2021 Air Quality Annual Status Report (ASR)

In fulfilment of Part IV of the Environment Act 1995

Local Air Quality Management

Date: 30th June 2021

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Executive Summary: Air Quality in Our Area

Air Quality in Blaby 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].

Blaby District Council has five Air Quality Management Areas (AQMAs). All were declared after monitoring (where indicated), or modelling, indicated an exceedance of the annual mean air quality objective for nitrogen dioxide, of 40µg/m^3. These AQMAs are currently as follows:

- AQMA 1: A5460 Narborough Road South
- AQMA 2: M1 corridor in Enderby and Narborough
- AQMA 3: M1 corridor between Thorpe Astley and Leicester Forest East
- AQMA 4B: Enderby Road, Whetstone
- AQMA 6: Mill Hill, Enderby

AQMA 2, AQMA 3 and AQMA 4B were reduced in size in 2020, in line with low NO_2 results from 2019 and previous 4 years, as reported in ASR 2020.

[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

Blaby District Council has a strong drive to continue its air quality activities, both monitoring and taking action to reduce levels of airborne pollutants. Elected Members and Senior Managers are actively engaged in supporting the work. The Environmental Services Team is responsible for air quality, environmental permitting and climate change, which allow these areas of work to be considered collectively. The Team comment on planning applications that have air quality as a potential constraint and have a good working relationship with the planning services teams. Section 106 funds have been secured from several approved developments to support air quality work.

Health, Leisure, and Tourism Services also have a close working relationship with Environmental Services, helping to deliver a programme of action funded by Air Quality Grant.

Blaby District Council continues to work closely with all Leicestershire authorities, including Leicester City Council, Leicestershire County Council (various sections including highways and transportation, public health, and sustainability), Highways England, the Environment Agency, and Public Health England. It also plays an active role in the Air Quality and Health Partnership (the successor to the Steering Group for the Joint Strategic Needs Assessment (JSNA) for air quality), which is chaired by Public Health. The Partnership is developing and implementing an action plan, based on the outcomes of the JSNA. This action plan is informing Blaby District Council's air quality and climate change work.

Blaby District Council also has an active role in the Leicester, Leicestershire and Rutland Air Quality Forum, and is a member of the East Midlands Air Quality Network. Both of these bodies improve the sharing of information and aid consistency of approach.

In addition to operating its own air quality monitoring stations, Blaby District Council also manages Leicestershire County Council's Air Quality Monitoring Station, Blaby 4 (CM 4).

Monitoring data shows that within the AQMAs the concentrations of pollutants are decreasing. The bias correction used for the diffusion tube data in 2020 for the laboratory that analyses our diffusion tubes is only based on 1 co-location study (Marylebone Road). It is acknowledged therefore that this adjustment factor should be used with caution (in accordance with national guidance) https://laqm.defra.gov.uk/bias-adjustment-factors/national-bias.html . The diffusion tube data show noticeably lower levels of nitrogen dioxide when compared to the results for 2019 and indicates that there have been no exceedances of the Air Quality Objective for nitrogen dioxide.

Nitrogen dioxide has seen a reduction across all diffusion tubes and at the continuous monitoring stations across the whole of Blaby District. Monitored levels of NO_2 continue to be well below air quality objectives around **AQMA 1**. Although low levels have been identified, no decisions will be made to revise the boundary as it is anticipated continued monitoring is important, due to the potential impact from new developments and road infrastructure proposals.

A consultation with stakeholders was undertaken and a decision to reduce the boundaries for **AQMA 2, AQMA 3** and **AQMA 4B** was agreed and the Variation Order was signed on 31st October 2020. Further monitoring will continue in the newly defined AQMAs before any further decisions are made, particularly in light of the implications from the COVID-19 pandemic.

AQMA 3 has recorded elevated levels of nitrogen dioxide over the last 4 years, with particular emphasis on the northern and eastern extents which comprise the revised AQMA boundary. Levels have reduced in 2020, both in the diffusion tubes and at the continuous monitoring station. However, the monitoring will continue to ensure that enough data is gathered to be able to establish if the reductions in NO_2 are a part of an ongoing trend. A decision was made to move continuous monitor (CM 3) located in AQMA 3 in July 2020 following the continued reduction of NO_2 seen at this station over the last 5 years. This leaves one continuous monitoring station still in AQMA 3.

AQMA 6 was declared in January 2018 due to elevated levels of NO_2 being identified. Monitoring was extended in 2020 to the south of the AQMA boundary. Initial monitoring data gathered in 2020 from this area indicates low levels of NO_2. A reduction in the levels of NO_2 were identified in 2019, but this was suspected to be in part due to the low bias correction factor applied, as explained in ASR 2020. Further reductions this year are likely due to the low bias correction and the implications of the COVID-19 pandemic and the subsequent local and national restrictions that were instigated across Leicestershire. Further monitoring will continue in 2021.

Monitoring continued and in certain parts of Blaby District it was increased during 2020, with a focus on the villages including Glenfield as discussed in ASR 2020. This included the transfer of one of the continuous monitoring stations in July 2020 to Glenfield. Initial results from this monitoring station do not highlight elevated levels of NO_2, which is corroborated by the diffusion tube (DT) data.

However, this is only based on 6 months of monitoring together with a considerable period of 2020, when the COVID-19 pandemic altered the behaviour and travel patterns of many. Monitoring will continue to establish the long-term pollution levels of Glenfield village.

It was reported in ASR 2020 that the continuous monitoring station located in **AQMA 2: M1 Corridor Enderby and Narborough** would be relocated to Stoney Stanton, following initial elevated levels of NO_2 in the preceding years. The move was delayed due to COVID-19 restrictions. Options for the relocation of existing equipment or the purchase of additional resources are being considered and will be reported next year in ASR 2022.

Section 106 funds were secured to monitor air quality in the area surrounding Fosse Park following recent large scale developments. This has enabled the purchase of an additional continuous monitor (CM 6) now positioned on Lubbesthorpe Road, representing the nearest receptor to the development.

The monitoring data from the remaining villages of Blaby District have not shown any concerns and continue to remain well below air quality objectives. The villages will remain a part of the monitoring regime, to support local interest from parish councils, residents and to support future developments and will be reported in ASR 2022.

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.

A significant project to encourage active travel and car use reduction, targeting schools and then local businesses within and around the District's AQMA's is being delivered by Blaby

[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

District Council, partly in partnership with Leicestershire County Council. This project engages many of the schools in the District, together with some businesses close to Junction 21 of the M1. The project is funded by our Air Quality Grants.

Blaby District Council was awarded a further Air Quality Grant of £123,378 for 2020/21, to deliver further work on behavioural change, and monitoring the impact of that work using low-cost monitors. Due to the reduced occupancy in schools and closure of businesses during the COVID-19 pandemic, a delayed start for this new behavioural work was agreed with DEFRA.

The quality and breadth of the monitoring data collected has been improved and is being used to better target effective actions. The monitoring undertaken by Blaby District Council, using continuous monitors and diffusion tubes, is now being supplemented with low-cost monitors.

Blaby District Council has been awarded another Air Quality Grant for 2021/22 of £139,300. This will fund the Countdown to Clean Air Project which includes:

- A Citizen Science Project involving five schools, five local youth and community groups, and parish councils.
- Further behavioural change work with schools and businesses.
- Production of a computer Micro Simulation Model for Enderby.
- Production of comprehensive air quality data through ongoing monitoring during project.
- A Communications plan developed and delivered to share timely messages about poor air quality, raise awareness about its causes and impacts, and alternative cleaner and more sustainable travel options.
- A Short film produced and available online to celebrate achievements from the project, educate and raise awareness in the wider community and encourage uptake from other schools, businesses and organisations in future air quality initiatives.

An Air Quality Strategy for 2018 – 2021 was adopted by Blaby District Council in July 2018, which contains a number of actions centred on 5 themes, intended to improve air quality: Air Quality Strategy 2018 - 2021.This strategy continues to be implemented.

It had been recognised that the 2014 Air Quality Action Plan (AQAP) did not reflect the current Air Quality situation within Blaby District.

Many of the actions in the 2014 AQAP have either been delivered, or found not to be viable, as shown in Table 2.2.

A new AQAP was adopted by the Council's Cabinet Executive in March 2021. This can be found here: 2021 Air Quality Action Plan. The new AQAP reflects the revisions to the AQMAs made in 2020. In contrast, the Air Quality Strategy, as described above, contains measures intended to improve air quality on a more widespread basis. The Strategy and AQAP will be kept as separate, but linked documents, with both contributing to the Climate Change Strategy and Carbon Neutral Action Plan.

Conclusions and Priorities

Monitoring will continue within all of the existing AQMAs, despite the reduction in levels of NO_2 across Blaby District. It is recognised that the reductions in pollutant levels are not fully representative of the situation and it is recognised that levels may increase when the situation with the COVID-19 pandemic becomes clear on a national and perhaps international level. It is anticipated, based on the national lockdown during the initial part of 2021, that this may impact the results seen during 2021. All AQMAs are to be retained.

The new Air Quality Action Plan (AQAP) was finalised in March 2021 and has replaced AQAP 2014, as previously reported in ASR 2020. This will be the focus of work during 2021, though it is acknowledged that there has been a slow start due to the continued restrictions imposed by the national lockdown during the first quarter of 2021.

Blaby District Council will continue to work closely with stakeholders, as described above and regard air quality as a high priority.

Work will continue on delivering deliver projects funded by the Air Quality Grants awarded to the Council. This will continue the work with schools and businesses for behavioural change, with new work on awareness raising and a Citizen Science project. More detail on how to get involved is given on page vii.

Work also continues on understanding the air quality issues in AQMA 6, which will help shape the actions relating to this area. Low-cost monitors have also been fitted in February 2021, which will supplement our datasets.

Other priorities include continued enhanced monitoring in the villages of Glenfield and Stoney Stanton. Initial high levels identified in 2018 and 2019 were reduced in 2020, but it is recognised that this may not be reflective of the levels going forward so a commitment has been made to continue the levels of monitoring. Although delays were incurred to

fitting a continuous monitoring station it is still planned to fit one in 2021 to help analyse trends and data.

The levels have shown a reduction this year, which may be accounted for by the bias correction factor, and COVID-19 pandemic, but further analysis will be undertaken to understand the results and to identify if this is a continual trend.

Monitoring was increased around the villages particularly where the proposed Rail Freight Interchange is expected to be located. Initial results show very low levels of NO_2. Although the planning application for the Rail Freight Interchange has not been submitted to date, the data will help provide evidence as part of any future planning application.

A review of monitoring locations takes place annually. No tubes have been altered in view of the effect of Covid on monitored levels. The next review will take place in Autumn 2021.

The Air Quality Strategy will continue to be implemented.

Local Engagement and How to get Involved

The Council works closely with other stakeholders and continues to play a lead role in the Air Quality Forum for Leicester, Leicestershire and Rutland, the East Midlands Air Quality Network, and the Air Quality and Health Partnership. This includes attending regular meetings, sharing best practice and providing updates on air quality within the District (as described on page iii above). Meetings have continued throughout 2020, though due to the interruption from the COVID 19 pandemic, their frequency was reduced.

Members of the public can help improve the air quality by participating in one of the many alternatives to personal car transport, i.e., park and ride bus schemes, car sharing, buses, walking and cycling. Blaby District Council has an active travel campaign to encourage those who travel to local schools and businesses to travel more sustainably. Air quality is being monitored at several schools within the District in order to identify any link between sustainable travel and air quality.

Officers continue to work closely with local parishes, residents and elected members, providing updates on monitoring results and continuing to identify areas of potential air quality problem through presentations at member meetings and other local events.

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1 Local Air Quality Management

This report provides an overview of air quality in Blaby 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 Blaby 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

2.1 Air Quality Management Areas

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

A summary of AQMAs declared by Blaby District Council can be found in Table 2.1. The table presents a description of the 5 AQMAs that are currently designated within Blaby District. Appendix D: Maps 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	Name and Date of AQAP Publication	Web Link to AQAP
AQMA 1: A5460 Narborough Road South	Declared September 2000; Amended January 2018	NO2 Annual Mean	Residential properties along a small section of Narborough Road South to the extent of Blaby District	NO	50 µg/m^3	17 µg/m^3	Air Quality Action Plan 2014*	link to Air Quality Action Plan for AQMA 1
AQMA 2: M1 corridor in Enderby and Narborough	Declared September 2000; Amended 2020	NO2 Annual Mean	Residential properties adjacent to the M1, between around 1.5 km and 3 km south of Junction 21.	YES	50 µg/m^3	18 µg/m^3	Air Quality Action Plan 2014*	link to Air Quality Action Plan for AQMA 2
AQMA 3: M1 corridor between Thorpe Astley and Leicester Forest East	Declared September 2000; Amended April 2005; Amended 2020	NO2 Annual Mean	Residential houses adjacent to the M1 and A47 between Thorpe Astley and Leicester Forest East	YES	62 µg/m^3	23 µg/m^3	Air Quality Action Plan 2014*	link to Air Quality Action Plan for AQMA 3

AQMA Name	Date of Declaration	Pollutants and Air Quality Objectives	One Line Description	Is air quality in the AQMA influenced by roads controlled by Highways England?	Level of Exceedance: Declaration	Level of Exceedance: Current Year	Name and Date of AQAP Publication	Web Link to AQAP
AQMA 4B: Enderby Road, Whetstone	Declared April 2005; Amended 2020	NO2 Annual Mean	Residential houses along Enderby Road, Whetstone	NO	50 µg/m^3	21 µg/m^3	Air Quality Action Plan 2014*	link to Air Quality Action Plan for AQMA 4B
AQMA6: Mill Hill, Enderby	Declared January 2018	NO2 Annual Mean	Residential properties along Hall Walk and Mill Hill, Enderby	NO	43 µg/m^3	29 µg/m^3	*	

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

☒ **Blaby District Council confirm that all current AQAPs have been submitted to Defra.**

* The Air Quality Action Plan 2014 was current during 2020. It was replaced in March 2021 by a new AQAP which included AQMA 6

2.2 Progress and Impact of Measures to address Air Quality in Blaby District

Defra's appraisal of last year's ASR recognised that progress had been made with measures to address air quality in Blaby. It was recognised that the ASR was well written and was only lacking details on calculations and an up to date AQAP, but DEFRA accepted the evidence for this lack was provided by the Blaby District and the conclusions reached were acceptable for all sources and pollutants. The following comments from the appraisal and how they are being addressed are detailed as follows:-

1. The report is well structured, detailed, and provides the information specified in the Guidance

   Response: Comment welcomed

2. Defra concluded that the council should prioritise the publication of an up to date AQAP by the 2021 ASR.

   Response: Comment welcomed. This was completed and finalised in March 2021.

3. Trends are presented and discussed and a robust comparison with air quality objectives is provided. Excellent use of the maps to display trends at each monitoring location.

   Response: Comment welcomed.

4. The AQAP needs to be updated as a matter of urgency as it is 6 years out of date and does not include the AQMA 6. Only 1 of the policies is currently in action with the others having been completed or ruled out.

   Response: The AQAP has now been updated. A more thorough update will be given in the on the work undertaken by Blaby in future ASR's, the actions will be reported on in ASR2021

5. Annualisation has been carried out for DT72 and DT78, although the monitoring sites used have been listed, the actual calculations have not been included which are required.
   Response. Comments acknowledged and this has now been addressed in this report.

6. It is disappointing that the council were unable to use the locally calculated bias adjustment factor due to poor data collection at their monitoring sites. It is promising that they have installed digital loggers at the sites to help alleviate this problem. The national factor used calculated from a single study in central London is unlikely to be very applicable to the council's study area.

   Response: Improvements have been made on data collection at monitoring sites, with more robust procedures in place regarding calibrations, site visits and identifying when there has been a break down in the information obtained by the digital loggers. Having followed the advice in the technical guidance, the national bias factor, rather than a local one is considered more appropriate to our monitoring. Further information is included in Annex C to this document.

7. The council state they are considering reducing the area of AQMAs 2, 3, and 4B. As concentrations in 2 and 4B have been shown to be consistently below the objective for NO_2, the council could consider revocation to target areas of greater concern if these values remain low.

   Response: The proposals to reduce the size of AQMAs 2, 3 and 4B has now been completed and the variation orders were signed on the 31 October 2020. The AQMA's will continue to be monitored closely with any future adjustments considered.

8. Tables contain red font, should all be black.

   Response: Comment welcomed. This has been addressed in this year's ASR report.

9. Regular reviewing of the monitoring network from the council is very positive and it is hoped they continue to be flexible as the monitoring results dictate.
   Response: Comment welcomed.

10. Feedback from last year's appraisal was included and addressed. This is welcomed and is encouraged to continue in future years.

    Response: Comment welcomed

11. The council provide excellent detail on $PM_{2.5}$ in the area and it is encouraged to continue this but could also refer to Public Health Outcomes Frameworks in the 2021 ASR.

    Response*:* Comment welcomed. The new AQAP links to the work of the Air Quality and Health Partnership, which builds on the JSNA Air Quality Chapter, which in turn links to Public Health Policy JSNA Air Quality Chapter May 2019.

Blaby District Council has taken forward a limited number of direct measures during the current reporting year of 2020 in pursuit of improving local air quality. Details of all measures completed, in progress or planned are set out in Table 2.2. These measures were from the 2014 AQAP, and had been pursued as far as they could be, pending a replacement with a new AQAP. There are no exceedances of the Air Quality Objectives in any of the AQMAs, and therefore no measures are currently needed to achieve compliance. Actions are being taken forward in the new AQAP and the Air Quality Strategy to further improve air quality. The existing AQMAs are reviewed in line with relevant guidance, with a view to revocation or shrinkage where appropriate.

The replacement AQAP is now in place, as described on page vii above.

Table 2.2 – Progress on Measures to Improve Air Quality (AQAP 2014)

Measure No.	Measure	Category	Classification	Year Measure Introduced	Estimated / Actual Completion Year	Organisations Involved	Funding Source	Defra AQ Grant Funding	Funding Status	Estimated Cost of Measure	Measure Status	Reduction in Pollutant / Emission from Measure	Key Performance Indicator	Progress to Date	Comments / Barriers to Implementation
1	Smart Motorways	Traffic Management	UTC, Congestion management, traffic reduction	Not introduced	Not available at present	Blaby District Council, Highways England	Not applicable	NO	Not Funded	> £10 million	Aborted	Would depend on the type of scheme implemented	Reduction in Nitrogen Dioxide emissions	Highways England are unable to implement project on this section of M1 due to other constraints	Other constraints inc. width of available motorway
2	Chevrons	Traffic Management	UTC, Congestion management, traffic reduction	Not introduced	Project will not be implemented	Blaby District Council, Highways England	Not applicable	YES	Not Funded	£10k - 50k	Aborted	Would depend on the type of scheme implemented	Reduction in Nitrogen Dioxide emissions	Highways England are unable to implement project on this section of M1 due to other constraints	Highways England view chevrons as an unnecessary asset
3	Reducing Speed Limits	Traffic Management	Reduction of speed limits, 20mph zones	Not introduced	Measure may be introduced as part of a future scheme (e.g. Smart Motorway)	Blaby District Council, Highways England	Not applicable	NO	Not Funded		Aborted	up to 2 microgrammes per cubic metre	Reduction in Nitrogen Dioxide emissions	Highways England are unable to implement project on this section of M1 due to other constraints	Constraints on Smart Motorway (see above)
4	Noise Barriers	Traffic Management	Other	2019	2019	Highways England	Highways England	NO	Funded	£1 million - £10 million	Completed	7% at 28.5m from the barrier	Reduction in Nitrogen Dioxide emissions	Project completed	Not applicable
5	Catalytic Paints	Traffic Management	Other	Not introduced	Measure may be introduced as part of a future scheme (e.g. Smart Motorway)	Blaby District Council, Highways England	Air Quality Grant	NO	Not Funded		Aborted	Imperceptible	Reduction in Nitrogen Dioxide emissions	Project has stalled Highways England are unable to implement project on this section of M1 due to other constraints	Constraints on Smart Motorway (see above)
6	Variable Message Signs (VMSs)	Public Information	Via other mechanisms	Not introduced	2021	Blaby District Council, Highways England, Leicestershire County Council	Various including section 106 agreements associated with appropriate developments	NO	Not Funded		Aborted	Would depend on the type of scheme implemented	Reduction in Nitrogen Dioxide emissions	Section 106 funds for VMSs from Castle Acres development	Joint approach between Leicestershire County Council and Blaby District Council
7	Eco Driving	Vehicle Fleet Efficiency	Driver training and ECO driving aids	2015	Driver training may be delivered as part of wider behavioural change project	Blaby District Council, external providers	Air Quality Grant	NO	Funded	< £10k	Completed	5% in vehicle emissions	Reduction in Nitrogen Dioxide emissions	Training was delivered to Blaby District Council staff	Poor take-up when training offered to businesses in 2016

Measure No.	Measure	Category	Classification	Year Measure Introduced	Estimated / Actual Completion Year	Organisations Involved	Funding Source	Defra AQ Grant Funding	Funding Status	Estimated Cost of Measure	Measure Status	Reduction in Pollutant / Emission from Measure	Key Performance Indicator	Progress to Date	Comments / Barriers to Implementation
8	Roadside Emissions Testing	Vehicle Fleet Efficiency	Testing Vehicle Emissions	Not introduced	Project will not be implemented	Blaby District Council, Leicestershire County Council, Police if mandatory	Air Quality Grant	NO	Not Funded		Aborted	Imperceptible	Reduction in Nitrogen Dioxide emissions	Project not implemented due to resourcing issues	High staffing demands
9	Tree Planting	Transport Planning and Infrastructure	Other	Not introduced	Not available at present	Blaby District Council, Leicestershire County Council	Air Quality Grant and possibly other external	NO	Not Funded		Aborted	Imperceptible	Reduction in Nitrogen Dioxide emissions	Measure included in Air Quality Strategy	Issues of future asset management

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

As detailed in Policy Guidance LAQM.PG16 (Chapter 7), local authorities are expected to work towards reducing emissions and/or concentrations of $PM_{2.5}$ (particulate matter with an aerodynamic diameter of 2.5µm or less). There is clear evidence that $PM_{2.5}$ has a significant impact on human health, including premature mortality, allergic reactions, and cardiovascular diseases.

Blaby District Council is taking the following measures to address $PM_{2.5}$:

Monitoring

- There are two continuous monitors that record concentrations of particulate matter. One located in AQMA2 (CM1): M1 corridor in Enderby and Narborough and is set up to collect quantitative and continuous data of PM_{10}; a correction factor can then be used to give an approximate expected $PM_{2.5}$ measurement.
- The second continuous monitoring station (CM5) located in AQMA 6 has been altered to allow it to measure $PM_{2.5}$ through the fitting of a sharp cut cyclone head. Furthermore, Blaby District Council has purchased 2 low-cost sensors which have been strategically placed along the AQMA to consider the possible canyon effects of the area. These sensors will monitor levels of $PM_{2.5}$, PM_{10}, NO_2 and O_3, representing newly monitored pollutants for the District. The research is being conducted by a member of the Environmental Services Team and will be supplemented by submission of a formal MSc dissertation. The results of this will be reported in ASR 2022.

Since 2017, six Frisbee style collection gauges have been placed around Croft Quarry to determine if the site generates significant particulate matter.

The Frisbee style gauges are changed monthly to be sent for laboratory analysis. This continued at the same regularity throughout monitoring year 2020, although regrettably some of the gauges were inaccessible at periods of lockdown due to access issues. The majority of the samplers were changed monthly, allowing continued PM monitoring throughout the pandemic.

Control of sources

The Environmental Services Team of Blaby District Council is responsible for operating the Environmental Permitting Regime (EPR) in the District. The Team currently permits a number of mobile crushers and screeners, a quarry, and several cement related processes. We will use the EPR regime to reduce emissions of dusty materials emitted from such processes. In addition, the Environmental Services Team provides advice to the Development Services Team in relation to planning applications. The construction and demolition phases associated with proposed developments are potential sources of $PM_{2.5}$. Where appropriate, we will recommend controls over dust. Any new point sources that have a potential to contribute to levels of $PM_{2.5}$ will be assessed and controlled. The section of the District termed as the Principle Urban Area (PUA) is covered by Smoke Control Areas (SCAs). The SCAs are enforced where reports of visible smoke are received.

The following is an extract from the current Air Quality Strategy, which was adopted by Council on the 24th July 2018:

Theme 3 – Air Quality and Public Health

In line with the recommendations in the Air Quality: A Briefing for Directors of Public Health, Defra, PHE, and LGA. March 2017, work is taking place with partners to improve air quality in Leicestershire.

During 2018/19 Leicestershire County Council Public Health has stated that it will work with key stakeholders, including Blaby District Council, to develop a Public Health Partnership Action Plan for Air Quality. The key elements will include:

- Gaining a better understanding of air pollution across Leicestershire and the impact it has on health. For example mapping areas of poor air quality against hospital admissions for conditions that are exacerbated by poor air quality to enable targeting of action.

- Engaging local decision makers about air pollution. This includes developing a strong strategic focus; championing action by all stakeholders, undertaking Health Impact Assessments / Health In All Policies approach to influence major developments and policies that may impact on air quality; promoting the co-benefits of actions that tackle air pollution for example promoting active travel, and the use of green spaces

- Communicating with the public on the short and long term impacts of air pollution. As well as providing information and mitigating immediate risks, this should be done to help empower local people to take individual action to reduce the production of air pollutants (active travel, good driving habits, using cleaner vehicles etc.)

The Action Plan will consider the evidence based for cost-effective interventions recommendation to tackle air pollution including for example NICE Guidance: Air pollution: outdoor air quality and health (NG70) 2017. This includes recommendations related to:

- Planning and Development Management
- Clean Air Zones
- Reducing emissions from public sector transport services and vehicle fleets (driver training and vehicle procurement)
- Smooth driving and speed reduction
- Walking and cycling
- Awareness raising including for vulnerable groups.

Actions for this Theme:

1. Be an active member of the Air Quality Public Health Partnership developed by Leicestershire County Council Public Health;

2. Implement a project of working with schools and businesses in the District to reduce the impact of the traffic associated with them using the awarded Defra funding;

3. Develop an approach to addressing $PM_{2.5,}$ which builds on that stated in the 2017 Annual Status Report;

The Air Quality Strategy is due to be refreshed in 2021. In terms of the Actions listed for Theme 3 above, actions 2 and 3 are being implemented. The Air Quality Public Health Partnership has been superseded by the Air Quality and Health Partnership, as referred to on page iii of this document.

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

This section sets out the monitoring undertaken within 2020 by Blaby 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.

3.1 Summary of Monitoring Undertaken

3.1.1 Automatic Monitoring Sites

Blaby District Council undertook automatic (continuous) monitoring at 5 sites during 2020. Table A.1 in Appendix A shows the details of the automatic monitoring sites. NB. Local authorities do not have to report annually on the following pollutants: 1,3 butadiene, benzene, carbon monoxide and lead, unless local circumstances indicate there is a problem. The following page presents automatic monitoring results for Blaby District Council.

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.

Data Capture for 4 of the continuous monitoring stations was good. However, at CM 6, an issue was found with the data capture during the first 4 months of 2020, where it was identified that the data was lost, resulting in an overall data capture of 60.6%. This data was annualised for the data to be deemed representative. This is a new CM station however the technical issues were resolved and data was found to be good during the remaining months of 2020.

The Continuous Monitoring station CM 7 was moved to Stamford Street on 8 July 2020. Initial data captured by the station indicates a concentration of 21 µg/m^3. However this is based on 6 months of data and further information will be required to fully assess the results and draw conclusions. Monitoring has been extended and will continue throughout 2021 to evaluate the results, which will be reported in ASR 2022.

Scheduled calibrations on the Continuous Monitoring Stations (CMs) were maintained throughout 2020, despite the limitations and drastic changes to how work was managed and undertaken across Environmental Services due to the COVID-19 pandemic, though the frequency was initially reduced to monthly during the initial months, in line with DEFRA Guidance. Digital Loggers for the stations are still in place and working. The stations have remained in good repair and back-office checks have been maintained throughout 2020. Work was effectively managed using a 'Monthly Air Quality / Action Plan Tracker' produced by Blaby District to manage tasks and work across the Environmental Services Team.

3.1.2 Non-Automatic Monitoring Sites

Blaby District Council undertook non-automatic (i.e. passive) monitoring of NO_2 at 44 sites during 2020, and uses one travel blank for Quality Assurance/Quality Control. 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.

Further information on our diffusion tube monitoring results can be found at the following page.

3.2 Individual Pollutants

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

3.2.1 Nitrogen Dioxide (NO_2)

Table A.3 and Table A.4 in Appendix A compare the ratified and adjusted monitored NO_2 annual mean concentrations for the past five years with the air quality objective of 40µg/m^3.

Note that the concentration data presented represents the concentration at the location of the monitoring site, following the application of bias adjustment and annualisation, as required (i.e. the values are exclusive of any consideration to fall-off with distance adjustment).

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

The black line represents the Air Quality Objective (AQO) for the named pollutant.

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.

Monitoring data has revealed that the there are no exceedances for any of the diffusion tubes (DT) or continuous monitoring stations (CM) for nitrogen dioxide in 2020. There were some adjustments to monitoring locations with the removal of 17 DT's and the introduction of 8 more DT's across Blaby District. The changes were made based on reduced levels of NO_2 at the respective locations in 2019. This shows that the concentrations of pollutants have decreased across Blaby District. More specifically, there have been no exceedances of the NO_2 annual mean objective of 40µg/m^3. There have been no exceedances of the NO_2 1-hour mean objective (200µg/m^3 not to be exceeded more than 18 times/year).

The bias correction used for the diffusion tube data in 2020 is only based on 1 study at Marylebone Road. The diffusion tube data shows noticeably lower levels of nitrogen dioxide than compared to previous year. It is acknowledged therefore that the adjustment factor

should be used with caution. The COVID-19 pandemic is also likely to have had an impact in 2020.

The Air Quality Management Areas (AQMAs) have also shown a reduction in concentrations of NO_2, even in locations where results were near to and exceeding air quality objectives in previous years.

The data has shown a reduction in nitrogen dioxide for all diffusion tubes with an average of 4-5 µg/m^3 reduction in the majority of the diffusion tubes, and some have fallen by as much as 8 µg/m^3.

AQMA 1 A5460 Narborough Road South

Monitoring continued in this area, though a few tubes were removed in 2020, to support the low NO_2 results from 2019 and earlier years. The levels of NO_2 have reduced in all diffusion tubes and levels remain well below Air Quality Objectives.

The currrent boundary is being maintained due to the potential impacts of new developments and road infrastructure proposals.

AQMA 2 M1 Corridor in Enderby and Narborough

This AQMA was reduced in site in 2020, in line with 5 years of monitoring data showing a consistent reduction in levels of NO_2. A number of the DT's have been removed, but monitoring is still taking place in the remaining boundary area, and these results have shown a reduction to NO_2 levels this year, in line with other areas across Blaby District. The levels will continue to be monitored over the next few years before any further decisions are made regarding the size of the AQMA.

Due to logistical reasons Continuous Monitoring Station 1 (CM1) has remained in the former boundary area, and will continue to remain there for the forseeable future and this will provide further justification data for the reduction of AQMA 2.

AQMA 3 M1 Corridor between Thorpe Astley and Leicester Forest East

CM4 (Hinckley Road, Leicester Forest East) has previously seen high levels of nitrogen dioxide for the last 4 years, with a peak noted in 2016 at 50 µg/m^3. The site lies in close proximity to a busy crossroads within AQMA 3, directly adjacent to one of the main roads into Leicester City centre (the A47). The A47 has high volumes of traffic throughout the day, though traffic levels are likely to have reduced in 2020. Data capture was found to be good at 89.7%. The levels of NO_2 were found to be reduced this year, to 23.3 µg/m^3, this supports

the data obtained from the diffusion tubes located in this area and the reduction is in line with the reduced levels across Blaby District. The Continuous Monitoring Station (CM3) was moved to Glenfield on 8 July 2020.The 2020 result, data captured by the station indicates a concentration of 18µg/m^3, based on 6 months of data.

AQMA 4B Enderby Road Whetstone

This AQMA was reduced in 2020, to support the consistent low levels of NO_2 across the wider boundary. Monitoring continued to be undertaken within the new AQMA boundary areas, and the data for 2020 has shown a fall in NO_2 levels, of between 5-7 µg/m^3 in line with other monitoring locations across Blaby District.

AQMA 6 Mill Hill, Enderby

AQMA 6 was declared January 2018 due to elevated levels of NO_2 being identified.

A reduction in the levels of NO_2 were identified in 2019, but this was in part due to the low bias correction factor applied, as explained in ASR 2020. In 2020, DT4 (Groom Lodge, Hall Walk) produced an annual concentration of 29 µg/m^3 which is a further reduction of 8 µg/m^3 compared to last year, a total reduction of 18 µg/m^3 when compared to 2018 data. This diffusion tube is located in close proximity to CM5, which in this monitoring year fell to 23 µg/m^3. This is 8 µg/m^3 less than 2019 data.

Enderby Village

Monitoring was extended to a site in central Enderby in 2020 (diffusion tube 82) south of the AQMA boundary. Initial information gathered from this area indicates low levels of NO_2.

Other Monitoring Areas

Lubbesthorpe Road, Braunstone Town

Additional resources were obtained to monitor air quality in the area surrounding Fosse Park following recent large scale planning developments. This has enabled the purchase of an additional continuous monitor now positioned on Lubbesthorpe Road, representing the nearest receptor to the development. These results will be used to assess current and future impacts. 2020 data shows an average annual concentration of 21 µg/m^3 which is below the objective for this pollutant. Monitoring will continue in this location.

Sharnford Hill, Sharnford

Monitoring in Sharnford has consistently recorded NO_2 levels well below air quality objectives. In 2020, the diffusion tube on Sharnford Hill was reinstated and produced an annual figure of 18 µg/m^3.

Croft Road, Cosby

Monitoring remains in Cosby due to the potential impacts of local developments with results consistently below the air quality objectives. This year, the results have fallen again to 12 µg/m^3. Air quality is not a concern in Cosby, but monitoring will continue.

Glenfield Village

As decribed in ASR 2020 monitoring was continued and extended across the village to assess whether there were any further exceedances. Additional tubes were added (DT84 and DT85) and the results can be seen on Figure 1. NO_2 levels were significantly lower in Glenfield in 2020 with DT65 falling to 26 µg/m^3, a reduction of 7 µg/m^3.

The Continuous Monitoring station CM7 was moved to Stamford Street on 8 July 2020. Initial data captured by the station indicates a concentration of 21 µg/m^3. However this is based on 6 months of data and further information will be required to fully assess the results and draw conclusions. Monitoring has been extended and will continue throughout 2021 to evaluate the results, which will be reported in ASR 2022.

New Bridge Road and Leicester Road, Glen Parva

The monitoring in Glen Parva has consistently shown low levels of NO_2. DT5 was reinstated in 2019 and the results have not shown any increase when compared to previous years. The results have both reduced in 2020, in line with the other monitoring results experienced across Blaby District.

Stoney Stanton Village

Stoney Stanton had some initial elevated levels of NO_2 in 2019 which led resources to be directed to exploring the area, through increased monitoring and the proposal to move the Continuous Monitoring Station (CM1) currently located in AQMA 2. The move of the CM1 has been delayed due to COVID-19 restrictions. Options for the relocation of existing equipment or the purchase of additional resources are being considered and will be reported on next year.

The 2020 monitoring results for this area are well below the air quality objective, for example DT73 at 25 µg/m^3, consistent with the lower levels observed across Blaby District. The level of monitoring has increased in Stoney Stanton and will be reported in ASR 2022.

Sapcote Village

Monitoring continued in 2020, with results dropping, similar to other monitoring areas of Blaby District. Monitoring is continuing in 2021 and results will be reported in ASR 2022.

Elmesthorpe Railway Bridge

A diffusion tube was located near Elmesthorpe to obtain background levels in light of the proposed rail freight terminal site. The second year of monitoring has shown a concentration again below the air quality objective and in line with other areas across Blaby District.

Braunstone Town and Thorpe Astley

DT70 on Murby Way, introduced in 2019 due to local concerns, was removed in 2020, as a result of low levels of NO_2. A decision was made relocate monitoring to the Community Centre. Initial analysis has shown very low results at 17 $\mu g/m^3$.

The other monitoring locations within Thorpe Astley have also shown low levels on NO_2. This area will continue to be monitored in 2021.

Kirby Muxloe

Monitoring here began in 2019, with low levels of NO_2 identified. The results for 2020 show that levels remain well below the air quality objectives.

Aston Firs near Sapcote

A diffusion tube was located near Aston Firs to obtain background levels in light of the proposed freight terminal site. It is noteworthy that there has been a considerable drop in reported concentrations between 2019 and 2020, although the former was based on only 6 months of data. Both monitoring years are below the Air Quality Objective and monitoring will continue to be reported in ASR 2022.

Main Street, Kilby

A diffusion tube was located in the village of Kilby, following concerns from the Parish Council. Initial concentrations were found to be below the Air Quality Objective although this is based on five months monitoring data. Monitoring will continue throughout 2021 and be reported in ASR 2022.

Summary

No monitoring locations within the District have recorded exceedances of the Air Quality Objectives in respect of nitrogen dioxide. All diffusion tube raw means were bias adjusted

using a national bias adjustment factor of 0.77. Annualisation was required for two diffusion tubes (DT43 and DT88) as data capture rates were below 75%.

3.2.2 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 40µg/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 50µg/m^3, not to be exceeded more than 35 times per year.

There have been no exceedances of PM_{10} air quality obejctives at the site that monitors this pollutant. Recorded levels was at 11.5 µg/m^3 for CM1 and and well below the air quality objective for PM_{10} of 40 µg/m^3.

It is evident from Table A.5 that PM_{10} levels for CM1 are at an all time low for the location. The levels add evidence to support the decision to relocate the monitoring station to Stoney Stanton.

3.2.3 Particulate Matter ($PM_{2.5}$)

Table A.8 in Appendix A presents the ratified and adjusted monitored $PM_{2.5}$ annual mean concentrations for the past five years derived from the PM_{10} monitoring results, for 2016 - 2019 in accordance with the guidance. There appears to be no clear trend with these results. Levels in 2019 were slightly higher than 2018, but lower than 2017. The first direct monitoring of $PM_{2.5}$ in Blaby District commenced in 2020 at CM5 (Mill Hill) The results show that levels were 8.4 µg/m^3, lower than the calculated levels from PM_{10} in 2019. Low cost sensors have been recently been installed in February 2021 to extend the monitoring capabilities of this pollutant and the data will be reported in ASR 2022.

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)
CM1	Blaby 1 (Packhorse Drive, Enderby)	Roadside	454482	298573	NO_2; PM_{10}	NO	Chemiluminescent; Gravimetric (TEOM)	12.6	0.65	3
CM3	Blaby 3 (Hinckley Road, LFE)	Roadside	453185	303310	NO_2	NO	Chemiluminescent	38	0.1	1.5
CM4	Blaby 4 (Hinckley Road, LFE)	Roadside	453492	303315	NO_2	YES; AQMA 3	Chemiluminescent	4	1	1.5
CM5	Blaby 2 (Mill Hill, Enderby)	Roadside	453594	299549	NO_2; $PM_{2.5}$	YES; AQMA 6	Chemiluminescent; Gravimetric (TEOM)	4	1	1.5
CM6	Blaby 5 (Lubbesthorpe Road, Braunstone Town)	Roadside	455722	300782	NO_2	NO	Chemiluminescent	7	1	1.5
CM7	Blaby 3 (Stamford Street, Glenfield)	Roadside	453934	305999	NO_2	NO	Chemiluminescent	5	2.4	1.5

Notes:

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

(2) N/A if not applicable

Table A.2 – Details of Non-Automatic Monitoring Sites

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube Co-located with a Continuous Analyser?	Tube Height (m)
1	Kingsway	Roadside	455970	301146	NO2	No	11.0	1.5	No	2.2
4	Hall Walk, Moores Lane, Enderby	Roadside	453606	299557	NO2	Yes, AQMA 6	0.0	1.5	No	1.8
5	204 Leicester Road, Glen Parva	Roadside	457011	299627	NO2	No	21.6	3.4	No	1.8
15	1 New Bridge Road	Other	456786	298547	NO2	No	0.0	7.8	No	2.8
16	The Cottage, Ratby Lane	Roadside	453220	304273	NO2	Yes, AQMA 3	15.0	5.4	No	1.3
18	62 Packer Avenue, LFE	Other	453488	303637	NO2	Yes, AQMA 3	0.0	22.7	No	1.4
20	159 Enderby Rd	Roadside	455819	297954	NO2	Yes, AQMA 4B	0.0	4.7	No	1.7
25	7 Narborough Road South	Roadside	456470	301903	NO2	Yes, AQMA 1	0.0	7.0	No	1.8
26	Junction of Victoria Rd	Roadside	455817	297937	NO2	Yes, AQMA 4B	15.5	2.2	No	2.0
30	55 Hinckley Road, Sapcote	Roadside	448481	293549	NO2	No	19.3	2.3	No	1.8
31	5 Hinckley Road, Sapcote	Roadside	448876	293447	NO2	No	0.0	1.9	No	1.8
32	Co-Op Croft Rd	Roadside	454554	294803	NO2	No	2.3	1.5	No	1.9
35	2 Narborough Rd. South	Roadside	456521	301896	NO2	Yes, AQMA 1	0.0	13.2	No	1.9
39	Sapcote Working Men's Club	Roadside	448847	293462	NO2	No	0.0	4.2	No	1.8
40	Conery Lane/Mill Hill Road	Roadside	453468	299737	NO2	Yes, AQMA 6	7.6	1.6	No	1.9
41	9 Mill Hill Road	Roadside	453439	299740	NO2	Yes, AQMA 6	0.0	3.8	No	1.9

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)
43	Blaby Rd	Roadside	453780	299360	NO2	No	1.4	1.4	No	1.7
44	1 Mill Hill Rd	Roadside	453706	299455	NO2	Yes, AQMA 6	1.2	1.6	No	1.8
48	98 Leicester Rd, Enderby	Roadside	454519	298148	NO2	Yes, AQMA 2	0.0	8.7	No	1.8
49	10 Hall Walk, Enderby	Roadside	453565	299609	NO2	Yes, AQMA 6	0.0	13.0	No	2.0
51	257 Willow Way, LFE	Roadside	452234	302753	NO2	No	0.0	11.3	No	1.9
54	71 Hinckley Rd, LFE	Roadside	453592	303415	NO2	Yes, AQMA 3	0.0	32.9	No	1.5
56	Avalon, 9 Hinckley Rd, LFE	Roadside	454079	303535	NO2	Yes, AQMA 3	0.0	20.0	No	1.8
57	6 Ratby Lane, LFE	Roadside	454096	303599	NO2	No	12.1	2.4	No	1.7
64	3 Kirby Road, Glenfield	Roadside	453622	306039	NO2	No	0.0	2.0	No	1.9
65	11 Stamford Street, Glenfield	Roadside	306077	453788	NO2	No	0.0	1.9	No	1.5
68	45 Mill Hill, Enderby	Roadside	299846	453281	NO2	Yes, AQMA 6	0.0	5.6	No	1.8
69	Station Road, Elmesthorpe	Roadside	447032	295877	NO2	No	49.3	1.2	No	1.8
71	82 Westover Road, Braunstone Town	Roadside	455061	302718	NO2	No	4.5	2.5	No	1.8
73	New Road, Stoney Stanton	Roadside	449036	294720	NO2	No	11.1	2.3	No	1.8
74	Broughton Road, Stoney Stanton	Roadside	449105	294705	NO2	No	3.3	2.7	No	1.8

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)
75	Long Street, Stoney Stanton	Roadside	449080	294785	NO2	No	1.4	1.2	No	1.8
76	The Pines, Kirby Muxloe	Other	452184	304813	NO2	No	0.0	24.5	No	1.8
77	The Chestnuts, Kirby Muxloe	Roadside	452309	304870	NO2	No	0.0	12.2	No	1.8
78	Aston Firs, Blaby	Roadside	446218	293831	NO2	No	17.0	37.5	No	1.8
80	Former Blaby 1 site, Packhorse Drive	Roadside	454483	298579	NO2	No	12.8	0.7	No	1.8
81	Newsagents near Blaby 4, LFE	Roadside	454038	303471	NO2	Yes, AQMA 3	6.2	2.4	No	1.8
82	Corner of King St/Mill Lane, Enderby	Roadside	453705	299187	NO2	No	0.5	1.0	No	1.8
83	Sharnford Hill, Sharnford	Roadside	448277	291869	NO2	No	2.9	1.4	No	1.8
84	Lamppost outside Glenfield Travel	Roadside	453914	306109	NO2	No	6.7	1.2	No	1.8
85	14 The Square, Glenfield	Roadside	453813	306106	NO2	No	0.0	4.1	No	1.7
86	Wilson Close, Braunstone Town	Roadside	454930	302529	NO2	No	13.4	0.2	No	1.8
87	Thorpe Astley Community Centre	Roadside	454178	302627	NO2	No	5.8	2.0	No	1.8
88	42 Main Street, Kilby	Roadside	462115	295374	NO2	No	0.0	2.0	No	1.7

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
CM1	454482	298573	Roadside	95.4	95.4	23	28.8	27	30.9	16
CM3	453185	303310	Roadside	94.5	94.5	**44**	25.4	27.6	24.8	18.2
CM4	453492	303315	Roadside	89.7	89.7	24.9	37.1	**47.3**	38.4	23.3
CM5	453594	299549	Roadside	78.7	78.7	24.9	**42.4**	38.3	30.9	22.9
CM6	455722	300782	Roadside	60.6	60.6	-	-	-	-	21
CM7	453934	305999	Roadside	94.5	94.5	-	-	-	-	21.1

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

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

Notes:

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

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

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

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

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

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

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

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) [1]	Valid Data Capture 2020 (%) [2]	2016	2017	2018	2019	2020
1	455970	301146	Roadside	100	100.0	34.7	32.8	30.8	25.1	20.5
4	453606	299557	Roadside	100	100.0	**53.3**	**42.6**	**47.1**	36.9	29.4
5	457011	299627	Roadside	100	100.0	22.0	-	-	19.5	15.1
15	456786	298547	Other	100	100.0	23.4	20.3	20.0	16.4	13.5
16	453220	304273	Roadside	100	100.0	38.4	38.7	34.4	27.9	22.2
18	453488	303637	Other	83	82.7	34.3	34.7	30.1	24.9	20.6
20	455819	297954	Roadside	100	100.0	27.8	26.8	25.7	20.6	15.8
25	456470	301903	Roadside	100	100.0	29.4	28.2	29.4	23.0	17.0
26	455817	297937	Roadside	100	100.0	34.9	33.5	31.5	27.6	20.7
30	448481	293549	Roadside	100	100.0	14.5	-	-	15.4	11.5
31	448876	293447	Roadside	100	100.0	18.9	-	-	16.4	11.5
32	454554	294803	Roadside	100	100.0	21.9	20.1	23.8	16.3	11.8
35	456521	301896	Roadside	100	100.0	30.1	27.3	26.1	22.2	16.8
39	448847	293462	Roadside	100	100.0	16.5	-	-	15.8	11.1
40	453468	299737	Roadside	100	100.0	33.1	29.2	28.7	21.9	17.8
41	453439	299740	Roadside	100	100.0	37.3	31.2	32.1	26.3	20.2
43	453780	299360	Roadside	67	67.3	33.1	31.3	32.5	25.2	18.3
44	453706	299455	Roadside	100	100.0	32.2	29.8	33.4	24.2	18.7
48	454519	298148	Roadside	100	100.0	-	35.5	34.0	25.0	18.2
49	453565	299609	Roadside	100	100.0	-	35.6	22.8	18.0	13.2
51	452234	302753	Roadside	100	100.0	-	22.6	22.4	18.0	13.0
54	453592	303415	Roadside	100	100.0	-	20.4	32.5	26.6	22.1
56	454079	303535	Roadside	100	100.0	-	26.3	24.8	21.0	15.9
57	454096	303599	Roadside	100	100.0	-	25.3	39.0	29.7	22.1
64	453622	306039	Roadside	100	100.0	-	25.3	24.3	22.4	17.0
65	306077	453788	Roadside	100	100.0	-	-	25.4	32.9	26.0
68	299846	453281	Roadside	100	100.0	-	-	25.7	23.8	18.4
69	447032	295877	Roadside	92	90.4	-	-	26.3	16.7	12.9
71	455061	302718	Roadside	100	100.0	-	-	-	16.1	13.3
73	449036	294720	Roadside	92	92.3	-	-	-	29.0	25.1
74	449105	294705	Roadside	100	100.0	-	-	-	25.5	20.4
75	449080	294785	Roadside	100	100.0	-	-	-	21.1	17.4

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2020 (%) (2)	2016	2017	2018	2019	2020
76	452184	304813	Other	100	100.0	-	-	-	11.4	12.2
77	452309	304870	Roadside	100	100.0	-	-	-	17.5	15.1
78	446218	293831	Roadside	100	100.0	-	-	-	31.5	19.3
80	454483	298579	Roadside	100	100.0	-	-	-	-	15.8
81	454038	303471	Roadside	100	100.0	-	-	-	-	19.6
82	453705	299187	Roadside	92	92.3	-	-	-	-	17.5
83	448277	291869	Roadside	100	100.0	-	-	-	-	18.4
84	453914	306109	Roadside	100	100.0	-	-	-	-	20.7
85	453813	306106	Roadside	100	100.0	-	-	-	-	13.4
86	454930	302529	Roadside	100	100.0	-	-	-	-	13.6
87	454178	302627	Roadside	100	100.0	-	-	-	-	16.8
88	462115	295374	Roadside	100	44.2	-	-	-	-	13.0

☒ **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.

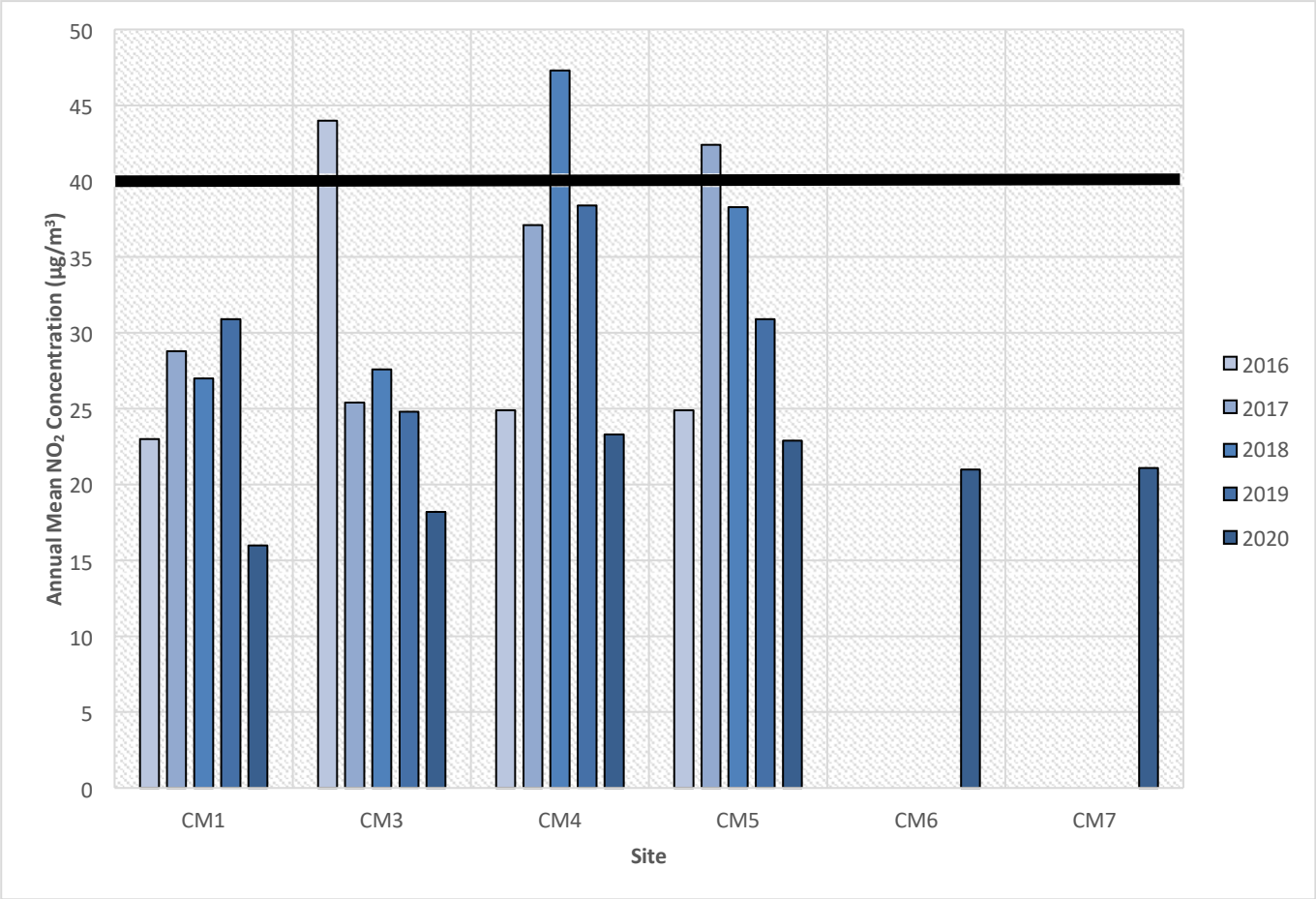
Concentrations are those at the location of monitoring and not those following any fall-off with distance adjustment.

(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%).

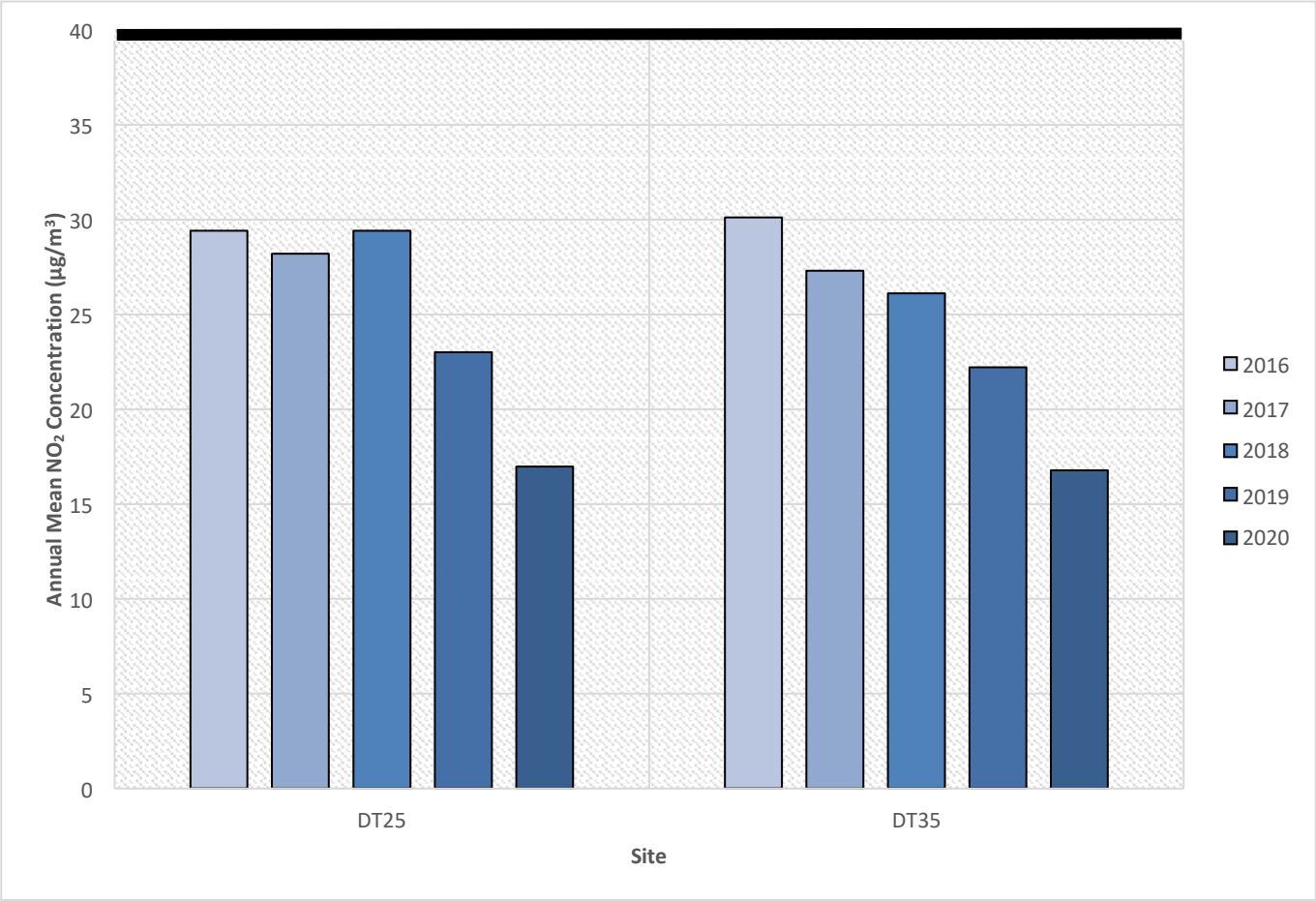
Figure A.1 – Trends in Annual Mean NO_2 Concentrations

Air Quality Monitoring Stations



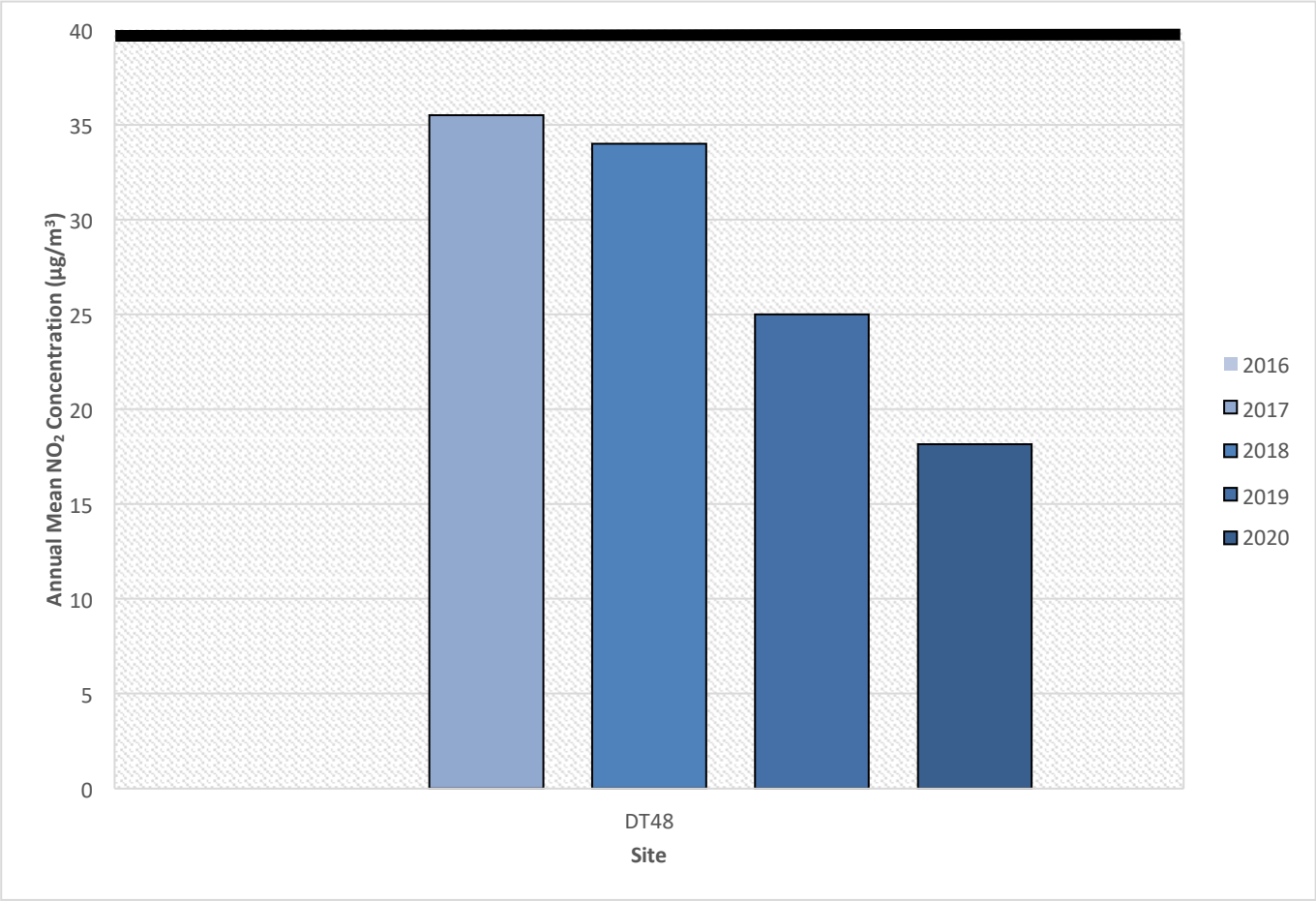
CM7 was relocated from Hinckley Road, Leicester Forest East (formerly CM3 within AQMA 3) to Stamford Street in Glenfield. This station shall now be known as CM7. The black line represents the Air Quality Objective (AQO) for the named pollutant.C:\Users\SChalmers\AppData\Local\Temp\{76B19EA9-347C-465C-AE52-DEBB55032DF6}.png

AQMA 1 – A5460 Narborough Road South



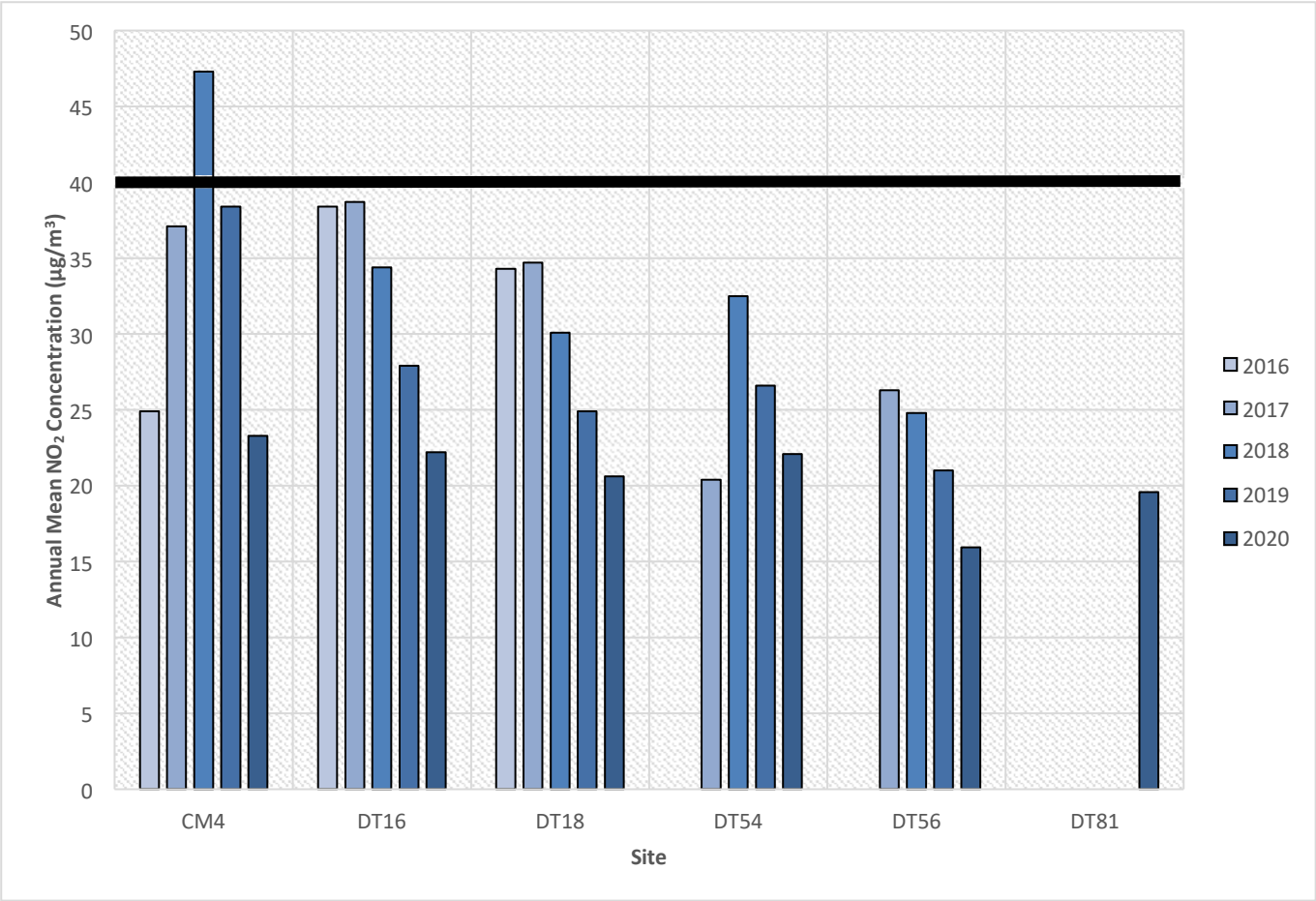
The black line represents the Air Quality Objective (AQO) for the named pollutant.

AQMA 2 – M1 corridor in Enderby and Narborough



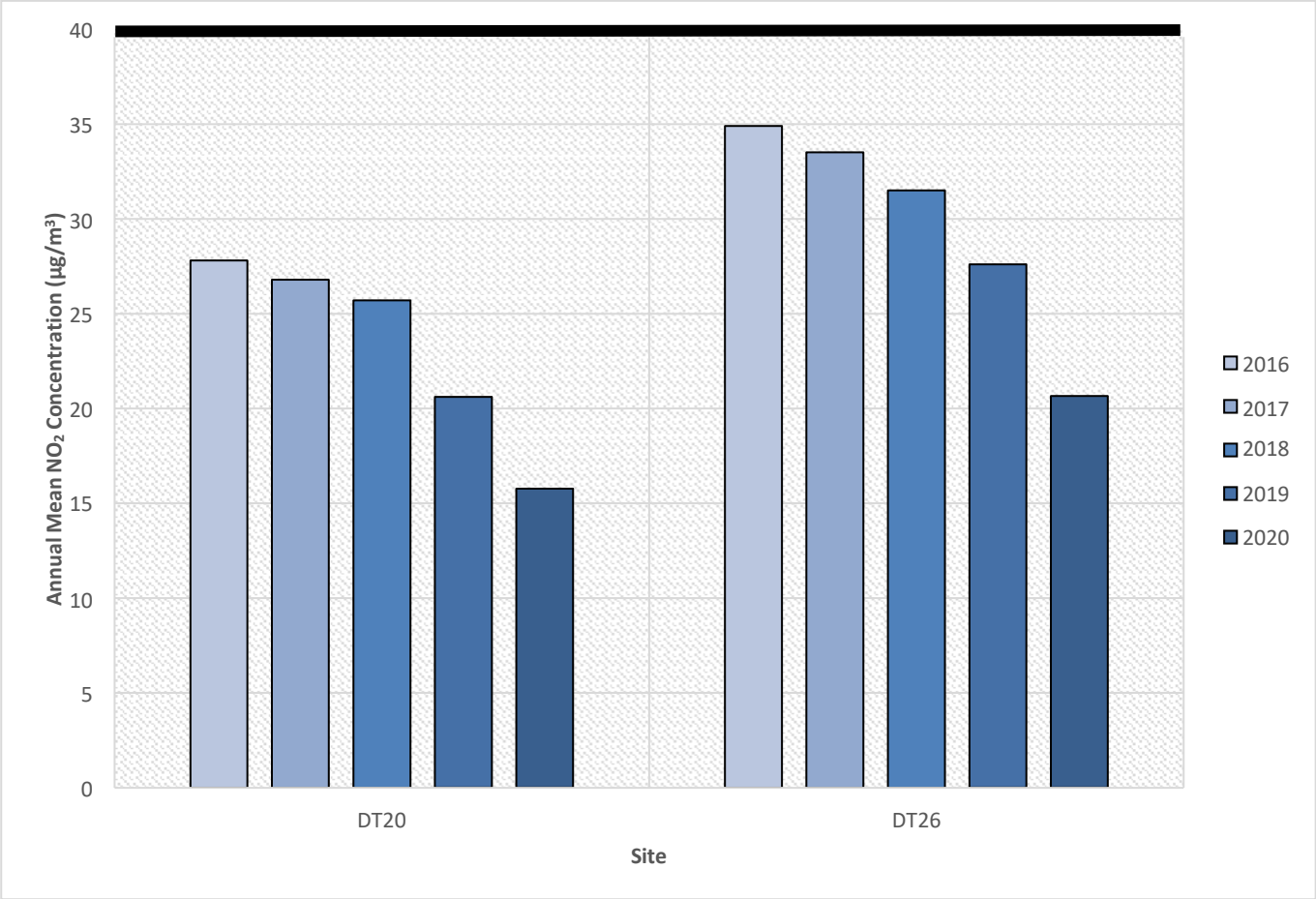
The black line represents the Air Quality Objective (AQO) for the named pollutant.

AQMA 3 – M1 corridor between Thorpe Astley and Leicester Forest East



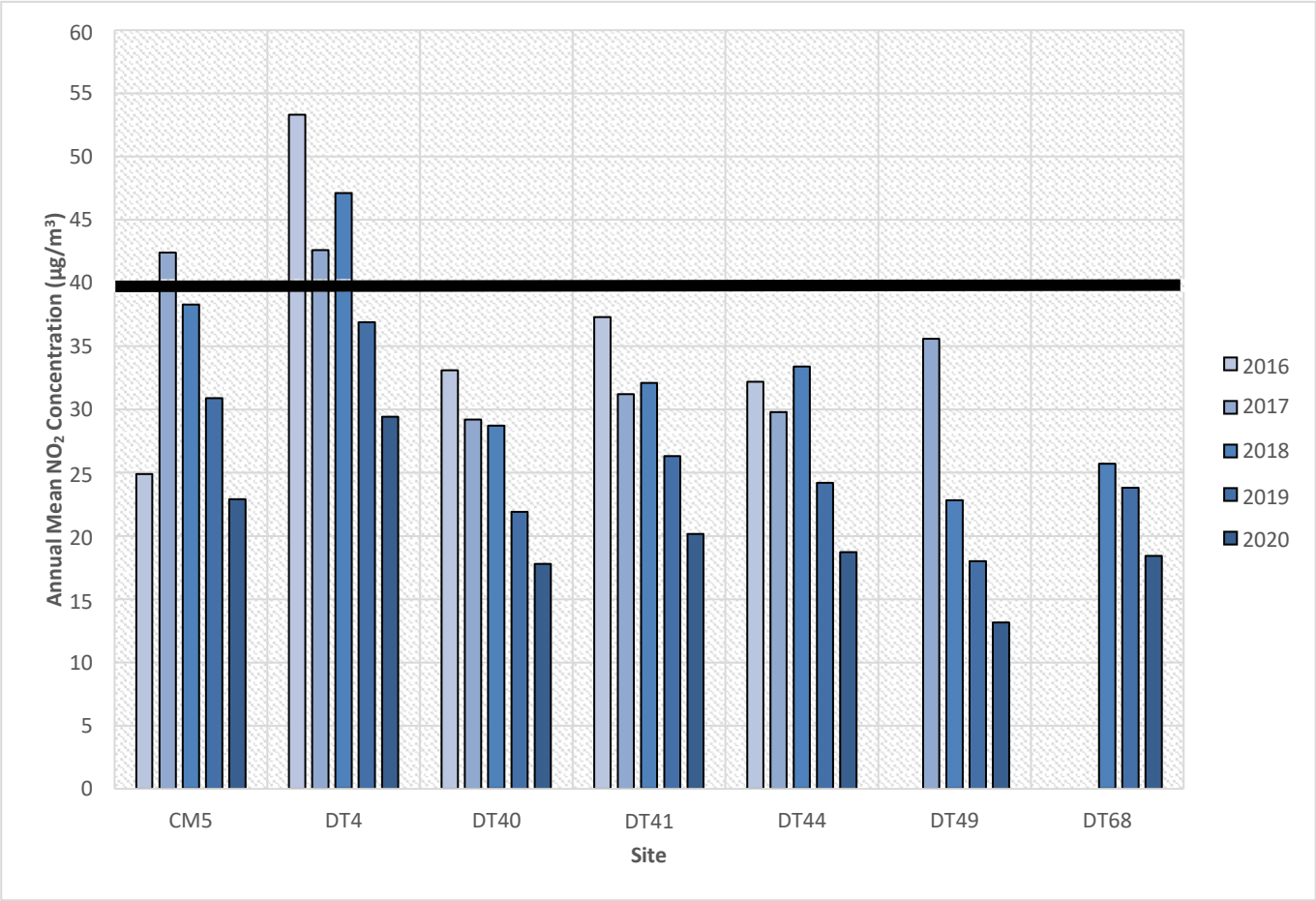
The black line represents the Air Quality Objective (AQO) for the named pollutant.

AQMA 4B – Enderby Road, Whetstone



The black line represents the Air Quality Objective (AQO) for the named pollutant.

AQMA 6 – Mill Hill, Enderby



The black line represents the Air Quality Objective (AQO) for the named pollutant.

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
CM1	454482	298573	Roadside	95.4	95.4	0	0	0	0	0
CM3	453185	303310	Roadside	94.5	94.5	0	0	0	0	0
CM4	453492	303315	Roadside	89.7	89.7	0	5	1	0	0
CM5	453594	299549	Roadside	78.7	78.7	3	8	0	0	0
CM6	455722	300782	Roadside	60.6	60.6	-	-	-	-	0
CM7	453934	305999	Roadside	94.5	94.5	-	-	-	-	0

Notes:

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

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

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

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

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

Table A.6 – Annual Mean PM_{10} Monitoring Results (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
CM1	454482	298573	Roadside	95.6	95.6	12	14.8	11	11.8	11.5

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

Notes:

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

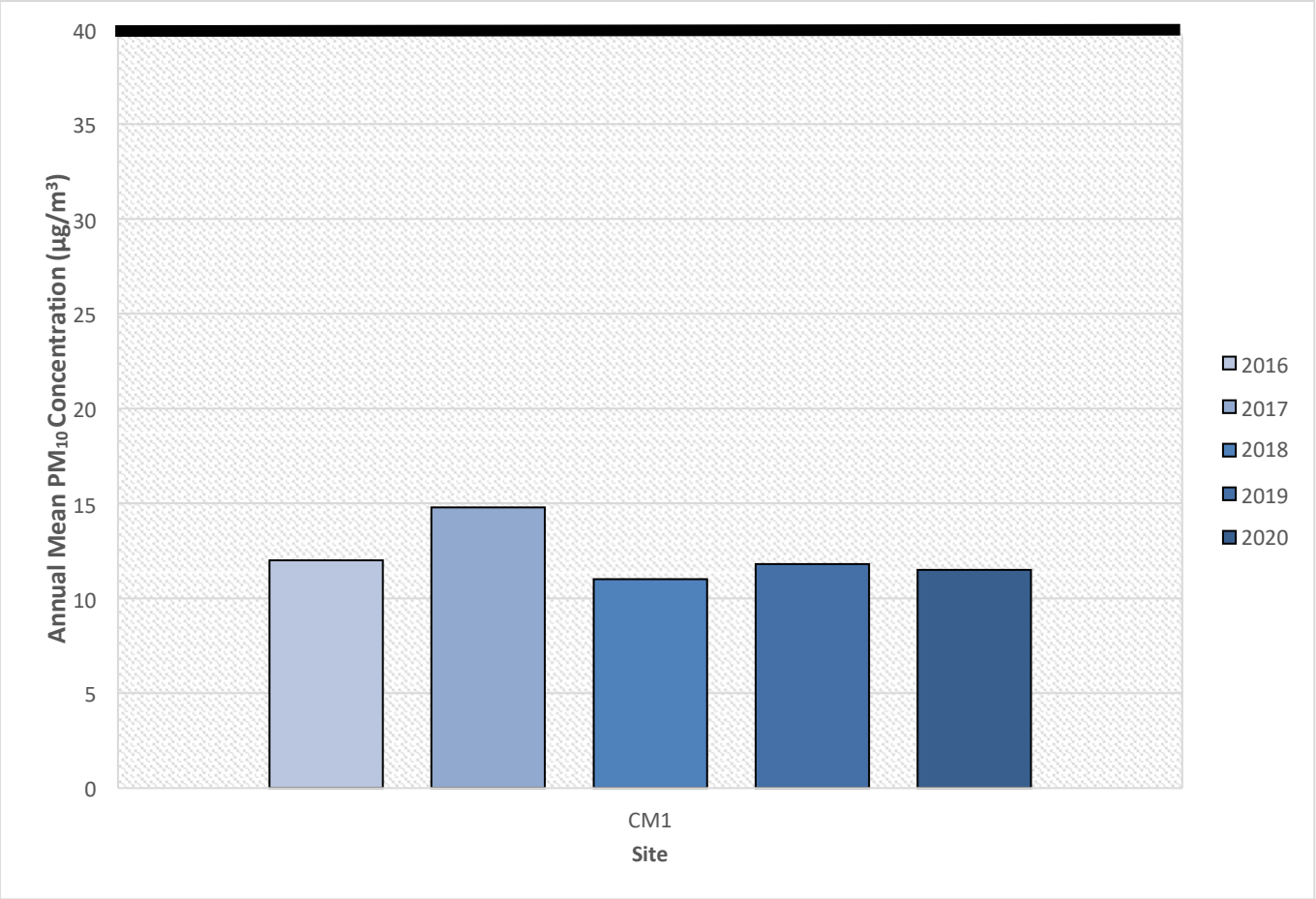
Exceedances of the PM_{10} annual mean objective of 40µg/m^3 are shown in **bold**.

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.

(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.2 – Trends in Annual Mean PM_{10} Concentrations



The black line represents the Air Quality Objective (AQO) for the named pollutant.

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 2020 (%) (2)	2016	2017	2018	2019	2020
CM1	454482	298573	Roadside	95.6	95.6	0	1	0	0	0

Notes:

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

Exceedances of the PM_{10} 24-hour mean objective (50µg/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 2020 (%) (2)	2016	2017	2018	2019	2020
CM1	454482	298573	Roadside	95.6	95.6	*8.4*	*10.4*	*7.7*	*8.3*	*8.1*
CM5	453594	299549	Roadside	78.5	78.5	*14*	*20.4*	*16*	*16.9*	8.4

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

Notes:

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

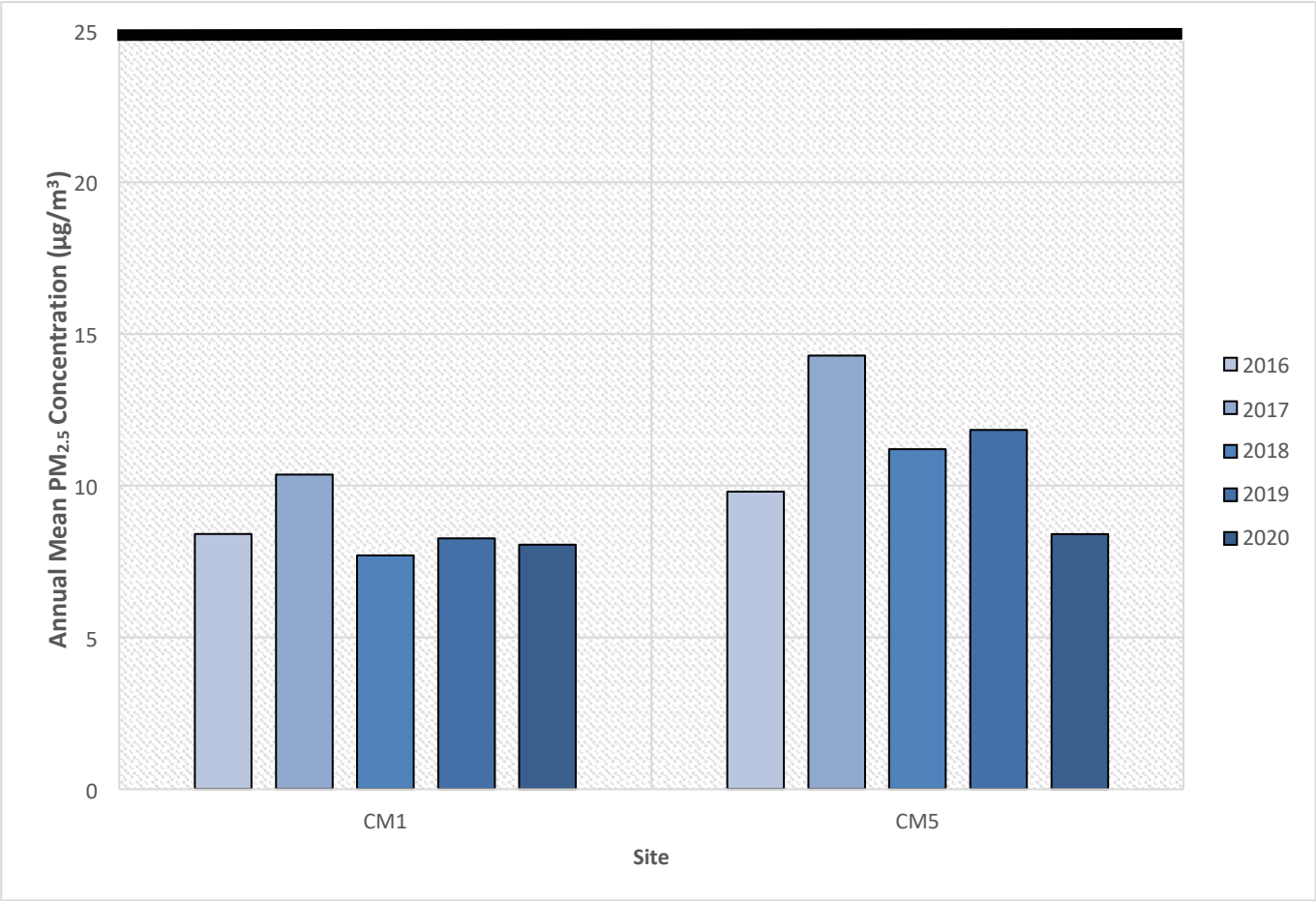
All means have been "annualised" as per LAQM.TG16 if valid data capture for the full calendar year is less than 75%. See Appendix C for details.

Concentrations in italics are estimated from monitored PM_{10} and derived using a factor of 0.7, further information can be found in Appendix C: Supporting Technical Information / Air Quality Monitoring Data QA/QC. The concentration given for CM5 in 2020 marks the beginning of our actual $PM_{2.5}$ monitoring.

(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.3 – Trends in Annual Mean $PM_{2.5}$ Concentrations



The black line represents the Air Quality Objective (AQO) for the named pollutant.

With the exception of CM5 in 2020, concentrations are derived from monitored PM_{10} concentrations. Further information can be found in Appendix C.

Appendix B: Full Monthly Diffusion Tube Results for 2020

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

DT ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Easting)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean: Raw Data	Annual Mean: Annualised and Bias Adjusted (0.77)	Annual Mean: Distance Corrected to Nearest Exposure	Comment
1	455970	301146	38.0	26.2	28.8	17.0	19.0	23.7	16.0	24.0	28.0	27.0	40.9	31.0	26.6	20.5		
4	453606	299557	50.0	43.9	43.3	23.0	30.0	36.3	31.0	40.0	40.0	36.3	45.9	38.8	38.2	29.4		
5	457011	299627	23.0	19.5	24.0	16.0	15.0	18.8	11.0	21.0	18.0	18.8	27.2	23.8	19.7	15.1		
15	456786	298547	21.0	17.1	16.9	15.0	14.0	22.0	10.0	20.0	20.0	15.4	20.7	18.9	17.6	13.5		
16	453220	304273	45.0	37.9	26.8	16.0	21.0	25.0	26.0	25.0	30.0	24.2	33.8	35.3	28.8	22.2		
18	453488	303637	39.0	33.7	25.8	15.0	17.0	21.1	-	-	28.0	26.0	32.9	29.3	26.8	20.6		
20	455819	297954	28.0	22.2	22.9	12.0	18.0	16.1	16.0	19.0	22.0	18.4	24.6	26.5	20.5	15.8		
25	456470	301903	33.0	25.2	24.9	16.0	16.0	22.2	14.0	18.0	21.0	21.9	28.8	23.6	22.0	17.0		
26	455817	297937	40.0	32.4	28.8	18.0	21.0	21.8	18.0	25.0	26.0	21.5	29.6	39.9	26.8	20.7		
30	448481	293549	25.0	18.1	16.4	9.0	10.0	13.9	9.0	11.0	13.0	13.3	21.5	18.9	14.9	11.5		
31	448876	293447	18.0	14.6	15.3	10.0	10.0	12.5	10.0	14.0	17.0	15.7	23.0	19.9	15.0	11.5		
32	454554	294803	20.0	14.5	18.5	11.0	12.0	14.6	9.0	16.0	17.0	14.8	19.3	17.7	15.4	11.8		
35	456521	301896	27.0	27.6	23.5	14.0	18.0	19.3	15.0	17.0	24.0	24.8	25.8	25.4	21.8	16.8		
39	448847	293462	20.0	14.5	14.9	12.0	9.0	11.9	9.0	13.0	14.0	14.7	22.8	17.2	14.4	11.1		
40	453468	299737	25.0	22.2	26.7	16.0	19.0	23.4	16.0	23.0	22.0	23.2	31.8	28.8	23.1	17.8		
41	453439	299740	31.0	24.0	28.8	22.0	22.0	29.2	18.0	27.0	28.0	27.3	30.9	26.1	26.2	20.2		
43	453780	299360	30.0	24.3	26.3	18.0	21.0	24.5	-	23.0	-	-	-	23.5	23.8	18.3		
44	453706	299455	29.0	23.4	28.5	20.0	20.0	23.8	15.0	28.0	26.0	21.2	27.3	29.7	24.3	18.7		
48	454519	298148	35.0	27.0	24.4	15.0	19.0	19.9	21.0	21.0	21.0	23.7	27.2	28.7	23.6	18.2		
49	453565	299609	25.0	18.8	21.7	12.0	12.0	15.3	11.0	15.0	16.0	14.4	20.2	23.5	17.1	13.2		
51	452234	302753	23.0	18.2	17.7	10.0	11.0	16.7	11.0	17.0	18.0	18.1	23.4	18.7	16.9	13.0		
54	453592	303415	39.0	36.0	37.4	21.0	19.0	20.7	17.0	21.0	27.0	37.0	34.9	34.1	28.7	22.1		
56	454079	303535	31.0	21.9	23.0	14.0	10.0	16.6	13.0	19.0	21.0	22.3	30.1	26.5	20.7	15.9		
57	454096	303599	37.0	29.2	29.1	22.0	21.0	28.5	21.0	29.0	31.0	29.3	33.1	34.8	28.8	22.1		
64	453622	306039	31.0	23.5	23.2	15.0	16.0	15.7	16.0	19.0	24.0	24.8	29.4	27.3	22.1	17.0		
65	306077	453788	45.0	36.3	30.9	26.0	24.0	25.3	23.0	37.0	34.0	41.4	37.3	45.3	33.8	26.0		
68	299846	453281	30.0	26.1	26.8	18.0	21.0	22.2	14.0	22.0	26.0	25.0	28.8	27.1	23.9	18.4		
69	447032	295877	23.0	17.4	18.1	12.0	13.0	14.7	11.0	17.0	18.0	16.2	24.1	-	16.8	12.9		
71	455061	302718	25.0	18.1	17.5	13.0	11.0	13.6	9.0	15.0	16.0	18.1	26.3	25.4	17.3	13.3		
73	449036	294720	44.0	35.8	30.8	-	24.0	26.7	28.0	29.0	31.0	33.0	39.1	37.4	32.6	25.1		
74	449105	294705	39.0	32.0	28.1	18.0	19.0	22.0	21.0	23.0	24.0	29.0	34.0	29.3	26.5	20.4		
75	449080	294785	34.0	25.9	23.3	15.0	13.0	19.8	15.0	20.0	20.0	22.7	34.2	28.5	22.6	17.4		
76	452184	304813	18.0	12.6	15.9	9.0	6.0	10.1	10.0	16.0	20.0	21.2	27.2	24.9	15.9	12.2		
77	452309	304870	28.0	20.8	23.3	14.0	15.0	17.9	11.0	17.0	19.0	19.0	25.4	24.2	19.5	15.1		
78	446218	293831	38.0	29.7	25.3	16.0	14.0	21.6	16.0	23.0	26.0	28.4	39.8	22.7	25.0	19.3		
80	454483	298579	30.0	21.9	20.1	19.0	14.0	13.4	13.0	16.0	21.0	22.1	31.9	23.7	20.5	15.8		
81	454038	303471	32.0	23.3	25.3	15.0	20.0	23.8	21.0	23.0	25.0	25.7	34.0	37.1	25.4	19.6		
82	453705	299187	33.0	23.6	23.6	17.0	14.0	18.5	17.0	19.0	-	25.4	29.7	29.0	22.7	17.5		
83	448277	291869	31.0	23.5	28.1	18.0	20.0	22.3	17.0	25.0	26.0	24.1	26.0	25.4	23.9	18.4		
84	453914	306109	39.0	28.9	27.7	11.0	18.0	21.8	17.0	25.0	29.0	31.3	37.5	36.3	26.9	20.7		
85	453813	306106	25.0	19.9	18.2	12.0	10.0	12.5	12.0	15.0	18.0	17.5	26.9	22.5	17.5	13.4		
86	454930	302529	29.0	20.4	19.2	13.0	10.0	11.9	10.0	13.0	17.0	16.2	20.0	31.7	17.6	13.6		
87	454178	302627	32.0	27.6	23.6	10.0	11.0	14.8	17.0	17.0	25.0	23.3	32.1	28.5	21.8	16.8		
88	462115	295374	-	-	-	-	-	-	-	17.0	18.0	17.7	21.3	21.2	19.0	13.0		

☒ **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.**

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

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

Notes:

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

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

See Appendix C for details on bias adjustment and annualisation.

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

As reported in ASR 2020, monitoring has been extended in the villages of Stoney Stanton and Glenfield. In both locations, an increased number of diffusion tubes have been deployed, whilst in Glenfield, a continuous monitoring station has been located. There are intentions to provide continuous monitoring in Stoney Stanton, although progress halted in 2020 due to COVID-19. It is hoped that the increased monitoring capabilities in both towns will inform the necessity for AQMA(s).

There have been no additional studies including screening of sources, dispersion modelling or monitoring campaigns conducted in 2020.

New or Changed Sources Identified Within Blaby District During 2020

Blaby District Council has not identified any new sources relating to air quality within the reporting year of 2020.

It was noted that road traffic counts dropped significantly during the various lockdown periods of 2020 and this undoubtedly impacted on concentrations of NO_2 seen in the results. Furthermore, it is likely that local industry ceased for some part of the year, particularly at the onset of the COVID-19 pandemic which may have implications for the PM concentrations recorded.

Additional Air Quality Works Undertaken by Blaby District Council During 2020

Blaby District Council has not completed any additional works within the reporting year of 2020.

Small amendments were made to the monitoring regime, primarily alterations to the number/location of diffusion tubes and the relocation of CM3 from Hinckley Road, Leicester Forest East (formerly within AQMA 3) to Stamford Street in Glenfield. This station shall now be known as CM7 to further investigate NO_2 concentrations in the town.

QA/QC of Diffusion Tube Monitoring

During the monitoring year all diffusion tubes were changed in accordance with Defra calendar (± 2 days) and none were exposed for prolonged periods. Samplers were stored in accordance with the guidance and promptly posted for laboratory analysis. Despite the COVID-19 pandemic, there is considered to be a very low impact on the diffusion tube results.

The supplier used to provide and analyse our diffusion tubes is South Yorkshire Air Quality Samplers (SYAQS) using the 50% TEA in acetone method of preparation. This laboratory is a regular contributor to the national bias correction spreadsheet database and has analysed the council's tubes for a number of years. The supplier maintained provision and analysis of diffusion tubes throughout 2020 enabling complete adherence to the Diffusion Tube Monitoring Calendar (± 2 days).

Diffusion Tube Annualisation

Where less than 75% (but > 25%) of the data set is available, the diffusion tube data has been annualised as per Technical Guidance LAQM.TG(16). This procedure was necessary for DT43 and DT88 due to capture rates of 67% and 44% respectively. This can be attributed to missing samplers in the former and a start date of August 2020 for the latter.

Annualisation was performed within the Diffusion Tube Data Processing Tool which is submitted with the report. The background stations utilised were Coventry Allesley, Leicester University and Leicester A594 Roadside, all of which had the requisite data capture in accordance with the guidance.

Diffusion Tube Bias Adjustment Factors

The diffusion tube data presented within the 2020 ASR have been corrected for bias using an adjustment factor. Bias represents the overall tendency of the diffusion tubes to under or over-read relative to the reference chemiluminescence analyser. LAQM.TG16 provides guidance with regard to the application of a bias adjustment factor to correct diffusion tube monitoring. Triplicate co-location studies can be used to determine a local bias correction 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.

Blaby District Council have applied a national bias adjustment factor of 0.77 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.

Having regard to Box 7.11 in LAQM.TG(16), consideration of whether or not a locally obtained bias adjustment factor may be more representative that the relevant national factor. No triplicate tubes were available for comparison in monitoring year 2020 and therefore the national bias correction factor has been chosen.

The bias correction factor was obtained from the DEFRA website using the National Diffusion Tube Bias Adjustment Factor Spreadsheet version 03/21. South Yorkshire Air Quality Samplers (SYAQS) were selected as they analyse the Councils diffusion tubes.

The following was considered when selecting and utilising the national bias correction factor:

- Tube exposure time – Blaby District Council's is monthly in accordance with the national factor.
- Length of the monitoring study – Blaby District Council's is yearly and spread across multiple calendar years.
- Dissimilar site – Blaby District Council's monitoring locations are considerably different to London Marylebone, which likely has very high traffic volumes (indicated by a mean DT concentration of 56µg/m^3 and mean continuous monitoring station concentration of 43µg/m^3). Caution will be exercised when using the factor for our results.
- Number of studies in the analysis (fewer than 5) – Just a single study analysed by this laboratory. Again caution is to be exercised when applying to results.

Table C.1 – Bias Adjustment Factor

Year	Local or National	If National, Version of National Spreadsheet	Adjustment Factor
2020	National	03/21	0.77
2019	National	09/20	0.78
2018	National	06/19	0.95
2017	National	09/18	0.88

Year	Local or National	If National, Version of National Spreadsheet	Adjustment Factor
2016	National	06/17	0.83

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 locations within Blaby District required distance correction during 2020, as per the recommendation output from the Diffusion Tube Data Processing Tool in tab 'STEP 4 – Fall off with Distance'.

Precision and Accuracy of Triplicates

This analysis was not completed for monitoring year 2020 as the triplicate set had been removed in anticipation of relocating CM1. Unfortunately the move did not occur due to logistical reasons and the difficulties presented by COVID-19.

A triplicate set will be installed at CM6 for monitoring year 2021, with the intention of contributing to the next available national bias correction spreadsheet and ideally the production of a local bias correction factor. This will be reported on further in ASR 2022.

QA/QC of Automatic Monitoring

Calibrations of the continuous monitoring stations are carried out fortnightly by members of the Environmental Services Team at Blaby District Council. During a period of 2020 (April to August), this was relaxed to a monthly frequency due to COVID-19 restrictions and in accordance with Defra guidance. Fortnightly calibrations resumed in September and have continued at this regularity.

Data validation and ratification is conducted on a monthly basis by those same colleagues, allowing for circumstantial information to be referenced with the data to produce more reliable concentrations. Monitoring station data and performance is checked regularly through a back office system and any irregularities are noted for later reference.

Data is ratified as per AURN recommended procedures. During calibrations, a zero reading is taken from the equipment using either a gas of known concentration or by the use of scrubbers. Span gas of a known concentration is then applied to the system to ensure consistency.

These readings are then used to adjust any offset of the baseline of the data. A correction factor is then calculated and applied as a linear correction factor for the data subsequent to the previous calibration. After the calibration factors have been applied, the data is further screened for errors by the Environmental Services team.

PM_{10} and $PM_{2.5}$ Monitoring Adjustment

PM_{10} data has been "factored" by applying a 1.3 multiplier to give "PM10 Gravimetric Equivalent" values, with further data corrections using the King's College Volatile Correction Mode. Further information on the Volatile Correction Model can be found at the following link.

$PM_{2.5}$ concentrations were derived by applying a conversion factor of 0.7 to the PM_{10} data. This enabled for results to be graphed and compared against air quality objectives. In 2020 a sharp cut cyclone PM2.5 head was fitted to CM5 allowing the direct monitoring of this pollutant for the first time, the data of which is visible in the report.

Automatic Monitoring Annualisation

Where less than 75% (but > 25%) of the data set is available, the continuous monitoring station data has been annualised as per Technical Guidance LAQM.TG(16). This procedure was necessary for CM6, attributed to a data capture rate of 60.6% for NO_2. The following background stations were used:

- Coventry Allesley (NO_2)
- Leicester University (NO_2)
- Nottingham Centre (NO_2)

Guidance was followed as closely as possible when selecting background stations for use in annualisation. Annualisation calculations for this station were submitted to Defra as a separate document.

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.

No automatic NO_2 monitoring locations within Blaby District required distance correction during 2020. All five stations are at roadside and within 2 metres of the highway.

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

Site ID	Annualisation Factor Coventry Allesley	Annualisation Factor Leicester University	Annualisation Factor A594 Roadside	Average Annualisation Factor	Raw Data Annual Mean	Annualised Annual Mean	Comments
43	0.9769	1.0002	1.0170	0.9980	23.8	23.8	
88	0.8719	0.8888	0.8956	0.8854	19.0	16.9	

Appendix D: Maps of Monitoring Locations and AQMAs

An assessment of 2020 results in the context of past data has been carried out for the following areas:

- AQMA 1 – A5460 Narborough Road South
- AQMA 2 – M1 corridor in Enderby and Narborough
- AQMA 3 – M1 corridor between Thorpe Astley and Leicester Forest East
- AQMA 4B – Enderby Road, Whetstone
- AQMA 6 – Mill Hill, Enderby
- Enderby Village
- Lubbesthorpe Road, Braunstone Town
- Sharnford Hill, Sharnford
- Croft Road, Cosby
- Glenfield Village
- New Bridge Road and Leicester Road, Glen Parva
- Stoney Stanton Village
- Sapcote Village
- Elmesthorpe Railway Bridge
- Braunstone Town and Thorpe Astley
- Desford Road, Kirby Muxloe
- Aston Firs, near Sapcote
- Main Street, Kilby

Maps showing the monitoring locations and corresponding average annual nitrogen dioxide concentrations (μg/m^3) are shown in Figures 1 to 18.

AQMA 1 – A5460 Narborough Road South

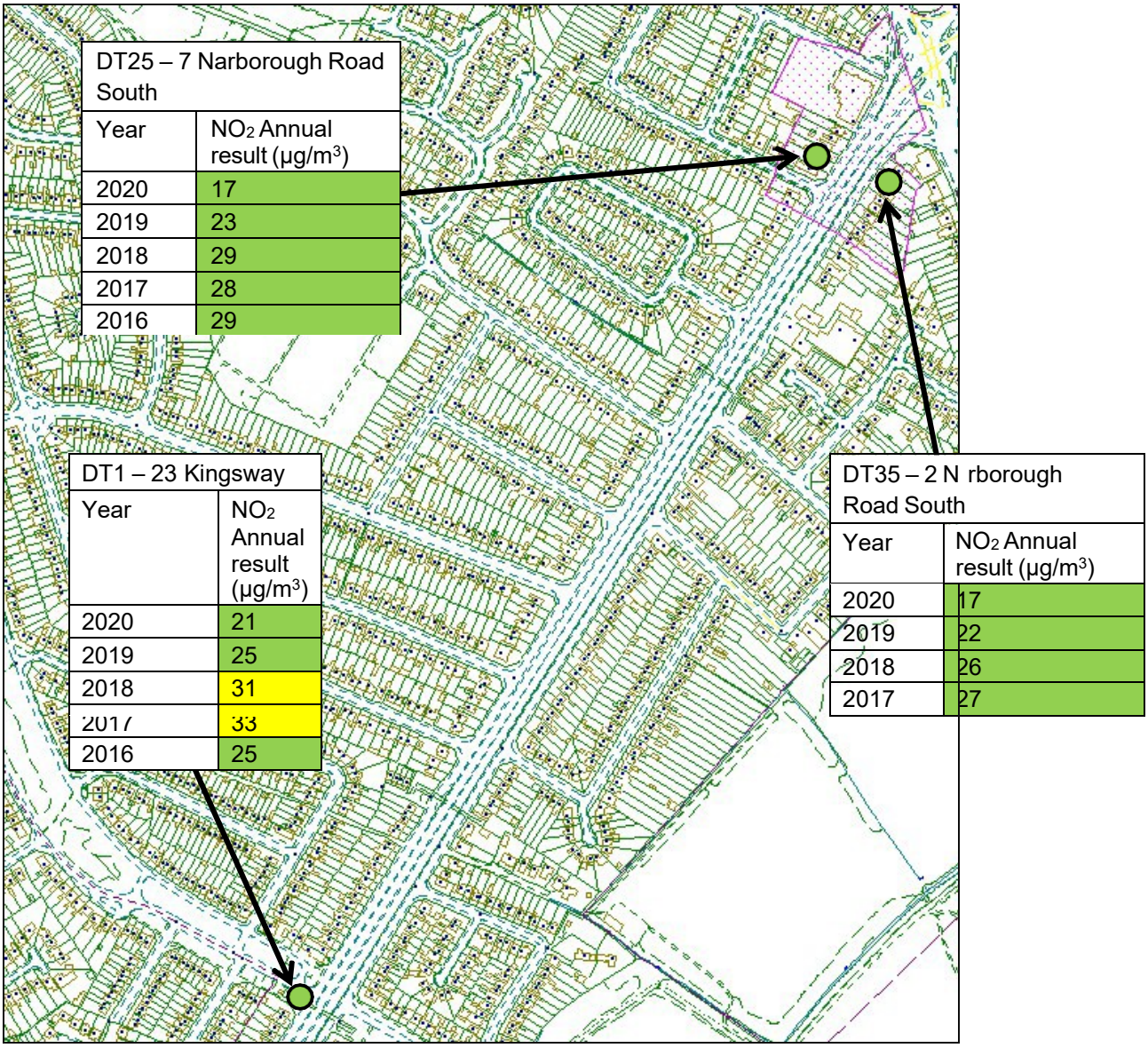


Figure 1: Map showing the locations and results of diffusion tubes in AQMA 1, including Narborough Road South and parts of Braunstone Town. AQMA boundary represented by pink outline. Results have been rounded to nearest whole number. 40 µg/m^3 is the air quality objective for this pollutant. © Crown copyright. All rights reserved.

Monitoring continued in this area, though a few tubes were removed in 2020, to support the low NO_2 results from 2019 and earlier years. The levels of NO_2 have reduced in all diffusion tubes and levels remain well below the air quality objective. The current boundary is being maintained due to the potential impacts of new developments and road infrastructure proposals. The results are displayed in Figure 1.

AQMA 2 – M1 corridor in Enderby and Narborough

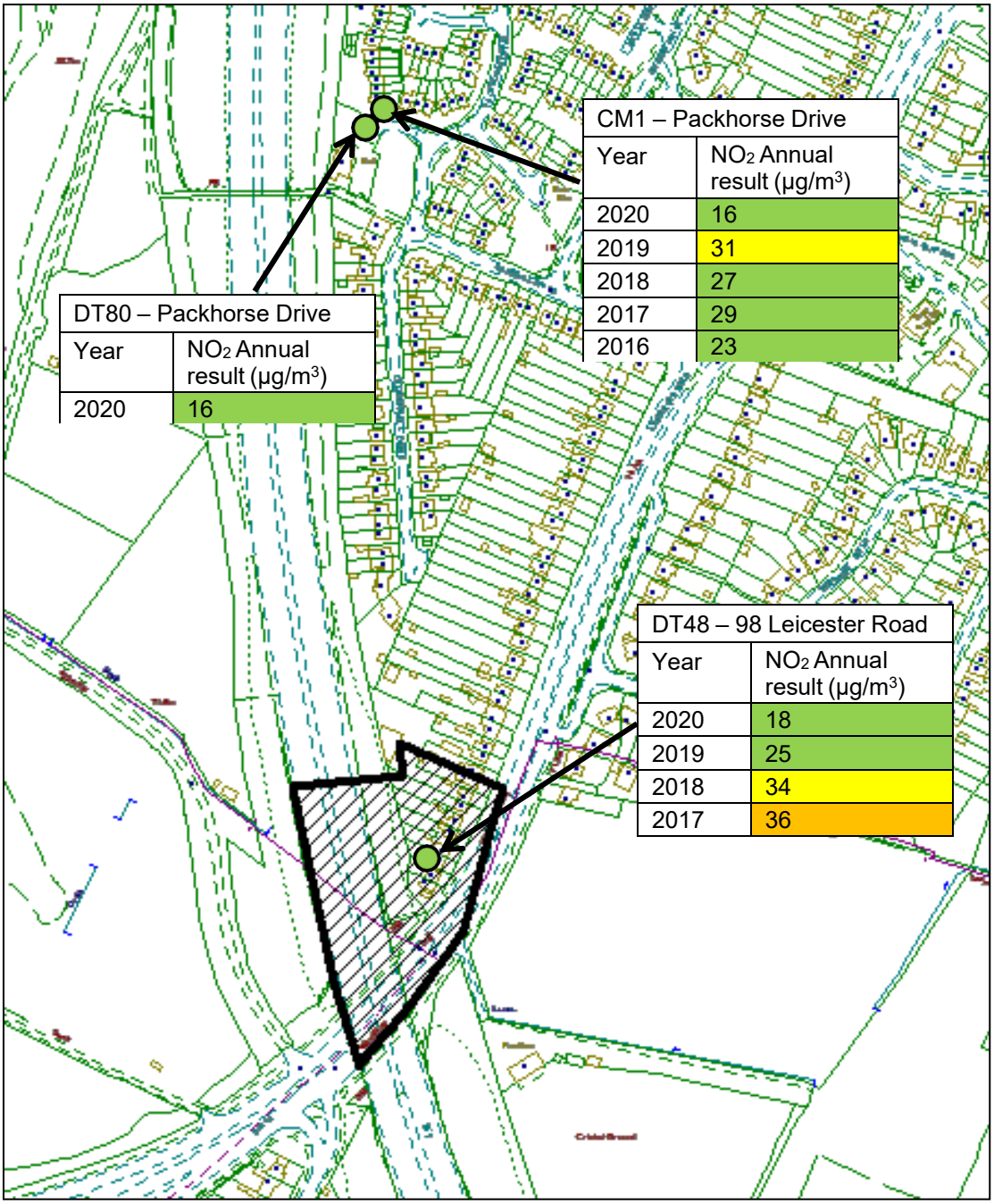


Figure 2: Map showing the locations and results of diffusion tubes and continuous monitoring stations in AQMA 2, along a corridor of the M1 between Enderby to the north and Narborough to the south. AQMA boundary represented by black outline. Results have been rounded to nearest whole number. 40 µg/m^3 is the air quality objective for this pollutant.

This AQMA was reduced in size in 2020, in line with 5 years of monitoring data showing a consistent reduction in levels of NO_2. A number of the diffusion tubes have been removed, but monitoring is still taking place in the remaining boundary area, and these results have shown a reduction to NO_2 levels this year, in line with other areas across Blaby District. The levels will continue to be monitored over the next few years before any further decisions are made regarding the size of the AQMA.

Due to logistical reasons Continuous Monitoring Station 1 (CM1) has remained in the former boundary area, and will continue to remain there for the forseeable future and this will provide further justification data for the reduction of AQMA 2.

AQMA 3 – M1 corridor between Thorpe Astley and Leicester Forest East

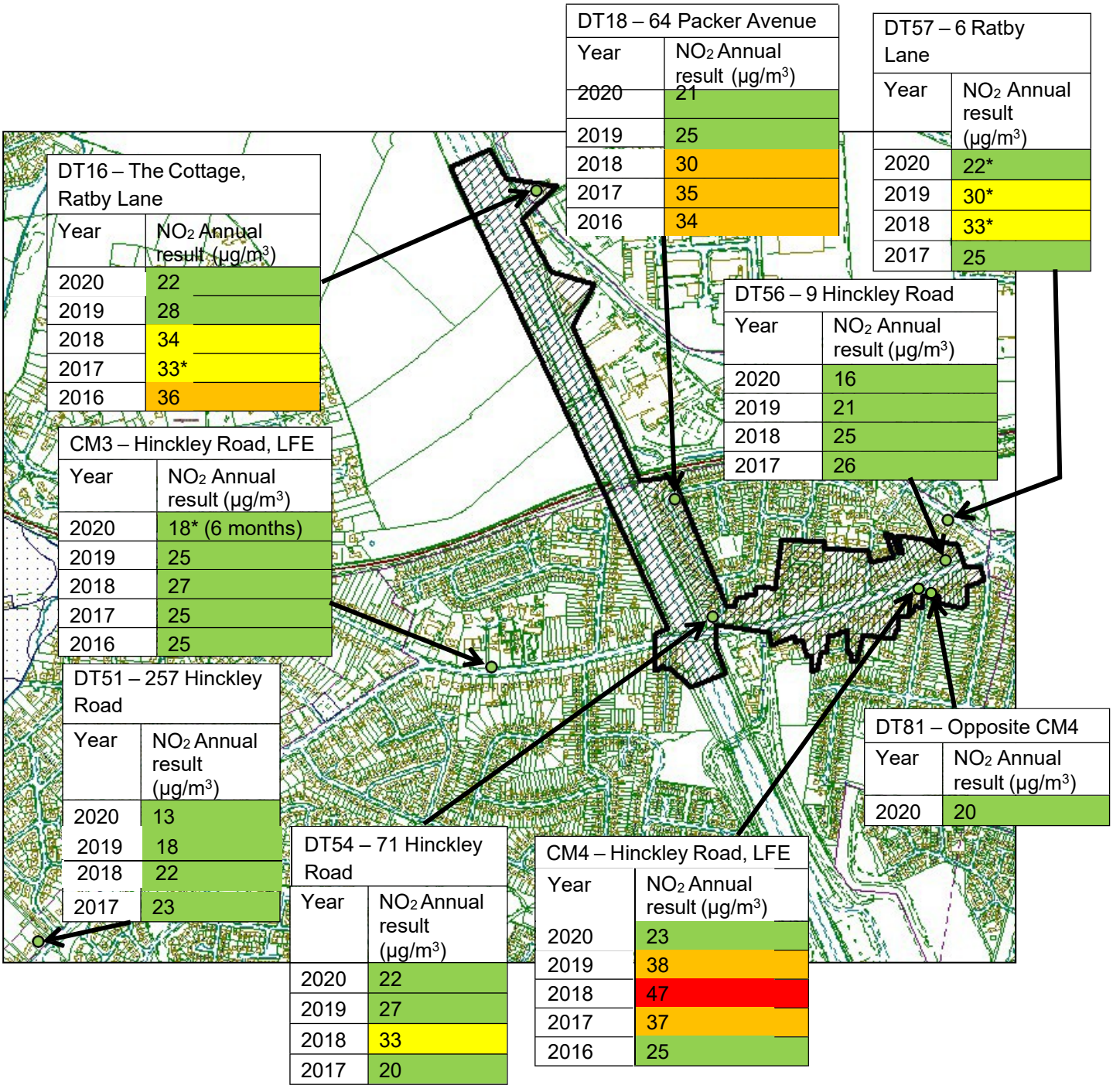


Figure 3: Map showing the locations and results of diffusion tubes and continuous monitoring stations in AQMA 3, along a corridor of the M1 between Thorpe Astley and Leicester Forest East. AQMA boundary represented by black outline. Results have been rounded to nearest whole number. * represents a result that has been annualised and/or distance corrected. 40 µg/m^3 is the air quality objective for this pollutant. © Crown copyright. All rights reserved.

Continuous Monitoring Station 4 (CM4) (Hinckley Road, Leicester Forest East) has recorded concentrations of nitrogen dioxide close to or in exceedance of the AQOover the last 3 years. The site lies in close proximity to a busy crossroads within AQMA 3, directly adjacent to one of the main roads into Leicester City centre (the A47). The road has high volumes of traffic throughout the day, though traffic levels are likely to have reduced in 2020. Data capture was found to be good at 89.7%. The levels of NO_2 were found to be reduced this year, to 23.3 µg/m^3, this supports the data obtained from the diffusion tubes located in this area and the reduction is in line with the reduced levels across Blaby District.

The Continuous Monitoring Station (CM3) was moved to Glenfield on 8 July 2020. The 2020 result, data captured by the station indicates a concentration of 18µg/m^3, based on 6 months of data.

AQMA 4B – Enderby Road, Whetstone

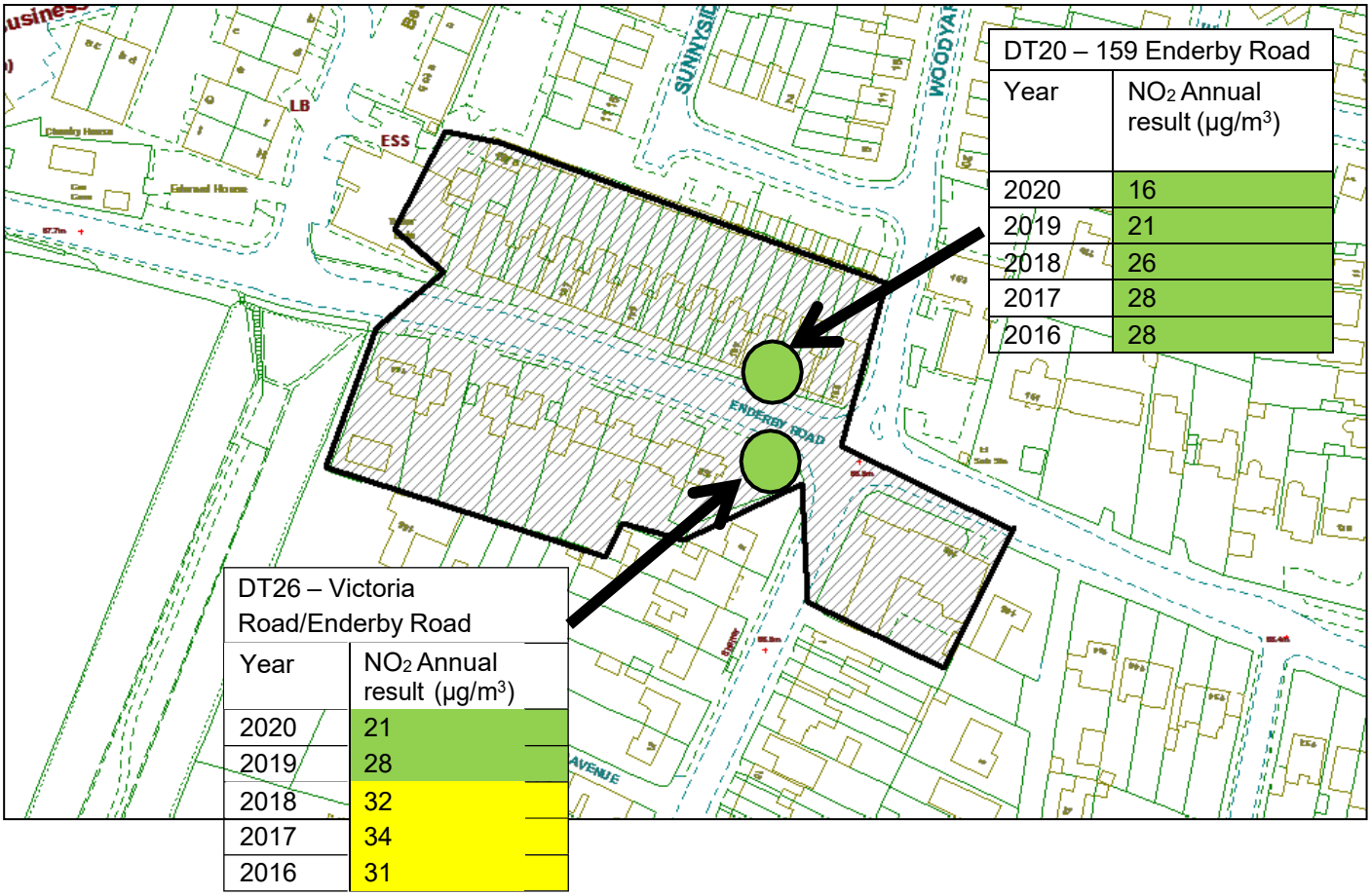


Figure 4: Map showing the locations and results of diffusion tubes in AQMA 4B, along Enderby Road in Whetstone. AQMA boundary represented by black outline. Results have been rounded to nearest whole number. 40 µg/m^3 is the air quality objective for this pollutant. © Crown copyright. All rights reserved.

This AQMA was reduced in size in 2020. Monitoring continued to be undertaken within the new AQMA boundary area, and the data for 2020 has shown a fall in NO_2 levels, of between 5-7 µg/m^3 in line with other monitoring locations across Blaby District. The results are displayed in Figure 4.

AQMA 6 – Mill Hill, Enderby

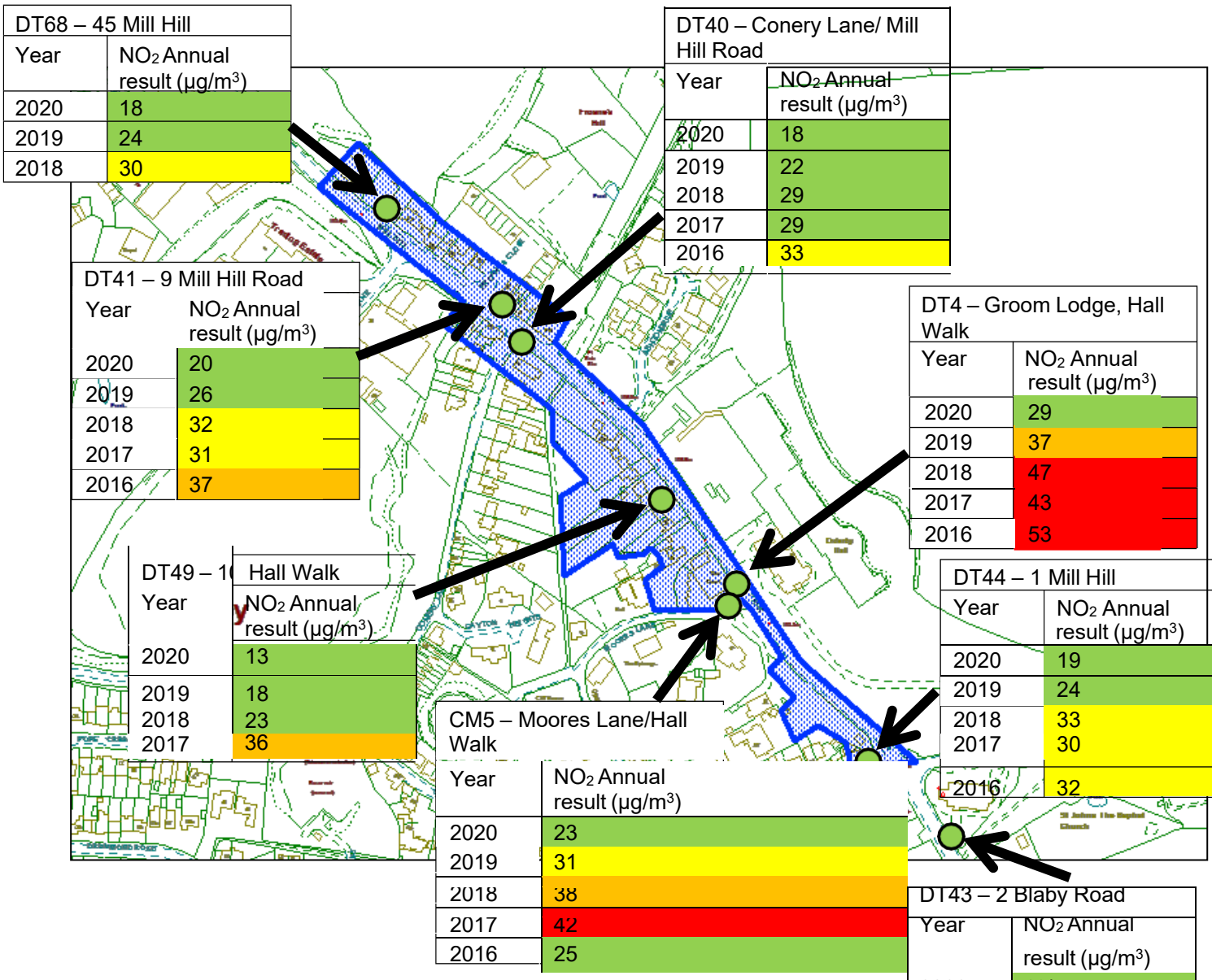


Figure 5: Map showing the locations and results of diffusion tubes and continuous monitoring stations in AQMA 6, along Mill Hill in Enderby. AQMA boundary represented by blue outline. Results have been rounded to nearest whole number. * represents a result that has been annualised and/or distance corrected. 40 µg/m^3 is the air quality objective for this pollutant. © Crown copyright. All rights reserved.

AQMA 6 was declared in January 2018 due to elevated levels of NO_2 being identified. A reduction in the levels of NO_2 were identified in 2019, but this was in part due to the low bias correction factor applied, as explained in ASR 2020. In 2020, Diffusion Tube 4 (Groom Lodge, Hall Walk) produced an annual concentration of 29 µg/m^3 which is a further reduction of 8 µg/m^3 compared to last year, a total reduction of 18 µg/m^3 when compared to 2018 data.

This diffusion tube is located in close proximity to Continuous Monitoring Station 5, which in this monitoring year fell to 23 µg/m^3. This is 8 µg/m^3 less than 2019 data.

Enderby Village

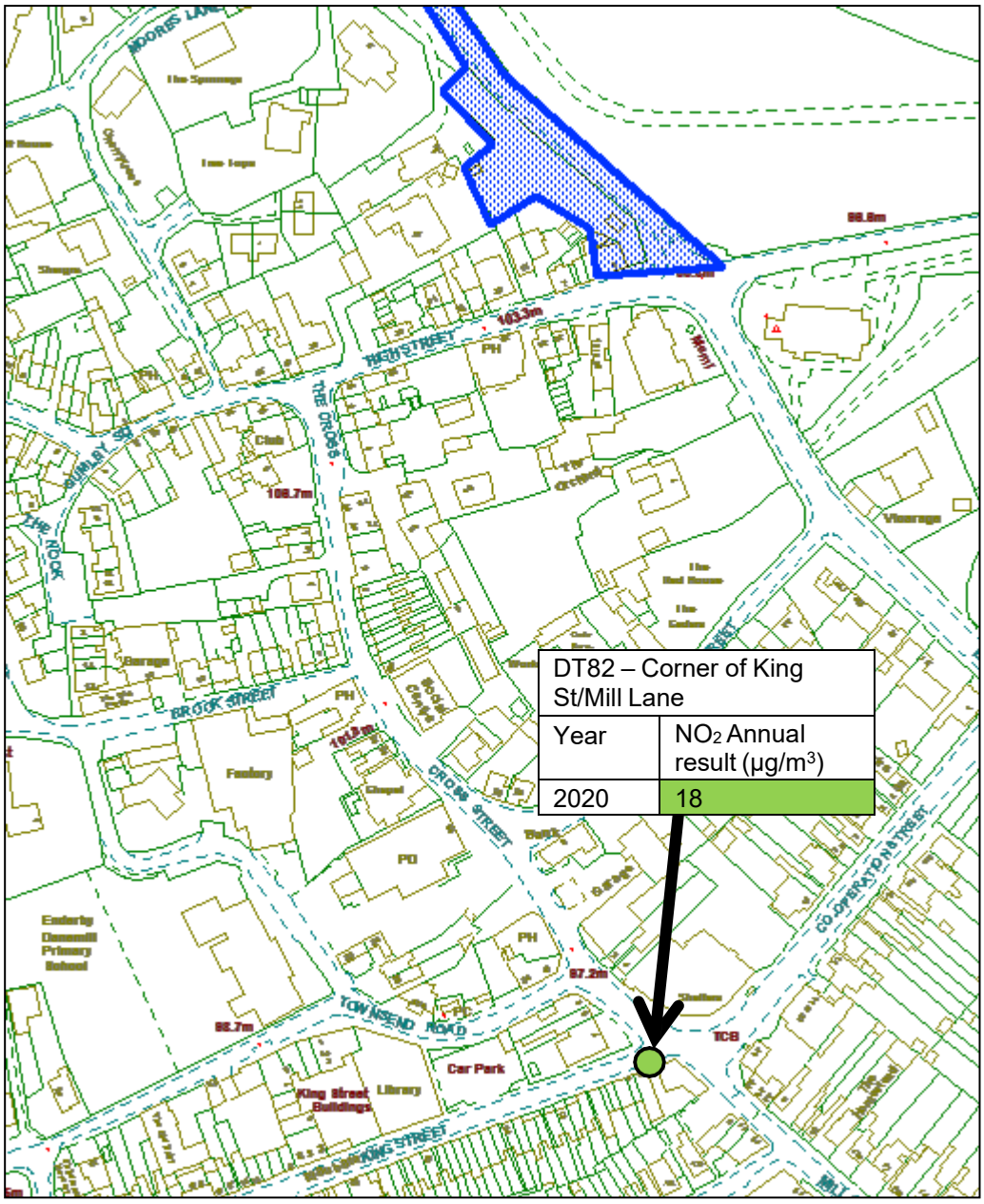


Figure 6: Map showing the locations and results of diffusion tubes in Enderby village. AQMA 6 boundary is visible to the north. Results have been rounded to nearest whole number. 40 µg/m^3 is the air quality objective for this pollutant. © Crown copyright. All rights reserved.

Monitoring was extended to a site in central Enderby in 2020 (Diffusion Tube 82) south of the AQMA boundary. Initial information gathered from this area indicates low levels of NO_2.

Lubbesthorpe Road, Braunstone Town

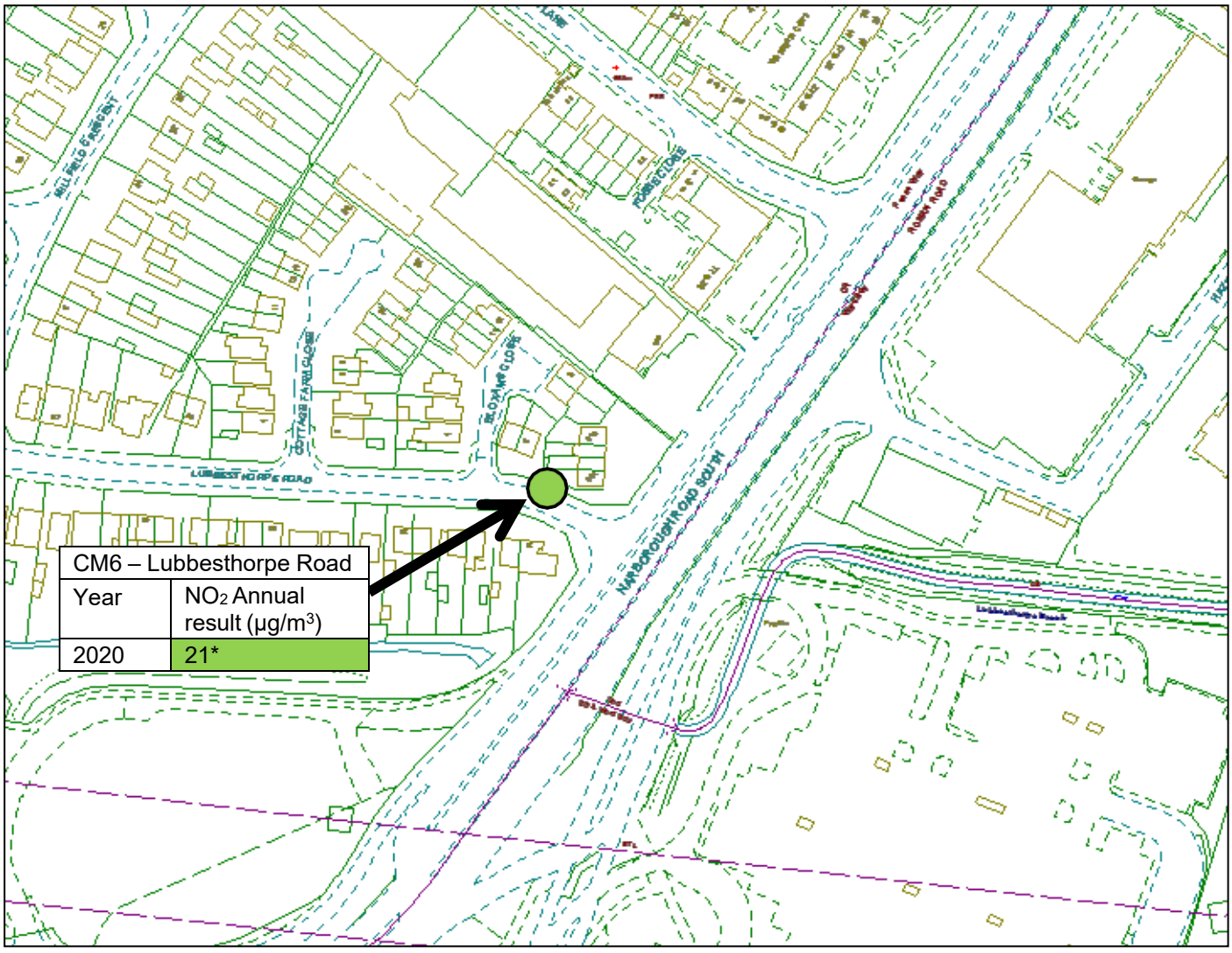


Figure 7: Map showing the location of a continuous monitoring station in Braunstone Town. Fosse Park is visible to the south. Results have been rounded to nearest whole number and annualised. 40 µg/m^3 is the air quality objective for this pollutant. © Crown copyright. All rights reserved.

following recent large scale developments. This enabled the purchase of an additional continuous monitor now positioned on Lubbesthorpe Road, representing the nearest receptor to the development. These results will be used to assess current and future impacts. 2020 data shows an average annual concentration of 21 µg/m^3 which is below the objective for this pollutant. Monitoring will continue in this location. The results are displayed in Figure 7.

Sharnford Hill, Sharnford

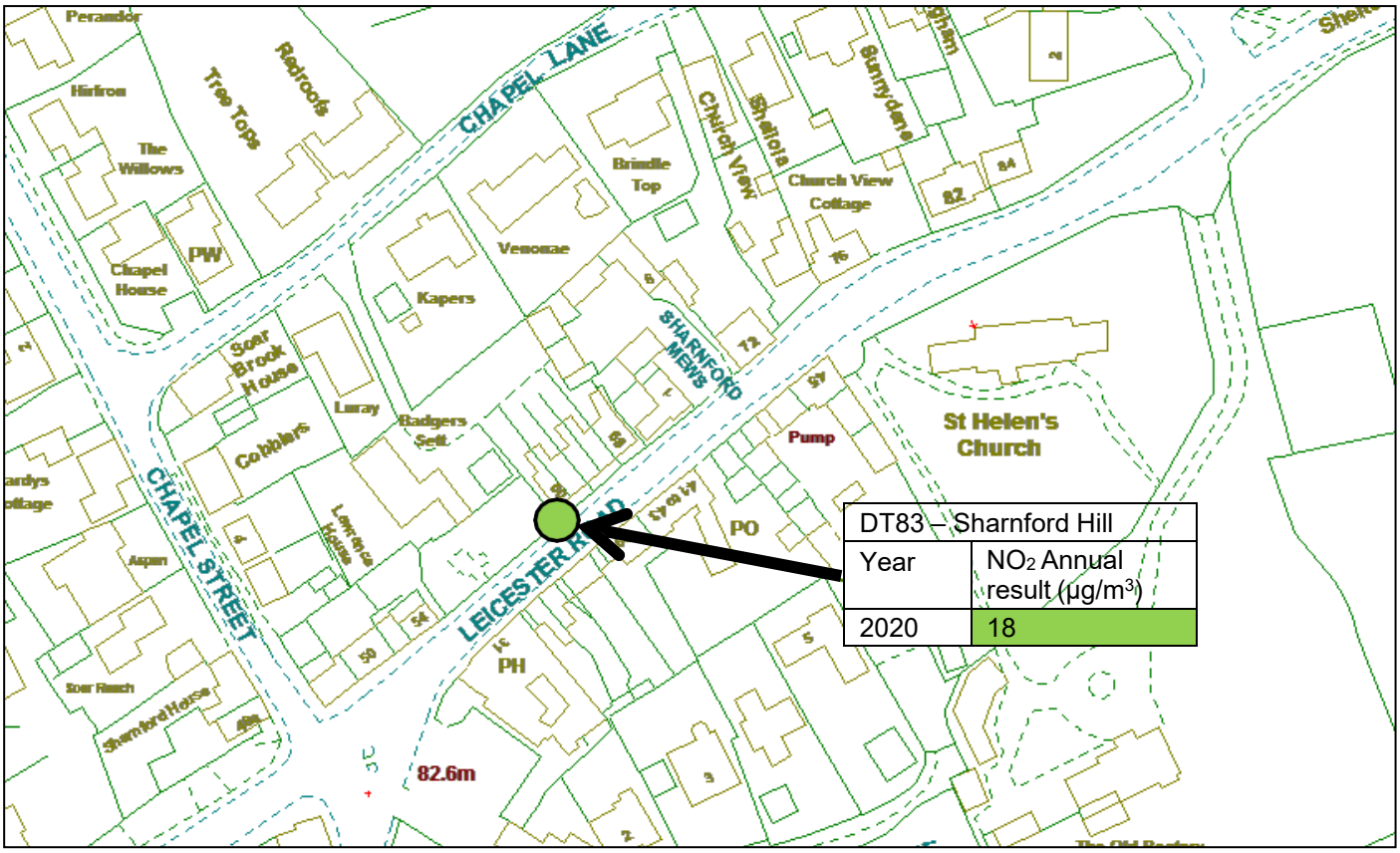


Figure 8: Map showing the locations and results of diffusion tubes in Sharnford. Results have been rounded to nearest whole number. 40 µg/m^3 is the air quality objective for this pollutant. © Crown copyright. All rights reserved.

Monitoring in Sharnford has consistently recorded NO_2 levels well below the air quality objective. In 2020, the diffusion tube on Sharnford Hill was reinstated and produced an annual figure of 18 µg/m^3 which can be seen in Figure 8.

Croft Road, Cosby

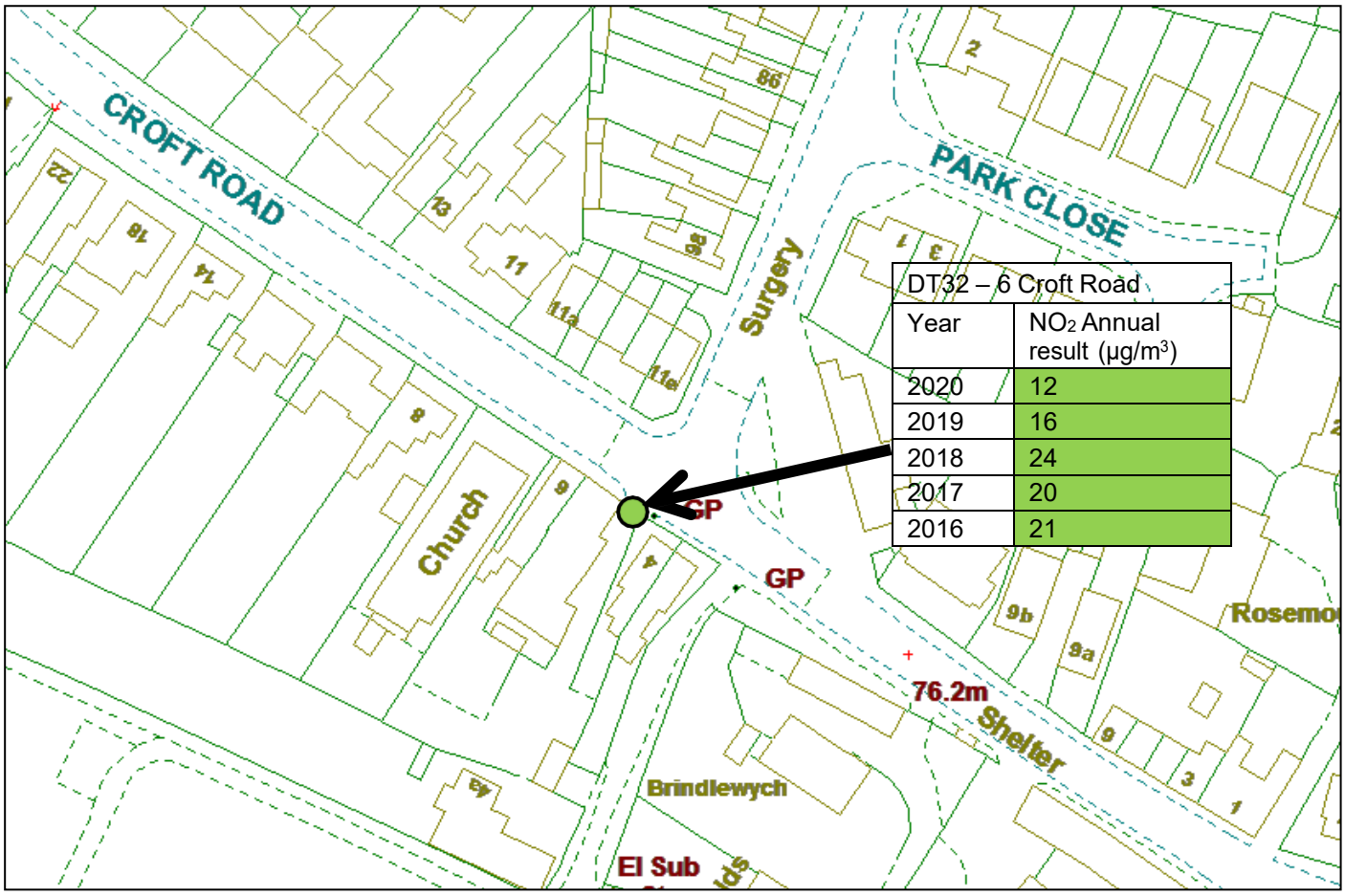


Figure 9: Map showing the locations and results of diffusion tubes in Cosby. Results have been rounded to nearest whole number. 40 µg/m^3 is the air quality objective for this pollutant. © Crown copyright. All rights reserved.

Monitoring remains in Cosby due to the potential impacts of local developments; with results consistently below the air quality objective. This year, the results have fallen again to 12 µg/m^3. The results are displayed in Figure 9.

Glenfield Village

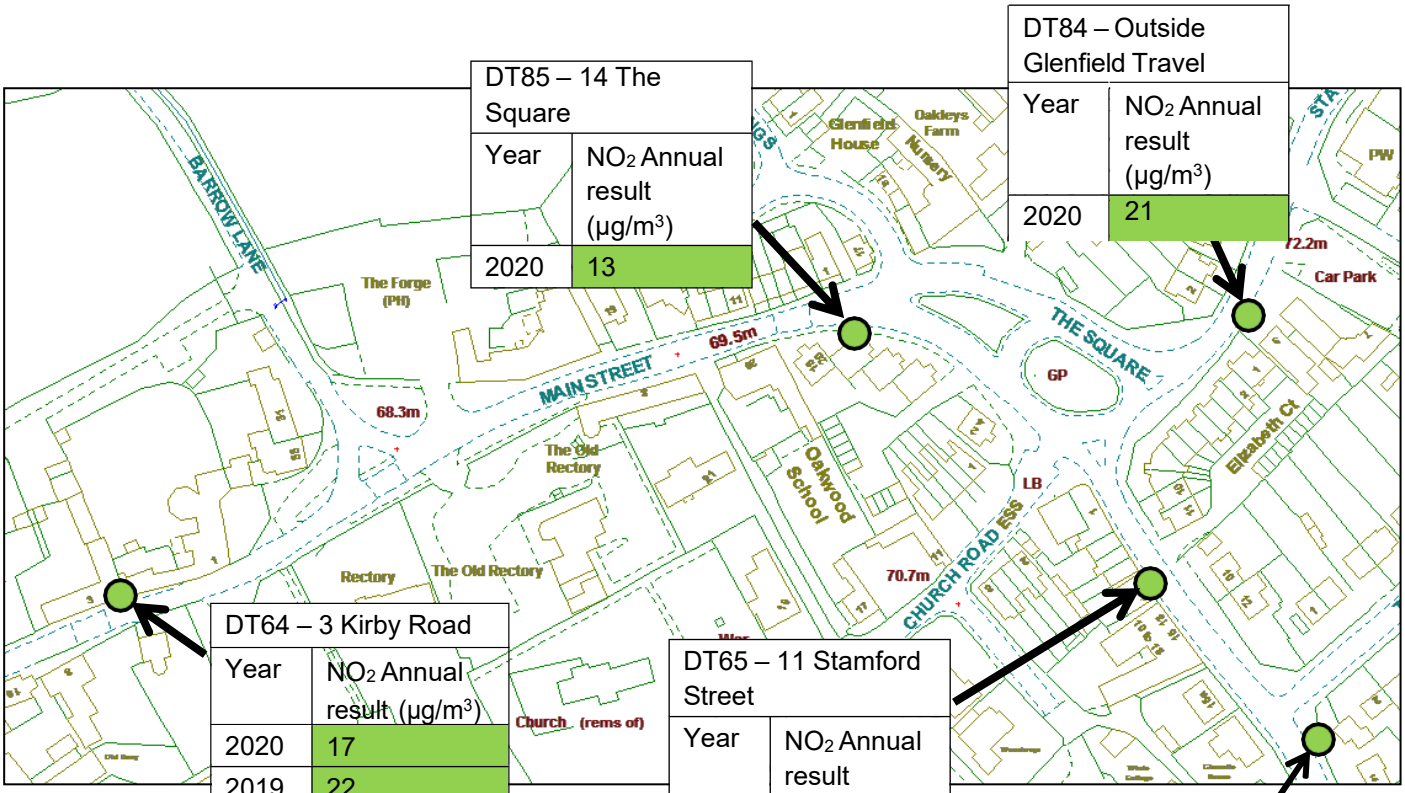


Figure 10: Map showing the locations and results of diffusion tubes and continuous monitoring stations in Glenfield. Note the result for CM7 is based on 6 months of data only. Results have been rounded to nearest whole number. 40 µg/m^3 is the air quality objective for this pollutant. © Crown copyright. All rights reserved.

As described in ASR 2020 monitoring was continued and extended across the village to assess whether there were any further exceedances. Additional tubes were added (Diffusion Tube 84 and Diffusion Tube 85) and the results can be seen on Figure 10. NO_2 levels were significantly lower in Glenfield in 2020 with Diffusion Tube 65 falling to 26 µg/m^3, a reduction of 7 µg/m^3.

The Continuous Monitoring station CM7 was moved to Stamford Street on 8 July 2020. Initial data captured by the station indicates a concentration of 21 µg/m^3. However this is based on 6 months of data and further information will be required to fully assess the results and draw conclusions. Monitoring has been extended and will continue throughout 2021 to evaluate the results, which will be reported in ASR 2022. The results are displayed in Figure 10.

New Bridge Road and Leicester Road, Glen Parva

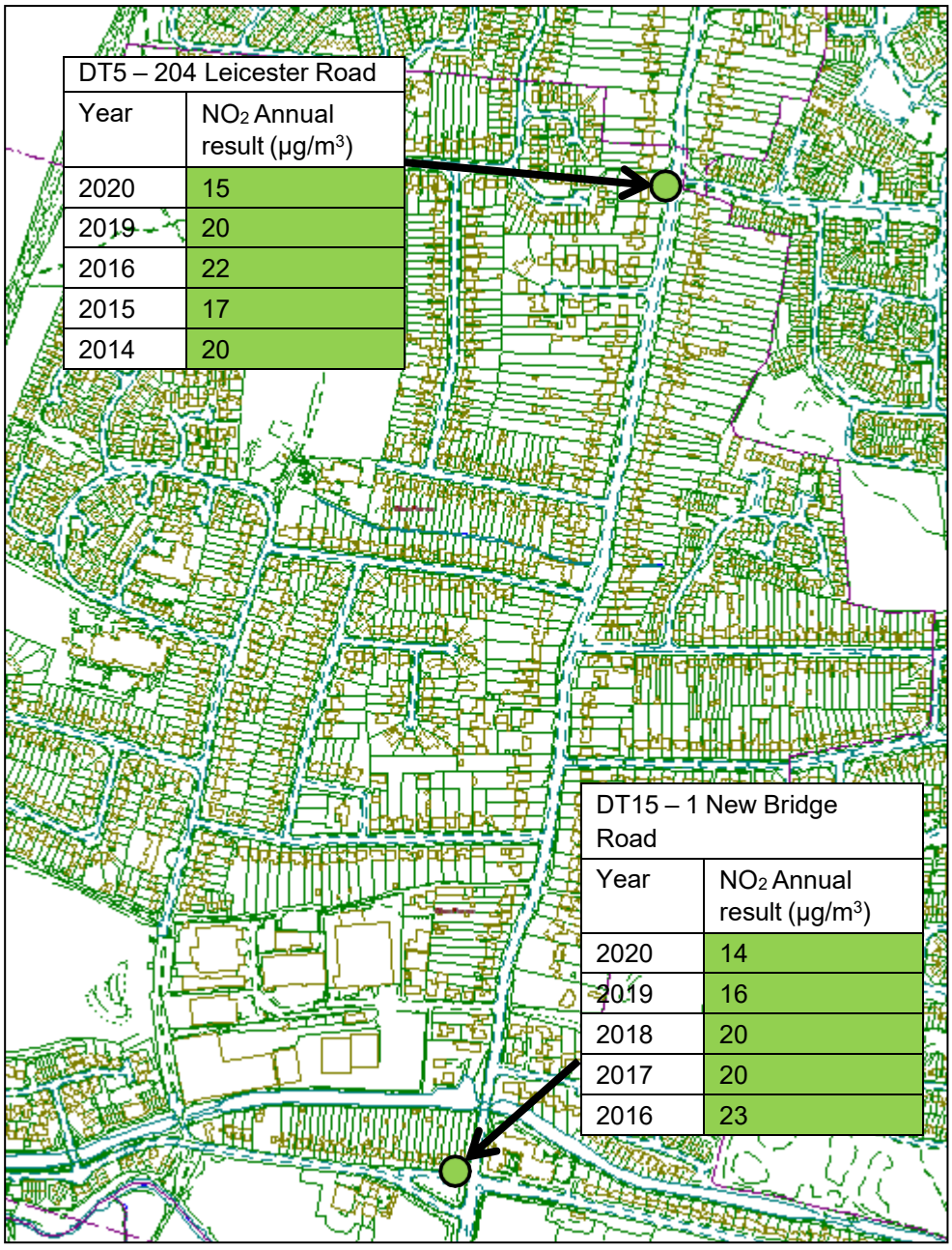


Figure 11: Map showing the locations and results of diffusion tubes in Glen Parva. Results have been rounded to nearest whole number. 40 µg/m^3 is the air quality objective for this pollutant.

The monitoring in Glen Parva has consistently shown low levels of NO_2. Diffusion Tube 5 was reinstated in 2019 and the results have not shown any increase when compared to previous years. The results have both reduced in 2020, in line with the other monitoring results experienced across Blaby District. The results are displayed in Figure 11.

Stoney Stanton Village

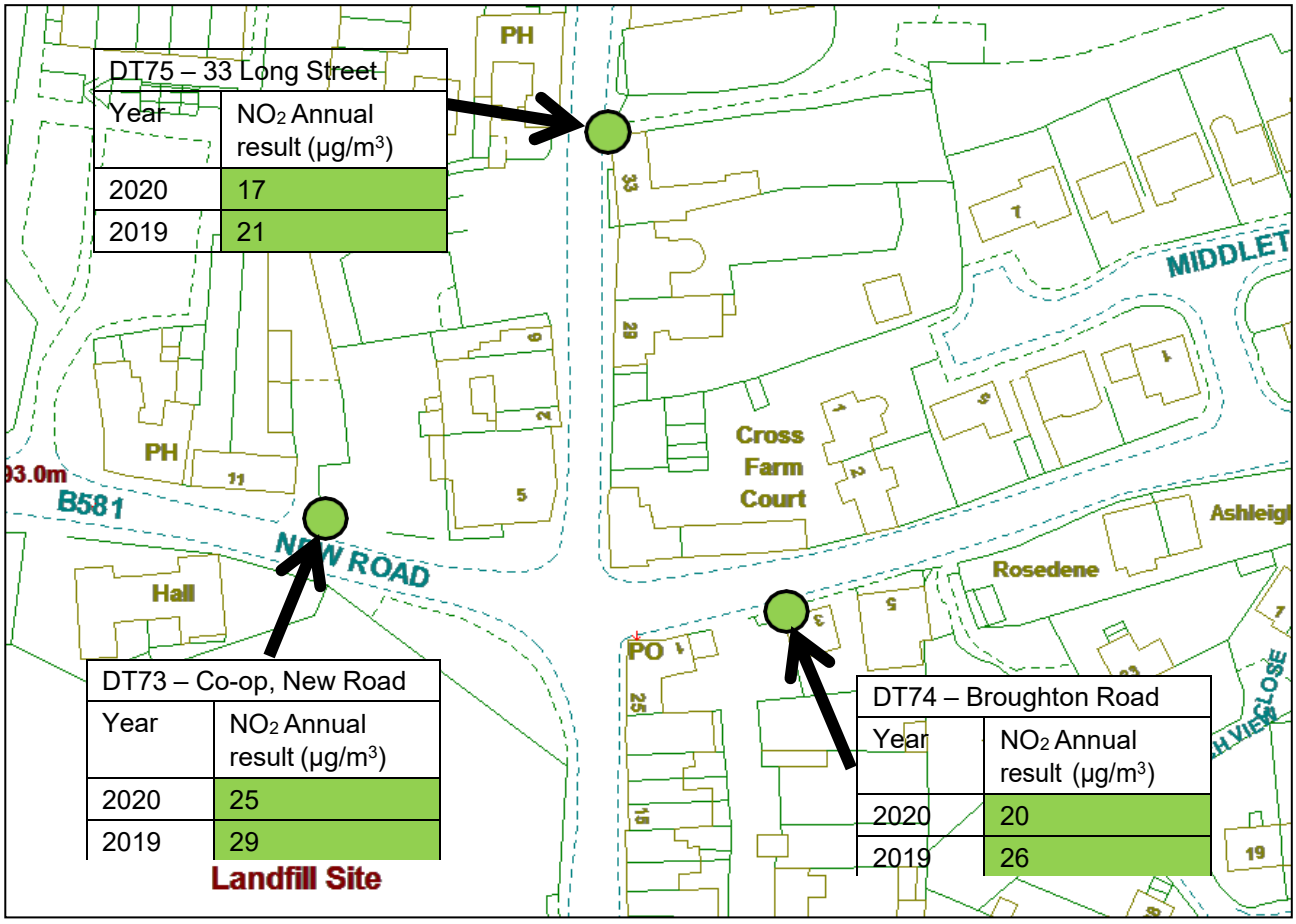
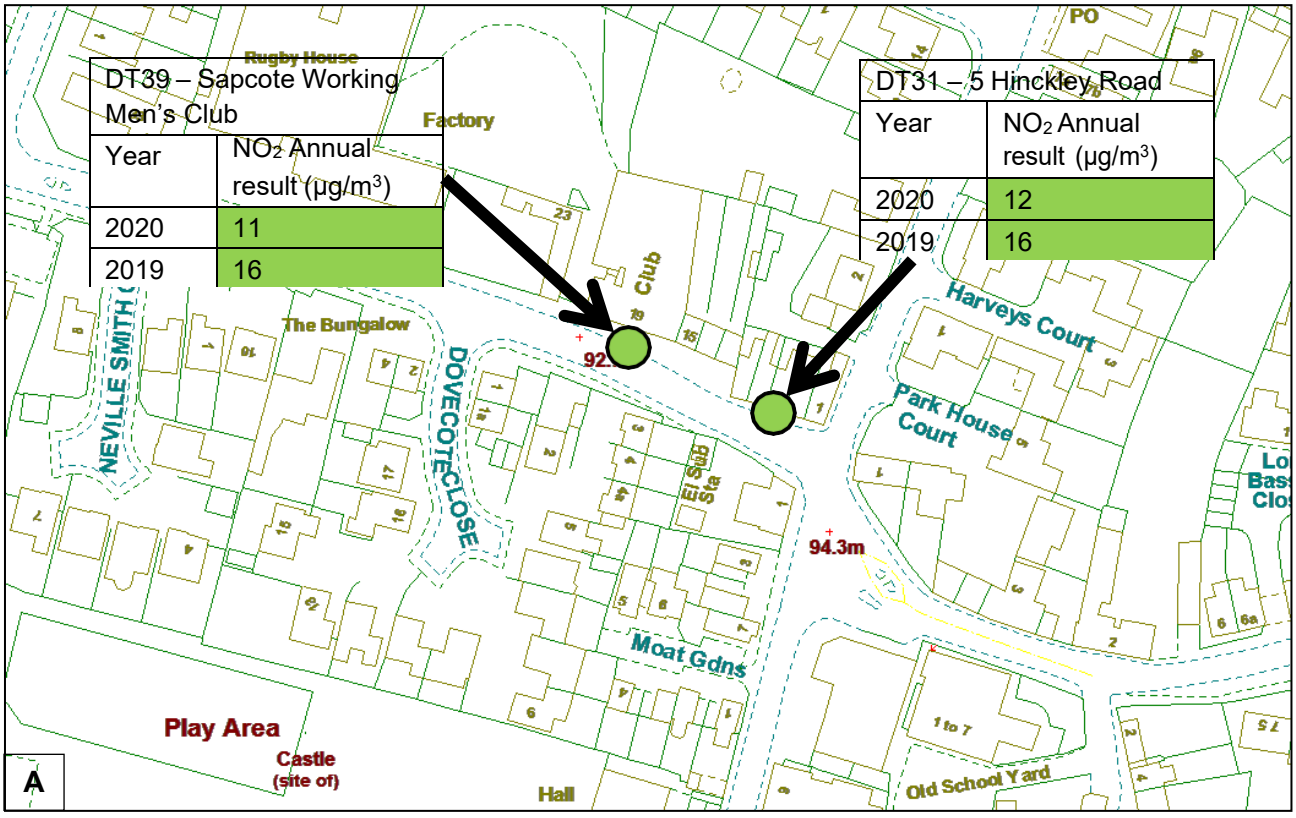


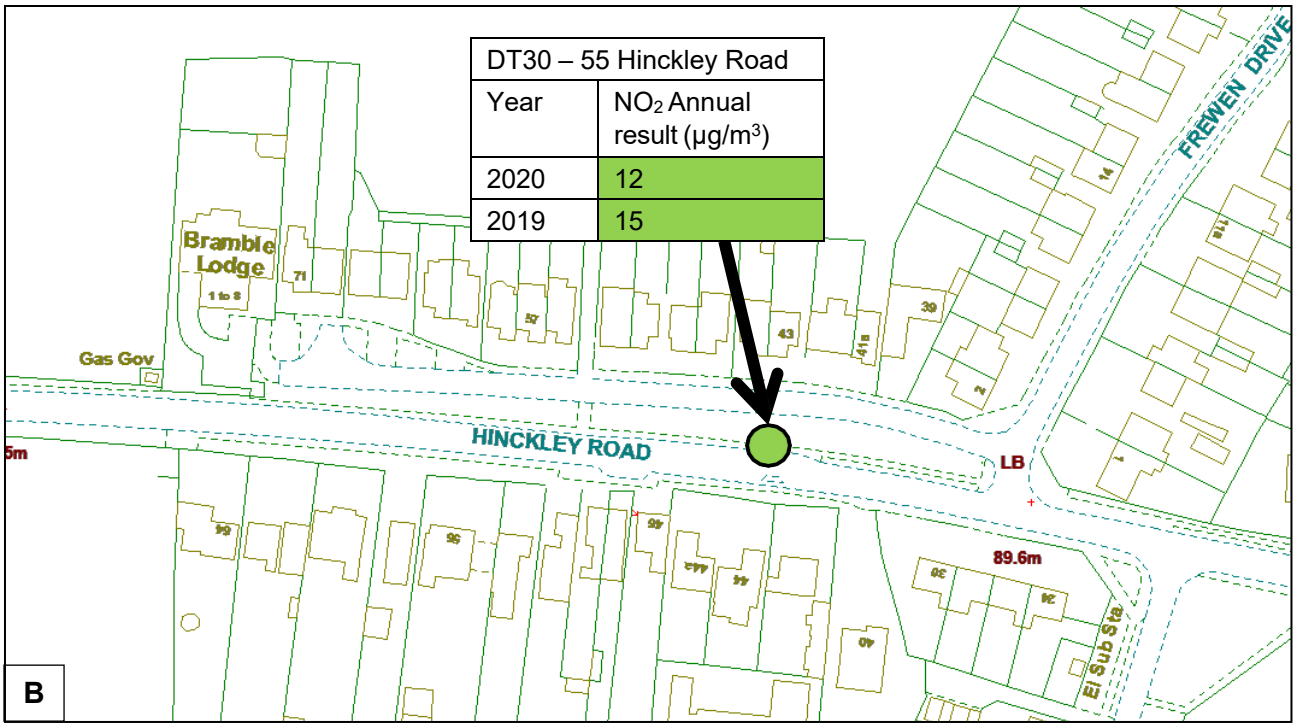
Figure 12: Map showing the locations and results of diffusion tubes in Stoney Stanton. Results have been rounded to nearest whole number. 40 µg/m^3 is the air quality objective for this pollutant. © Crown copyright. All rights reserved.

Stoney Stanton had some initial elevated levels of NO_2 in 2019 which led resources to be directed to exploring the area, through increased monitoring and the proposal to move the Continuous Monitoring Station (CM1) currently located in AQMA 2. The move of the CM1 has been delayed due to COVID-19 restrictions. Options for the relocation of existing equipment or the purchase of additional resources are being considered and will be reported on next year.

The 2020 monitoring results for this area are well below the air quality objective, for example Diffusion Tube 73 at 25 µg/m^3, consistent with the lower levels observed across Blaby District. The level of monitoring has increased in Stoney Stanton and will be reported in ASR 2022. The results are displayed in Figure 12.

Sapcote Village





Figures 13A and B: Maps showing the locations and results of diffusion tubes in Sapcote. Results have been rounded to nearest whole number. 40 µg/m^3 is the air quality objective for this pollutant. © Crown copyright. All rights reserved.

Concerns raised by elected members led to the introduction of monitoring in the village, beginning Monitoring continued in 2020, with results dropping, similar to other monitoring areas of Blaby District. Monitoring is continuing in 2021 and results will be reported in ASR 2022. The results are displayed in Figures 13A & B.

Elmesthorpe Railway Bridge

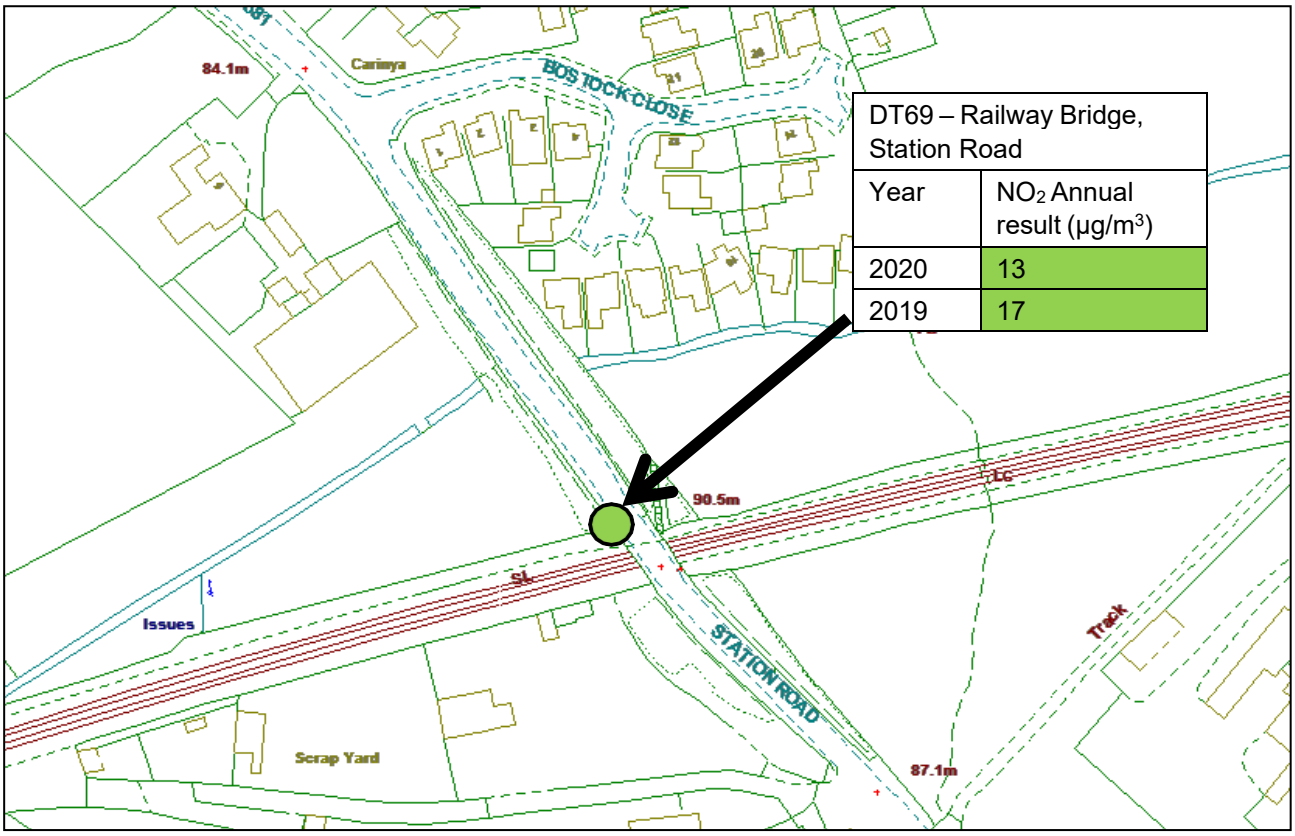
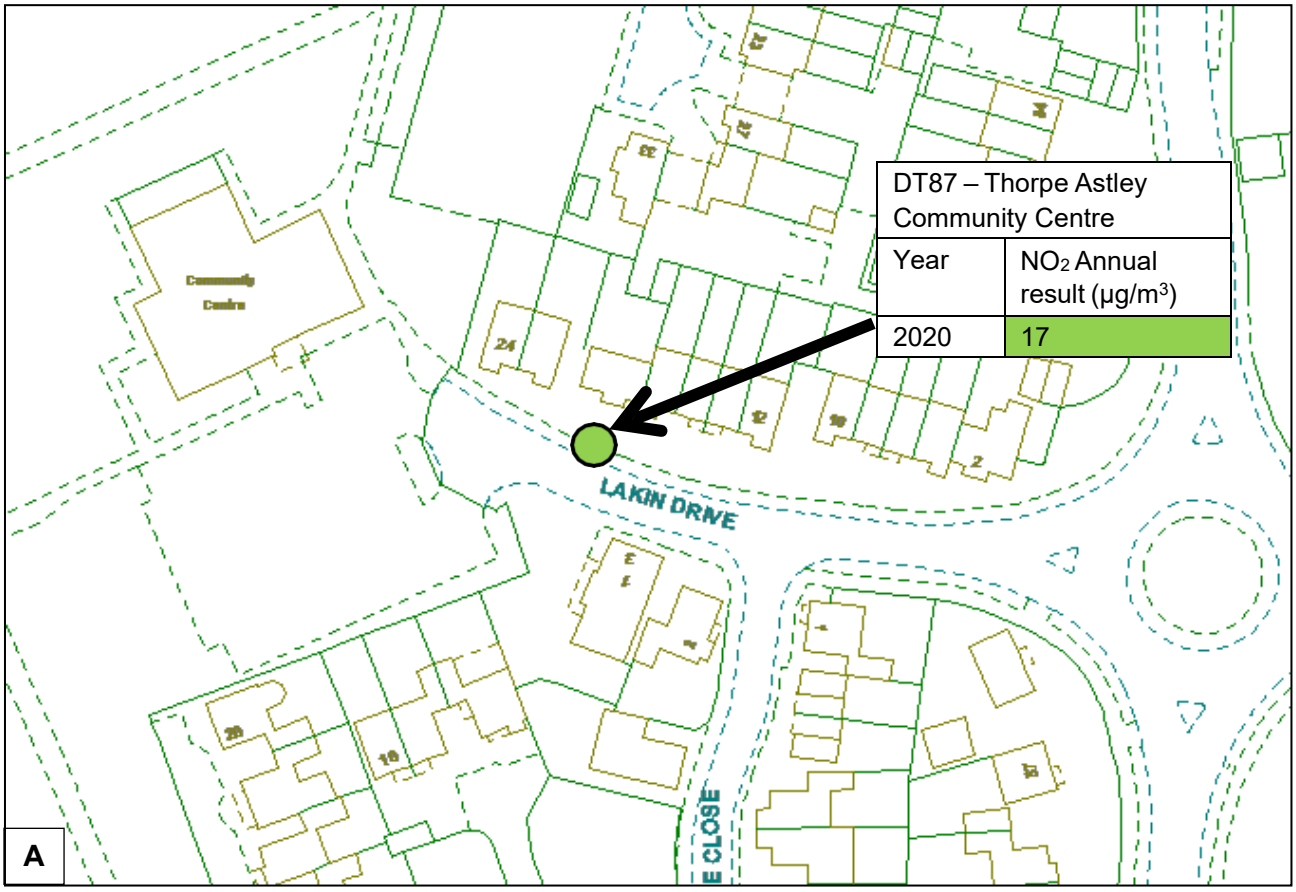
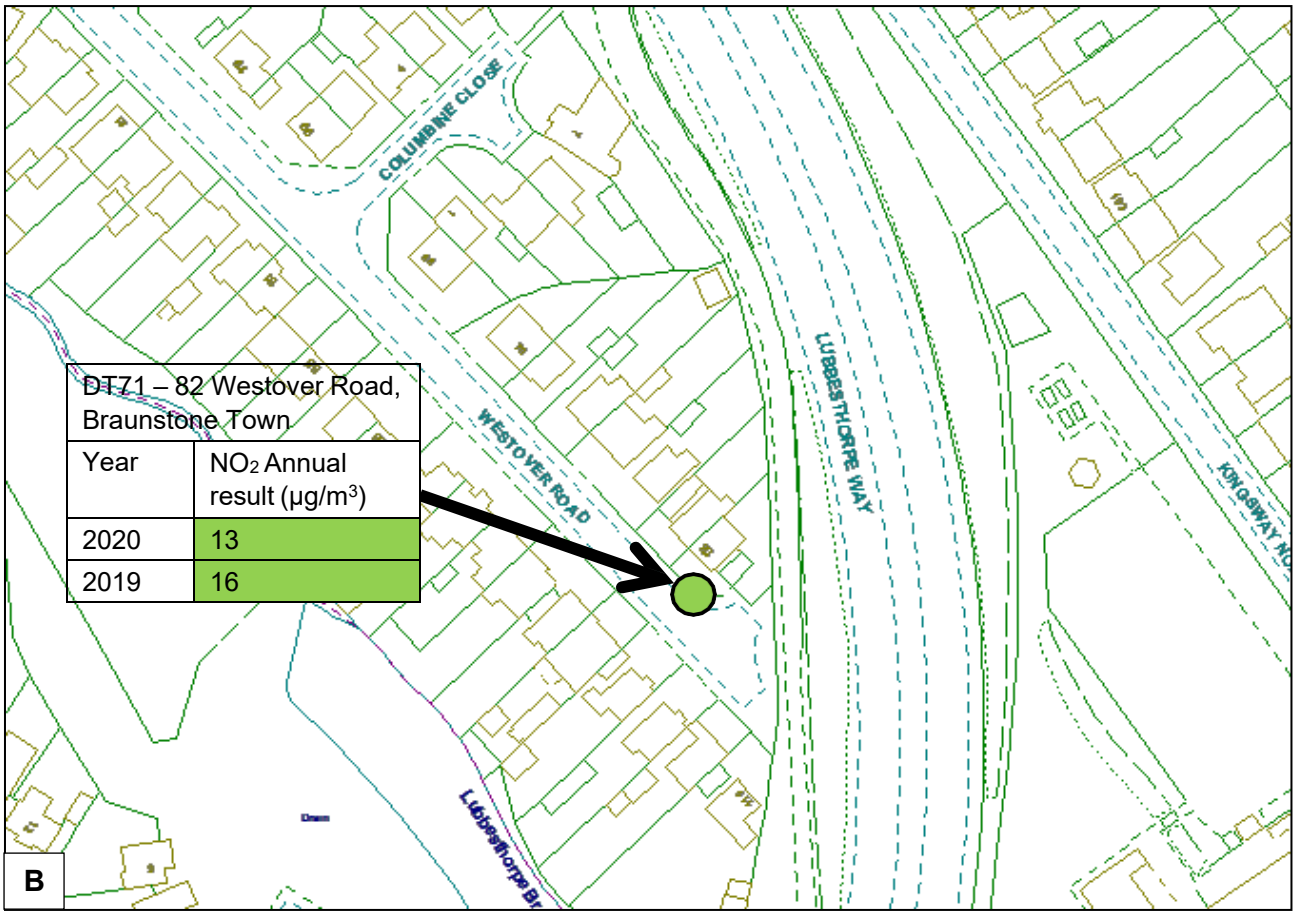


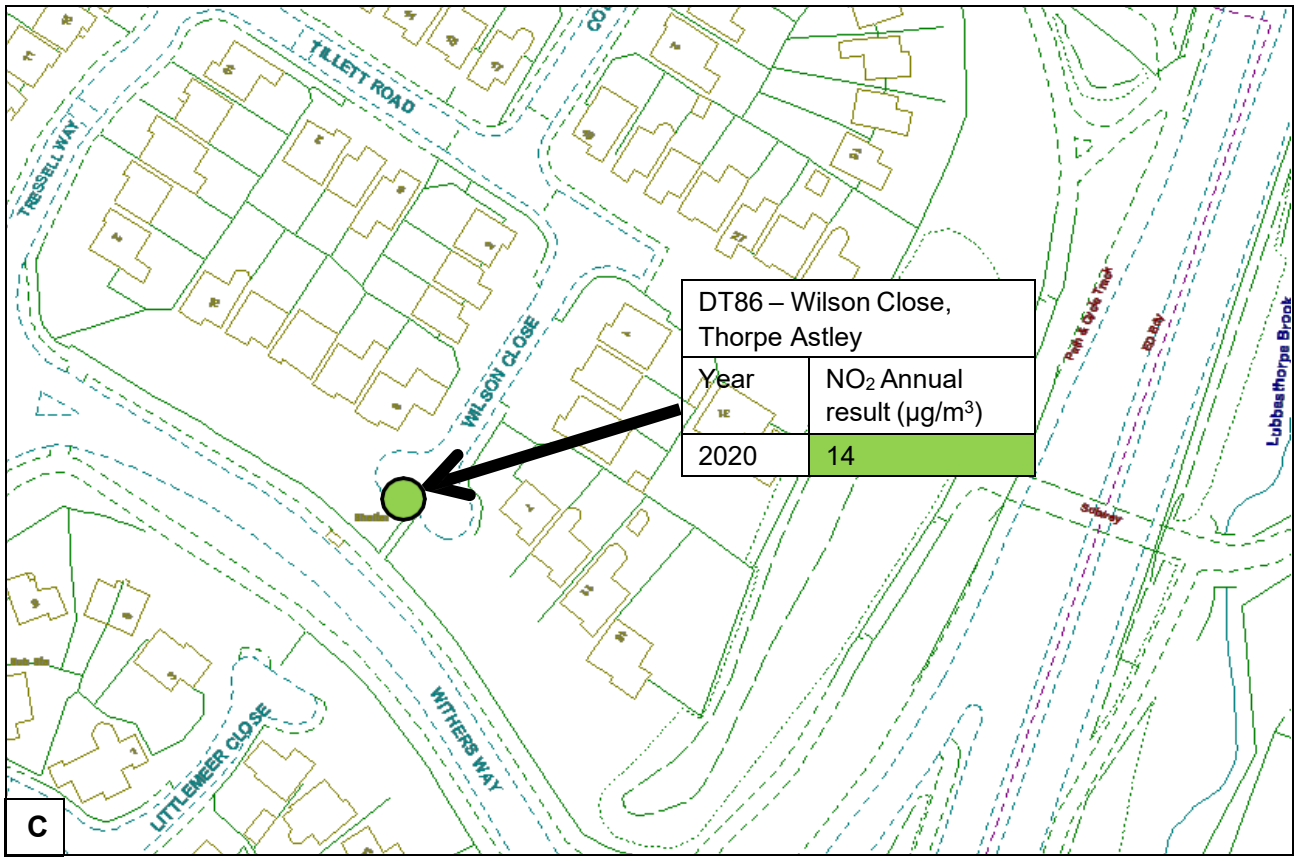
Figure 14: Map showing the locations and results of diffusion tubes near Elmesthorpe. Results have been rounded to nearest whole number. 40 µg/m^3 is the air quality objective for this pollutant. © Crown copyright. All rights reserved.

A diffusion tube was located near Elmesthorpe to obtain background levels in light of the proposed rail freight terminal site. The second year of monitoring has shown a concentration again below the air quality objective and in line with other areas across Blaby District. The results are displayed in Figure 14.

Braunstone Town and Thorpe Astley







Figures 15A, B and C: Maps showing the locations and results of diffusion tubes in Thorpe Astley. Results have been rounded to nearest whole number. 40 µg/m^3 is the air quality objective for this pollutant. © Crown copyright. All rights reserved.

Diffusion Tube 70 on Murby Way, introduced in 2019 due to local concerns, was removed in 2020, as a result of low levels of NO_2. Following a discussion with Braunstone Town Council, a diffusion tube was located at a position close to the Community Centre, and the closest housing to the M1 motorway. Initial analysis has shown very low results at 17 µg/m^3. The other monitoring locations within Thorpe Astley have also shown low levels on NO_2. This area will continue to be monitored in 2021. The results are displayed in Figures 15A, B & C.

Desford Road, Kirby Muxloe

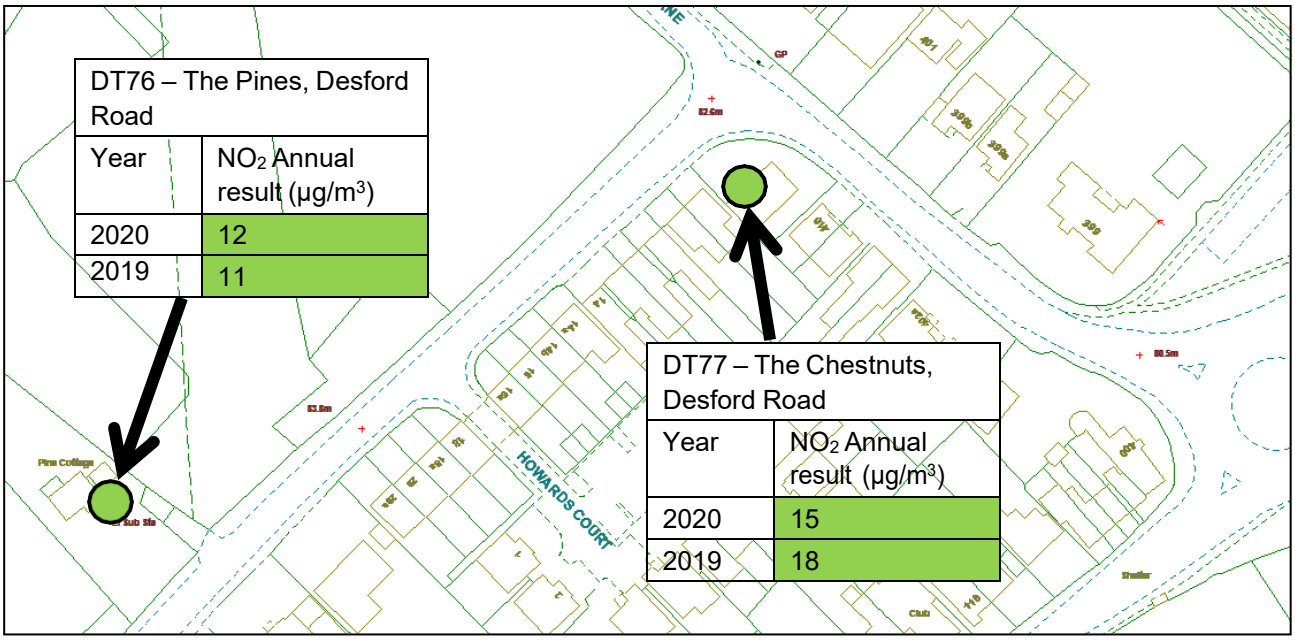


Figure 16: Map showing the locations and results of diffusion tubes along Desford Road in Kirby Muxloe. Results have been rounded to nearest whole number. 40 µg/m^3 is the air quality objective for this pollutant. © Crown copyright. All rights reserved.

Monitoring here began in 2019, with low levels of NO_2 identified. The results for 2020 show that levels remain well below the air quality objectives. The results are displayed in Figure 16.

Aston Firs, near Sapcote

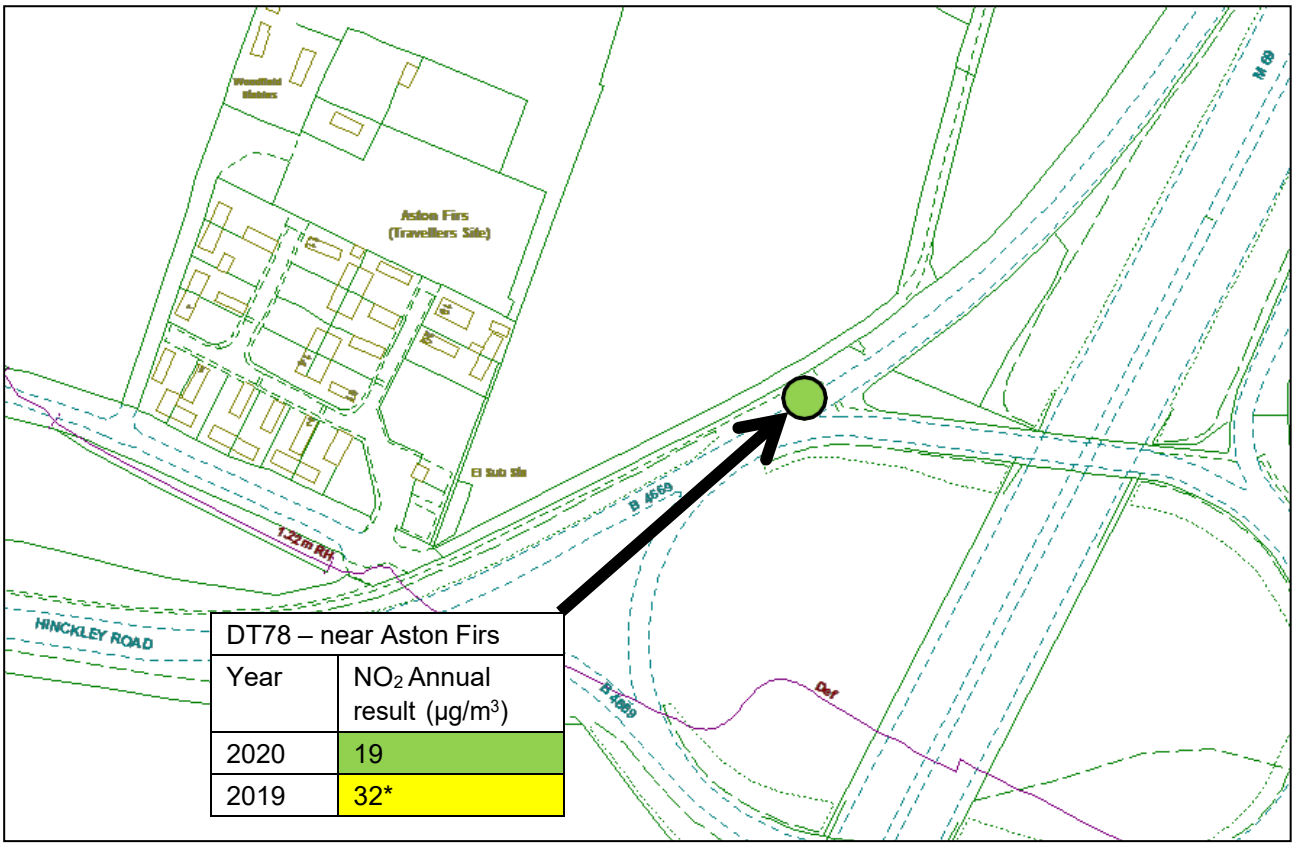


Figure 17: Map showing the locations and results of diffusion tubes near Aston Firs in Sapcote. The M69 can be seen to the east. Results have been rounded to nearest whole number. * represents a result that has been annualised and/or distance corrected. 40 µg/m^3 is the air quality objective for this pollutant.

A diffusion tube was located near Aston Firs to obtain background levels in light of the proposed rail freight terminal site. It is noteworthy that there has been a considerable drop in reported concentrations between 2019 and 2020, although the former was based on only 6 months of data. Both monitoring years are below the Air Quality Objective and monitoring will continue to be reported in ASR 2022. The results are displayed in Figure 17.

Main Street, Kilby

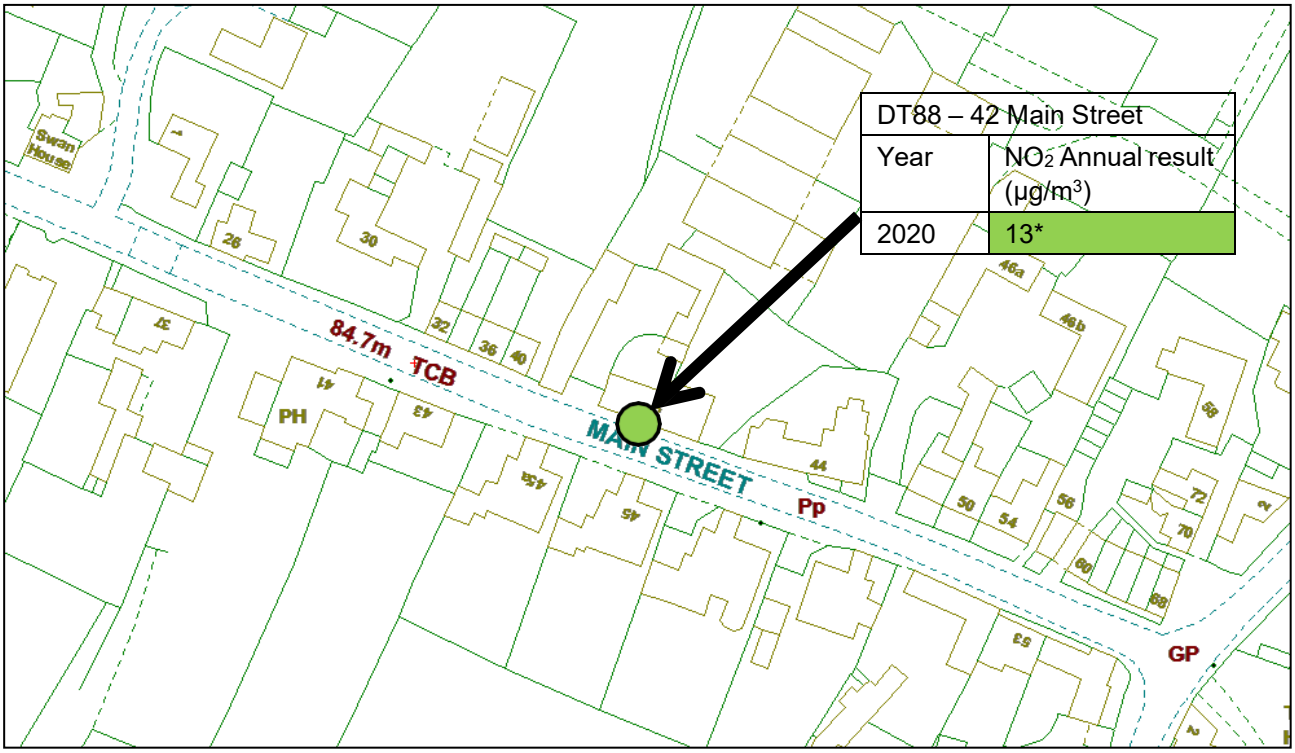


Figure 18: Map showing the locations and results of diffusion tubes in Kilby. Results have been rounded to nearest whole number. * represents a result that has been annualised and/or distance corrected. 40 µg/m^3 is the air quality objective for this pollutant. © Crown copyright. All rights reserved.

A diffusion tube was located in the village of Kilby, following concerns from the Parish Council. Initial concentrations are found to be below the Air Quality Objective although this is based on five months monitoring data. Monitoring will continue throughout 2021 and be reported in ASR 2022. The results are displayed in Figure 18.

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 were between 20 and 30% relative to pre-pandemic levels, which

[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

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 Blaby District

The below Tables show the monitored impacts of COVID-19 on air quality monitoring results from the five continuous monitoring stations in Blaby District.

Table 3.1 – Monthly Mean NO_2 and PM Concentrations (µg/m^3) comparison for period of Covid-19 Lockdown 1

		CM1	CM1	CM3	CM4	CM5	CM5
Month	Year	NO_2	PM_{10}	NO_2	NO_2	NO_2	$PM_{2.5/10}$
March	2019	29.9	11.6	21.7	30.4	25.7	16.2
	2020	14.9 ↓	13.0 ↑	22.9 ↑	26.4 ↓	27.4 ↑	8.6
April	2019	23.5	14.7	26.2	32.9	42.4	21.8
	2020	12.2 ↓	14.1 ↓	16.7 ↓	21.7 ↓	18.7 ↓	8.9
May	2019	28.3	10.7	20.2	33.4	37.5	17.0
	2020	10.8 ↓	12.3 ↑	14.4 ↓	23.1 ↓	13.5 ↓	8.1
June	2019	29.8	11.1	18.6	29.5	30.5	22.3
	2020	9.3 ↓	11.2 ↑	16.0 ↓	20.0 ↓	21.8 ↓	8.3

In Blaby District, an early comparison of data showed for NO_2 that the majority of months compared across the two years showed a reduction in concentration, most notably at CM1 and CM5, the latter being within AQMA 6. Many reductions are in excess of 50%, similar to the drop in vehicle movements reported nationally. Slight increases are visible in the

March comparison, although these are minimal and it should be noted that lockdown did not officially begin until March 23rd.

For Particulate Matter, changes in concentration are less pronounced with some locations actually increasing, although only minimally. It is difficult to make comparisons at site CM5 as in 2020 this station was modified to monitor $PM_{2.5}$ whilst the previous year measured PM_{10}. Rudimentary calculations applying a factor to derive $PM_{2.5}$ from measured PM_{10} concentrations do suggest a decrease in concentration between the years, although little confidence could be applied in attributing this to lockdown.

Table 3.2 – Monthly Mean NO_2 and PM Concentrations (µg/m^3) comparison for period of Covid-19 Lockdown 2

		CM1	CM1	CM3	CM4	CM5	CM5	CM6
Month	Year	NO_2	PM_{10}	NO_2	NO_2	NO_2	$PM_{2.5/10}$	NO_2
Nov	2019	26.4	12.1	-	36.7	36.6	16.2	-
Nov	2020	18.4 ↓	13.3 ↑	-	23.6 ↓	31.6 ↓	10.1	24.0

The second lockdown period was considerably shorter although NO_2 decreased at all sites when comparing to 2019 data. A most notable reduction was seen at CM4 with a 35% drop in concentration between years. The site is situated on a busy crossroads and major route into Leicester city centre and arguably this lockdown had the effect of reducing the concentration seen. PM_{10} concentrations increased slightly at CM1, as with lockdown 1. Data has been omitted at CM3 as this station was relocated in July 2020 meaning a comparison was not possible. CM5 suffered from the same split in monitored PM fraction as described above and monitoring only commenced at CM6 in January 2020.

Opportunities Presented by COVID-19 upon LAQM within Blaby District

No LAQM related opportunities have arisen as a consequence of COVID-19 within Blaby District.

However, the vast majority of the authorities' employees have worked from home for the duration of the COVID-19 pandemic, significantly reducing commutes and the production of NO_2 in the District. Where vehicle journeys have been necessary for some colleagues, mileage has reduced drastically for both casual and essential users which will further reduce pollutant concentrations.

Challenges and Constraints Imposed by COVID-19 upon LAQM within Blaby District

The COVID-19 pandemic has had a minimal but noteworthy impact on LAQM procedures for Blaby District Council during 2020. Staff availability and resources were stretched in the early period of lockdown 1 but the Environmental Services team quickly adapted to this new way of working. A summary of each LAQM category is found below and is displayed in Table F 1.

- Automatic Monitoring – Data Capture (%) – continuous monitoring data capture was good for most stations, although CM6 required annualisation. Regular checking of station performance was undertaken remotely with any issues picked up at LSO visits and escalation to a dedicated maintenance team if required. **Impact: None**
- Automatic Monitoring – QA/QC Regime – continuous monitoring stations were routinely calibrated throughout 2020. In the initial lockdown these were conducted on a monthly basis (as per Defra guidance), before returning to the recommended fortnightly frequency later in the year. Data ratification and cleansing was performed without hindrance. **Impact: Small**
- Passive Monitoring – Data Capture (%) – diffusion tube capture was very good for almost all locations in 2020, with just two tubes requiring annualisation. Access to all monitoring locations was maintained throughout the year and any LSO issues reported back. **Impact: None**
- Passive Monitoring – Bias Adjustment Factor – the process of selection and implementation of the bias correction factor was not impacted by COVID-19. The

national factor was selected due to the absence of a local triplicate set for comparison (if suitable) and is further reported on in Appendix C. **Impact: None**

- Passive Monitoring – Adherence to Changeover Dates – the Defra diffusion tube calendar was fully adhered to (± 2 days) each month throughout 2020. Passive samplers were not exposed for any longer than the standard 4-5 weeks on any occasion. **Impact: None**
- Passive Monitoring – Storage of Tubes – passive samplers were stored in accordance with the guidance and promptly shipped for laboratory analysis. There were no excess periods of storage which could impact results. **Impact: None**
- AQAP – Measure Implementation – there has been limited progress in taking the remaining actions in the 2014 AQAP forward, as described in Section 2.2 above, but these were not directly associated with Covid. **Impact: None**
- AQAP – New AQAP Development – the replacement AQAP was developed in 2020, and eventually adopted in March 2021. There were no delays directly associated with Covid. **Impact: None**

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 implementation of measures, but is on-going	Long delay (>6 months) in implementation of measures, but is on-going	No progression in implementation of measures
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
AQO	Air Quality Objective
ASR	Annual Status Report
BDC	Blaby District Council
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.

Air quality information for Blaby District Council, as well as previous versions of the ASR can be found on our website at this link.

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