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: May, 2024

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Executive Summary: Air Quality in Our Area

Air Quality in Newark & Sherwood

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 year[1].

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 pollution[2].

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.

Table ES 1 - Description of Key Pollutants

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. PM_{10} refers to particles under 10 micrometres. Fine particulate matter or $PM_{2.5}$ are particles under 2.5 micrometres.

[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 Newark & Sherwood, the Office for Health Improvement & Disparities have calculated that 5.6% of mortality is attributable to particulate air pollution (Indicator D01), which is lower than the East Midlands (6.1%) and lower than the England (5.8%) percentage figures (2022 period, using new method).

In Newark & Sherwood the predominant sources of air pollution are from vehicle emissions, industrial processes and agriculture. The main pollutants of concern being nitrogen dioxide and particulate matter, a significant source of both coming from vehicle exhaust emissions. Ambient background levels are also affected by emissions from domestic heating: NO_x from domestic gas boilers and PM from wood, coal and oil fired burners and boilers.

Newark & Sherwood District Council only use NO_2 diffusion tubes for air quality monitoring and don't have any real time continuous monitoring stations. NO_2 levels in 2023 were slightly reduced from those of 2022 and reported in last year's ASR at all sites monitored. No sites levels increased during 2023 from 2022 which is very encouraging.

The trend over the last few years seems to have been a significant reduction in NO_2 levels from 2019-20 during COVID 19 pandemic restrictions. 2020 saw an increase as things started to get back to normal and businesses opened and commuting began again, however it was noticeable that levels during this period didn't return to pre pandemic levels. Since 2020 the levels of NO_2 observed have continued to reduce year on year and during 2023 were back to or lower than that recorded during the height of the pandemic restrictions in 2019/20. As reported in previous years, these continuing reductions can be attributed to improving technology, gradual upgrade of vehicle fleets and continued uptake of flexible working arrangements. Going forward we expect this trend to continue to a certain degree however there may be a plateau effect whereby many of the large wins are realised and smaller more focussed objectives are required to continue the reduction. Generally speaking the NO_2 reduction pattern echoes the UK trend in recent years.

The three sites where results were most elevated were the same as reported in the 2023 ASR FADS Cartergate, Brunel Drive/Lincoln Road, and Bowbridge Road but in a different order with the FADS site being the highest this time. This site is at the busy Beaumond Cross junction in Newark where there is regularly queuing traffic which is controlled by traffic lights and where Lombard Street, London Road and Portland Street meet. There is a busy Asda supermarket, large doctors' surgery and multiple shops and restaurants. This

area is regularly bustling with vehicles and pedestrians. Bias adjusted annual mean for 2023 here was 24.62 µg/m^3.

The Brunel Drive and Lincoln Road junction is a hotspot where traffic builds up particularly when private and business vehicles are exiting the nearby industrial estate to access the nearby A1 or A46. Bias adjusted annual mean for 2023 was 24.05 µg/m^3.

Bowbridge Road is a predominantly residential street, but one end shares a junction with the busy London Road and the other end has a significant amount of development occurring as part of the large Middlebeck development site. There is also Newark Sports and Fitness Centre and the YMCA Community and Activity Village situated off Bowbridge Road, both of which attract a lot of visitors and likely contribute to these elevated recorded levels. In addition Bowbridge Road is often used by HGV's to access the Hawton Lane industrial sites at the end of Bowbridge Road . Bowbridge Road regularly has queuing traffic due to traffic lights at each end to control the volumes of vehicles. Bias adjusted annual mean for 2023 was 23.51 µg/m^3.

We regularly review tube locations and consider these the current worst-case scenarios and representative of relevant exposure.

These areas have historically shown some of the most elevated monitored levels of nitrogen dioxide in the district, although the levels are significantly below Air Quality Objectives for England (Table E1) and below that required for declaring a new Air Quality Management Areas (AQMA) and any associated action plan or strategy.

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 Plan[3] 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 of most harmful to human health. The Air

[3] Defra. Environmental Improvement Plan 2023, January 2023

Quality Strategy[4] provides more information on local authorities' responsibilities to work towards these new targets and reduce fine particulate matter in their areas.

The Road to Zero[5] 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.

A summary of our core actions to target sources of air pollution are based on recommendations made in the Air Quality Strategy for Nottingham and Nottinghamshire 2020-2030 and include:

- To review and assess air quality in the district against national health-based standards and produce annual reports of our assessment and monitoring (strategic objective 1 of NAQS2020).
- We work with colleagues from Nottinghamshire County Council Highways to implement actions to ease congestion and maintain a flow of traffic (reducing the stop/start) and promote alternatives such as public transport and cycling/walking (strategic objectives 1 & 2 of NAQS2020).
- We work with colleagues in the Planning Unit to ensure air quality is a material consideration in the forward planning process and during consultation for new developments. We may consult with neighbours on proposed development with significant impacts on air quality across our boundaries and can require modelling or monitoring to establish impact of developments on air quality. Air Quality also forms part of the Spatial Planning & Health Framework and Health Impact Checklist produced and used for Local Development Plans (strategic objective 1 of NAQS2020).
- We work with the UK Health Security Agency and other health professionals to raise awareness and promote measures to improve air quality whilst reducing emissions to air from our own activities (strategic objective 4 of NAQS2020).

[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

- We rigorously enforce legislation to control industrial emissions and carry out risk-based enforcement and charging. We can also assist and advise businesses where required (strategic objective 3 of NAQS2020).
- We enforce legislation to control emissions from chimneys and bonfires and assess biomass burners for air quality using the DEFRA biomass screening tool (strategic objective 3).
- We promote clean air and good practise through our website and publish DEFRA guidance on Open Fires and Wood Burning Stoves and the Woodsure Ready to Burn initiative. We have produced a webpage which includes information aimed at educating wood burner owners to improve practices to increase efficiency and reduce particulate emissions. This has been promoted through our corporate social media accounts.

We try to encourage consumers to buy Eco Design stoves. This is a European-wide initiative designed to lower emissions from Stoves. In 2015 DEFRA stated Eco Design as the method it will use to improve efficiency and reduce emissions from solid fuel stoves.

In addition to the above, HETAS has introduced the Cleaner Choice Product Approval Scheme. Stoves approved by the scheme are independently proven to meet the most stringent emissions criteria, going further than any other industry scheme and exceeding Eco Design and Defra Exemption requirements. We would recommend that consumers consider these schemes when looking to purchase a new stove.

We have worked with Nottinghamshire County Council Trading Standards to ensure that solid fuel checks in the County are being carried out and include a check on the 'Ready to Burn' certification and that emission requirements are met. This is reported on the NCC website here. (strategic objectives 3 & 4 of NAQS2020)

- We advise householders to encourage reduction and recycling of household waste. NSDC has just introduced a kerbside glass recycling service which will reduce the need for residents journeys to recycle glass (strategic objectives 4 of NAQS2020).
- We have carried out anti-vehicle idling interventions at several schools across the district this year and have focussed on school pick up times when engines may be left running. We are currently at the planning phase of extending the vehicle idling program to a more structured approach which will involve input from the schools, Councillors and media publications with the support of our Communications team. Initially this will be a small pilot but the plan is to extend this beyond the initial start up project (strategic objectives 2 & 4 of NAQS2020).

- We promote and welcome the use of electric vehicle charging points across the district (strategic objectives 1 of NAQS2020).
- We encourage developers and consultants go beyond basic air quality assessments and mitigation measures where we can. Often this is difficult due to low levels in NSDC already, however we are currently in communication with a consultant on the Dukeries Academy development which proposes Low Emission Design into the project which will go beyond basic mitigation recommendations and we will promote this approach for other applications going forward (strategic objectives 1 & 2 of NAQS2020).

Conclusions and Priorities

This authority has never had to declare an AQMA and Nitrogen Dioxide levels during the last few years continue to reduce. Our priorities are therefore to ensure that the levels of air pollution continue to reduce or at least don't increase and that AQMA declaration is avoided. Levels observed in 2023 were reduced from to those of 2022 across all sites monitored. As described above the 2020 COVID 19 pandemic restrictions resulted in a significant reduction in NO_2 levels monitored for that year, levels increased again as lockdown restrictions were removed but since then a gradual reduction has been seen each year, sufficient that currently in Newark and Sherwood, levels are back down to lockdown levels.

There were no exceedances of air quality objectives at any location across the district. There are some large residential developments proposed and ongoing across the district, however we ensure that air quality is considered as part of the planning application and require air quality assessments and construction management plans where appropriate. During 2023 officers from Public Protection were present for many of the technical working group meetings for the A46 widening scheme which is at the planning stages. We have been involved in discussions with the air quality consultant regarding the air quality assessment and at the time of writing are awaiting its submission. Initial discussions suggest that the project will improve air quality by improving traffic flows at junctions that regularly are congested. Further details are available at https://nationalhighways.co.uk/our-roads/east-midlands/a46-newark-bypass/

Below is a brief summary of our priorities in addressing air quality for the coming year:

- We will continue to monitor for Nitrogen Dioxide in the areas of concern. We review monitoring locations on a regular basis to ensure that worst case relevant exposure is represented.

- We are a member of the Nottinghamshire Environmental Protection Working Group (NEPWG) and the newly formed Nottingham and Nottinghamshire Air Quality Oversight Group (NNAQOG) which has forged strong links with colleagues in Public Health. Air Quality forms a key part of the Nottinghamshire Joint Health and Wellbeing Strategy for 2022-2026. The key aims of this being to promote recommendations for action to improve health and wellbeing and reduce health inequalities. We will use the planning and transport system, along with economic planning, licensing and policy decisions, to create places that do this. This will also help to reduce health inequalities and benefit the environment, for a better quality of life. Clean air is essential for good health and for the environment and climate. We will work to make positive changes which can also have a positive impact on air quality and to ensure that outdoor air quality supports healthier lives in all communities.

- Air Quality Strategy for Nottingham and Nottinghamshire 2020-2030 was rewritten in 2020 with an anticipated ten year review period but the Countywide strategic group plan is to reduce this to a possible review every five years to ensure it continues to meet the aims of the group. We take into consideration the recommendations made within and align our actions accordingly with them going forward.

- More recently the Nottingham and Nottinghamshire Air Quality Oversight Group has been set up by Nottinghamshire County Council to review the delivery of the Nottinghamshire Air Quality Strategy aims and to ensure that they are acted upon and that the strategy remains current with more regular reviews. This group is separate from the regional pollution group and meets quarterly and consists of members including Public Health, Environmental Health, Transport Planning, National Highways, Environment Agency, UKHSA, NHS among others.

Please see table 2.2 below for specific measures and targets.

Local Engagement and How to get Involved

As a resident of Newark and Sherwood District you can help to make a difference:

- Why not try cycling to work instead of driving if it is a viable option for you and work is not too far away for you to do this. Even if for only for one day a week, you will be having a beneficial effect on air quality by reducing vehicle emissions and also improving your own health by exercising. If cycling to work is not possible, could you use public transport instead?

- When you look to buy a new car do some research and look for one that has low emissions such as modern petrol, hybrid or electric.

- If you are thinking of installing a biomass burner (i.e. a wood or pellet or briquette burner) either for domestic or industrial use, make sure that it is an exempt appliance (i.e. exempt from certain parts of the Clean Air Act 1993) or use an authorised fuel if you are going to use it in a smoke control zone. Also make sure that it is correctly installed (with HETAS or Building Regulation approval for domestic) and correctly maintained including regular services and the chimney swept at least twice per year. The fuel used should be appropriate for the burner; this should be provided in the manufacturer's instructions. Guidance on wood burners and the Woodsure scheme is available from the Smoke Control Area section of our website.

- During the COVID 19 pandemic you may have had to work at home for some of the time. Evidence in this report and elsewhere nationally has shown that there was a large reduction in emissions during the pandemic and working at home more often was one of the factors which contributed to this reduction. Is working at home something that you could try and continue to do in the future if your employer allows? Even if you can only manage one day every few weeks you will be reducing your commuter emissions and collectively this can have a huge impact as the COVID 19 pandemic has shown. Do you really need to travel to that meeting, can it be attended virtually instead?

Changing your behaviour can reduce your exposure to pollution:

- Pollution levels vary over very short distances: in general, the closer you are to the sources, the more you breathe in.

- If you're walking or cycling, you can easily avoid the worst pollution by travelling along quieter streets. Even walking on the side of the pavement furthest from the road can help.

- One of the worst places for pollution is inside vehicles on busy roads where levels inside the car are typically as high as just outside.

- The health benefits of physical activity (walking or cycling) outweigh the risks from air pollution. If you're in a vehicle, you just get the risks with none of the benefits.

- Try to turn your vehicle engine off if you are stationary for a significant amount of time or enable stop/start if your vehicle has it fitted. An idling engine can produce up to twice as much exhaust emissions as an engine from a vehicle in motion.

Local Responsibilities and Commitment

This ASR was prepared by the Public Protection Department of Newark & Sherwood District Council with the support and agreement of the following officers and departments:

Planning at Newark & Sherwood District Council

Nottinghamshire County Council

UK Health Security Agency

Office for Health Improvement and Disparities

This ASR has been approved by:

Jo Marshall

Public Health & Commissioning Manager | Public Health

Adult Social Care & Public Health | Nottinghamshire County Council

If you have any comments on this ASR, please send them to Jim Hemstock at:

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Figures

Tables

1 Local Air Quality Management

This report provides an overview of air quality in Newark & Sherwood 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 Newark & Sherwood District 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 Appendix E: Summary of Air Quality Objectives in England

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.

Newark & Sherwood currently does not have and never has had to declare any AQMAs within the District. Levels seem to be reducing year on year so it would seem unlikely at this stage that any AQMA will be declared anytime soon.

The Air Quality Strategy for Nottingham and Nottinghamshire 2020-2030 is in place to prevent and reduce polluting activities. We shall have regard for recommendations made within it across the district going forward.

We are a member of the Nottinghamshire Environmental Protection Working Group (NEPWG) and the newly formed Nottingham and Nottinghamshire Air Quality Oversight Group (NNAQOG) which has forged strong links with colleagues in Public Health. Air Quality forms a key part of the Nottinghamshire Joint Health and Wellbeing Strategy for 2022-2026. The key aims of this being to promote recommendations for action to improve health and wellbeing and reduce health inequalities. We will use the planning and transport system, along with economic planning, licensing and policy decisions, to create places that do this. This will also help to reduce health inequalities and benefit the environment, for a better quality of life. Clean air is essential for good health and for the environment and climate. We will work to make positive changes which can also have a positive impact on air quality and to ensure that outdoor air quality supports healthier lives in all communities.

For reference, a map of Newark & Sherwood District Council's monitoring locations is available in Appendix D

2.2 Progress and Impact of Measures to address Air Quality in Newark & Sherwood

Defra's appraisal of last year's ASR concluded that the 2023 ASR was accepted for all sources and pollutants with no particular adverse comments, the main commentary points are presented below.

The report is well structured, detailed, and provides the information specified in the Guidance. The following comments are designed to help inform future reports.

1. The policy text, for example around the Environment Act, is up-to-date in this report. In the last report it was commented that the amendments of the Environment Act were not reflected in the ASR, so this demonstrates strong improvement.

2. The Council provide a good discussion of NO_2 trends within the district as well as the impacts of the easing of COVID-19 restrictions has had on air quality.

3. The map of the locations of the diffusion tubes is very good. The diffusion tube locations are clearly labelled and a second map zoomed into Newark-on-Trent shows the diffusion tubes in the city centre.

4. There are still some issues with the units of pollutant concentrations. For example, in section 2.3 the unit for PM concentrations used is "µm³", however, the correct unit is "µg/m³" or "µg m $^{-3}$". This should be amended to ensure consistency across the report.

5. The intext reference for Table A.1 is not working in section 3.21. Intext references should be double checked before submitting the ASR.

6. In Table B.1, the bias adjustment factor is missing in the header "Annual Mean: Annualised and Bias Adjusted". This should be added for clarification.

7. In section 3, the shortened version of sulphate dioxide is missing the subscript symbol: SO_2. This should be amended to ensure consistency across the report.

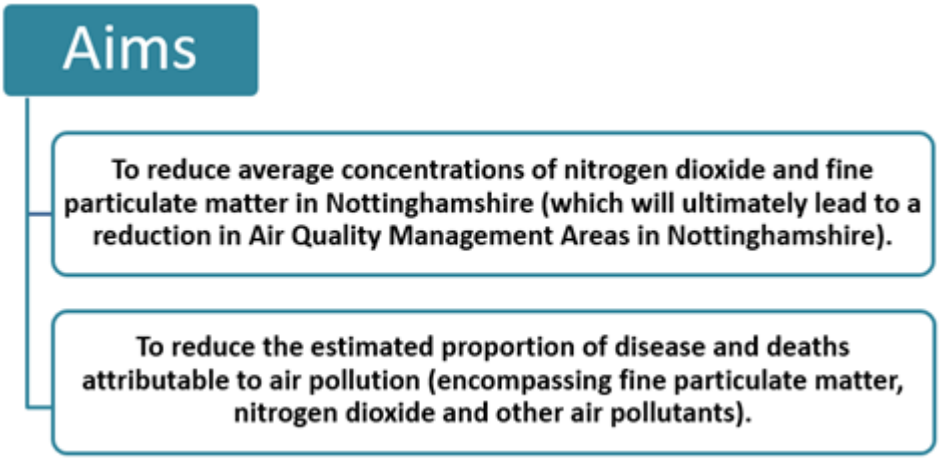
8. From 2023 those authorities who have not had to designate AQMAs and produce AQAPs should draw up a local Air Quality Strategy. Defra will monitor whether Local Authorities have or are developing a local Air Quality Strategy through the ASR appraisal process. Whilst reference is made to the Nottinghamshire Strategy, it should be clarified how this directly affects Newark and Sherwood.

Newark and Sherwood has never had to declare an AQMA and given current levels, it seems unlikely that an AQMA is going to be declared in the near future. This rural authority has less significant issues than the neighbouring Nottingham conurbation.

This can give the perception that there isn't an air quality problem in the district; however it is important to continue with the measures to ensure this situation doesn't deteriorate.

Newark and Sherwood District Council does not have an air quality strategy solely for this District, however this ASR is written taking into account the aims and objectives of the Air Quality Strategy for Nottingham and Nottinghamshire 2020-2030. The Air Quality Strategy for Nottingham and Nottinghamshire 2020-2030 demonstrates how as a partnership we are continuing to improve local air quality and maintain ongoing compliance with AQ objectives.

This strategy is considered to be relevant for the City/County and all regional authorities within it. Its aims are to encourage prevention and reduction of polluting activities across a range of diverse sectors.



The Strategy is subject to ongoing review by the Nottingham and Nottinghamshire Air Quality Oversight Group (NNAQOG) to ensure it remains current and that progress is fed back to the County and City Health and Well Being Boards.

The NNAQOG includes colleagues from City and County Local Authorities and consists of Public Health, Environmental Health, Transport Planning and the local NHS; with input also from National Highways, Environment Agency, UKHSA, among others.

The NNAQOG will also look to engage with the Mayor's office for the East Midlands Combined County Authority (EMCCA) at the earliest opportunity.

NSDC core actions to target sources of air pollution are those measures described in the county wide Air Quality Strategy for Nottingham and Nottinghamshire 2020-2030 and include:

- To review and assess air quality in the district against national health-based standards and produce annual reports of our assessment and monitoring (strategic objective 1 of NAQS2020).
- We work with colleagues from Nottinghamshire County Council Highways to implement actions to ease congestion and maintain a flow of traffic (reducing the stop/start) and promote alternatives such as public transport and cycling/walking (strategic objectives 1 & 2 of NAQS2020).
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Please see table 2.2 below for specific measures and targets.

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
1	Robust PPC inspection and enforcement regime	Environmental Permits	Other measure through permit systems and economic instruments	No AQAP	Ongoing	Local Authority Public Protection	Permitting Fees (£25-30k)	No	Funded by permit fees	£40-50k	Implementation	Process dependant	Compliance with permit conditions and emissions limits.	Ongoing	Business reluctant to go beyond BAT due to financial outlay required.
2	Ensuring Air Quality is Material Consideration for Planning Development	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	No AQAP	2025	Local Authority Public Protection, Planning and Planning Policy Departments	LA	No			Consultation with internal departments	Reduction in particulates and NO_2 during construction and operational phases of developments	NO2 tube monitoring, compliance with CEMP and reduced complaints.	Ongoing	Unless complaints are received often difficult to know if CEMP is complied with.
3	Attendance at Regional Pollution and Air Quality Oversight Group Meetings	Policy Guidance and Development Control	Regional Groups Co-ordinating programmes to develop Area wide Strategies to reduce emissions and improve air quality	No AQAP	Ongoing	Local Authority Public Protection, Public Health, Environmental Health, Transport Planning, National Highways, Environment Agency, UKHSA, NHS among others.	Regional	No			Implementation	Long term reduction in NO_2 and PM emissions.	Good attendance and engagement. Countywide Strategy remains relevant and actions implemented.	Ongoing	Difficult to get all stakeholders to attend. Regional priorities & funding may differ.
4	Vehicle Anti-idling Education	Traffic Management	Anti-idling enforcement	No AQAP	Ongoing	Local Authority Public Protection	LA	No			Implementation	NO_2 & PM reduction at sensitive sources i.e. primary schools	Reduction in vehicle idling complaints, observed compliance during interventions.	Ongoing	Enforcement in LA area that has an AQMA which NSDC does not have (DEFRA query ref #9470). Penalty fines are small and the admin cost is greater than pursuing non payment.
5	A46 Newark Widening Scheme	Traffic Management	Strategic highway improvements, Re-prioritising road space away from cars, including Access management, Selective vehicle priority, bus priority, high vehicle occupancy lane	No AQAP	2028	Local Authority Public Protection, Local Authority Planning, Local Authority Conservation, Skanska Mott MacDonald, National Highways, Environment Agency, Historic England, Natural England, Nottinghamshire County Council.	Department for Transport	No	Approved	£500m	Planning	Reduction in congestion around major junctions along route.	Reduction in NO_2 tube results at locations in close proximity.	Awaiting planning application DCO submission. Involvement in Technical Working Group and initial discussions with air quality consultants.	Multi agency, government funded, political change could impact on funding. Environmental Health is consultee only.
6	Wood Burner and Smoke Control Area Enforcement and Education	Promoting Low Emission Plant	Other Policy	No AQAP	Ongoing	Local Authority Public Protection.	LA	No			Implementation	Reduction in PM and smoke/odour.	Fewer wood burner smoke complaints, increased compliance with CAA & SCA.	Ongoing	Staffing resources
7	Clean Air Day 2024 Promotion	Public Information	Via other mechanisms	No AQAP	2024	Global Action Plan, Local Authority Public Protection & Communications, NCC & Countywide EH departments.	Global Action Plan & LA	No	N/A		Planned		N/A	Planned for 2024	Staffing resources

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 Strategy[6], 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.

In Newark & Sherwood, the Office for Health Improvement & Disparities have calculated that 5.6% of mortality is attributable to particulate air pollution (Indicator D01), which is lower than the East Midlands (6.1%) and lower than the England (5.8%) percentage figures (2022 period, using new method).

This authority does not monitor for $PM_{2.5}$ and so to consider the probable levels across the district, reference can be made to the following information sources:

Nottingham Centre AURN site – the monitored annual mean concentration for 2023 was 10.5 µg/m^3.

DEFRA Background Levels – Background maps are available from the DEFRA webpages, 2022 levels for Newark Sherwood are predicted as an average of 8.08 µg/m^3.

The World Health Organisation guideline value for annual average is now 5µg/m^3 which has been halved from pre 2021. The UK objective brought about by Environment Act 2021 and The Environmental Targets (Fine Particulate Matter) (England) Regulations 2023 is for the annual mean level in ambient air to be equal or less than 10µg/m^3 by 31st December 2040. Given this proposed future UK target limit, the modelled average level shows that Newark and Sherwood is compliant.

In order to maintain compliance with $PM_{2.5}$ limits, Environmental Health implements a number of actions listed in table 2.2 above. As part of the planning process we request Construction Management Plans and Dust Management Plans to accompany planning applications of large-scale development. We are in the process of seeking adoption of a

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

planning policy guidance document which is based in the East Midlands version (table 2.2 action 2).

We educate and enforce the relevant provisions of the Clean Air Act such as Smoke Control Areas and Chimney Heights. More recently DEFRA and the National Clean Air Strategy has seen focus placed on wood burning stoves as a significant source of $PM_{2.5}$ emissions. Newark & Sherwood District Council has taken this on board and has produced a web page to promote the correct use of stoves and initiatives such as Woodsure and Burnrite in order to try to tackle this source of $PM_{2.5.}$ This has been published throughout corporate social media accounts (table 2.2 action 6).

We regulate 52 permitted sites under the Environmental Permitting Regulations 2016 (as amended) and carry out risk-based enforcement and charging (table 2.2 action 1).

Environmental Health promotes anti-vehicle idling at school pick up locations. Currently this is just being done as an education program for drivers and is not being formally enforced. There are however plans for a pilot project for later in the year which will involve local councillors, the communications team and 3-4 schools with the focus being on engagement with schools and pupils to drive change. If successful and depending on resources, this could be expended to more schools in the future. (table 2.2 action 4).

Whilst these four actions from table 2.2 can directly impact on $PM_{2.5,}$ the other actions in the table also can the potential to provide a positive impact, such as clean air day which in the past has focussed on vehicle idling and wood burning stoves.

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

This section sets out the monitoring undertaken within 2023 by Newark & Sherwood District 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

Newark & Sherwood District Council doesn't carry out any automatic monitoring.

3.1.2 Non-Automatic Monitoring Sites

Newark & Sherwood District Council undertook non- automatic (i.e. passive) monitoring of NO_2 at 13 sites during 2023. Table A. 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.

3.2 Individual Pollutants

The air quality monitoring results presented in this section are, where relevant, adjusted for bias, annualisation (where the annual mean data capture is below 75% and greater than 25%), and distance correction. Further details on adjustments are provided in Appendix C.

3.2.1 Nitrogen Dioxide (NO_2)

Table A.4 in Appendix A compares the ratified and adjusted monitored NO_2 annual mean concentrations for the past five years with the air quality objective of 40µg/m^3. Note that the concentration data presented represents the concentration at the location of the

monitoring site, following the application of bias adjustment and annualisation, as required (i.e. the values are exclusive of any consideration to fall-off with distance adjustment).

For diffusion tubes, the full 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.

NO_2 levels in 2023 were slightly reduced from those of 2022 and reported in last year's ASR at all sites monitored. No sites increased during 2023 which is very encouraging.

The trend over the last few years seems to have been a significant reduction in NO_2 levels from 2019-20 during COVID 19 pandemic restrictions. 2020 saw an increase as things started to get back to normal and businesses opened and commuting began again, however it was noticeable that levels during this period didn't return to pre pandemic levels. Since 2020 the levels of NO_2 observed have continued to reduce year on year and during 2023 were back to or lower than that recorded during the height of the pandemic restrictions in 2019. As reported in previous years, these continuing reductions can be attributed to improving technology, gradual upgrade of vehicle fleets and continued uptake of flexible working arrangements. Going forward we expect this trend to continue to a certain degree however there may be a plateau effect whereby the large wins are realised and smaller more specialised objectives are required to continue the reduction. Generally speaking the NO_2 reduction pattern echoes the UK trend in recent years.

The three sites where results were most elevated were the same as reported in the 2023 ASR FADS Cartergate, Brunel Drive/Lincoln Road, and Bowbridge Road but in a different order with the FADS site being the highest this time. This site is at the busy Beaumond Cross junction in Newark where there is regularly queuing traffic which is controlled by traffic lights and where Lombard Street, London Road and Portland Street meet. There is a busy Asda supermarket, large doctors' surgery and multiple shops and restaurants. This area is regularly bustling with vehicles and pedestrians. Bias adjusted annual mean for 2023 here was 24.62 µg/m^3

The Brunel Drive and Lincoln Road junction is a hotspot where traffic builds up particularly when private and business vehicles are exiting the nearby industrial estate to access the nearby A1 or A46. Bias adjusted annual mean for 2023 was 24.05 µg/m^3.

Bowbridge Road is a predominantly residential street, but one end shares a junction with the busy London Road and the other end has a significant amount of development occurring as part of the large Middlebeck development site. There is also Newark Sports and Fitness Centre and the YMCA Community and Activity Village situated off Bowbridge Road both of which attract a lot of visitors and likely contribute to these elevated recorded levels. In addition Bowbridge Road is often used by HGV's to access the Hawton Lane industrial sites at the end of Bowbridge Road . Bowbridge Road regularly has queuing traffic due to traffic lights at each end to control the volumes of vehicles. Bias adjusted annual mean for 2023 was 23.51 µg/m^3.

The laboratory bias adjustment factor for 2023 for the method and laboratory used was 0.81 which was calculated using the National Diffusion Tube Bias Factor Adjustment Spreadsheet (03/24, see appendix C). The laboratory used was Gradko and the method was 20% TEA in water.

The NO_2 tubes monitoring sites are regularly reviewed and are located where the public could be regularly present for a considerable period of time and are therefore considered to be representative of relevant public exposure. We are in the process of looking at additional sites to locate diffusion tubes and are in discussions with Councillors and management regarding funding for this.

These areas have historically shown some of the most elevated monitored levels of nitrogen dioxide in the district, although the levels are significantly below Air Quality Objectives for England (Table E1) and below that required for declaring a new Air Quality Management Areas (AQMA) and any associated action plan or strategy.

3.2.2 Particulate Matter (PM_{10})

No PM_{10} monitoring has been carried out during 2023 by Newark & Sherwood District Council.

3.2.3 Particulate Matter ($PM_{2.5}$)

No $PM_{2.5}$ monitoring has been carried out during 2023 by Newark & Sherwood District Council.

3.2.4 Sulphur Dioxide (SO_2)

No SO_2 monitoring has been carried out during 2023 by Newark & Sherwood District Council

Appendix A: Monitoring Results

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)
3N_a, 3N_b	Balderton 3N	Suburban	481681	351500	NO_2	Not in AQMA	5.0	1.0	No	2.0
5N_a, 5N_b	Northern Rd 5N	Roadside	480400	355000	NO_2	Not in AQMA	5.0	1.0	No	2.0
7N_a, 7N_b	Bowbridge Rd 7N	Kerbside	480153	353320	NO_2	Not in AQMA	5.0	1.0	No	2.0
1N_a, 1N_b	FADS Cartergate 1N	Roadside	479851	353692	NO_2	Not in AQMA	1.0	2.0	No	2.0
4N_a, 4N_b	Farndon 4N	Suburban	477200	351900	NO_2	Not in AQMA	5.0	2.0	No	2.0
6N_a, 6N_b	War Memorial Appleton Gate 6N	Urban Centre	480006	353892	NO_2	Not in AQMA	1.0	2.0	No	2.0
9N_a, 9N_b	Albert St 9N	Roadside	479778	353621	NO_2	Not in AQMA	1.0	1.0	No	2.0
10N_a, 10N_b	Handley Court 10N	Urban Background	479859	354223	NO_2	Not in AQMA	1.0	1.0	No	2.0
11N_a, 11N_b	The Lodge 11N	Urban Background	481460	355900	NO_2	Not in AQMA	2.0	N/A	No	2.0

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)
12N_a, 12N_b	Newark Castle 12N	Urban Centre	479676	354016	NO_2	Not in AQMA	3.0	5.0	No	2.0
16N_a, 16N_b	Brunel Dr/Lincoln Rd 16N	Roadside	481152	355589	NO_2	Not in AQMA	3.0	2.0	No	2.0
18N_a, 18N_b	Big Fish 18N	Kerbside	465090	367595	NO_2	Not in AQMA	3.0	1.0	No	2.0
21N_a, 21N_b	Friary Road 21N	Roadside	480276	354029	NO_2	Not in AQMA	5.0	1.0	No	2.0

Notes:

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

(2) N/A if not applicable.

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

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) [1]	Valid Data Capture 2023 (%) [2]	2019	2020	2021	2022	2023
3N_a, 3N_b	481681	351500	Suburban	100	100.0	16.4	12.3	12.9	12.8	11.2
5N_a, 5N_b	480400	355000	Roadside	92.4	92.4	29.0	21.0	22.9	22.2	21.6
7N_a, 7N_b	480153	353320	Kerbside	92.4	92.4	28.5	21.8	25.9	25.1	23.8
1N_a, 1N_b	479851	353692	Roadside	100	100.0	31.2	24.3	24.5	25.4	24.4
4N_a, 4N_b	477200	351900	Suburban	100	100.0	14.4	10.8	10.8	10.4	9.2
6N_a, 6N_b	480006	353892	Urban Centre	100	100.0	21.2	16.0	16.9	16.5	15.6
9N_a, 9N_b	479778	353621	Roadside	100	100.0	27.9	19.7	22.7	21.9	21.0
10N_a, 10N_b	479859	354223	Urban Background	100	100.0	20.6	14.7	16.6	16.0	14.0
11N_a, 11N_b	481460	355900	Urban Background	100	100.0	30.3	21.0	24.3	22.5	21.1
12N_a, 12N_b	479676	354016	Urban Centre	100	100.0	18.5	12.0	13.0	13.9	12.0
16N_a, 16N_b	481152	355589	Roadside	84.9	84.9	35.4	23.3	27.9	26.6	23.9
18N_a, 18N_b	465090	367595	Kerbside	100	100.0	32.1	22.8	24.6	25.1	23.2

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
21N_a, 21N_b	480276	354029	Roadside	100	100.0	25.1	18.7	21.1	21.3	19.0

☒ **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 µg/m^3.

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

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

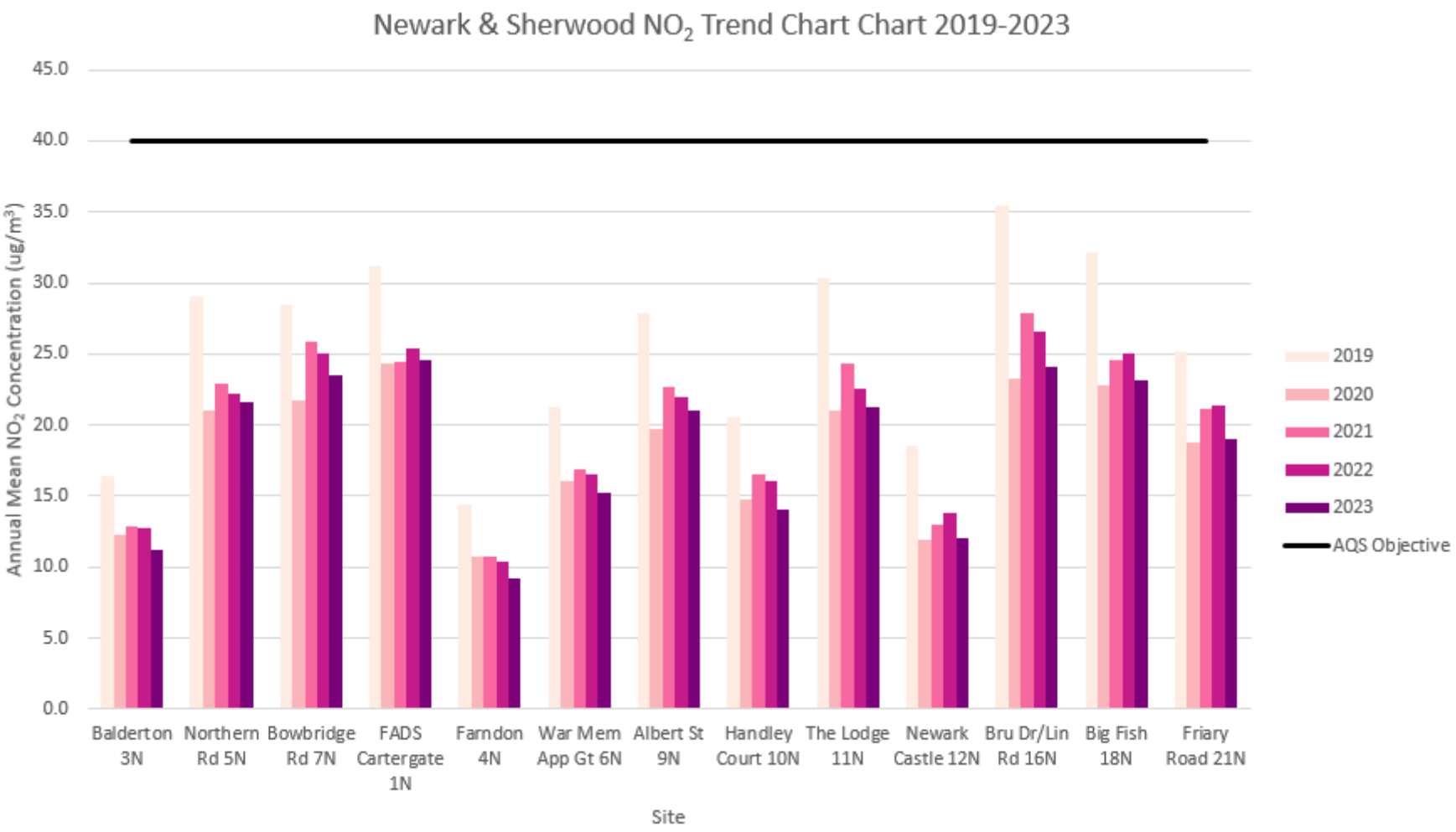
Means for diffusion tubes have been corrected for bias. All means have been "annualised" as per LAQM.TG22 if valid data capture for the full calendar year is less than 75%. See Appendix C for details.

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 NO_2 Concentrations



Appendix B: Full Monthly Diffusion Tube Results for 2023

Table B.1 – NO_2 2023 Diffusion Tube Results ($\mu g/m^3$)

DT ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean: Raw Data	Annual Mean: Annualised and Bias Adjusted (0.81)	Annual Mean: Distance Corrected to Nearest Exposure	Comment
3N_a	481681	351500	20.4	18.2	14.1	12.2	8.8	8.0	8.7	10.9	11.7	17.3	20.8	16.4	-	-	-	Duplicate Site with 3N_a and 3N_b - Annual data provided for 3N_b only
3N_b	481681	351500	19.9	18.8	13.2	11.8	8.8	8.2	8.7	10.9	11.7	16.0	20.5	16.1	13.8	11.2	-	Duplicate Site with 3N_a and 3N_b - Annual data provided for 3N_b only
5N_a	480400	355000	33.5	31.8	26.4		22.5	21.9	21.8	21.6	27.0	26.6	34.8	30.6	-	-	-	Duplicate Site with 5N_a and 5N_b - Annual data provided for 5N_b only
5N_b	480400	355000	33.1	34.5	23.8		21.3	20.4	21.0	21.9	23.5	27.7	32.8	28.6	26.7	21.6	-	Duplicate Site with 5N_a and 5N_b - Annual data provided for 5N_b only
7N_a	480153	353320	40.0	37.7	29.2	23.6	24.0	24.2		21.9	19.3	29.1	35.7	31.9	-	-	-	Duplicate Site with 7N_a and 7N_b - Annual data provided for 7N_b only
7N_b	480153	353320	40.6		28.0	24.1	23.6	23.9		22.7	30.1	31.3	36.7	32.2	29.4	23.8	-	Duplicate Site with 7N_a and 7N_b - Annual data provided for 7N_b only
1N_a	479851	353692	37.9	33.9	28.2	27.3	23.1	19.7	25.7	23.9	29.0	29.8	36.7	31.7	-	-	-	Duplicate Site with 1N_a and 1N_b - Annual data provided for 1N_b only
1N_b	479851	353692	37.7	36.3	30.9	26.7	22.8	19.8	24.9		58.4	26.5	35.7	32.8	30.1	24.4	-	Duplicate Site with 1N_a and 1N_b - Annual data provided for 1N_b only
4N_a	477200	351900	17.9	16.2	10.7	9.4	7.3	7.6	6.7	8.5	10.2	13.4	16.8	13.8	-	-	-	Duplicate Site with 4N_a and 4N_b - Annual data provided for 4N_b only
4N_b	477200	351900	17.2	15.9	10.3	9.1	7.3	7.1	6.6	8.7	10.6	13.7	15.3	13.4	11.4	9.2	-	Duplicate Site with 4N_a and 4N_b - Annual data provided for 4N_b only
6N_a	480006	353892	27.2	26.6	26.6	15.6	13.9	12.4	12.9	14.3	18.3	21.0	23.5	21.4	-	-	-	Duplicate Site with 6N_a and 6N_b - Annual data provided for 6N_b only
6N_b	480006	353892	25.6	25.4	25.9	17.2	11.7	11.6	11.9	14.1	16.8	20.5	24.8	24.5	19.3	15.6	-	Duplicate Site with 6N_a and 6N_b - Annual data provided for 6N_b only
9N_a	479778	353621	32.8	33.3	26.6	24.8	22.4	18.1	21.0	22.2	25.8	26.4	30.7	26.9	-	-	-	Duplicate Site with 9N_a and 9N_b - Annual data provided for 9N_b only
9N_b	479778	353621	32.9	32.8	25.9	24.9	20.6	21.1	20.8	22.5	24.7	27.4	32.7	26.0	26.0	21.0	-	Duplicate Site with 9N_a and 9N_b - Annual data provided for 9N_b only
10N_a	479859	354223	24.1	21.3	18.9	16.5	13.1	13.3	10.9	14.2	15.8	18.9	21.9	19.9	-	-	-	Duplicate Site with 10N_a and 10N_b - Annual data provided for 10N_b only

DT ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean: Raw Data	Annual Mean: Annualised and Bias Adjusted (0.81)	Annual Mean: Distance Corrected to Nearest Exposure	Comment
10N_b	479859	354223	22.4	23.1	19.7	16.6	12.3	13.6	10.4	13.8	14.1	19.3	21.4	19.5	17.3	14.0	-	Duplicate Site with 10N_a and 10N_b - Annual data provided for 10N_b only
11N_a	481460	355900	34.3	34.8	26.4	26.2	22.4	22.5		23.6	24.6	25.7	29.9	25.1	-	-	-	Duplicate Site with 11N_a and 11N_b - Annual data provided for 11N_b only
11N_b	481460	355900	32.0	33.0	26.8	25.6	22.4	21.9	20.6	22.4	24.7	23.9	30.7	25.1	26.0	21.1	-	Duplicate Site with 11N_a and 11N_b - Annual data provided for 11N_b only
12N_a	479676	354016	20.1	18.7	15.6	13.5	11.1	11.1	9.7	12.5	15.0	17.3	19.1	17.1	-	-	-	Duplicate Site with 12N_a and 12N_b - Annual data provided for 12N_b only
12N_b	479676	354016	19.3	19.7	15.1	13.3	10.6	11.0	9.5	12.2	14.4	16.9	18.4	15.4	14.9	12.0	-	Duplicate Site with 12N_a and 12N_b - Annual data provided for 12N_b only
16N_a	481152	355589	34.6	30.7	29.2		29.9	26.9		26.8	26.4	29.9	32.3	28.1	-	-	-	Duplicate Site with 16N_a and 16N_b - Annual data provided for 16N_b only
16N_b	481152	355589	35.1	34.0	27.8		30.1	27.1			25.3	29.7	32.6	27.8	29.5	23.9	-	Duplicate Site with 16N_a and 16N_b - Annual data provided for 16N_b only
18N_a	465090	367595	35.7	33.3	28.6	28.9	24.5	24.0	24.7	26.7	30.5	29.6	32.4	25.6	-	-	-	Duplicate Site with 18N_a and 18N_b - Annual data provided for 18N_b only
18N_b	465090	367595	35.4	32.8	27.6	29.3	25.4	22.5	25.4	27.4	29.5	27.8	32.1	27.0	28.6	23.2	-	Duplicate Site with 18N_a and 18N_b - Annual data provided for 18N_b only
21N_a	480276	354029	30.9	30.5	25.8	24.4	19.6	18.9	14.4	18.8	23.1	25.2	26.8	23.9	-	-	-	Duplicate Site with 21N_a and 21N_b - Annual data provided for 21N_b only
21N_b	480276	354029	30.7	30.5	26.7	24.3	19.7	19.0	14.9	18.3	23.1	24.3	25.8		23.5	19.0	-	Duplicate Site with 21N_a and 21N_b - Annual data provided for 21N_b only

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

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

☐ **Local bias adjustment factor used.**

☒ **National bias adjustment factor used.**

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

☒ **Newark & Sherwood District Council confirm that all 2023 diffusion tube data has been uploaded to the Diffusion Tube Data Entry System.**

Notes:

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

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

See Appendix C for details on bias adjustment and annualisation.

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

New or Changed Sources Identified Within Newark & Sherwood During 2023

Newark & Sherwood District Council has not identified any new or changed sources relating to air quality within the reporting year of 2023. We are expecting the Development Consent Order (DCO) application submission for the A46 Newark Bypass to be submitted during the next few months.

Additional Air Quality Works Undertaken by Newark & Sherwood District Council During 2023

Newark & Sherwood District Council has not completed any additional works within the reporting year of 2023.

QA/QC of Diffusion Tube Monitoring

Diffusion tube data for Newark and Sherwood District Council is supplied and analysed by Gradko International Ltd, the tubes were prepared using the 20% TEA in water preparation method. The exposure period corresponded with the exposure calendar where possible. On occasion the 'changeover day' was moved to fit in with workload and staff availability. During January 2024 the changeover day had to be delayed by one week due to the impact of Storm Henk when all Environmental Health staff were redeployed to assist with the emergency response. This meant December 2023 tubes were completed on the 10th January 2024 instead of the 3rd January 2024, which resulted in a five week exposure instead of the scheduled four for December. However given that March, June, August and November 2023 were also five week exposure periods (as scheduled in the exposure calendar), it was considered that extending December to five weeks was acceptable and the results could be reported and included in this ASR. DEFRA LAQM Helpdesk and Gradko laboratory were consulted regarding this at the time. There was no requirement to distance correct as levels were not high enough to warrant it. Precision summary data for Gradko is presented below.

Precision Summary Table

Diffusion Tube Preparation Method	2021 Good	2021 Bad	2022 Good	2022 Bad	2023 Good	2023 Bad
Gradko, 20% TEA in Water	34	0	33	0	21	0

Participation in Laboratory Proficiency Testing Scheme

Gradko International Ltd take part in the AIR PT scheme which is operated by LGC Standards and supported by the Health and Safety Executive (HSE). The scheme provides a means for assessing the analytical performance of those laboratories supplying diffusion tubes to Local Authorities for use in the context of Local Air Quality Management (LAQM). An edited summary of the AIR PT results showing only Gradko results is provided below:

The following table lists those UK laboratories undertaking LAQM activities that have participated in recent AIR NO_2 PT rounds and the percentage (%) of results submitted which were subsequently determined to be **satisfactory** based upon a **z**-score of $\leq \pm 2$ as defined above.

AIR PT Round	AIR PT AR046	AIR PT AR049	AIR PT AR050	AIR PT AR052	AIR PT AR053	AIR PT AR055	AIR PT AR056	AIR PT AR058	AIR PT AR059
Round conducted in the period	September – October **2021**	January – February **2022**	May – June **2022**	July – August **2022**	September – October **2022**	January – February **2023**	May – June **2023**	July – August 2023	September – October 2023
Gradko International	100 %	100 %	100 % [1]	100 %	100 %	100 %	100 %	100 %	100 %

[1] Participant subscribed to two sets of test results (2 x 4 test samples) in each AIR PT round.
[2] NR, No results reported.
[3] Cardiff Scientific Services, Exova (formerly Clyde Analytical), Kent Scientific Services, Kirklees MBC, Northampton Borough Council and West Yorkshire Analytical Services; no longer carry out NO2 diffusion tube monitoring and therefore did not submit results.

Diffusion Tube Annualisation

All diffusion tube monitoring locations within Newark & Sherwood recorded data capture of 75% therefore it was not required to annualise any monitoring data.

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/NO_2 continuous analysers. Alternatively, the national database of diffusion tube co-location surveys provides bias factors for the relevant laboratory and preparation method.

Newark & Sherwood District Council have applied a national bias adjustment factor of 0.81 to the 2023 monitoring data. A summary of bias adjustment factors used by Newark & Sherwood District Council over the past five years is presented in Table C.2.

Table C.2 – Bias Adjustment Factor

National Diffusion Tube Bias Adjustment Factor Spreadsheet — Spreadsheet Version Number: 03/24

Follow the steps below **in the correct order** to show the results of **relevant** co-location studies

Data only apply to tubes exposed monthly and are not suitable for correcting individual short-term monitoring periods

Whenever presenting adjusted data, you should state the adjustment factor used and the version of the spreadsheet

This spreadsheet will be updated every few months: the factors may therefore be subject to change. This should not discourage their immediate use.

This spreadsheet will be updated at the end of June 2024

LAQM Helpdesk Website

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

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

Step 1: Select the Laboratory that Analyses Your Tubes from the Drop-Down List

If a laboratory is not shown, we have no data for this laboratory.

Step 2: Select a Preparation Method from the Drop-Down List

If a preparation method is not shown, we have no data for this method at this laboratory.[2]

Step 3: Select a Year from the Drop-Down List

If a year is not shown, we have no data[2]

Step 4:

Where there is only one study for a chosen combination, you should use the adjustment factor shown with caution. Where there is more than one study, use the overall factor[3] shown in blue at the foot of the final column.

If you have your own co-location study then see footnote[4]. If uncertain what to do then contact the Local Air Quality Management Helpdesk at LAQMHelpdesk@bureauveritas.com or 0800 0327953

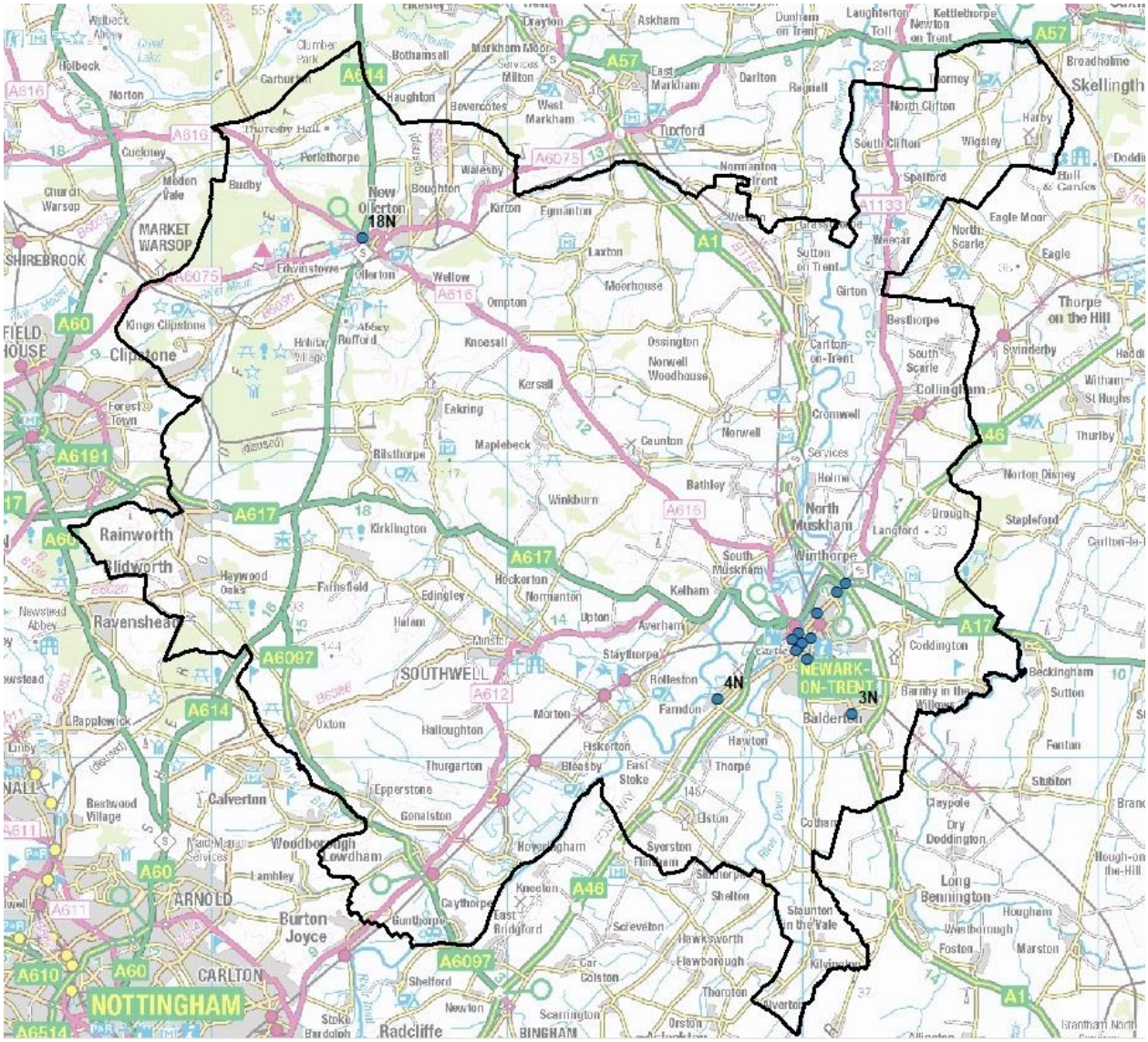
Analysed By[1]	Method (To undo your selection, choose (All) from the pop-up list)	Year[5] (To undo your selection, choose (All))	Site Type	Local Authority	Length of Study (months)	Diffusion Tube Mean Conc. (Dm) (µg/m³)	Automatic Monitor Mean Conc. (Cm) (µg/m³)	Bias (B)	Tube Precision[6]	Bias Adjustment Factor (A) (Cm/Dm)
Gradko	20% TEA in Water	2023	R	Monmouthshire County Council	11	33	26	26.5%	G	**0.79**
Gradko	20% TEA in water	2023	R	Blackburn With Darwen Bc	12	23	16	43.8%	G	**0.70**
Gradko	20% TEA in water	2023	R	Lancaster City Council	10	35	27	28.6%	G	**0.78**
Gradko	20% TEA in water	2023	R	Eastleigh Borough Council	12	33	26	26.4%	G	**0.79**
Gradko	20% TEA in water	2023	R	Eastleigh Borough Council	12	22	19	12.5%	G	**0.89**
Gradko	20% TEA in water	2023	R	Plymouth City Council	12	35	26	38.3%	S	**0.72**
Gradko	20% TEA in water	2023	R	Plymouth City Council	10	39	31	24.2%	S	**0.80**
Gradko	20% TEA in water	2023	UC	Belfast City Council	10	26	19	38.3%	G	**0.72**
Gradko	20% TEA in water	2023	R	Cheshire West And Chester	12	35	32	10.0%	G	**0.91**
Gradko	20% TEA in water	2023	R	Cheshire West And Chester	10	32	28	14.6%	G	**0.87**
Gradko	20% TEA in water	2023	R	Dudley Mbc	12	27	23	17.1%	G	**0.85**
Gradko	20% TEA in water	2023	UB	Dudley Mbc	12	19	13	45.4%	G	**0.69**
Gradko	20% TEA in water	2023	R	Dudley Mbc	12	40	37	7.7%	G	**0.93**
Gradko	20% TEA in water	2023	R	Gateshead Council	12	23	20	17.7%	G	**0.85**
Gradko	20% TEA in water	2023	R	Gateshead Council	11	23	18	26.9%	G	**0.79**
Gradko	20% TEA in water	2023	R	Gateshead Council	12	27	22	20.7%	G	**0.83**
Gradko	20% TEA in water	2023	R	Gateshead Council	12	29	23	25.9%	G	**0.79**
Gradko	20% TEA in water	2023	R	Gateshead Council	12	30	33	-7.8%	G	**1.08**
Gradko	20% TEA in water	2023	KS	Marylebone Road intercomparison	11	45	38	20.3%	G	**0.83**
Gradko	20% TEA in water	2023	B	South Holland District Council	10	8	7	12.4%	G	**0.89**
Gradko	20% TEA in water	2023	R	Worcestershire	12	12	11	17.4%	G	**0.85**
Gradko	20% TEA in Water	2023	R	Ards And North Down Borough Council	12	33	21	60.2%	G	**0.62**
Gradko	20% TEA in Water	2023	R	Lisburn & Castlereagh City Council	11	24	20	22.1%	G	**0.82**
Gradko	20% TEA in water	2023		**Overall Factor[3] (23 studies)**				**Use**		**0.81**

Monitoring Year	Local or National	If National, Version of National Spreadsheet	Adjustment Factor
2023	National	03/24	0.81
2022	National	03/23	0.83
2021	National	03/22	0.84
2020	National	03/21	0.81
2019	National	03/20	0.93

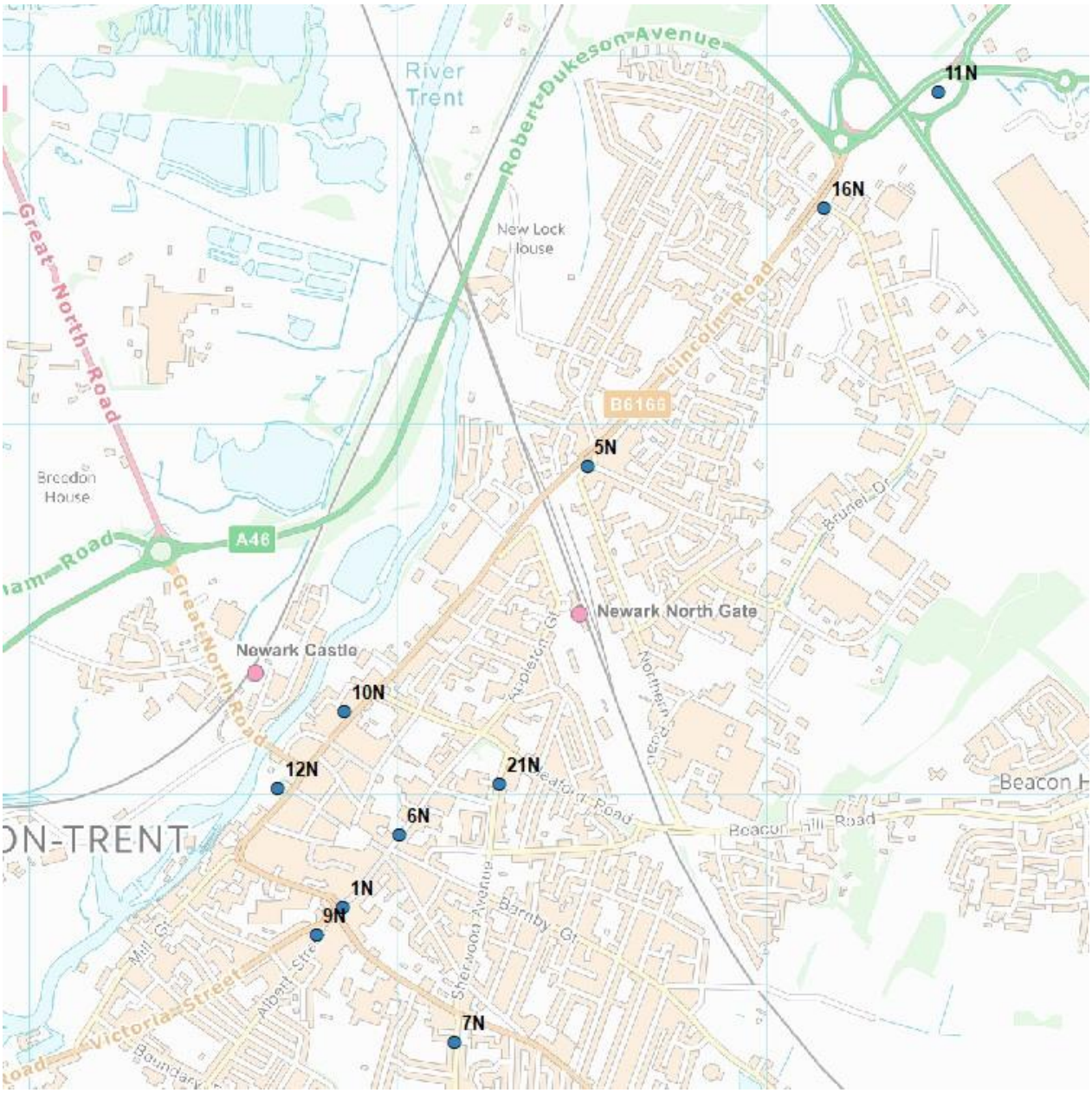
Appendix D: Map(s) of Monitoring Locations and AQMAs

Figure D.1 – Map of Non-Automatic Monitoring Site

NSDC NO2 Diffusion Tube Locations Full Map



NSDC NO_2 Diffusion Tube Locations Newark Detail Map



Appendix E: Summary of Air Quality Objectives in England

Table E.1 – Air Quality Objectives in England[7]

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

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

Glossary of Terms

Abbreviation	Description
AQAP	Air Quality Action Plan - A detailed description of measures, outcomes, achievement dates and implementation methods, showing how the local authority intends to achieve air quality limit values'
AQMA	Air Quality Management Area – An area where air pollutant concentrations exceed / are likely to exceed the relevant air quality objectives. AQMAs are declared for specific pollutants and objectives
ASR	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
NAQS2020	Air Quality Strategy for Nottingham and Nottinghamshire 2020-2030
NCC	Nottinghamshire County Council
NNAQOG	Nottingham and Nottinghamshire Air Quality Oversight Group
NO_2	Nitrogen Dioxide
NO_x	Nitrogen Oxides
NSDC	Newark & Sherwood District Council
PM_{10}	Airborne particulate matter with an aerodynamic diameter of 10µm or less
$PM_{2.5}$	Airborne particulate matter with an aerodynamic diameter of 2.5µm or less
QA/QC	Quality Assurance and Quality Control
SO_2	Sulphur Dioxide

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