 2020 diffusion tube results. The calculation of the local bias adjustment factor was performed in accordance as per Chapter 7 of LAQM.TG16.

Calculation of combined bias correction factor:
29% (Chevallier Street) + 38% (St Matthews Street) / 2 = 33.5
0.335% + 1 = 1.335
1/1.335 = **0.75**



Checking Precision and Accuracy of Triplicate Tubes

AEA Energy & Environment
From the AEA group

Diffusion Tubes Measurements

Period	Start Date dd/mm/yyyy	End Date dd/mm/yyyy	Tube 1 µgm^{-3}	Tube 2 µgm^{-3}	Tube 3 µgm^{-3}	Triplicate Mean	Standard Deviation	Coefficient of Variation (CV)	95% CI of mean
1	09/01/2020	05/02/2020	36.9	36.9	37.3	37	0.2	1	0.6
2	05/02/2020	04/03/2020	25.5	29.0	26.8	27	1.8	7	4.4
3	04/03/2020	31/03/2020	24.5	24.9	23.2	24	0.9	4	2.2
4	31/03/2020	29/04/2020	21.8	21.6	18.6	21	1.8	9	4.5
5	29/04/2020	02/06/2020	19.9	22.4	20.7	21	1.3	6	3.2
6	02/06/2020	30/06/2020	23.6	23.4	24.7	24	0.7	3	1.7
7	30/06/2020	30/07/2020	19.5	18.3	17.9	19	0.8	4	2.1
8	30/07/2020	01/09/2020	25.3	24.7	24.3	25	0.5	2	1.3
9	01/09/2020	29/09/2020	30.7	30.1	29.0	30	0.9	3	2.1
10	29/09/2020	02/11/2020	28.4	27.5	24.1	27	2.3	9	5.6
11	02/11/2020	02/12/2020	36.8	36.9	33.3	36	2.1	6	5.1
12	02/12/2020	06/01/2021	31.8	24.3	31.1	29	4.1	14	10.3
13									

Automatic Method		Data Quality Check	
Period Mean	Data Capture (% DC)	Tubes Precision Check	Automatic Monitor Data
27.12	99.69	Good	Good
21.12	99.7	Good	Good
20.67	92.14	Good	Good
21.3	79.63	Good	Good
18	80.54	Good	Good
18	85.88	Good	Good
14	96.12	Good	Good
17	75.91	Good	Good
24	97.18	Good	Good
20	98.65	Good	Good
24.51	99.72	Good	Good
22.8	99.29	Good	Good
	Overall survey -->	Good precision	Good Overall DC

It is necessary to have results for at least two tubes in order to calculate the precision of the measurements

Site Name/ ID: Chevallier Street

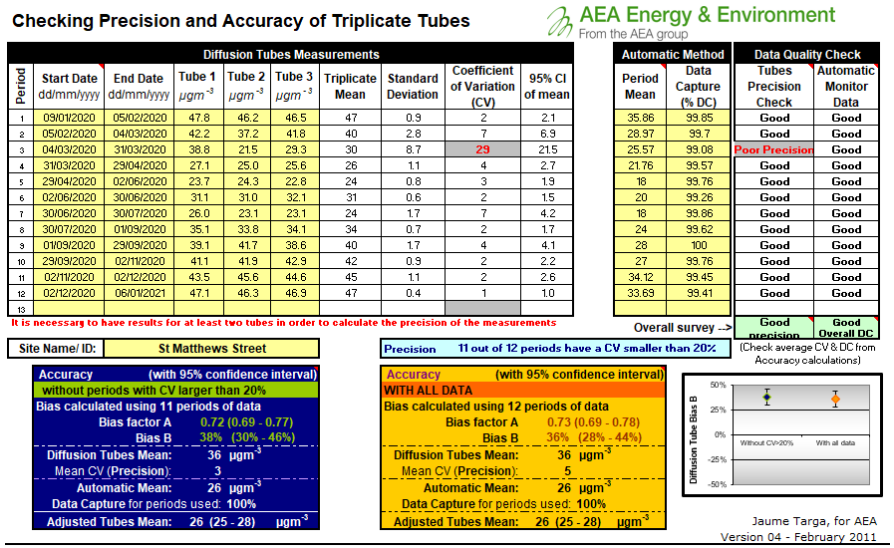
Precision: 12 out of 12 periods have a CV smaller than 20%

(Check average CV & DC from Accuracy calculations)

Accuracy (with 95% confidence interval) without periods with CV larger than 20%
Bias calculated using 12 periods of data
Bias factor A 0.78 (0.73 - 0.84)
Bias B 29% (20% - 37%)
Diffusion Tubes Mean: 27 µgm^{-3}
Mean CV (Precision): 6
Automatic Mean: 21 µgm^{-3}
Data Capture for periods used: 92%
Adjusted Tubes Mean: 21 (19 - 22) µgm^{-3}

Accuracy (with 95% confidence interval) WITH ALL DATA
Bias calculated using 12 periods of data
Bias factor A 0.78 (0.73 - 0.84)
Bias B 29% (20% - 37%)
Diffusion Tubes Mean: 27 µgm^{-3}
Mean CV (Precision): 6
Automatic Mean: 21 µgm^{-3}
Data Capture for periods used: 92%
Adjusted Tubes Mean: 21 (19 - 22) µgm^{-3}

Jaume Targa, for AEA
Version 04 - February 2011



Checking Precision and Accuracy of Triplicate Tubes

AEA Energy & Environment
From the AEA group

Diffusion Tubes Measurements

Period	Start Date dd/mm/yyyy	End Date dd/mm/yyyy	Tube 1 µgm^{-3}	Tube 2 µgm^{-3}	Tube 3 µgm^{-3}	Triplicate Mean	Standard Deviation	Coefficient of Variation (CV)	95% CI of mean
1	09/01/2020	05/02/2020	47.8	46.2	46.5	47	0.9	2	2.1
2	05/02/2020	04/03/2020	42.2	37.2	41.8	40	2.8	7	6.9
3	04/03/2020	31/03/2020	38.8	21.5	29.3	30	8.7	29	21.5
4	31/03/2020	29/04/2020	27.1	25.0	25.6	26	1.1	4	2.7
5	29/04/2020	02/06/2020	23.7	24.3	22.8	24	0.8	3	1.9
6	02/06/2020	30/06/2020	31.1	31.0	32.1	31	0.6	2	1.5
7	30/06/2020	30/07/2020	26.0	23.1	23.1	24	1.7	7	4.2
8	30/07/2020	01/09/2020	35.1	33.8	34.1	34	0.7	2	1.7
9	01/09/2020	29/09/2020	39.1	41.7	38.6	40	1.7	4	4.1
10	29/09/2020	02/11/2020	41.1	41.9	42.3	42	0.9	2	2.2
11	02/11/2020	02/12/2020	43.5	45.6	44.6	45	1.1	2	2.6
12	02/12/2020	06/01/2021	47.1	46.3	46.9	47	0.4	1	1.0
13									

Automatic Method		Data Quality Check	
Period Mean	Data Capture (% DC)	Tubes Precision Check	Automatic Monitor Data
35.86	99.85	Good	Good
28.97	99.7	Good	Good
25.57	99.08	Poor Precision	Good
21.76	99.57	Good	Good
18	99.76	Good	Good
20	99.26	Good	Good
18	99.86	Good	Good
24	99.62	Good	Good
28	100	Good	Good
27	99.76	Good	Good
34.12	99.45	Good	Good
33.69	99.41	Good	Good
	Overall survey -->	Good precision	Good Overall DC

It is necessary to have results for at least two tubes in order to calculate the precision of the measurements

Site Name/ ID: St Matthews Street

Precision: 11 out of 12 periods have a CV smaller than 20%

(Check average CV & DC from Accuracy calculations)

Accuracy (with 95% confidence interval) without periods with CV larger than 20%
Bias calculated using 11 periods of data
Bias factor A 0.72 (0.69 - 0.77)
Bias B 38% (30% - 46%)
Diffusion Tubes Mean: 36 µgm^{-3}
Mean CV (Precision): 3
Automatic Mean: 26 µgm^{-3}
Data Capture for periods used: 100%
Adjusted Tubes Mean: 26 (25 - 28) µgm^{-3}

Accuracy (with 95% confidence interval) WITH ALL DATA
Bias calculated using 12 periods of data
Bias factor A 0.73 (0.69 - 0.78)
Bias B 36% (28% - 44%)
Diffusion Tubes Mean: 36 µgm^{-3}
Mean CV (Precision): 5
Automatic Mean: 26 µgm^{-3}
Data Capture for periods used: 100%
Adjusted Tubes Mean: 26 (25 - 28) µgm^{-3}

Jaume Targa, for AEA
Version 04 - February 2011

Table C.4 – NO_2 Fall off With Distance Calculations (concentrations presented in µg/m^3)

Site ID	Distance (m): Monitoring Site to Kerb	Distance (m): Receptor to Kerb	Monitored Concentration (Annualised and Bias Adjusted	Background Concentration	Concentration Predicted at Receptor	Comments
DT 64, 65	1.3	1.65	40.4 (DT64 – 40.5/ DT65 – 40.3)	14.61236	39.1	

BUREAU VERITAS

Enter data into the pink cells

Step 1	How far from the KERB was your measurement made (in metres)?	1.3	metres
Step 2	How far from the KERB is your receptor (in metres)?	1.65	metres
Step 3	What is the local annual mean background NO_2 concentration (in µg/m^3)?	14.61236	µg/m^3
Step 4	What is your measured annual mean NO_2 concentration (in µg/m^3)?	40.4	µg/m^3
Result	The predicted annual mean NO_2 concentration (in µg/m^3) at your receptor	*39.1*	µg/m^3

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

Figure D.1 – Overview of Ipswich AQMA boundaries and Monitoring Locations

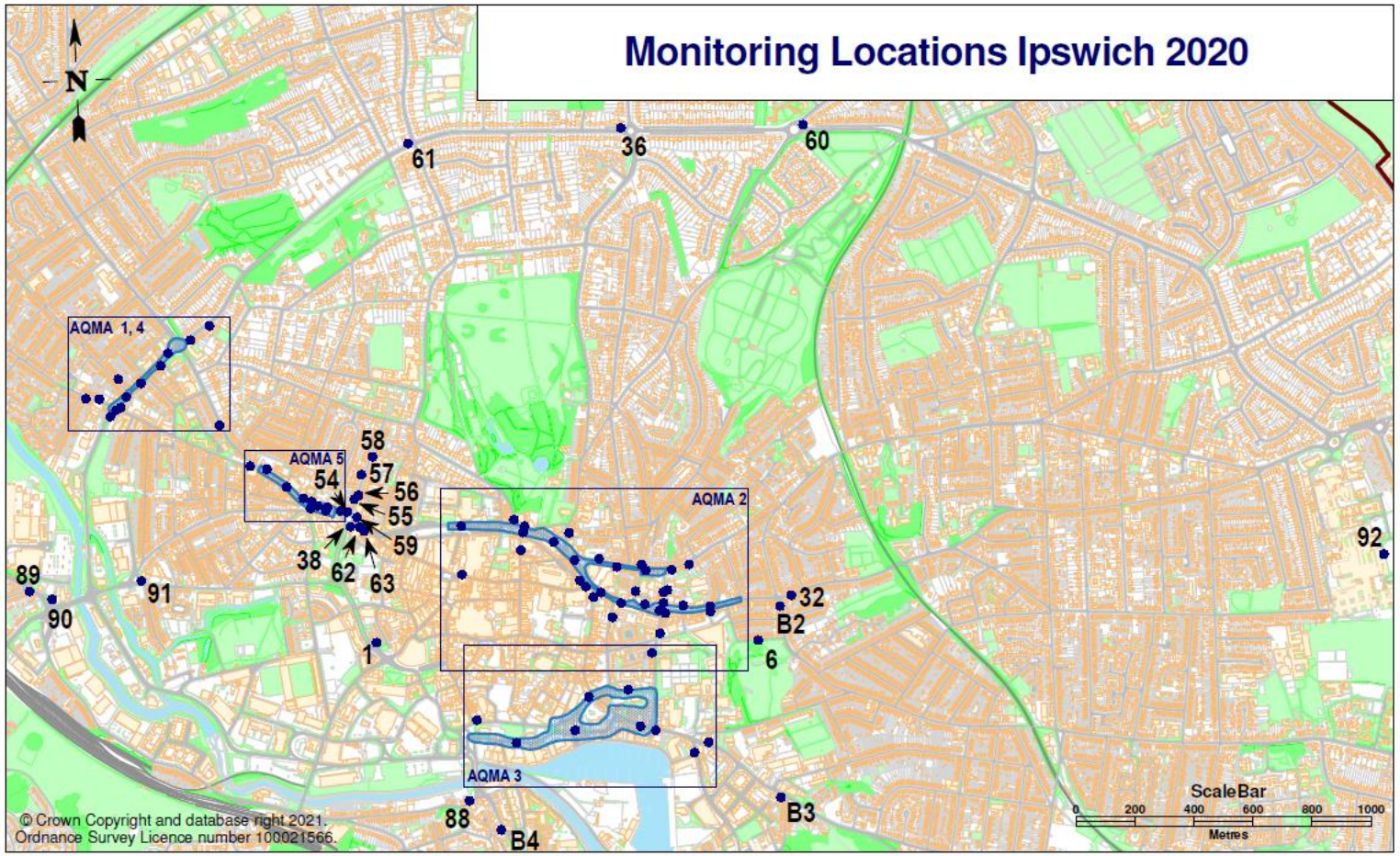


Figure D.2 – Ipswich Air Quality Management Areas 1 and 4

Figure D.3 – Ipswich Air Quality Management Area 2

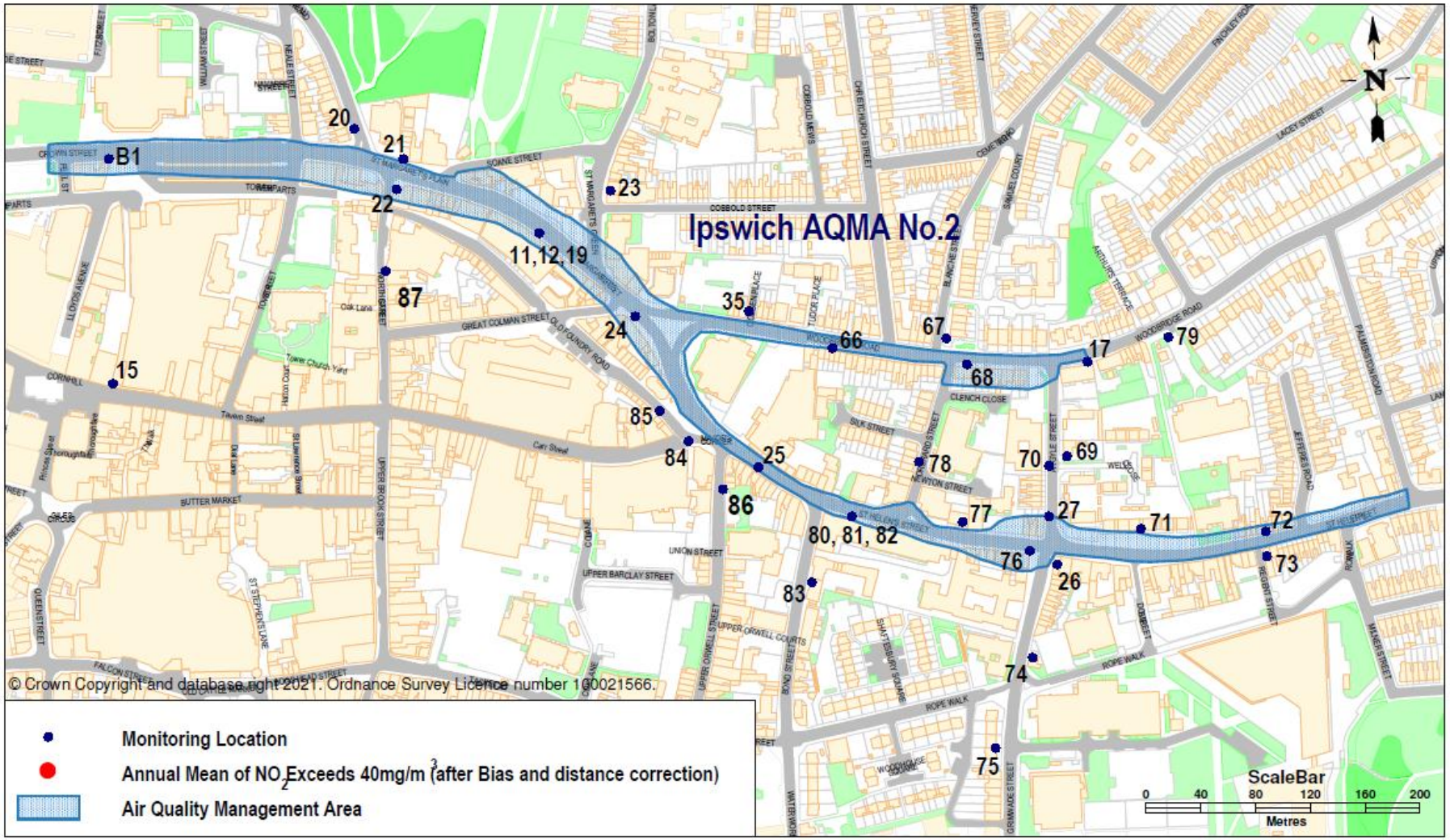


Figure D.4 – Ipswich Air Quality Management Area 3

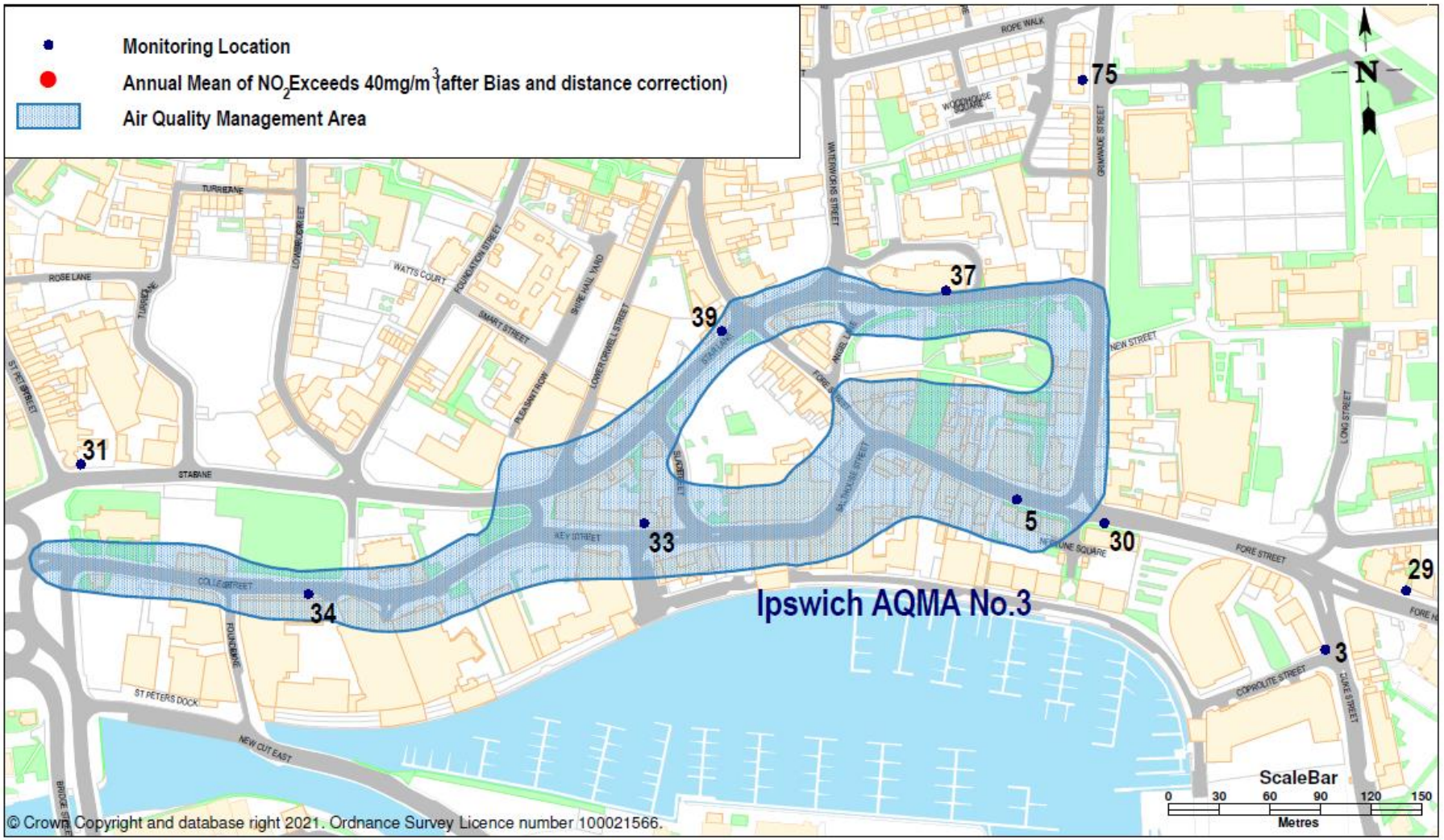
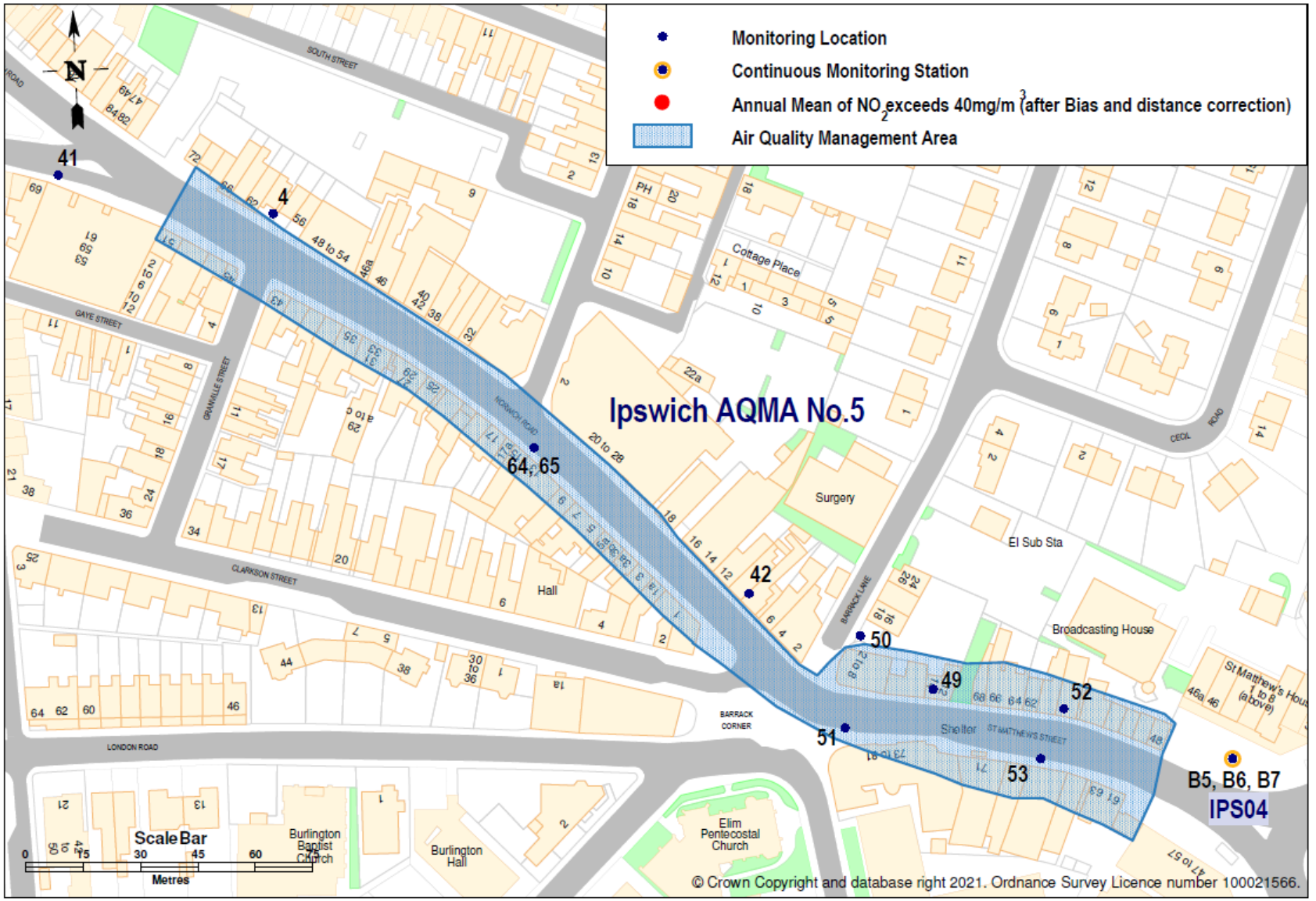


Figure D.5 – Ipswich Air Quality Management Area 5



Appendix E: Summary of Air Quality Objectives in England

Table E.1 – Air Quality Objectives in England[9]

Pollutant	Air Quality Objective: Concentration	Air Quality Objective: Measured as
Nitrogen Dioxide (NO_2)	200µg/m^3 not to be exceeded more than 18 times a year	1-hour mean
Nitrogen Dioxide (NO_2)	40µg/m^3	Annual mean
Particulate Matter (PM_{10})	50µg/m^3, not to be exceeded more than 35 times a year	24-hour mean
Particulate Matter (PM_{10})	40µg/m^3	Annual mean
Sulphur Dioxide (SO_2)	350µg/m^3, not to be exceeded more than 24 times a year	1-hour mean
Sulphur Dioxide (SO_2)	125µg/m^3, not to be exceeded more than 3 times a year	24-hour mean
Sulphur Dioxide (SO_2)	266µg/m^3, not to be exceeded more than 35 times a year	15-minute mean

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

Appendix F: Impact of COVID-19 upon LAQM

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

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

Despite the challenges that the pandemic has given rise to, the events of 2020 have also provided Local Authorities with an opportunity to quantify the air quality impacts associated with wide-scale and extreme intervention, most notably in relation to emissions of air pollutants arising from road traffic. The vast majority (>95%) of AQMAs declared within the UK are related to road traffic emissions, where attainment of the annual mean objective for nitrogen dioxide (NO_2) is considered unlikely. On 23rd March 2020, the UK Government released official guidance advising all members of public to stay at home, with work-related travel only permitted when absolutely necessary. During this initial national lockdown (and to a lesser extent other national and regional lockdowns that followed), marked reductions in vehicle traffic were observed; Department for Transport (DfT) data[10] suggests reductions in vehicle traffic of up to 70% were experienced across the UK by mid-April, relative to pre COVID-19 levels.

This reduction in travel in turn gave rise to a change of air pollutant emissions associated with road traffic, i.e. nitrous oxides (NO_x), and exhaust and non-exhaust particulates (PM). The Air Quality Expert Group (AQEG)[11] has estimated that during the initial lockdown period in 2020, within urbanised areas of the UK reductions in NO_2 annual mean concentrations were between 20 and 30% relative to pre-pandemic levels, which

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

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

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

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

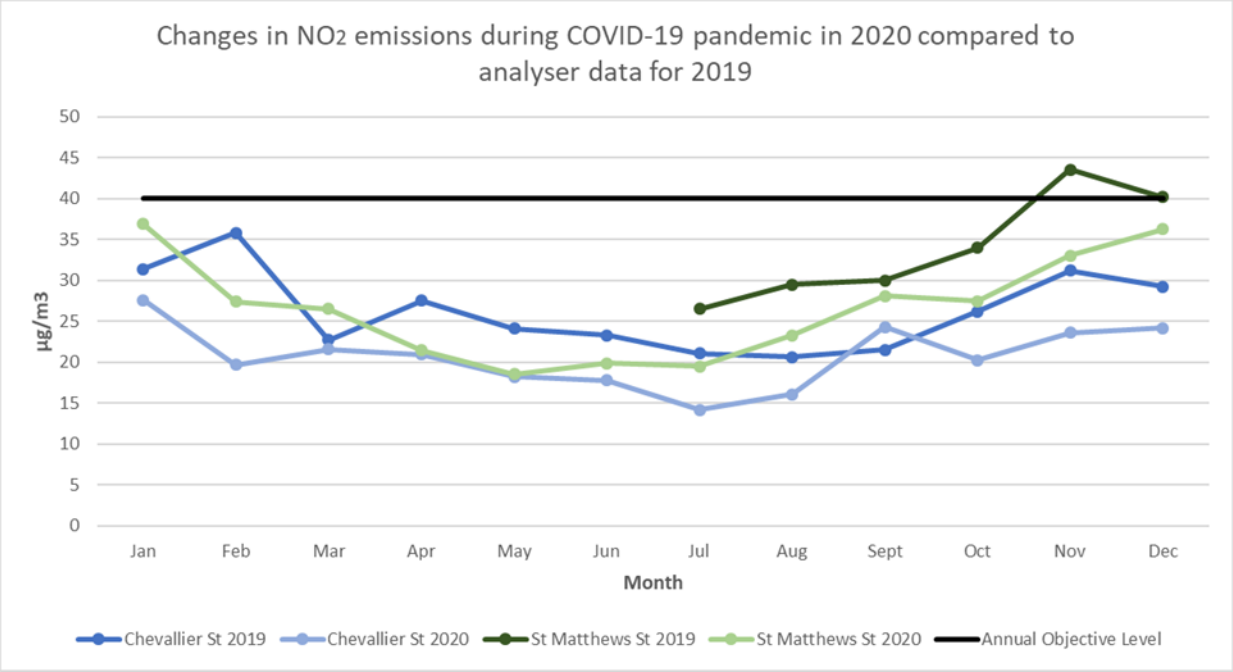
Impacts of COVID-19 on Air Quality within Ipswich

Automatic Air Quality Analyser Data

Overall, at the Chevallier Street analyser site (IPS3), a 20% reduction in NO_2 concentrations during 2020 was experienced compared to levels in 2019. This equates to a reduction of around 5µg/m^3 in the annual average concentration experienced at the site.

For the period between July – December 2020, an 18% reduction in NO_2 concentrations was experienced at the St Matthews Street analyser site (IPS04) compared to the equivalent period in 2019. As the analyser was not commissioned until late June 2019, a full year's comparison between 2019 and 2020 cannot be made. However, had an 18% reduction in concentration been experienced throughout the whole of 2020 compared to 2019, this would equate to a reduction of around 6µg/m^3 in the annual average concentration experienced at the site. Figure F.1 presents these findings in graphical form.

Figure F.1 – Changes in NO_2 concentrations during COVID-19 pandemic in 2020 compared to analyser data in 2019



Diffusion Tube Data

Overall, once adjusted for bias, distance corrected and annualised where appropriate, diffusion tube sites in the Borough in 2020 experienced an average reduction in NO_2 concentrations of approximately 23% compared to 2019. This equates to a reduction of around 7µg/m^3 experienced at each diffusion tube site.

Note averaging of diffusion tube annual average data does not show site specific changes in NO_2 concentrations. Some diffusion tube sites may have experienced greater/less concentration changes than other sites, so this assumption should be used with caution.

Trends in the annual average NO_2 concentration averaged across all sites between 2016 and 2020 following bias and distance correction (and annualisation if required) can be seen in Figure F.2 below.

Trends in the unadjusted monthly data (not bias and distance corrected, nor annualised) averaged across all sites throughout 2020 compared to 2019 can be seen in Figure F.3 below.

Figure F.2 – Changes in annual average NO_2 concentrations at all diffusion tube sites

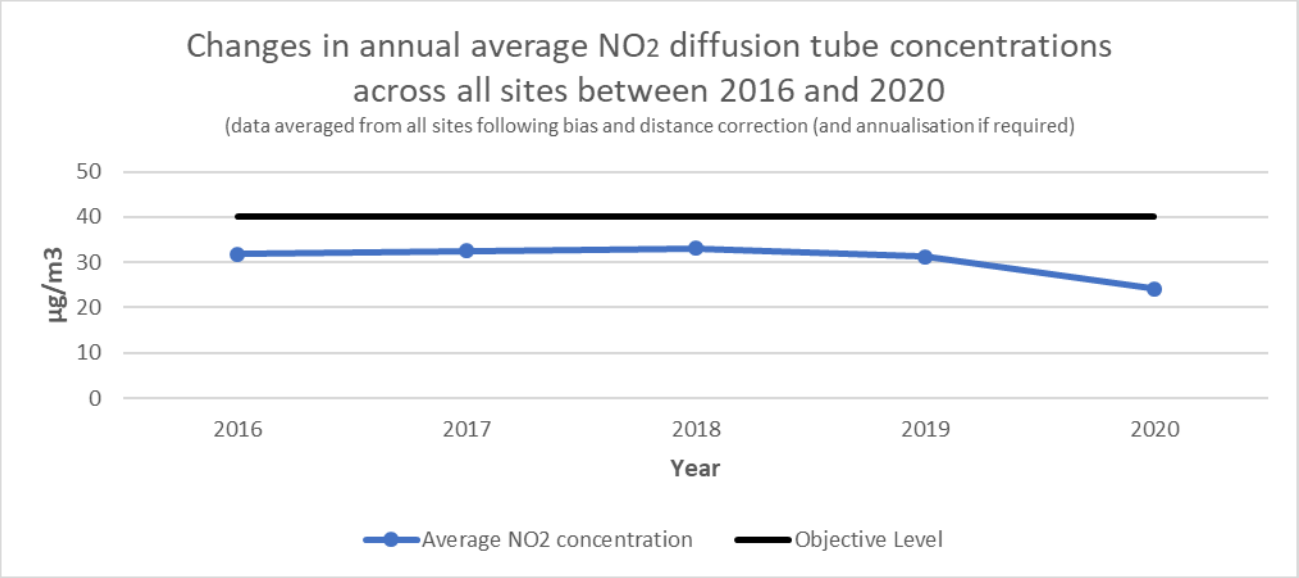
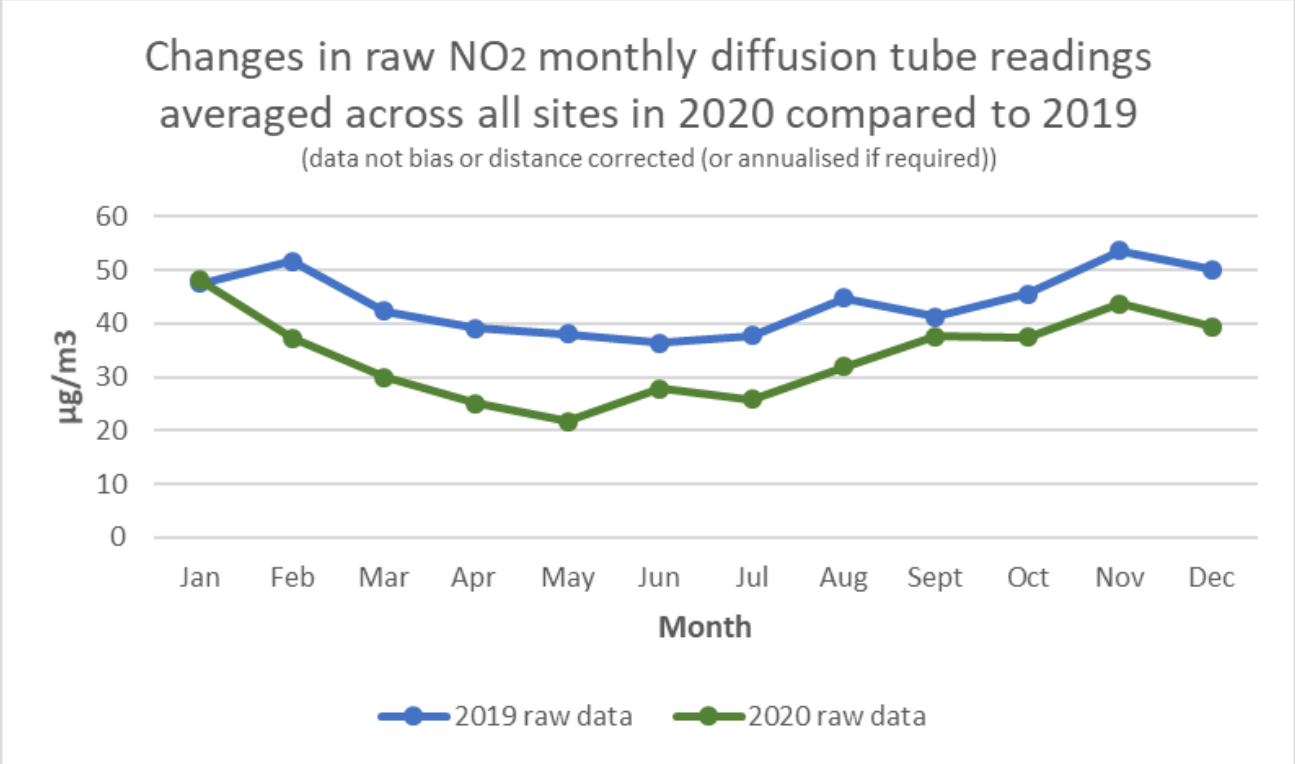


Figure F.3 – Changes in unadjusted NO_2 monthly diffusion tube readings averaged across all sites in 2020 compared to 2019



Diffusion Tube Data for lockdown periods

As diffusion tubes are changed monthly in line with the LAQM diffusion tube monitoring calendar, the readings below include times outside of the Government lockdown

restrictions (i.e. diffusion tube data collected in March includes pre-lockdown emissions). It is also worth noting that due to the to the necessity to change diffusion tubes in line with the LAQM diffusion tube monitoring calendar, the averages shown below technically relate to monitoring periods rather than months (e.g. the monitoring period for March 2020 ran from 4th Mar – 1st Apr rather than 1st Mar – 31st Mar, the monitoring period for April 2020 ran from 1st Apr to 29th Apr rather than 1st Apr – 30th Apr etc..).

In addition to the above, the Council increased its diffusion tube monitoring programme in 2020 (seven tubes – Tubes 86 – 92). Data obtained from these tubes was not included in the analysis against 2019 tube data.

Furthermore, as the data below and shown in Figure F.3 is based on monthly, not annual averages, it has not been adjusted for bias, distance corrected or annualised where appropriate and should be used with caution.

Examination of NO_2 Concentrations and National Government COVID Restrictions: 23rd March – 10th May 2020

Overall, sites on average recorded a reduction of 36% in NO_2 concentrations during the first Government imposed lockdown compared to the equivalent recording period for 2019. Specifically:

- March – sites on average recorded a reduction of 29% less emissions compared to 2019
- April – sites on average recorded a reduction of 36% less emissions compared to 2019
- May – sites on average recorded a reduction of 43% less emissions compared to 2019

Examination of NO_2 Concentrations and National Government COVID Restrictions: 5th November – 1st December 2020

Overall, sites on average recorded a reduction of 20% in NO_2 concentrations during the second Government imposed lockdown compared to the equivalent recording period for 2019.

- November – sites on average recorded a reduction of 19% less emissions compared to 2019
- December – sites on average recorded a reduction of 21% less emissions compared to 2019

Tier 4 restrictions: 26th December 2020 – 4th January 2021

Suffolk was subject to Tier 4 restrictions between 26th December 2020 and 4th January 2021. In January 2021 sites on average recorded a concentration reduction of 16% compared to January 2019, and 17% compared to January 2020.

Examination of NO_2 Concentrations and National Government COVID Restrictions: 5th January 2021 – 7th March 2021/28th March 2021

Between 5th January 2021 and 7th March 2021, England was subject to a third Government imposed lockdown. From 8th March 2021, schools and colleges were allowed to open and people were allowed to leave home for recreation and exercise outdoors with their household or support bubble, if they were eligible for one, or with one person from outside their household. Care home residents were also allowed one regular visitor. From 29th March 2021, the 'Stay at Home' rule was lifted.

Between January and March 2021, sites on average recorded a concentration reduction of 30% compared to the same period in 2019, but unfortunately 2% worse concentrations compared to the same period in 2020. Concentrations worsened by approximately 20% in March 2021 compared to March 2020, but still remained approximately 15% below concentrations in March 2019. This suggests a return to emissions closer to pre COVID-19 levels. Concentrations in 2021 will be further reported in the 2022 ASR.

No exceedances of the annual mean NO_2 concentration was experienced at any diffusion tube site in 2020 following bias and distance correction (and annualisation if appropriate). The locations of the three highest recorded diffusion tube sites for 2020 are highlighted below:

Highest recorded reading: Norwich Road (tubes 64/65 – AQMA 5): 39.1µg/m3 (approx. 21% improvement compared to 2019)

2nd highest recorded reading: St Margaret's Street/ Piper's Court (tubes 11, 12 and 19 – AQMA 2): 37.2µg/m3 (approx. 20% improvement compared to 2019)

3rd highest recorded reading: St Matthews Street (tube 52 – AQMA 5): 36.5µg/m3 (approx. 19% improvement compared to 2019)

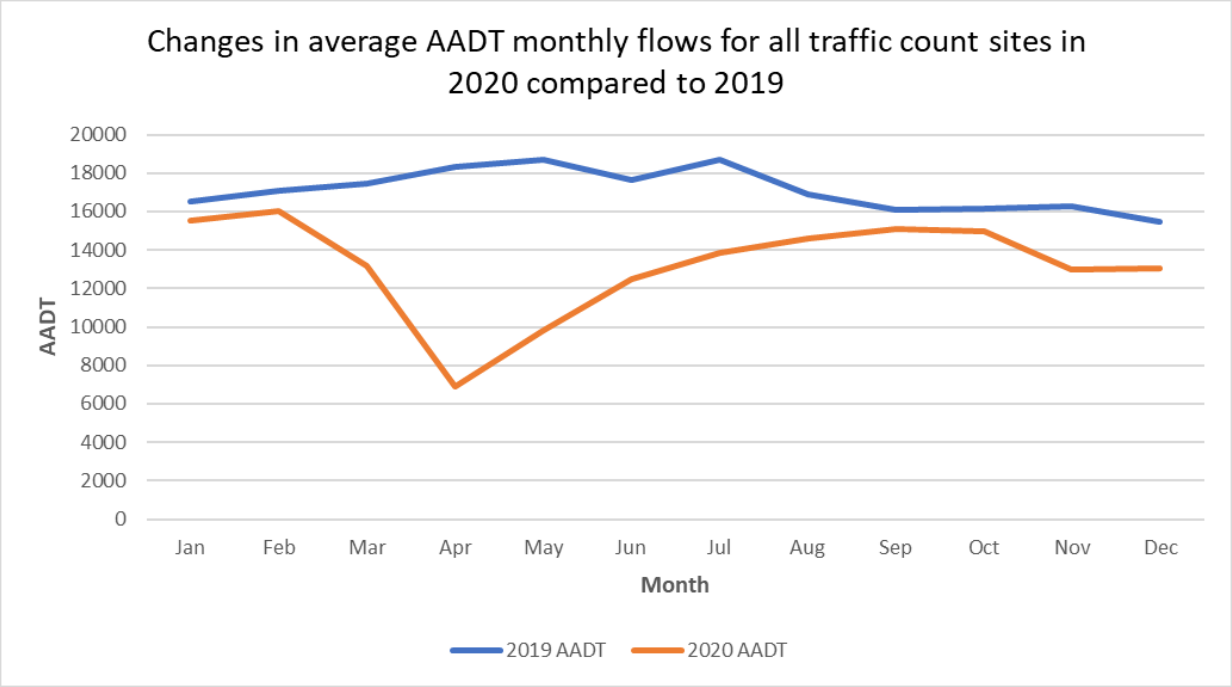
It is also important to caveat all the data above and emphasise that the comparisons drawn do not consider the impact that changes in meteorological conditions may have had on pollutant concentrations. Nor does it consider the impacts of other possible influences such as the implementation of measures from the Council's Air Quality Action Plan or the

projected uptake of lower emission vehicles in the UK. It is worth noting that it is very difficult to quantify the impact of a number of the measures detailed in the AQAP on pollutant concentrations.

Summary of traffic flow data and comparison with NO_2 concentrations

Traffic count data obtained from sites in Ipswich indicated an overall reduction in average traffic flows of approximately 17% in 2020 compared to traffic flows in 2019. As can be seen in Figure F.4 below, the most significant period of traffic reduction in 2020 was between March and June, which encompassed the Governments first national lockdown restrictions.

Figure F.4 – Changes in average Annual Average Daily Traffic (AADT) flows in 2020 compared to 2019



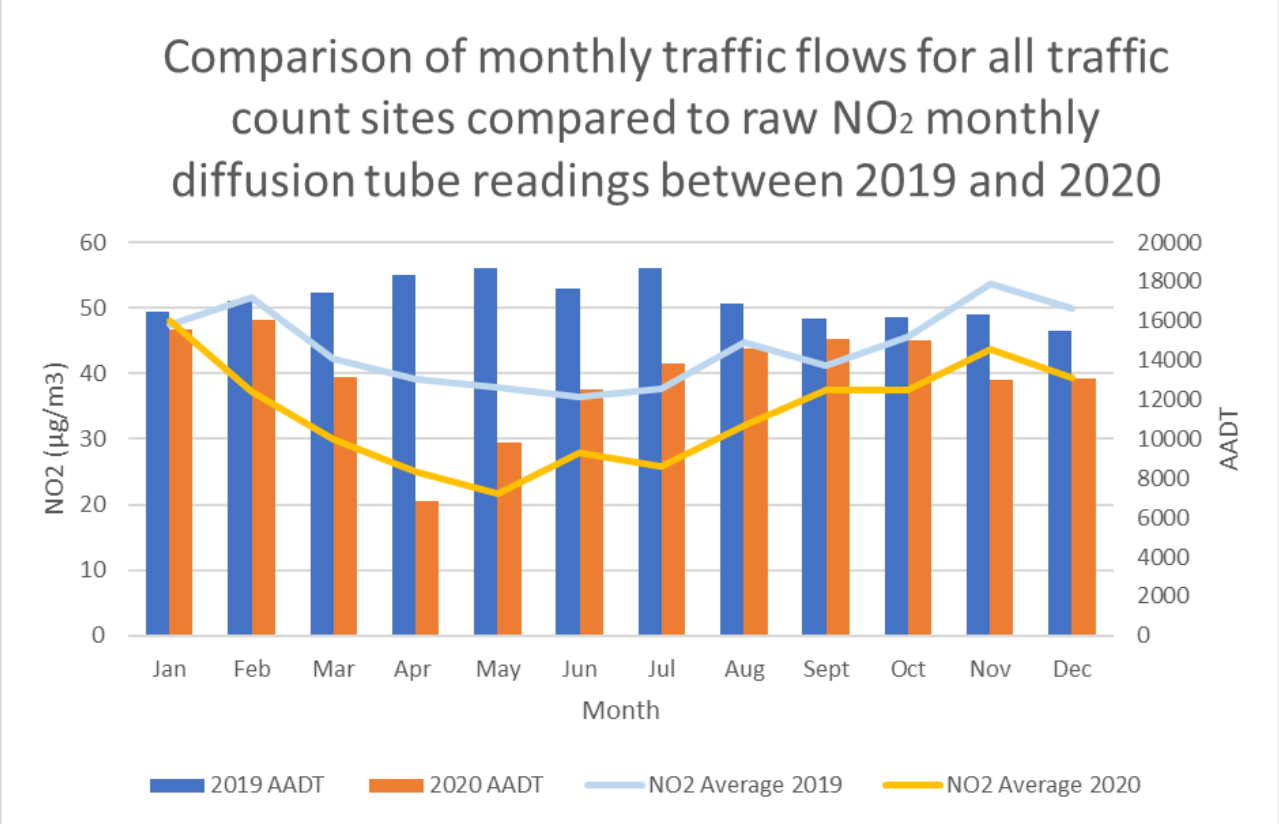
The traffic count data in operation during 2019 and 2020 has enabled a comparison of AADT (annual average daily traffic) traffic flows with monthly NO_2 concentrations experienced at diffusion tube sites. This has enabled estimations to be made for the reduction in traffic flow required to achieve compliance with the annual mean NO_2 objective. Given that, following bias and distance correction, the highest recorded annual mean NO_2 concentration was 39.1µg/m^3 in AQMA 5 (tubes 64/65 - duplicate), it is assumed that a 17% reduction in traffic flow will be required to ensure all sites are compliant with the annual mean NO_2 objective.

In addition to the above, when comparing the reduction in annual traffic flow to bias, distance corrected and annualised (where appropriate) diffusion tube sites, it is estimated that a reduction in traffic flows of 17% equates to an average reduction in NO_2 concentrations of 23%.

It is important to highlight that the traffic count sites are not positioned in the same locations as the Councils air quality monitoring equipment, therefore the above estimations should be used with caution. Furthermore, this estimation does not consider possible fleet projection trends and associated variations in emissions.

Figure F.5 below shows average monthly AADT flows for all traffic count sites against unadjusted NO_2 concentration data for all diffusion tube sites between 2019 and 2020. As can been seen in Figure F.5, average traffic flows and NO_2 concentrations were lower in 2019 compared to 2020. This is with the exception of a marginally higher NO_2 average in January 2020 compared to the equivalent period in 2019.

Figure F.5 – Average monthly traffic flows for all traffic count sites compared to unadjusted monthly NO_2 diffusion tube data between 2019 and 2020



Opportunities Presented by COVID-19 upon LAQM within Ipswich

- Temporary Cycle Lanes – A number of temporary cycle lanes were installed. Further information can be found in the draft Ipswich Walking and Cycling Infrastructure Plan. Ipswich area schemes have been developed as part of those identified in the five year rolling programme across Suffolk but COVID-19 enabled the development of some schemes to be accelerated. Suffolk County Council has been awarded £376,000 in tranche one and £1.685 million in tranche two from the Active Travel Fund. This ranks Suffolk as the highest percentage increase in allocation of grants in England.
- Despite COVID-19 impacting on how the Council engages with schools, a video was created aimed at educating primary school children on air pollution. This was made available on Youtube.

Challenges and Constraints Imposed by COVID-19 upon LAQM within Ipswich

- COVID 19 has presented a number of challenges for transport related works, this includes the inability to undertake traffic data surveys, public engagement and it has also affected the delivery of schemes. **Medium Impact**
- The Implementation of Action Plan measures 7 and 8. Ipswich Buses fleet projection may not be feasible given the current economic uncertainty following the impact of Covid. Their capacity for fleet renewal will depend on shape and size of the bus network following the pandemic along with advances in alternative fuels and available funding for vehicles and associated re-fuelling infrastructure. Due to the Covid outbreak, there is uncertainty across the economy, and particularly regarding high street retail footfall and employment. Given this, it is unlikely that any fleet will be replaced in 2022. Ipswich Buses state that the Covid outbreak has made bus services uneconomic to operate which is why Government's CBSSG funding is currently in place, to prop up operators to ensure they can reach break-even and cover all their costs, despite passenger usage having reduced by some 35%. First Buses have 3 buses that are due retrofits, but the contractor doing them was unable to attend site due to the pandemic. As restrictions are easing it is hoped the retrofits will be completed. **Medium Impact**

- During 2020, routine calibrations took place of the automatic air quality monitors but not to normal regime. Routine audits were undertaken alongside service and maintenance programmes. **Small Impact**

The impacts as presented above are aligned with the criteria as defined in Table F 1, with professional judgement considered as part of their application.

Table F 1 – Impact Matrix

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

Appendix G: Detailed Assessment of Air Quality for Ipswich Borough Council, November 2020

IPSWICH
BOROUGH COUNCIL

Detailed Assessment of Air Quality for Ipswich Borough Council

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

November, 2020

Local Authority Officer	Andrew Coleman
Department	Environmental Protection
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Report Reference Number	AJC/DA/20
Date	November 2020

Executive Summary

Part IV of the Environment Act 1995 placed a requirement on local authorities to periodically review and assess air quality in their districts. This involves identifying those areas where it is considered likely that the Air Quality Objectives will be exceeded. Local authorities have a duty to designate any such locations as Air Quality Management Areas (AQMAs) and pursue improvements in air quality in those areas.

Ipswich currently has 5 AQMA's. This report is written in recognition that the boundaries of the existing AQMAs need reviewing on a regular basis to ensure they remain relevant.

This report has been prepared in accordance with Local Air Quality Management Guidance Note LAQM.TG (16).

Monitoring data indicates that there is an area outside AQMA 3 where the annual mean nitrogen dioxide (NO2) objective level is being exceeded. In addition, there is an area within AQMA 1 that, for several years, has not exceeded the annual mean objective level. Furthermore, once bias and distance correction have been applied, there have been no measured exceedances of the air quality objective for NO2 concentrations over the last six years in AQMA 4.

In light of this, the detailed assessment recommends the following:

- The boundary of AQMA No. 3 is amended (marginally increased).
- The boundary of AQMA No. 1 is amended (decreased).
- AQMA No. 4 is revoked.

Ipswich Borough Council will now consult with DEFRA and other statutory consultees, members, Suffolk County Council and members of the public regarding this decision.

Monitoring results in AQMA No 2. and AQMA No 5. still indicate NO2 concentrations above the air quality objective at various locations, and as such, no plans are being made to amend the boundary of these AQMAs.

Monitoring of nitrogen dioxide will continue at a number of locations within the Ipswich borough using both continuous monitoring and diffusion tubes. This will ensure that the AQMAs remain relevant, will identify other areas of poor air quality, and will, over time, give an indication of any improvement in air quality as the actions within the Air Quality Action plan are implemented.

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Background to Local Air Quality Management in Ipswich

Ipswich Borough Council has completed six rounds of air quality review and assessment since 2000 and has submitted Annual Status Reports since 2016 as part of the LAQM system.

During the second round of review and assessment in 2003, the Council identified three areas where it was considered air quality objectives for Nitrogen Dioxide (NO2) were likely to be exceeded. Faber Maunsell - AECOM were commissioned in 2005 to undertake a Detailed Assessment which verified that air quality objectives were not being met due to an exceedance of the annual mean of 40µg/m3 for NO2. The Council subsequently declared three AQMA's on 11th April 2006. The extent of the AQMAs as originally declared are shown below:

Figure 1: Ipswich Air Quality Management Order No.1, 2006: Norwich Road, Chevallier Street and Valley Road

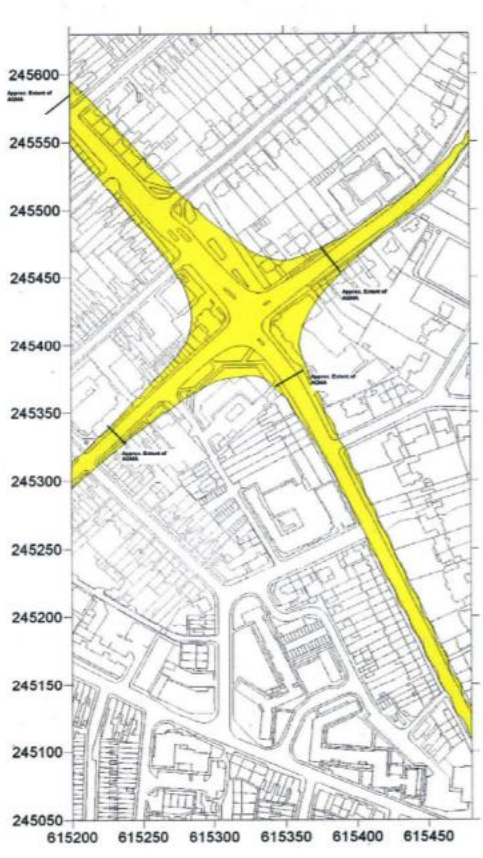


Figure 2: Ipswich Air Quality Management Order No.2, 2006: Junction of Crown Street with Fonnereau Road and St Margaret's Street and St Margaret's Plain

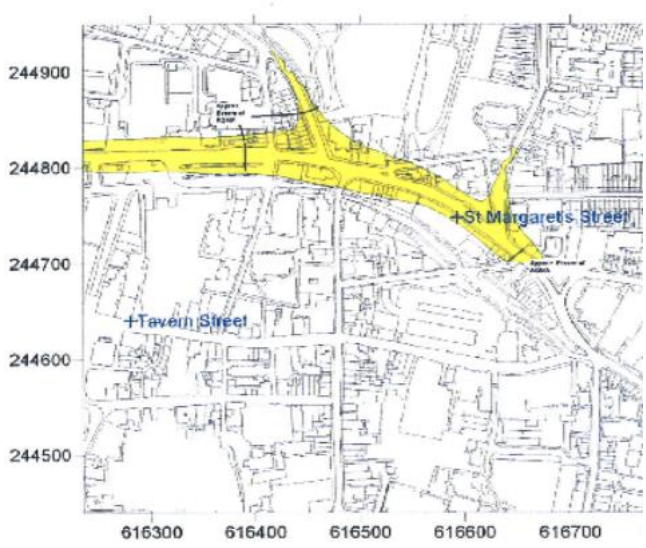
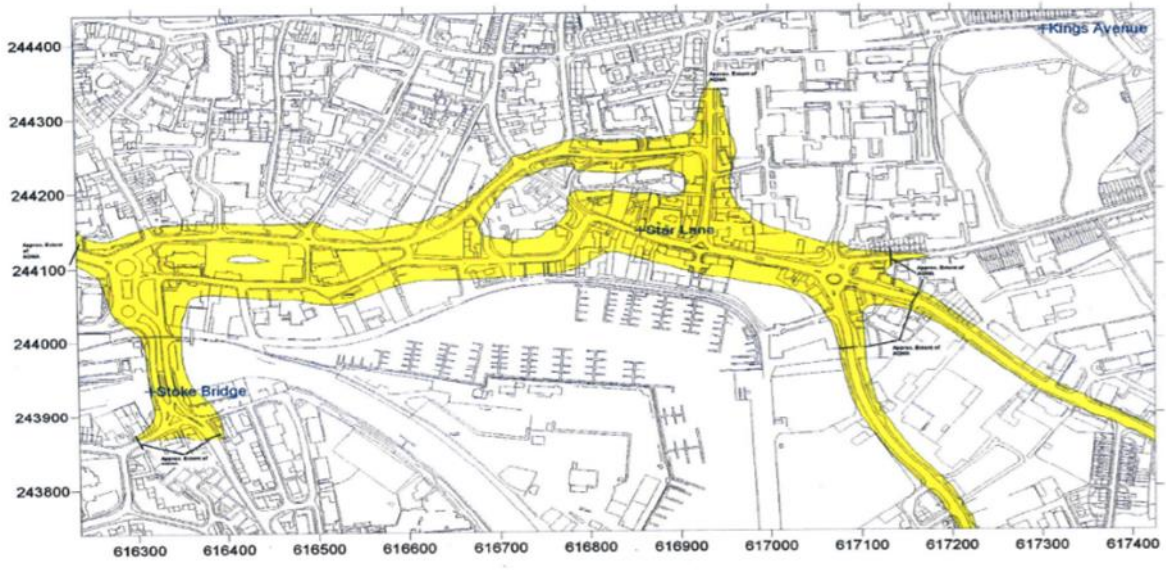


Figure 3: Ipswich Air Quality Management Order No 3 2006: Star Lane gyratory system and St Helen's Street/Grimwade Street

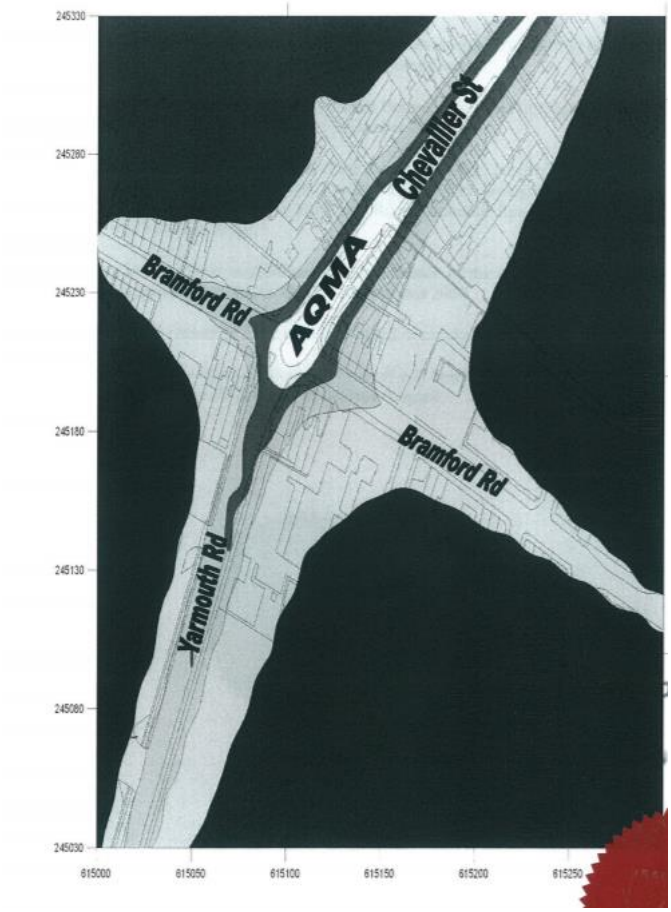


The Council produced an Air Quality Action Plan (AQAP) in 2008 for the three declared AQMAs. Source apportionment identified road traffic emissions as the main source of pollution responsible for the exceedance of the annual average Nitrogen Dioxide objective.

As part of the Councils third round of review and assessment, a Detailed Assessment, finalised August 2010, concluded that there were likely to be exceedances of the annual mean NO2 objective at the Bramford Road/Yarmouth Road/Chevallier Street junction. The

predicted exceedances of the annual mean objective were attributed to slow moving vehicles, congestion and queuing traffic. A new AQMA was declared in December 2010 and is shown below:

Figure 4: Ipswich Air Quality Management Order No 4, 2010: Bramford Road, Yarmouth Road, Chevallier Street junction.



The Council carried out Detailed Assessments in 2012 as part of its fifth round of review and assessment and concluded that specific areas along St Helens Street be considered for declaration as an AQMA. Furthermore, it concluded that specific areas along St Matthews Street be considered for declaration as an AQMA.

In 2015, a further Detailed Assessment was carried out. Monitoring data indicated some areas of Ipswich where the annual average nitrogen dioxide objective level were being exceeded outside of the existing AQMAs. In addition, there were areas within the existing AQMAs where, for several years, there had not been exceedances of the objective levels. As such, it was recommended that AQMAs No. 1, 2 and 3 were amended and one new AQMA declared. Again, traffic emissions were identified as the main pollution source responsible for the declaration of an additional AQMA. In 2017, the existing AQMAs were

amended and AQMA No.5 was declared. AQMA No:5 as originally declared is shown below (it has not been amended since the original declaration):

Figure 5: Ipswich Air Quality Management Order No 5, 2017: St. Matthews Street / Norwich Road between the Civic Drive roundabout and Bramford Road

Currently, Ipswich Borough Council has declared a total of five AQMAs, all due to continued exceedance of the annual mean NO2 objective level. These are:

- Ipswich AQMA No.1 - Encompassing the land in and around the junction of Norwich Road, Chevallier Street and Valley Road, extending along Chevallier Street to beyond the junction with Waterloo Road (declared 2006; amended 2017);
- Ipswich AQMA No. 2 - From the junction with Peel Street, extending along Crown Street, St Margarets Street and St Helens Street to the junction with Palmerston Road, and from St Margarets Street extending up Woodbridge Road to just beyond the junction with Argyle Street. (declared 2006; amended 2017);
- Ipswich AQMA No. 3 - Following the route of the Star Lane / Key Street / College Street gyratory clockwise from the junction with Lower Orwell Street, extending along Star Lane, Grimwade Street, Fore Street, Salthouse Street, Key Street and College Street, terminating at the junction with Bridge Street (declared 2006; amended 2017);

- Ipswich AQMA No. 4 - Incorporating the Bramford Road / Yarmouth Road / Chevallier Street junction and part of Chevallier Street (declared 2010);
- Ipswich AQMA No. 5 - Incorporating the land in or around St. Matthews Street / Norwich Road between the Civic Drive roundabout and Bramford Road (declared 2017).

Figure 6 below shows the current Air Quality Management Areas in Ipswich.

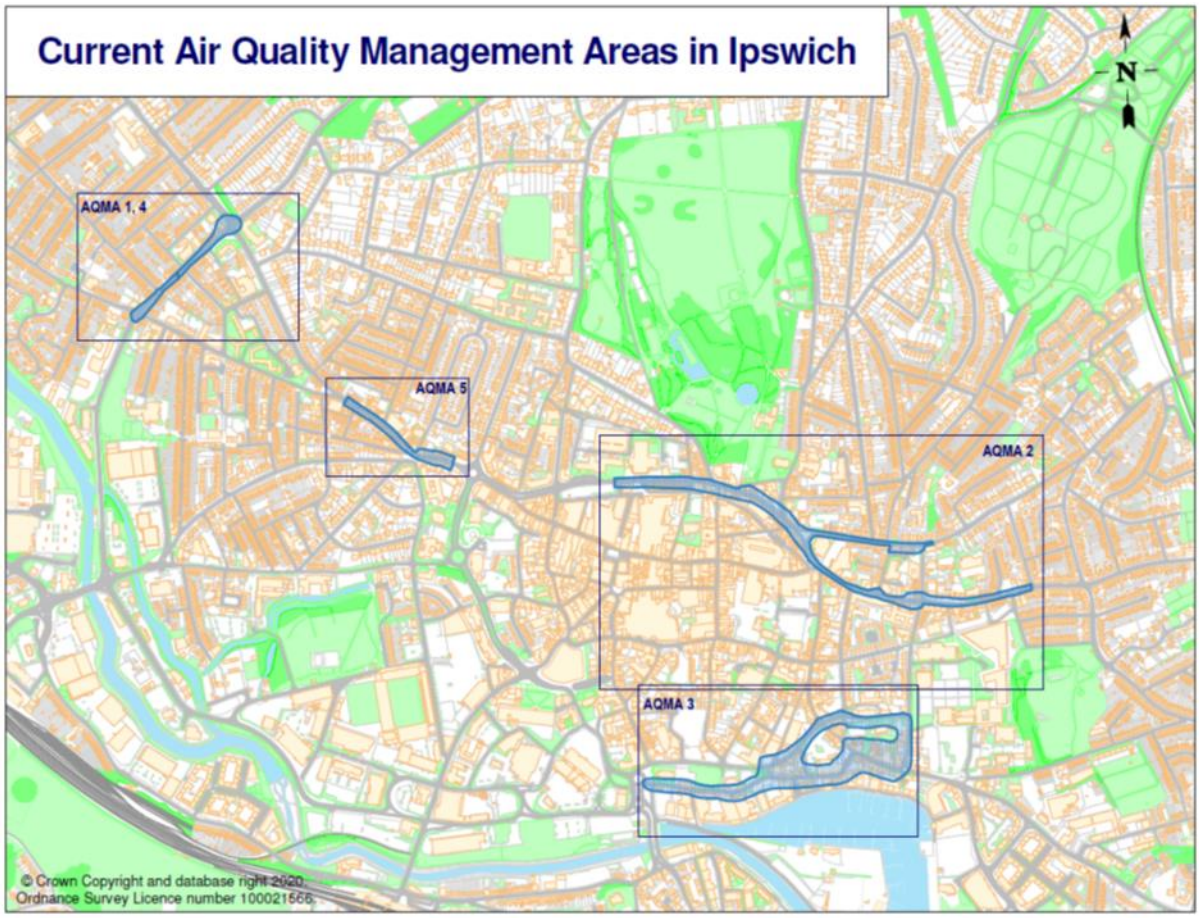


Figure 6: Current Air Quality Management Areas in Ipswich

In 2019, the Council published its latest Air Quality Action Plan aimed at addressing the exceedances of the NO2 annual mean objective level.

The latest 2020 Annual Status Report (ASR) concluded that there is an exceedance of the NO2 annual mean objective level just outside the boundary of AQMA 3. Furthermore, the ASR indicated that there are a number of locations where exceedances of the annual NO2 objective level have not been experienced for several years. In light of this, the Council is now reviewing the monitoring data to determine whether the existing AQMAs are still appropriate and whether any require amendment/revocation.

A copy of the Councils air quality reports can be found at:
https://www.ipswich.gov.uk/airqualitymanagement

Detailed Assessment of NO_2 Monitoring in Ipswich

Overview of Monitoring

DEFRA's LAQM Helpdesk has previously confirmed that dispersion modelling is not essential for the purposes of a Detailed Assessment. Paragraph 3.49 of LAQM.TG(16) supports this and states "*in some instances if compelling evidence exists, detailed modelling to support the decision to amend/revoke an AQMA may not be necessary and an AQMA may be amended or revoked following a screening assessment or on the basis of robust monitoring evidence*."

The Council currently monitors NO2 levels using 99 diffusion tubes positioned at 88 locations in and around the perimeter of the AQMAs, at background locations, or at locations where it is suspected that concentrations may be close to the annual objective level. In addition, the Council operates two continuous monitors, one of which is located within AQMA No.1 on Chevallier Street, and the other being located just outside the periphery of AQMA No.5 on St Matthews Street.

Monitoring results in AQMA No 2. and AQMA No 5. still indicate NO2 concentrations above the air quality objective at various locations, and as such, no plans are being made to amend the boundary of these AQMAs. In light of this, the focus of this detailed assessment is on AQMA's No.1, 3 and 4.

This detailed assessment is based on diffusion tube readings placed out in and around the perimeters of AQMAs No.1, 3 and 4 over the last 6 years. It is also based on continuous monitor data obtained from the Chevallier Street monitor over the last 3 years.

In accordance with the current LAQM regime in the UK, a copy of this assessment will be appended to the Councils next Annual Status Report.

Diffusion Tube Analysis

Triplicate tubes reviewed in this assessment have been suitably checked for precision and accuracy and were found to have good precision overall. All diffusion tubes reviewed in the assessment had a high data capture rate (above 75%) with the exception of diffusion tube 31 in 2016. This tube was annualised in accordance with Box 7.9 in LAQM.TG(16).

All diffusion tube results have been suitably corrected for bias. A national bias correction factor was applied to results between 2014 – 2017. A locally derived bias correction factor

was used for the 2018 and 2019 results due to the resumption of automatic air quality monitoring at the Chevallier Street site, with a high rate of data capture (99% in 2018 and 98% in 2019).

Paragraph 1.51 of LAQM.TG(16) stated that likely exceedances of the objectives should be assessed in relation to 'the quality of the air at locations which are situated outside of buildings or other man-made structures, above or below ground, and where members of the public are likely to be regularly present'. Building facades of residential properties, schools, hospitals and care homes would all be relevant in terms of long-term annual mean objectives.

Where diffusion tube locations were not representative of annual mean exposure to relevant receptors, the data was distance corrected, where possible, using the Defra Nitrogen Dioxide fall off with distance calculator to estimate the annual mean NO2 concentration at the façade of the closest property.

Automatic Monitoring

The automatic monitor located on Chevallier Street (IPS3) used in this assessment is subject to fortnightly routine calibration by an Ipswich Borough Council Environmental Health Officer or Technical Officer. The analyser has also been serviced and the monitoring site audited biannually by Matts Monitors and Ricardo Energy & Environment respectively. The Chevallier Street monitor is co-located with triplicate tubes, numbers 45, 46, and 47 and is in AQMA No.1.

All automatic monitoring data collected is managed by Ricardo Energy & Environment using the same quality control procedures utilised by Defra's national air quality network stations. These procedures represent best practice and fully meet the requirements set out in LAQM.TG(16).

All collected data is screened and scaled (based on site calibrations) and the final data sets presented within this report have benefitted from a full process of data ratification, including thorough additional data quality checks that include site audits and a ratification process that corrects data for instrument sensitivity drift between routine calibrations.

Further details on the QA/QC for the air quality monitoring data can be found in the ASR's, Updating and Screening Assessments and Progress Reports on the Councils website.

Monitoring Data

The maps and tables below show the monitoring locations and annual mean NO2 concentrations within AQMAs No. 1, 3 and 4 for the period 2014 – 2019.

AQMA No.1

A map detailing the monitoring locations in and around the perimeter of AQMA 1 is shown below:

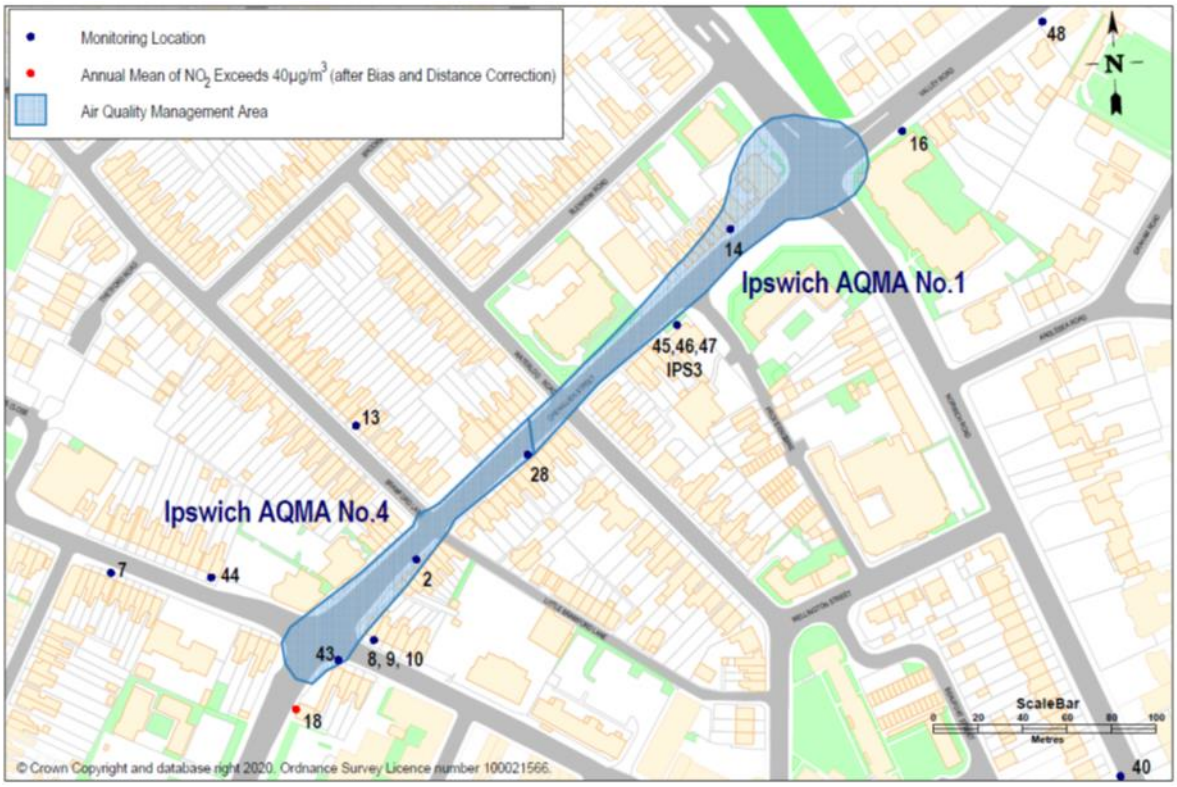


Figure 7: Monitoring Locations in and around AQMA 1

Table 1: Values of NO2 at façade for monitoring sites near AQMA 1 *(note: IPS3 is a continuous monitoring site)*

Monitoring site	In AQMA	Distance correction required	NO_2 Concentrations (µg/m^3) (unadjusted values not located at façade of relevant receptor provided in brackets)					
			2014 - NF	2015 - NF	2016 - NF	2017 - NF	2018 - LF	2019 - LF
IPS3	Y	Did not distance correct monitor data	N/A	N/A	N/A	29	28	26
DT45 (trip)	Y	Y	(29.6)	(29.1)	25.7 (27.4)	25.0 (26.5)	26.5 (28.3)	24.3 (25.7)
DT46 (trip)	Y	Y	(29.3)	(28.4)	25.7 (27.4)	25.0 (26.5)	26.5 (28.3)	24.3 (25.7)
DT47 (trip)	Y	Y	(28.6)	(28.0)	25.8 (27.6)	25.0 (26.5)	26.5 (28.3)	24.3 (25.7)
DT14	Y	Y	**45.7 (46.7)**	**46.2 (47.8)**	**45.9 (47.4)**	**43.7 (45.1)**	**43.5 (44.5)**	39.8 **(41.0)**
DT16	N	Y	(33.2)	(36.4)	32.2 (35.1)	33.6 (36.7)	32.0 (35.3)	30.3 (33.0)
DT48	N	Y	(27.1)	(27.4)	23.1 (27.1)	24.4 (28.8)	22.5 (26.5)	21.6 (25.0)

Bias Correction Factor used: NF – National Factor / LF – Local Factor
N/A – no data held

The results show that with the exception of DT14, all monitoring sites have been reading below the relevant objective for the last six years. DT14 is located on a narrow stretch of road, leading up to a roundabout that is often congested, particularly at peak times.

AQMA No.3

A map detailing the monitoring locations in and around the perimeter of AQMA 3 is shown below:

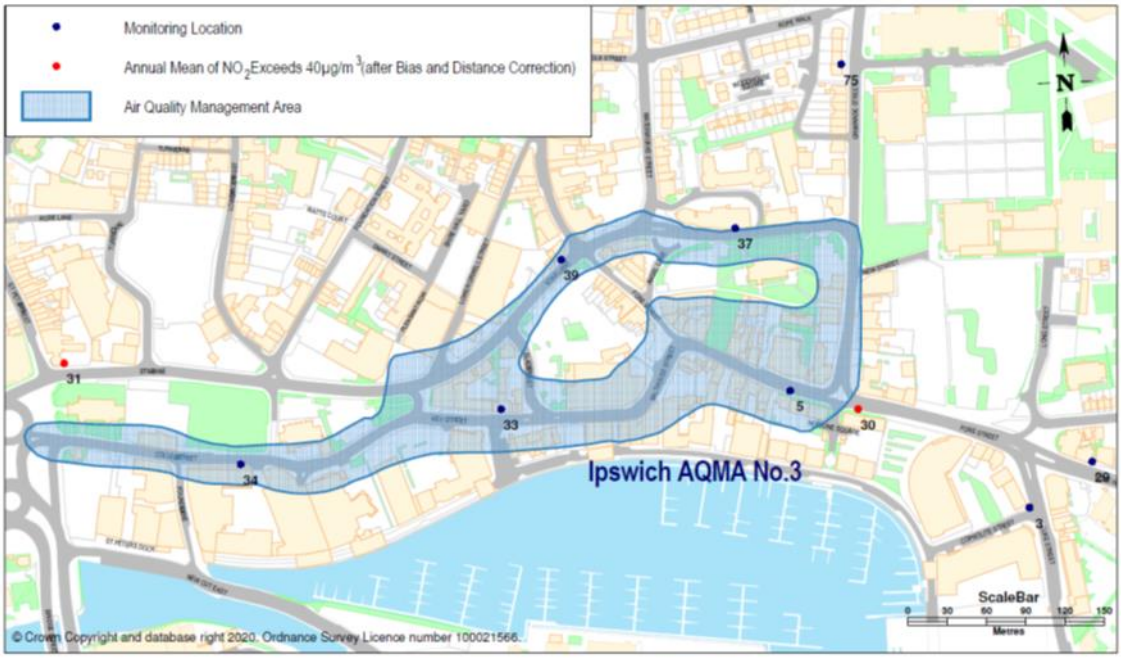


Figure 8: Monitoring Locations in and around AQMA 3

Table 2: Values of NO2 at façade for diffusion tube monitoring sites near AQMA 3

Monitoring Site	In AQMA	Distance correction required	NO_2 Concentrations (µg/m^3) (unadjusted values not located at façade of relevant receptor provided in brackets)					
			2014 - NF	2015 - NF	2016 - NF	2017 - NF	2018 - LF	2019 - LF
3	N	N/A	(28.8)	(27.9)	(26.6)	(26.0)	(26.9)	(26.1)
5	Y	Y	(39.8)	39.9 **(41.9)**	39.1 **(41.0)**	**42.0 (44.2)**	**40.6 (42.1)**	37.7 (39.0)
29	N	N	29.8	30.9	31.6	33.1	32.1	30.9
30	N	Y	(29.3)	**43.3 (47.4)**	**42.1 (46.2)**	**46.3 (51.0)**	**45.5 (48.7)**	**43.0 (45.9)**
31 (no receptor)	N	N/A	(32.4)	(33.7)	(35.5)	**(42.6)**	**(45.3)**	**(43.7)**
33	Y	N	32.9	32.9	33.0	33.4	34.0	32.1
34	Y	N/A	**(41.6)**	(38.2)	(37.0)	(39.8)	(38.6)	(32.9)
37	N	N/A 2014-2018 N - 2019	(24.1)	(24.9)	(23.7)	(24.7)	(25.0)	M 31.4
39	Y	N/A 2014-2018	(38.9)	**(42.2)**	**(40.7)**	**(42.7)**	**(42.6)**	M 37.0 **(41.2)**

		Y - 2019						
75	N	N	23.1	25.4	25.4	25.4	25.7	M 21.8

Bias Correction Factor used: NF – National Factor / LF – Local Factor
N/A – unable to distance correct to nearest exposure / no relevant exposure
M = Moved to new Location

Diffusion Tubes 3, 29, 33, 37 and 75 have remained below the relevant objective for the last six years. Diffusion tubes 37, 39 and 75 were relocated in 2019 to enable calculations of relevant exposure; all tubes remained below the objective level (DT75 was located on a building planned to be demolished, hence the relocation to a relevant receptor close to the monitoring site used between 2014-2018).

Although DT31 is above the annual objective level, there is no relevant exposure in the vicinity. Given the closest relevant exposure along St Peters Street is approximately 50 meters away, it is highly unlikely that there will be an exceedance at this location, particularly as traffic volume at this location is known not to be heavy. Furthermore, the Council has confirmed that there are no permanent residents of the Novotel hotel opposite DT31, hence the objective would not apply there. DT34 has continued to experience concentrations within 10% the annual objective level; it has not exceeded the objective level since 2014. Diffusion Tubes 5 and 39 have continued to experience concentrations above, or within 10% of the objective level for the last six years.

Diffusion Tube 30 is located approximately 8 meters outside of the existing AQMA and has remained consistently above the annual mean objective level since 2015. The tube is located near to a zebra crossing on a three-way junction as can be seen in the photographs below.

Photographs 1-3: Junction of Fore Street with Grimwade Street (location of DT30 is circled in red)

Photograph 1 – viewing junction from Fore Street facing West

Photograph 2 – viewing junction from Fore Street facing East

Photograph 3 – viewing junction from Grimwade Street

AQMA No.4

A map detailing the monitoring locations in and around the perimeter of AQMA 4 is shown below:

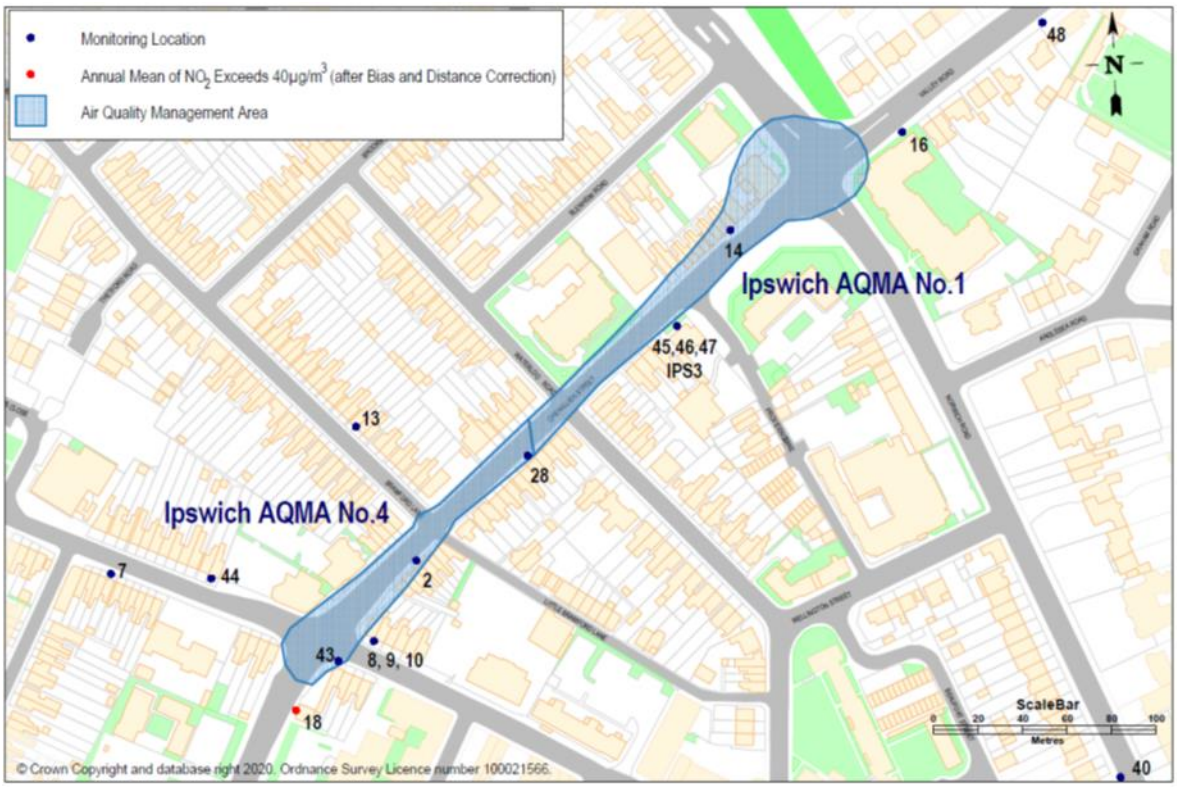


Figure 9: Monitoring Locations in and around AQMA 4

Table 3: Values of NO2 at façade for diffusion tube monitoring sites near AQMA 4

Tube	In AQMA	Distance correction required	NO_2 Concentrations (µg/m^3) (unadjusted values not located at façade of relevant receptor provided in brackets)					
			2014 – NF	2015 - NF	2016 - NF	2017 - NF	2018 - LF	2019 - NF
2	Y	Y	39.4 **(42.5)**	37.9 **(40.8)**	36.6 (39.4)	37.3 **(40.2)**	38.4 **(42.1)**	34.4 (37.5)
7	N	N	(32.4)	(32.6)	30.5	31.7	31.1	30.2
8 (trip)	N	Y	(32.7)	(33.7)	29.8 (34.5)	30.1 (35.2)	28.7 (33.6)	27.9 (32.3)
9 (trip)	N	Y	(33.1)	(34.3)	30.4 (35.3)	30.1 (35.2)	28.7 (33.6)	27.9 (32.3)
10 (trip)	N	Y	(32.9)	(33.8)	29.0 (33.5)	30.1 (35.2)	28.7 (33.6)	27.9 (32.3)
13	N	Y	(35.1)	(22.3)	21.8 (23.9)	22.3 (24.6)	21.6 (24.2)	21.1 (23.3)
18	N	N	29.5	29.5	28.4	27.0	28.1	**M 40.5**
28	Y	Y	(35.2)	(37.1)	31.7 (35.5)	32.2 (36.0)	33.6 (38.3)	30.8 (34.5)
43	Y	Y	(37.0)	39.9 **(40.4)**	36.7 (37.1)	38.7 (39.1)	37.3 (38.2)	34.7 (35.5)
44	N	Y	(36.7)	(36.6)	30.5 (37.4)	30.7 (37.6)	30.6 (37.6)	28.2 (34.0)

Bias Correction Factor used: NF – National Factor / LF – Local Factor
N/A – no data held
M = Moved to new Location

The results show that all monitoring sites within AQMA No.4, once bias corrected and distance adjusted for relevant exposure, have been reading below the relevant objective for the last six years.

Diffusion tube 18 was relocated to the front of the same residential property in 2019 and experienced a marginal exceedance in the same year. At the time of writing this report, current monitoring results at this location in 2020 indicate that this location will not experience an exceedance of the annual objective level in 2020.

Analysis of Trends in NO_2 Monitoring Data

According LAQM TG.(16), when considering whether to revoke or amend an AQMA, local authorities should consider measurements for several years or more (i.e. three to five years). They should also investigate national trends and local influences that may be affecting the AQMA. The guidance also states that when conducting trend analysis, ideally more than five years' worth of data should be assessed to demonstrate whether trends are statistically significant. The reason for this is because changes in concentrations occur from year to year due to meteorological conditions. Given that the Council has obtained six

years of data for most of the monitoring sites used in this review, it can be confident of the findings.

This section considers the trends in annual mean concentrations measured in the period 2014-2019 within AQMAs 1, 3 and 4 against the annual mean objective level of 40µg/m3. Figures 10 – 12 present the same information from Tables 1-3 in graphical form.

LAQM.TG (16) states that “it can be considered that exceedances of the NO2 1-hour objective may occur at roadside sites if the annual mean is above 60µg/m3”. From the above tables it is clear that monitoring values at all sites for the last six years are significantly below the annual mean value of 60µg/m3. Therefore, the Council does not consider there to be a risk of exceedance of the hourly objective at any site.

AQMA No.1 - Trends in NO2 concentrations

Figure 10 below shows that although concentrations exhibit a small year on year variability, the overall trend is for concentrations to have declined since 2014. With the exception of DT14, once bias and distance corrected, all sites have experienced concentrations below the objective since 2014.

Although DT14 recorded an annual mean of 39.8 µg/m3 in 2019, the Council is not confident that levels will not exceed the objective in future years. In light of this the AQMA will not be revoked.

However, despite the concerns around DT14 exceeding the objective, the Council concludes that is unlikely that an exceedance of the annual mean objective for NO2 will occur at other locations within or around the perimeter of AQMA 1 in the foreseeable future. Diffusion tubes 45, 46, and 47 have read under 30µg/m3 since 2014, and the co-located automatic monitor IPS3 has also read below 30µg/m3 since its reinstatement in 2017.

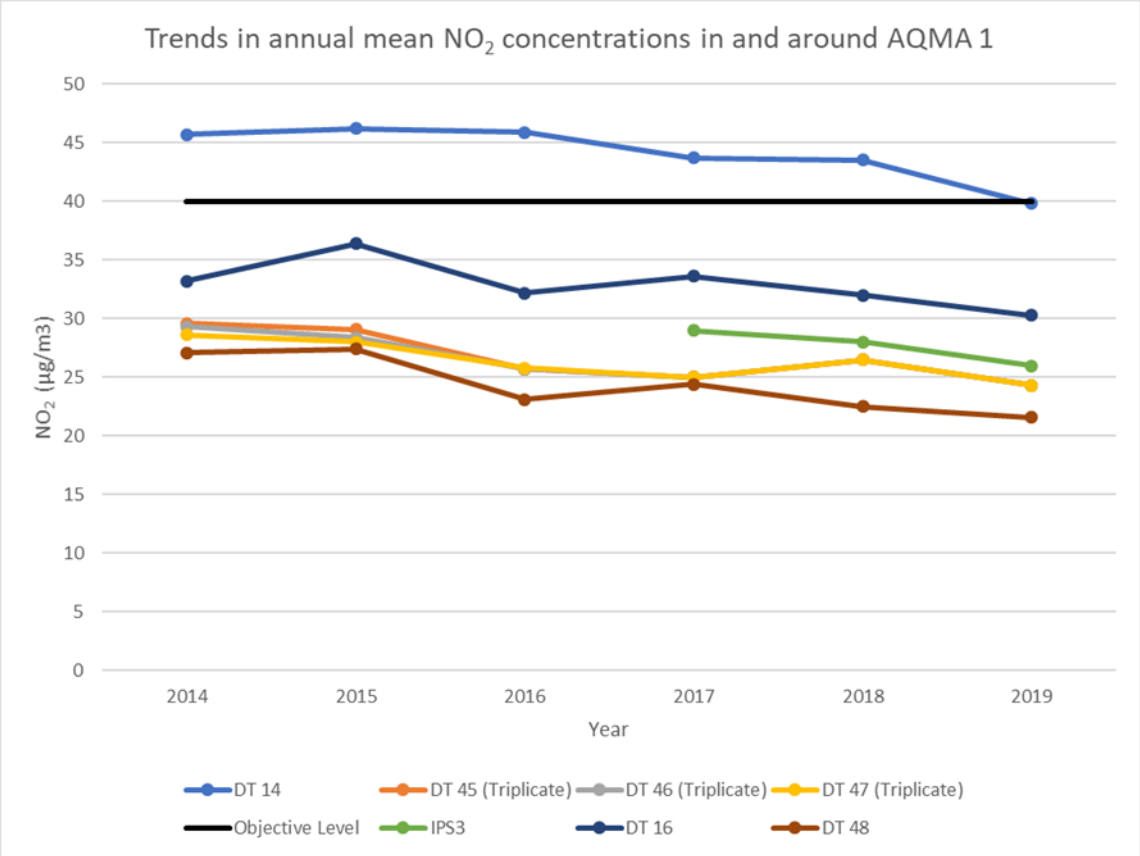


Figure 10: Trends in annual mean NO2 concentrations in and around AQMA 1

AQMA No.3 - Trends in NO2 concentrations

Figure 11 below shows that within and around AQMA 3, the picture is mixed. Of particular note is DT30 which is located just outside the perimeter of the AQMA. Unfortunately, concentrations at this site have remained about the annual objective level since 2015, with a peak recorded concentration of 46.3 µg/m3 in 2017 following bias and distance correction.

Concentrations at DT5 have varied slightly year on year, although they have essentially remained static since 2014.

Although DT31 is above the annual objective level, with a marginal upward trend, there is no relevant exposure in the vicinity for the purposes of the air quality objectives. DT31 is close to the junction of Star Lane and St Peters Street and was placed in that position to help define the boundary of AQMA 3.

Despite the small year on year variability, there is a marginal downward trend at DT34 since 2014. It should be noted however that the Council are unable to distance correct to the nearest exposure from this location.

Concentrations at DT37 have remained essentially static since 2014 until an increase to 31.4µg/m3 in 2019. However, this is likely as a result of the site being moved in 2019 to enable the calculation of relevant exposure.

Concentrations at DT39 have also varied slightly year on year, although they have essentially remained static since 2014. The site was relocated to the opposite side (north-western side) of the Star Lane/Fore Street junction in 2019 to enable the calculation of relevant exposure.

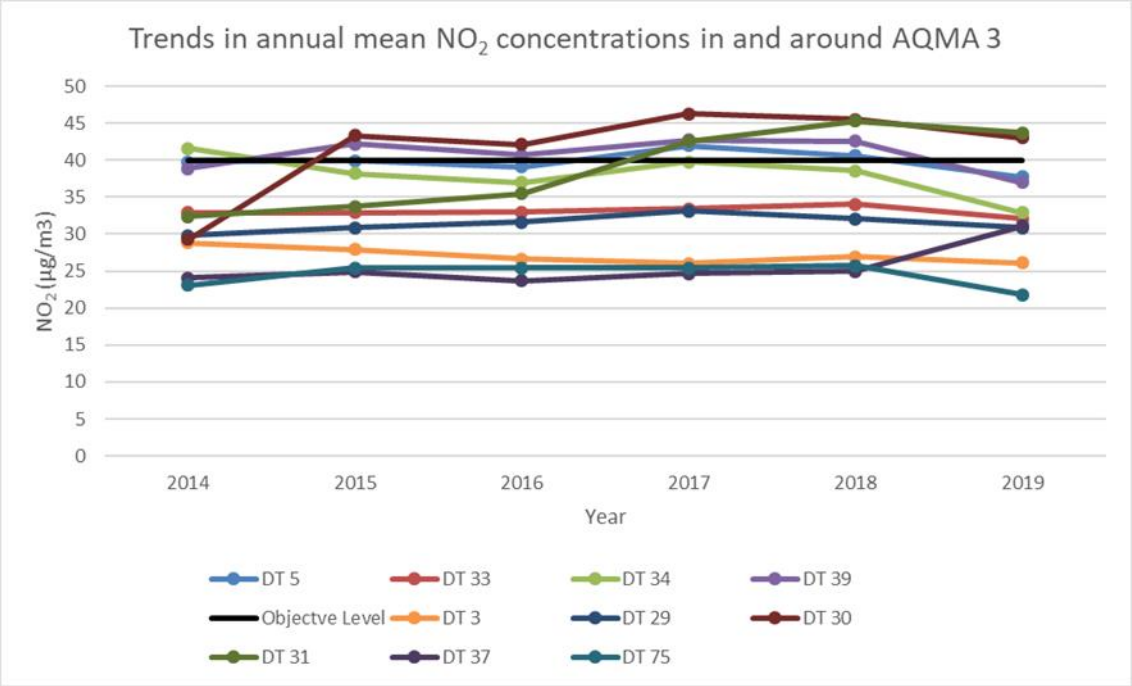


Figure 11: Trends in annual mean NO2 concentrations in and around AQMA 3

AQMA No.4 - Trends in NO2 concentrations

Figure 12 below shows a general downward trend over the last six years. Once bias corrected and distance adjusted for relevant exposure, all sites have experienced concentrations below the relevant objective for the last six years. It is therefore concluded that is very unlikely that an exceedance of the annual mean objective for NO2 will occur within AQMA 4 in the foreseeable future.

It is recommended that the AQMA No.4 is revoked.

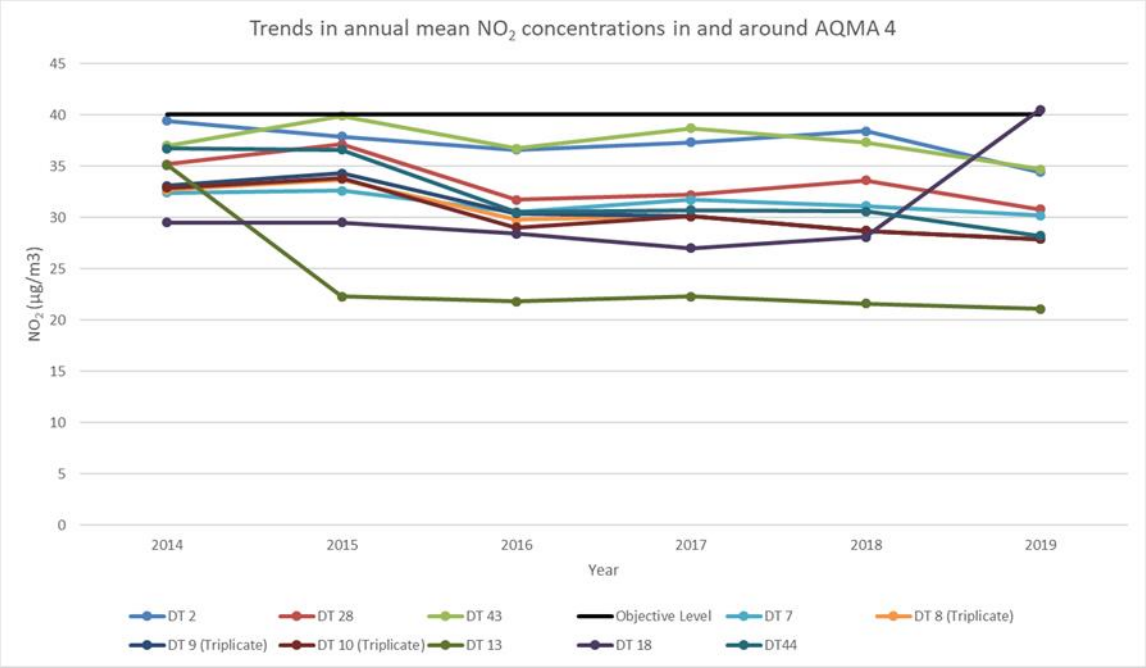


Figure 12: Trends in annual mean NO2 concentrations in and around AQMA 4

Diffusion tube 18 was relocated to the front of the same residential property in 2019 and experienced a marginal exceedance in the same year. At the time of writing this report, current monitoring results at this location in 2020 indicate that this location will not experience an exceedance of the annual objective level in 2020. Given this marginal exceedance, it is unlikely to provide sufficient evidence to fast track a declaration of an AQMA. The Council has discussed this exceedance with the LAQM helpdesk who supported this decision. Additional monitoring at this location is required in order to make an informed decision for the declaration of a new AQMA in line with the guidance for declaration in LAQM. PG(16).

Setting the AQMA boundaries

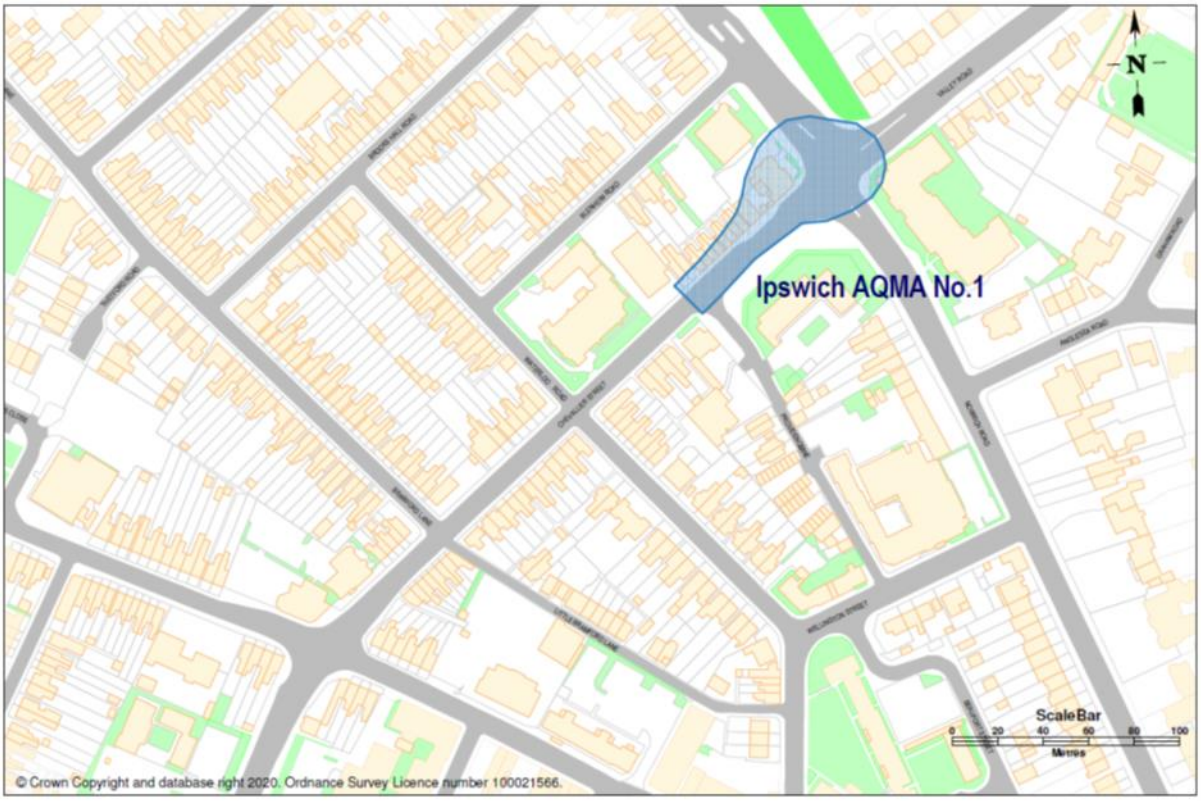
Local authorities have a duty under section 83(1) of the 1995 Environment Act to designate those areas where air quality objectives are unlikely to be, or are not being, met as air quality management areas. These areas have to be designated officially by means of an ‘order’.

Setting the boundary of an air quality management area involves an element of judgement and can vary from the designation of an isolated property to designation of a whole local authority area. However, the air quality management area must encompass all known and predicted areas of exceedance where there is relevant exposure. The local authority can base AQMAs on geographical or man-made features or roads rather than individual properties.

Boundaries of AQMAs 1 and 3 are still generally relevant, but there could be some boundary changes where areas within the AQMAs have been found to be achieving the objective levels or objective levels are exceeded at areas outside of the existing AQMAs.

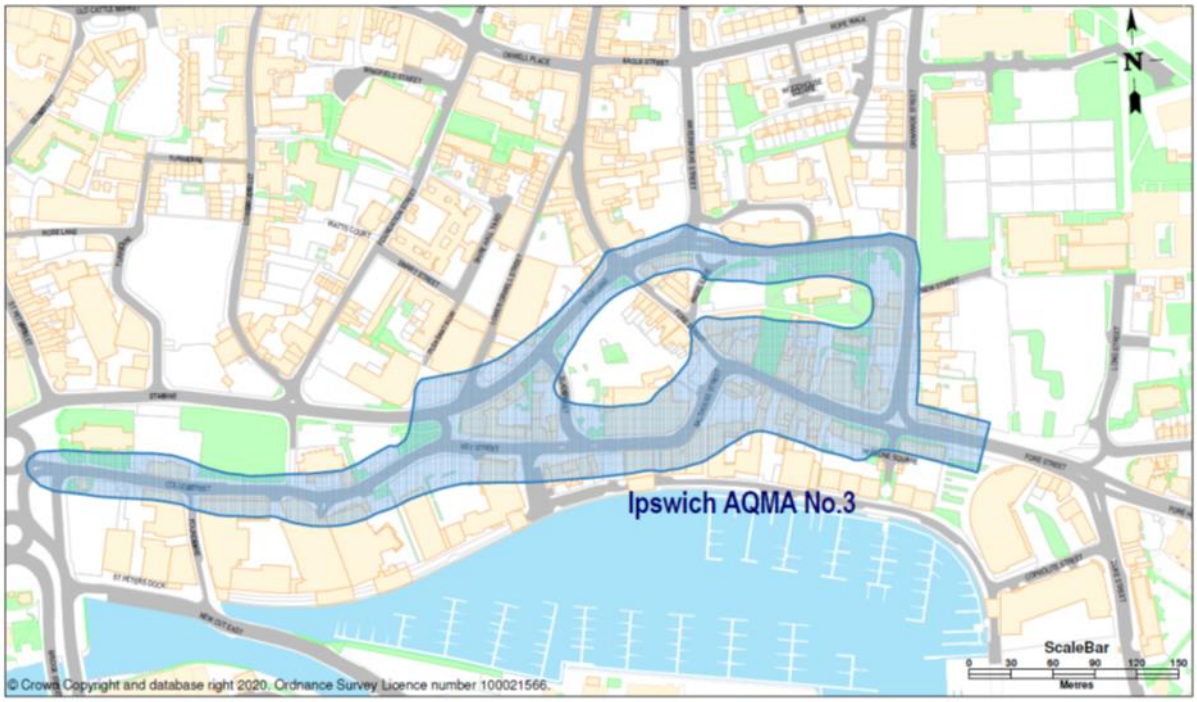
Figures 13 and 14 show the proposed areas to be covered by the amended boundaries to AQMAs 1 and 3 respectively. These have been drawn taking into consideration monitoring locations and traffic flows, and are subject to further consultation with Members of the Council, Suffolk County Council as Highways Authority, and the public. Suffolk County Council Highways has already been consulted to consider the practicalities of the proposed AQMA area with regard action planning and transport. Suffolk County Council made no comment on this assessment other than they have no funding to review the traffic management arrangements in this area.

Figure 13: Recommended area to covered by the amended boundary to AQMA No.1



Monitoring over the last six years has shown that it is unlikely that there will be exceedances of the nitrogen dioxide annual average objective level on the length of Chevallier Street from the junction with Providence Lane to the southwestern perimeter of the AQMA. The AQMA Order will therefore be amended/varied and reduced in size whilst still covering the current areas of exceedance of the objective level along Chevallier Street and a small area on Norwich Road roundabout.

Figure 14: Recommended area to be covered by the amended boundary to AQMA No.3



Due to a persistent exceedance of DT30, it is proposed that the south-eastern boundary of the AQMA is extended to include a further length of Fore Street. The proposed boundary extension will cover additional relevant receptors on the eastern side of the three-way junction between Fore Street and Grimwade Street.

Monitoring results further towards the junction of Fore Hamlet, Back Hamlet and Duke Street (DT3, DT29) have not shown any exceedances of the objective level, so it is not proposed to extend the boundary as far as this junction. Furthermore, DT75 on Grimwade Street has remained below objective level for the last six years so no alterations to the north-eastern boundary are proposed.

It should be noted that there will be some areas within the proposed AQMA that will not be exceeding the annual mean nitrogen dioxide objective level but for the purposes of action planning and administration are included.

Due to NO2 concentrations remaining below the annual mean objective level for the last six years, it is proposed that AQMA No.4 is revoked.

Estimating Population Exposure

Local authorities are required to estimate the number of people exposed to pollutant concentrations above the objective levels, and the maximum pollutant concentration at a relevant receptor location.

Defra inform that it is the population within the exceedance area that is of interest, and not the population within the AQMA. Total relevant exposure has been estimated within the area using GIS and manual surveys.

Defra inform that Authorities should assume that the residential population is representative of exposure within the exceedance area.

The total population for the area of exceedance in AQMA 1 is estimated to be 25. The maximum pollutant concentration at a relevant receptor location was 41.0µg/m3 (distance corrected to 39.8µg/m3) in 2019 measured by diffusion tube.

The total population for the area of exceedance in AQMA 3 is estimated to be 191. The population within the proposed AQMAs is greater than this. The maximum pollutant concentration at a relevant receptor location was 45.9µg/m3 (distance corrected to 43.0µg/m3) in 2019 measured by diffusion tube.

Conclusions and Recommendations

Monitoring of nitrogen dioxide indicates that there are several locations across Ipswich where the annual average objective level for nitrogen dioxide is exceeded. Most of these locations fall within existing AQMAs, but there is a location just outside the scope of AQMA No.3 where it does not. There are areas of the existing AQMA No.1 where monitoring indicates that there is no continuing exceedance of the objective level. Furthermore, monitoring indicates that there is no continuing exceedance of the annual average objective level in AQMA No.4.

The Council view the marginal exceedance of diffusion tube 18 for one year as insufficient evidence for concluding whether to declare a new AQMA at this location. At the time of writing this assessment, it appears that this location will not exceed the annual mean objective level in the year 2020. Additional monitoring at this location is required in order to make an informed decision for the declaration of a new AQMA in line with the guidance for declaration in LAQM. PG(16).

In light of the above, it is recommended that the following actions are taken:

- The boundary of AQMA No. 3 is amended (marginally increased).

- The boundary of AQMA No. 1 is amended (decreased).
- AQMA No. 4 is revoked.

As such, and following approval of this report by Defra, consultation will take place with members of the council, the statutory consultees and the public. Following consultation, and assuming approval of the proposed actions by the local authority Executive, it is recommended that amendments/variations are made to two of the five existing AQMAs, and one AQMA is revoked.

Following any amendment of AQMA No.3, the Council will look to review the current AQAP and establish if there are any additional measures that can be included to help address the additional exceedance at site DT30.

Monitoring will continue within and around the AQMAs, at locations close to exceeding the objective level, or where exceedance has historically occurred. Further changes to the AQMAs will be made as and when required, dependent on the outcome of any Further Assessment and future monitoring or air quality modelling results.

Glossary of Terms

Abbreviation	Description
AQAP	Air Quality Action Plan - A detailed description of measures, outcomes, achievement dates and implementation methods, showing how the local authority intends to achieve air quality limit values'
AQMA	Air Quality Management Area – An area where air pollutant concentrations exceed / are likely to exceed the relevant air quality objectives. AQMAs are declared for specific pollutants and objectives
ASR	Annual Status Report
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 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.TG16. April 2021. Published by Defra in partnership with the Scottish Government, Welsh Assembly Government and Department of the Environment Northern Ireland.
- Local Air Quality Management Policy Guidance LAQM.PG16. May 2016. Published by Defra in partnership with the Scottish Government, Welsh Assembly Government and Department of the Environment Northern Ireland.