North West Leicestershire District Council

2023 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 2023

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Executive Summary: Air Quality in Our Area

Air Quality in North West Leicestershire

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

The mortality burden of air pollution within the UK is equivalent to 29,000 to 343,000 deaths at typical ages[3], with a total estimated healthcare cost to the NHS and social care of £157 million in 2017[4].

North West Leicestershire District has 2 declared AQMAs in Castle Donington and Copt Oak.

There is a potential AQMA in Ibstock that requires further investigation.

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[5] sets out actions that will drive continued improvements to air quality and to meet the new national interim and long-term $PM_{2.5}$ targets. The National Air Quality Strategy, due to be published in 2023, will provide more information on local authorities' responsibilities to work towards these new targets and reduce $PM_{2.5}$ in their areas. The Road to Zero[6] details the approach to reduce exhaust emissions from road transport through a number of mechanisms; this is extremely

[1] Public Health England. Air Quality: A Briefing for Directors of Public Health, 2017
[2] Defra. Air quality and social deprivation in the UK: an environmental inequalities analysis, 2006
[3] Defra. Air quality appraisal: damage cost guidance, January 2023
[4] Public Health England. Estimation of costs to the NHS and social care due to the health impacts of air pollution: summary report, May 2018
[5] Defra. Environmental Improvement Plan 2023, January 2023
[6] DfT. The Road to Zero: Next steps towards cleaner road transport and delivering our Industrial Strategy, July 2018

important given that the majority of Air Quality Management Areas (AQMAs) are designated due to elevated concentrations heavily influenced by transport emissions.

During 2022, in line with the councils Zero Carbon Road Map Action Plan, the council has continued to expand its EV charging network and reduce emissions from the council's vehicle fleet.

During 2022 the council in Partnership with Harborough District Council started an air quality grant funded project looking at the impacts of solid fuel burning on $PM_{2.5}$.

Conclusions and Priorities

The ASR concludes that:

- There is a possible exceedance of the annual mean air quality standard in Ibstock.

In 2023 the council plans to:

- Implement AQMA action plan
- Undertake dispersion modelling and further investigate possible AQMA in Ibstock
- Complete the DEFRA funded joint project with Harborough District Council on the impacts of solid fuel burning

Local Engagement and How to get Involved

The main contributions that our community can make to improving air quality are around minimising emissions from traffic and other sources and limiting exposure at times of poor air quality. Specifically, that means avoiding unnecessary car use for short journeys, utilising public transport where possible, buying and maintaining low emissions vehicles and being linked into the national alert system for predicted episodes of poor air quality.

The public can get further information on Air Quality from the following websites:

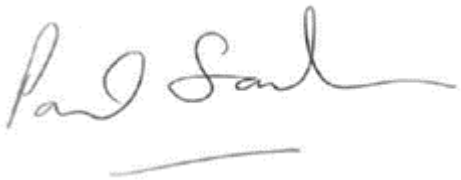
- North West Leicestershire District Council Air quality website http://www.nwleics.gov.uk/pages/air_quality
- DEFRAs UK-AIR: Air information Resource website https://uk-air.defra.gov.uk/
- DEFRAs Local Air Quality Management (LAQM) Support website http://laqm.defra.gov.uk/
- Environmental Protection UK Air Pollution website http://www.environmental-protection.org.uk/policy-areas/air-quality/about-air-pollution/
- Choose How You Move https://www.choosehowyoumove.co.uk/

Local Responsibilities and Commitment

This ASR was prepared by the Environmental Protection Department of North West Leicestershire District Council with the support and agreement of the following officers and departments:

Environmental Protection, North West Leicestershire District Council

This ASR has been approved by:



Paul Sanders, Head of Community Services

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

Mike Sandys, Director of Public Health, Leicestershire County Council

If you have any comments on this ASR, please send them to Environmental Protection North West Leicestershire District Council at:

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1 Local Air Quality Management

This report provides an overview of air quality in North West Leicestershire during 2022. 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 North West Leicestershire 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 Table E.1.

2 Actions to Improve Air Quality

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 North West Leicestershire District Council can be found in Table 2.1. The table presents a description of the 2 AQMAs that are currently designated within North West Leicestershire. Appendix D: Map(s) of Monitoring Locations and AQMAs provides maps of AQMAs and also the air quality monitoring locations in relation to the AQMAs. The air quality objectives pertinent to the current AQMA designations are as follows:

- NO_2 annual mean;

Table 2.1 – Declared Air Quality Management Areas

AQMA Name	Date of Declaration	Pollutants and Air Quality Objectives	One Line Description	Is air quality in the AQMA influenced by roads controlled by Highways England?	Level of Exceedance: Declaration	Level of Exceedance: Current Year	Number of Years Compliant with Air Quality Objective	Name and Date of AQAP Publication	Web Link to AQAP
Castle Donington	09/01/2008	NO2 Annual Mean	An area encompassing the High Street and Bondgate area of Castle Donnington.	NO	47.83µg.m^{-3}	39.67µg.m^{-3}			Castle Donington
Copt oak	30/07/2009	NO2 Annual Mean	An area of the village of Copt Oak that lies within the boundaries of NW Leicestershire District Council.	YES	44µg.m^{-3}	39µg.m^{-3}			Copt oak

☒ **North West Leicestershire District Council confirm the information on UK-Air regarding their AQMA(s) is up to date.**

☒ **North West Leicestershire District Council confirm that all current AQAPs have been submitted to Defra.**

Progress and Impact of Measures to address Air Quality in North West Leicestershire

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

1. The Council has included discussion and review of its AQMAs and monitoring strategy. This demonstrates the Councils proactive approach to ensuring good air quality across the district.
2. The Council have not experienced exceedances of the annual and hourly mean NO_2 and PM_{10} concentrations objectives. The Council should continue the monitoring next year and only consider AQMA revocation when all concentrations are substantively and continuously below objectives.
3. Two AQMAs were revoked during the reporting year, but there is very little discussion of this within the ASR.
    - Noted for future revocations.
4. The Council has provided maps of the diffusion tube monitoring network with clear labels, which is welcomed. However, the boundaries of the AQMAs are not clear and the names of the AQMAs are not labelled.
    - This has been updated for this ASR.
5. Trends of the NO_2 concentrations are displayed in the report and a robust comparison with air quality objectives is provided. The Council could also include some discussion about the trends over the last 5 years.
    - Comments on trends have been included where appropriate within the ASR.
6. Review of monitoring strategy is encouraged as the highest NO_2 concentration recorded of 39.9 $\mu g.m^{-3}$ at 32N is not within an AQMA. The Local authority should seek to further establish whether there is a risk of exceedance at this location.
    - There is no receptor at the location. The nearest receptor is at location 64N therefore there is no exceedance at this location.
7. There has been no update of the AQAP since 2008 and Table 2.2 needs to be updated to give more details on the measures and progress if the AQMAs are not revoked within the next year. If revocation is completed, the Council could consider retaining an updated version of the AQAP to form the basis of a local air quality strategy as per paragraph 4.11 of LAQM.PG(16).
    - An AQAP has been submitted to DEFRA on 03/07/2023.
8. The Zephyr has been presented throughout the report as an automatic station. As the monitoring sensor is not reference accredited, the details should be included

within an appendix rather than the main body of the report. However, it is helpful to include comparisons of results within the report.

- Noted and reflected within this ASR.

9. The Local Authority are encouraged to follow the discussion points set out in the ASR template. The first section on Summary of Air Quality Issues does not provide further detail on local issues.
    - Updated within the ASR.
10. Robust and accurate QA/QC procedures were generally applied. Calculations for national bias adjustment and annualisation factors were outlined in detail. However, a more recent version of the Bias Adjustment spreadsheet was available on publication (06/22). The Local Authority are encouraged to check this and use the latest available bias adjustment factor prior to submission for future ASRs.
    - Latest adjustment has been used.
11. Review of any anomalous diffusion tube monitoring data is encouraged, and this should either be discussed within the text of the ASR or removed.
    - Noted and updated.
12. 64N is classed as a roadside diffusion tube, however distance to kerb of nearest road is 30m. This does not fall within the roadside site classification detailed within TG.22.
    - The location is on the façade of a property with a major road source 30m away. Though the distance is greater than that listed in TG22 it is the most appropriate of the available classifications.
13. There are several formatting errors through the report, there are different fonts of texts and there are some words overlayed on each other. Cross-references were not linked properly, the broken links ‘Error! Reference source not found’ need to be updated.
    - Noted and updated.
14. There are no additional references added in the report, please update.
    - Noted and resolved.
15. ASR has been signed off by the Director of Public Health – this is welcomed.

North West Leicestershire District Council has taken forward a number of direct measures during the current reporting year of 2022 in pursuit of improving local air quality. Details of all measures completed, in progress or planned are set out in Table 2.2. 7 measures are included within Table 2.2, with the type of measure and the progress North West

Leicestershire have made during the reporting year of 2022 presented. Where there have been, or continue to be, barriers restricting the implementation of the measure, these are also presented within Table 2.2.

North West Leicestershire District Council worked to implement these measures in partnership with the following stakeholders during 2022:

- Continued expansion of the Electric Vehicle charging infrastructure across the district;
- Ongoing collaboration with planning colleagues both in relation to planning applications, and also the update of Local Plan policies and associated guidance. The council's planning department have commissioned Air Quality Consultants ltd. to draft a Supplementary Planning Document (SPD) for air quality, this is currently being consulted on; and
- Attendance by Environmental Protection officers at ongoing health partnership meetings with contribution to future projects on air quality. The current action plan has been completed and the District Council are supporting the partnership with drafting the Air Quality and Health Partnership 2023-26 action plan.

The principal challenges and barriers to implementation that North West Leicestershire District Council anticipates facing are the priorities of partner organisations.

Progress on the following measures has been slower than expected due to the priorities of partner organisations and the priorities of private companies

- Implementation of traffic management measures by Leicestershire County Council within Castle Donington (to complement the Relief Road);
- Leicestershire County Council to adopt the Local Cycling and Walking Infrastructure Plan (providing the framework to apply for further funding for measure 2 in the AQAP);

Whilst the measures stated above and in Table 2.2 will help to contribute towards compliance, North West Leicestershire District Council anticipates that further additional measures not yet prescribed will be required in subsequent years to achieve compliance and enable the revocation of Castle Donington.

Table 2.2 – Progress on Measures to Improve Air Quality

Measure No.	Measure	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	Castle Donington Relief Road and supporting traffic management measures in Castle Donington	Traffic Management	Strategic Highway Improvements	2020	Completed February 2020 for relief road, 2021 for measure as a whole	NWLDC	Consortium of Developers	No	Fully funded	£7.76 million in total	Mainly implemented	Reductions large enough to achieve the annual mean NO_2 at all relevant monitoring locations	Traffic flows on Bondgate in Castle Donington, and resulting nitrogen dioxide concentrations	Road built and open. Traffic light rephasing complete. Post scheme monitoring still to be undertaken (delays due to impacts on traffic from Covid restrictions)	Traffic calming measures still to be implemented
2	Promote Behaviour Change away from Single Occupancy Private Vehicle Use	Promoting Travel Alternatives	Encourage/ facilitate home working, intensive active travel campaign & infrastructure, Personalised Travel Planning, Promotion of Cycling, Promotion of Walking, School Travel Plans, Workplace Travel Planning	Ongoing group of measures	Ongoing for the measure as a whole, late 2021 for LCC Local Cycling and Walking Infrastructure Plan	NWLDC	Transforming Cities Fund, DfT, LCC	No	Partially funded	Lots of different schemes, difficult to estimate overall cost	Being Implemented	n/a – strategic measure which will also assist in achievement of air quality objective in AQMA	Monitoring strategy for LTP includes	Ongoing work with schools mainly, and travel plans through planning system. Local Cycling and Walking Infrastructure plan being drafted	Largely implemented by LCC. Restricted by resourcing.
3	Promote the use of Alternatively Fuelled Vehicles	Promoting Low Emission Transport	Priority Parking for LEVs, procuring alternative refuelling infrastructure to promote Low Emission Vehicles, EV recharging, Gas fuel recharging, taxi emission incentives, taxi licensing conditions	Ongoing group of measures	Ongoing with Zero Carbon Road map	LCC and NWLDC	Office for Low Emission Vehicles (OLEV), Energy Savings Trust (EST), neighbouring local authorities	No	Partially funded	Lots of different schemes, difficult to estimate overall cost	Being Implemented	n/a – strategic measure which will also assist in achievement of air quality objective in AQMA	Proportion of alternatively fuelled vehicles in the fleet on Leicestershire's roads	EV charging points increasing in NWL as funding will allow ultra-low emission buses on Skylink route	
4	Support Actions in the Zero Carbon Road Map Action Plan	Wide range of measures spanning a number of categories	Wide range of measures spanning a number of categories	2019	Ongoing with Zero Carbon Road map	NWLDC	Office for Low Emission Vehicles (OLEV), Energy Savings Trust (EST), NWLDC	No	Partially funded	Lots of different schemes, difficult to estimate overall cost	Being Implemented	n/a – strategic measure which will also assist in achievement of air quality objective in AQMA	Wide range of measures, therefore range of KPIs, which will be driven by Climate Emergency work	EV infrastructure, work on some council properties, some housing stock changed to air source heat pumps	
5	Develop Planning Policies to Support Better Air Quality	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance, Low emission strategy, other policy, regional groups	2021	2023	NWLDC	Mainly from existing budgets. Planning system could generate funding through s106 contributions from developers.	No	Funded (collaborative working)	Unknown, but mainly staff time	Planning Phase: Initial discussions held	n/a – strategic measure which will also assist in achievement of air quality objective in AQMA	Broader Policy in Local Plan, SPD on Air Quality	Discussions between EH and planning on review of Local Plan	
6	Support and collaborate with LCC on wider Public Health projects	Policy Guidance and Development Control	Regional Groups Co-ordinating programmes to develop Area wide strategies to reduce emissions and improve air quality	Ongoing	n/a	NWLDC	Funding through public health, internal budgets for staff time	No	Funded (collaborative working)	No specific budget, as ongoing collaborative work	Being Implemented	n/a – strategic measure which will also assist in achievement of air quality objective in AQMA	n/a as no specific projects identified as yet	Ongoing Health Partnership meetings with the districts, boroughs, and Public Health Leicestershire.	Non statutory function will require additional resources to implement
7	Control Domestic Emissions	Promoting Low Emission Plant	Regulations for fuel quality for stationary and mobile sources	2021	n/a	LCC and NWLDC	Mainly from existing budgets.	No	No funding for information campaigns	No specific budget	Planning Phase	n/a – strategic measure which will also assist in achievement of air quality objective in AQMA	Level of solid fuel burning	Some council housing stock changed to air source heat pumps	Very difficult to quantify any change without detailed survey work

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

As detailed in Policy Guidance LAQM.PG22 (Chapter 8), local authorities are expected to work towards reducing emissions and/or concentrations of $PM_{2.5}$ (particulate matter with an aerodynamic diameter of 2.5µm or less). There is clear evidence that $PM_{2.5}$ has a significant impact on human health, including premature mortality, allergic reactions, and cardiovascular diseases.

North West Leicestershire District Council is taking the following measures to address $PM_{2.5}$:

- Ongoing work in collaboration with public health staff at Leicestershire County Council is delivered through the Joint Strategic Needs Assessment (JSNA) and associated action plan. Within the JSNA there is a chapter on air quality and health. The chapter recognises that by its nature, air quality cannot be controlled by geographical boundaries or by a single individual alone. Instead, collective, systematic efforts are required to reduce air pollution and its harmful effects on health. The key recommendation was that the Leicestershire Air Quality and Health Partnership Steering Group should agree a plan to deliver joint actions to tackle poor air quality and related health issues. The first plan has been completed and the group are currently drafting the Air Quality and Health Partnership 2023-26 document.
- Many of the measures within the AQAP are designed to target $PM_{2.5}$ as well as NO_2. In particular, measure 2 aims to promote behaviour change away from single occupancy vehicle use, encouraging active travel and hence reducing traffic related $PM_{2.5}$. The promotion of electric vehicles will reduce tailpipe emissions of $PM_{2.5}$, but it is acknowledged that emissions from brake and tyre wear will remain, and in some cases increase. Collaborative projects with public health and ongoing work with planning colleagues will both directly address $PM_{2.5}$ in the longer term and moves to reduce solid fuel burning will directly impact $PM_{2.5}$ rather than NO_2.
- Successfully secured grant funding with Harborough District Council to increase the level of knowledge of $PM_{2.5}$ and ultimately reduce $PM_{2.5}$ emissions by changing behavioural attitudes to solid fuel burning. This project is ongoing and will be concluded the end of 2023. All data will be feedback to DEFRA through the grant evaluation process.

The indicator in the Public Health Outcomes Framework (PHOF) reports the estimates fraction of all-cause adult mortality attributable to anthropogenic particulate air pollution (measured as fine particulate matter).

Based on the latest available figures the position in North West Leicestershire district can be compared to the situation across the rest of England, East Midlands, and nearby districts.

North West Leicestershire has:

- attributable deaths lower than Oadby and Wigston, Leicester, Hinckley and Bosworth, and Charnwood.
- attributable deaths on par with Blaby;
- Attributable deaths higher than Harborough, and Melton

$PM_{2.5}$ background air quality data published by DEFRA for 2022 shows the district has background concentrations between 7.3 $\mu g.m^{-3}$ and 11.14 $\mu g.m^{-3}$ with a mean of 8.0 $\mu g.m^{-3}$. Only 1 location exceeds the new National Annual Mean Concentration Target of 10$\mu g.m^{-3}$ to be met across England by 2040. The location is in the Copt Oak area and contains the M1 motorway and is near to Bardon Quarry.

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

This section sets out the monitoring undertaken within 2022 by North West Leicestershire District Council and how it compares with the relevant air quality objectives. In addition, monitoring results are presented for a five-year period between 2018 and 2022 to allow monitoring trends to be identified and discussed.

Summary of Monitoring Undertaken

Automatic Monitoring Sites

North West Leicestershire District Council did not undertake automatic (continuous) monitoring using a reference monitor during 2022.

North West Leicestershire District Council undertook automatic (continuous) monitoring using low-cost non-reference Zephyr monitors at 5 sites during 2022
Table A.1 in Appendix A shows the details of the automatic monitoring sites.

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.

Non-Automatic Monitoring Sites

North West Leicestershire District Council undertook non- automatic (i.e., passive) monitoring of NO_2 at 39 sites during 2022. 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.

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.

Nitrogen Dioxide (NO_2)

Table A.3 and Table A.4 in Appendix A compare the ratified and adjusted monitored NO_2 annual mean concentrations for the past five years with the air quality objective of 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 2022 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.

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

Castle Donington

There are 3 diffusion tubes within the AQMA and 6 other nearby locations.

A relief road was opened in 2020 which will have likely diverted traffic away from the AQMA.

All diffusion tube locations in 2022 met the annual mean objective however this is likely a result of reduced traffic caused by COVID-19 some of the improvements may be a result of the relief road opening.

Copt Oak

There was 2 long term monitoring location within the Copt Oak AQMA. There is 1 monitoring locations outside of the AQMA.

All locations were substantially below the air quality standard.

Kegworth

There were 8 diffusion tube monitoring locations in Kegworth. 3 locations were ended in 2022.

7 of the locations were significantly below the air quality standard. 1 location (46N) exceeded the standard however this appears anomalous. All other locations along the road were complaint and the concentration is significantly higher than typical for that location over the last 5 years.

Coalville

There are 7 monitoring locations in Coalville area.

All monitoring locations have been below the objective since 2013 and are located closer to the road that relevant receptors so represent a worst-case exposure.

2 zephyrs are located in the Coalville area. The zephyr located on Bardon Road did not exceed the air quality standard.

The zephyr located near Bardon quarry recorded 216 exceedances of the hourly mean however there are no nearby receptors.

Ibstock

There are 4 diffusion tubes located in Ibstock during 2022, 1 zephyr was located in Ibstock during 2022

3 diffusion tube locations were below the Air Quality Standard.

Location 65n is located outside a primary school and exceeded the annual mean Air Quality Standard.

The zephyr was located slightly north of the school and also recorded an exceedance of 43.2 $\mu g.m^{-3}$. When façade corrected the concentration at the nearest receptor is 34.9 $\mu g.m^{-3}$.

Ashby

There are 2 monitoring locations within Ashby.

Both locations were below the annual mean air quality standard

Other Locations

There are 6 other monitoring locations in district, all locations were below the air quality standard.

2 zephyrs are located in Oakthorpe and Donisthorpe both locations are below the air quality standard.

Particulate Matter (PM_{10})

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 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.

No exceedences of the PM_{10} objectives was recorded.

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.

2 of the zephyrs recorded exceedances of the new environmental target for $PM_{2.5}$ in Oakthorpe and Donisthorpe.

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)
Z2	Ibstock (Z250)	Roadside	440551	310360	NO_2, PM_{10} $PM_{2.5}$	NO	Zephyr Low-cost analyser	0	2	3
Z3	Bardon Road (Z902)	Roadside	443991	313322	NO_2, PM_{10} $PM_{2.5}$	NO	Zephyr Low-cost analyser	2.6	3.3	3
Z4	Bardon Quarry (Z904)	Rural	445286	312418	NO_2, PM_{10} $PM_{2.5}$	NO	Zephyr Low-cost analyser	N/A	N/A	3
Z5	Donisthorpe (Z1141)	Rural	431982	314134	NO_2, PM_{10} $PM_{2.5}$	NO	Zephyr Low-cost analyser	N/A	N/A	3
Z6	Oakthorpe (Z1142)	Rural	432654	313155	NO_2, PM_{10} $PM_{2.5}$	NO	Zephyr Low-cost analyser	N/A	N/A	3

Notes:

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

(2) N/A if not applicable

Table A.2 – 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)
06N	Broomleys junction (1)	Roadside	443632	314026	NO_2		5.8	2.0		2.0
08N	End Cottage Copt Oak	Rural	448138	313012	NO_2	Copt Oak	0.0	N/A		2.0
12N	Aeropark	Other	444161	326355	NO_2		N	N/A		2.0
14N	69 High St CD	Roadside	444216	326788	NO_2		0.0	2.9		2.0
16N	Crossroads CD	Roadside	444450	327233	NO_2	Castle Donington	7.5	1.0		2.0
17N	13 Bondgate CD	Roadside	444512	327335	NO_2	Castle Donington	2.0	2.5		2.0
18N	34 Bondgate CD	Roadside	444580	327411	NO_2	Castle Donington	0.0	2.3		2.0
19N	94 Bondgate CD	Roadside	444707	327603	NO_2	Castle Donington	0.8	1.4		2.0
20N	Derby Rd Kegworth (Benny's Hill)	Roadside	448523	326885	NO_2		3.2	1.0		2.0
22N	Keg A6 2	Roadside	448817	326621	NO_2		0.0	2.3		2.0
23N	120 Whatton Road Kegworth	Suburban	448108	326305	NO_2		N	N/A		2.0
31N	Sinope	Roadside	440167	315264	NO_2		7.8	3.2		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)
32N	M1 Bridge Copt Oak	Other	448082	313100	NO_2		N	N/A		2.0
39N	LW new M1	Other	446935	323744	NO_2		N	N/A		2.0
40N	35 High Street Castle Donington	Roadside	444323	326975	NO_2		3.0	0.9		2.0
41N	18 High Street Castle Donington	Roadside	444474	327171	NO_2		4.0	1.0		2.0
43N	Direction Sign Bardon Rd/A511 RBT	Roadside	443675	313642	NO_2		2.4	3.0		2.0
46N	Kegworth PO Derby Road	Roadside	448724	326702	NO_2		0.0	1.3		2.0
47N	12 Derby Rd Kegworth	Roadside	448639	326805	NO_2		4.7	2.5		2.0
48N	28 London Road Kegworth	Roadside	448792	326533	NO_2		0.8	1.5		2.0
49N	10 Central Road Hugglescote	Roadside	442578	312871	NO_2		4.1	2.5		2.0
50N	Hugglescote crossroads	Roadside	442562	312823	NO_2		5.4	1.0		2.0
51N	40mph sign N of petrol station	Roadside	448361	326997	NO_2		9.6	3.2		2.0
52N	lamppost 65 Derby Road	Roadside	448436	326931	NO_2		5.9	2.5		2.0
53N	20mph sign outside 10 Greenhill Road	Roadside	448436	326931	NO_2		5.9	2.5		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)
54N	Telegraph pole outside 21 Park Lane CD	Roadside	444331	327257	NO_2		8.8	2.0		2.0
56N	lamppost adjacent 27 Broomleys Road	Roadside	443649	314040	NO_2		1.8	1.2		2.0
57N	lamppost outside 21 Broomleys Road	Roadside	443630	314028	NO_2		4.7	3.0		2.0
58N	M1 Bridge Copt Oak	Roadside	443634	313996	NO_2	Copt Oak	12.0	5.0		2.0
59N	zebra crossing the green Whitwick	Roadside	442754	317177	NO_2		0.5	0.5		2.0
60N	lamppost outside 53 North Street Whitwick	Roadside	443366	316277	NO_2		0.0	1.0		2.0
61N	lamppost outside 53 Wood Street Ashby	Roadside	436194	316958	NO_2		1.0	1.0		2.0
62N	lamppost 45 The Callis, Ashby (opposite Rowena drive)	Roadside	435587	317204	NO_2		4.0	0.5		2.0
63N	Whitwick Road Coalville	Roadside	442800	314466	NO_2		0.0	2.4		2.0
64N	M1 corner farm	Roadside	448081	313098	NO_2	Copt Oak	6.4	30.0		2.0
65N	Ibstock - Yellow Parking Sign outside jr school	Roadside	440566	310316	NO_2		0.0	2.0		2.0
66N	Ibstock - 191 Melbourne Road	Roadside	440525	310507	NO_2		5.0	2.2		2.0
67N	Ibstock - 76 Melbourne Road	Roadside	440537	310041	NO_2		2.5	0.5		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)
68N	Ibstock - 125 Melbourne Road	Roadside	440598	310238	NO_2		0.0	4.0		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.3 – Annual Mean NO_2 Monitoring Results: Automatic Monitoring (µg.m^{-3})

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2022 (%) (2)	2018	2019	2020	2021	2022
Z2	440551	310360	Roadside	95.04	64.89					**43.2**
Z3	443991	313322	Roadside	100	100					19.8
Z4	445286	312418	Rural	91.87	91.87					27.25
Z5	431982	314134	Rural	60.11	23.79					12.88
Z6	432654	313155	Rural	51.65	13.58					8.5

☒ **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.**

Notes:

The annual mean concentrations are presented as µg.m^{-3}.

Exceedances of the NO_2 annual mean objective of 40 µg.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%).

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 2022 (%) (2)	2018	2019	2020	2021	2022
06N	443632	314026	Roadside	84.6	84.6	34.05	32.47	25.3	21.4	14.1
08N	448138	313012	Rural	92.3	92.3	23.39	22.37	16.9	18.8	13.2
12N	444161	326355	Other	92.3	92.3	19.14	18.86	13.4	13.0	24.0
14N	444216	326788	Roadside	92.3	92.3	23.93	20.68	16.1	14.8	16.7
16N	444450	327233	Roadside	92.3	92.3	35.86	31.51	21.5	22.8	29.5
17N	444512	327335	Roadside	83.0	83.0	36.97	30.88	20.7	21.3	17.5
18N	444580	327411	Roadside	92.3	92.3	**51.93**	**42.05**	29.8	34.2	15.3
19N	444707	327603	Roadside	92.3	92.3	30.67	27.29	19.7	19.4	23.8
20N	448523	326885	Roadside	15.4	15.4	25.37	21.81	16.5	16.4	-
22N	448817	326621	Roadside	42.3	42.3	28.43	23.35	17.6	17.8	14.8
23N	448108	326305	Suburban	92.3	92.3	19.81	20.49	16.0	15.2	25.3
31N	440167	315264	Roadside	92.3	92.3	22.31	22.62	17.2	18.9	18.4
32N	448082	313100	Other	92.3	92.3	**59.47**	**53.91**	39.3	39.9	23.6
39N	446935	323744	Other	92.3	92.3	24.38	20.91	16.3	16.4	15.2
40N	444323	326975	Roadside	38.5	38.5	25.72	22.94	14.8	15.3	20.4
41N	444474	327171	Roadside	92.3	92.3	**42.67**	36.16	24.1	24.1	20.5
43N	443675	313642	Roadside	92.3	92.3	28.76	25.84	23.2	19.2	16.4
46N	448724	326702	Roadside	50.0	50.0	31.59	24.56	17.6	17.2	**43.4**
47N	448639	326805	Roadside	84.3	84.3	29.58	24.5	18.5	17.6	15.7
48N	448792	326533	Roadside	83.0	83.0	34.07	26.29	18.0	17.5	13.4
49N	442578	312871	Roadside	92.3	92.3	36.52	30.94	24.5	25.5	14.5
50N	442562	312823	Roadside	92.3	92.3	33.06	33.22	29.2	28.6	14.5
51N	448361	326997	Roadside	92.3	92.3	26.46	22.4	18.3	18.3	14.8

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 2022 (%) (2)	2018	2019	2020	2021	2022
52N	448436	326931	Roadside	50.0	50.0	28.85	23.29	18.1	18.0	11.2
53N	448436	326931	Roadside	92.3	92.3	21.89	19.79	16.1	15.6	27.3
54N	444331	327257	Roadside	92.3	92.3	27.39	24.74	20.0	17.8	22.4
56N	443649	314040	Roadside	92.3	92.3	36.58	34.23	26.7	22.7	16.7
57N	443630	314028	Roadside	92.3	92.3		32.02	27.3	27.8	17.1
58N	443634	313996	Roadside	92.3	92.3		23.08	21.3	23.2	23.6
59N	442754	317177	Roadside	65.4	65.4			17.7	15.9	19.1
60N	443366	316277	Roadside	92.3	92.3			24.4	26.4	13.6
61N	436194	316958	Roadside	84.6	84.6			31.9	25.9	22.5
62N	435587	317204	Roadside	83.0	83.0			16.9	15.6	30.0
63N	442800	314466	Roadside	75.3	75.3			18.9	18.5	16.7
64N	448081	313098	Roadside	83.0	83.0				21.1	15.5
65N	440566	310316	Roadside	42.3	42.3					**41.0**
66N	440525	310507	Roadside	42.3	42.3					11.4
67N	440537	310041	Roadside	26.9	26.9					11.9
68N	440598	310238	Roadside	25.0	25.0					14.2

☒ **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 – Castle Donington Trends in Annual Mean NO_2 Concentrations

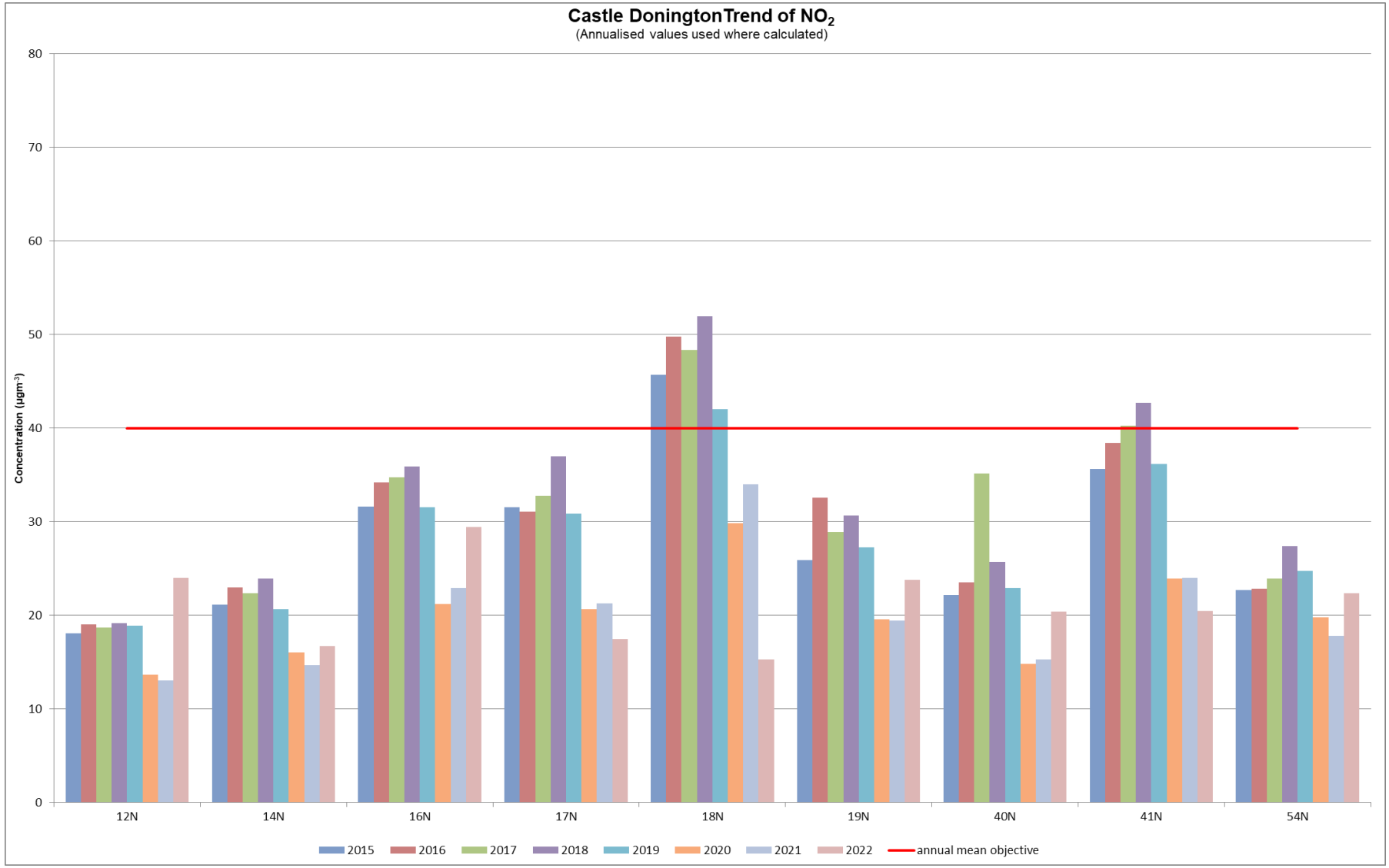


Figure A.2 – Copt Oak Trends in Annual Mean NO_2 Concentrations

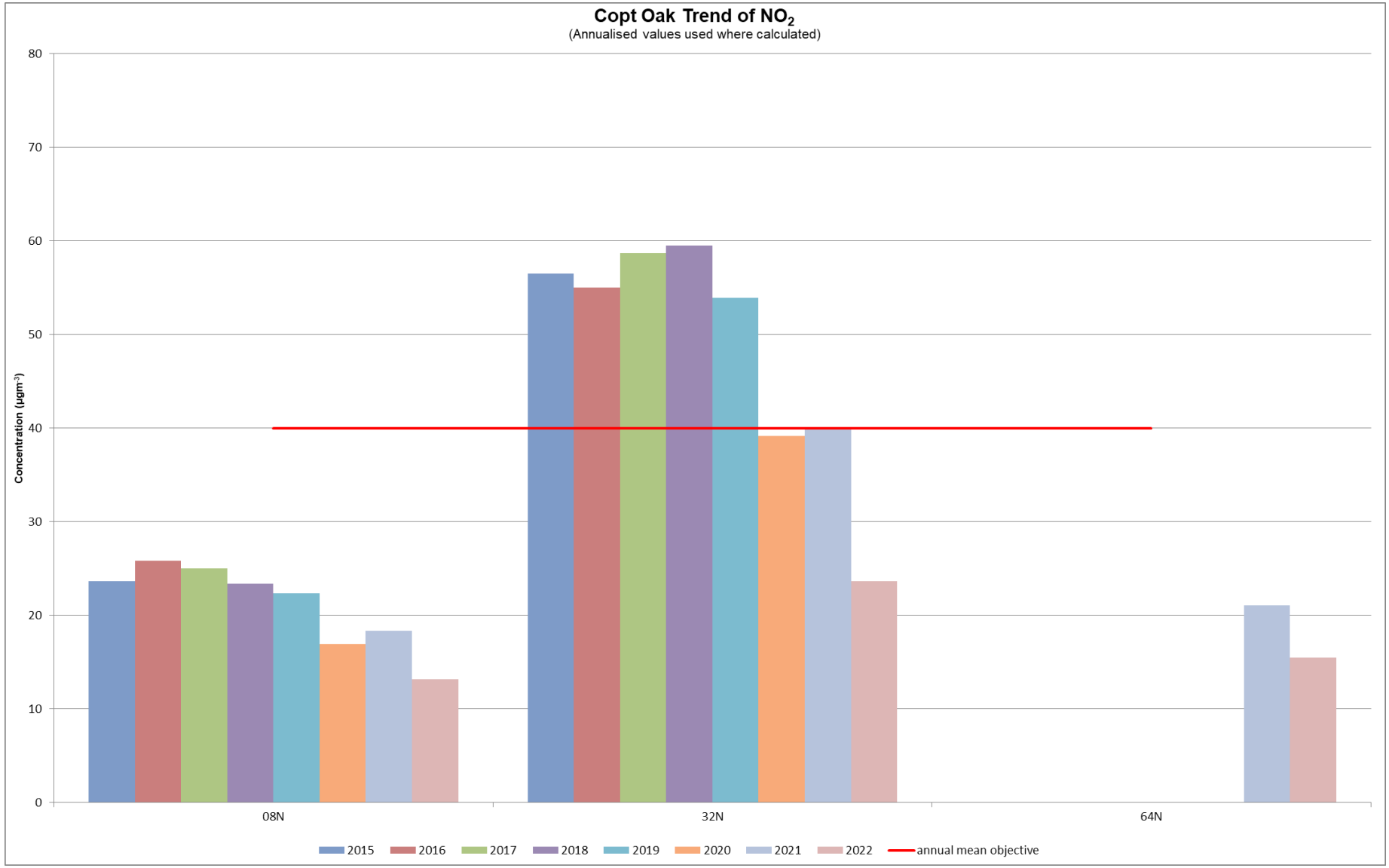


Figure A.3 – Kegworth Trends in Annual Mean NO_2 Concentrations

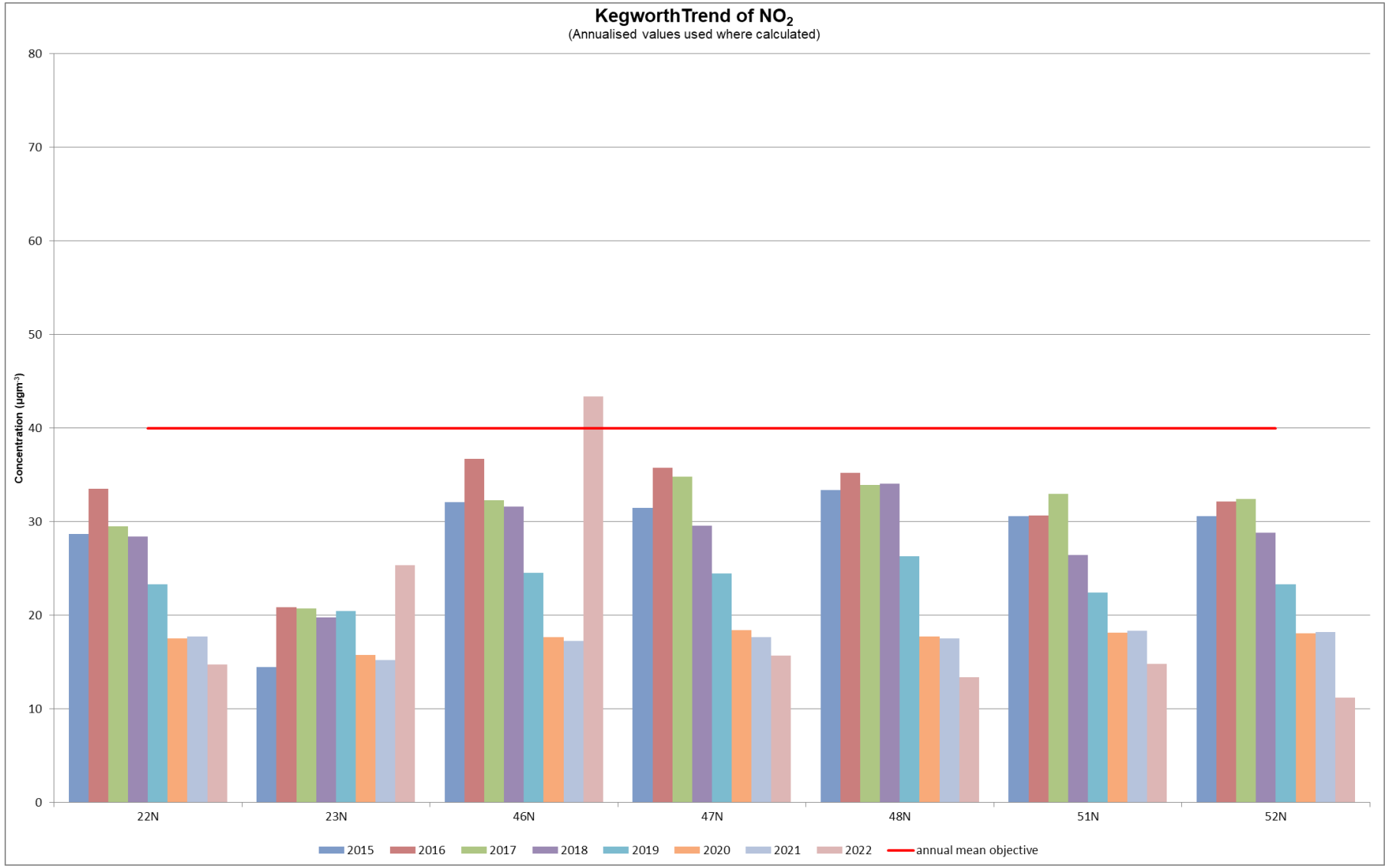


Figure A.4 – Coalville Trends in Annual Mean NO_2 Concentrations

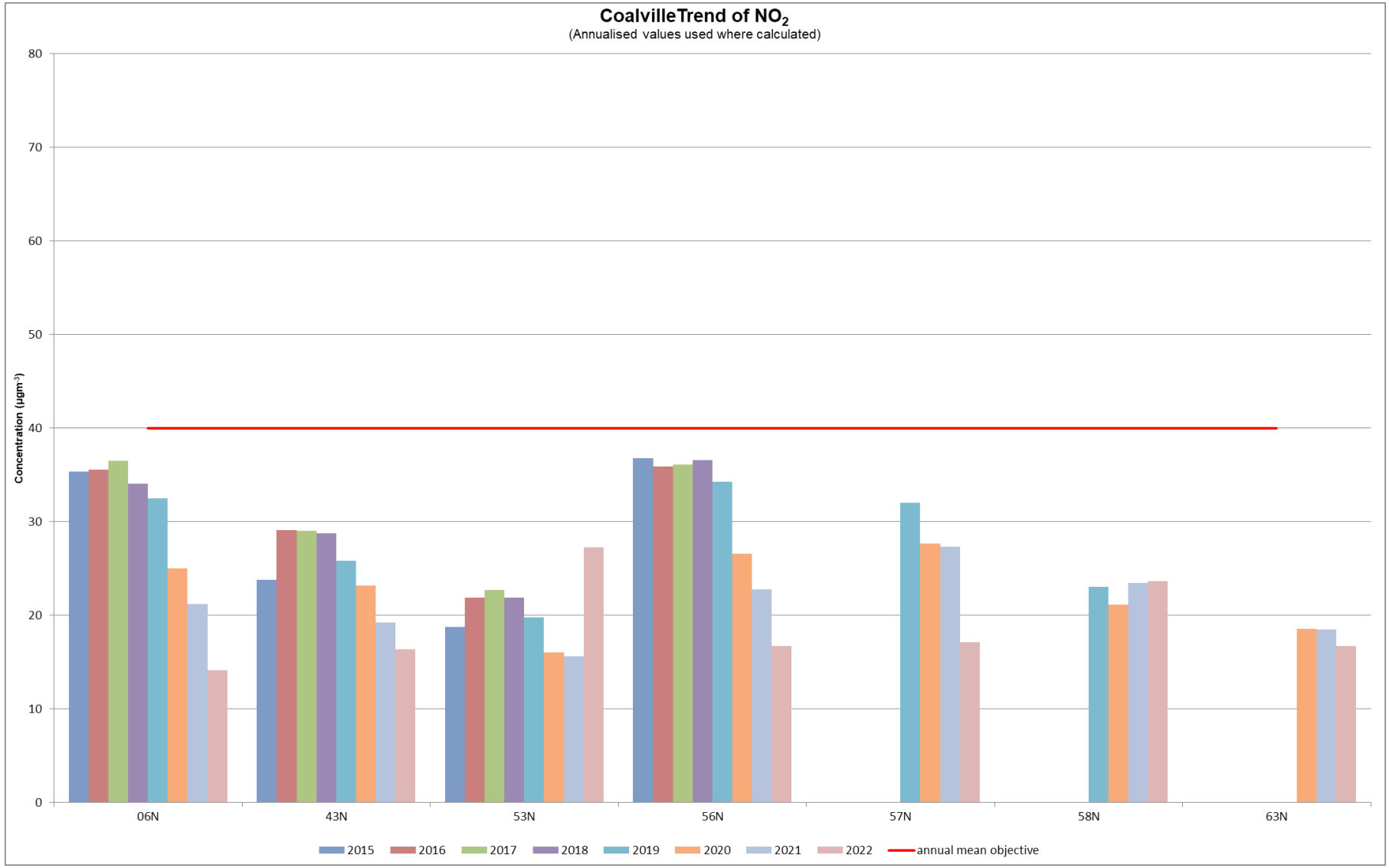


Figure A.5 – Ibstock Trends in Annual Mean NO_2 Concentrations

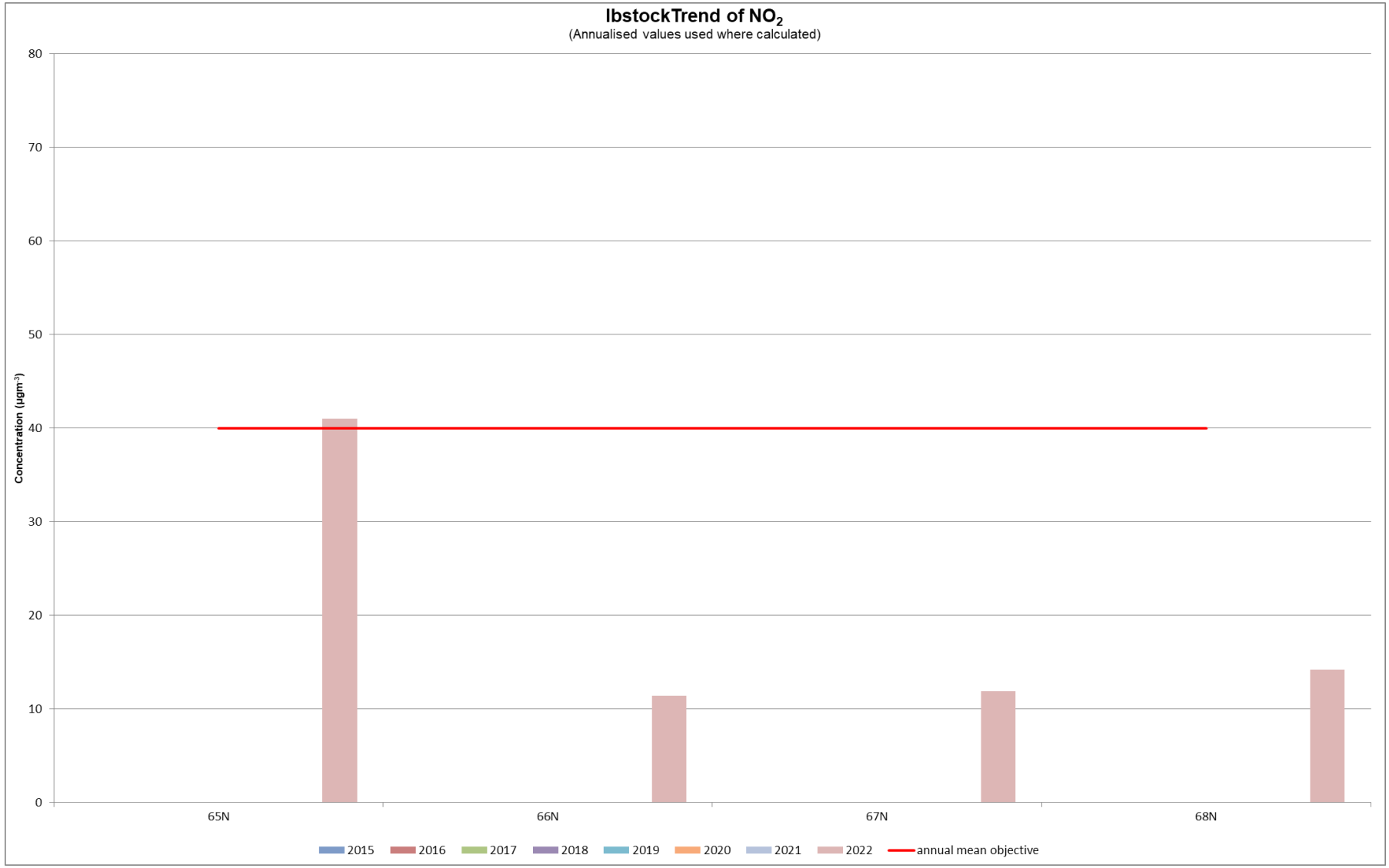


Figure A.6 – Ashby Trends in Annual Mean NO_2 Concentrations

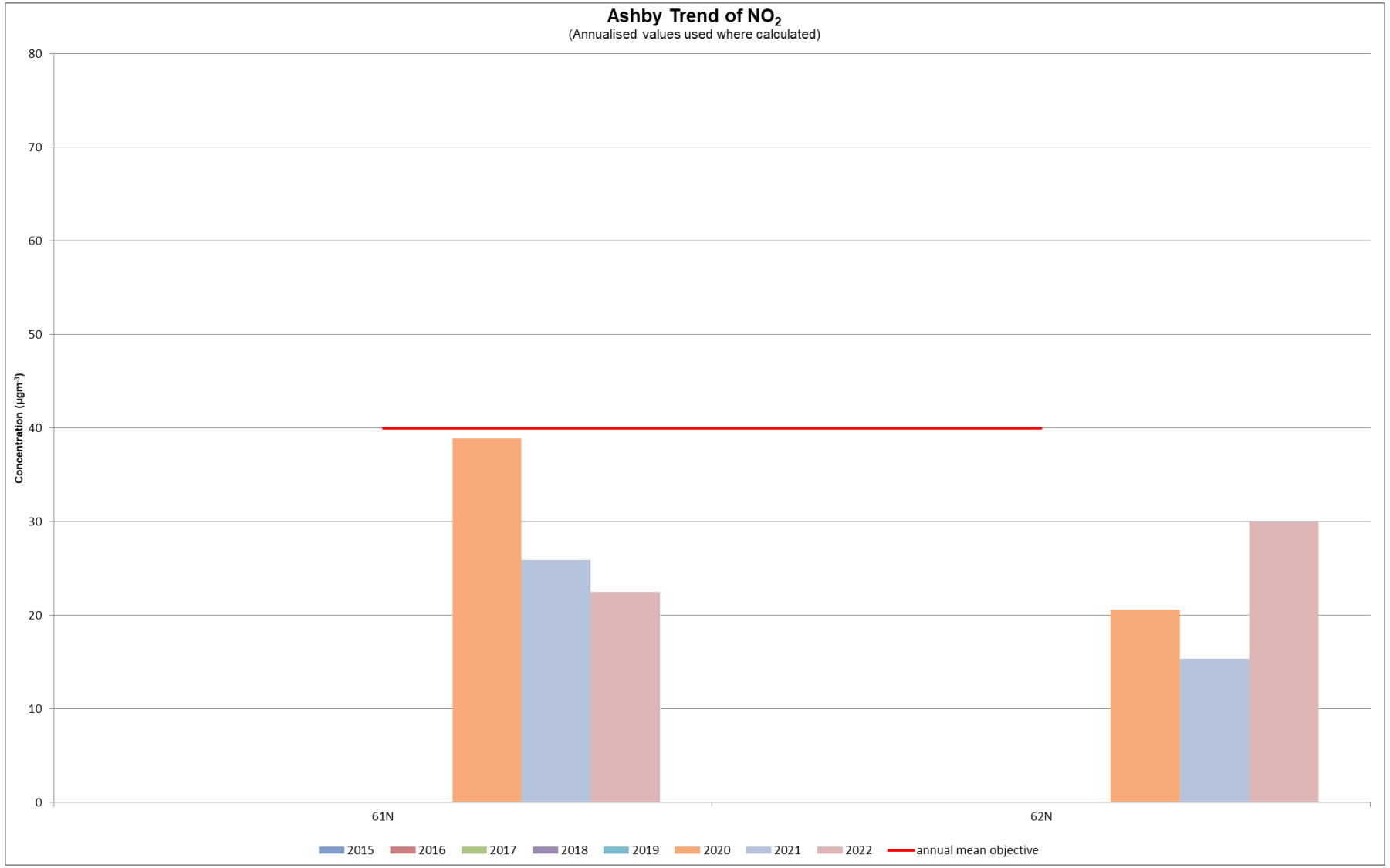


Figure A.7 – Other Location Trends in Annual Mean NO_2 Concentrations

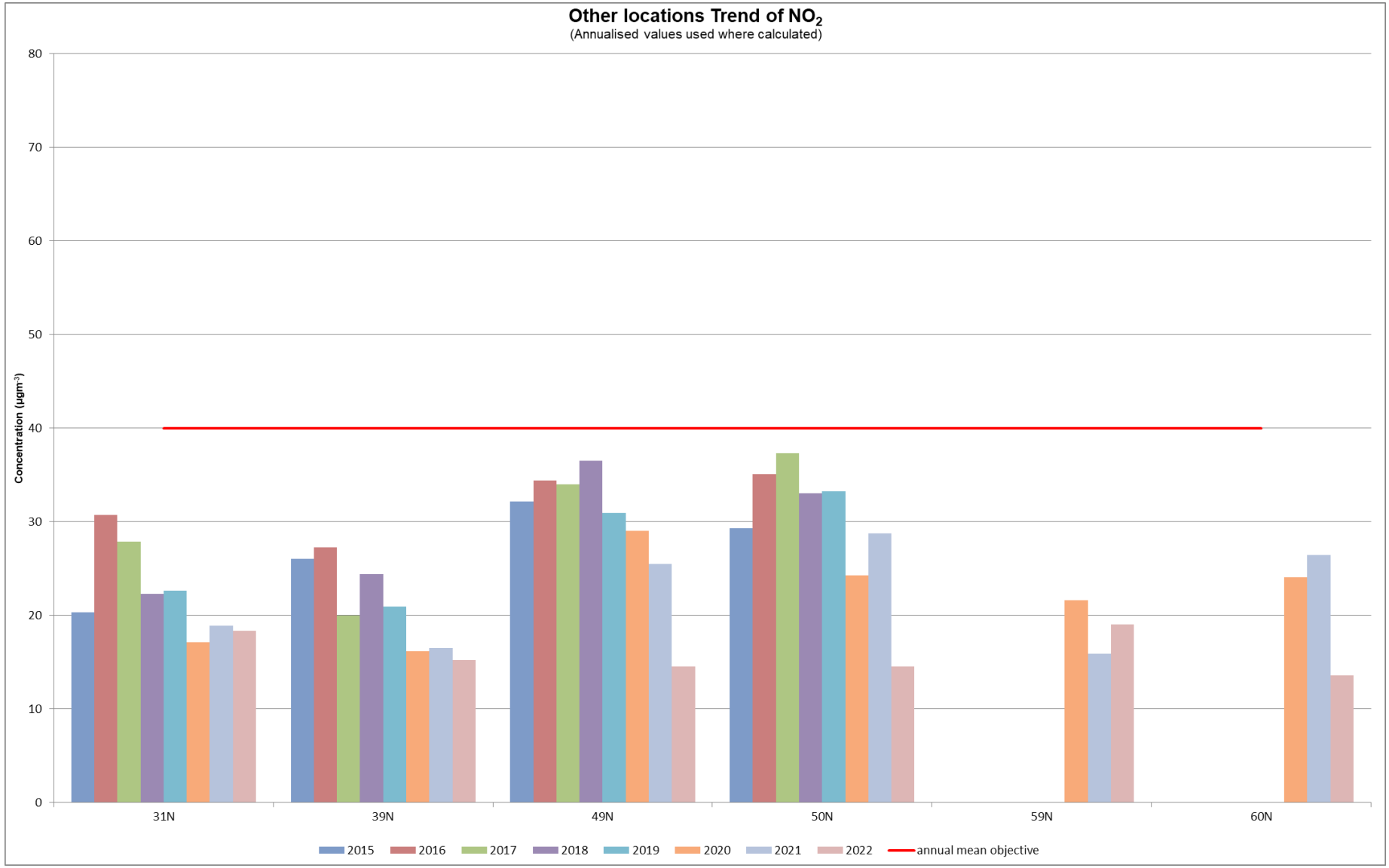


Table A.5 – 1-Hour Mean NO_2 Monitoring Results, Number of 1-Hour Means > 200µg.m^{-3}

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2022 (%) (2)	2018	2019	2020	2021	2022
Z2	440551	310360	Roadside	95.04	64.89					0
Z3	443991	313322	Roadside	100	100					0
Z4	445286	312418	Rural	91.87	91.87					**219 (541)**
Z5	431982	314134	Rural	60.11	23.79					0
Z6	432654	313155	Rural	51.65	13.58					0

Notes:

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

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

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

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

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

Table A.6 – Annual Mean PM_{10} Monitoring Results ($\mu g.m^{-3}$)

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2022 (%) (2)	2018	2019	2020	2021	2022
Z2	440551	310360	Roadside	95.04	64.89					**11.7**
Z3	443991	313322	Roadside	100	100					12.72
Z4	445286	312418	Rural	91.87	91.87					9.65
Z5	431982	314134	Rural	60.11	23.79					11.9
Z6	432654	313155	Rural	51.65	13.58					13.1

☒ **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 PM_{10} 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.

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

Table A.7 – 24-Hour Mean PM_{10} Monitoring Results, Number of PM_{10} 24-Hour Means > 50µg.m^{-3}

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2022 (%) (2)	2018	2019	2020	2021	2022
Z2	440551	310360	Roadside	99.7	89					0
Z3	443991	313322	Roadside	100	29.6					**0(36)**
Z4	445286	312418	Rural	100	26.3					0(35.9)
Z5	431982	314134	Rural	100	100					0
Z6	432654	313155	Rural	99.7	99.7					0

Notes:

Results are presented as the number of 24-hour periods where daily mean concentrations greater than 50 µg.m^{-3} have been recorded.

Exceedances of the PM_{10} 24-hour mean objective (50 µg.m^{-3} 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.

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

Table A.8 – Annual Mean $PM_{2.5}$ Monitoring Results ($\mu g.m^{-3}$)

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2022 (%) (2)	2018	2019	2020	2021	2022
Z2	440551	310360	Roadside	95.04	64.89					8.1
Z3	443991	313322	Roadside	100	100					9.7
Z4	445286	312418	Rural	91.87	91.87					7.5
Z5	431982	314134	Rural	60.11	23.79					11.1
Z6	432654	313155	Rural	51.65	13.58					15.1

☒ **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.

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

Appendix B: Full Monthly Diffusion Tube Results for 2022

Table B.1 – NO_2 2022 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 0.76	Annual Mean: Distance Corrected to Nearest Exposure	Comment
06N	443632	314026	27.9	22.5	20.6	17.4	17.4		11.2	12.9	16.4	19.1		20.6	18.6	14.1	-	
08N	448138	313012	32.0	18.8	16.0	14.5	14.5	15.6	13.6	15.9	17.9	16.5		16.0	17.4	13.2	-	
12N	444161	326355	40.4	29.1	31.6	28.8	28.8	31.8	28.9	33.7	34.6	28.2		31.6	31.6	24.0	-	
14N	444216	326788	30.5	21.9	20.9	19.2	19.2	23.4	19.2	21.5	19.1	26.4		20.9	22.0	16.7	-	
16N	444450	327233	49.9	32.0	43.0	36.1	36.1	11.3	39.2	48.2	43.1	44.5		43.0	38.8	29.5	-	
17N	445122	327335	26.9	23.8	24.9	20.8	20.8	19.6	19.9	26.1	22.4			24.9	23.0	17.5	-	
18N	445580	327411	29.1	21.8	17.3	18.9	18.9	21.4	18.5	19.5	18.8	20.3		17.3	20.2	15.3	-	
19N	444707	327603	46.5	39.3	29.9	24.3	24.3	33.6	28.6	26.9	28.9	32.2		29.9	31.3	23.8	-	
20N	448523	326885	26.5	23.4											-	-	-	
22N	448817	326621	35.6	17.4	21.5	16.3	16.3								21.4	14.8	-	
23N	448108	326306	52.8	34.3	32.3	31.2	31.2	30.6	31.9	23.9	31.0	35.1		32.3	33.3	25.3	-	
31N	440167	315264	41.1	24.6	21.7	22.5	22.5	20.8	20.7	18.8	22.0	29.7		21.7	24.2	18.4	-	
32N	448082	313100	37.4	22.8	33.9	28.4	28.4	25.6	28.8	36.4	35.7	30.7		33.9	31.1	23.6	-	
39N	446935	323744	26.7	22.0	19.0	16.8	16.8	20.6	16.0	20.5	19.8	23.5		19.0	20.1	15.2	-	
40N	444323	326975	39.3	27.1				32.8	1.2	33.0					26.7	20.4	-	
41N	444774	327171	40.0	29.6	27.9	23.4	23.4	22.5	23.9	26.9	24.0	26.6		27.9	26.9	20.5	-	
43N	443675	313642	37.0	25.2	20.9	18.3	18.3	18.4	15.3	21.7	20.3	20.6		20.9	21.5	16.4	-	
46N	448724	326702	72.2	61.8	52.3	54.7	54.7	63.4							59.9	**43.4**	-	
47N	448639	326806	37.6	24.2	18.7	17.0	17.0	17.6	15.0	19.2		21.2		18.7	20.6	15.7	-	
48N	448792	326533	11.2	16.6	15.1	13.6	13.6	16.9	13.8	17.8	42.5			15.1	17.6	13.4	-	
49N	442578	312871	34.7	22.8	25.8	17.0	17.0	10.5	9.9	18.0	12.4	16.3		25.8	19.1	14.5	-	
50N	442562	312823	25.7	20.4	18.7	15.0	15.0	21.2	15.2	19.9	19.2	21.3		18.7	19.1	14.5	-	
51N	448361	326997	35.6	24.5	18.1	16.5	16.5	14.4	12.7	18.4	19.6	19.8		18.1	19.5	14.8	-	
52N	448436	326931	19.0	15.2	16.8	13.4	13.4	15.1							15.5	11.2	-	
53N	448436	326931	54.1	30.1	39.5	33.6	33.6	33.6	27.8	35.7	36.1	31.3		39.5	35.9	27.3	-	
54N	444331	327257	50.0	36.2	25.4	27.8	27.8	31.2	23.5	20.9	25.0	30.9		25.4	29.5	22.4	-	
56N	443649	314040	39.7	26.1	19.7	19.6	19.6	21.3	17.5	16.3	20.5			19.7	22.0	16.7	-	
57N	443630	314028	36.0	23.2	20.5	19.2	19.2	19.7	18.6	23.7	24.7			20.5	22.5	17.1	-	
58N	443634	313996	37.4	22.8	33.9	28.4	28.4	25.6	28.8	36.4	35.7	30.7		33.9	31.1	23.6	-	
59N	442754	317177	56.2	32	23.3				30.8	31.5	30.2	28.4		23.3	28.4	19.1	-	
60N	443366	316277	32.4	18.5	19.1	13.9	13.9	18.1	11.7	15.8	15.3	19.2		19.1	17.9	13.6	-	

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 0.76	Annual Mean: Distance Corrected to Nearest Exposure	Comment
61N	436194	316958	36.2	31.5	34.4	26.3	26.3		27.4	32.4	25.8	21.5		34.4	29.6	22.5	-	
62N	436387	317204	58.5	43.0	39.5	37.4	37.4	36.2	37.1	33.1	33.2			39.5	39.5	30.0	-	
63N	442800	314466	31.5	18.4	25.6	18.8	18.8		17.4	21.1	20.8			25.6	22.0	16.7	-	
64N	448081	313098	36.3	23.2	18.3	17.4	17.4	16.3	15.9	18.7	22.1			18.3	20.4	15.5	-	
65N	440666	310316							54.0	54.4	52.2	60.6		52.3	54.7	**41.0**	-	
66N	440625	310507							9.7	12.5	15.7	16.8		21.5	15.2	11.4	-	
67N	440537	310041									18.3	20.4		16.8	18.5	11.9	-	
68N	440698	310238								17.8	13.7	19.2			16.9	14.2	-	

☒ 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.

☒ Harborough District Council confirm that all 2022 diffusion tube data has been uploaded to the Diffusion Tube Data Entry System.

Notes:

Exceedances of the NO_2 annual mean objective of 40 µg.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 North West Leicestershire District Council During 2022

North West Leicestershire District Council has not identified any new sources relating to air quality within the reporting year of 2022.

Additional Air Quality Works Undertaken by North West Leicestershire District Council During 2022

North West Leicestershire District Council has worked with Harborough District Council

QA/QC of Diffusion Tube Monitoring

2021 diffusion tubes were supplied by Socotec (Didcote) using 50% TEA in acetone.

Diffusion Tube Annualisation

Table C.1 – Annualisation Summary (concentrations presented in µg.m^{-3})

Site ID	Annualisation Factor Leamington Spa	Annualisation Factor Leicester A594 Roadside	Annualisation Factor Northampton Spring Park	Annualisation Factor Leicester University	Average Annualisation Factor	Raw Data Annual Mean	Annualised Annual Mean
22N	0.8625	0.9544	0.9017	0.9123	0.9077	21.4	19.4
40N	0.9864	0.9540	1.0735	1.0135	1.0068	26.7	26.9
46N	0.9210	0.9753	0.9659	0.9551	0.9543	59.9	57.1
52N	0.9210	0.9753	0.9659	0.9551	0.9543	15.5	14.8
59N	0.8346	0.8891	0.8860	0.9270	0.8842	28.4	25.1
65N	0.9449	0.9488	1.0234	1.0293	0.9866	54.7	54.0
66N	0.9449	0.9488	1.0234	1.0293	0.9866	15.2	15.0
67N	0.7714	0.8663	0.8406	0.9051	0.8458	18.5	15.6
68N	1.1184	0.9707	1.1923	1.1385	1.1050	16.9	18.7

Diffusion Tube Bias Adjustment Factors

The diffusion tube data presented within the 2022 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.

North West Leicestershire District Council have applied a national bias adjustment factor of 0.76 to the 2022 monitoring data. A summary of bias adjustment factors used by North West Leicestershire District Council over the past five years is presented in Table C.2.

Table C.2 – Bias Adjustment Factor

Monitoring Year	Local or National	If National, Version of National Spreadsheet	Adjustment Factor
2022	National	03/2023	0.76
2021	National	03/22	0.78
2020	National	03/21	0.82
2019	National	03/20	0.87
2018	National	03/19	0.92
2017	National	03/18	0.97

QA/QC of Automatic Monitoring

The zephyr analyser data is subject to QA/QC procedures conducted by Earthsense the manufacturer of the Zephyr.

Automatic Monitoring Annualisation

For annualisation data of zephyr analyser see Appendix C3 Zephyr Monitoring Data

NO_2 Fall-off with Distance from the Road

Wherever possible, monitoring locations are representative of exposure. However, where this is not possible, the NO_2 concentration at the nearest location relevant for exposure has been estimated using the NO_2 fall-off with distance calculator available on the LAQM Support website. Where appropriate, non-automatic annual mean NO_2 concentrations corrected for distance are presented in Table B.1.

Fall off with distance of the Zephyr analyser is attached as appendix C4.

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

Figure D.1 – Map of Monitoring Sites North of the District

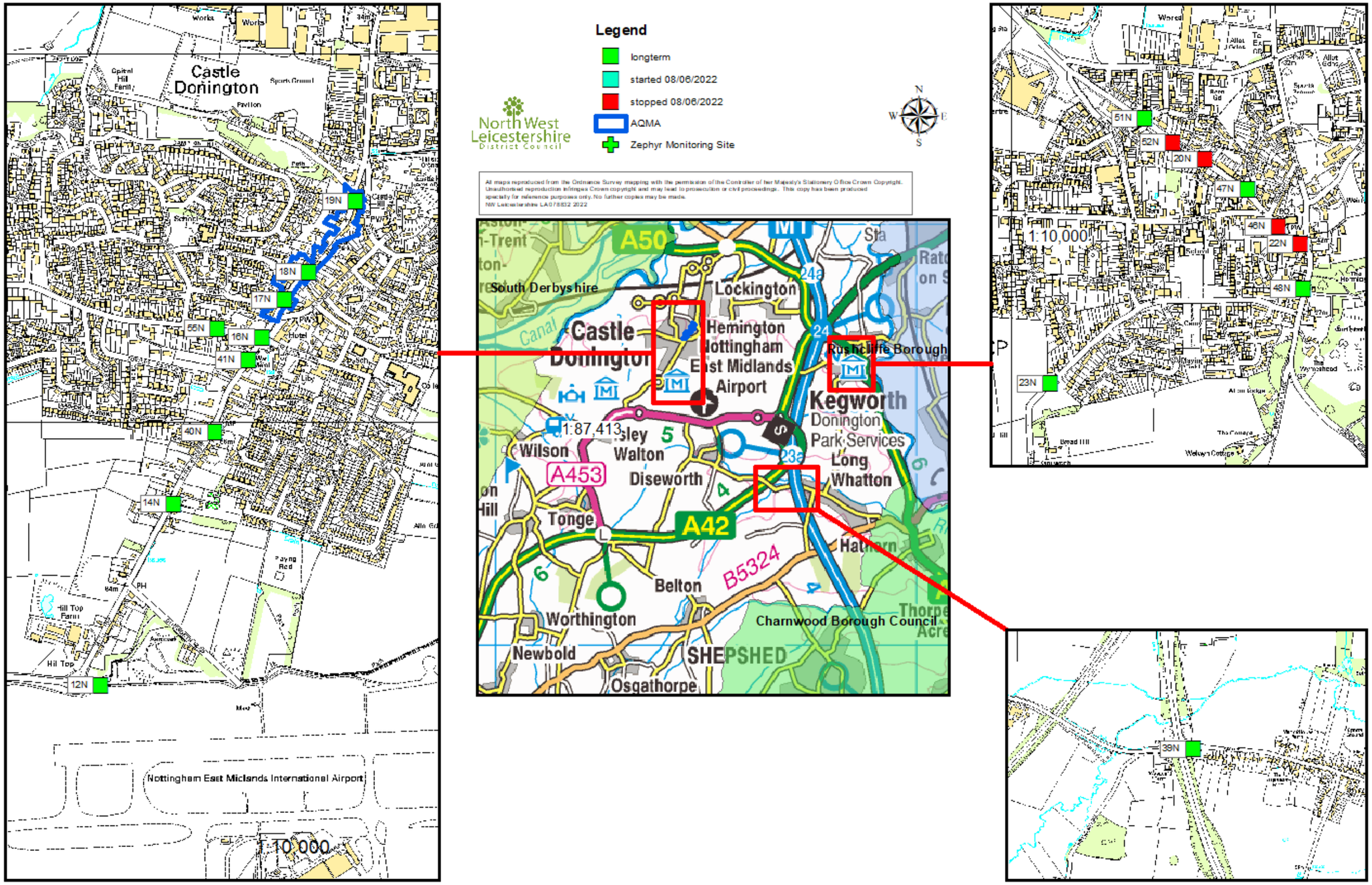
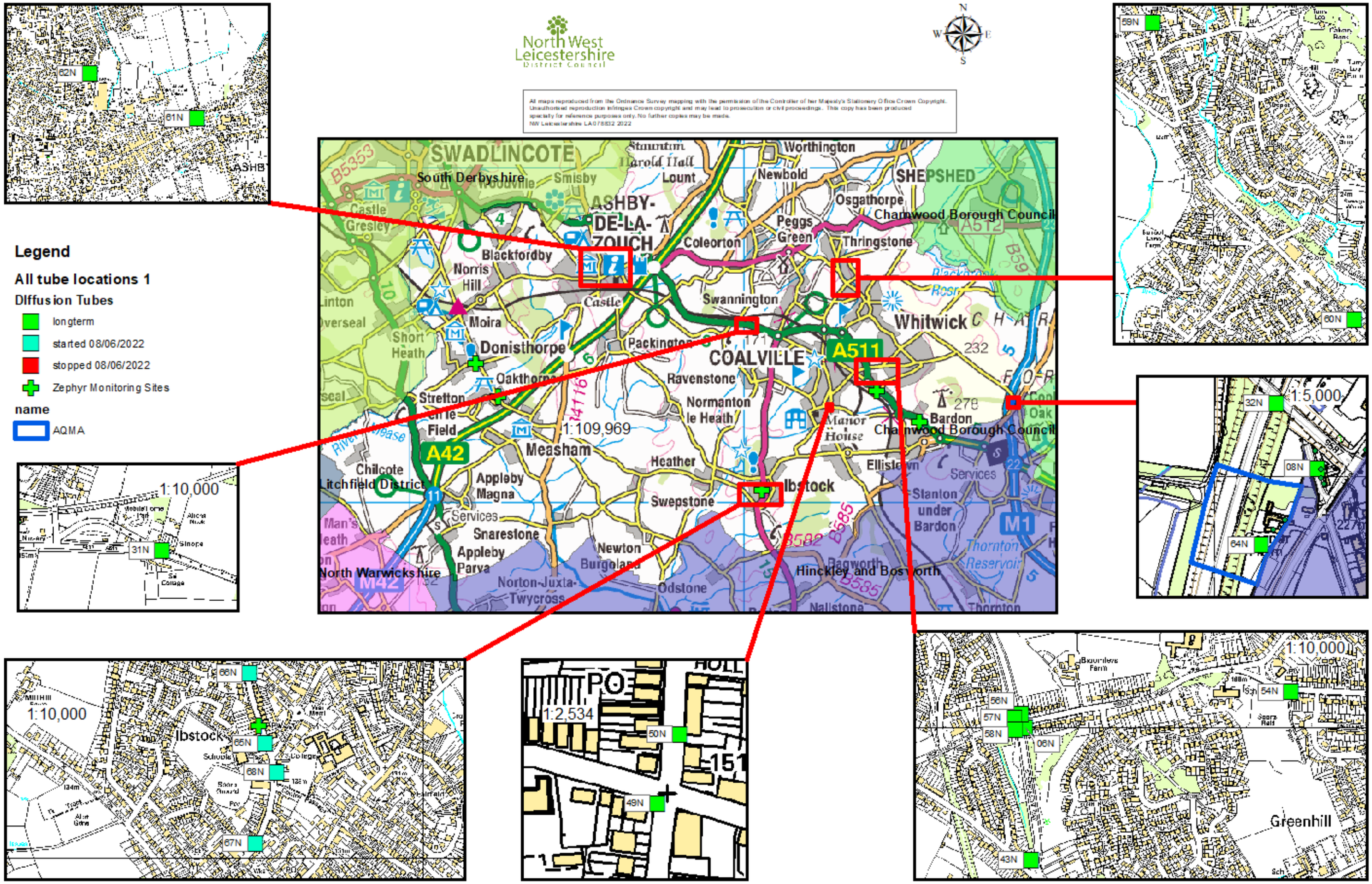


Figure D.2 – Map of Monitoring Sites South of the District



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

[7] The units are in microgrammes of pollutant per cubic metre of air (µg.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
NO_2	Nitrogen Dioxide
NO_x	Nitrogen Oxides
PM_{10}	Airborne particulate matter with an aerodynamic diameter of 10µm or less
$PM_{2.5}$	Airborne particulate matter with an aerodynamic diameter of 2.5µm or less
QA/QC	Quality Assurance and Quality Control
SO_2	Sulphur Dioxide

References

- Local Air Quality Management Technical Guidance LAQM.TG22. August 2022. Published by Defra in partnership with the Scottish Government, Welsh Assembly Government and Department of the Environment Northern Ireland.
- Local Air Quality Management Policy Guidance LAQM.PG22. August 2022. Published by Defra in partnership with the Scottish Government, Welsh Assembly Government and Department of the Environment Northern Ireland.
- 2023 DEFRA Diffusion Tube Bias Adjustment Factor v03/23 https://laqm.defra.gov.uk/air-quality/air-quality-assessment/nation
- DEFRA Background maps https://laqm.defra.gov.uk/air-quality/air-quality-assessment/background-maps/
- Public Health Outcomes Framework (PHOF) https://fingertips.phe.org.uk/profile/public-health-outcomes-framework
- UK AURN Network Data https://uk-air.defra.gov.uk/data/data_selector
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