

2024 Air Quality Annual Status Report (ASR)

In fulfilment of Part IV of the Environment Act 1995 Local Air Quality Management, as amended by the Environment Act 2021

Date: June, 2024

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Executive Summary: Air Quality in Our Area

Air Quality in Ipswich Borough

Breathing in polluted air affects our health and costs the NHS and our society billions of pounds each year. Air pollution is recognised as a contributing factor in the onset of heart disease and cancer and can cause a range of health impacts, including effects on lung function, exacerbation of asthma, increases in hospital admissions and mortality. In the UK, it is estimated that the reduction in healthy life expectancy caused by air pollution is equivalent to 29,000 to 43,000 deaths a year¹.

Air pollution particularly affects the most vulnerable in society, children, the elderly, and those with existing heart and lung conditions. Additionally, people living in less affluent areas are most exposed to dangerous levels of air pollution².

Table ES 1 provides a brief explanation of the key pollutants relevant to Local Air Quality Management and the kind of activities they might arise from.

Pollutant	Description
Nitrogen Dioxide (NO ₂)	Nitrogen dioxide is a gas which is generally emitted from high- temperature combustion processes such as road transport or energy generation.
Sulphur Dioxide (SO ₂)	Sulphur dioxide (SO ₂) is a corrosive gas which is predominantly produced from the combustion of coal or crude oil.
Particulate Matter (PM ₁₀ and PM _{2.5})	 Particulate matter is everything in the air that is not a gas. Particles can come from natural sources such as pollen, as well as human made sources such as smoke from fires, emissions from industry and dust from tyres and brakes. PM₁₀ refers to particles under 10 micrometres. Fine particulate matter or PM_{2.5} are particles under 2.5 micrometres.

Table ES 1 - Description of Key Pollutants

¹ UK Health Security Agency. Chemical Hazards and Poisons Report, Issue 28, 2022.

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

In order to comply with its duty to review the air quality within its area, Ipswich Borough Council (IBC) monitors nitrogen dioxide (NO₂) levels within the town using two automatic monitors located on St Matthews Street and Chevallier Street and a total of 96 diffusion tubes positioned at 86 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.

Currently, Ipswich Borough Council has a total of four AQMAs, all due to continued exceedance of the annual mean NO₂ objective level:

- *Ipswich AQMA No.1* Encompassing the land in and around the junction of Norwich Road, Chevallier Street and Valley Road, this area extends along Chevallier Street to the junction with Providence Lane. (declared 2006; amended in 2017 and 2021);
- 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 Encompassing the land in and around College Street, Key Street, Salthouse Street, Fore Street, Star Lane, Neptune Square and Grimwade Street. (declared 2006; amended in 2017 and 2021);
- 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 <u>Ipswich Borough Council's AQMA webpage</u> on the <u>DEFRA</u> website.

Following the amendment of AQMA Nos. 1 to 3 and the revocation of AQMA No. 4 (Incorporating the Bramford Road / Yarmouth Road / Chevallier Street junction and part of Chevallier Street (declared 2010)) in August 2021, Ipswich Borough Council worked closely with the local Highway Authority, Suffolk County Council and other stakeholders, including Public Health, to update the 2019 - 2024 Air Quality Action Plan (AQAP). The updated AQAP was published in October 2021.

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

When comparing the 2023 bias adjusted results to the 2022 results; in 2022 there were three recorded exceedances which are the same three sites that were within 10% of the annual mean NO_2 objective level in 2023 (one site located within AQMA 2 and two sites located within AQMA 5).

For the fifth year in a row, there were no exceedances of the annual mean NO₂ objective level in AQMA 1. However, in 2019, Tube 14 within AQMA recorded a concentration within 10% below the annual mean NO₂ objective level. Despite this, AQMA 1 has experienced four consecutive years of annual mean concentrations being lower than 36µg/m³. In line with LAQM.TG22, the Council have conducted a detailed assessment with regards to the revocation of AQMA 1. The detailed assessment was submitted to the LAQM helpdesk for appraisal and is attached to Appendix E. DEFRA has agreed that the AQMA is no longer required and advised the Council to submit an AQMA revocation order, as concentrations of NO₂ have shown to be below the annual mean objective level for five years. The Council will now take the next steps to determine whether it is appropriate to revoke this AQMA, which includes consultation with members of the council, statutory consultees and the public.

Figures A.1 – A.11 shows bias corrected trendline plots for clusters of passive monitoring locations in and around each of the 4 AQMAs. Despite AQMA 4 being revoked in August 2021, it is included for transparency to help demonstrate that it was appropriate to revoke the AQMA due to continued NO_2 concentrations under the national objective level.

When looking at the bias corrected data for 2023, annual mean NO₂ concentrations have generally increased slightly compared to the previous two years. However, concentrations have generally remained below 2019 levels. It is likely that the increase in concentrations in 2021 - 2023 compared to 2020 was linked to the relaxation and removal of Government restrictions associated with the COVID-19 pandemic. Further changes to emissions will be reported on in subsequent ASR's.

LAQM Annual Status Report 2024

Actions to Improve Air Quality

Whilst air quality has improved significantly in recent decades, there are some areas where local action is needed to protect people and the environment from the effects of air pollution.

The Environmental Improvement Plan³ sets out actions that will drive continued improvements to air quality and to meet the new national interim and long-term targets for fine particulate matter (PM_{2.5}), the pollutant most harmful to human health. The Air Quality Strategy⁴ provides more information on local authorities' responsibilities to work towards these new targets and reduce fine particulate matter in their areas.

The Road to Zero⁵ details the Government's approach to reduce exhaust emissions from road transport through a number of mechanisms, in balance with the needs of the local community. This is extremely important given that cars are the most popular mode of personal travel and the majority of Air Quality Management Areas (AQMAs) are designated due to elevated concentrations heavily influenced by transport emissions.

Delivery of Defra grant funded monitoring and behavioural change campaign focused on domestic burning.

The Council was awarded £115,632 from Defra in March 2022 as part of its Air Quality Grant Programme. The two-year project is focused on a monitoring and behavioural change campaign around domestic burning. Data collected as part of the burning experiments will be used in behaviour change materials. As part of the grant, the Council arranged the installation of a FIDAS analyser which has been gathering data since May last year. The Council are committed to delivering this project to help better inform the public on the harmful impact of domestic burning and to reduce concentrations of particulate matter. At the time of writing this report, the Council have prepared social media posts following the collection and analysis of data from the indoor winter burning period in 2023. Furthermore, we will shortly be collaborating with the Suffolk Fire and Rescue Service to conduct a range of outdoor domestic burning experiments measuring

³ Defra. Environmental Improvement Plan 2023, January 2023

⁴ Defra. Air Quality Strategy – Framework for Local Authority Delivery, August 2023

⁵ DfT. The Road to Zero: Next steps towards cleaner road transport and delivering our Industrial Strategy, July 2018

concentrations of particulate matter. For more information visit Domestic Burning in

Ipswich.





Find out more at: www.ipswich.gov.uk/domestic-burning-ipswich

Continued commitment to zero emission fleet

The Council's 3-year replacement plan for small vehicle fleet to zero emission was concluded in 2022. However, the Council are committed to reducing emissions within the fleet. Currently the fleet composition now includes 26.04 % EV, 30.21 % ULEV, 34.84 % Low Emission vehicles. Within the 2024/2025 budget 20 vehicles are due to be replaced with zero emission fleet. The aim of the vehicle replacement plan is in line with the Councils Climate Change Strategy and Action Plan. This aims to reduce CO2 to net zero by 2030, with vehicles being zero emissions or as low as reasonably practicable by the same date. This will have the co-benefit of eliminating exhaust emissions of nitrogen dioxide and particulate matter.

Funding boost for new and existing bus services across Suffolk

Suffolk County Council have been awarded £3.7m (over two years) from the Department for Transport's Bus Service Improvement Fund Phase 2 to deliver improvements to public transport in Suffolk. Funding is now in the process of being allocated to bus operators and some community-based schemes. In the main these relate to new or enhanced bus services. Measures have been delivered to improve bus punctuality and reliability including a new bus lane on West End Road, Ipswich, part of the Park and Ride route from Copdock to Ipswich town centre.

Suffolk EV Infrastructure Strategy and LEVI funding



The <u>Suffolk EV Infrastructure Strategy</u> has now been published. The EV Strategy will be reviewed on a two-year basis to ensure the size and scale of charge point installation takes place ahead of the forecasted need from drivers, commercial trends and in line with the national policy.

The County Council have been allocated £7.3 million to develop EV charging across the County as part of the Government's Local Electric Vehicle Infrastructure (LEVI) fund. £5.9 million has been provided for Suffolk residents without off-street parking, and a further £1.4 million will be

used to develop the county's existing EV charging network. Funding will provide opportunities to develop kerbside and car park charging points, community charging hubs and fast and rapid charging point infrastructure improvements.

Conclusions and Priorities

Since 2020, the Council have used a combined local bias correction factor as a result of a high data capture rate from both of our continuous analysers. However, due to the issues with the analyser at Chevallier Street in 2022 and 2023, the Council decided to apply the national bias adjustment factor to the data again this year to give robust, conservative results.

Once bias adjusted using the national factor and distance corrected, the nitrogen dioxide diffusion tube data for 2023 shows that the national air quality objective for mean annual NO₂ concentrations was not exceeded at any monitoring locations. Three sites were recorded as within 10% of the annual mean NO₂ objective level. These sites were located within AQMAs 2 and 5.

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

• To continue to work towards implementing the measures in the existing AQAP and to develop and implement a new Air Quality Action Plan.

- DEFRA has agreed that the AQMA 1 is no longer required to remain should the Council wish to submit an AQMA revocation order, as concentrations of NO2 have shown to be below the annual mean objective level for five years. The Council can now consider taking the next steps to determine whether it is appropriate to revoke this AQMA.
- 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; the Low Emissions SPD (adopted in November 2021) should assist with this.
- The Council was awarded £115,632 from Defra in March 2022 as part of its Air Quality Grant Programme. The two-year project is focused on a monitoring and behavioural change campaign around domestic burning. Delivering this project will be a key priority for the Council over the next reporting period.

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 NO₂, PM₁₀ 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 <u>Way</u> 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 <u>Zap Map website</u> for locations of charging points.
- Consider car sharing to reduce emissions and save money. See the <u>Suffolk Car</u>
 <u>Share website</u> 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 <u>environmental.health@ipswich.gov.uk</u>.

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 <u>Defra website</u>.

Local Responsibilities and Commitment

This ASR was prepared by the Environmental Health Department of Ipswich Borough Council with the support and agreement of the following officers and departments:

Council with the support and agreement of the following departments:

Public Protection, Ipswich Borough Council

• Principal Environmental Health Officer (Environmental Protection)

• Environmental Health Officer (Environmental Protection)

Planning and Development, Ipswich Borough Council

- Operations Manager Planning and Development
- Planning Policy Team Leader

Culture and Environment, Ipswich Borough Council

• Climate Change Project Officer

Growth, Highways and Infrastructure, Suffolk County Council

- Transport Policy & Development Manager
- Senior Principal Transport Planner
- Behaviour Change Manager

Public Health and Communities, Suffolk County Council

• Health Protection Manager

This ASR has been approved by the Assistant Director for Communities (Ipswich Borough Council.

This ASR has been signed off by a Director of Public Health.

If you have any comments on this ASR please send them to Environmental Health at: Ipswich Borough Council, Grafton House, Ipswich, Suffolk, IP1 2DE

Telephone: 01473 433115

Email: environmental.health@ipswich.gov.uk

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1 Local Air Quality Management

This report provides an overview of air quality in Ipswich Borough during 2023. It fulfils the requirements of Local Air Quality Management (LAQM) as set out in Part IV of the Environment Act (1995), as amended by the Environment Act (2021), and the relevant Policy and Technical Guidance documents.

The LAQM process places an obligation on all local authorities to regularly review and assess air quality in their areas, and to determine whether or not the air quality objectives are likely to be achieved. Where an exceedance is considered likely the local authority must declare an Air Quality Management Area (AQMA) and prepare an Air Quality Action Plan (AQAP) setting out the measures it intends to put in place in order to achieve and maintain the objectives and the dates by which each measure will be carried out. This Annual Status Report (ASR) is an annual requirement showing the strategies employed by 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 18 months. The AQAP should specify how air quality targets will be achieved and maintained, and provide dates by which measures will be carried out.

A summary of AQMAs declared by Ipswich Borough Council can be found in Table 2.1. The table presents a description of the four 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:

• NO₂ annual mean less than 40µg/m³;

DEFRA has agreed that the AQMA 1 is no longer required and advised the Council to submit an AQMA revocation order, as concentrations of NO₂ have shown to be below the annual mean objective level for five years. The Council will now take the next steps to determine whether it is appropriate to revoke this AQMA, which includes consultation with members of the council, statutory consultees and the public (see Appendix E for the detailed assessment in relation to this AQMA).

Table 2.1 – D	eclared Air	Quality	Managem	ent Areas
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AQMA Name	Date of Declaration	Pollutants and Air Quality Objectives	One Line Description	Is air quality in the AQMA influenced by roads controlled by Highways England?	Level of Exceedance: Declaration	Level of Exceedance: Current Year	Number of Years Compliant with Air Quality Objective	Name and Date of AQAP Publication	Web Link to AQAP
lpswich AQMA No.1	Declared 11/04/2006 Amended 12/09/2017 Amended 19/09/2021	NO2 Annual Mean	Encompassing the land in and around the junction of Norwich Road, Chevallier Street and Valley Road, this area extends along Chevallier Street to the junction with Providence Lane	NO	50µg/m3	32	5 years	Ipswich Borough Council Air Quality Action Plan 2019- 2024 (updated 2021)	https://www.ipswich.gov. uk/sites/www.ipswich.gov uk/files/air quality actio n_plan_2019- 2024 updated 2021.pdf
lpswich 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	NO	45µg/m3	37	1 year	Ipswich Borough Council Air Quality Action Plan 2019- 2024 (updated 2021)	https://www.ipswich.gov. uk/sites/www.ipswich.gov .uk/files/air_quality_actio n_plan_2019- 2024_updated_2021.pdf

AQMA Name	Date of Declaration	Pollutants and Air Quality Objectives	One Line Description	Is air quality in the AQMA influenced by roads controlled by Highways England?	Level of Exceedance: Declaration	Level of Exceedance: Current Year	Number of Years Compliant with Air Quality Objective	Name and Date of AQAP Publication	Web Link to AQAP
			Road to just beyond the junction with Argyle Street.						
lpswich AQMA No.3	Declared 11/04/2006 Amended 12/09/2017 Amended 19/08/2021	NO2 Annual Mean	Encompassing the land in and around College Street, Key Street, Salthouse Street, Fore Street, Star Lane, Neptune Square and Grimwade Street.	NO	50µg/m3	35	4 years	Ipswich Borough Council Air Quality Action Plan 2019- 2024 (updated 2021)	https://www.ipswich.gov. uk/sites/www.ipswich.gov .uk/files/air_quality_actio n_plan_2019- 2024_updated_2021.pdf
lpswich 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	49µg/m3	39	1 year	Ipswich Borough Council Air Quality Action Plan 2019- 2024 (updated 2021)	https://www.ipswich.gov. uk/sites/www.ipswich.gov .uk/files/air_quality_actio n_plan_2019- 2024_updated_2021.pdf

☑ 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 accepted for all sources and pollutants."

Ipswich Borough Council has taken forward a number of direct measures during the current reporting year of 2024 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 2024 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 (updated 2021). 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 includes 26.04% EV, 30.21% Ultra Low Emission and 34.84% Low Emission electric vehicles.
- EV charging infrastructure continues to be installed at the Council's offices and Council owned car parks.
- The updated <u>Suffolk anti-idling campaign</u> has been launched.
- The Introduction of a Hackney Carriage and Private Hire Licensing Policy 2022-2025 which sets standards in relation to vehicle age to help reduce the levels of pollutants emitted from the local taxi fleet.
- The Councils <u>Low Emissions SPD</u> was adopted in November 2021 which requires developers to mitigate against air quality impacts arising from development.
- The Councils Local Plan was adopted in March 2022 which includes a policy on Air Quality.
- The Council has success in obtaining grant funding from Defra under the 2021 Air Quality Grant Programme to run a campaign around domestic burning. Unfortunately, the Government has currently withdrawn additional funding under the

air quality grant scheme. The Council will look to bid for grant funding opportunities if they become available again in the future.

- Although not a specific measure listed within the AQAP, an <u>Air Quality Profile</u> for Suffolk has been produced. The report maps, at a district and borough level, local air pollution levels and explores evidence-based interventions that can be undertaken by local authorities, businesses, communities and individuals to improve air quality.
- Although not a specific measure listed within the AQAP, Suffolk County Council have also published their <u>Air Quality Strategy and Action Plan</u>. A key element of the Air Quality Strategy is a public engagement plan which has been developed to increase public awareness of the health impacts of air quality in Suffolk, enabling individuals to make choices that protect both their health and the health of others from the harmful effects of pollution. The delivery of the strategy will be closely monitored by the council to ensure it is accomplishing what it has set out to do. The strategy will also feed into the collective work of the Suffolk Health and Wellbeing Board. Every quarter a monitoring report is published on the Healthy Suffolk website setting out progress against each of the actions identified in the Strategy. At the time of writing this report, a strategy review and update was scheduled for May 2024.

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

- 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 (Measure D1). Although the project is due to conclude early 2025, the key information and materials in connection with the project should be finalised in 2024.
- The development and publication of a new Air Quality Action Plan. It is likely that several measures from the Council's existing action plan will be taken forward with a range of new measures to continue to reduce the concentrations of NO2 (and particular matter) within and outside of AQMAs. A number of measures within the existing AQAP are considered to be educational/promotional in nature (such as Measure A1 - Development and implementation of an anti-idling campaign and Measure A2 - Campaign to raise awareness of air quality issues in schools near

AQMAs to subsequently influence behavioural change and improve air quality near schools), hence why these will continue into the future AQAP.

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

- To continue to work towards implementing the measures in the existing AQAP and to develop and implement a new Air Quality Action Plan. In conjunction with work procured by Suffolk County Council, Ricardo have been appointed to undertake a study to determine the feasibility of introducing an option or package of options aimed at reducing air pollution from road transport within the borough of Ipswich, with particular focus on the urban area settlements and the AQMAs. This work will include a source apportionment study and will likely feed into the development of the new AQAP.
- Following advice from DEFRA, to take the next steps in considering whether to submit an AQMA revocation order for AQMA 1.
- To continue to monitor air quality across lpswich as this is essential for informing our air quality work and developing measures that can provide potential improvements.
- 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.
- 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 progress the Councils monitoring and behavioural change campaign focused on domestic burning.
- To continue to deliver anti-idling events using the updated Suffolk anti-idling campaign materials.

Ipswich Borough Council worked to implement these measures in partnership with the following stakeholders during 2023:

- Suffolk County Council Public Health, Highways, Fire and Rescue Service
- Neighbouring district and borough Councils in Suffolk
- The University of Suffolk

• Ipswich and East Suffolk Clinical Commissioning Group

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.

Progress on the following measures has been slower than expected:

- The delivery of air quality messages on IBC procured variable messaging signs.
 The signs have been installed but the contract surrounding their use has lapsed.
 This has meant that there is a delay on allowing air quality messages to be used.
 The Council are in the process of rectifying the issue as soon as possible.
- Work with other Bus Operators in the town to encourage the renewal of their fleets

 The current economic climate and limited funding from Government has meant that the operators have very little spare funding to invest in new fleet.
- Supporting, where appropriate, the measures identified in the Ipswich Strategic Planning Area (ISPA) Transport Mitigation Strategy – Not much further progress has been made on this since the last ASR. All adopted Local Plans have policies to secure ISPA Transport Mitigation contributions from developers and this is built into CIL arrangements at East Suffolk and Babergh/Mid Suffolk. In Ipswich for larger sites, there is some overlap with Damage Costs mitigation as part of the Low Emissions SPD which is designed to capture contributions and work to reduce the transport impact on air quality in Ipswich.

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 Title	Category	Classification	Year Measure Introduced in AQAP	Estimated / Actual Completion Date	Organisations Involved	Funding Source	Defra AQ Grant Funding	Funding Status	Estimated Cost of Measure	Measure Status	Reduction in Pollutant / Emission from Measure	Key Performance Indicator	Progress to Date	Comments / Barriers to Implementation
D2	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	Suffolk County Council and Ipswich Borough Council	Suffolk Council and Ipswich Borough Council	NO	Not Funded	Unknown	Planning	Potentially high (depending on the measures 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 have been monitoring at this location since 2021 to ascertain current concentrations. Current concentrations at this location are below the national annual mean objective level for nitrogen dioxide.	Ricardo have now been appointed to undertake a study to determine the feasibility of introducing an option or package of options aimed at reducing air pollution from road transport within the borough of Ipswich, with particular focus on the urban area settlements and the AQMAs.
C7	Supporting, where appropriate, the measures identified in the Ipswich Strategic Planning Area Transport Mitigation Strategy developed by Suffolk County Council to support the Ipswich Strategic Plan Area (ISPA) local plans, works to be funded by the ISPA authorities	Policy Guidance and Developmen t Control	Regional Groups Co- ordinating programmes to develop Area wide Strategies to reduce emissions and improve air quality	2021		Suffolk County Council. IPSA authorities	IPSA authoritie s	NO	Not Funded	Unknown	Planning	Medium	Implementation of transport mitigation strategy	The Ipswich Strategic Planning Area (ISPA) mitigation strategy has been used to secure sustainable transport mitigation on larger sites, such as Wolsey Grange 2 recently. But coming up with a funding formula which can be applied to a wider range of rural and urban sites has proven to be more difficult. Discussions are ongoing with the District / Borough councils to try and refine a project plan and agree on a mechanism for funding. The Funding Strategy Group continues to meet regularly to find a way that will allow the Highway Authority to secure contributions to mitigate the cumulative impacts of development in the Ipswich Strategic Planning Area.	Not much further progress has been made on this since the last ASR. All adopted Local Plans have policies to secure ISPA Transport Mitigation contributions from developers and this is built into CIL arrangements at East Suffolk and Babergh/Mid Suffolk. In Ipswich for larger sites, there is some overlap with Damage Costs mitigation as part of the Low Emissions SPD which is designed to capture contributions and work to reduce the transport impact on air quality in Ipswich. The recent Humber Doucy Lane application will need to include measures which address the Transport Mitigation Strategy and the adopted Low Emissions SPD, including damage costs measures because of the scale of the development.
D1	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	2021	2024	Ipswich Borough Council	lpswich Borough Council, DEFRA	YES	Funded	£100k - £500k	Implementati on	Low	Reduction in number of domestic burning complaints received. Reduction in PM concentrations	Information produced on IBC website relating to domestic burning. Bonfire complaint letters also updated with information. Social media posts produced alongside designs around winter burning. Information currently being collected on outdoor burning. Ipswich secured £115,632 from Defra as part of the 2021 Air Quality Grant Programme to run a monitoring and behavioural change campaign around domestic burning. Project ongoing. Ipswich have committed £33,939 in match funding. Hetas and Woodsure have been proactively looking online at wood sellers and identifying those who are not signed up to Woodsure 'Burn Right' campaign.	Ongoing project

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A1	Development and implementation of an anti-idling campaign, including where appropriate an enforcement regime	Other	Other	2019	2024	Ipswich Borough Council	lpswich Borough Council	NO	Funded	< £10k	Implementati on	Low	Development of campaign materials	Campaign materials previously produced by the Suffolk Air Quality Working Group and updated by the Suffolk Public Health Department in 2024 in partnership with District and Borough's. Implementation on-going. Internal staff within Environmental Health and Waste Operations have been given anti-idling training. A number of anti-idling events have been held outside schools. Anti-idling events are currently planned at two schools in June 2024.	Ongoing campaigns, hence completion date listed for lifetime of current AQAP. Exact costs unknown – will be from officer time and material costs.
Α2	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	No	NO	Funded	£10k - 50k	Implementati on	Low. Specific value not known. However, a study in Lambeth found that school streets reduced NO2 concentrations by up to 23%. A study in Birmingham has shown that school streets have led to a reduction in car use up to 15%.	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. This is available at: <u>https://www.ipswich.gov.uk/content/air-quality- resources-schools</u> . SCC have a School Streets Policy. Ranelagh Primary School now have a school street which was launched on 4th January 2024. Another two schools are going through the consultation process for a school street. Five schools in Ipswich have Modeshift Stars accreditation. For 2023, 3,769 year 5 and 6 students from schools across Suffolk have been trained to Bikeability Level 2.	It has been difficult to engage with some schools, possibly due to competing demands they face. Ongoing campaign, hence completion date listed for lifetime of current AQAP. Costs unknown – will be officer and material costs.

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A3	Promote the Councils Green Travel Plan to employees, including use of agile working. Confirm SCC and Mid Suffolk and Babergh DC are promoting their own travel plans	Promoting Travel Alternatives	Workplace Travel Planning	2019	2024	Ipswich Borough Council	Ipswich Borough Council	No	Funded	< £10k	Implementati on	Specific value not known but will contribute to overall reduction in NO2 levels in town centre and surrounds	Annual promotion of travel plan. Increase in the number of employees walking, cycling or using public transport in the Councils Travel Plan survey	Staff travel plan promoted on the intranet. A large proportion of staff are 'hybrid working', dividing their working time between home and the office, thereby reducing the number of commuting trips. Dr Bike sessions promoted to employees to enable their bikes to be checked and maintained by a competent mechanic. From January 2024, free bus travel for Council staff on routes run by Ipswich Buses. IBC have joined Modeshiift Stars as a Local Authority member.	
A4	Active participation in annual Clean Air Days	Public Information	Other	2019	2024	Ipswich Borough Council	lpswich Borough Council	No	Funded	Unknown	Implementati on	Low	Participation in annual Clean Air Days	Clean Air Day 2024 is currently being planned at the time of writing this years ASR. Two schools are signed up for a workshop and anti-idling event on the day. Officers also intend to publish information relating to the Defra grant funded domestic burning campaign.	Ongoing commitment, hence completion date listed for lifetime of current AQAP. Costs unknown – will be officer and material costs. Global Action Plan indicate that most people (90%) now report doing at least one thing to help reduce outdoor air pollution. 82% of people think that air pollution should be a priority for the UK an increase of 11% over the last three years.
A5	Investigate the feasibility of promoting air quality messages on IBC procured variable message signs around Ipswich	Public Information	Other	2019	2024	Ipswich Borough Council	lpswich Borough Council	No	Funded	£100k - £500k	Completed	Low	Promote anti- idling messages quarterly.	VMS project cost £259,000. All VMS have been installed.	The signs have been installed but the contract surrounding their use has lapsed. This has meant that there is a delay on allowing air quality messages to be used. The Council are in the process of rectifying the issue as soon as possible.

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A6	Promotion of travel alternatives e.g. walking, cycling, public transport, car sharing & air quality matters. Measure includes: Development and implementation of the lpswich Air Aware Campaign. Investigate the feasibility of promoting air quality messages on non IBC owned variable message signs around lpswich (e.g. Bury Road)	Public Information	Other	2019	2024	Ipswich Borough Council	Ipswich Borough Council	NO	Partially Funded	Unknow	Implementati	Low	Website patronage, number of facebook posts/comments, number of video views Air quality messages being displayed. The Way To Go Suffolk Website had 90,887 visitors over 6 months.	 Ipswich Air Aware Communications campaign drafted. Officers currently in discussions with SCC Public Health around extending the campaign to a wider campaign across Suffolk. In 2020, SCC worked with borough and district councils to develop the Suffolk Air Quality Profile, published in 2021, with the aim of increasing local knowledge, identifying areas of concern and making recommendations on what could be done to mitigate the impact of poor air quality. This led to the Suffolk Health and Wellbeing Board making air quality a priority. The recommendations from the Suffolk Profile have informed both the development of a Suffolk wide Air Quality Strategy, published in May 2023, and a Suffolk Air Quality Community Engagement Plan. The Community Engagement Plan also includes engaging with the public on sustainable transport issue to try and encourage modal shift. In Suffolk in 2023: 2 School Streets established, 3 more planned. 80 E-bike trials delivered, 30 more scheduled. 1 Accessible Cycling club delivered, which has enabled approx. 50 uses of accessible cycles, and 15 individuals now regularly accessing them •Free bikes provided to 31 school pupils (with plans for another approx. 60 to be provided over summer 2024) New scheme launched for parents / carers to trial a cargo bike for the school run. 3 Cargo bikes being used around the county for business trials. 3769 year 5 & 6 students trained in Bikeability Level 2. Over 100 participants registered for the initial Social Prescribing trial scheme in Ipswich and Lowestoft. Facilitation and funding of two community walking and cycling hubs (1 in Ipswich, 1 in Stowmarket). First Mile/ Last Mile Deliveries: SCC are exploring developing a First Mile/ Last Mile delivery offer with community interest groups to establish a trial in Ipswich. A meeting has been held with potential provider in December 2023, and we now awaiting business case propos	Messages can also link to other campaigns: ant idling/ domestic burning/ clean air day/ discounted public transport promotions. SCC requirements to use the VMS largely restrict messages that can be displayed. They cannot be too long, refer to secondary sources of information or ask a question.

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B1	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	2024	Suffolk County Council and Ipswich Borough Council	Suffolk County Council and Ipswich Borough Council	NO	Partially Funded	£1 million - £10 million	Planning	Low	Increase in Park and Ride uptake	 £3.7m (over two years) BSIP2 funding is now in the process of being allocated to bus operators and some community-based schemes. In the main these relate to new or enhanced bus services. Measures have been delivered to improve bus punctuality and reliability including a new bus lane on West End Road, Ipswich, part of the Park and Ride route from Copdock to Ipswich town centre The focus is to use the funding to target actions that will deliver the best overall outcomes in growing long term patronage and revenues to stabilise service levels, whilst maintaining essential social and economic connectivity for local communities. Central to bus priority measures will be the strategic use of traffic signals underpinned by Suffolk's new Traffic Signal Policy. 	 SCC indicate that increasing the use of the Park & Ride scheme, along with other bus patronage, is an objective of the Enhanced Bus Partnership (EP) and is identified in the Ipswich Strategic Planning Area (ISPA) mitigation strategy. To ensure the financial viability of the North West Park & Ride services, the existing service would need to increase patronage before additional sites could be viable. Opening the North West P&R site is included within the ISPA strategy. Barriers to the development of this measure include decreasing bus patronage, linked to level and cost of parking in the town (particularly company-owned car parks), and also continued home-working for many.

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Β2	Procurement of low emission vehicles in lpswich Borough Council Fleet	Promoting Low Emission Transport	Public Vehicle Procurement - Prioritising uptake of low emission vehicles	2019	2031	Ipswich Borough Council	Ipswich Borough Council	NO	Funded	£1 million - £10 million	Implementati on	Low	Provision of new vehicles	3-year replacement plan for small vehicle fleet to zero emission was concluded in 2022. However, the Council are committed to reducing emissions within the fleet. Currently within Ipswich Borough Council fleet currently breaks down as followed: EV Fleet = 26.04 % Ultra Low Emission = 30.21 % Low Emission = 34.84 % High Emission = 8.91 %. Within the 2024/2025 budget 20 vehicles are due to be replaced with zero emission fleet. The aim of the vehicle replacement plan is in line with the Councils Climate Change Strategy and Action Plan. This aims to reduce CO2 to net zero by 2030, with vehicles being zero emissions or as low as reasonably practicable by the same date. This will have the knock on benefit of eliminating exhaust emissions of nitrogen dioxide and particulate matter.	

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B3	Provision of EV charging points across IBC offices, Crown Street and Elm Street public car parks and investigate the feasibility of additional 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 – 28 Gipping House – 9 Christchurch Mansion – 4 Chantry Park – 2 Holywells Park – 2 Crematorium – 1 Gainsborough sports centre – 2 Crown Car Park – 28 Elm St Car Park – 2 Upper Orwell Street North Car Park - 3. 3 DC charging points (twin), 32 EV charging points and 4 fork lift charging points proposed at New Way depot – completion date December 2024. The Council have also secured some external funding from the ORCS/Energy Savings Trust to install 24 charging units in 7 additional car parks - William Street, Fore Street, Smart Street, Regent Street, Portman Road A, Cromwell Square, and South Street. while the back office systems for parking services, currently run through MiPermit, are procured. This is due for tender this year and once the selected provider is in place we should be able to continue with the procurement of the chargepoints. We do have a large funding gap for that project so it is reliant on further IBC funding being provided.	Provision of additional charging points depends on success of usage of current charging points. Usage at sites increasing year on year. Crown car park – Between June 2023 and April 2024 – there has been 25075hrs of charging sessions using total of 163321.18kWh. Upper Orwell North car park – Between June 2023 and April 2024 there has been 4607hrs8mins of charging sessions using total of 25511.25kWhr. Elm Street Car Park - Between June 2023 and March 2024 – there has been 5091hrs41mins of charging sessions using total of 76221.77kWh.
B4	Promote the use of Norwich Road Shoppers Car Park, short term parking bays behind businesses on Norwich Road. Incentivising use of allocated parking and enforcement against unauthorised on street loading/ parking to assist with the reduction of congestion in the area.	Traffic Management	Other	2019	2024	Ipswich Borough Council	Ipswich Borough Council	NO	Funded	Unknown	Implementatio n	Low	Reduction in congestion along Norwich Road/St Matthews Street. Number of penalty notices served	Between 15/5/2023 - 13/5/2024 the following number of PCNs were served along Norwich Road, St Matthews Street and St Matthews Street Service Road (North): 1068 for parking on a restricted street 38 for loading in a restricted street/3 for parking in a bus stop or stand/ 5 for parking on a pedrestrian crossing. 7 PCN's were issued in Norwich Road Shoppers Car Park for overstaying in the free parking bays.	Implementation costs not known.

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Β5	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		Ipswich Borough Council. Other organisations . LEVI funding	Depends on the organisati on as to the funding source	Νο	Partially Funded	£1 million - £10 million	Implementati	Low		 The Suffolk EV Infrastructure Strategy has now been published and is available to access on the Suffolk County Council website. The EV Strategy will be reviewed on a two-year basis to ensure the size and scale of charge point installation takes place ahead of the forecasted need from drivers, commercial trends and in line with the national policy: https://www.suffolk.gov.uk/asset-library/imported/SEVC-INFRASTRUCTURE-STRATEGY-2023.pdf. To date Suffolk County Council has secured £7.3million in funding from the Government's Local Electric Vehicle Infrastructure (LEVI) fund, which supports local authorities to plan and deliver charging infrastructure for residents without off-street parking. £5.9 million funding comes from the latest round of LEVI funding -£1.4 million comes from previous LEVI pilot money for expanding community-based EV provision This investment continues the council's contribution to the Suffolk Climate Emergency Plan, which identifies that the decarbonisation of vehicles in Suffolk is a key aspect of meeting the net zero by 2030 target for the county. EV charge points on SCC own properties for SCC use: 81. 8 charge points being installed April/May 2024. BC have supported the local CCG to develop their ICS Green Plan which was rolled out on 1st July 2022. The NHS has committed to investing in Trust fleets being ELV or ULEV to help improve air quality and deliver net zero emission. 	Completion date unknown as an ongoing measure. It is hoped that the Council can work with Ipswich Town Football Club in the future to develop initiatives that encourage sustainable travel to games. The football club have partnered with First Buses to offer free park and ride travel to games.

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В6	Accelerate the provision of on- street public EV charging points	Promoting Low Emission Transport	Other	2021	TBC	Suffolk County Council	Suffolk County Council	NO	Partially Funded	£1 million - £10 million	Implementati	Low	Provision of EV	The County Council have million to develop EV of County. £5.9 million ha Suffolk residents without of further £1.4 million will be county's existing EV char will provide oppourtunitie and car park charging charging hubs and fast ar infrastructure improveme public who are interested charging can request it via SCC identify where more facilities may be requ The Suffolk EV Infrastruc been published and is ava Suffolk County Co The EV Strategy will be re basis to ensure the size point installation takes forecasted need from driv- and in line with the https://www.suffoll library/imported/SEVC-1 <u>STRATEGY-</u>

D	Date		

Comments / Barriers to Implementation

ave been allocated £7.3 V charging across the has been provided for t off-street parking, and a be used to develop the arging network. Funding ties to develop kerbside ng points, community and rapid charging point nents. Members of the d in community on-street via this link. This will help ore residential charging equired in the future.

cture Strategy has now vailable to access on the Council website.

reviewed on a two-year te and scale of charge is place ahead of the ivers, commercial trends in national policy: blk.gov.uk/asset--INFRASTRUCTURE-Y-2023.pdf.

Completion date unknown as an ongoing measure.

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Β7	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	Unknown at this point	IBC staff can now get free travel on lpswich Buses for work and personal travel. In respect of parking, the changes last year were additional increases this year. These have been the subject of a statutory public consultation and are due to go to Executive next month for formal approval. The changes are as follows: Off-Street * Long-stay parking charges (including season tickets) increasing by between 2.1% to 12.9%, with all day parking increasing from £6.20 to £7. On-Street * Parking charges increasing by varying amounts, across most tariff bands, between 8.3% to 13.6%. * Charging hours increased so that charges now apply until 10pm rather than 8pm. Increasing parking charges could be considered to be an environmental benefit by helping to encourage the use of more sustainable modes of transport.	

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88	Continue to explore the possibility and apply to DEFRA for grant funding under Air Quality Grant Schemes and any other appropriate funding	Public Information	Other	2019	2024	Ipswich Borough Council	Ipswich Borough Council	YES	Funded	£100k - £500k	Implementati on	Low	Depends on the nature of the works relating to grant funding. Current grant project will be a reduction in domestic burning complaints. Reduced PM concentrations	 Ipswich secured £115,632 from Defra as part of the 2021 Air Quality Grant Programme to run a monitoring and behavioural change campaign around domestic burning. Ipswich have committed £33,939 in match funding. Officers are currently progressing with the grant project. A bid was submitted to DEFRA in September 2023 by Sulfolk Council Council in partnership with Babergh and Mid-Suffolk District Councils, East Sulfolk Council, Ipswich Borough Council and West Sulfolk Council for £ 545,701 of Lot 2 Funding from the 2024/25 Air Quality Grant. The bid was for a 2-year evidence-led education and behaviour change project. The project aims to increase public knowledge about air quality, its health impacts, and how people can both reduce their emissions and protect themselves from its harms. In doing so, it aims to reduce pollution exposure, particularly amongst vulnerable groups, and encourage behaviour change to reduce emissions. In turn, this will improve health outcomes and reduce associated health inequalities. The funding covers the purchase and installation of 15 sensors monitoring Nitrogen Dioxide (NO2) and Particulate Matter (PM2.5 and PM10) to provide live pollution data to be made publicly accessible via a Suffolk Air Quality website. Having live hourly data along with Particulate Matter readings will be a first for Suffolk and will provide long term evidence linking to how and where improvements in air quality can be achieved. The bid also includes funding for 10 School Streets in or close to Air Quality Management Areas, a school toolkit and a communication and behaviour change campaign. Funding was awarded to Suffolk County Council and Partners in February 2024, but the Air Quality Grant was subsequently withdrawn by the Air Quality Minister in April 2024 under his overarching duty to manage public monies. 	Unfortunately, the Government has currently withdrawn additional funding under the air quality grant scheme. The Council will look to bid for grant funding opportunities if they become available again in the future.
В9	Work with Bus Operators in the town (i.e. Ipswich Buses, 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	Suffolk County Council and Ipswich Borough Council	Bus Operators (plus other sources of funding)	NO	Partially Funded	Unknown	Implementati on	Low	Reduced fleet emissions	 First - The Current fleet profile is as follows: 1 x Euro 3, 13 x Euro 4, 15 x Euro 5, 26 X Euro 6. The DfT funding of the £2 fare cap remains in place until the end of December 2024. Any vehicle replacements will continue to move them towards lower emission standards although given the rural nature of routes and the current range limitations of electric vehicles these will be incremental and staged. We are actively looking at new technologies and battery improvements which we hope will present new opportunities in the near future. First are also trying to encourage sustainable travel and they have entered into an agreement with Ipswich Town FC to promote bus services and to offer free Park and Ride to ticket holders for some matches. <u>https://www.itfc.co.uk/news/2024/may/05/townpatter-with-first-bus/</u>. They were also very happy to have provided both of the open top buses for the promotion parade through our close relationship with Ensign Bus. They will be continuing to work with the club and other stakeholders to offer transport to home and away fans where that is possible. As part of our commitment to the wider community First Bus are also Platinum sponsors for the Suffolk Show 2024 	Our £3.7m (over two years) BSIP2 funding is now in the process of being allocated to bus operators and some community-based schemes. In the main these relate to new or enhanced bus services. Measures have been delivered to improve bus punctuality and reliability including a new bus lane on West End Road, Ipswich, part of the Park and Ride route from Copdock to Ipswich town centre. The current economic climate and limited funding from Government has meant that the operators have very little spare funding to invest in new fleet.

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Measure No.	Measure Title	Category	Classification	Year Measure Introduced in AQAP	Estimated / Actual Completion Date	Organisations Involved	Funding Source	Defra AQ Grant Funding	Funding Status	Estimated Cost of Measure	Measure Status	Reduction in Pollutant / Emission from Measure	Key Performance IndicatorProgress to Datea large stand there promoting sustainable transport and our work with ITFC.lpswich Buses - The post-pandemic challenge to the bus industry and the company remain however, are now centred around funding and cost escalations as opposed to uncertainties over customer numbers which have stabilised The industry continues to be funded on an ad hoc basis by Government to help maintain the stability of commercial bus networks across England, with all 'exceptional' funding streams due to end in June 2025. Post-pandemic use of the English National Concessionary Travel Scheme is also significantly lower than pre- pandemic use (around 30%), meaning the bus industry and lpswich Buses will see a significar reduction in the revenue gained from the carriage of concessionary passengers, with loc authorities no longer required to pay operation concessionary fare reimbursement at pre- pandemic levels.The periodic removal of funding, combined with the shift to 'reimbursement by use' of ENCTS pass holders presents a risk to the industry and lpswich Buses and is likely to prevent independent or municipal bus companies from making large-scale investments in fleets in the very near future.With consideration of this, the company has identified a need to upgrade and invest in its fle and has ringfenced a modest capital pot for the 2024/25 financial year. The challenges around costs and the required infrastructure to operation concessional year. The challenges around costs and the required infrastructure to operation	comments / Barriers to Implementation
													costs and the required infrastructure to operate vehicles using alternative fuels, combined with the limitation of vehicle 'ranges' means a shift t alternative fuels is not immediately deliverable of practical. Therefore, the company's shorter-tern aim is to replace its older, lower Euro-graded diesel vehicles with higher Euro-graded diesel buses. In the shorter term, these will likely be pre-used instead of brand-new.	י כ אר ח
													The company has recently purchased two Euro V-graded buses and four Euro VI-graded buses The company is also in the process of securing further two Euro-VI graded buses. When these vehicles join Ipswich Buses' fleet, it will allow th company to decommission and dispose of the existing Euro-III graded vehicles.) a : e
													Emissions: Total Euro 3 8 Euro 4 10 Euro 5 48 Euro 6 6 Total fleet size: 72	

Measure No.	Measure Title	Category	Classification	Year Measure Introduced in AQAP	Estimated / Actual Completion Date	Organisations Involved	Funding Source	Defra AQ Grant Funding	Funding Status	Estimated Cost of Measure	Measure Status	Reduction in Pollutant / Emission from Measure	Key Performance Indicator	Progress to Date	Comments / Barriers to Implementation
B10	Work with other Bus Operators in the town (i.e. First, Norse, Beestons) to encourage the renewal of their fleets to cleaner i.e. Euro VI or better and/or low emission, hybrid buses, on certain routes.	Transport Planning and Infrastructure	Other											Amalgamated measure B10 with measure B9 so the combined measure refers to all bus operators in the town	
B11	Introduction of taxi emissions standards policy	Promoting Low Emission Transport	Taxi Licensing conditions	2018	2019	lpswich Borough Council	lpswich Borough Council	No	Funded	Unknown	Completed	Low	Reduction in non- euro 6 diesel	Completed - New Hackney Carriage and Private Hire Licensing Policy 2019-2022	Future revisions to this policy are likely to include requirements for vehicles licensed as taxi and private hire in Ipswich to be zero or extremely low carbon emission.
B12	Review opportunities for alterations to traffic management to reduce congestion in AQMAs, including the provision of red routes.	Traffic Management	UTC, Congestion management, traffic reduction	2019	TBC	Suffolk County Council	Suffolk County Council	NO	Not Funded	Unknown	Planning	AQMA No.5 approx. 2% reduction in NOx	Reduction in congestion on Civic Drive/ St Matthews Street roundabout	Ricardo have been appointed to undertake a study to determine the feasibility of introducing an option or package of options aimed at reducing air pollution from road transport within the borough of Ipswich, with particular focus on the urban area settlements and the AQMAs. The work will commence in April 2024.	No completion for this measure known. Possible mitigation dependant on funding and appropriate support from stakeholders. Likely that funding will be sought as and when opportunity arise, unless suitable funding agreement made available from other sources e.g. Defra or DfT.
B13	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	TBC	Suffolk County Council	Suffolk County Council	No	Not Funded	Unknown	Planning	Low	Reduction in congestion along Norwich Road & St Matthews Street	This will tie into the IPSA transport mitigation work. See measure C7.	An action within the Suffolk Air Quality Strategy Action Plan, published in May 2023, is to scope out evidence-based initiatives to reduce transport related emissions. Ricardo have now been appointed to undertake a study to determine the feasibility of introducing an option or package of options aimed at reducing air pollution from road transport within the borough of Ipswich, with particular focus on the urban area settlements and the AQMAs.
Measure No.	Measure Title	Category	Classification	Year Measure Introduced in AQAP	Estimated / Actual Completion Date	Organisations Involved	Funding Source	Defra AQ Grant Funding	Funding Status	Estimated Cost of Measure	Measure Status	Reduction in Pollutant / Emission from Measure	Key Performance Indicator	Progress to Date	Comments / Barriers to Implementation
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C1	Develop and implement a Low Emission Strategy SPD	Policy Guidance and Developmen t Control	Low Emissions Strategy	2019	2021	Ipswich Borough Council	lpswich Borough Council	No	Funded	Unknown	Completed	Medium	Implementation of SPD	Low Emissions SPD formally adopted in November 2021.	The Low Emissions Supplementary Planning Document was adopted in November 2021 and is now in use. Training was delivered to Council planning staff, whilst agents and developers were alerted to the new requirements to enable planning applications to be validated.
C2	Embed air quality considerations in the Councils Local Plan	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	2019	2021	lpswich Borough Council	lpswich Borough Council	NO	Funded	Unknown	Completed	Medium	Air quality considerations embedded in Local Plan	Local Plan formally adopted on 23rd March 2022. Includes policy DM3 Air Quality	
C3	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 Developmen t Control	Air Quality Planning and Policy Guidance	2019	2024	lpswich Borough Council	lpswich Borough Council	NO	Funded	£10k - 50k	Implementati on	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.
C4	Support Suffolk County's development of Local Ipswich Cycling and Walking Infrastructure Plans, and work to improve existing cycle routes	Policy Guidance and Developmen t Control	Regional Groups Co- ordinating programmes to develop Area wide Strategies to reduce emissions and improve air quality	2019		Suffolk County Council	Suffolk County Council	NO	Partially Funded	> £10 million	Implementati on	Medium	Implementation of Walking and Cycling Infrastructure Plan	 SCC has delivered schemes in Ipswich for tranches 1 and 2 of the Active Travel Fund. Schemes delivered include new or upgraded cycle lanes on Portman Road, Princes Street, Valley Road, Colchester Road and Bixley Road, modal filters on Fuchsia Lane, Wellesley Road, Milner Street, Leopold Road, Westbury Road, Portman Road, Chalon Street, Jovian Way, The Avenue and Bridge Street. These schemes were all delivered on a trial basis initially and have all since been made permanent. Other permanent improvements delivered include upgraded provision for pedestrians and cyclist on the Waterfront, placemaking schemes that enhance and build on the upgrades delivered. In 2023, £7.9m was secured through Active Travel Fund 4 to deliver 3 schemes: Active Travel Woodbridge (£5.2m – construction) Ipswich Hospital to the Waterfront (£1.2m – construction) Maidstone Road/Grange Road, Felixstowe (£1.3m – construction) Capel St Mary to Copdock Park & Ride 	

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														 •Ipswich Package (development) •Bury St Edmunds East-West (development) Stage 1 consultations were held for all except Active Travel Woodbridge in 2023 and follow-up consultations are to be held in 2024 which will include schemes funded through Active Travel Fund 3 which include: •Nacton Road, Ipswich •Princes Street, Ipswich •Woodbridge Road, Ipswich Delivery of all schemes is expected in 2024 and 2025. During 2023, trial modal filters on Portman Road, Jovian Way and Cavendish Street were made permanent. A new parallel crossing and associated shared-use footway was delivered across Defoe Road as part of planned development in the area. The first School Street scheme in Suffolk was launched in 2023, with Pauls Road, Ipswich restricted during school opening and closing times to support children walking and cycling to Ranelagh Primary School. Sustrans have been commissioned by Ipswich Borough Council to undertake the appraisal and prioritisation of the 85 routes identified from the Local Plan, Cycle Strategy SPD and Town Centre and Waterfront Public Realm SPD in accordance with DfT's LCWIP Guidance. The scoring of the routes is also being done alongside the Ipswich routes identified in the SCC LCWIP to ensure that there is a strong synergy with the Ipswich schemes. This work is ongoing and is expected to be completed in the early summer for it to be put to Councillors to contribute to the prioritisation element. Taking it to Executive is planned for Autumn 2024, with a public consultation planned for 2025. 	
C5	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	Suffolk County Council has produced a Local Transport Plan consultation brochure, and questions for the public to complete. Both contain references to air quality and linkages to decarbonising the transport sector. It is expected that the consultation will take place in Spring 2024: <u>https://www.suffolk.gov.uk/roads-and- transport/transport-planning/suffolks-local- transport/plann</u> The LTP will contain a dedicated section on Air Quality.	

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C6	Supporting, where appropriate, Suffolk Climate Change, Environment & Energy Board's development and implementation of the Suffolk Climate Emergency Plan.	Policy Guidance and Development Control	Regional Groups Co- ordinating programmes to develop Area wide Strategies to reduce emissions and improve air quality	2019	2030	Suffolk Climate Change, Energy & Environment Board (SCCEEB) reporting to Suffolk Public Sector Leaders (SPSL)	Suffolk Climate Change, Energy & Environm ent Board (SCCEEB) reporting to Suffolk Public Sector Leaders (SPSL)	NO	Partially Funded	£1 million - £10 million	Implementati	- (Relates to CO2 emissions not NO2)	Reduction in absolute CO2 emissions in Suffolk	The Suffolk Climate Emergency Plan has been agreed by Suffolk's Public Sector Leaders and is available at: https://www.greensuffolk.org/about/sccp/climate emergency_plan/. IBC have involvement in all of the SCEP action themes: https://www.greensuffolk.org/ap/uploads/2021/0 7/Suffolk-CEP-Table-of-actions.pdf. The Suffolk Climate Change, Environment and Energy Board (SCCEEB) are co-ordinating work to improve the energy efficiency of homes using low carbon methods. A youth climate conference was held in July 23 with 82 pupils attending from 9 schools. A second conference is being held in July 24, with 21 schools booked. A High School Environmental Network is also being set up with 20 schools having signed up so far. This is to support teachers in delivering sustainability across the curriculum and to support schools with decarbonisation plans. The Suffolk Climate Change, Energy & Environment Board (SCCEEB) 'Transformative Project' proforma, to be used by Theme Delivery Leads to summarise potential projects for Suffolk Public Sector Leads (SPSL) funding asks, has been amended to include a specific reference to air quality co-benefit capture. This will be tested as part of the next SPSL funding ask, in Summer 2024. The Carbon Charter was launched by Suffolk County Council and the Environment Agency in 2010 as a means for local businesses to have their achievements verified and has since evolved into Suffolk's well-known hub for business sustainability. It provides support and recognition to businesses throughout Suffolk as they take positive action towards net zero. Providing a benchmark for sustainable businesses making a clear and visible statement of their commitment to reducing the environmental impact of their operations. Holding the certification has become a recognised mark of sustainable business in Suffolk. The Net Zero Business consultancy, in partnership with Groundwork East, provides fully flexible expert support to Suffolk SMEs around any aspect of their net zero journey. Nearly 300 businesses have been	IBC have recently appointed a Climate Change Project Manager who will hopefully feed in the Councils contribution to this workstream.

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C7	Supporting, where appropriate, the measures identified in the Ipswich Strategic Planning Area Transport Mitigation Strategy developed by Suffolk County Council to support the Ipswich Strategic Plan Area (ISPA) local plans, works to be funded by the ISPA authorities	Policy Guidance and Developmen t Control	Regional Groups Co- ordinating programmes to develop Area wide Strategies to reduce emissions and improve air quality	2021	TBC	Suffolk County Council. IPSA authorities	IPSA authoritie s	NO	Not Funded	Unknown	Planning	Medium	Implementation of transport mitigation strategy	The Ipswich Strategic Planning Area (ISPA) mitigation strategy has been used to secure sustainable transport mitigation on larger sites, such as Wolsey Grange 2 recently. But coming up with a funding formula which can be applied to a wider range of rural and urban sites has proven to be more difficult. Discussions are ongoing with the District / Borough councils to try and refine a project plan and agree on a mechanism for funding. The Funding Strategy Group continues to meet regularly to find a way that will allow the Highway Authority to secure contributions to mitigate the cumulative impacts of development in the Ipswich Strategic Planning Area.	Not much further progress has been made on this since the last ASR. All adopted Local Plans have policies to secure ISPA Transport Mitigation contributions from developers and this is built into CIL arrangements at East Suffolk and Babergh/Mid Suffolk. In Ipswich for larger sites, there is some overlap with Damage Costs mitigation as part of the Low Emissions SPD which is designed to capture contributions and work to reduce the transport impact on air quality in Ipswich. The recent Humber Doucy Lane application will need to include measures which address the Transport Mitigation Strategy and the adopted Low Emissions SPD, including damage costs measures because of the scale of the development.
D1	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	2021	2024	lpswich Borough Council	lpswich Borough Council, DEFRA	YES	Funded	£100k - £500k	Implementati on	Low	Reduction in number of domestic burning complaints received. Reduction in PM concentrations	Information produced on IBC website relating to domestic burning. Bonfire complaint letters also updated with information. Social media posts produced alongside designs around winter burning. Information currently being collected on outdoor burning. Ipswich secured £115,632 from Defra as part of the 2021 Air Quality Grant Programme to run a monitoring and behavioural change campaign around domestic burning. Project ongoing. Ipswich have committed £33,939 in match funding. Hetas and Woodsure have been proactively looking online at wood sellers and identifying those who are not signed up to Woodsure 'Burn Right' campaign.	Ongoing project

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D2	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	Suffolk County Council and Ipswich Borough Council	Suffolk Council and Ipswich Borough Council	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 have been monitoring at this location since 2021 to ascertain current concentrations. Current concentrations at this location are below the national annual mean objective level for nitrogen dioxide.	Ricardo have now been appointed to undertake a study to determine the feasibility of introducing an option or package of options aimed at reducing air pollution from road transport within the borough of Ipswich, with particular focus on the urban area settlements and the AQMAs.
D3	Provision of A rated boilers in IBC owned housing stock	Promoting Low Emission Plant	Other Policy	2019	2023	Ipswich Borough Council	Ipswich Borough Council	NO	Funded	Unknown	Implementati on	Low	All larger properties are to have low NOx boilers, defined as boilers that meet a dry NOx emission rating of 40mg/kWh	Completed. The Council are now replacing boilers on a 15-year replacement cycle.	The Council has produced an Asset Management Strategy and are looking at a pilot of 50 homes to achieve net zero carbon Target of all IBC homes to meet EPC Band C by 2030 and being 'net zero carbon' by 2050. Currently have a budget of £177M between 2025 and 2035 to achieve net zero carbon across the stock. The Council are hoping to get grant funding to fill the gap (estimated that around £340M is required).
D4	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	lpswich Borough Council	NO	Funded	£100k - £500k	Completed	Low	100% of all grants with air quality implications	Policy revised to include energy efficient measures e.g. A rated boilers and insulation, thereby helping to reduce energy use and associated emissions. £50k budget set aside for grants annually.	

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

As detailed in Policy Guidance LAQM.PG22 (Chapter 8) and the Air Quality Strategy⁶, local authorities are expected to work towards reducing emissions and/or concentrations of fine particulate matter (PM_{2.5})). There is clear evidence that PM_{2.5} (particulate matter smaller 2.5 micrometres) has a significant impact on human health, including premature mortality, allergic reactions, and cardiovascular diseases.

Ipswich Borough Council is undertaking a number of measures within its AQAP to improve air quality generally, as described above, which we consider will also have a positive impact on PM_{2.5}. The Suffolk Air Quality Group, of which Ipswich Borough Council is a member, has engaged with Suffolk County Council's (SCC) Public Health Department 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. Work has also been focused on providing information to the public on the harmful impacts of domestic burning, thereby encouraging behaviour change and reduced/improved burning practices.

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 2022 in Ipswich is 6.3%, above the average for England (5.8%) and the East of England Region (6.2%). This would suggest that PM_{2.5} concentrations in Ipswich are slightly higher than other areas in the UK⁷. However, it should be noted that a large proportion of the PM_{2.5} in Suffolk is derived from intercontinental sources over which the local authority has no control; this may explain,

⁶ Defra. Air Quality Strategy – Framework for Local Authority Delivery, August 2023

⁷ Public Health England, Public Health Outcomes Framework, accessed 06/05/2024. Available at: <u>https://fingertips.phe.org.uk/profile/public-health-outcomes-</u> framework/data#page/4/gid/1000043/ati/501/iid/93861/age/230/sex/4/cat/-1/ctp/-1/yrr/1/cid/4/tbm/1

either partly or wholly, why the fraction of mortality in those aged over 30 years, is above the average for England.

Following on from the Councils successful bid to Defra, the Council secured £115,632 from Defra as part of the 2021 Air Quality Grant Programme to run a monitoring and behavioural change campaign around domestic burning. As part of this, the Council has procured a FIDAS reference analyser which was installed on St Helens Street. This is the first year the Council has begun to monitor for PM_{2.5} following the purchase and installation of a FIDAS analyser in May 2023. Following ratification and annualisation, an annual mean concentration of $8\mu g/m^3$ was recorded at the monitor on St Helens Street. This is below the annual mean concentration target of $10\mu g/m^3$ to be met by 2040.

As part of the domestic burning campaign, six portable sensors measuring PM₁₀ and PM_{2.5} were also procured. These were installed in the homes of volunteers who used open fires and wood burning stoves. Although the research is ongoing, findings so far indicate that average concentrations of particulate matter are around four times higher when burning compared to average background concentrations. Furthermore, significant peak spikes of particulate matter were found during burning episodes, such as when a stove door is opened. In addition, untreated wood and heat logs were found to produce less particulate matter than pallet wood and smokeless coal. The key findings from the study so far have been put into messages and are currently being disseminated via the Councils social media platforms. Examples of the designs and messages accompanying the campaign are shown below:



As the project progresses, additional findings from the monitoring programme, together with how the behavioural change aspect of the campaign is progressing, will be reported in the 2025 ASR. It is hoped that the behavioural change aspect of the campaign will lead to a reduction in concentrations of particulate matter associated with domestic burning.

In addition to the above, the Council are continuing to work with Defra and the Environment Agency to identify a suitable location for a particulate analyser that forms part of the Automatic Urban and Rural Network (AURN). Currently, a location on St George's Street is being proposed. If a suitable location is found, any data subsequently collected will be reported on in future ASR submissions.

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 maps, at a district and borough level, local air pollution levels and explores evidence-based interventions that can be undertaken by local authorities, businesses, communities and individuals to improve air quality. The report was published in June 2021 following sign-off from the Suffolk Director of Public Health.

As a result of the report, air quality was made a priority by the <u>Suffolk Health and</u> <u>Wellbeing board</u> as part of their duty to "encourage integrated working" between health, care, police and other public services in order to improve wellbeing outcomes for Suffolk. The recommendations from the Suffolk Profile have also informed both the development of a Suffolk-wide <u>Air Quality Strategy</u> which was published in May 2023 and the Suffolk Community Engagement Plan.

The Air Quality Strategy sets out the range of actions identified as being important to the improvement of air quality (both concentrations of nitrogen dioxide and particulate matter), along with who is the lead authority for the work, timescales for implementation, and what measurements or outcomes will be achieved. Updates on progress with the Air Quality Strategy can be found on the <u>Healthy Suffolk Website</u>.

The Suffolk Community Engagement Plan set out the action Suffolk County Council (SCC), working with borough and district partners, will take to raise awareness of the health impacts of air quality in Suffolk. The aim is to increase awareness to enable individuals to make choices that protect both their health and the health of others from the harmful effects of pollution. As part of this approach, the Public Health team have been out in Suffolk ascertaining views from local people about air quality. In October 2022, 338 people gave their views about air pollution in Suffolk covering issues from health and burning at home through to travel and air quality alerts. A <u>research evaluation report</u> was

produced which indicated that only 8% of people identified home burning as a source of pollution. This demonstrates the need for domestic burning campaigns, such as the Defra grant funded project, mentioned above, to help encourage people to stop burning at home.

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 2023 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 2019 and 2023 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 three sites during 2023. Table A.1 in Appendix A shows the details of the two automatic monitoring sites measuring for NO₂. The <u>Air Quality England</u> page presents automatic monitoring results for NO₂ for Ipswich Borough Council, with automatic monitoring results also available through the <u>UK-Air Website</u>.

The one automatic (continuous) monitoring site measuring for PM₁₀ and PM_{2.5} is not currently supported by a public facing website. This is an issue the Council are looking to address when presenting monitoring results in the future.

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 nonautomatic (i.e. passive) monitoring of NO₂ at 86 sites during 2023. 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.

As a result of readings well below 10% of the annual mean NO₂ objective level, the following tubes were removed from the Councils 2023 monitoring programme:

- Tube 10 Bramford Road (formerly part of a triplicate with Tubes 8 and 9)
- Tube 57 Berners Street
- Tube 62 St Matthews Street
- Tube 69 Argyle Street
- Tube 92 Ipswich Hospital

Due to issues with vandalism leading to low data capture, tube 32 – Spring Road has been relocated to a new location for the 2024 monitoring period. The tube is still located on Spring Road, but it is hoped that it will not be vandalised in its new location, thereby providing the Council with data to report on in the 2025 ASR.

Tube 95 – Vernon Street was relocated in 2023 as a result of experiencing concentrations well below 10% of the annual mean NO₂ concentration for the last few years. The tube was classed as a new location in 2023 for the purposes of accurate data analysis and the reporting of trends. Once suitably corrected for bias (distance correction not required), the location was not within 10% of the annual mean NO₂ concentration. Further details can be found in Appendix B. The Council will continue to monitor levels of pollution at this site in 2024 and report on them in the 2025 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 (NO₂)

Table A.3 and Table A.4 in Appendix A compare the ratified and adjusted monitored NO₂ annual mean concentrations for the past five years with the air quality objective of $40\mu g/m^3$. 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 2023 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/m3 that would indicate an exceedance of the 1-hour mean objective.

Table A.5 in Appendix A compares the ratified continuous monitored NO₂ hourly mean concentrations for the past five years with the air quality objective of $200\mu g/m^3$, not to be exceeded more than 18 times per year.

Looking at the nationally bias adjusted and distance corrected data for the non-automatic monitoring locations, there were no exceedances of the NO₂ concentration. Once bias and distance corrected, three sites recorded concentrations within 10% below the annual mean NO₂ objective level, these were:

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

When comparing the 2023 bias adjusted results to the 2022 results; in 2022 there were three recorded exceedances which were the same three sites detailed above that in 2023 recorded concentrations within 10% below the annual mean NO₂ objective level. In 2022, there were six sites that recorded concentrations within 10% below the annual mean NO₂ objective level. These sites were in AQMA 2 (Tube 68), AQMA 3 (Tube 30), AQMA 5 (Tubes 49 and 53) and two sites outside AQMAS (Tubes 18 and 31). These sites were not within 10% of the annual mean NO₂ objective level in 2023.

For the fifth year in a row, there were no exceedances of the annual mean NO₂ objective level in AQMA 1. However, in 2019, Tube 14 within AQMA recorded a concentration within 10% below the annual mean NO₂ objective level. Despite this, AQMA 1 has experienced four consecutive years of annual mean concentrations being lower than 36µg/m³. In line with LAQM.TG22, the Council have conducted a detailed assessment with regards to the revocation of AQMA 1. The detailed assessment was submitted to the LAQM helpdesk for appraisal and is attached to Appendix E. DEFRA has agreed that the AQMA is no longer required and advised the Council to submit an AQMA revocation order for AQMA 1.

Figures A.1 – A.11 shows bias corrected trendline plots for clusters of passive monitoring locations in and around each of the 4 AQMAs. Despite AQMA 4 being revoked in August 2021, it is included for transparency to help demonstrate that it was appropriate to revoke the AQMA due to continued NO_2 concentrations under the national objective level.

When looking at the bias corrected data for 2023, annual mean NO₂ concentrations have generally increased slightly compared to the previous two years. However, concentrations have generally remained below 2019 levels. It is likely that the increase in concentrations in 2021 - 2023 compared to 2020 was linked to the relaxation and removal of Government restrictions associated with the COVID-19 pandemic.

Between 2019 and 2021, the Council used a combined local bias correction factor as a result of a high data capture rate from both of our continuous analysers. However, due to exceptional temperatures experienced in the summer of 2022, data between June and September had to be rejected from our analyser on Chevallier Street as the monitor could not be cooled sufficiently despite the procurement of a new air conditioning unit. Furthermore, the same monitor experienced faults in both May – June and December 2023. As a result of these issues, we had less than 75% data capture for the Chevallier Street site and were unable to calculate a combined local bias correction factor for 2022. The combined local bias correction factor in 2023 was to be used with caution due to less than 90% data capture at the Chevallier Street site. As a result of the poor data capture again at this monitor (<90%) in 2023, it was decided to apply the national bias adjustment factor for the second year running. It was felt that this was a more conservative approach, thereby giving greater confidence in the data presented. Further details on this are given in Appendix C.

The Council calculated a local bias correction factor from both the Chevallier Street and St Matthews Street analysers (86% and 99% data capture respectively), and this was recorded as 0.75. As the local bias correction factor was calculated using only 10 periods of data for Chevallier Street, and was lower than the nationally derived bias correction factor (0.77), it was decided to apply the national correction factor to the data this year to give robust, conservative results. Had the Council applied the local correction factor to the data, only tubes 64 and 64 – duplicate (AQMA 5) would be within 10% of the annual mean NO_2 objective level.

3.2.2 Particulate Matter (PM₁₀)

Table A.6 in Appendix A: Monitoring Results compares the ratified and adjusted monitored PM_{10} annual mean concentrations for the past five years with the annual mean air quality objective of $40\mu g/m^3$.

Table A.7 in Appendix A compares the ratified continuous monitored PM_{10} daily mean concentrations for the past five years with the air quality objective of $50\mu g/m^3$, not to be exceeded more than 35 times per year.

This is the first year the Council has begun to monitor for PM₁₀ following the purchase and installation of a FIDAS analyser in May 2023; we have no PM₁₀ data prior to this date. Following ratification and annualisation, an annual mean concentration of 13.6µg/m³ was recorded at the monitor on St Helens Street. This is below the annual mean objective level. No exceedances of the 24-hour mean were observed.

3.2.3 Particulate Matter (PM_{2.5})

Table A.8 in Appendix A presents the ratified and adjusted monitored PM_{2.5} annual mean concentrations for the past five years.

This is the first year the Council has begun to monitor for $PM_{2.5}$ following the purchase and installation of a FIDAS analyser in May 2023; we have no $PM_{2.5}$ data prior to this date. Following ratification and annualisation, an annual mean concentration of $8\mu g/m^3$ was recorded at the monitor on St Helens Street. This is below the annual mean concentration target of $10\mu g/m^3$ to be met by 2040.

In addition to the above, the Council are continuing to work with Defra to identify a suitable location for a particulate analyser that forms part of the Automatic Urban and Rural Network (AURN). If a suitable location is found, any data subsequently collected will be reported on in future ASR submissions.

3.2.4 Sulphur Dioxide (SO₂)

Ipswich Borough Council does not monitor for Sulphur Dioxide (SO2) – 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	NO. Was in AQMA 1 until amended on 19/08/2021	Chemiluminescent	2.5	2.5	1.5
IPS04	St Matthews Street	Roadside	615870	244858	NO2	NO	Chemiluminescent	12.8	2.9	1.38
IPS05	St Helens Street	Roadside	617007	244528	PM2.5, PM10	Yes. AQMA 2	FIDAS 200 – Optical light scattering	7.5	5	2

Notes:

(1) Om 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	No	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	Urban Background	617288	244429	NO2	No	0.0	4.3	No	2.1
7	Bramford Road	Roadside	615007	245239	NO2	No	0.0	5.6	No	2.3
8, 9	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	Urban 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	No	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	Yes - AQMA 3	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	2.5	No	2.7
43	Bramford Road / Yarmouth Road	Roadside	615109	245200	NO2	No	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	No	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)
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
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
70	Argyle Street	Roadside	616965	244583	NO2	No	N/A	1.6	No	2.3
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

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)
74	Grimwade Street	Roadside	616953	244443	NO2	No	N/A	2.1	No	2.5
75	Grimwade Street	Roadside	616927	244395	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
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

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)
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	2.3
91	London Road	Roadside	615195	244621	NO2	No	0.0	9.7	No	2.3
93	Grove Lane	Roadside	617360	244536	NO2	No	0.0	4.8	No	2.4
94	Fore Hamlet	Roadside	617363	243887	NO2	No	0.0	7.5	No	2.7
95	Vernon Street	Roadside	616424	243804	NO2	No	0.0	6.1	No	2.7
96	Crown Street	Kerbside	616279	244807	NO2	Yes - AQMA 2	2.2	0.9	No	2.4
97	Crown Street/Northgate Street	Kerbside	616474	244795	NO2	Yes - AQMA 2	5.8	2.9	No	2.2
98	Fore Street	Kerbside	617037	244085	NO2	No	0.0	2.3	No	2.4
99, 100, 101	St Matthew's Street	Roadside	615870	244858	NO2	No	11.9	4.2	Yes	1.4

Notes:

(1) Om 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.

There is a unique ID for each site where a diffusion tube has been deployed. Site ID's are not reused, hence new tube locations are assigned a new site ID. Any sites withdrawn from the monitoring programme will retain their original site ID for historical refence.

Table A.3 – Annual Mean NO₂ Monitoring Results: Automatic Monitoring (µg/m³)

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2023 (%) ⁽²⁾	2019	2020	2021	2022	2023
IPS3	615261	245350	Roadside	86.2	86.2	26	20.7	23	20	20
IPS04	615870	244858	Roadside	99.7	99.7	37	26.3	28	28	27

Annualisation has been conducted where data capture is <75% and >25% in line with LAQM.TG22

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

 \boxtimes Where exceedances of the NO₂ annual mean objective occur at locations not representative of relevant exposure, the fall-off with distance concentration has been calculated and reported concentration provided in brackets for 2023.

Notes:

The annual mean concentrations are presented as µg/m³.

Exceedances of the NO₂ annual mean objective of $40\mu g/m^3$ are shown in **bold**.

All means have been "annualised" as per LAQM.TG22 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%).

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 2023 (%) ⁽²⁾	2019	2020	2021	2022	2023
1	615992	244412	Roadside	100	100.0	24.0	18.5	19.3	21.0	18.6
2	615144	245245	Roadside	100	100.0	38.0	30.1	30.9	33.7	31.0
3	617070	244039	Kerbside	100	100.0	26.0	19.5	20.9	22.0	20.3
4	615620	245000	Roadside	100	100.0	31.0	24.5	26.3	27.4	24.4
5	616887	244128	Roadside	100	100.0	39.0	32.1	33.3	33.4	31.2
6	617288	244429	Urban Background	100	100.0	<u>N/A</u>	<u>N/A</u>	12.1	12.9	11.4
7	615007	245239	Roadside	100	100.0	30.0	23.4	25.4	26.2	23.4
8, 9	615125	245209	Roadside	100	100.0	32.0	25.4	29.1	28.4	26.6
13	615117	245305	Roadside	100	100.0	23.0	18.3	20.4	19.8	18.0
14	615285	245393	Roadside	100	100.0	41.0	32.1	34.2	33.1	32.2
15	616282	244643	Urban Background	100	100.0	22.0	16.7	17.8	19.1	17.9
16	615362	245437	Roadside	100	100.0	33.0	25.6	27.3	28.3	26.9
17	616993	244659	Roadside	100	100.0	42.0	32.9	35.2	35.0	32.5

Table A.4 – Annual Mean NO₂ Monitoring Results: Non-Automatic Monitoring (µg/m³)

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 2023 (%) ⁽²⁾	2019	2020	2021	2022	2023
18	615090	245178	Roadside	100	100.0	41.0	33.4	36.3	37.4	33.6
11, 12, 19	616593	244753	Roadside	100	100.0	47.0	36.7	41.9	42.2	37.0
20	616458	244829	Roadside	100	100.0	29.0	21.9	24.2	26.4	22.7
21	616494	244807	Roadside	90.4	90.4	34.0	25.7	27.2	30.7	29.4
22	616489	244785	Roadside	90.1	90.1	34.0	23.6	25.4	30.0	27.2
23	616645	244784	Roadside	100	100.0	21.0	15.9	17.3	17.9	15.8
24	616663	244692	Roadside	100	100.0	38.0	30.3	34.2	33.4	32.0
25	616753	244582	Roadside	100	100.0	36.0	29.6	34.8	33.2	29.9
26	616971	244511	Roadside	100	100.0	34.0	25.4	30.0	29.4	27.3
27	616965	244546	Roadside	90.4	90.4	38.0	29.0	31.6	32.6	30.9
28	615194	245292	Roadside	100	100.0	35.0	26.4	29.6	29.7	27.0
29	617118	244074	Roadside	100	100.0	31.0	24.0	27.6	26.9	25.1
30	616939	244114	Roadside	100	100.0	46.0	34.7	37.5	39.6	35.2
31	616332	244149	Roadside	100	100.0	44.0	33.8	38.6	38.3	34.4

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 2023 (%) ⁽²⁾	2019	2020	2021	2022	2023
32	617398	244573	Roadside	17.6	17.6	30.0	23.3	25.2	26.7	-
33	616666	244114	Roadside	100	100.0	32.0	23.4	27.7	27.7	24.6
34	616467	244072	Roadside	100	100.0	33.0	25.0	27.7	28.4	24.9
35	616746	244696	Roadside	100	100.0	26.0	19.6	21.2	22.4	20.9
36	616820	246158	Roadside	100	100.0	31.0	22.8	22.6	24.6	22.8
37	616845	244252	Roadside	100	100.0	31.0	22.4	25.2	27.8	24.4
38	615904	244805	Kerbside	100	100.0	33.0	25.1	27.7	29.8	26.7
39	616712	244228	Kerbside	100	100.0	41.0	30.5	36.5	37.4	34.2
40	615460	245148	Roadside	100	100.0	27.0	20.1	23.8	22.9	20.7
41	615564	245010	Roadside	100	100.0	36.0	27.2	29.2	30.6	26.7
42	615744	244901	Roadside	100	100.0	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>	34.1	28.5
43	615109	245200	Roadside	85.1	85.1	36.0	28.8	30.9	32.4	28.7
44	615052	245237	Roadside	100	100.0	34.0	26.1	30.4	30.4	26.5
45, 46, 47	615261	245350	Roadside	100	100.0	26.0	19.9	22.3	22.0	20.5

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 2023 (%) ⁽²⁾	2019	2020	2021	2022	2023
48	615425	245486	Roadside	100	100.0	25.0	19.0	20.7	21.6	21.0
49	615792	244876	Roadside	84.8	84.8	42.0	32.0	37.5	37.6	33.3
50	615773	244890	Roadside	100	100.0	24.0	19.2	20.2	22.8	21.3
51	615769	244866	Kerbside	81.8	81.8	37.0	26.5	30.3	33.6	27.6
52	615826	244871	Roadside	100	100.0	45.0	36.4	40.1	40.3	37.0
53	615820	244858	Roadside	100	100.0	44.0	33.8	35.8	37.8	32.5
54	615893	244855	Roadside	100	100.0	36.0	27.5	29.2	32.3	28.0
55	615917	244898	Roadside	100	100.0	27.0	20.1	23.2	24.6	21.8
56	615931	244911	Roadside	89.5	89.5	27.0	20.9	24.0	22.9	24.1
58	615978	245042	Kerbside	92.3	92.3	24.0	17.4	19.1	19.9	17.2
59	615926	244837	Roadside	100	100.0	32.0	24.2	25.4	27.1	25.7
60	617438	246168	Roadside	100	100.0	28.0	20.5	21.8	22.5	20.0
61	616099	246105	Roadside	100	100.0	38.0	28.3	30.2	31.2	29.4
63	615950	244790	Roadside	100	100.0	37.0	27.0	30.6	33.2	29.5

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 2023 (%) ⁽²⁾	2019	2020	2021	2022	2023
64, 65	615688	244939	Roadside	100	100.0	51.0	40.3	41.9	44.6	40.4
66	616807	244669	Roadside	100	100.0	39.0	31.0	33.3	33.4	29.8
67	616890	244676	Roadside	100	100.0	27.0	21.3	23.2	23.3	21.2
68	616905	244657	Roadside	100	100.0	43.0	33.2	36.2	36.2	33.3
70	616965	244583	Roadside	90.4	90.4	36.0	25.8	28.0	29.5	26.9
71	617032	244537	Roadside	100	100.0	24.0	17.3	20.6	20.3	18.9
72	617123	244535	Roadside	100	100.0	35.0	26.0	30.3	30.4	28.5
73	617124	244517	Kerbside	100	100.0	22.0	16.0	17.4	17.0	16.4
74	616953	244443	Roadside	100	100.0	26.0	20.1	22.1	21.9	22.0
75	616927	244395	Roadside	100	100.0	<u>N/A</u>	<u>N/A</u>	18.9	18.6	17.3
76	616951	244521	Roadside	100	100.0	36.0	28.0	31.0	31.6	28.4
77	616902	244542	Roadside	100	100.0	26.0	20.2	23.1	24.2	21.5
78	616870	244586	Roadside	100	100.0	23.0	17.6	20.1	19.8	18.0
79	617052	244677	Kerbside	90.4	90.4	35.0	27.8	31.1	29.6	26.8

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 2023 (%) ⁽²⁾	2019	2020	2021	2022	2023
80, 81, 82	616821	244546	Kerbside	100	100.0	36.0	27.4	30.1	32.0	28.0
83	616792	244498	Roadside	100	100.0	29.0	21.8	25.9	24.6	21.9
84	616702	244601	Roadside	90.4	90.4	24.0	18.0	20.1	20.7	17.8
85	616681	244623	Roadside	92.3	92.3	30.0	23.9	26.4	25.9	23.5
86	616727	244566	Kerbside	92.8	92.8	<u>N/A</u>	19.9	22.7	23.4	21.3
87	616481	244725	Roadside	92.6	92.6	<u>N/A</u>	22.3	21.3	28.4	25.1
88	616307	243875	Roadside	100	100.0	<u>N/A</u>	28.4	32.8	31.6	31.8
89	614816	244585	Roadside	100	100.0	<u>N/A</u>	21.8	24.0	24.8	21.5
90	614893	244558	Roadside	100	100.0	<u>N/A</u>	20.1	21.1	21.2	20.2
91	615195	244621	Roadside	100	100.0	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>	21.2	16.3
93	617360	244536	Roadside	100	100.0	32.0	24.2	25.8	26.2	24.9
94	617363	243887	Roadside	100	100.0	26.0	20.6	20.6	21.9	19.8
95	616424	243804	Roadside	100	100.0	24.0	17.4	19.8	18.5	29.7
96	616279	244807	Kerbside	100	100.0	42.0	30.5	32.9	36.7	31.7

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 2023 (%) ⁽²⁾	2019	2020	2021	2022	2023
97	616474	244795	Kerbside	100	100.0	<u>N/A</u>	<u>N/A</u>	32.2	36.3	31.5
98	617037	244085	Kerbside	100	100.0	<u>N/A</u>	<u>N/A</u>	30.7	31.4	27.1
99, 100, 101	615870	244858	Roadside	100	100.0	41.0	26.8	29.6	32.1	27.7

Annualisation has been conducted where data capture is <75% and >25% in line with LAQM.TG22.

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 $\mu g/m^3$.

Exceedances of the NO₂ annual mean objective of $40\mu g/m^3$ are shown in **bold**.

 NO_2 annual means exceeding $60\mu g/m^3$, indicating a potential exceedance of the NO_2 1-hour mean objective are shown in <u>bold and</u> <u>underlined</u>.

Means for diffusion tubes have been corrected for bias. All means have been "annualised" as per LAQM.TG22 if valid data capture for the full calendar year is less than 75%. See Appendix C for details.

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

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

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

Figure A.1 – Trends in Annual Mean NO₂ Concentrations in AQMA No.1



Figure A.2 – Trends in Annual Mean NO₂ Concentrations in AQMA No.2



Figure A.3 – Trends in Annual Mean NO₂ Concentrations in AQMA No.3



Figure A.4 – Trends in Annual Mean NO₂ Concentrations in former AQMA No.4. AQMA revoked on 19/08/2021.



Figure A.5 – Trends in Annual Mean NO₂ Concentrations in AQMA No.5



Figure A.6 – Trends in Annual Mean NO₂ Concentrations outside of AQMA sites (other tubes between 1 – 19)


Figure A.7 – Trends in Annual Mean NO₂ Concentrations outside of AQMA sites (other tubes between 20 – 39)



Figure A.8 – Trends in Annual Mean NO₂ Concentrations outside of AQMA sites (other tubes between 40 – 59)



Figure A.9 – Trends in Annual Mean NO₂ Concentrations outside of AQMA sites (other tubes between 60 – 79)



Figure A.10 – Trends in Annual Mean NO₂ Concentrations outside of AQMA sites (other tubes between 80 – 89)



Figure A.11 – Trends in Annual Mean NO₂ Concentrations outside of AQMA sites (other tubes between 90 – 101)



Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2023 (%) ⁽²⁾	2019	2020	2021	2022	2023
IPS3	615261	245350	Roadside	86.2	86.2	0	0	0	0	0
IPS04	615870	244858	Roadside	99.7	99.7	0(117)	0	0	0	0

Table A.5 – 1-Hour Mean NO₂ Monitoring Results, Number of 1-Hour Means > 200µg/m³

Notes:

Results are presented as the number of 1-hour periods where concentrations greater than 200µg/m³ have been recorded.

Exceedances of the NO₂ 1-hour mean objective (200µg/m³ 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.

Table A.6 – Annual Mean PM₁₀ Monitoring Results (µg/m³)

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2023 (%) ⁽²⁾	2019	2020	2021	2022	2023
IPS05	617007	244528	Roadside	90	56	N/A	N/A	N/A	N/A	13.6

Annualisation has been conducted where data capture is <75% and >25% in line with LAQM.TG22.

Notes:

The annual mean concentrations are presented as $\mu g/m^3$.

Exceedances of the PM₁₀ annual mean objective of $40\mu g/m^3$ are shown in **bold**.

All means have been "annualised" as per LAQM.TG22 if valid data capture for the full calendar year is less than 75%. See Appendix C for details.

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

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2023 (%) ⁽²⁾	2019	2020	2021	2022	2023
IPS05	617007	244528	Roadside	90	56	N/A	N/A	N/A	N/A	0

Notes:

Results are presented as the number of 24-hour periods where daily mean concentrations greater than 50µg/m³ have been recorded.

Exceedances of the PM₁₀ 24-hour mean objective (50µg/m³ not to be exceeded more than 35 times/year) are shown in **bold**.

If the period of valid data is less than 85%, the 90.4th percentile of 24-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.

Table A.8 – Annual Mean PM_{2.5} Monitoring Results (µg/m³)

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2023 (%) ⁽²⁾	2019	2020	2021	2022	2023
IPS05	617007	244528	Roadside	90	56	N/A	N/A	N/A	N/A	8

Annualisation has been conducted where data capture is <75% and >25% in line with LAQM.TG22.

Notes:

The annual mean concentrations are presented as $\mu g/m^3$.

All means have been "annualised" as per LAQM.TG22 if valid data capture for the full calendar year is less than 75%. See Appendix C for details.

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

Appendix B: Full Monthly Diffusion Tube Results for 2023

Table B.1 – NO₂ 2023 Diffusion Tube Results (µg/m³)

DT ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Jan	Feb	Mar	Apr	Мау	Jun	Jul	Aug	Sep	Oct	Νον	Dec	Annual Mean: Raw Data	Annual Mean: Annualised and Bias Adjusted (0.77)	Annual Mean: Distance Corrected to Nearest Exposure	Comment
1	615992	244412	31.1	36.8	24.4	22.5	17.2	17.8	18.6	18.4	25.1	29.6	23.1	25.7	24.2	18.6	15.8	
2	615144	245245	44.4	45.4	40.7	52.3	35.8	35.8	34.4	36.2	46.0	44.9	36.2	31.7	40.3	31.0	28.5	
3	617070	244039	29.6	33.8	29.7	22.5	19.2	20.1	21.2	19.7	38.0	32.7	27.6	22.1	26.4	20.3	-	
4	615620	245000	30.9	39.5	27.8	34.9	33.5	32.7	24.2	28.9	33.2	35.9	30.4	28.1	31.7	24.4	-	
5	616887	244128	47.1	49.6	42.5	38.2	32.4	33.1	36.0	37.9	47.9	46.3	34.6	40.7	40.5	31.2	30.0	
6	617288	244429	20.5	22.9	13.8	13.1	13.1	11.2	10.8	11.3	14.8	19.0	13.9	14.0	14.9	11.4	-	
7	615007	245239	35.5	38.1	30.7	26.4	24.5	23.6	27.0	28.1	36.1	36.0	30.8	28.4	30.4	23.4	-	
8	615125	245209	40.7	44.6	34.0	35.7	33.7	34.6	26.3	33.4	36.5	36.4	29.9	30.2	-	-	-	Duplicate Site with 8 and 9 - Annual data provided for 9 only
9	615125	245209	40.7	43.1	33.1	35.4	32.5	36.0	25.4	30.7	35.9	38.3	30.3	32.6	34.6	26.6	22.9	Duplicate Site with 8 and 9 - Annual data provided for 9 only
																-	-	Tube 10 removed for 2023 monitoring programme
11	616593	244753	56.2	56.7	47.7	40.4	34.3	27.6	48.7	44.5	58.7	55.1	50.3	43.2	-	-	-	Triplicate Site with 11, 12 and 19 - Annual data provided for 19 only
12	616593	244753	51.3	63.0	51.4	48.0	32.5	40.3	45.6	46.7	63.4	55.1	51.2	51.0	-	-	-	Triplicate Site with 11, 12 and 19 - Annual data provided for 19 only
13	615117	245305	31.4	31.6	25.9	22.8	18.5	16.2	15.5	17.7	23.8	28.5	27.3	21.9	23.4	18.0	16.4	
14	615285	245393	51.3	53.1	40.5	40.5	41.7	37.1	33.7	36.4	42.7	44.0	43.5	37.7	41.9	32.2	31.6	
15	616282	244643	28.0	29.4	20.7	20.3	16.6	28.7	14.1	14.7	21.5	24.1	40.7	19.5	23.2	17.9	-	
16	615362	245437	39.4	44.7	33.6	33.7	25.9	29.1	31.9	31.1	40.6	43.1	27.7	38.8	35.0	26.9	24.6	
17	616993	244659	43.1	51.8	39.6	43.0	34.9	37.5	34.4	41.1	50.4	50.2	43.8	37.3	42.3	32.5	28.9	
18	615090	245178	41.0	50.1	45.6	47.6	43.6	46.3	38.7	39.2	53.1	44.9	39.4	34.9	43.7	33.6	-	

DT ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Jan	Feb	Mar	Apr	Мау	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean: Raw Data	Annual Mean: Annualised and Bias Adjusted (0.77)	Annual Mean: Distance Corrected to Nearest Exposure	Comment
19	616593	244753	53.9	58.2	47.7	41.7	35.0	35.1	50.6	42.8	53.0	59.8	50.4	39.7	48.1	37.0	-	Triplicate Site with 11, 12 and 19 - Annual data provided for 19 only
20	616458	244829	37.6	35.1	27.6	29.9	26.4	13.7	30.7	30.9	36.0	37.5	33.2	15.9	29.5	22.7	21.6	
21	616494	244807	42.1	48.6	40.1	34.7	39.8		33.4	32.0	37.9	44.9	38.8	27.9	38.2	29.4	-	
22	616489	244785	36.9	41.6	37.2	37.6	33.9	34.0	29.3	31.2	36.7	38.6		31.6	35.3	27.2	-	
23	616645	244784	20.0	29.8	21.6	20.1	17.3	13.1	15.8	16.7	22.7	24.7	22.4	21.7	20.5	15.8	-	
24	616663	244692	47.8	50.3	42.4	39.0	31.1	33.6	36.4	35.9	47.3	50.9	43.9	39.7	41.5	32.0	-	
25	616753	244582	42.6	48.3	39.3	39.2	31.6	32.1	34.0	34.8	43.2	46.1	40.4	34.4	38.8	29.9	28.7	
26	616971	244511	36.4	45.3	36.6	29.1	38.7	37.3	27.4	34.5	37.6	35.7	38.0	29.2	35.5	27.3	-	
27	616965	244546	42.8	49.4	42.3	39.0	30.1		37.4	33.2	42.0	46.0	42.2	37.4	40.2	30.9	30.2	
28	615194	245292	36.5	39.1	38.2	36.4	29.8	29.5	32.4	29.4	42.7	41.0	36.0	30.1	35.1	27.0	24.6	
29	617118	244074	35.5	42.5	32.0	32.8	36.1	33.4	24.0	30.0	33.9	37.1	30.3	24.2	32.7	25.1	-	
30	616939	244114	52.7	57.1	51.1	45.7	37.9	36.7	43.9	43.1	39.5	57.9	40.8	41.8	45.7	35.2	33.1	
31	616332	244149	46.6	55.4	44.7	40.4	36.2	35.3	36.3	41.3	55.5	51.0	47.7	46.1	44.7	34.4	-	
32	617398	244573										34.8	30.3		-	-	-	Data collection below <25% so unable to annualise
33	616666	244114	37.4	43.4	34.3	29.8	31.7	27.1	20.9	29.7	38.6	37.1	38.2	15.5	32.0	24.6	-	
34	616467	244072	34.8	42.4	33.7	32.4	25.5	25.3	25.9	30.5	34.6	37.8	35.0	30.2	32.3	24.9	-	
35	616746	244696	26.9	33.4	25.8	25.3	20.0	21.1	37.0	20.8	28.8	36.2	29.6	21.5	27.2	20.9	-	
36	616820	246158	33.8	41.2	26.0	26.9	20.1	18.3	27.1	25.5	34.3	39.5	30.8	31.9	29.6	22.8	19.0	
37	616845	244252	35.2	41.4	32.8	30.6	34.7	23.2	22.8	26.5	51.1	36.0	20.6	26.0	31.7	24.4	-	
38	615904	244805	38.9	38.8	33.9	38.7	30.2	29.2	31.7	32.0	36.7	40.1	35.7	29.6	34.6	26.7	21.9	
39	616712	244228	46.6	60.7	47.2	41.7	43.5	42.9	37.5	40.3	46.9	46.7	45.5	33.2	44.4	34.2	30.6	

DT ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Jan	Feb	Mar	Apr	Мау	Jun	Jul	Aug	Sep	Oct	Νον	Dec	Annual Mean: Raw Data	Annual Mean: Annualised and Bias Adjusted (0.77)	Annual Mean: Distance Corrected to Nearest Exposure	Comment
40	615460	245148	34.5	38.8	28.4	25.0	25.9	13.2	19.4	21.9	28.4	25.4	34.6	26.4	26.8	20.7	19.1	
41	615564	245010	35.6	39.8	35.5	33.3	27.8	27.7	31.2	31.8	43.9	43.0	36.1	30.3	34.7	26.7	25.9	
42	615744	244901	35.8	46.1	38.5	46.3	45.6	41.8	27.4	33.1	18.6	42.4	38.3	30.4	37.0	28.5	-	
43	615109	245200	41.3	44.4	38.2	34.0		35.3	32.5	34.7		40.8	37.6	33.8	37.3	28.7	28.2	
44	615052	245237	34.3	47.5	36.2	34.8	33.3	29.5	25.7	24.5	42.3	36.0	37.1	31.5	34.4	26.5	22.1	
45	615261	245350	29.5	32.2	25.9	24.8	26.1	21.8	18.7	24.0	28.4	30.9	29.5		-	-	-	Triplicate Site with 45, 46 and 47 - Annual data provided for 47 only
46	615261	245350	30.8	34.4	27.4	24.9	24.7	24.4	19.4	23.2	29.4	29.6	25.3		-	-	-	Triplicate Site with 45, 46 and 47 - Annual data provided for 47 only
47	615261	245350	27.4	34.2	27.8	25.1	23.2	25.4	18.4	21.8	30.2	37.5	26.8	25.8	26.7	20.5	19.4	Triplicate Site with 45, 46 and 47 - Annual data provided for 47 only
48	615425	245486	32.9	39.1	26.5	24.0	23.2	17.9	23.1	21.7	27.5	31.0	31.8	28.1	27.2	21.0	18.1	
49	615792	244876	45.8	50.6	42.4		46.0	45.9	26.5	28.8	56.1	49.8	41.0		43.3	33.3	-	
50	615773	244890	33.1	37.2	26.0	25.1	17.6	17.9	31.2	21.8	31.7	30.5	31.7	27.6	27.6	21.3	20.0	
51	615769	244866	33.0	41.0	39.7		34.8	36.7	26.6		42.2	47.3	36.7	20.6	35.9	27.6	22.4	
52	615826	244871	46.7	54.9	50.7	50.8	48.0	47.7	38.2	48.4	46.2	56.7	49.7	39.1	48.1	37.0	-	
53	615820	244858	46.8	49.3	43.2	42.5	30.6	31.6	40.2	41.2	49.2	50.1	38.0	43.5	42.2	32.5	-	
54	615893	244855	39.0	46.0	40.8	34.3	30.1	27.2	28.2	31.5	39.6	47.1	39.5	32.8	36.3	28.0	21.0	
55	615917	244898	27.5	39.1	29.8	27.3	24.9	22.5	21.9	23.3	29.0	31.5	35.5	27.2	28.3	21.8	-	
56	615931	244911	33.7	38.9	32.4	30.9	21.1	27.6	25.8		34.3	39.9	31.8	27.9	31.3	24.1	-	
																-	-	Tube 57 removed for 2023 monitoring programme
58	615978	245042	27.6	31.8	24.1		16.7	17.9	15.1	17.1	24.8	28.2	22.4	19.3	22.3	17.2	15.2	
59	615926	244837	40.8	38.9	33.8	32.7	27.7	28.6	27.0	27.0	37.4	39.7	35.7	31.1	33.4	25.7	-	
60	617438	246168	29.0	36.0	25.2	24.7	23.0	13.5	22.6	23.0	26.7	31.2	29.1	27.4	26.0	20.0	15.5	

DT ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Jan	Feb	Mar	Apr	Мау	Jun	Jul	Aug	Sep	Oct	Νον	Dec	Annual Mean: Raw Data	Annual Mean: Annualised and Bias Adjusted (0.77)	Annual Mean: Distance Corrected to Nearest Exposure	Comment
61	616099	246105	43.7	50.1	36.7	33.5	35.8	34.4	31.0	34.4	40.6	45.9	40.7	31.7	38.2	29.4	19.2	
																-	-	Tube 62 removed for 2023 monitoring programme
63	615950	244790	40.6	44.5	38.4	35.7	27.2	28.7	38.4	35.4	47.6	48.0	38.3	36.6	38.3	29.5	-	
64	615688	244939	64.2	65.2	55.2	51.4	33.6	38.9	50.0	45.8	59.9	61.6	59.5	54.1	-	-	-	Duplicate Site with 64 and 65 - Annual data provided for 65 only
65	615688	244939	60.4	63.2	54.3	50.0	37.7	39.1	48.5	50.5	49.5	60.3	57.0	48.1	52.4	40.4	39.0	Duplicate Site with 64 and 65 - Annual data provided for 65 only
66	616807	244669	43.7	47.7	41.6	39.8	32.3	34.2	21.5	37.3	49.0	44.5	36.5	35.8	38.7	29.8	-	
67	616890	244676	28.6	36.3	29.6	26.8	21.3	21.2	20.3	24.3	30.8	34.3	30.4	26.7	27.6	21.2	18.9	
68	616905	244657	51.1	53.2	44.6	47.0	36.1	35.3	38.3	37.4	47.9	50.6	40.0	37.7	43.3	33.3	-	
																-	-	Tube 69 removed for 2023 monitoring programme
70	616965	244583	39.9	49.1	33.2	29.7	26.6		29.1	27.9	36.2	42.6	38.0	32.0	34.9	26.9	-	
71	617032	244537	29.7	35.1	26.5	21.7	23.7	20.8	17.5	21.0	24.0	27.0	27.0	20.6	24.6	18.9	-	
72	617123	244535	40.7	51.6	41.2	35.5	35.9	35.2	28.6	31.6	38.0	41.4	40.9	24.3	37.1	28.5	-	
73	617124	244517	25.6	30.9	24.2	19.2	18.6	17.9	14.8	16.4	20.5	27.4	25.6	13.9	21.3	16.4	-	
74	616953	244443	28.1	39.4	29.0	26.8	26.9	23.4	19.2	25.9	30.9	37.3	32.2	24.0	28.6	22.0	-	
75	616927	244395	29.0	32.0	23.2	19.5	15.0	15.0	17.5	18.0	27.7	31.6	28.2	12.4	22.4	17.3	-	
76	616951	244521	44.2	46.8	39.1	37.0	31.6	31.8	26.9	35.5	44.0	46.7	21.9	36.6	36.8	28.4	-	
77	616902	244542	32.8	32.9	29.6	29.9	29.7	27.1	19.7	22.6	27.8	34.3	26.8	21.9	27.9	21.5	-	
78	616870	244586	31.0	34.4	20.4	22.2	18.4	18.3	16.1	17.3	22.1	28.8	29.8	22.3	23.4	18.0	17.5	
79	617052	244677	47.0	41.4	31.0	30.0	29.7		28.5	28.8	32.2	41.8	39.8	32.5	34.8	26.8	-	
80	616821	244546	37.4	45.5	37.4	33.5	24.9	30.0	34.4	31.2	42.2	45.6	35.8	36.9	-	-	-	Triplicate Site with 80, 81 and 82 - Annual data provided for 82 only

DT ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Jan	Feb	Mar	Apr	Мау	Jun	Jul	Aug	Sep	Oct	Νον	Dec	Annual Mean: Raw Data	Annual Mean: Annualised and Bias Adjusted (0.77)	Annual Mean: Distance Corrected to Nearest Exposure	Comment
81	616821	244546	37.9	44.7	37.7	36.8	28.6	25.7	33.8	29.2	41.6	44.5	37.9	36.0	-	-	-	Triplicate Site with 80, 81 and 82 - Annual data provided for 82 only
82	616821	244546	42.3	46.3	37.3	36.7	28.6	30.3	30.4	32.0	42.4	46.1	37.3	29.5	36.3	28.0	-	Triplicate Site with 80, 81 and 82 - Annual data provided for 82 only
83	616792	244498	30.7	34.8	26.5	42.6	25.4	23.3	19.0	22.9	32.3	33.9	27.5	21.7	28.4	21.9	20.9	
84	616702	244601	23.9	32.1	24.2	23.8	21.9		13.3	20.0	24.5	28.9	21.3	20.1	23.1	17.8	-	
85	616681	244623	36.0	42.3	32.6	31.2	24.9	22.6	23.3	26.5	34.3		34.2	27.9	30.5	23.5	23.3	
86	616727	244566	32.4	34.6	28.6	27.8	26.1	24.7	20.1	24.4		31.9	29.0	24.4	27.6	21.3	-	
87	616481	244725	36.1	37.2	35.2	34.8	29.0	25.4		30.4	35.9	37.1	30.2	27.3	32.6	25.1	-	
88	616307	243875	50.2	53.0	39.1	35.8	36.3	35.8	37.2	37.2	41.4	47.6	46.4	35.0	41.3	31.8	-	
89	614816	244585	30.4	33.7	32.0	31.9	25.4	23.5	24.9	25.9	33.4	30.7	19.8	24.1	28.0	21.5	19.1	
90	614893	244558	30.7	30.7	26.7	23.2	20.3	18.3	22.4	21.4	31.1	34.3	28.4	27.3	26.2	20.2	-	
91	615195	244621	21.6	30.2	20.2	21.4	16.5	16.6	17.0	15.8	23.5	27.5	25.6	18.2	21.2	16.3	-	
																-	-	Tube 92 removed for 2023 monitoring programme
93	617360	244536	41.8	43.4	34.9	26.6	23.0	23.8	26.7	27.4	34.2	36.7	35.2	35.0	32.4	24.9	-	
94	617363	243887	31.9	33.9	25.8	21.8	17.3	17.9	23.3	22.6	28.8	31.3	27.9	25.8	25.7	19.8	-	
95	616424	243804	35.8	44.8	38.9	39.1	36.5	39.4	30.2	38.2	41.1	45.9	40.5	32.4	38.6	29.7	-	
96	616279	244807	42.9	51.2	42.0	41.7	35.4	41.2	35.9	38.5	47.6	49.9	27.0	41.5	41.2	31.7	27.7	
97	616474	244795	47.3	46.8	44.5	46.1	35.5	38.3	34.6	36.0	47.9	47.1	28.3	37.9	40.9	31.5	26.9	
98	617037	244085	39.9	44.8	41.5	35.4	32.5	30.9	33.7	35.4	26.0	41.5	29.8	30.8	35.2	27.1	-	
99	615870	244858	41.1	42.9	35.9	40.7	30.0	30.4	28.4	30.5	38.7	43.0	38.7	31.9	-	-	-	Triplicate Site with 99, 100 and 101 - Annual data provided for 101 only
100	615870	244858	39.2	43.3	39.0	40.5	32.4	29.2	26.1	33.3	39.3	42.8	38.9	26.4	-	-	-	Triplicate Site with 99, 100 and 101 - Annual data provided for 101 only

DT ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Jan	Feb	Mar	Apr	Мау	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean: Raw Data	Annual Mean: Annualised and Bias Adjusted (0.77)	Annual Mean: Distance Corrected to Nearest Exposure	Comment
101	615870	244858	41.0	40.8	39.6	36.3	33.4	31.5	29.9	32.0	39.9	44.5	35.6		36.0	27.7	22.1	Triplicate Site with 99, 100 and 101 - Annual data provided for 101 only

⊠ All erroneous data has been removed from the NO₂ diffusion tube dataset presented in Table B.1.

Annualisation has been conducted where data capture is <75% and >25% in line with LAQM.TG22.

⊠ 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 2023 diffusion tube data has been uploaded to the Diffusion Tube Data Entry System.

Notes:

Exceedances of the NO₂ annual mean objective of $40\mu g/m^3$ are shown in **bold**.

NO₂ annual means exceeding 60µg/m³, indicating a potential exceedance of the NO₂ 1-hour mean objective are shown in **bold and underlined**. See Appendix C for details on bias adjustment and annualisation.

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

New or Changed Sources Identified Within Ipswich During 2023

Ipswich Borough Council has not identified any new sources relating to air quality within the reporting year of 2023.

Additional Air Quality Works Undertaken by Ipswich Borough Council During 2024

Ipswich Borough Council performed a Detailed Assessment relating to the revocation of AQMA 1. The Council submitted a copy of the Detailed Assessment to the LAQM Helpdesk requesting their views on whether they support the revocation of this AQMA. A copy of the Detailed Assessment is attached to Appendix E. DEFRA has agreed that the AQMA is no longer required and advised to submit an AQMA revocation order, as concentrations of NO2 have shown to be below the annual mean objective level for five years.

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 2023 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 NO₂ PT scheme, the

results of which indicate that between September 2021 – October 2023 (more recent data unavailable at the time of writing this report) 100% of QC samples reported were analysed satisfactorily.

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*" with the exception of *Period 12 at Chevallier Street* (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)

Ch	ecking l	Precisio	n and	Accu	racy o	f Triplic	ate Tub	bes	B	AE/		rgy & E	nvironme	ent
			Diff	usion Tu	bes Mea	surements			,	1 IOIII I	Automa	tic Method	Data Quali	ty 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	04/01/2023	01/02/2023	40.7	40.7		41	0.0	0	0.0				Good	
2	01/02/2023	28/02/2023	44.6	43.1		44	1.1	2	9.5				Good	
3	28/02/2023	04/04/2023	34.0	33.1		34	0.6	2	5.7				Good	
4	04/04/2023	02/05/2023	35.7	35.4		36	0.2	1	1.9				Good	
5	02/05/2023	30/05/2023	33.7	32.5		33	0.8	3	7.6				Good	
6	30/05/2023	04/07/2023	34.6	36.0		35	1.0	3	8.9				Good	
7	04/07/2023	31/07/2023	26.3	25.4		26	0.6	2	5.7				Good	
8	31/07/2023	07/09/2023	33.4	30.7		32	1.9	6	17.2				Good	
э	07/09/2023	03/10/2023	36.5	35.9		36	0.4	1	3.8				Good	
10	03/10/2023	31/10/2023	36.4	38.3		37	1.3	4	12.1				Good	
11	31/10/2023	06/12/2023	29.9	30.3		30	0.3	1	2.5				Good	
12	06/12/2023	02/01/2024	30.2	32.6		31	1.7	5	15.2				Good	
13														
lt is	necessary to l	have results fo	or at least	two tube:	s in order	to calculate	the precision	n of the measur	ements	-	Overa	ill survey>	Good precision	
Sit	e Name/ ID:	E	Bramford	Road			Precision	12 out of 12	periods h	ave a C	V smaller	than 20%	(Check average	CV & DC from
			0.531					6 - 10	0.54			_	Accuracy ca	alculations)
	Accuracy	(witi	1 95% COI	ntidence	interval)		Accuracy	(Witi	n 95% con	fidence	e interval)	50%		
	without per	riods with CV	larger ti	han 20%			WITHALL	DATA				8		
	Bias calcula	ited using 0 p	periods o	f data			Bias calcu	lated using 0	periods of	f data		5 25% ·		
	E	Bias factor A						Bias factor A				a		•
		Bias B						Bias B				1 0%	Without CV>20%	With all data
	Diffusion	Tubes Mean:		µgm∼°			Diffusion	Tubes Mean:		µgm~°		-25% ·		
	Mean CV	(Precision):					Mean C	V (Precision):				- Diffe		
	Auto	matic Mean:		µgm⁻³			Aut	omatic Mean:		µgm ⁻³		-50%		
	Data Cap	ture for perio	ds used:				Data Ca	pture for perio	ods used:					
	Adjusted	Tubes Mean:			µgm ⁻³		Adjusted	Tubes Mean:			µgm ⁻³		Jaume Tar	ga, for AEA
												Ve	ersion 04 - Feb	ruary 2011

Cł	Checking Precision and Accuracy of Triplicate Tubes													
			Diff	usion Tu	bes Mea	surements					Automa	tic Method	Data Quali	ty 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	04/01/2023	01/02/2023	56.2	51.3	53.9	54	2.5	5	6.1				Good	
2	01/02/2023	28/02/2023	56.7	63.0	58.2	59	3.3	6	8.2				Good	
3	28/02/2023	04/04/2023	47.7	51.4	47.7	49	2.1	4	5.3				Good	
4	04/04/2023	02/05/2023	40.4	48.0	41.7	43	4.1	9	10.1				Good	
5	02/05/2023	30/05/2023	34.3	32.5	35.0	34	1.3	4	3.2				Good	
6	30/05/2023	04/07/2023	27.6	40.3	35.1	34	6.4	19	15.9				Good	
7	04/07/2023	31/07/2023	48.7	45.6	50.6	48	2.5	5	6.3				Good	
8	31/07/2023	07/09/2023	44.5	46.7	42.8	45	2.0	4	4.9				Good	
9	07/09/2023	05/10/2023	58.7	63.4	53.0	58	5.2	9	12.9				Good	
10	05/10/2023	31/10/2023	55.1	55.1	59.8	57	2.7	5	6.7				Good	
11	31/10/2023	06/12/2023	50.3	51.2	50.4	51	0.5	1	1.2				Good	
12	06/12/2023	02/01/2024	43.2	51.0	39.7	45	5.8	13	14.4				Good	
13														
lt is	necessary to	have results fo	or at least	two tube:	s in order	to calculate	the precision	of the measur	ements		Overa	all survey>	Good precision	
Sit	e Name/ ID:		Pipers C	Court			Precision	12 out of 12	periods h	ave a C	V smaller	than 20%	(Check average	CV & DC from
	Accuracy (with 95% confidence interval) without periods with CV larger than 20% Bias calculated using 0 periods of data Bias factor A Bias B						Accuracy WITH ALL I Bias calcul	(with) DATA lated using 0 Bias factor A Bias B	n 95% con periods of	fidence f data	e interval)	50% · 8 25% · 0% ·	Without CV>20%	With al data
	Diffusion Mean CV Auto Data Cap	Tubes Mean: (Precision): matic Mean: ture for perio	ds used:	µgm ⁻³ µgm ⁻³			Diffusion Mean C Auto Data Ca	Tubes Mean: V (Precision): omatic Mean: pture for perio	ods used:	µgm ^{-s} µgm ^{-s}		-25% - 100; 50% -		
	Adjusted	Tubes Mean:			µgm ⁻³		Adjusted	Tubes Mean:			µgm ⁻³		Jaume Tar	ga, for AEA

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

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



Cł	Checking Precision and Accuracy of Triplicate Tubes 3 AEA Energy & Environment From the AEA group													
			Diff	usion Tu	bes Mea	surements					Automa	tic Method	Data Quali	ty 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	05/01/2023	01/02/2023	64.2	60.4		62	2.7	4	24.1				Good	
2	01/02/2023	01/03/2023	65.2	63.2		64	14	2	12.7				Good	
3	01/03/2023	04/04/2023	55.2	54.3		55	0.6	1	5.7				Good	
4	04/04/2023	02/05/2023	51.4	50.0		51	1.0	2	8.9				Good	
5	02/05/2023	30/05/2023	33.6	37.7		36	2.9	8	26.0				Good	
6	30/05/2023	04/07/2023	38.9	39.1		39	0.1	0	1.3				Good	
7	04/07/2023	31/07/2023	50.0	48.5		49	11	2	9.5				Good	
8	31/07/2023	07/09/2023	45.8	50.5		48	3.3	7	29.9				Good	
9	07/09/2023	05/10/2023	59.9	49.5		55	7.4	13	66.1				Good	
10	05/10/2023	31/10/2023	61.6	60.3		61	0.9	2	8.3				Good	
11	31/10/2023	06/12/2023	59.5	57.0		58	1.8	3	15.9				Good	
12	06/12/2023	02/01/2024	54.1	48.1		51	4.2	8	38.1				Good	
13														
It is	necessary to I	have results fo	or at least	two tube:	s in order	to calculate	the precision	of the measur	ements		Overa	II survey>	Good precision	
Sit	e Name/ ID:		Norwich	Road			Precision	12 out of 12	periods h	ave a C	V smaller	than 20%	(Check average	CV & DC from
	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:						Accuracy WITH ALL I Bias calcul Diffusion Mean C Auto Data Ca	(with DATA lated using 0 p Bias factor A Bias B Tubes Mean: V (Precision): omatic Mean: pture for perio	periods of	fidence f data µgm ⁻³ µgm ⁻³	e interval)	50% - 25% - 75% - 75% - 50% - 50% -	Without CV-2015	With all data
	Adjusted	lubes Mean:			µgm ⁻³		Adjusted	Tubes Mean:			µgm ⁻³	Ve	Jaume Tan	ga, for AEA

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

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

Ch	Checking Precision and Accuracy of Triplicate Tubes AEA Energy & Environment													
			Diff	fusion Tu	bes Mea	surements					Automa	tic Method	Data Qual	ity 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	04/01/2023	01/02/2023	37.4	37.9	42.3	39	2.7	7	6.7				Good	
2	01/02/2023	28/02/2023	45.5	44.7	46.3	46	0.8	2	2.0				Good	
3	28/02/2023	04/04/2023	37.4	37.7	37.3	37	0.2	1	0.5				Good	
4	04/04/2023	02/05/2023	33.5	36.8	36.7	36	1.9	5	4.7				Good	
5	02/05/2023	30/05/2023	24.9	28.6	28.6	27	2.1	8	5.3				Good	
6	30/05/2023	04/07/2023	30.0	25.7	30.3	29	2.6	9	6.4				Good	
7	04/07/2023	31/07/2023	34.4	33.8	30.4	33	2.2	7	5.4				Good	
8	31/07/2023	07/09/2023	31.2	29.2	32.0	31	14	5	3.6				Good	
3	07/09/2023	05/10/2023	42.2	41.6	42.4	42	0.4	1	1.0				Good	
10	05/10/2023	31/10/2023	45.6	44.5	46.1	45	0.8	2	2.0				Good	
11	31/10/2023	06/12/2023	35.8	37.9	37.3	37	11	3	2.7				Good	
12	06/12/2023	02/01/2024	36.9	36.0	29.5	34	4.0	12	10.0				Good	
13														
Ris	necessary to I	have results fo	or at least	two tube	s in order	to calculate	the precision	of the measur	ements		Overa	Il survey>	Good precision	
Sit	e Name/ ID:	S	t Helens	Street			Precision	12 out of 12	periods h	ave a C	V smaller	than 20%	Uneck average	CV & DC from
- I	Accuracy	(wit)	h 95% co	nfidence	interval)		Accuracy	(with	1 95% con	fidence	interval)		Hoodiacy of	
	without per	riods with CV	/ larger t	han 20%	,		WITH ALL I	DATA				50%	1	
	Bias calcula	ted using 0 p	periods o	of data			Bias calcul	lated using 0 (periods of	f data		10 12 25%		
	E	Bias factor A						Bias factor A				B		
		Bias B						Bias B				đ 0%	Without Chapter	With all data
	Diffusion	lubes Mean:		µgm ⁻³			Diffusion	Tubes Mean:		µgm ⁻³		5	111111 07-20%	THE REAL PROPERTY AND ADDRESS OF ADDRESS OF ADDRESS AD
	Mean CV	(Precision):					Mean C	V (Precision):				50%		
	Automatic Mean: µgm ³						Aut	omatic Mean:		µgm ⁻³		□ _{.50%}		
Data Capture for periods used: Data Capture for									ds used:					
	Adjusted 1	lubes Mean:			uam ⁻³		Adjusted	Tubes Mean:			uam ⁻³		Jaume Tar	rga, for AEA
· ·												Ve	ersion 04 - Feb	oruary 2011

Cł	Checking Precision and Accuracy of Triplicate Tubes													
			Diff	fusion Tu	bes Mea	surements					Automa	tic Method	Data Quali	ty 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	05/01/2023	01/02/2023	41.1	39.2	41.0	40	1.1	3	2.7				Good	
2	01/02/2023	01/03/2023	42.9	43.3	40.8	42	1.3	3	3.3				Good	
3	01/03/2023	04/04/2023	35.9	39.0	39.6	38	2.0	5	4.9				Good	
4	04/04/2023	02/05/2023	40.7	40.5	36.3	39	2.5	6	6.2				Good	
5	02/05/2023	30/05/2023	30.0	32.4	33.4	32	1.7	5	4.3				Good	
6	30/05/2023	04/07/2023	30.4	29.2	31.5	30	1.2	4	2.9				Good	
7	04/07/2023	31/07/2023	28.4	26.1	29.9	28	1.9	7	4.8				Good	
8	31/07/2023	07/09/2023	30.5	33.3	32.0	32	1.4	4	3.5				Good	
э	07/09/2023	05/10/2023	38.7	39.3	39.9	39	0.6	2	1.5				Good	
10	05/10/2023	31/10/2023	43.0	42.8	44.5	43	0.9	2	2.3				Good	
11	31/10/2023	06/12/2023	38.7	38.9	35.6	38	1.9	5	4.6				Good	
12	06/12/2023	02/01/2024	31.9	26.4		29	3.9	13	34.9				Good	
13														
lt is	necessary to l	have results fo	or at least	two tube:	s in order	to calculate	the precision	of the measur	ements		Overa	ll survey>	Gand procirian	
Sit	e Name/ ID:	St	Matthew	s Street			Precision	12 out of 12	periods h	ave a (V smaller	than 20%	(Check average	CV & DC from
	Accuracy	(with	h 95% co	nfidence	interval)		Accuracy	(with	n 95% con	fidenc	e interval)	50%	Accuracy ca	
	without per	riods with CV	/ larger t	han 20%			WITHALL					8		
	Bias calcula	ited using 0 p	periods o	of data			Blas calcu	lated using 0	periods of	r data		25% -		
	E	Blas tactor A						Blas factor A				ag 0%.		
	Difference	Blas B					Difference	Blas B				P	Without CV>20%	With all data
	Dimusion	ubes Mean:		µgm -			Diffusion	Tubes Mean:		µgm ·		-25% -		
	Mean CV	(Precision).					ivean C	v (Precision).				E .50%		
	Auto Data Can	mauc Mean: ture for perio	ds used:	µgm -			Aut Data Ca	omatic Mean: pture for perio	ods used:	µgm ·		100 / (
	Adjusted	Tubes Mean:	40 4004.		uam ⁻³		Adjusted Tubes Mean:				uam ⁻³		Jaume Targa, for AEA	
	Jaoroa											Ve	ersion 04 - Feb	oruary 2011

f) St. Matthews Street (Site ID: 99, 100 & 101 co-located with IPS04)

Diffusion Tube Annualisation

All diffusion tube monitoring locations within Ipswich recorded data capture of 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. Only periods of diffusion tube data were ascertained for Site 32, so there was insufficient data capture to perform annualisation.

Diffusion Tube Bias Adjustment Factors

The diffusion tube data presented within the 2024 ASR have been corrected for bias using an adjustment factor. Bias represents the overall tendency of the diffusion tubes to under or over-read relative to the reference chemiluminescence analyser. LAQM.TG22 provides guidance with regard to the application of a bias adjustment factor to correct diffusion tube monitoring. Triplicate co-location studies can be used to determine a local bias factor based on the comparison of diffusion tube results with data taken from NO_x/NO₂ continuous analysers. Alternatively, the national database of diffusion tube co-location surveys provides bias factors for the relevant laboratory and preparation method.

Consulting the National Diffusion Tube Bias Adjustment Factor Spreadsheet Version 03/24 published on the DEFRA LAQM Support website, for the SOCOTEC, Didcot laboratory;

preparation method 50% TEA in acetone; for the year 2023, a bias adjustment figure of 0.77 was obtained based on 28 studies.

Ipswich Borough Council have applied a national bias adjustment factor of 0.77 to the 2023 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 national bias adjustment factor gave consideration to the guidance in Box 7.13 of LAQM.TG22. The reason for the decision was due to:

- Between 2019 2021, the Council have used a combined local bias correction factor as a result of a high data capture rate from both of our continuous analysers. However, due to the exceptional temperatures experienced in the summer of 2022, data between June and September had to be rejected from our analyser on Chevallier Street as the monitor could not be cooled sufficiently despite the procurement of a new air conditioning unit. Furthermore, the same monitor experienced faults in both May June and December 2023. As a result of these issues, we had less than 75% data capture for the Chevallier Street site and were unable to calculate a combined local bias correction factor for 2022 and 2023. As a result of the poor data capture again at this monitor (<90%) in 2023, it was decided to apply the national bias adjustment factor for the second year running. It was felt that this was a more conservative approach, thereby giving greater confidence in the data presented.</p>
- The Council calculated a local bias correction factor from both the Chevallier Street and St Matthews Street analysers (86% and 99% data capture respectively), and this was recorded as 0.75 – see Table C.2 below for the calculation of the local bias correction factor. As the local bias correction factor was calculated using only 10 periods of data for Chevallier Street, and was lower than the nationally derived bias correction factor (0.77), it was decided to apply the national correction factor to the data this year to give robust, conservative results.

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

Example of applying the national bias correction factor to diffusion tube data:

Diffusion tube 34 (College Street) – annual mean 32.3µg/m³ (average from 12 months of monthly diffusion tube readings).

 $32.3\mu g/m^3 \ge 0.77 = 24.9\mu g/m^3$

Monitoring Year	Local or National	lf National, Version of National Spreadsheet	Adjustment Factor
2023	National Factor	03/24 – 28 studies	0.77
2022	National Factor	03/23 – 26 studies	0.76
2021	Local	-	0.78
2020	Local	-	0.75
2019	Local	-	0.75

Table C.1 – Bias Adjustment Factor

Table C.2 – Local Bias Adjustment Calculation

	Local Bias Adjustment Input 1 (Chevallier St)	Local Bias Adjustment Input 2 (St Matthews St)	Local Bias Adjustment Input 3	Local Bias Adjustment Input 4	Local Bias Adjustment Input 5
Periods used to calculate bias	10	12			
Bias Factor A	0.75 (0.71-0.78)	0.74 (0.7-0.79)			
Bias Factor B	34% (28% - 40%)	34% (27% - 42%)			
Diffusion Tube Mean (µg/m ³)	27.1	36.0			
Mean CV (Precision)	5.1%	5.0%			
Automatic Mean (µg/m ³)	20.2	26.8			
Data Capture	97%	99%			
Adjusted Tube Mean (µg/m ³)	20 (19 - 21)	27 (25 – 28)			

NO₂ Fall-off with Distance from the Road

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

Distance correction should be considered at any monitoring site where the annual mean concentration is greater than 36µg/m³ 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 $36\mu g/m^3$ and not located at a point of relevant exposure were sites 64&65 (duplicate). The corrections were 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.3.

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

Site ID	Distance (m): Monitoring Site to Kerb	Distance (m): Receptor to Kerb	Monitored Concentration (Annualised and Bias Adjusted	Background Concentration	Concentration Predicted at Receptor	Comments
DT 64/65	1.3	1.7	40.4	13.1	39.0	Within 10% of the AQS objective.

QA/QC of Automatic Monitoring

The automatic NO₂ monitors located on Chevallier Street (IPS3) and St Matthews Street (IPS04) are subject to fortnightly routine calibration by an Ipswich Borough Council Environmental Health Officer or Technical Officer.

The NO₂ 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 2023) 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(22). 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

The FIDAS monitor located on St Helens Street is not independently audited but AECOM carry out the data checking, processing and validation in line with standard requirements on behalf of Ipswich Borough Council. This includes regular checks to make sure the monitor is running and data are being downloaded and raising any issues with the supplier when identified to resolve and manual review of the data to exclude any data due to instrument malfunctions or faulty calibrations.

In line with guidance in LAQM.TG (22), the FIDAS instrument processes the PM10 and PM2.5 data using an inbuilt algorithm. This algorithm known as Method 11 has been certified in the UK. The Method 11 PM10 data can be used by Local Authorities without the need for correction for slope and/or intercept but the Method 11 PM2.5 data needs correction for slope by dividing by 1.06. Therefore, the FIDAS PM2.5 data provided in the report have been scaled accordingly. The calibration certificate is presented in Figure C.6.

Figure C.2 – Certificate of Calibration for IPS3

UKAS Dummente 0401	Oxfordshi	ne OX11 OQR. Te	lephone 01235 753092		RICAR	RDO
					Page 1 of 3	
pproved Signatories:		8000	S. Eaton S Copsey N Rand B Davies D Lane	0000	B Stacey S Stratton S Telfer S Gray T Green	
igned:	Ð					
Date of issue:	11 Dec 23					
Certificate Number:	6566					
Sustomer Name and Address	5:	Ipswich Bo Grafton Ho 15-17 Russ	rough Council use well Boad			
		Ipswich IP1 2DE				
Description:		Ipswich IP1 2DE Calibration Ipswich Ch	factors for the air	r monitori	ng station at	
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Certificate Number:

6566

ED79001143/November 2023

Ricardo Energy & Environment ID:

Ipswich Chevallier Street Date of audit: 21 Nov 2023

Species		Zero Response ¹	Zero uncertainty nmol/mol	Calibration Factor ²	Factor uncertainty	Converter efficiency (%) ³	Converter uncertainty (%)
NOx	1172	4.1	2.6	1.1320	3.5	97.2 (274ppb)	1.4
NO	1172	0.9	2.6	1.1332	3.5	100 (200ppb)	1.4

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Ipswich Chevallier Street_Cert 6566_Nov 2023 2 of 3



CERTIFICATE OF CALIBRATION



Page 3 of 3

Date of issue:

11 Dec 23

Certificate Number:

6566

Ricardo Energy & Environment ID:

ED79001143/November 2023

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 reported in concentration units of nmol/mol or µmol/mol.

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 (nmol/mol for NO, NOx, SO2, O3 and µmol/mol for CO). 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 NO2 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.

End of certificate

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Ipswich Chevallier Street_Cert 6566_Nov 2023 3 of 3

Figure C.3 – Certificate of Calibration for IPS04

UKAS CABREEN	Oxforda	hine OK11 OQR. To	elephone 01235 753652		RICARD
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proved Signatories:			S. Eaton S Copsey N Rand B Davies D Lane		3 Stacey 5 Stratton 5 Telfer 5 Gray 1 Green
gned:	H				
ite of issue:	11 Dec 23				
rtificate Number:	6567				
		Grafton Ho 15-17 Russ	sell Road		
		IP1 2DE			
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Escription: cardo Energy & Environme The reported expanded uncertaint confidence of approximately 95% T This certificate is insued in accorda provides traceability of measurems Laboratory or other recognised nat the prior written approval of the is	ent ID: tes are based on a star The uncertainty evaluation ince with the laborator ant to the Si system of focasi metrology institu- souing laboratory	Ipswich IP1 2DE Calibration Ipswich St ED7900114 dard uncertainty of tion has been carr y accreditation re- units and/or to un des. This certificat	factors for the a Matthews Street 43/November 202 molipled by a coverage fa fed out in accordance with parements of the United X bits of measurement realis is of measurement realis	ir monitorin 23 ctor k=2 providing UEAS requiremen ingdom Accredita ed at the National other than in full,	g station at a level of ds. toon S envice. It Physic al exce pt with
Escription : cardo Energy & Environme The reported expanded uncertaint confidence of approximately 95% T This certificate is issued in accorda provides traceability of measurem Laboratory or other recognised nat the prior written approxal of the is Recardo Energy & Environment Head Office Gemin Building, Feeri Avenue, Hannel,	ent ID: ins are based on a star the uncertainty evalua- nce with the laborator ent to the Si system of Schull metrology institu- suing laboratory Registered offic Shoreharn by-Se Week Sames BN43 SFG	Ipswitch IP1 2DE Calibration Ipswitch St ED7900114 dard uncertainty s too has been carr y accreditation rec units and/or to us data. This certificat	factors for the a Matthews Street 43/November 202 multiplied by a coverage fa red out in accordance with parements of the United X bits of measurement realis to may not be reproduced	tr monitorin 23 ctor k=2 providing UEAS requirement of at the National other than in full,	g station at a level of ts. ton S entice. It Physic al exce pt with
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Ipswich St Matthews Street_Cert 6567_Nov 2023 1 of 3



CERTIFICATE OF CALIBRATION



Page 2 of 3

Date of issue:	11 Dec 23
Certificate Number:	6567
Ricardo Energy & Environment ID:	ED79001143/November 2023

Ipswich St Matthews Street Date of audit: 20 Nov 2023

Species	Analyser Serial no	Zero Response ¹	Zero uncertainty nmol/mol	Calibration Factor ²	Factor uncertainty %	Converter efficiency (%) ³	Converter uncertainty (%)
NOx	2696	2.2	2.6	1.1194	3.5	98.8 (264ppb)	0.8
NO	2696	0.9	2.6	1.1524	3.5	99.8 (139ppb)	0.8

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Certificate Number:

CERTIFICATE OF CALIBRATION



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Date of issue:

11 Dec 23

6567

Ricardo Energy & Environment ID:

ED79001143/November 2023

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 reported in concentration units of nmol/mol or umol/mol.

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 (nmol/mol for NO, NOx, SO2, O3 and µmol/mol for CO). 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 NO2 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.

End of certificate

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Figure C.4 – 2022 Air Pollution Report – Ipswich Chevallier Street (Site ID: IPS3)

Air Pollution Report

1st January to 31st December 2023



Ipswich Chevallier Street (Site ID: IPS3)

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

Path teat	hio	hio.	hits an hit	_
Polutant	NU	2	NUxasNU	2
	hð/m.	hð/m,	hð/m,	_
Number Days Low	-	323	1.1.1.1	•
Number Days Moderate	-	0		•
Number Days High	-	0		-
Number Days Very High	-	0		•
Msx Daily Mean	128	50	24	٥
Annual Max	367	94	63	1
Annual Mean	14	20	4	1
99.8th Percentile of hourly mean	-	80		-
98th Percentile of hourly mean	88	57	18	3
95th Percentile of hourly mean	44	46	110	٥
50th Percentile of hourly mean	8	17	2	9
% Annual data capture	86.18	86.18	86.1	8

ant 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 NO₂ µg m-3

	Standards regulations 2010		
Nitrogen dioxide	Hourly Mean > 200 microgrammes per metre cubed	0	'
Nitrogen dioxide	Annual Mean > 40 microgrammes	0	



Figure C.5 – 2022 Air Pollution Report – Ipswich St Matthews Street (Site ID: IPS04)

Air Pollution Report

1st January to 31st December 2023



Ipswich St Matthews Street (Site ID: IPS04)

These data have been fully ratified Only relevant statistics for LAQM are presented

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

B-sheet-	han	hum.	hin
Pollutant	NO	NO ₂	NO _x asNO ₂
	hðuu.	hðim,	hð\u,
Number Days Low	-	365	-
Number Days Moderate	-	0	-
Number Days High	-	0	-
Number Days Very High	-	0	-
Max Daily Mean	129	63	253
Areual Max	383	127	682
Annual Mean	21	27	58
99.8h Percentile of hourly mean	-	96	-
98th Percentile of hourly mean	96	70	211
95h Percentile of houty mean	64	59	155
50th Percentile of hourly mean	14	23	46
% Annual data capture	99.70	99.70	99.70

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 NO₂ µg m-3

Pollutant	Air Quality	Exceedances	Days	ł
	Standards		L	
	regulations 2010			
Nitrogen dioxide	Hourly Mean >	0	0	
	200			
	microgrammes			
	per metre			l
	cubed			l
Nitrogen dioxide	Annual Mean >	0	-	
	40			
	microgrammes			
			I	





Figure C.6 – Certificate of Calibration for IPS05

Calibration Certificate No.: 19006-17012023



Calibration Certificate

Fidas[®]200





Suitability Tested Complying with 2008/50/EC EN 15267 Regular Surveillanca www.buv.com ID 0000040212

Palas GmbH Partikel- und Lasermesstechnik Greschbachstraße 3b 76229 Karlsruhe, Germany www.palas.de Management: Dr.-Ing. Maximilian Weiß Michael Wolf



Handelsregister/ Commercial Register: Mannheim HRB 103813 Sitz des Unternehmens/ Place of Business: Karlsruhe

Fidas# 200

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Calibration Certificate No.: 19006-17012023



Basic Information

Device		Calibrator	Valid until
Fidas® 20	0	T. Jäger	23.01.2028
Device Under Test		Test Conditions	
Model	Fidas® 200	Humidity:	32 %
Serial number	19006	Air pressure	998 mbar
Firmware version	100535	Air temperature	24 °C
Size range	0.18 – 18 µm		

Used Reference and Test Equipment

All test equipment as well as the reference devices are subject to test equipment monitoring and are therefore calibrated regularly.

Type	Model	Serial number
Flowmeter (25 °C,	Defender 530 +	158881
1013 mbar)	(Tolerance range ±1%)	
Reference dust	MonoDust 1500	130809-048-035 #1
Fidas	Fidas* 200	12003

Instrumental Check-up

General Settings

rande 0.18 - 19.0 um, PM-DUS	Swrace	a la		
Sie (used025-151og.107 min size: 0.1 um mars size: 15:8 µm DVC: 1.828 V measuring location: 0 PM senso	length: 262.0 µm length: 162.8 µm width: 262.0 µm annor Sone 4.600 l/win particle velocity: 9.30 m/s alkalaov. 1000 1 min: 0.0 µm			
andre 1808 Antiladie 180 Antiladie 197	w.	an or california		
menu	1 1 at const 2200	11145 90 8 46 4030500		
lype	Parameter	Allowable range	Value	Status
low measurement	Aerosol flow rate	4.75 ~ 4.85 l/min	4.80 l/min	

Calibration Certificate No.: 19006-17012023

MonoDust 1500: Raw data distribution, signal length distribution



MonoDust 1500: Size distribution with 64 channels



Ambient air: Size distribution with 64 channels/decade



Page 3 of 6

Calibration Certificate No.: 19006-17012023



Zero filter measurement for 120 seconds: Size distribution with 64 channels Measured particle concentration: 0 P/cm³



Signal noise with zero filter and signal amplification by a factor of 10



Offset measurement



Fidas® 200

Page 4 of 6
Calibration Certificate No.: 19006-17012023

General IO/Suction pump/Fiber test



TOP-OR OTHER DESIGN Insertion Laboration ing 1 0 -14.000 formin allege rabart 41 sectors \$1 1.04 . ÷ . C and by her ۵ and the state an Antegorgania 10.044 in. ------ 20.60 CHILITIT +++ -(Angle) new specific data IT'S Palet Literature Ethiopiet 0 nes . 100 stational d

PM Calibration

Fine dust calibration procedure without correction factor (increasing PM-value) Result (average of PM2.5 and PM10 ratio): (nominal: 1.00 ± 0.06)



Calibration Certificate No.: 19006-17012023



Fine dust calibration procedure with correction factor (decreasing PM-value) Result (average of PM2.5 and PM10 ratio): (nominal: 1.00 ± 0.02)





Karlsruhe, 17.01.2023

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Basic Information

	Calibrator	Valid until
MonoDust 1500	T. Jäger	26.09.2024
Test conditions		
Humidity:	42 %	
Air pressure	998 mbar	

Air pressure	998 mbai
Air temperature	24 °C

Used Test Equipment

Monopust 1500	420000 049 052
Lot. Number	130809-046-052
NIST Deference Material	
Peference PSI 6i76	0.994 µm ± 0.015 µm
Manufacturer	Thermo Scientific
Lot. Number	240525
Lised Spectrometer	
Promo® 1000	SN 10393
Welas 1200 Sensor	SN 13307

Test results

Measured size (modal value):	1.287 µm	
Calibration range	Setpoint raw chan.	Permissible tolerance
0.11 - 3 um	221.1	0.5 raw channel
0.2 - 10 um	163.7	0.5 raw channel
0.3 - 17 um	139.9	0.5 raw channel
0.6 – 40 µm	95.6	0.5 raw channel



Karlsruhe, 26.09.2022

MonoDust 1500

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PM₁₀ and PM_{2.5} Monitoring Adjustment

The type of PM10/PM2.5 monitor utilised within Ipswich does not require the application of a correction factor.

Automatic Monitoring Annualisation

All automatic NO₂ monitoring locations within Ipswich 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.

As the automatic PM₁₀ & PM_{2.5} monitor was not installed until May 2023, a data capture rate of less than 75% was obtained. In light of this, the data was annualised in accordance with LAQM TG.22. The results are shown in Table C.4 below.

Table C.4 – Annualisation Summary (concentrations presented in µg/m³)

Site ID	Annualisati on Factor Norwich Lakenfield	Annualisati on Factor St Osyth	Annualisati on Factor Southend	Average Annualisati on Factor	Raw Data Annual Mean	Annualised Annual Mean	
10005	1.12	1.09	1.08	1.10	7.2	7.94 (PM2.5)	
12505	1.06	1.03	1.06	1.05	13.0	13.6 (PM10)	

NO₂ Fall-off with Distance from the Road

Wherever possible, monitoring locations are representative of exposure. However, where this is not possible, the NO₂ concentration at the nearest location relevant for exposure has been estimated using the NO₂ fall-off with distance calculator available on the LAQM Support website. Where appropriate, automatic annual mean NO₂ concentrations corrected for distance are presented in Table A.3.

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

Figure D.1 – Overview of Ipswich AQMA boundaries and monitoring locations



Monitoring Locations Ipswich 2023

Figure D.2 – Ipswich Air Quality Management Area 1





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

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Appendix E: Detailed Assessment of AQMA 1



Detailed Assessment of Air Quality for Ipswich Borough Council

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

June, 2024

Local Authority Officer	Andrew Coleman
Department	Environmental Protection
Address	Grafton House, 15-17 Russell Road, Ipswich, IP1 2DE
Telephone	01473 432000
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Report Reference Number	AJC/DA/24
Date	June 2024

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 4 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 (22).

Monitoring data indicates that there have been no measured exceedances of the air quality objective for NO_2 concentrations over the last five years in AQMA 1.

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

• AQMA No. 1 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, AQMA No 3 and AQMA No 5. still indicate NO_2 concentrations within 10% of the air quality objective at various locations within the last 5 years, 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 seven 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 40μ g/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

In 2020, a further Detailed Assessment was carried out. Monitoring data indicated an area outside of AQMA No. 3 where the annual average nitrogen dioxide objective level was being exceeded. 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 AQMA No. 1 was amended to reduce the boundary, AQMA No.3 amended to marginally increase the boundary, and that AQMA No.4 was revoked.

Currently, Ipswich Borough Council has declared a total of four 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, this area extends along Chevallier Street to the junction with Providence Lane (declared 2006; amended 2017; amended 2021);
- 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 Encompassing the land in and around College Street, Key Street, Salthouse Street, Fore Street, Star Lane, Neptune Square and Grimwade Street (declared 2006; amended 2017; amended 2021);
- 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.



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 NO_2 annual mean objective level. The Action Plan was updated in 2021 to reflect the reduction in the number of AQMAs in the town.

The latest 2024 Annual Status Report (ASR) currently being prepared indicates that there have been no measured exceedances of the air quality objective for NO_2 concentrations over the last five years in AQMA No.1. In light of this, the Council is now reviewing the monitoring data to determine whether the existing AQMA is still appropriate and whether it can be revoked.

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

Detailed Assessment of NO2 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 3.55 of LAQM.TG(22) 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 93 diffusion tubes positioned at 83 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 that measure concentrations of nitrogen dioxide, one of which is located just outside the periphery of AQMA No.1 on Chevallier Street, and the other being located just outside the periphery of AQMA No.5 on St Matthews Street.

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Monitoring results in AQMA No 2, AQMA No 3, and AQMA No 5. still indicate NO_2 concentrations within 10% or above the air quality objective at various locations within the last 5 years, and as such, no plans are being made to amend the boundaries of these AQMAs. In light of this, the focus of this detailed assessment is on AQMA No.1.

This detailed assessment is based on diffusion tube readings placed out in and around the perimeter of AQMAs No.1 over the last 10 years. It is also based on continuous monitor data obtained from the Chevallier Street monitor over the last 7 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%).

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 - 2021 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, 98% in 2019 and 2020, 92% in 2021). A national bias correction factor was again used in 2022, due to less than 75% data capture from the analyser as a result of exceptional temperatures experienced in the summer of 2022; data between June and September had to be rejected as the analyser could not be cooled sufficiently despite the procurement of a new air conditioning unit. Furthermore, the same monitor experienced faults in both May – June and December 2023. As a result of this, we had less than 75% data capture for the Chevallier Street site and were unable to calculate a combined local bias correction factor for 2023 either.

Paragraph 1.63 of LAQM.TG(22) states 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 NO_2 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 just outside the boundary of 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(22).

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 map and table below show the monitoring locations and annual mean NO_2 concentrations within AQMA No. 1 for the period 2014 – 2023.

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

ing site	In AQMA	Distance correction required	NO ₂ Concentrations (μg/m ³) (unadjusted values not located at façade of relevant receptor provided in brackets)									
Monitor			2014 - NF	2015 - NF	2016 - NF	2017 - NF	2018 - LF	2019 - LF	2020 - LF	2021 - LF	2022 - NF	2023 - NF
IPS3	N	Did not distance correct monitor data	N/A	N/A	N/A	29	28	26	20.7	23	20	20
DT45 (trip)	N	Y	(29.6)	(29.1)	25.7 (27.4)	25.0 (26.5)	26.5 (28.3)	24.3 (25.7)	19.2 (19.4)	21.1 (22.3)	20.8 (22.0)	19.4 (20.5)
DT46 (trip)	N	Y	(29.3)	(28.4)	25.7 (27.4)	25.0 (26.5)	26.5 (28.3)	24.3 (25.7)	19.2 (19.4)	21.1 (22.3)	20.8 (22.0)	19.4 (20.5)
DT47 (trip)	N	Y	(28.6)	(28.0)	25.8 (27.6)	25.0 (26.5)	26.5 (28.3)	24.3 (25.7)	19.2 (19.4)	21.1 (22.3)	20.8 (22.0)	19.4 (20.5)
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)	31.5 (32.1)	33.5 (34.2)	32.4 (33.1)	31.6 (32.2)
DT16	N	Y	(33.2)	(36.4)	32.2 (35.1)	33.6 (36.7)	32.0 (35.3)	30.3 (33.0)	23.8 (25.7)	25.1 (27.3)	25.8 (28.3)	24.6 (26.9)
DT48	N	Y	(27.1)	(27.4)	23.1 (27.1)	(28.8)	22.5 (26.5)	21.6 (25.0)	17.3 (19.1)	18.2 (20.7)	18.6 (21.6)	18.1 (21)

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

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 ten years. DT14 is located on a narrow stretch of road, leading up to a roundabout that is often congested, particularly at peak times.

Analysis of Trends in NO2 Monitoring Data

According to LAQM TG.(22), 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, several 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 ten 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 2014-2023 within AQMA 1 against the annual mean objective level of $40\mu g/m^3$. Figure 8 presents the same information from Table 1 in graphical form.

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LAQM.TG (22) states that "exceedances of the NO_2 1-hour mean are unlikely to occur where the annual mean is below $60\mu g/m^3$ ". From the above table it is clear that monitoring values at all sites for the last nine years are significantly below the annual mean value of $60\mu g/m^3$. 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 8 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 diffusion tube sites have experienced concentrations below the objective since 2014. The automatic monitor IPS3 has also read below 30μ g/m3 since its reinstatement in 2017.

Although DT14 recorded an annual mean of 39.8 μ g/m³ in 2019, the Council is now confident that levels will not exceed the objective in future years. Concentrations have remained below 10% of the annual mean objective level since the COVID-19 pandemic in 2020, and have remained below 10% of the annual objective level since.



Figure 8: Trends in annual mean NO2 concentrations in and around AQMA 1

Due to NO_2 concentrations remaining below the annual mean objective level for the last five years, it is proposed that AQMA No.1 is revoked.

Conclusions and Recommendations

Monitoring of nitrogen dioxide indicates that there is no continuing exceedance of the annual average objective level in AQMA No.1.

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

• AQMA No. 1 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 action by the local authority Executive, it is recommended that the AQMA is revoked.

Monitoring will continue within and around the AQMA where exceedance has historically occurred. Further changes to any of Ipswich's other AQMAs will be made as and when required, dependent on the outcome of any Further Assessment and future monitoring or air quality modelling results.

Appendix F: Summary of Air Quality Objectives in England

Table E.1 – Air Quality Objectives in England⁸

Pollutant	Air Quality Objective: Concentration	Air Quality Objective: Measured as
Nitrogen Dioxide (NO2)	200µg/m ³ not to be exceeded more than 18 times a year	1-hour mean
Nitrogen Dioxide (NO2)	40µg/m³	Annual mean
Particulate Matter (PM ₁₀)	50µg/m ³ , not to be exceeded more than 35 times a year	24-hour mean
Particulate Matter (PM10)	40µg/m³	Annual mean
Sulphur Dioxide (SO2)	350µg/m ³ , not to be exceeded more than 24 times a year	1-hour mean
Sulphur Dioxide (SO2)	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

 $^{^{8}}$ The units are in microgrammes of pollutant per cubic metre of air (µg/m³).

Glossary of Terms

Abbreviation	Description
AQAP	Air Quality Action Plan - A detailed description of measures, outcomes, achievement dates and implementation methods, showing how the local authority intends to achieve air quality limit values'
AQMA	Air Quality Management Area – An area where air pollutant concentrations exceed / are likely to exceed the relevant air quality objectives. AQMAs are declared for specific pollutants and objectives
ASR	Annual Status Report
Defra	Department for Environment, Food and Rural Affairs
DMRB	Design Manual for Roads and Bridges – Air quality screening tool produced by National Highways
EU	European Union
FDMS	Filter Dynamics Measurement System
LAQM	Local Air Quality Management
NO ₂	Nitrogen Dioxide
NOx	Nitrogen Oxides
PM ₁₀	Airborne particulate matter with an aerodynamic diameter of $10\mu m$ 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

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- Local Air Quality Management Policy Guidance LAQM.PG22. August 2022.
 Published by Defra in partnership with the Scottish Government, Welsh Assembly Government and Department of the Environment Northern Ireland.
- Chemical hazards and poisons report: Issue 28. June 2022. Published by UK Health Security Agency
- Air Quality Strategy Framework for Local Authority Delivery. August 2023.
 Published by Defra.