Mansfield
District Council

2021 Air Quality Annual Status Report (ASR)

In fulfilment of Part IV of the Environment Act 1995

Local Air Quality Management

Date: 30 June, 2021

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The cover photo shows the Mansfield Brewery buildings taken from the River Maun pedestrian bridge at Titchfield Park.

Executive summary: Air quality in our area

Air quality in the Mansfield district

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

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

Historically, the District relied heavily on coal for heating and the pollutants of concern were therefore black smoke and sulphur dioxide. Over a number of years, Smoke Control Orders were introduced to cover the whole district, which produced a major improvement in air quality, both for smoke and SO_2. Following the closure of the coal mines and therefore the massive reduction in residential solid fuel use, the emphasis has shifted to vehicle exhaust emissions (NO_2), and, to a smaller degree, airborne dust (PM_{10}). Currently, the Council does not undertake PM_{10} monitoring, but it does monitor extensively for NO_2.

The Council has no Air Quality Management Areas at present, but has been continuing to pay greater attention to the northern end of Chesterfield Road North, Pleasley, and the Debdale Lane/Chesterfield Road North junction, Mansfield, where the highest NO_2 levels in the District are experienced. We have a real-time analyser and 15 diffusion tubes in place at roadside locations throughout the District. In 2020, none of our monitoring sites were exceeding the national Air Quality Objective of an annual mean of 40µgm^3 when the required

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

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

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

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

factors were applied. The trend for NO_2 generally in the District over the last seven years shows a decline in levels.

A detailed assessment was carried out for Pleasley in 2015, using NO_2 diffusion tubes and a real-time analyser, and it was concluded that an Air Quality Management Area was not required, but monitoring would continue. Unfortunately, due to the age and condition of the NO_2 analyser and its enclosure, real-time monitoring had to cease in August 2017. Monitoring began again in the Pleasley area in April 2019, using an NO_2 analyser in a new enclosure at a site about 100m further south of the previous location. It was hoped that after two years' monitoring at this location, the real-time unit could be moved to another site, but this has been delayed because the results for 2020 were artificially lowered by the travel restrictions necessary during the Covid-19 outbreak.

It is difficult for a local Council alone to reduce NO_2 emissions in its District, as these are primarily from vehicle exhausts. Consequently, the Council is reliant on actions also being taken by the County Council, Highways England, vehicle manufacturers and other involved parties.

Actions to improve air quality

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

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

Mansfield District Council's Smoke Control Area programme has been a great success in reducing air pollution from domestic heating sources, and the Council has not needed to

[5] Defra. Clean Air Strategy, 2019

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

monitor for ‘black smoke’ or sulphur dioxide for some twelve years. However, it is necessary to remind residents at intervals about the requirements of the Smoke Control Orders.

Nationwide, there has been a massive increase in the use of wood-burning stoves, and whenever Mansfield’s Environmental Health Department becomes aware of people installing these locally, it endeavours to give them advice and assistance. Fortunately, these stoves tend to be scattered about the District rather than concentrated in an area, so effects are usually confined to their immediate surroundings.

In 2015, five old coal-fired group heating systems in Council estates were removed and replaced with individual heating systems in 1,350 individual properties, augmented by air- or ground-source heat pumps. The Council used to receive complaints of airborne dust in the vicinity of the boiler-houses. The boiler-houses have been demolished and the sites have been grassed over until a decision is made about their future use. A small number of Council properties still require converting from old solid fuel-fired district heating systems to gas or electric, but this has been delayed, as only essential works could be carried out to Council houses in 2020 due to the Covid-19 outbreak.

A new list of measures being taken by various Council departments to improve local air quality was put together in 2016, with several items on it already completed. This has been updated every year; unfortunately the Covid-19 restrictions, including staff working from home and being redeployed, has meant that this could not be done in 2020. The 2019 version is included for information as Table 2.1, ‘Progress on measures to improve air quality’. Work should re-start on updating the Air Quality Action Plan in 2021.

A closer working relationship with other Councils has been achieved through various schemes, including the Local Authority Energy Partnership and the Nottingham City Procurement Unit.

Mansfield is part of the group led by Nottinghamshire County Council that has updated the Nottinghamshire Air Quality Improvement Strategy.

Conclusions and priorities

Our conclusions from monitoring in 2020 are:

1) Results recorded in 2020 by the 14 NO_2 diffusion tubes and the real-time monitoring unit were all below the annual Objective of 40µg/m^3. These results were recorded in

an exceptional year, with working from home encouraged and travel discouraged due to the Covid-19 outbreak, and therefore an increase in levels should be expected in subsequent years. However, it is hoped that public experience of living and working during the Covid-19 year will lead to fewer car journeys on a permanent basis.

2) Although the Council does not monitor for $PM_{2.5}$, we assume that, comparing monitored levels recorded in the centre of Nottingham with Defra's modelled background level for Mansfield, $PM_{2.5}$ levels in the area will not be a cause for concern. No Air Quality Objective has been set to date for $PM_{2.5}$, but the World Health Organisation guideline value is 10µgm^3. Mansfield's levels are thought likely to be around 7.9µgm^3. The actions identified in Table 2.1 that will help to reduce PM_{10} concentrations should also reduce $PM_{2.5}$.

3) Detailed dispersion modelling was carried out in 2018 by a consultant looking at possible air quality issues from three road junctions and two residential development locations for the proposed Local Plan allocation. The report concluded that, although implementation of the Local Plan would cause an increase in traffic loading at the junctions, it would not have significant impacts on local air quality. Even if the expected improvements in vehicle emissions did not materialise, the impact would still be 'negligible' to 'slight'. Monitoring has been taking place for some years at one of the junctions in question; a diffusion tube was due to be put in place at a suitable point once the residential developments have been completed, as a receptor was identified that might experience an increase in NO_2 levels of up to 3.9µgm^3. This was not done in 2020, since due to the Covid situation the developments are still being built.

Our priorities for the coming year are:

1) To continue diffusion tube monitoring for NO_2 throughout the District to enable us to have an ongoing indication of levels of this pollutant;

2) To monitor throughout 2021, and probably in 2022, with the NOx real-time analyser in the new location on Chesterfield Road North in Pleasley, as the 2020 results are likely to have been artificially lowered by the Covid-19 restrictions on travel;

3) To reinstate real-time PM_{10} monitoring in the District;

4) To implement and continue to develop the various measures the Council is taking to improve local air quality;

5) To adopt and promote the new Nottinghamshire Air Quality Improvement Strategy; and

6) To promote the requirements of the Air Quality Regulations 2020 (England) once they come into force (scheduled for 1 May 2021).

Local engagement and how to get involved

Several of the initiatives detailed in Table 2.1 have been undertaken in partnership with other bodies, usually the County Council or county-wide groups. This helps to achieve both efficiency and consistency.

The Environmental Health Department continues to give advice on air quality issues when requested by the public, particularly in respect of wood-burning stoves and garden bonfires.

The public can help to improve air quality in the district in several ways:

1) If you are using an open fire, burn only solid smokeless fuels on it, not wood or coal. This is a legal requirement under the Clean Air Act 1993 and the Smoke Control Order that covers your property. The Clean Air Act 1993 is available at www.legislation.gov.uk/ukpga/1993/11/contents; information on the Council's Smoke Control Orders and the streets within each is available on request from the Environmental Health section.

2) If you have a closed solid-fuel fire (roomheater), burn only the type of fuel recommended by the manufacturer. Again, this is a legal requirement. Some roomheaters are advertised as 'multi-fuel', but if they are not on the Defra 'approved appliance' list, you cannot burn anything except smokeless fuel on them. Approved appliances are listed at www.smokecontrol.defra.gov.uk/appliances.php?country=england; and authorised fuels at www.smokecontrol.defra.gov.uk/fuels.php.

3) If you are using a wood-burning stove, burn only clean, dry wood. Wood must be left to dry for at least a year before you use it (unless you have bought 'kiln-dried' wood), and it must contain less than 20% moisture. Moisture meters can be bought to check this; they are particularly useful if you buy wood from several different sources, as

the moisture content may not be consistent. Store your firewood in a place where it will not get damp; failing that, bring wood indoors at least a week before using it, to help it to dry out, and check its moisture content before using it. Never burn wood that has been painted, varnished or treated in any way (this includes pallets), as it could cause damage to the interior of your stove and release fumes inside your house. New legislation is coming into force in May 2021 to regulate the sale of wood as a fuel. Check www.hetas.co.uk/ready-to-burn-what-consumers-need-to-know for more information.

4) Since 2005, wood-burning stoves have been required by law to have a Certificate of Compliance from a HETAS-registered engineer, or a Building Notice from a Building Control Officer, to confirm that they have been fitted correctly. If you do not have a certificate for your stove, you can have it serviced by a HETAS engineer, who will give you a certificate for twelve months.

5) Avoid garden bonfires as much as possible. Never burn household waste, furniture, carpets, anything containing plastics or foam rubber, or any other items likely to cause black smoke and smell. You can burn plant and tree cuttings from your garden, but you must allow them to dry out before burning them. You can also burn confidential papers. Any garden fire you do have should be attended at all times by someone with access to a hosepipe or a bucket of water, soil or sand, to put it out if it gets out of hand or the wind changes to take the smoke towards another property or a road. Fires must be put out before leaving them at night.

6) Wherever possible, use alternative forms of transport rather than your car. When changing cars, look for a ‘cleaner’ vehicle; in particular, be aware that the government proposes that new single-fuel cars (i.e. those that only use petrol or diesel) will no longer be produced from 2030. Have your car serviced regularly, and if the exhaust starts smoking, have it checked.

Table of contents

Executive summary: Air quality in our area i
Air quality in the Mansfield district i
Actions to improve air quality ii
Conclusions and priorities iii
Local engagement and how to get involved v
1 Local Air Quality Management 1
2 Actions to improve air quality 2
Air Quality Management Areas 2
$PM_{2.5}$ – Local Authority approach to reducing emissions and/or concentrations 9
3 Air quality monitoring data and comparison with Air Quality Objectives and National Compliance 11
Summary of monitoring undertaken 11
3.1.1 Automatic monitoring sites 11
3.1.2 Non-automatic monitoring sites 11
Individual pollutants 11
3.1.3 Nitrogen dioxide (NO_2) 12
3.1.4 Particulate matter (PM_{10}) 12
3.1.5 Particulate matter ($PM_{2.5}$) 12
Appendix A: Monitoring results 13
Appendix B: Full monthly diffusion tube results for 2020 19
Appendix C: Supporting technical information/air quality monitoring data QA/QC 20
New or changed sources identified within the Mansfield District during 2020 20
Additional air quality works undertaken by Mansfield District Council during 2020 20
QA/QC of diffusion tube monitoring 20
Diffusion tube annualisation 22
Diffusion tube bias adjustment factor 22
NO_2 fall-off with distance from the road 23
QA/QC of automatic monitoring 23
Automatic monitoring annualisation 24
NO_2 fall-off with distance from the road 24
Appendix D: Map(s) of monitoring locations 26
Appendix E: Summary of Air Quality Objectives in England 34
Appendix F: Impact of Covid-19 upon LAQM 35
Impacts of Covid-19 on air quality within the Mansfield District 36
Opportunities presented by Covid-19 upon LAQM within the Mansfield District 37
Challenges and constraints imposed by Covid-19 upon LAQM within the Mansfield District 37
Glossary of terms 39

References 40

Figures

Figure A.1 – Trends in annual mean NO_2 concentrations 17
Figure D.1a – Map of non-automatic monitoring sites in central Mansfield 26
Figure D.1b - Map of non-automatic monitoring sites in northern Mansfield 27
Figure D.1c - Map of non-automatic monitoring site in Pleasley 28
Figure D.1d - Map of non-automatic monitoring site in Mansfield Woodhouse 29
Figure D.1e - Map of non-automatic monitoring sites in Forest Town 30
Figure D.1f - Map of non-automatic monitoring sites in Warsop 31
Figure D.1g - Map of non-automatic monitoring site in Rainworth 32
Figure D.1h - Map of real-time monitoring location 33

Tables

Table 2.1 - Progress on measures to improve air quality 5
Table A.1 – Details of automatic monitoring sites 13
Table A.2 – Details of non-automatic monitoring sites 14
Table A.3 – Annual mean NO_2 monitoring results: automatic monitoring ($\mu g/m^3$) 15
Table A.4 – Annual mean NO_2 monitoring results: non-automatic monitoring ($\mu g/m^3$) 16
Table B.1 – NO_2 2020 diffusion tube results ($\mu g/m^3$) 19
Table C.1 – Bias adjustment factor 23
Table C.2 – Annualisation summary (concentrations presented in $\mu g/m^3$) 25
Table E.1 – Air Quality Objectives in England 34
Table F.1 - Impact matrix 38

1 Local Air Quality Management

This report provides an overview of air quality in the Mansfield District during 2020. It fulfils the requirements of Local Air Quality Management (LAQM) as set out in Part IV of the Environment Act (1995) and the relevant Policy and Technical Guidance documents.

The LAQM process places an obligation on all local authorities to regularly review and assess air quality in their areas, and to determine whether or not the air quality objectives are likely to be achieved. Where an exceedance is considered likely the local authority must declare an Air Quality Management Area (AQMA) and prepare an Air Quality Action Plan (AQAP) setting out the measures it intends to put in place in pursuit of the objectives. This Annual Status Report (ASR) is an annual requirement showing the strategies employed by Mansfield 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 12 months setting out measures it intends to put in place in pursuit of compliance with the objectives.

Mansfield District Council does not have any AQMAs at present, but has for some years been compiling and updating a list of measures it has been taking to improve air quality. Unfortunately it has not been possible to update the Air Quality Action Plan this year; due to the restrictions imposed by Covid-19, many initiatives have had to be put on hold. The plan as it was in 2019 has been repeated as Table 2.1 for information. For reference, maps of the Council's monitoring locations are available in Appendix D.

Progress and impact of measures to address air quality in the Mansfield District

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

- "The highest NO_2 annual mean concentration recorded was 37.9µg/m^3 at the monitoring location on Portland Street that reduced to 32.8µg/m^3 after distance correction. Whilst distance correction is appropriate for this site, the Council is advised that this has been incorrectly applied to all other sites. There are no calculations for the Portland Street site, although it is discussed in the appendix. It is recommended that the calculations are shown to provide full clarity for the adjustment."

  Distance correction has not been applied at any site in 2020, as no sites recorded an annual mean NO_2 concentration of over 36µg/m^3.

- "One exceedance did occur at the automatic site (Chesterfield Road North, Pleasley) of the hourly NO_2 objective. This site exceeded 200µg/m^3 47 times despite a reduced annual data capture, which exceeded the objective of exceeding 200 µg/m^3 18 times in a year. It is recommended that the Council continue monitoring at this site to collect additional data, if the site continues to exceed next year the council should proceed

to declaring an AQMA around the area and subsequently produce an AQAP in order to address the exceedances."

Due to the exceptional circumstances prevailing in 2020, the Council intends to leave the real-time monitoring unit in place on Chesterfield Road North, Pleasley, throughout 2021 and probably throughout 2022.

- "QA/QC of monitoring data is shown in the report for bias adjustment (where the national factor is used). The Council is encouraged to install triplicate diffusion tubes at the Chesterfield Road North automatic monitoring station, so that a co-location study can be carried out. Derivation of a local bias adjustment factor would be welcomed, and is encouraged."

  Due to the restrictions associated with Covid-19 and the redeployment of staff, the normal diffusion tube monitoring programme could not be maintained throughout 2020. Co-located tubes will be installed once the monitoring programme can be carried out as normal.

Mansfield District Council has been unable to update its Action Plan for 2020 due to the restrictions imposed following the Covid-19 outbreak. The Action Plan for 2019 is included as Table 2.1 for information. The Council hopes that future easing of the Covid-19 restrictions will allow progress on the 23 measures listed to start again.

Mansfield District Council's priorities for the coming year are:

- To continue to monitor in the current locations, as the results recorded in 2020 are very likely to have been affected by the restrictions associated with the outbreak of Covid-19.
- To update the Air Quality Action Plan as soon as circumstances allow.

Mansfield District Council is one of the councils who produced the Nottinghamshire Air Quality Improvement Strategy, and was involved in the updating of this document by a group led by Nottinghamshire County Council. The final version of the new strategy was brought before the various councils' committees in October 2020; it is available on the Nottingham City Council's website.

The District Council's Local Plan was adopted in November 1998 and is in the process of being updated. Most of its policies have been 'saved' until it is superseded by the new document. The Council submitted the proposed Local Plan, together with the representations received and other relevant supporting documents, to the Secretary of State for Housing Communities and Local Government on 19 December 2018 for independent examination. A report from the Planning Inspectorate is expected in the spring of 2020. Information about the plan and its progress can be found at http://www.mansfield.gov.uk/local-plan/local-plan-2013-2033-submission-1.

A policy for assessing air quality is included in the new plan, to ensure its impact is considered during the planning stage of all new developments. Climate change has also been incorporated in the plan.

The Nottinghamshire Local Transport Plan 2011-2026 can be found at https://www.nottinghamshire.gov.uk/media/123040/local-transport-plan-strategy.pdf, and the county's action plans for public transport can be found at www.nottinghamshire.gov.uk/transport/public-transport/plans-strategies-policies.

Much of Mansfield's future approach to air quality issues will be influenced by the actions that are taken in and around the city of Nottingham, which was included in the recent World Health Organisation list of the ten UK cities failing to meet WHO air pollution standards.

Table 2.1 – Progress on measures to improve air quality

Measure no.	Measure	EU Category	EU Classification	Date measure introduced	Organisations involved	Funding source	Key performance indicator	Reduction in pollutant/ emission from measure	Progress to date	Estimated / actual completion date	Comments/barriers to implementation
1	Home energy conservation	Policy guidance and development control	Other policy	2011/ 2013/ 2015	MDC Housing	Internal	Percentage reduction in heating costs	N/K	Home Energy Conservation Act Report	When all MDC properties reach required standard	A further 125 Council properties converted from district heating systems to gas central heating in 2019 - over 1,800 properties converted since scheme began. Only 62 properties still to convert
2	School travel plans	Promoting travel alternatives	School travel plans	N/K	Notts County Council Education Department	NCC	Reduction in number of private vehicle “school runs”	N/K	Several school travel plans already implemented	Ongoing	One more school travel plan implemented in 2018
3	Cleaner taxis	Promoting low emission transport	Taxi emission incentives	2016	MDC Taxi Licencing	Internal	Increased number of taxi operators using cleaner vehicles	N/K	Licence fee for hybrid vehicles reduced by 10%	Ongoing	Monitoring similar projects in neighbouring districts, and will consider review if necessary
4	Cleaner taxis	Promoting low emission transport	Taxi licensing conditions	2016	MDC Taxi Licencing	Internal	Fewer older vehicles operating	N/K	No current plans to review age criteria for either new vehicle applications or existing licensed vehicles with MDC	N/K – depends on creation of any national standards	Awaiting the creation of National Standards, and will consider implementation where relevant
5	MDC vehicle fleet efficiency	Vehicle fleet efficiency	Fleet efficiency and recognition schemes	N/K	MDC Fleet Management	Internal	Percentage reduction in emissions and fuel usage; increased number of cleaner vehicles	N/K	Vehicle replacement scheme in operation, with aim of all vehicles to be Euro 6	When all MDC fleet vehicles are Euro 6	No fleet vehicles are older than 10 years; no Euro 4 vehicles now in use. All existing refuse vehicles are Euro 5 or 6. All newly-purchased commercial vehicles are Euro 6. Scheme permits replacement of 1 refuse vehicle and 10-15 vans per year
6	Alternative fuels	Promoting low emission plant	Shift to installations using low-emission fuels for stationary and mobile sources	2015	MDC Facilities	Internal	Reduction in electricity costs	N/K	Solar panels put on Civic Centre roof in March 2016 – savings of some £30,000 to date	When all sources meet required standard	Solar panels being put on several new MDC commercial and residential buildings

7	Working from home	Promoting travel alternatives	Encourage/ facilitate home-working	2014	MDC	Internal	Number of people taking up option	N/K	Home working policy implemented 2014	Ongoing	Home working being trialled by Finance Department. 13 officers expressed an interest at start of trial
8	LEV parking and charging	Promoting low emission transport	Priority parking for LEVs	N/K	MDC Planning	Internal	Number of spaces provided alongside demand	N/K	Emerging Local Plan (2013-33) policies addressing electric car charging include: Policy IN10 (Car and cycle parking) - promotes inclusion of electric car charging points in development; Policy P5 (Climate Change and new development) – need for new developments to address mitigation and adaptation to climate change. Local Plan Annual Monitoring Report has recorded number of applications for electric car charging points and renewable energy. Please see https://www.mansfield.gov.uk/planning-policy/annual-monitoring-reports-1 Development Management starting to put conditions on for electric charging points and request information through planning applications. This comes from local plan policy	Ongoing	District now has least 30 charging points for electric cars - several stores and public houses have indicated they will be applying for planning permission to provide charging points in their car parks
9	Carbon management plan	Policy guidance and development control	Low Emissions Strategy	2010	MDC Planning Policy	Internal	Percentage reduction in emissions. Carbon-neutral status	N/K	Full Council declared Climate Emergency on 5 March 2019: Climate emergency declared 'in principle'; council to go carbon-neutral by 2040; Sign up to 'Global Covenant of Mayors'; Ask government to reflect seriousness of situation in national policy and strategy and release funds to LAs to allow them to take necessary measures at local level; Pledge to make Mansfield carbon- neutral by 2040 and work with local business and industry; Mayor to report back to Council in 12 months with Action Plan. Full Council meeting minutes	Ongoing	Cut emissions by 35% from Council activities from 2008/09 baseline in 5 years
10	Warm Homes on Prescription	Policy guidance and development control	Other	N/K	MDC Private Sector Housing	N/K	Number of homes improved	N/K	24 properties improved in 2018/19. 63 properties improved since grant introduced in 2016/17	N/K - when funding exhausted	Health professionals encouraged to refer their patients if they have concerns about heating and insulation of their homes
11	Speed limit reductions	Traffic management	Reduction of speed limits, 20mph zones	Included in Transport Plan 2011-2026	Notts County Council Highways	NCC	Reduction in traffic emissions; accident reduction	N/K	Some 40mph roads reduced to 30; 20mph zones around several schools. One further 20mph zone put in place outside a school in 2018	Ongoing	Primarily for road safety, but should also improve air quality

12	Delivery management	Freight and delivery management	Quiet & out-of-hours delivery	N/K	MDC Planning	N/K	Reduction in complaints from nearby residents	N/K	Discussions with businesses to reduce frequency of deliveries	Ongoing	Considered during planning process and conditions attached where appropriate
13	“Part B” process controls	Environ-mental permits	Measures to reduce pollution through IPPC permits going beyond BAT	N/K	MDC Environmental Health	N/K	Reduction in solvent use	N/K	Permitted processes reporting on progress every two years	Ongoing	Discussed with businesses during inspection process; also considered in each business’s Five Year Review
14	Energy partnership	Policy guidance and development control	Regional groups co-ordinating programmes to develop area-wide strategies to reduce emissions and improve air quality	N/K	Local Authority Energy Partnership made up of 20 authorities from Nottinghamshire and Derbyshire	N/K	Co-ordination of strategies likely to have a positive effect on air pollution throughout the county	N/K	Strategies to being written and programmes developed	Ongoing funding available	Local Energy Partnership has not met for some time (approx. 2012/13). No further progress in MDC since 2017, as Climate Change Officer post deleted
15	Local Plan	Policy guidance and development control	Air quality planning and policy guidance	2013	MDC Planning Policy	Internal	Increased awareness of air quality issues, and action to improve air quality, among developers in the District	N/K	Emerging Local Plan (2013-33) has been reviewed by Planning Inspector and recommended for adoption, barring specific modifications. Awaiting Full Council meeting to progress to adoption. See https://www.mansfield.gov.uk/local-plan/local-plan-2013-2033-submission-1	2020	Emerging Local Plan addresses air quality in policies P7 (Amenity) and NE3 (Pollution and land stability). Main modifications (MM15 & MM88) to Emerging Local Plan address the following: ‘An Air Quality and Emissions Mitigation Guidance for Developers Supplementary Planning Document (SPD) will provide further guidance for policy implementation.’ Based on guidance from Nottinghamshire County Council which will be used to write Supplementary Planning Guidance Document to support policy implementation in local plan. Writing of this will be led by Planning Policy and require input from Environmental Health. Emerging Local Plan Objectives 9 and 12, and monitoring indicator for NE3, address air quality
16	Sustainable procurement	Policy guidance and development control	Sustainable procurement guidance	N/K	Nottingham City Council Procurement Unit	N/K	Impact on air quality	N/K	Minimise environmental impact of goods, services and works procured	Ongoing compliance with strategy	

17	Personal travel plans	Promoting travel alternatives	Personal travel plans	2017	MDC, Notts County Council	DfT	Number of people taking up option	N/K	Target groups identified: jobseekers, school leavers, employees and residents	2019/20	
18	Cycle-to-work scheme	Promoting travel alternatives	Promotion of cycling	2016	MDC	Internal	Number of people cycling to work	N/K	Implemented cycle-to-work scheme at MDC – wider scheme recently proposed	Ongoing	To be included in new Health and Wellbeing Agenda
19	Cycle network	Promoting travel alternatives	Promotion of cycling	2017/18	MDC, Notts County Council	D2N2 LEP LGF	Increased use of cycle network	N/K	Consultation on proposals in early 2017; potential routes identified	2018/19	
20	Promotion of walking	Promoting travel alternatives	Promotion of walking	2016	MDC	Internal	Increased number of people walking; improvements in health	N/K	New corporate priorities launched 2016, including actions to help people live healthier lives, and for climate change issues, district heating improvements, energy efficiency, carbon footprint reductions	Ongoing	To be included in new Health and Wellbeing Agenda
21	Bus lane	Traffic management	Strategic highway improvements, re-prioritising road space away from cars, including access management, selective vehicle priority, bus priority, high vehicle occupancy lane	Included in Transport Plan 2011-2026	Notts County Council Highways	NCC	Reduction of bus waiting time at one busy traffic-lighted junction	N/K	Bus lane on Leeming Lane South has been in place for several years	Complete	Reduced bus waiting time by 2 minutes on average
22	Public information	Public information	Via radio, press, and internet	N/K	MDC Public Relations and Communications Team	Internal	Increased number of ‘hits’, comments and ‘likes’ recorded from website, Facebook pages, etc.	N/K	Positive publicity via social media, MDC website, press releases, etc., and by taking part in national awareness campaigns	Ongoing	
23	Public information	Public information	Via leaflets, radio, and internet	N/K	MDC Environmental Health	Internal	Increased number of requests per annum for leaflets and interviews; increased number of “hits” on EH section of website	N/K	Various leaflets always available on request; interviews as requested by local radio station; information on MDC website	Ongoing	

$PM_{2.5}$ – Local Authority approach to reducing emissions and/or concentrations

As detailed in Policy Guidance LAQM.PG16 (Chapter 7), local authorities are expected to work towards reducing emissions and/or concentrations of $PM_{2.5}$ (particulate matter with an aerodynamic diameter of 2.5µm or less). There is clear evidence that $PM_{2.5}$ has a significant impact on human health, including premature mortality, allergic reactions, and cardiovascular diseases. The Public Health Outcomes Framework Indicator[5] 3.01, 'Fraction of mortality attributable to particulate air pollution' for Nottinghamshire (measured as $PM_{2.5}$ and taken from 2019 data) is 5.3%. This is the same as the East Midlands figure, but a little above the figure for the whole of England, which is 5.1%.

Mansfield District Council does not monitor for $PM_{2.5}$ at present, therefore the likely local levels have been predicted from the nearest AURN site that measures $PM_{2.5}$ and the modelled background concentrations from the Defra website. The modelled background level for 2020 from the Defra website for the Mansfield area is about 7.9µgm^3, a small reduction from the 2019 figure of 8.2µgm^3. In 2020, the annual mean concentration at the AURN site in Nottingham Centre was 8.7µgm^3, a considerable reduction from the 2019 figure of 10.83µgm^3. (Please note that the Mansfield figure is modelled, whereas the Nottingham one is monitored).

The World Health Organisation guideline value[6] for $PM_{2.5}$ is 10µgm^3; no air quality objective has been set to date. The European Union legal annual mean is 25µg/m^3, which has been transposed into UK law, although the Mayor of London said in the Greater London Authority's 2019 report, "$PM_{2.5}$ in London: roadmap to meeting World Health Organisation guidelines by 2030" that he did not think this limit "goes far enough for the protection of human health". Several countries with large cities comparable to London have set out to meet the WHO guideline rather than the EU one.

It seems very unlikely that the levels in Mansfield town centre would be as high as those in Nottingham city centre, so we must assume that Mansfield's levels are closer to the modelled 7.9µgm^3 than to Nottingham's monitored 8.7µgm^3, and therefore that there is unlikely to be a major problem with $PM_{2.5}$ in the District. Both Mansfield's modelled and Nottingham's monitored levels are currently below the WHO guideline value.

Mansfield District Council does not currently have any measures in place to deal specifically with $PM_{2.5}$. However, the levels of PM_{10} that we were finding in the District up to August 2016 (when real-time PM_{10} monitoring stopped) suggested that we would not have high

levels of $PM_{2.5}$, since studies indicate that $PM_{2.5}$ levels tend to be approximately 0.6% of PM_{10} levels. In addition, we believe that the measures we are taking to reduce PM_{10} will have a knock-on effect on $PM_{2.5}$. These measures are detailed in Table 2.1 above.

3 Air quality monitoring data and comparison with Air Quality Objectives and National Compliance

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

Summary of monitoring undertaken

3.1.1 Automatic monitoring sites

Mansfield District Council undertook automatic (continuous) monitoring at one site during 2020. Table A.1 in Appendix A shows the details of the automatic monitoring sites.

A map showing the location of the monitoring site is provided in Appendix D as Figure D.1h. Further details on how the monitors are calibrated and how the data has been adjusted are included in Appendix C.

3.1.2 Non-automatic monitoring sites

Mansfield District Council undertook non-automatic (i.e. passive) monitoring of NO_2 at 14 sites during 2020. Table A.2 in Appendix A presents the details of the non-automatic sites.

Maps showing the location of the monitoring sites are provided in Appendix D as Figures D.1a to D.1g. 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.

3.1.3 Nitrogen dioxide (NO_2)

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

For diffusion tubes, the full 2020 dataset of monthly mean values is provided in Appendix B. Note that the concentration data presented in Table B.1 includes distance-corrected values only where relevant.

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

No exceedances of the annual mean or hourly mean Air Quality Objectives were recorded in 2020. However, due to the enforced reduction in traffic following the national lockdown starting 23 March, and to the continuing encouragement to work from home and discouragement of travel, the 2020 monitoring results are clearly the product of exceptional circumstances, and levels seem likely to rise again once all restrictions have been lifted. It will be interesting to see whether Covid-19 has a lasting effect on air pollution levels, and to what extent.

3.1.4 Particulate matter (PM_{10})

Mansfield District Council does not currently monitor for PM_{10}.

3.1.5 Particulate matter ($PM_{2.5}$)

Mansfield District Council does not currently monitor for $PM_{2.5}$.

Appendix A: Monitoring results

Table A.1 – Details of automatic monitoring sites

Site name	Site type	X OS grid ref (easting)	Y OS grid ref (northing)	Pollutants monitored	In AQMA?	Monitoring technique	Distance to relevant exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Inlet height (m)
Chesterfield Road North	Roadside	450974	363730	NO_2	N	Real-time chemiluminescence	1	5	2

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?	Distance to relevant exposure (m) [1]	Distance to kerb of nearest road (m) [2]	Tube co-located with a continuous analyser?	Tube height (m)
AR	Abbott Road	Roadside	451854	362436	NO_2	N	8	1	N	2
CRN 1	Chesterfield Road North 1	Roadside	450840	363896	NO_2	N	0	3	N	2
CRN 2	Chesterfield Road North 2	Roadside	450820	364028	NO_2	N	0	1	N	2
DL	Debdale Lane	Roadside	452515	362508	NO_2	N	4	3	N	2
FT1	Forest Town 1	Roadside	457199	362697	NO_2	N	9	5	N	2
FT2	Forest Town 2	Roadside	457407	362701	NO_2	N	11	2	N	2
HL	Hermitage Lane	Roadside	452423	360050	NO_2	N	12	6	N	2
LLS	Leeming Lane South	Roadside	454421	362860	NO_2	N	11	3	N	2.5
NR	Nottingham Road	Roadside	453842	360174	NO_2	N	5	2	N	2.5
OML	Old Mill Lane	Roadside	455834	362101	NO_2	N	11	3	N	2
SS	Sherwood Street	Roadside	456928	367423	NO_2	N	8	4	N	2.5
SRE	Southwell Road East	Roadside	458513	358623	NO_2	N	8	3	N	2
TL	Toothill Lane	Roadside	454072	361102	NO_2	N	6	2	N	2
WT	Warsop Town Hall	Roadside	456663	368019	NO_2	N	7	4	N	2

Notes:

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

(2) N/A if not applicable.

Table A.3 – Annual mean NO_2 monitoring results: automatic monitoring (µg/m^3)

Site ID	X OS grid ref (easting)	Y OS grid ref (northing)	Site type	Valid data capture for monitoring period (%) (1)	Valid data capture 2020 (%) (2)	2016	2017	2018	2019	2020
Chesterfield Road North	450974	363730	Roadside	Real-time chemiluminescence	100	-	-	-	14.2	6.5

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

Notes:

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

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

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

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

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

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

Table A.4 – Annual mean NO_2 monitoring results: non-automatic monitoring (µg/m^3)

Diffusion tube ID	X OS grid ref (easting)	Y OS grid ref (northing)	Site type	Valid data capture for monitoring period (%) (1)	Valid data capture 2020 (%) (2)	2016	2017	2018	2019	2020
AR	451854	362436	Roadside	100	17	32.5	31.0	30.6	29.8	28.3
CRN 1	450840	363896	Roadside	100	17	-	-	-	31.2	36.0
CRN 2	450820	364028	Roadside	100	17	**43.0**	37.8	35.8	34.4	33.0
DL	452515	362508	Roadside	100	25	**47.2**	37.1	37.6	33.2	21.5
FT 1	457199	362697	Roadside	100	25	36.5	23.3	25.6	23.9	15.3
FT 2	457407	362701	Roadside	100	17	20.8	21.0	19.3	18.4	20.4
HL	452423	360050	Roadside	100	25	**43.0**	26.0	22.1	25.3	14.3
LLS	454421	362860	Roadside	100	25	31.2	28.0	29.7	27.3	15.4
NR	453842	360174	Roadside	100	25	37.1	37.9	35.5	31.2	18.2
OML	455834	362101	Roadside	100	25	**48.8**	28.5	30.6	27.9	15.7
SS	456928	367423	Roadside	100	25	23.2	21.1	21.6	19.4	11.7
SRE	458513	358623	Roadside	100	25	21.5	20.1	20.9	18.3	10.6
TL	454072	361102	Roadside	100	17	24.9	23.1	22.4	20.9	20.0
WT	456663	368019	Roadside	100	25	32.5	24.7	26.5	23.0	13.5

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

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

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

Notes:

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

Exceedances of the NO_2 annual mean objective of 40µg/m^3 are shown in **bold**. NO_2 annual means exceeding 60µg/m^3, indicating a potential exceedance of the NO_2 1-hour mean objective are shown in **bold and underlined**.

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

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

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

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

Figure A.1 – Trends in annual mean NO_2 concentrations

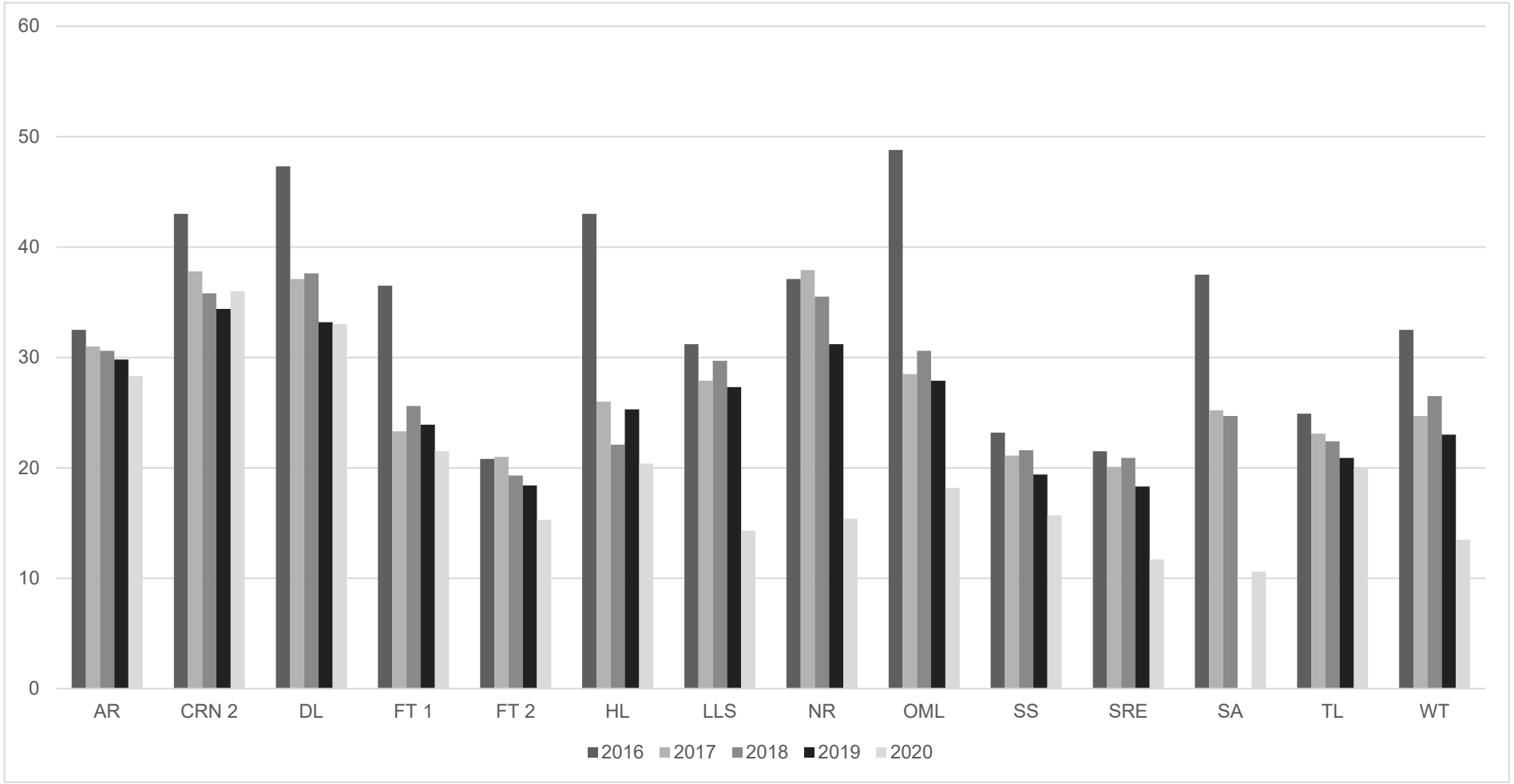


Figure A.1 presents NO_2 annual mean concentrations for the 14 diffusion tube monitoring sites between years 2016 to 2020. There are no exceedances of the annual mean objective in 2020 and there is a general trend of reduction experienced across the sites.

Table A.5 – 1-hour mean NO_2 monitoring results, number of 1-hour means >200µg/m^3

Site ID	X OS grid ref (easting)	Y OS grid ref (northing)	Site type	Valid data capture for monitoring period (%) (1)	Valid data capture 2020 (%) (2)	2016	2017	2018	2019	2020
Chesterfield Road North	450974	363730	Automatic	N/A	100	-	-	-	**47** (99.8th percentile 351.6)	None

Notes:

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

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

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

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

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

Please note that a trend chart has not been completed, as the Council only began monitoring again for NO_2 in 2019, and no 1-hour means over 200µg/m^3 were recorded in 2020.

Appendix B: Full monthly diffusion tube results for 2020

Table B.1 – NO_2 2020 diffusion tube results (µg/m^3)

DT ID	X OS Grid Ref (easting)	Y OS Grid Ref (northing)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean: raw data	Annual Mean: annualised and bias-adjusted (factor 0.81)	Annual Mean: distance-corrected to nearest exposure	Comment
AR	451854	362436	39.5	30.2											34.9	28.3	NA	
CRN 1	450840	363896	46.0	42.7											44.4	36.0	NA	
CRN 2	450820	364028	42.0	39.3											40.7	33.0	NA	
DL	452515	362508	40.3	45.3									46.3		44.0	21.5	NA	
FT 1	457199	362697	30.4	26.7									36.8		31.3	15.3	NA	
FT 2	457407	362701		22.9									27.4		25.1	20.4	NA	
HL	452423	360050	31.6	25.4									30.6		29.2	14.3	NA	
LLS	454421	362860	28.3	29.6									36.9		31.6	15.4	NA	
NR	453842	360174	39.4	33.9									38.4		37.2	18.2	NA	
OML	455834	362101	34.1	26.8									35.6		32.2	15.7	NA	
SS	456928	367423	27.0	21.0									24.2		24.1	11.7	NA	
SRE	458513	358623	23.7	17.5									23.9		21.7	10.6	NA	
TL	454072	361102	21.7	27.7											24.7	20.0	NA	
WT	456663	368019	28.8	25.4									28.6		27.6	13.5	NA	

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

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

☒ **National bias adjustment factor used.**

☒ **Mansfield District Council confirms that all 2020 diffusion tube data has been uploaded to the Diffusion Tube Data Entry System**.

Notes:

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

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

See Appendix C for details on bias adjustment and annualisation.

Appendix C: Supporting technical information/air quality monitoring data QA/QC

New or changed sources identified within the Mansfield District during 2020

In 2019, the Council reported on the results of modelling air quality at three junctions and two residential development locations, as part of the Local Development Plan. The consultant's conclusion was that the impact on air quality would be 'negligible' to 'slight' at 48 of the 49 receptors. One receptor, at a junction near the Penniment housing development on Abbott Road, was predicted to experience a 'moderate' impact, with an increase in NO_2 levels of 3.9µg/m^3. The receptors located near the other junctions and the Lindhurst development were not predicted to experience any impact.

The Council decided that a diffusion tube would be put in place at a suitable location near the highlighted receptor near the Penniment development to check these conclusions. The development is still being built, and although some houses are occupied, it has been decided to delay putting up a diffusion tube until the development is complete.

Additional air quality works undertaken by Mansfield District Council during 2020

Mansfield District Council has not completed any additional air quality works within the reporting year of 2020.

QA/QC of diffusion tube monitoring

All the Local Authorities in Nottinghamshire have a contract with Gradko International for the supply and analysis of NO_2 diffusion tubes, so that there is consistency throughout the county. Gradko has a very strict QA procedure which involves analysing, once a month, a certified solution supplied by AEA Technology. Gradko also takes part in the NO_2 Network Field Intercomparison Exercises carried out by AEA Technology, in which it is rated as 'good'.

The diffusion tubes used are Nottinghamshire are prepared using 20% TEA in water. Mansfield's tubes are stored under refrigeration prior to use, and are used within the specified expiry dates. Upon changing the tubes, the date, site and exposure times are

recorded and they are put into a sealed bag. They are forwarded to Gradko for analysis along with a sealed 'travel blank' tube.

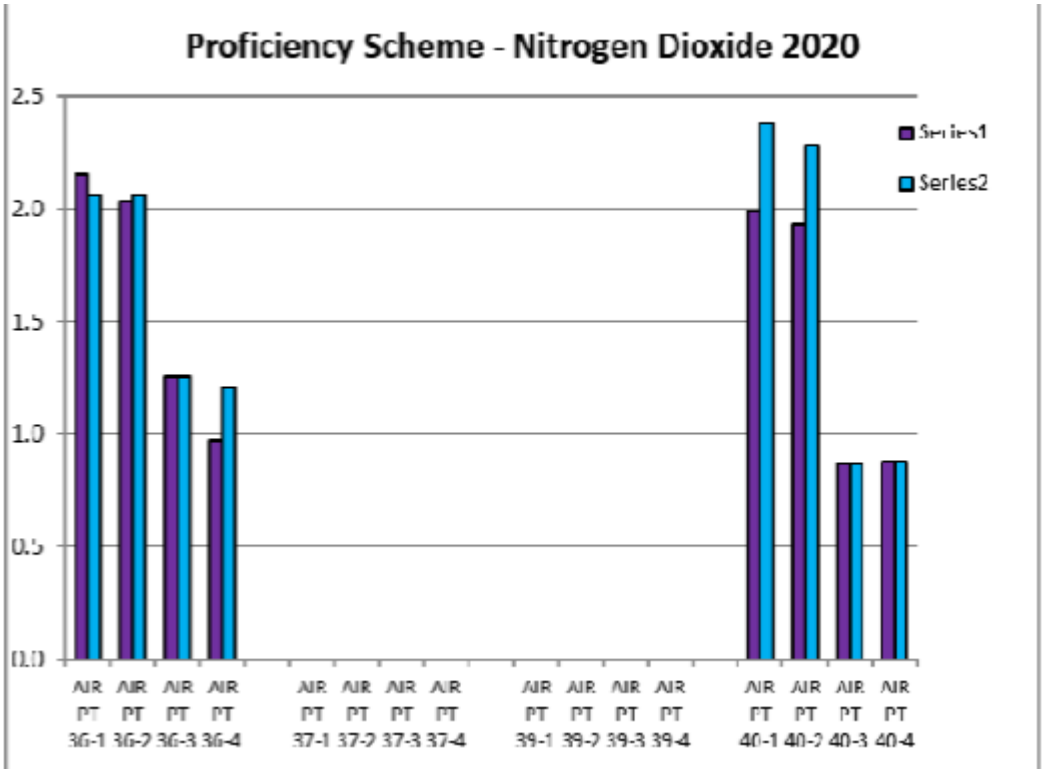
Due to the restrictions associated with the Covid-19 outbreak, subsequent redeployment of staff, and the Council's wish to protect them and the public as much as possible, only the tubes for January and February were put out in 2020, plus those at nine of the sites in November. The tube exposure periods conformed to the Diffusion Tube Exposure Calendar.

Gradko has confirmed that the laboratory complies with the procedures detailed in the Defra Harmonisation Practical Guidance. They state that "The laboratory carried out internal blind testing in September 2020 as Air PT samples could not be provided due to Covid-19. This cannot be considered the same as proficiency testing, but is included to provide reassurance of laboratory performance during this period."

Their proficiency scheme results for 2020 are as follows:

Method – GLM7-CARY 60 spectrophotometer

AIR PT Proficiency Scheme - Nitrogen Dioxide 2020					
Date	Round	Assigned value	Procedure GLM 7		
			Measured concentration	z-Score	% Bias
Feb-20	AIR PT 36-1	2.06	2.15	0.58	4.4%
Feb-20	AIR PT 36-2	2.06	2.03	-0.19	-1.5%
Feb-20	AIR PT 36-3	1.26	1.26	0	0.0%
Feb-20	AIR PT 36-4	1.21	0.98	-2.43	-19.0%
May-20	AIR PT 31-1	Proficiency scheme not available			
May-20	AIR PT 31-2				
May-20	AIR PT 31-3				
May-20	AIR PT 31-4				
Aug-20	AIR PT 33-1	Proficiency scheme not available			
Aug-20	AIR PT 33-2				
Aug-20	AIR PT 33-3				
Aug-20	AIR PT 33-4				
Oct-20	AIR PT 34-1	2.38	1.99	-2.08	-16.4%
Oct-20	AIR PT 34-2	2.28	1.93	-1.90	-15.4%
Oct-20	AIR PT 34-3	0.87	0.87	0	0.0%
Oct-20	AIR PT 34-4	0.88	0.88	0.08	0.0%



Diffusion tube annualisation

Of the 14 diffusion tubes on site in 2020, nine had a data capture of 25% and the other five had a data capture of 17%. The results from the five with the lowest data capture did not require annualisation; the results from the other nine have been annualised.

The AURN sites used to annualise Mansfield's data were Nottingham Centre (23km away), Chesterfield Loundsley Green (23km), and Burton-on-Trent Horningslow (56km), which all had a good rate of data capture.

The new Diffusion Tube Data Processing Tool was used to derive the data presented in the tables above.

Diffusion tube bias adjustment factor

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

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

Mansfield District Council has applied the national bias adjustment factor of 0.81 to the 2020 monitoring data. A summary of bias adjustment factors used by the Council over the past five years is presented in Table C.1.

The Council has used the national bias adjustment factor for several years, as it currently has no co-located diffusion tubes. Three co-located diffusion tubes were sited on the roadside elevation of the former monitoring unit at the Landmark Centre, Chesterfield Road North, Pleasley, but the factor derived from them was seldom used as it was usually considered too low to be acceptable; in 2014, it was as low as 0.53.

Table C.1 – Bias adjustment factor

Year	Local or National	If National, Version of National Spreadsheet	Adjustment Factor
2020	National	03/21	0.81
2019	National	03/20	0.84
2018	National	03/19	0.93
2017	National	03/18	0.89
2016	National	03/17 v2	0.94

NO_2 fall-off with distance from the road

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

No diffusion tube NO_2 monitoring results within the Mansfield District required distance correction during 2020, as no annual mean concentrations were greater than 36µg/m^3.

QA/QC of automatic monitoring

Two officers normally share the task of servicing the real-time monitoring unit and uploading the data, and visit the site once a month. However, due to the various lockdowns and

restrictions associated with Covid-19, and because the new data logger has a large capacity, visits to the site have been kept to an absolute minimum; the 2020 data was uploaded for the Council by an engineer from the Signal Ambitech Group during the annual service.

The data has been collated and ratified in-house by the officer who has been compiling the Air Quality Review since its inception in 2003.

Only summary data is available on the Council's website, by downloading copies of the Air Quality Reviews (to be found at www.mansfield.gov.uk/pollution/air-quality-1). Only reviews from 2014 are on the website; earlier copies are available on request.

Automatic monitoring annualisation

The automatic monitoring unit within the Mansfield District recorded a data capture of greater than 75%, therefore no annualisation of monitoring data was required.

NO_2 fall-off with distance from the road

Wherever possible, local authorities should ensure that monitoring locations are representative of exposure. However, where this is not possible, the NO_2 concentration at the nearest location relevant for exposure should be estimated using the 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.

The 2020 results from the automatic NO_2 monitoring unit within the Mansfield District do not required distance correction, as the levels were below 36µg/m^3.

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

Site ID	Annualisation factor (Burton Horninglow)	Annualisation factor (Chesterfield Loundsley)	Annualisation factor (Nottingham Centre)	Annualisation factor	Average annualisation factor	Raw data annual mean	Annualised annual mean	Comments
DL	0.6021	0.6165	0.5894	-	0.6027	44.0	26.5	
FT 1	0.6021	0.6165	0.5894	-	0.6027	31.3	18.9	
HL	0.6021	0.6165	0.5894	-	0.6027	29.2	17.6	
LLS	0.6021	0.6165	0.5894	-	0.6027	31.6	19.0	
NR	0.6021	0.6165	0.5894	-	0.6027	37.2	22.4	
OML	0.6021	0.6165	0.5894	-	0.6027	32.2	19.4	
SS	0.6021	0.6165	0.5894	-	0.6027	24.1	14.5	
SRE	0.6021	0.6165	0.5894	-	0.6027	21.7	13.1	
WT	0.6021	0.6165	0.5894	-	0.6027	27.6	16.6	

Appendix D: Map(s) of monitoring locations

Figure D.1a – Map of non-automatic monitoring sites in central Mansfield

Please note that this document was compiled during lockdown for the Covid-19 virus, and we have been unable to update maps 2.1a and 2.1c via the remote access system. The maps will be updated as soon as possible.

Figure D.1b Location map of non-automatic monitoring sites in northern Mansfield

Figure D.1c Location map of non-automatic monitoring site in Pleasley

Please note that the distance to the M1 junction should read 4 miles

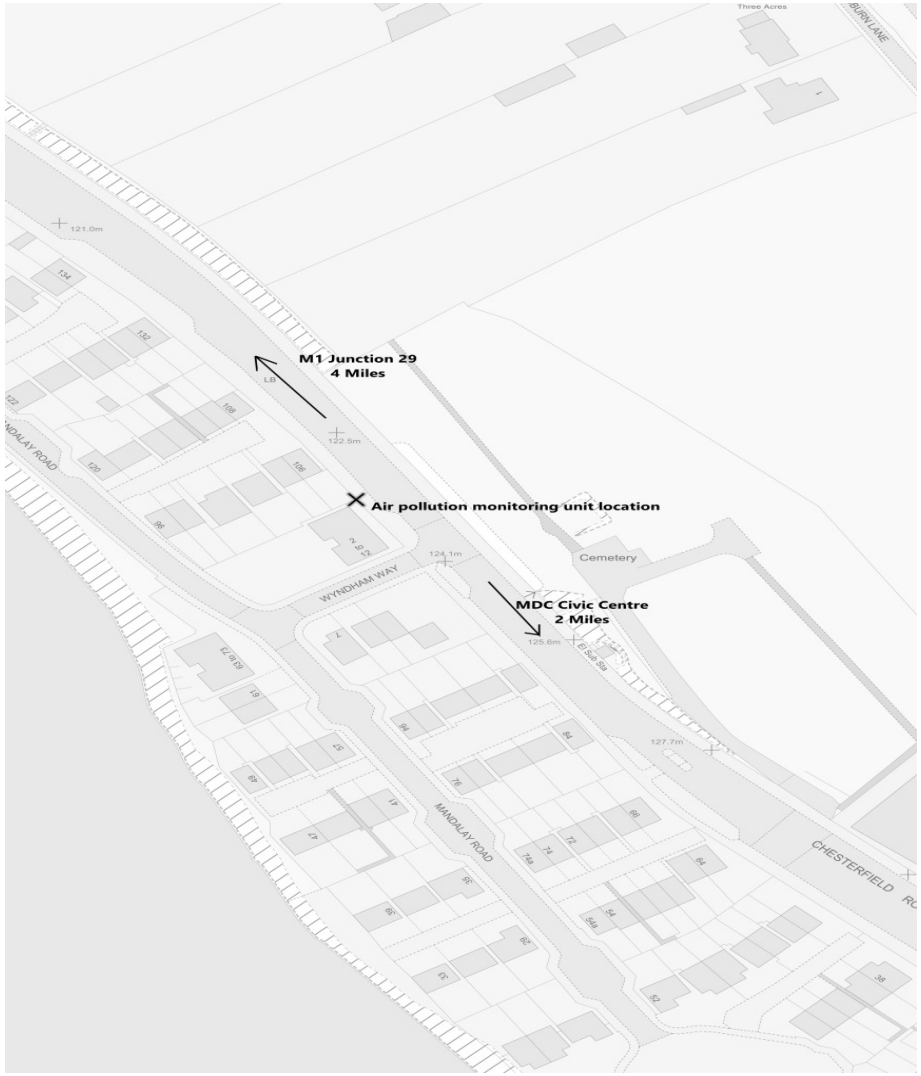
Figure D.1d Location map of non-automatic monitoring site in Mansfield Woodhouse

Figure D.1e Location map of non-automatic monitoring sites in Forest Town

Figure D.1f Location map of non-automatic monitoring sites in Warsop

Figure D.1g Location map of non-automatic monitoring site in Rainworth

Figure D.1h Map of real-time monitoring location



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).

Appendix F: Impact of Covid-19 upon LAQM

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

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

Despite the challenges that the pandemic has given rise to, the events of 2020 have also provided Local Authorities with an opportunity to quantify the air quality impacts associated with wide-scale and extreme intervention, most notably in relation to emissions of air pollutants arising from road traffic. The vast majority (>95%) of AQMAs declared within the UK are related to road traffic emissions, where attainment of the annual mean objective for nitrogen dioxide (NO_2) is considered unlikely. On 23rd March 2020, the UK Government released official guidance advising all members of public to stay at home, with work-related travel only permitted when absolutely necessary. During this initial national lockdown (and to a lesser extent other national and regional lockdowns that followed), marked reductions in vehicle traffic were observed; Department for Transport (DfT) data[8] suggests reductions in vehicle traffic of up to 70% were experienced across the UK by mid-April, relative to pre Covid-19 levels.

This reduction in travel in turn gave rise to a change of air pollutant emissions associated with road traffic, i.e. nitrous oxides (NO_x), and exhaust and non-exhaust particulates (PM). The Air Quality Expert Group (AQEG)[9] has estimated that during the initial lockdown period in 2020, within urbanised areas of the UK reductions in NO_2 annual mean concentrations

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

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

were between 20 and 30% relative to pre-pandemic levels, which represents an absolute reduction of between 10 to 20µg/m^3 if expressed relative to annual mean averages. During this period, changes in $PM_{2.5}$ concentrations were less marked than those of NO_2. $PM_{2.5}$ concentrations are affected by both local sources and the transport of pollution from wider regions, often from well beyond the UK. Through analysis of AURN monitoring data for 2018-2020, AQEG have detailed that $PM_{2.5}$ concentrations during the initial lockdown period are of the order 2 to 5µg/m^3 lower relative to those that would be expected under business-as-usual conditions.

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

Impacts of Covid-19 on air quality within the Mansfield District

- Results from the automatic traffic counts throughout the county in 2020 allowed a comparison of traffic numbers with the reduction of monthly NO_2 concentrations experienced at relevant monitoring locations. Daily traffic flows reduced in towns in Nottinghamshire by 40% at the beginning of lockdown; over the whole year, traffic levels were about 85% of the average daily flow.

- Reductions of NO_2 concentrations of between 20 and 30% were experienced at nine of the roadside diffusion tube monitoring sites in the few months monitored in 2020.

- Industrial and commercial emissions will have reduced during the lockdown period and due to the continuing restrictions that have followed. The increase in home-working will offset this slightly with an increase in home heating and cooking.

- There is likely to have been an increase in air pollution due to the number of garden bonfires; many more bonfires than usual were reported to the Environmental Health section during warm weather periods in 2020, particularly during the lockdown when people were at home and were working on their gardens to pass the time.

Mansfield does not carry out the type of monitoring that would allow us to quantify pollution from the last two, but we may be able to make local assumptions from any national data that becomes available.

Opportunities presented by Covid-19 upon LAQM within the Mansfield District

Health impacts of the lockdown, travel restrictions and working from home have led to a nationwide campaign to encourage the public to take more exercise. Walking and cycling have noticeably increased in the district, which will have contributed to the reduction in NO_2 levels. No active encouragement to take more exercise and use other forms of transport has yet taken place – the Council's proposed Health and Wellbeing Agenda was approved on 18 March 2020, just five days before lockdown.

Challenges and constraints imposed by Covid-19 upon LAQM within the Mansfield District

- As with previous years, a national bias adjustment factor has been utilised to adjust the diffusion tube results for 2020. Within 2019 there were 25 co-location studies that were utilised to calculate the bias factor for the laboratory and preparation method used. For 2020, this number has reduced to only three studies. There is therefore the potential for there to be a greater degree of uncertainty associated with the resultant annual mean NO_2 concentrations in 2020 than in previous years. **Large impact**

- From 23 March 2020, the Council offices were closed and Council staff were instructed to work from home and carry out only the most essential visits (and then only after consultation with their seniors). The changing of diffusion tubes was not classed as essential, therefore only the January and February tubes were put out. Later in the year, the Council relaxed its policy slightly, but due to redeployment only the November tube could be put out, at nine of the sites. Therefore it was not possible to maintain diffusion tube monitoring for the full year, which has affected data capture, resulting in monitoring results having to be annualised. **Medium impact**

- Owing to the reallocation of Council resources, delays in communication with staff owing to them all working from home, and difficulty of access to certain documents since the closure of the Civic Centre on 23 March, the annual updating of the AQAP could not be carried out in 2020. **Small impact**

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

Table F 1 – Impact Matrix

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

Glossary of terms

Abbreviation	Description
AQAP	Air Quality Action Plan – a detailed description of measures, outcomes, achievement dates and implementation methods, showing how the local authority intends to achieve air quality limit values
AQMA	Air Quality Management Area – an area where air pollutant concentrations exceed/are likely to exceed the relevant air quality objectives. AQMAs are declared for specific pollutants and objectives
ASR	Annual Status Report
Defra	Department for Environment, Food and Rural Affairs
DMRB	Design Manual for Roads and Bridges – air quality screening tool produced by Highways England
EU	European Union
FDMS	Filter Dynamics Measurement System
LAQM	Local Air Quality Management
NO_2	Nitrogen dioxide
NO_x	Nitrogen oxides
PM_{10}	Airborne particulate matter with an aerodynamic diameter of 10µm or less
$PM_{2.5}$	Airborne particulate matter with an aerodynamic diameter of 2.5µm or less
QA/QC	Quality Assurance and Quality Control
SO_2	Sulphur dioxide

References

- Local Air Quality Management Technical Guidance LAQM.TG16. April 2021. Published by Defra in partnership with the Scottish Government, Welsh Assembly Government and Department of the Environment Northern Ireland.
- Local Air Quality Management Policy Guidance LAQM.PG16. May 2016. Published by Defra in partnership with the Scottish Government, Welsh Assembly Government and Department of the Environment Northern Ireland.