Mansfield
District Council

2024 Air Quality Annual Status Report (ASR)

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

Date: June 2024

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The front cover photograph shows the bandstand at Carr Bank Park, Mansfield. Carr Bank is a popular Green Flag park only ½ mile from the town centre; the bandstand is a recent replacement of the original, in the Edwardian style.

Executive summary: air quality in our area

Air quality in the Mansfield District

Breathing in polluted air affects our health and costs the NHS and our society billions of pounds each year. Air pollution is recognised as a contributing factor in the onset of heart disease and cancer and can cause a range of health impacts, including effects on lung function, exacerbation of asthma, increases in hospital admissions and mortality. In the UK, it is estimated that the reduction in healthy life expectancy caused by air pollution is equivalent to 29,000 to 43,000 deaths a year[1].

Air pollution particularly affects the most vulnerable in society, children, the elderly, and those with existing heart and lung conditions. Additionally, people living in less-affluent areas are most exposed to dangerous levels of air pollution[2].

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

Table ES 1 - Description of key pollutants

Pollutant	Description
Nitrogen dioxide (NO_2)	Nitrogen dioxide is a gas which is generally emitted from high-temperature combustion processes such as road transport or energy generation
Sulphur dioxide (SO_2)	Sulphur dioxide (SO_2) is a corrosive gas which is predominantly produced from the combustion of coal or crude oil
Particulate matter (PM_{10} and $PM_{2.5}$)	Particulate matter is everything in the air that is not a gas. Particles can come from natural sources such as pollen, as well as human made sources such as smoke from fires, emissions from industry and dust from tyres and brakes. PM_{10} refers to particles under 10 micrometres. Fine particulate matter or $PM_{2.5}$ are particles under 2.5 micrometres

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

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

Mansfield's air quality focus continues to be on NO_2 and $PM_{2.5}$/PM_{10}. The closure of the coal mines and the decline in domestic solid fuel burning has shifted the emphasis onto vehicle emissions and airborne dust.

No $PM_{2.5}$ monitoring is currently occurring within the district, but a site has been identified by Bureau Veritas where a real-time analyser will monitor particulate matter. At the time of writing no date has been confirmed for commencement of works or monitoring; however, expectations are that $PM_{2.5}$ will begin to be monitored in the district within the next two years.

No Air Quality Management Areas have had to be declared throughout the district for NO_2. None of our monitoring sites exceeded the national Air Quality Objective of an annual mean of 40µgm^3.

Data from NO_2 monitoring indicates that levels of the pollutant are declining in the district (see figure A.1 for graphs of yearly average NO_2 levels). In 2023, seven out of eight sites had previous annual data to compare with; all but one site had a lower annual mean compared to 2022.

In December 2022, the Council's air pollution monitoring tube network was extended; during 2023 17 tubes at 15 locations in Mansfield, Mansfield Woodhouse, Warsop, Forest Town and Rainworth were utilised. This included three co-located tubes next to the real-time monitoring unit in Pleasley. The co-located tubes would have enabled a local factor to be calculated for use in annualising monitoring results, rather than continuing to rely on the national one. Unfortunately, the real-time unit produced very low results in 2023, taking its location into account and despite its being regularly serviced. In addition, data capture was poor. Consequently, no automatic monitoring data is presented in this report. The co-located tubes continued to be sited at the automatic monitoring location, and another tube will be installed further north along the same road in 2024.

The Pleasley area has been an area of attention over air quality, but the levels of monitored pollutants have never been high enough to declare an Air Quality Management Area.

While mean NO_2 levels have consistently reduced over the years, it is difficult for a local Council alone to reduce NO_2 emissions in its district, as these are primarily from vehicle exhausts. Consequently, the Council is reliant on actions also being taken by the County Council, Highways England, vehicle manufacturers and other involved parties.

Actions to improve air quality

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

The Environmental Improvement Plan[3] sets out actions that will drive continued improvements to air quality and to meet the new national interim and long-term targets for fine particulate matter ($PM_{2.5}$), the pollutant of most harmful to human health. The Air Quality Strategy[4] provides more information on local authorities' responsibilities to work towards these new targets and reduce fine particulate matter in their areas.

The Road to Zero[5] details the Government's approach to reduce exhaust emissions from road transport through a number of mechanisms, in balance with the needs of the local community. This is extremely important given that cars are the most popular mode of personal travel and the majority of Air Quality Management Areas (AQMAs) are designated due to elevated concentrations heavily influenced by transport emissions.

Mansfield District Council continues to enforce its Smoke Control Area programme (which covers the whole district, including all the open land). The programme has been a great success in reducing air pollution from domestic heating sources, and the Council has not needed to monitor for 'black smoke' or sulphur dioxide for over 13 years. However, when necessary Environmental Health reminds residents about the requirements of the Smoke Control Orders.

Whenever Mansfield's Environmental Protection team becomes aware of people installing wood-burning stoves locally, it offers them advice on the installation and use of these stoves. Fortunately, the stoves tend to be scattered about the district rather than concentrated in an area, so any effects are usually confined to their immediate surroundings, and do not present any significant concern to district air quality.

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

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

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

A closer working relationship with other Councils has been achieved through various schemes, including the Local Authority Energy Partnership, the Nottingham City Procurement Unit and the development of the Nottingham and Nottinghamshire air quality oversight group. This group has recently reviewed the Nottingham and Nottinghamshire Air Quality Strategy 2020-2030 and will take this strategy forward (Air Quality Strategy for Nottingham and Nottinghamshire 2020-2030)

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

All large developments have been required to submit an air quality assessment and an environmental management plan. Air quality forms part of the Spatial Planning & Health Framework and Health Impact Checklist produced and used for Local Development Plans.

Conclusions and priorities

Mansfield District Council is only reporting on NO_2 monitored using passive methods. No exceedances of the annual mean objective of 40µg/m^3 were identified during 2023. No Air Quality Management Areas for NO_2 have been declared or were necessary in any part of the district.

Mean levels of NO_2 have continued to decrease, indicating that, despite post-pandemic return to normality, air quality is steadily improving. Possible explanations may come from more working from home, and greater electric vehicle usage.

The automatic monitoring unit will be deactivated in 2024, justified by NO_2 levels in the district not being a significant issue.

The tube network, extended to 15 sites across Mansfield in 2023, has provided a broad picture of NO_2 levels throughout the district. Continued monitoring of these sites will occur in 2024. This network of passive monitoring will provide all the NO_2 monitoring throughout the district.

Our priorities for the coming year are:

- To implement and continue to develop the various measures the Council is taking to improve local air quality
- To work in partnership to promote the Air Quality Strategy for Nottingham and Nottinghamshire 2020-2030, and to encourage the prevention and reduction of polluting activities as detailed in the strategy

- To promote the requirements of the Air Quality Regulations 2020 (England), which came into force on 1 May 2021, and
- To continue to run the network of 15 tube sites effectively and extend the network with a new tube location in Pleasley.

Local engagement and how to get involved

Mansfield Council continues to be proactive and engaged with all stakeholders regarding air quality. Several of the initiatives detailed in Table 2.1 have been undertaken in partnership with other bodies, usually the County Council or county-wide groups. This helps to achieve both efficiency and consistency.

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

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

1) If you are using an open fire, you must burn only solid smokeless fuels, not wood or coal. This is a legal requirement under the Clean Air Act 1993 and the various Smoke Control Orders that cover all properties in the district. The text of the Clean Air Act 1993 is available at www.legislation.gov.uk/ukpga/1993/11/contents; information on the Council's Smoke Control Orders and the streets within each is available on request from the Environmental Health section. Please note that Mansfield has Smoke Control Areas, not "Smokeless Zones", and smoke will be emitted by a chimney when an open or closed solid-fuel fire is being lit from cold or re-fuelled.

2) If you have a closed solid-fuel fire (stove or room heater), you should burn only the type of fuel recommended by the manufacturer. Again, this is a legal requirement. Some stoves are advertised as 'multi-fuel', but if they are not on the Defra 'approved appliances' list, you cannot burn anything except smokeless fuel on them. Approved appliances are listed at www.smokecontrol.defra.gov.uk/appliances.php?country=england, and authorised fuels at www.smokecontrol.defra.gov.uk/fuels.php. If you use other types of fuel on a stove, you risk damaging its interior, which may release fumes into your house or cost you money to repair.

3) If you are using a wood-burning stove, you should burn only clean, dry wood. Wood must be left to dry for at least a year before you use it (unless you have bought 'kiln-dried' wood), and it must contain less than 20% moisture. Moisture meters can be

bought to check this; they are particularly useful if you buy wood from several different sources, as the moisture content may not be consistent. Store your firewood in a place where it will not get damp - if possible, bring wood indoors at least a week before using it, to help it to dry out further, and check its moisture content before using it. Never burn wood that has been painted, varnished or treated in any way (this includes pallets), as it could cause damage to the interior of your stove and release fumes inside your house or cost you money to repair. New legislation came into force in May 2021 to regulate the sale of wood as a fuel - visit www.hetas.co.uk/ready-to-burn-what-consumers-need-to-know for more information.

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

5) Avoid garden bonfires as much as possible. Never burn household waste, furniture, carpets, anything containing plastics or foam rubber, or any other items likely to cause black smoke and smell. You can burn plant and tree cuttings from your garden, but you must allow them to dry out first, so that they produce less smoke and burn away quickly. You can also burn confidential papers if you cannot shred them or dispose of them securely in another way. Any garden fire you do have should be attended at all times by someone with access to a hosepipe or a bucket of water, soil or sand, to put it out if it gets out of control or if the wind blows the smoke towards another property or a road. Fires must be put out before leaving them at night. Please note that garden fires are not covered by Smoke Control Orders or the Clean Air Act 1993; bonfires that are causing a nuisance are dealt with under the Environmental Protection Act 1990. There are no set times when a bonfire can be lit; we ask that residents avoid lighting them on windy days, or when other residents have their washing out, their windows open, or are sitting in their gardens.

6) Wherever possible, use alternative forms of transport rather than your car. When changing cars, look for a ‘cleaner’ vehicle; in particular, be aware that no new single-fuel cars and vans (i.e. those that only use petrol or diesel) will be produced after 2030. Have your car serviced regularly, and if the exhaust starts smoking, have it checked. Please note that car exhaust emissions are not covered by Smoke Control

Areas or the Clean Air Act 1993, which only deal with emissions from chimneys. Vehicle idling (i.e. leaving the engine running when the vehicle is stationary for a long period of time) is an offence against the Road Traffic (Vehicle Emissions) (Fixed Penalty) (England) Regulations 2002, and a fine can be given to a person who does not switch off their vehicle engine when asked to do so.

The public can find out more about Mansfield's air quality on the Council website www.mansfield.gov.uk/airquality

Local responsibilities and commitment

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

Planning; Planning Policy; Housing; Private Sector Housing; Taxi Licencing; Fleet Management; Facilities; and Public Relations.

This ASR has been approved by the Assistant Director – Health and Communities.

This ASR has been signed off by Nottinghamshire's Public Health and Commissioning Manager on behalf of the Interim Director of Public Health.

If you have any comments on this ASR please send them to Zac Mott at:

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Tables

1 Local Air Quality Management

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

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

The statutory air quality objectives applicable to LAQM in England are presented in Table E.1.

2 Actions to improve air quality

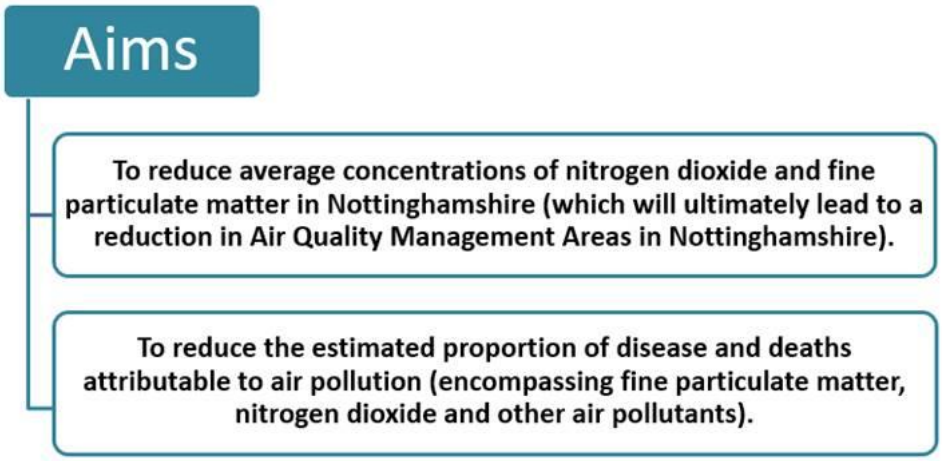
2.1 Air Quality Management Areas

Air Quality Management Areas (AQMAs) are declared when there is an exceedance or likely exceedance of an air quality objective. After declaration, the authority should prepare an Air Quality Action Plan (AQAP) within 18 months. The AQAP should specify how air quality targets will be achieved and maintained and provide dates by which measures will be carried out.

No exceedances or likely exceedances exist within the district. Therefore, Mansfield District Council currently does not have any declared AQMAs, nor is it preparing any.

Mansfield District Council does not have its own air quality strategy but was one of the councils that produced the Air Quality Strategy for Nottingham and Nottinghamshire 2020-2030 (an updated version of the previous strategy 'A Breath of Fresh Air for Nottinghamshire' published in 2008). This ASR is written taking into account the aims and objectives of the Air Quality Strategy for Nottingham and Nottinghamshire 2020-2030**.** The Air Quality Strategy for Nottingham and Nottinghamshire 2020-2030 demonstrates how as a partnership we are continuing to improve local air quality and maintain ongoing compliance with AQ objectives.

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



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

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

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

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

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

1. The Council has addressed the comments made in last year's appraisal, in a good level of detail and this is appreciated, and it is encouraged that this continues in future reports. It is noted with great appreciation that the trend figure now displays the air quality objective of 40µg/m^3 and that the figures in Appendix D are clearer.

   RESPONSE – this report continues the efforts of last year in attempting to include a good level of detail. The 40µg/m^3 objective has been highlighted in Appendix A.

2. There is good discussion on what the Council is doing to tackle $PM_{2.5}$ concentrations and emissions within its boundaries. However, the Public Health Outcomes Framework indicator D01 "Fraction of mortality attributable to particulate air pollution" was not discussed in this ASR. A comparison of the local value to the national average should be included in future reports.

   RESPONSE – a comparison of the local value with the national average has been included in this report.

3. Table A.3, A.4 and A.5 are missing the valid data capture for the monitoring period. If the monitoring period started in January and ended in December, then the data capture for the monitoring period is the same as the valid data capture in 2022. This information should be included in future reports.

   RESPONSE – valid data capture column has been filled in as required.

4. Figure A.1 is missing the x and y axis titles. This should be included in future reports for clarity.

   RESPONSE – axis titles for all charts and graphs have been included.

5. Chapter "Diffusion tube annualisation" is missing the prescribed text which can be found in the ASR template in the blue box. This information should be included in future reports.

   RESPONSE – this has been included in this report.

6. The table contents of table 2.1 do not match the table contents in the table template excel workbook. In the template 24 measures are listed, however, in the ASR 26 measures are listed. It should be ensured that the information provided in the ASR and template is consistent in future reports.

   RESPONSE – this has been corrected in this report

7. In the chapter “QA/QC of automatic monitoring” it is not clarified whether the automatic data has been ratified following guidance in LAQM.TG22. The automatic monitoring data appears to be very low for a roadside monitor, especially, when compared to the non-automatic NO_2 concentrations which are obtained from roadside diffusion tube monitoring locations. Confirmation that automatic monitoring data has been ratified following guidance in LAQM.TG22 should be included in future reports.

   RESPONSE – The decision has been taken to close down the council’s automatic monitor as it continued to produce very low results in 2023, despite being regularly serviced. In addition, data capture was very poor for 2023, consequently no automatic monitoring data is used in this report. NO_2 monitoring in the district will be carried out using diffusion tubes for the foreseeable future.

Mansfield District Council has taken forward a number of direct measures during the current reporting year of 2023 in pursuit of improving local air quality. Details of all measures completed, in progress or planned are set out in Table 2.1. 29 measures are included within Table 2.1, with the type of measure and the progress Mansfield District Council has made during the reporting year of 2023 presented. Where there have been, or continue to be, barriers restricting the implementation of the measure, these are also presented within Table 2.1.

More detail on these measures can be found in their respective Action Plans

- The Nottinghamshire County Council’s Local Transport Plan 2011-2026 can be found at https://www.nottinghamshire.gov.uk/transport/public-transport/plans-strategies-policies/local-transport-plan
- Mansfield District Council’s Local Plan was adopted on 8 September 2020 and can be found at https://www.mansfield.gov.uk/downloads/file/1645/mdc-adopted-local-plan-2020. The Local Plan includes pollution and air quality, outlining how these factors are considered in planning throughout the district. The plan also considers the impacts of climate change

Key completed measures are:

- The Nottinghamshire Air Quality Strategy was written and adopted, ensuring a consistent approach countywide
- Cleaner Taxis - All new diesel taxis are at least Euro 6

- Sustainable procurement – new contract with Nottinghamshire County Council with sustainable procurement guidance issued ensuring this is considered during significant purchases

Mansfield District Council expects the following measures to be completed over the course of the next reporting year:

- Green Homes Grant LAD Scheme - Potentially locally significant impact, may prevent residents resorting to cheaper, possibly non-authorised fuels
- Carbon reducing and energy saving measures – improvements to the leisure centres began in 2023; the work is to be completed in 2024

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

- To promote LEV parking and charging
- To implement the actions identified in the Carbon Management Plan
- To promote the grants available for Warm Homes on Prescription

Mansfield District Council worked to implement these measures in partnership with the following stakeholders during 2023:

- Internal MDC departments
- Nottinghamshire County Council
- Serco
- Local Authority Energy Partnership (Nottinghamshire and Derbyshire).
- Severn Trent Water

A reduction in finances and resources at Mansfield District Council are the principal challenges and barriers to the implementation of these measures, also meaning that progress on certain measures has been slower than expected.

Table 2.1 – Progress on measures to improve air quality

Measure no.	Measure title	Category	Classification	Year measure introduced in AQAP	Estimated / actual completion date	Organisations involved	Funding source	Defra AQ grant funding	Funding status	Estimated cost of measure	Measure status	Reduction in pollutant / emission from measure	Key performance indicator	Progress to date	Comments / barriers to implementation
1	LEV parking and charging	Promoting low emission transport	Priority parking for LEVs		Ongoing	MDC Planning	Internal	No				Greatest impact may not be seen for some years after 2030, when natural wastage of existing single-fuel vehicles takes effect	Number of spaces provided alongside demand	Updated Local Plan (2013-33) includes policies addressing electric car charging, and mitigation and adaptation to climate change. Local Plan Annual Monitoring Report has recorded number of applications for electric car charging points and renewable energy. See https://www.mansfield.gov.uk/planning-policy/annual-monitoring-reports-1 Development Management putting conditions on new developments for electric charging points	District now has least 60 public charging points for electric cars. Numerous stores and public houses have charging points in their car parks
2	Carbon management plan	Policy guidance and development control	Low Emissions Strategy	2010	Ongoing	MDC Planning Policy	Internal	No				Climate change mitigation measures will reduce air pollutants and lead to improvements in health	% reduction in emissions. Carbon-neutral status	Full Council declared climate emergency 'in principle' on 5 March 2019. Council to go carbon-neutral by 2040. Pledge to make Mansfield carbon-neutral by 2040 and work with local businesses and industry	Climate Change Strategy & Delivery Plans have been produced
3	Warm Homes on Prescription	Policy guidance and development control	Other		When funding exhausted	MDC Private Sector Housing		No				See Measure 4 below	Number of homes improved	143 properties improved since grant introduced in 2016/17, including 33 in 2022/23 financial year	Health professionals encouraged to refer patients if they have concerns about heating and insulation of their homes
4	Home energy conservation	Policy guidance and development control	Other policy	2011/ 2013/ 2015	2023	MDC Housing	Internal	No				Potentially locally-significant impact – may prevent residents resorting to cheaper, possibly non-authorised, fuels	% reduction in heating costs	Home Energy Conservation Act Report	Remaining MDC properties converted from district heating systems to gas central heating, with exception of one sheltered scheme scheduled to be upgraded in 2023
5	Green Homes Grant LAD Scheme	Policy guidance and development control	Other	2020	September 2023	MDC Private Sector Housing	BEIS	No		£2.1m	EWI, loft and cavity insulation to be completed by September 2024	See Measure 4 above	Number of homes improved	Over 235 properties improved to date.	Targeted advertisement towards eligible properties
6	Carbon-reducing and energy- saving measures	Promoting low emission plant	Shift to installations using low emission fuels for stationary and mobile sources	2022	2023	MDC Leisure Services, Serco		No		£1.3m	Began May 2022	Estimated 417,825kgCO_2 p.a.	Meeting estimated target	Works to leisure centres – one solar panel installation scheme complete; another installation begun. One new boiler installed. Existing ground-source heat pumps to be replaced with new pumps. Other measures such as roof insulation, light management plans and pool covers to be completed by 2023	
7	Sustainable procurement	Policy guidance and development control	Sustainable procurement guidance		Ongoing compliance with strategy	Nottingham County Council Procurement Unit		No			Sustainable procurement considered as part of new contract with Notts. County Council beginning in June 2023	Potentially significant impact of less-frequent deliveries in town centre, as most delivery vehicles are diesel	Impact on general air quality	Minimise environmental impact of goods, services and works procured	
8	Energy partnership	Policy guidance and development control	Regional groups co-ordinating programmes to develop area-wide strategies to		Ongoing funding available	Local Authority Energy Partnership made up of 20 authorities from		No			Internal Climate Change and Resilience Group set up	Co-ordination of strategies likely to have positive effect on air pollution	Impact on general air quality	MDC's strategy published – see https://www.mansfield.gov.uk/downloads/file/2970/approved-draft-climate-change-strategy-september-2021.	Internal Climate Change Action Plan to be developed in 2024

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			reduce emissions and improve air quality			Nottinghamshire and Derbyshire					to drive policies forward locally	throughout county			
9	Air quality strategies	Policy guidance and development control	Regional groups co-ordinating programmes to develop area-wide strategies to reduce emissions and improve air quality	2022	2022	Nottinghamshire local authorities		No			Completed	Potentially significant impact on air quality and health	Impact on general air quality	Nottinghamshire Air Quality Strategy – see https://committee.nottinghamcity.gov.uk/documents/s107973/Notts%20AQ%20Strategy%202020%20FINALv1.0.pdf. Nottinghamshire Joint Health and Wellbeing Strategy – see https://www.nottinghamshire.gov.uk/policy-library/38815/the-joint-health-and-wellbeing-strategy-for-2022-2026	
10	Cleaner taxis	Promoting low emission transport	Taxi emission incentives	Will be introduced in 2023	Ongoing	MDC Taxi Licencing	Internal	No			Ongoing	Gradual replacement of older diesel vehicles will contribute to local AQ improvements	Increased number of taxi operators using cleaner vehicles	Licence fee for hybrid vehicles reduced by 25%. MDC continuing to review taxi licencing policy to encourage newer, cleaner vehicles	Monitoring projects in neighbouring districts
11	Cleaner taxis	Promoting low emission transport	Taxi licensing conditions	Will be introduced in 2023	Depends on creation of any national standards	MDC Taxi Licencing	Internal	No			Completed March 2023 for requirements for new vehicles	See Measure 10 above	Fewer older vehicles operating	All new vehicles are at least Euro 6	
12	MDC vehicle fleet efficiency	Vehicle fleet efficiency	Fleet efficiency and recognition schemes		When all MDC fleet vehicles are Euro 6 (or ideally electric)	MDC Fleet Management	Internal	No			Major review planned for 2025	Gradual replacement of diesel fleet vehicles with electric ones will contribute to local AQ improvements	% reduction in emissions and fuel usage; increased number of cleaner vehicles	15% of current HGV fleet is Euro 5. 25% of current LGV fleet is Euro 5. Fleet replacement budget approved to enable replacement of HGVs within desired 10-year timeframe. Council's refuse collection fleet currently contains 3 Euro % variants (out of 20 vehicles) and will be fully Euro 6 by end of 2025. MDC currently has 9 electric HGVs in fleet, which will continue to expand as specific vehicles are due for replacement, based on prices at replacement time. Depot has 5 electric charging points – sufficient for current fleet – which again will expand as need arises. Large-scale electrification of vehicle fleet to be looked at in greater depth in 2025	Power supply at depot sufficient to move towards electric refuse collection vehicles but current capital programme does not have sufficient funds to make purchase
13	Alternative fuels	Promoting low emission plant	Shift to installations using low-emission fuels for stationary and mobile sources	2015	When all sources meet required standard	MDC Facilities	Internal	No			Ongoing		Reduction in electricity costs	Solar panels put on Civic Centre roof in March 2016 – savings of over £70,000 to date. Wind turbine project put on hold due to possibility of MDC moving to town centre premises. Building Management System to be upgraded in 2023	Solar panels being put on several new MDC commercial and residential buildings
14	School travel plans	Promoting travel alternatives	School travel plans		Ongoing	Notts County Council Education Department	NCC	No				Potentially locally significant impact, particularly in areas of high-density housing	Reduction in number of private vehicle school runs	Several school travel plans already implemented	Lack of cycle lanes could be a barrier to implementation
15	Working from home	Promoting travel alternatives	Encourage/ facilitate home-working	2014	Ongoing	MDC Human Resources	Internal	No				Impact likely to be most noticeable at peak times – people working from home likely to plan journeys to avoid those times	Number of people taking up option	Home working policy implemented 2014; updated to include 'hybrid working'	MDC now operates hybrid working system – staff work from home, but come into office when necessary
16	Bus lane	Traffic management	Strategic highway improvements, re-prioritising road space away from cars, including access management, selective vehicle priority, bus priority, high-occupancy lane	Included in Transport Plan 2011-2026	Ongoing – new bus lanes under consideration	Notts County Council Highways	NCC	No				Local impact potentially quite significant – existing bus lane is on street with terraced houses next to traffic lights	Reduction of bus waiting time at one busy traffic-lighted junction	Bus lane on Leeming Lane South has been in place for several years. Possibility of two further bus lanes, plus extension of existing one, being investigated by NCC	Existing bus lane has reduced bus waiting time at traffic lights by two minutes on average
17	Speed limit reductions	Traffic management	Reduction of speed limits, 20mph zones	Included in Transport	Ongoing	Notts County Council Highways	NCC	No				Potentially significant	Reduction in traffic emissions;	Some 40mph roads reduced to 30; 20mph zones around most schools in district, although those on main roads	Primarily for road safety, but should also

Measure no.	Measure title	Category	Classification	Year measure introduced in AQAP	Estimated / actual completion date	Organisations involved	Funding source	Defra AQ grant funding	Funding status	Estimated cost of measure	Measure status	Reduction in pollutant / emission from measure	Key performance indicator	Progress to date	Comments / barriers to implementation
				Plan 2011-2026								impact during peak times	accident reduction	operate only during school start and finish times on Mondays to Fridays during school terms	improve air quality
18	Delivery management	Freight and delivery management	Quiet & out-of-hours delivery		Ongoing	MDC Planning		No				Local impact potentially quite significant for large developments	Reduction in complaints from nearby residents	Discussions with businesses to reduce frequency of deliveries. Construction Environmental Management Plan conditions put on major developments as standard to restrict deliveries and lorry routing during building process; Air Quality Impact Assessments often required	Considered during planning process; conditions attached where appropriate
19	"Part B" process controls	Environmental permits	Measures to reduce pollution through IPPC permits going beyond BAT		Ongoing	MDC Environmental Health		No				Potentially large local impact from releases – controls through new technology, usage reduction and BAT	Reduction in solvent use	Permitted processes reporting on progress every two years	Discussed with businesses during inspection; also considered in business's Six-Year Review
20	Local Plan	Policy guidance and development control	Air quality planning and policy guidance	2013	Ongoing development and refinement of AQ policies	MDC Planning Policy	Internal	No				Impact in immediate area of development potentially significant – development should include potential to reduce poor air quality in area	Increased awareness of air quality issues, and action to improve air quality, among developers in District	Updated Local Plan adopted September 2020 (https://www.mansfield.gov.uk/local-plan/adopted-local-plan-2013-2033). Plan addresses air quality in policies P7 (Amenities) and NE3 (Pollution and land stability). Objectives 9 and 12 and monitoring indicator for NE3 address air quality. Review of Council's Local Plan has commenced with 'Issues and Options' paper being issued for consultation in summer 2023. Further progress dependent on changes to Planning Regulations but will consider need for air quality evidence to inform emerging policies and proposals	Evidence on air quality to be gathered and used to inform AQ policies within local plan
21	Renewable energy statements	Policy guidance and development control	Other policy	2022	Ongoing	MDC Planning		No						Renewable Energy Statement required for major planning applications (Planning Policy P5 Climate Change)	
22	Environmental road improvements	Traffic management	Other	2023	Ongoing	MDC, Notts County Council, Severn-Trent Water	Severn-Trent Water	No			Ongoing	Small local impact from speed reduction		Building of SUDs commenced 2023, resulting in narrowing of certain sections of road – speed reduction	
23	Cycle-to-work scheme	Promoting travel alternatives	Promotion of cycling	2016	Ongoing; relaunched 2022	MDC	Internal	No			Ongoing	Considered likely to have only small impact on AQ – will mostly affect health	Number of people cycling to work	Cycle-to-work scheme already implemented at MDC. Scheme relaunched and promoted internally	Low take-up
24	Cycle network	Promoting travel alternatives	Promotion of cycling	2017/18	Ongoing	MDC, Notts County Council	D2N2 LEP LGF	No				See Measure 23 above	Increased use of cycle network	Potential cycle routes identified in 2017; one implemented by 2023	
25	Promotion of walking	Promoting travel alternatives	Promotion of walking	2016	Ongoing	MDC Planning Policy	Internal	No				See Measure 23 above	Increased number of people walking; improvements in health	Early-stage engagement with Nottinghamshire County Council on potential routes and strategic approach. County Council are progressing LCWIP in order to encourage greater use of walking and cycling, reducing pollution from vehicles	
26	Mansfield Town Centre Masterplan and Design Code	Policy guidance and development control	Policy guidance to improve the quality of design in town centre	2023	Design Code and masterplan adopted 2023. Development will be ongoing in short, medium and longer term	MDC Planning Policy	MDC / DLUHC	No				Policy guidance includes mitigating impacts of poor air quality through tree planting and more sustainable movement	Increased tree planting in town centre	Design Code and masterplan adopted 2023	
27	Supplementary Planning Documents on Green infrastructure, Sustainable Drainage and Biodiversity Net gain	Policy guidance and development control	Policy guidance to improve environmental quality increase biodiversity and reduce flood risk	2022	2023	MDC Planning Policy	MDC	No				Policy guidance includes measures to help mitigate impacts of poor air quality including greening and tree planting	Increased greening and tree planting in district as result of new development	Green infrastructure, Sustainable Drainage and Biodiversity Net gain SPDs have all been adopted as Supplementary Planning Documents by MDC	
28	Public information	Public information	Via radio, press, and internet		Ongoing	MDC Public Relations and Communications Team	Internal	No					Increased number of hits, comments and likes	Positive publicity via social media, MDC website, press releases, etc., and by taking part in national awareness campaigns such as Clean Air Day, anti-idling campaigns and Ready-to-Burn Scheme	

Measure no.	Measure title	Category	Classification	Year measure introduced in AQAP	Estimated / actual completion date	Organisations involved	Funding source	Defra AQ grant funding	Funding status	Estimated cost of measure	Measure status	Reduction in pollutant / emission from measure	Key performance indicator	Progress to date	Comments / barriers to implementation
													recorded from website, Facebook pages, etc.		
29	Public information	Public information	Via leaflets, radio, and internet		Ongoing	MDC Environmental Health	Internal	No				Local impact potentially quite significant – necessary to remind residents at intervals of requirements of Smoke Control Orders	Increased number of requests per annum for leaflets and interviews; increased number of hits on EH section of website	Various leaflets always available on request; interviews as requested by local radio station; information on MDC website	Some requests received for advice on wood-burning stoves, but clearly many more stoves being put in without MDC advice

2.3 $PM_{2.5}$ – Local authority approach to reducing emissions and/or concentrations

As detailed in Policy Guidance LAQM.PG22 (Chapter 8) and the Air Quality Strategy[6], local authorities are expected to work towards reducing emissions and/or concentrations of fine particulate matter ($PM_{2.5}$). There is clear evidence that $PM_{2.5}$ (particulate matter smaller than 2.5 micrometres) has a significant impact on human health, including premature mortality, allergic reactions, and cardiovascular diseases.

Mansfield District Council does not monitor for $PM_{2.5}$ at present, therefore the local levels have been predicted from the nearest AURN site that measures $PM_{2.5}$, and the modelled background concentrations from the Defra website. This website was checked on 14 May 2024. The modelled background level for 2023 for the Mansfield area is 7.63µgm^3. In 2023, the annual mean concentration at the AURN site in Nottingham Centre was 10.47µgm^3, a decrease from the 2022 figure of 11.9µgm^3. (Please note that the Mansfield figure is modelled, whereas the Nottingham one is monitored).

In November 2022, Bureau Veritas carried out a scoping exercise on six sites in the district, with a view to installing a $PM_{2.5}$ urban background monitoring station. The site to be used was decided upon in mid-2023, but the unit has not been put in place at the time of writing this report.

In September 2021, the World Health Organisation published its updated Air Quality Guidelines, and its guideline value[6] for $PM_{2.5}$ is now 5µgm^3; no air quality objective has been set to date. The Environmental Improvement Plan 2023 for England set interim targets that by January 2028 an annual average of 12µg/m^3 for $PM_{2.5}$ is not exceeded at any monitoring station and that population exposure to $PM_{2.5}$ is at least 22% less than in 2018.

The European Union legal annual mean is 25µg/m^3, which has been transposed into UK law, although the Mayor of London said in the Greater London Authority's 2019 report, "$PM_{2.5}$ in London: roadmap to meeting World Health Organisation guidelines by 2030" that he did not think this limit "goes far enough for the protection of human health". Several

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

countries with cities of a size comparable to London have set out to meet the previous WHO guideline of 10µgm^3, rather than the EU legal annual mean.

It seems very unlikely that the levels in Mansfield town centre would be as high as those in Nottingham city centre, so the assumption has been made that Mansfield's levels are closer to the modelled 7.63µgm^3 than to Nottingham's monitored 10.47µgm^3, and therefore there is unlikely to be a major problem with $PM_{2.5}$ in the district. Mansfield's modelled levels are below the European Union legal annual mean and the WHO guideline value.

The Public Health Outcomes Framework indicator D01, "Fraction of mortality attributable to particulate air pollution", measures the proportion of deaths influenced by air pollution. The most recent data from 2022 shows that air pollution contributed to 5.8% of deaths nationally. There are no specific figures available for Mansfield or the East Midlands as a whole. However, estimates indicate that 5.9% of deaths in Nottinghamshire are attributable to air pollution, suggesting that the impact in Nottinghamshire is similar to the national average. This data was obtained from the Office for Health Improvement and Disparities (formerly Public Health England) website on 29/05/24. For more information and data on mortality attributable to air pollution, visit the OHID website: https://fingertips.phe.org.uk/search/mortality%20air%20pollution.

Mansfield District Council does not currently have any measures in place to deal specifically with $PM_{2.5}$. However, the levels of PM_{10} that we were finding in the district up to August 2016, when real-time PM_{10} monitoring stopped, suggested that we would not have high levels of $PM_{2.5}$, since studies indicate that $PM_{2.5}$ levels tend to be approximately 0.6% of PM_{10} levels. In addition, we believe that the measures we are taking to reduce PM_{10} will have a knock-on effect on $PM_{2.5}$. These measures are detailed in Table 2.2 above.

3 Air quality monitoring data and comparison with air quality objectives and national compliance

This section sets out the monitoring undertaken within 2023 by Mansfield District Council and how it compares with the relevant air quality objectives. In addition, monitoring results are presented for a five-year period between 2019 and 2023 to allow monitoring trends to be identified and discussed.

3.1 Summary of monitoring undertaken

3.1.1 Automatic monitoring sites

Mansfield District Council undertook automatic (continuous) monitoring at one site during 2023. Unfortunately, the decision has had to be made to close down the monitoring unit, as it continued to produce very low results in 2023 taking its location into account (as noted in Bureau Veritas' comments for 2022 – see page 5) and despite being regularly serviced. In addition, data capture was poor in 2023 (only 117 full days, with long runs of NO_2 data logged as 0).

Consequently, no automatic monitoring data is presented in this report, and NO_2 monitoring in the district will be carried out using diffusion tubes for the foreseeable future.

3.1.2 Non-automatic monitoring sites

Mansfield District Council undertook non-automatic (i.e. passive) monitoring of NO_2 at 15 sites during 2023. Table A.1 in Appendix A presents the details of the non-automatic sites.

The number of diffusion tubes on the district had decreased to eight during the Covid-19 outbreak, as several tube fixings had become unstable or had fallen away, and they could not be renewed at the time. Tube fixings have since been replaced at former sites, and some new sites have been added. The tubes co-located with the real-time unit are to be moved to other sites – one is already earmarked for a site in Pleasley.

Maps showing the location of the monitoring sites are provided in Appendix D. Further details on Quality Assurance/Quality Control (QA/QC) for the diffusion tubes, including bias adjustments and any other adjustments applied (e.g. annualisation and/or distance correction), are included in Appendix C.

3.2 Individual pollutants

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

3.2.1 Nitrogen dioxide (NO_2)

Table A.2 in Appendix A compares the ratified and adjusted monitored NO_2 annual mean concentrations for the past five years with the air quality objective of 40µg/m^3. Note that the

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

For diffusion tubes, the full 2023 dataset of monthly mean values is provided in Appendix B. Note that the concentration data presented in Table B.1 includes distance-corrected values only where relevant. No distance correction was required at any site in 2023.

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

No exceedances of the annual mean or hourly mean Air Quality Objectives were recorded in 2023. Indicating that no NO_2 issues are present within Mansfield Council's district.

Appendix A: Monitoring results

Table A.1 – Details of non-automatic monitoring sites

Diffusion tube ID	Site name	Site type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants monitored	In AQMA?	Distance to relevant exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube co-located with continuous analyser?	Tube height (m)
AR	Abbott Road	Roadside	451892	362443	NO_2	No	8.0	0.5	No	2.0
CRN 1, 2 & 3	Chesterfield Road North	Roadside	450980	363716	NO_2	No	5.0	1.0	Yes	2.0
CRS	Chesterfield Road South	Roadside	453349	361915	NO_2	No	9.0	1.0	No	2.5
DL	Debdale Lane	Roadside	452515	362508	NO_2	No	4.0	3.0	No	2.0
FT 1	Clipstone Road East	Roadside	457199	362697	NO_2	No	9.0	5.0	No	2.0
FT 2	Clipstone Road West	Roadside	456251	362135	NO_2	No	11.0	2.0	No	2.0
HL	Hermitage Lane	Roadside	452429	360052	NO_2	No	10.0	2.0	No	2.0
LLS	Leeming Lane South	Roadside	454421	362860	NO_2	No	11.0	3.0	No	2.5
NR	Nottingham Road	Roadside	453842	360174	NO_2	No	5.0	2.0	No	2.5
OML	Old Mill Lane	Roadside	455834	362101	NO_2	No	11.0	3.0	No	2.0

Diffusion tube ID	Site name	Site type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants monitored	In AQMA?	Distance to relevant exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube co-located with continuous analyser?	Tube height (m)
PR	Priory Road	Roadside	453709	363105	NO_2	No	9.0	1.0	No	2.0
RS	Rosemary Street	Roadside	453269	361308	NO_2	No	16.0	1.0	No	2.0
SS	Sherwood Street	Roadside	456889	367638	NO_2	No	8.0	4.0	No	2.5
SRE	Southwell Road East	Roadside	458513	358623	NO_2	No	8.0	3.0	No	2.0
WT	Warsop Town Hall	Roadside	456663	368019	NO_2	No	7.0	4.0	No	2.0

Notes:

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

(2) N/A if not applicable.

Table A.2 – Annual mean NO_2 monitoring results: non-automatic monitoring (µg/m^3)

Diffusion tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site type	Valid data capture for monitoring period (%) [1]	Valid data capture 2023 (%) [2]	2019	2020	2021	2022	2023
AR	451892	362443	Roadside	100	90.4	-	-	-	-	26.1
CRN 1, 2 & 3	450980	363716	Roadside	100	100.0	-	-	-	-	17.9
CRS	453349	361915	Roadside	100	92.3	-	-	-	-	20.2
DL	452515	362508	Roadside	100	82.7	33.2	21.5	28.7	27.7	26.2
FT 1	457199	362697	Roadside	100	75.0	23.9	15.3	20.1	19.2	20.0
FT 2	456251	362135	Roadside	100	90.4	-	-	-	-	20.7
HL	452429	360052	Roadside	100	90.4	-	-	-	-	19.4
LLS	454421	362860	Roadside	100	100.0	27.3	15.4	20.8	22.0	20.4
NR	453842	360174	Roadside	100	92.3	31.2	18.2	23.5	26.1	25.4
OML	455834	362101	Roadside	100	100.0	27.9	15.7	23.0	22.6	22.0
PR	453709	363105	Roadside	100	90.4	-	-	-	-	25.9

Diffusion tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site type	Valid data capture for monitoring period (%) (1)	Valid data capture 2023 (%) (2)	2019	2020	2021	2022	2023
RS	453269	361308	Roadside	100	92.3	-	-	-	-	21.0
SS	456928	367423	Roadside	100	25.0	19.4	11.7	16.0	16.5	15.1
SRE	458513	358623	Roadside	75	25.0	18.3	10.6	14.0	15.2	14.8
WT	456663	368019	Roadside	100	82.7	23.0	13.5	20.4	20.7	18.6

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

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

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

Notes:

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

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

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

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

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

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

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

Figure A.1 – Trends in annual mean NO_2 concentrations

Figure A1.1 NO_2 Annual mean concentration (µg/m^3) 2019 to 2023

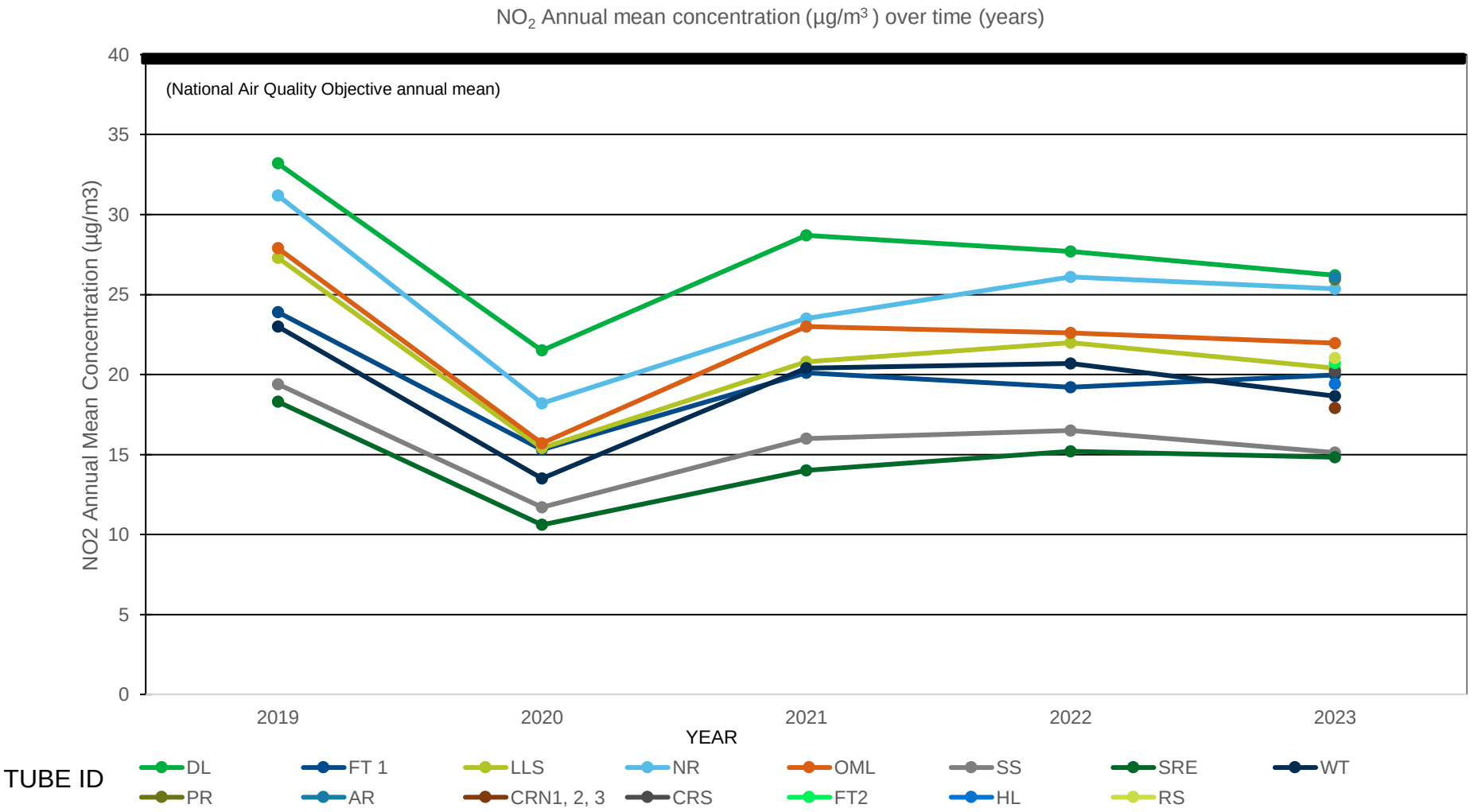


Figure A1.1 shows NO_2 annual mean plotted over the previous five years. 2020's data shows the impact of COVID lockdowns. This chart shows the downward trend of NO_2 levels.

Figure A1.2 NO_2 Bar chart of annual mean concentration (µg/m^3) at tube locations across the Mansfield District

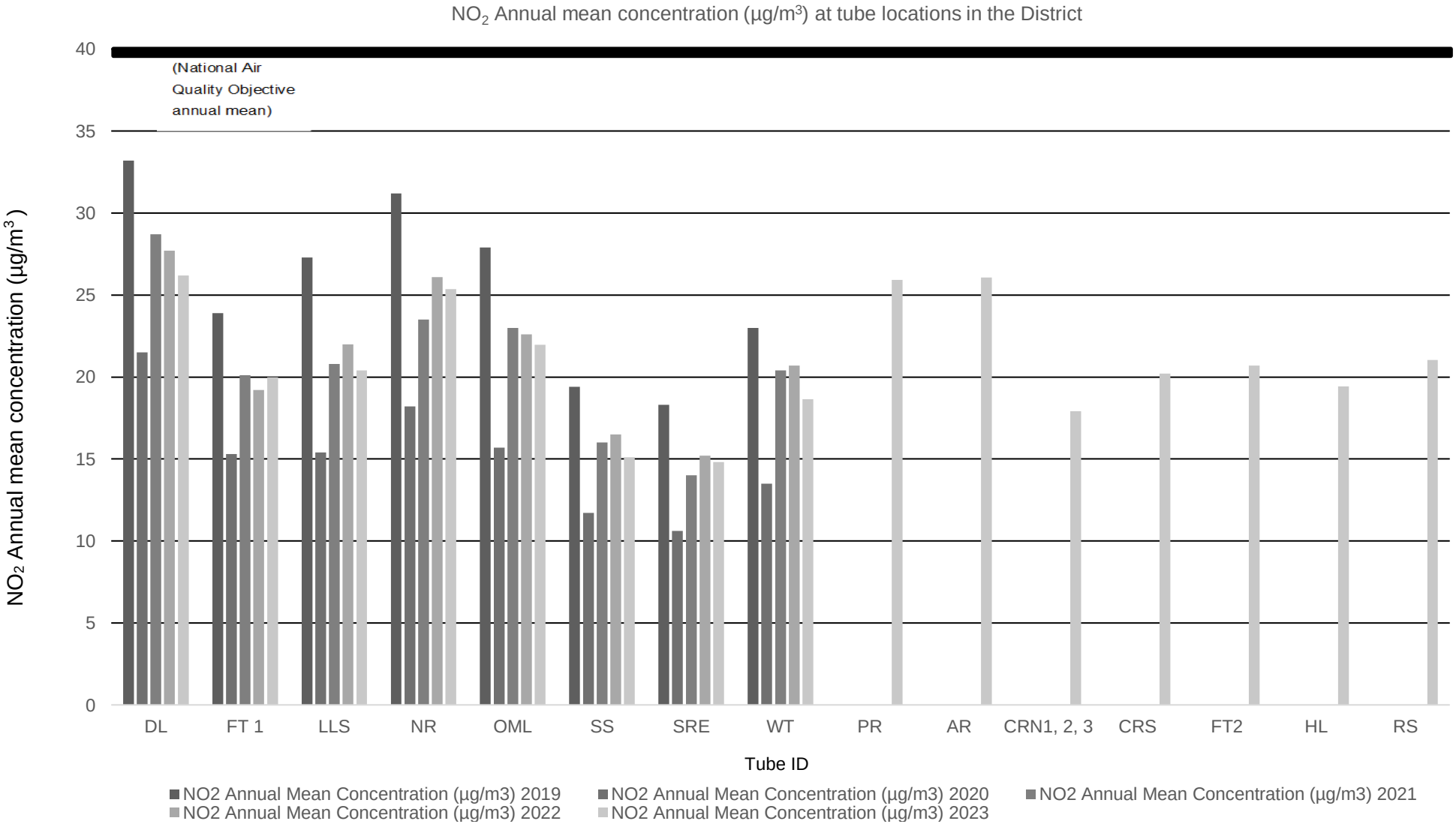


Figure A1.2 shows NO_2 annual mean at various sites between 2019 and 2023, showing no exceedances and a downward trend in sites monitored for more than one year.

Appendix B: Full monthly diffusion tube results for 2023

Table B.1 – NO_2 2023 diffusion tube results (µg/m^3)

DT ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual mean: raw data	Annual mean: annualised and bias adjusted (0.81)	Annual mean: distance corrected to nearest exposure	Comment
AR	451892	362443	40.0	39.7	33.4	32.3	28.8	25.3	28.6	27.6	34.0	35.0		29.3	32.2	26.1	-	
CRN 1	450980	363716	27.6	26.4	22.9		20.8	19.4	15.4	18.7	22.4	24.4	26.7	17.9	-	-	-	Triplicate site with CRN 2 and CRN 3 - annual data provided for CRN 3 only
CRN 2	450980	363716	26.4	26.5	20.9	24.3	19.2	19.8	15.5	17.5	21.8	24.1	26.8	19.5	-	-	-	Triplicate site with CRN 1 and CRN 3 - annual data provided for CRN 3 only
CRN 3	450980	363716	25.8	26.8	23.8	24.1	20.6	20.1	16.3	17.8	22.5	21.3	27.4	20.0	22.1	17.9	-	Triplicate site with CRN 1 and CRN 2 - annual data provided for CRN 3 only
CRS	453349	361915	41.3		28.2	22.8	18.5	17.5	18.5	19.6	26.8	26.9	28.8	25.5	24.9	20.2	-	
DL	452515	362508	41.8	36.9			29.7	25.4	29.5	26.6	33.8	33.2	36.0	30.5	32.3	26.2	-	
FT 1	457199	362697	33.5	30.7	23.6	20.3				18.2	23.8	19.6	29.4	23.0	24.7	20.0	-	
FT 2	456251	362135	34.4	31.2		25.4	23.4	22.5	18.1	20.5	26.3	27.8	31.3	20.5	25.6	20.7	-	
HL	452429	360052	30.2	28.7	25.9	22.8	20.7		17.3	19.0	26.0	24.4	28.8	20.0	24.0	19.4	-	
LLS	454421	362860	32.3	32.2	27.8	25.6	20.5	19.3	18.4	20.0	26.3	25.8	30.0	24.0	25.2	20.4	-	
NR	453842	360174	35.9		33.1	32.0	32.6	31.6	24.1	26.9	33.3	30.5	37.3	27.3	31.3	25.4	-	
OML	455834	362101	35.0	29.1	28.8	28.3	25.4	22.6	19.8	21.7	27.8	30.1	34.3	22.7	27.1	22.0	-	
PR	453709	363105	36.6	38.0		34.0	29.7	29.9	23.7	28.3	33.8	36.4	35.4	26.4	32.0	25.9	-	
RS	453269	361308	31.1		31.3	30.0	22.3	21.6	19.6	19.8	29.6	28.3	27.0	25.3	26.0	21.0	-	
SS	456928	367423	26.2	25.6	20.5										24.1	15.1	-	
SRE	458513	358623	27.3		18.2									15.5	20.3	14.8	-	
WT	456663	368019	29.7	30.2			23.5	18.2	17.5	19.1	23.4	21.1	27.4	20.0	23.0	18.6	-	

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

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

☐ **Local bias adjustment factor used.**

☒ **National bias adjustment factor used.**

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

☒ **Mansfield District Council confirms that all 2023 diffusion tube data has been uploaded to the Diffusion Tube Data Entry System.**

Notes:

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

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

See Appendix C for details on bias adjustment and annualisation.

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

New or changed sources identified within the Mansfield District during 2023

Several large areas of housing are being built or are planned in the district, the locations being:

- To the south of Mansfield, along the A617 outer ring road (Sherwood Way East), where land is being developed on the north side of the road. About half the proposed development has been completed.
- Two adjacent sites on Clipstone Road East, Forest Town, on the south side of the road. Only a few properties have been completed on both developments.
- To the west of Mansfield, between the A617 outer ring road and the A6075 (Abbott Road). The housing development has been completed. An application has been received for a commercial development on the land to the south, but no works have taken place to date.
- To the south-west of Warsop, off Stonebridge Lane. A substantial amount of the development was completed in 2023; construction is still ongoing.
- Off Blidworth Lane in Rainworth, to the south-east of Mansfield. Construction began in spring 2023.

An Air Quality Assessment has been required for each development as part of the planning process, and none has indicated that there would be a significant increase in NO_2 levels caused by extra vehicle movements.

Since much of the district is on sandy soil, new developments have a potential to cause dust emissions during the construction phase. It is therefore standard practice to require an environmental management plan to ensure emissions are controlled in line with recognised best practice. In conjunction with the Planning Department, the Environmental Protection Team responds to complaints about dust from these developments and ensures that appropriate measures are in place to minimise emissions.

Additional air quality works undertaken by Mansfield District Council during 2023

Mansfield District Council has not completed any additional works within the reporting year of 2023.

Mansfield District Council is planning a vehicle anti-idling campaign for 2024. The campaign will utilise an educational approach, focusing on schools within the district. School traffic is a major cause of vehicle idling, as drivers leave engines running at pick-up/drop-off locations. The campaign will involve giving schools a free banner to be displayed on roadside fences, as well as leaflets to be handed out. Information will be given to participating schools for them to organise lessons or pass on information at their discretion. Although the impact of the campaign cannot be measured, it is hoped that this activity will raise awareness of air quality issues in the district.

QA/QC of diffusion tube monitoring

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

The diffusion tubes used in Nottinghamshire are prepared using 20% TEA in water. Mansfield's tubes are stored under refrigeration prior to use and are used within the specified expiry dates. The tube exposure periods in 2023 conformed to the Diffusion Tube Exposure Calendar.

Upon changing the tubes, the date, site and exposure times are recorded, and the tubes are put into a sealed bag. They are forwarded to Gradko for analysis along with an unexposed tube from the same batch.

Gradko has confirmed that the laboratory complies with the procedures detailed in the Defra Harmonisation Practical Guidance.

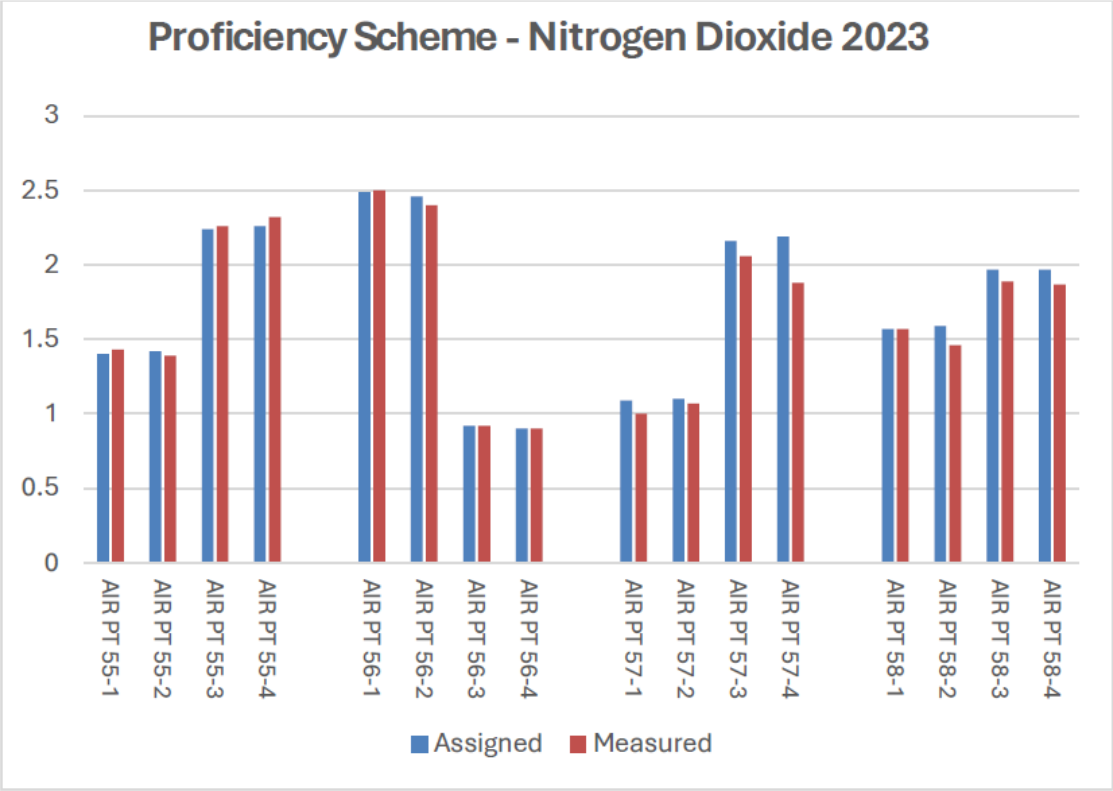
Their proficiency scheme results for 2023 are as follows:

AIR PT Proficiency Scheme - Nitrogen Dioxide 2023

Methods: GLM 7 – CARY 60 Spectrophotometer

AIR PT Nitrogen Dioxide Proficiency Scheme Results 2023

Date	Round	Assigned value	Measured concentration	Procedure GLM 7 z-Score	% Bias
Feb-23	AIR PT 55-1	1.4	1.43	0.29	2.1%
Feb-23	AIR PT 55-2	1.42	1.39	-0.28	-2.1%
Feb-23	AIR PT 55-3	2.24	2.26	0.11	0.9%
Feb-23	AIR PT 55-4	2.26	2.32	0.34	2.7%
Jun-23	AIR PT 56-1	2.49	2.5	0.05	0.4%
Jun-23	AIR PT 56-2	2.46	2.4	-0.33	-2.4%
Jun-23	AIR PT 56-3	0.92	0.92	0	0.0%
Jun-23	AIR PT 56-4	0.9	0.9	0	0.0%
Aug-23	AIR PT 57-1	1.09	1.00	-1.1	-8.3%
Aug-23	AIR PT 57-2	1.10	1.07	-0.36	-2.7%
Aug-23	AIR PT 57-3	2.16	2.06	-0.62	-4.6%
Aug-23	AIR PT 57-4	2.19	1.88	-1.89	-14.2%
Oct-23	AIR PT 58-1	1.57	1.57	0	0.0%
Oct-23	AIR PT 58-2	1.59	1.46	-1.09	-8.2%
Oct-23	AIR PT 58-3	1.97	1.89	-0.54	-4.1%
Oct-23	AIR PT 58-4	1.97	1.87	-0.68	-5.1%



Diffusion tube annualisation

Table C.1 – Annualisation summary (concentrations presented in µg/m^3)

Annualisation was required for two non-automatic monitoring sites, Sherwood Street (SS) and Southwell Road East (SRE).

Site ID	Annualisation factor Chesterfield Loundsley Green	Annualisation factor Nottingham Centre	Annualisation factor Leicester University	Average annualisation factor	Raw data annual mean	Annualised annual mean
SS	0.7096	0.8516	0.7611	0.7741	24.1	18.7
SRE	0.7872	0.9930	0.9229	0.9010	20.3	18.3

Diffusion tube bias adjustment factors

The diffusion tube data presented within the 2024 ASR have been corrected for bias using an adjustment factor. Bias represents the overall tendency of the diffusion tubes to under or over-read relative to the reference chemiluminescence analyser. LAQM.TG22 provides guidance with regard to the application of a bias adjustment factor to correct diffusion tube monitoring. Triplicate co-location studies can be used to determine a local bias factor based on the comparison of diffusion tube results with data taken from NO_x/NO_2 continuous analysers. Alternatively, the national database of diffusion tube co-location surveys provides bias factors for the relevant laboratory and preparation method.

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

Table C.2 – Bias adjustment factor

Monitoring year	Local or national	If national, version of national spreadsheet	Adjustment factor
2023	National	03/24	0.81
2022	National	03/23	0.83
2021	National	03/22	0.84
2020	National	03/21	0.81
2019	National	03/20	0.84

Table C.3 – Local bias adjustment calculation

No local bias adjustment has been calculated due to the decision not to use the automatic monitoring data.

NO_2 fall-off with distance from the road

Wherever possible, monitoring locations are representative of exposure. However, where this is not possible, the NO_2 concentration at the nearest location relevant for exposure has been estimated using the Diffusion Tube Data Processing Tool/NO_2 fall-off with distance calculator available on the LAQM Support website.

No diffusion tube monitoring locations within the district required distance correction in 2023.

Appendix D: Maps of monitoring locations

D1 - Abbott Road
D2 - Chesterfield Road North 1, 2 & 3
D3 - Chesterfield Road South
D4 - Debdale Lane
D5 - Forest Town 1
D6 - Forest Town 2
D7 - Hermitage Lane
D8 - Leeming Lane South
D9 - Nottingham Road
D10 - Old Mill Lane
D11 - Priory Road
D12 - Rosemary Street
D13 - Sherwood Street
D14 - Southwell Road East
D15 - Warsop Town Hall

Figure D.1 – Map of non-automatic monitoring site AR (Abbott Road)

The blue marker shows the tube's location on Abbott Road (A6075) in Mansfield (451892 362443), approximately 2km NW of Mansfield town centre.

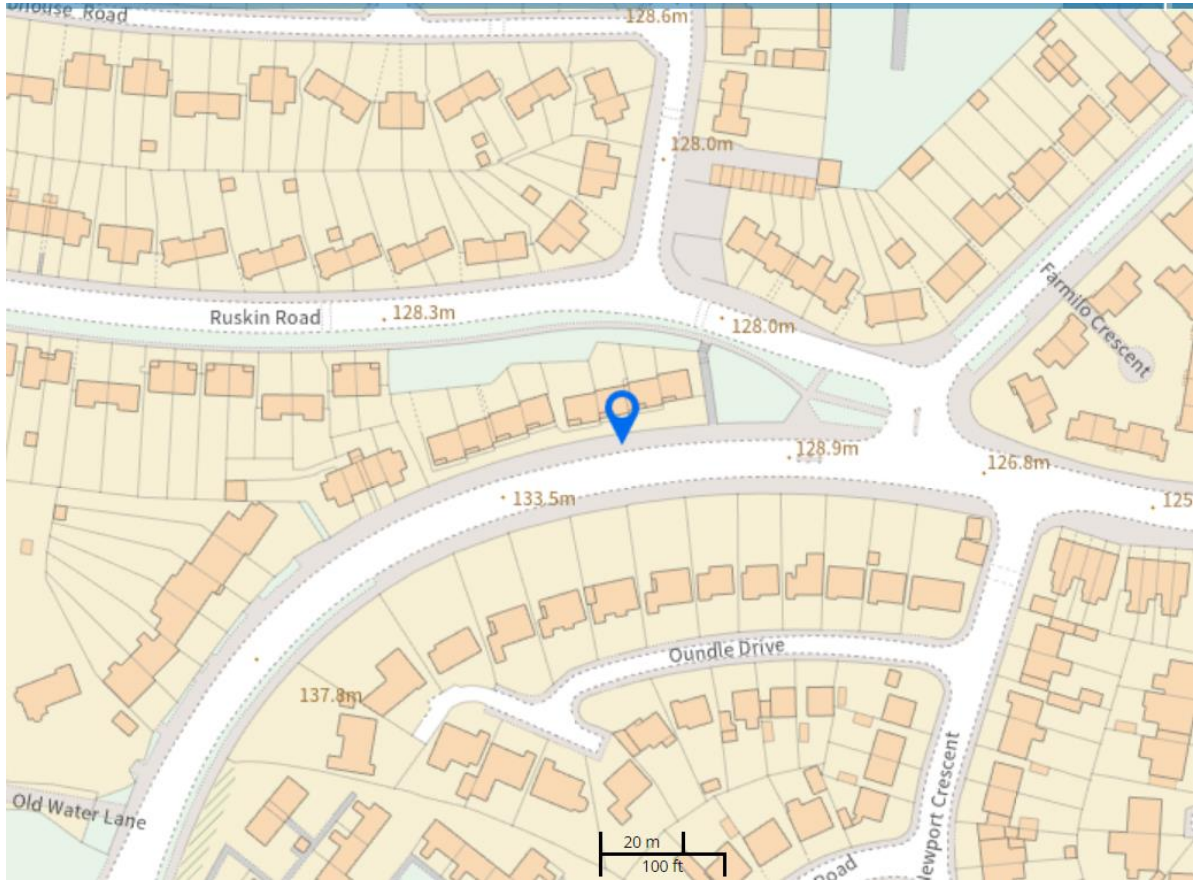


Figure D.2 – Map of non-automatic monitoring site CRN 1, CRN 2, CRN 3 (co-located tubes Chesterfield Road North 1, 2, 3)

The blue marker shows the tube's location on Chesterfield Road North (A6191) in Pleasley Hill, Mansfield (450980 363716), approximately 3.5km NW of Mansfield town centre.

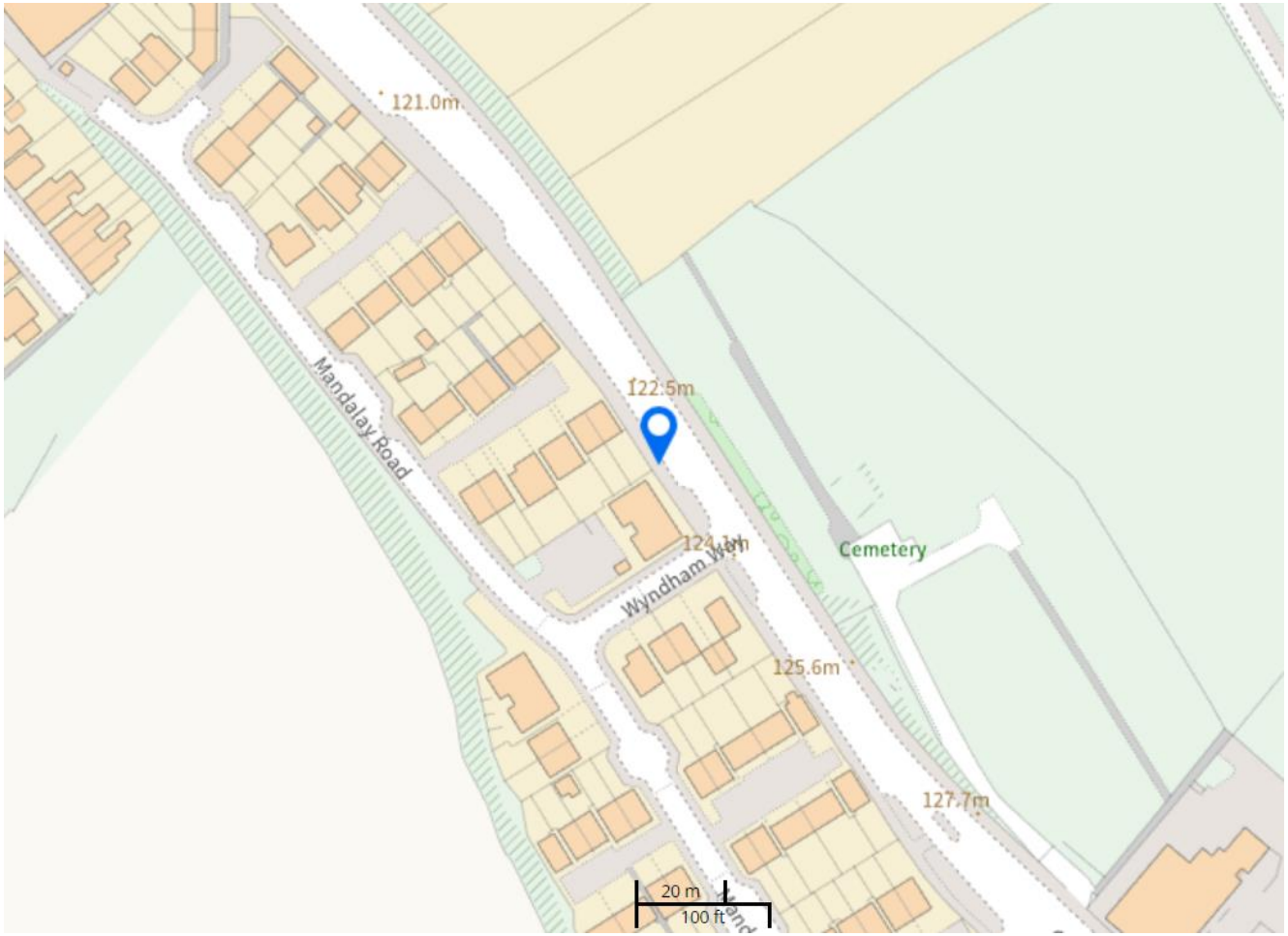


Figure D.3 – Map of non-automatic monitoring site CRS (Chesterfield Road South)

The blue marker shows the tube's location on Chesterfield Road South (A6191) in Mansfield (453349 361915), approximately 1km NW of Mansfield town centre.

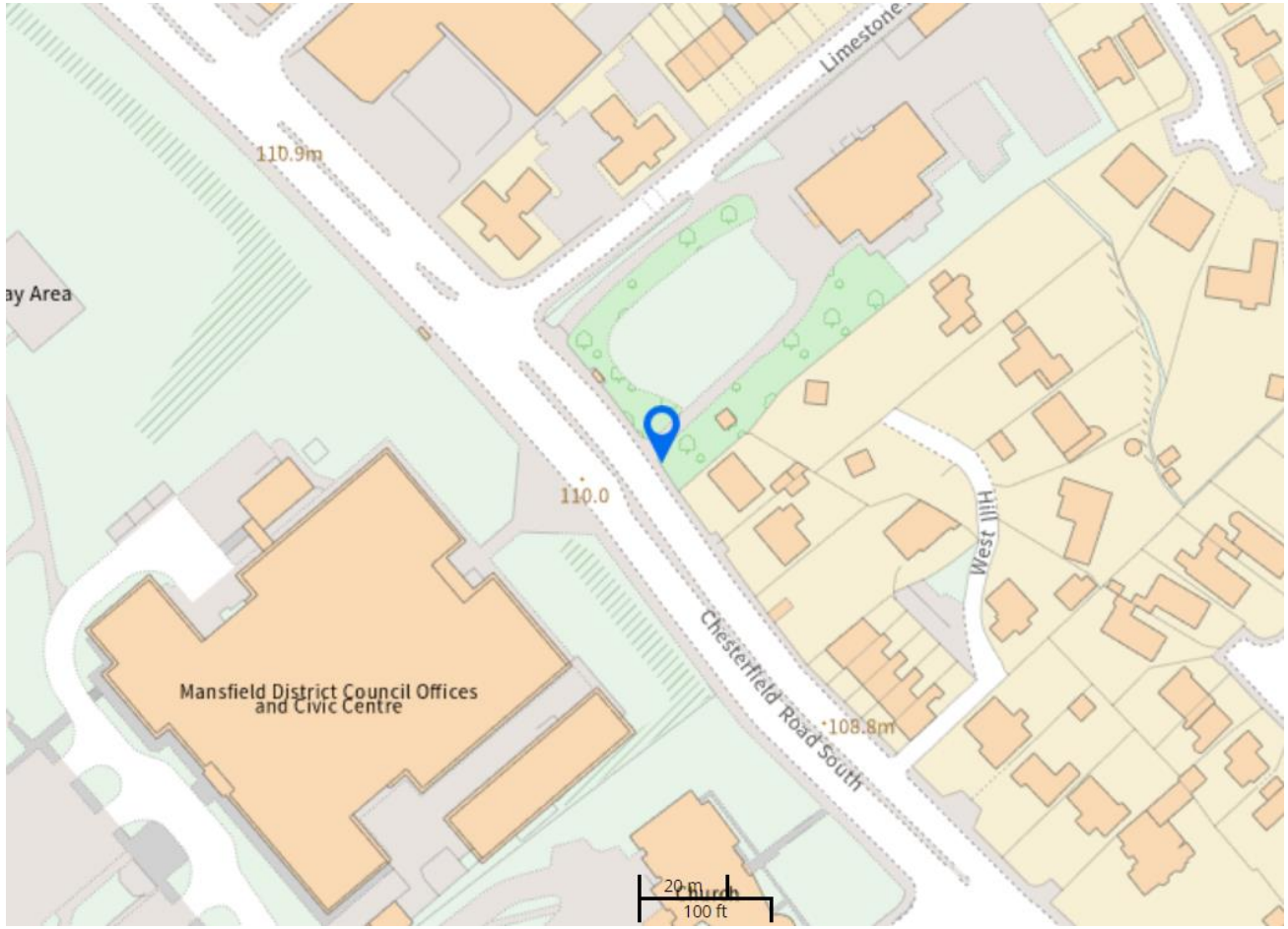


Figure D.4 – Map of non-automatic monitoring site DL (Debdale Lane)

The blue marker shows the tube's location near the junction of the A6191 (Chesterfield Road) and the A6075 (Debdale Lane) in Mansfield at 452515 362598, approximately 3km WNW of the town centre and 12.5km SE of M1 junction 29.

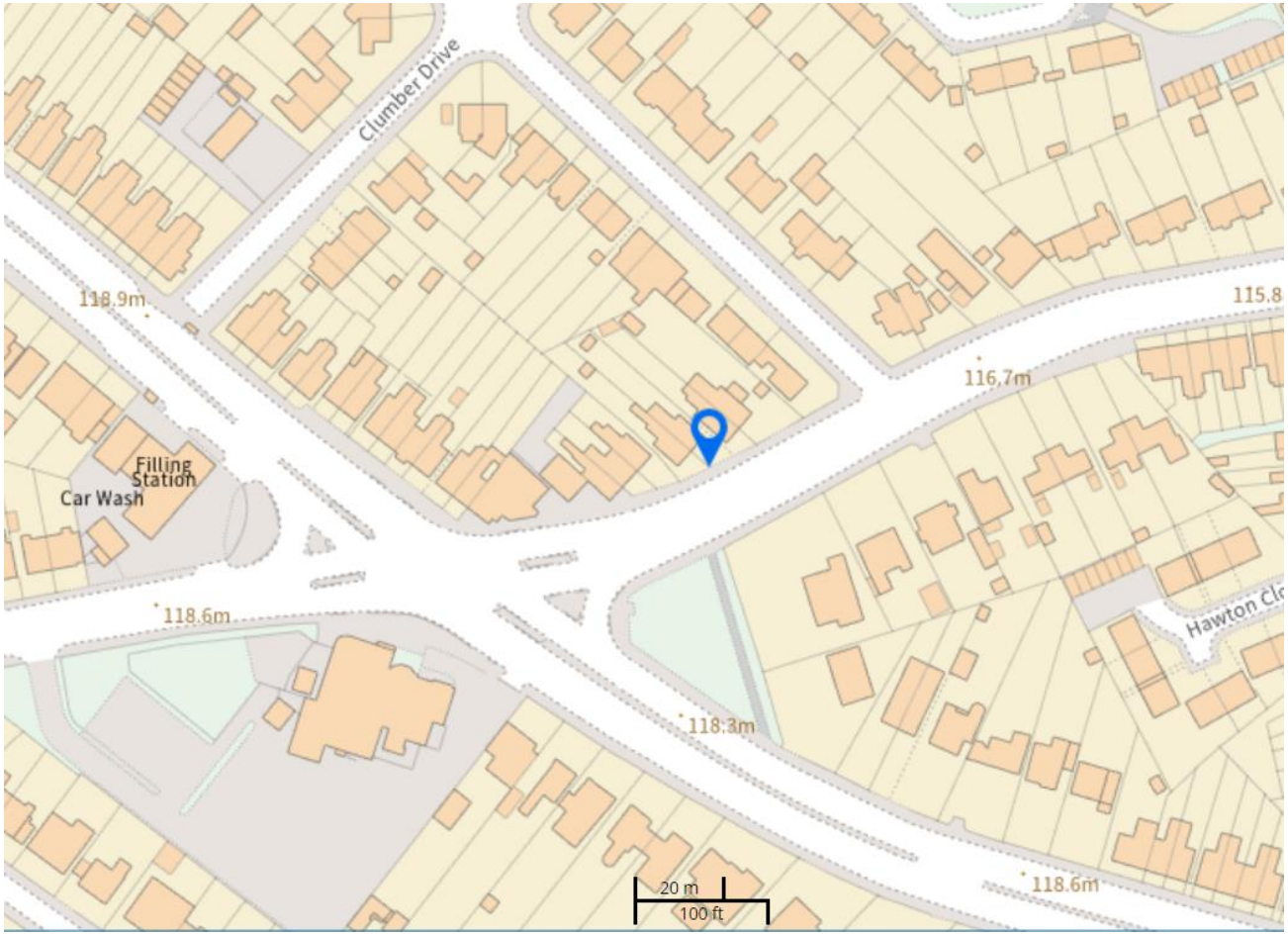


Figure D.5 – Map of non-automatic monitoring site FT 1 (Clipstone Road East)

The blue marker shows the tube's location on the B6030 (Clipstone Road East) in Forest Town at 457199 362697, approximately 4.5km NE of Mansfield town centre.

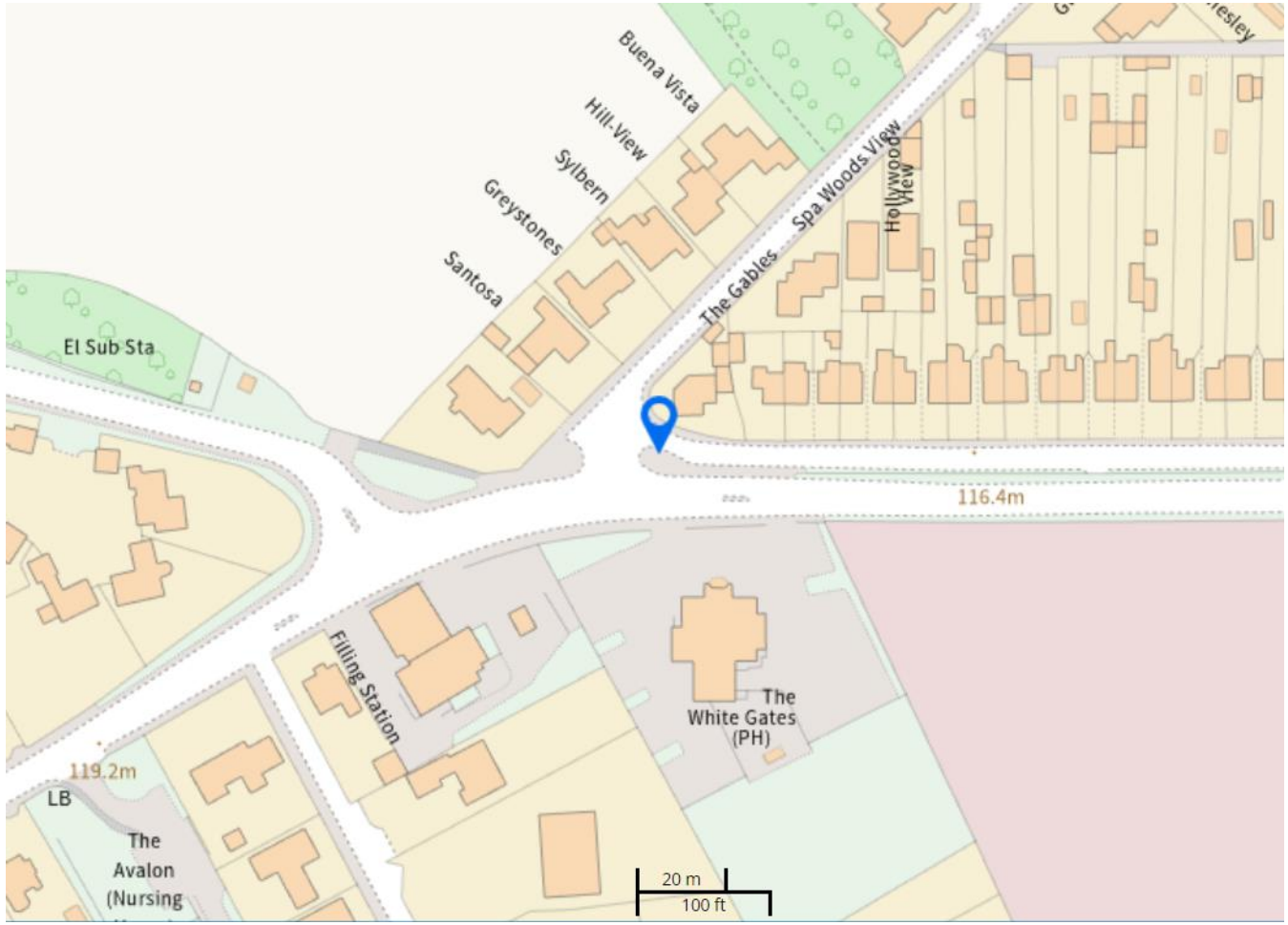


Figure D.6 – Map of non-automatic monitoring site FT 2 (Clipstone Road West)

The blue marker shows the tube's location on Clipstone Road West (B6030) in Forest Town, Mansfield (456251 362135), approximately 2.5km NE of Mansfield town centre.

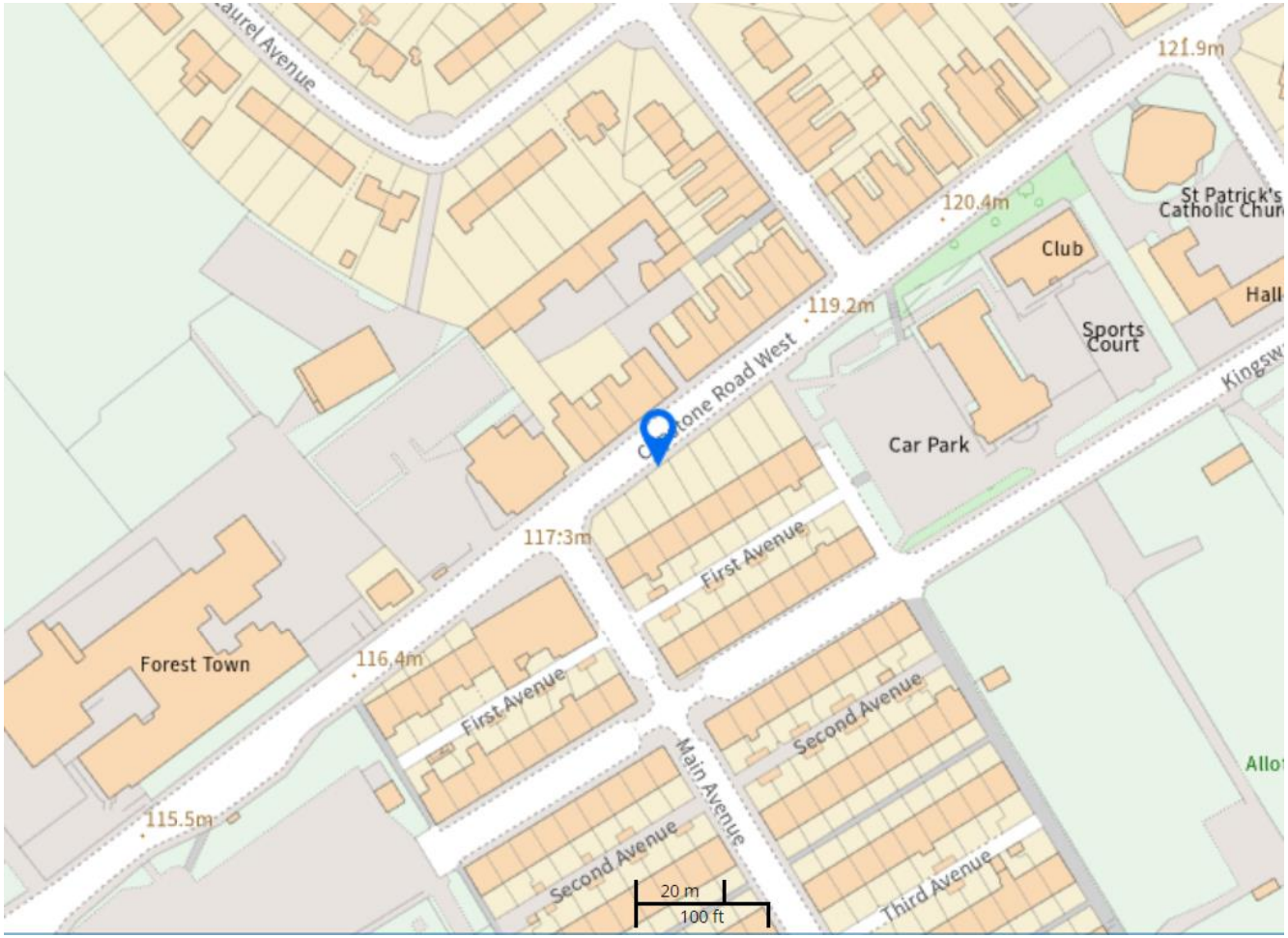


Figure D.7 – Map of non-automatic monitoring site HL (Hermitage Lane)

The blue marker shows the tube's location on Hermitage Lane, Mansfield (452429 360052), approximately 2.5km SW of Mansfield town centre.

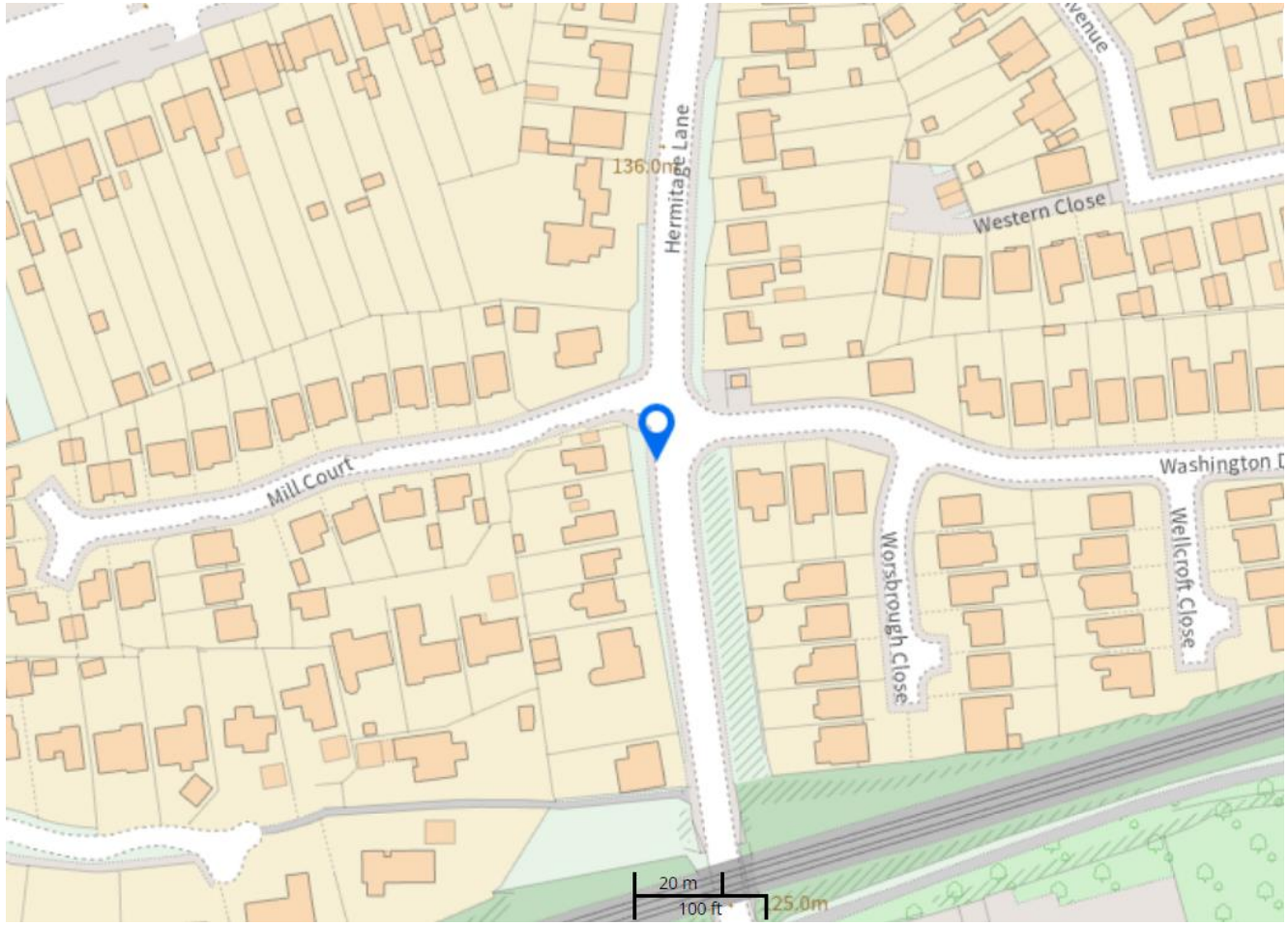


Figure D.8 – Map of non-automatic monitoring site LLS (Leeming Lane South)

The blue marker shows the tube's location on the A60 (Leeming Lane South) in Mansfield Woodhouse at 454421 362860, approximately 3km NNE of Mansfield town centre.

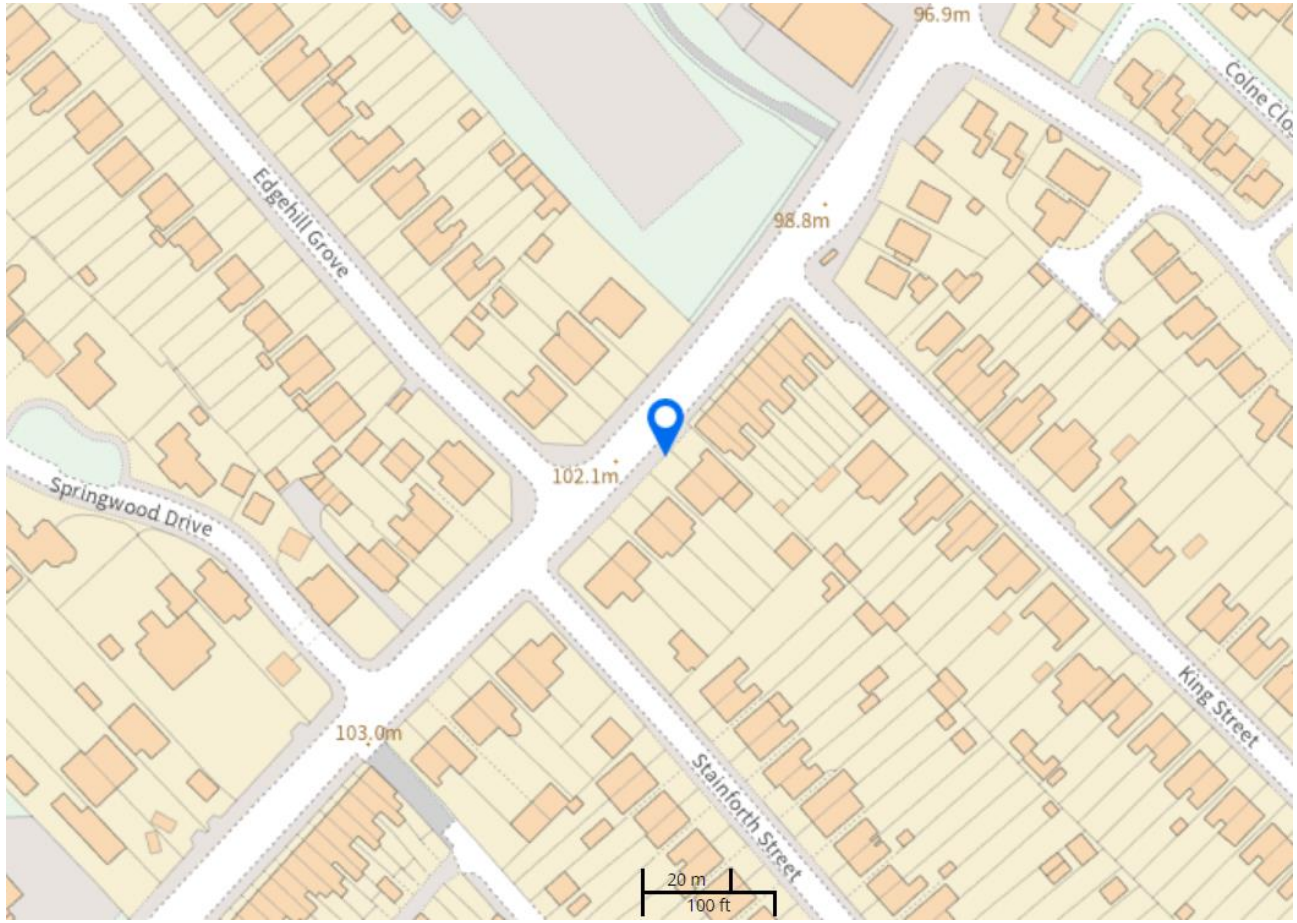


Figure D.9 – Map of non-automatic monitoring site NR (Nottingham Road)

The blue marker shows the tube's location on the A60 (Nottingham Road) in Mansfield at 453842 360174, approximately 1km N of Mansfield town centre and 6km S of the Mansfield outer ring road (the A617).

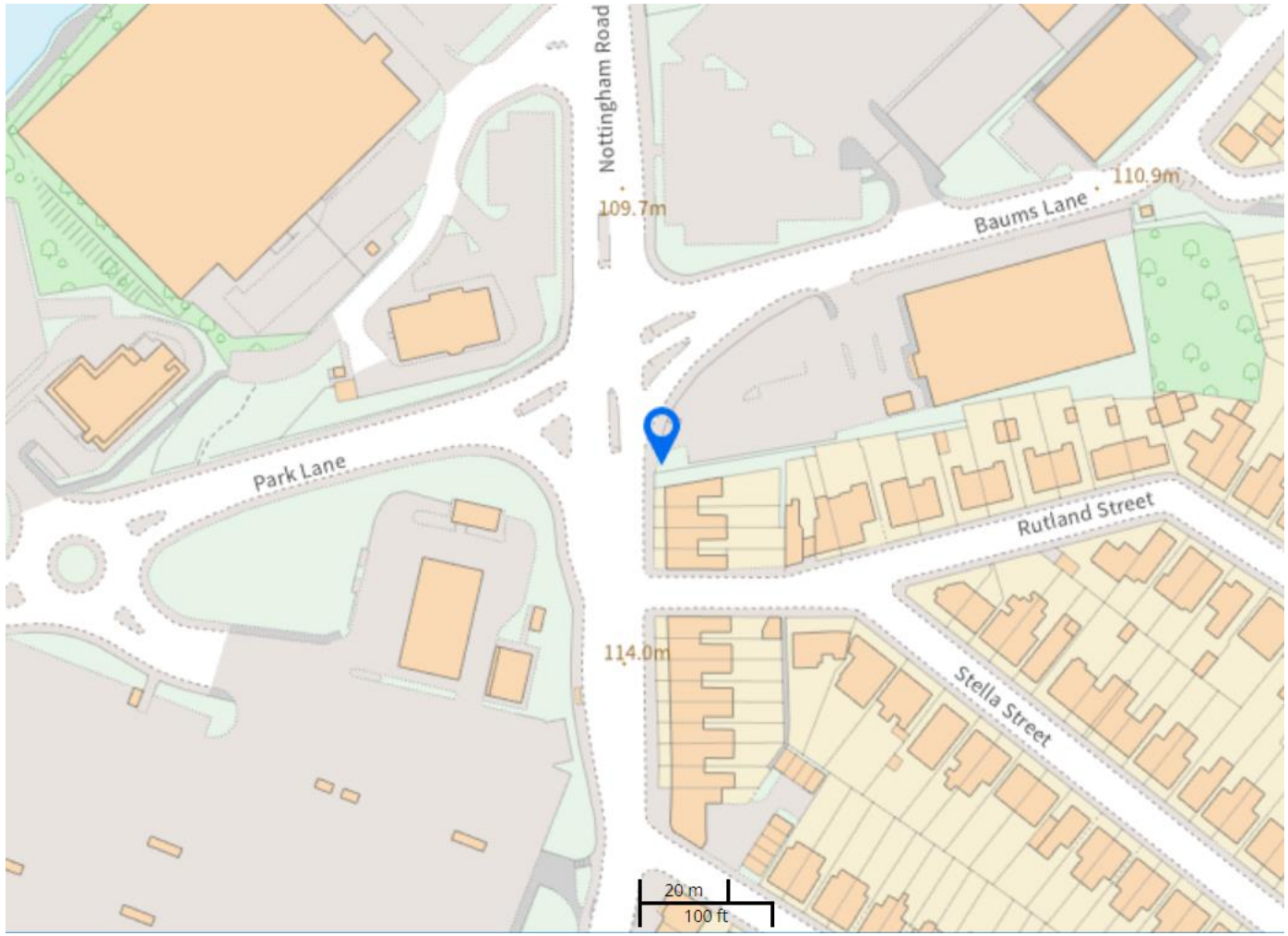


Figure D.10 – Map of non-automatic monitoring site OML (Old Mill Lane)

The blue marker shows the tube's location on the A6117 (Old Mill Lane) in Forest Town at 455834 362101, approximately 3km WSW of Mansfield town centre.

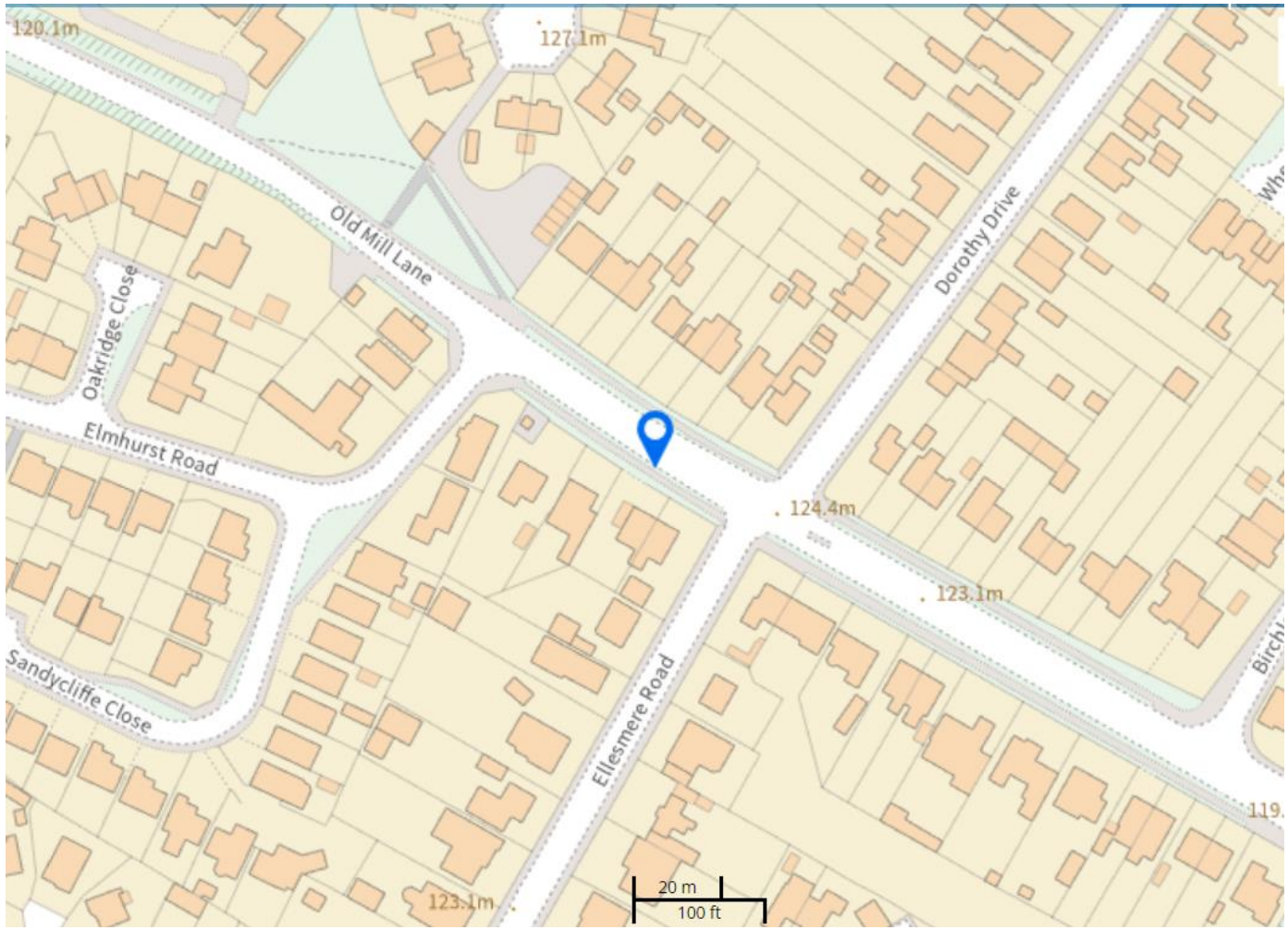


Figure D.11 – Map of non-automatic monitoring site PR (Priory Road)

The blue marker shows the tube's location on Priory Road (A6075) in Mansfield Woodhouse (453709 363105), approximately 2km N of Mansfield town centre.

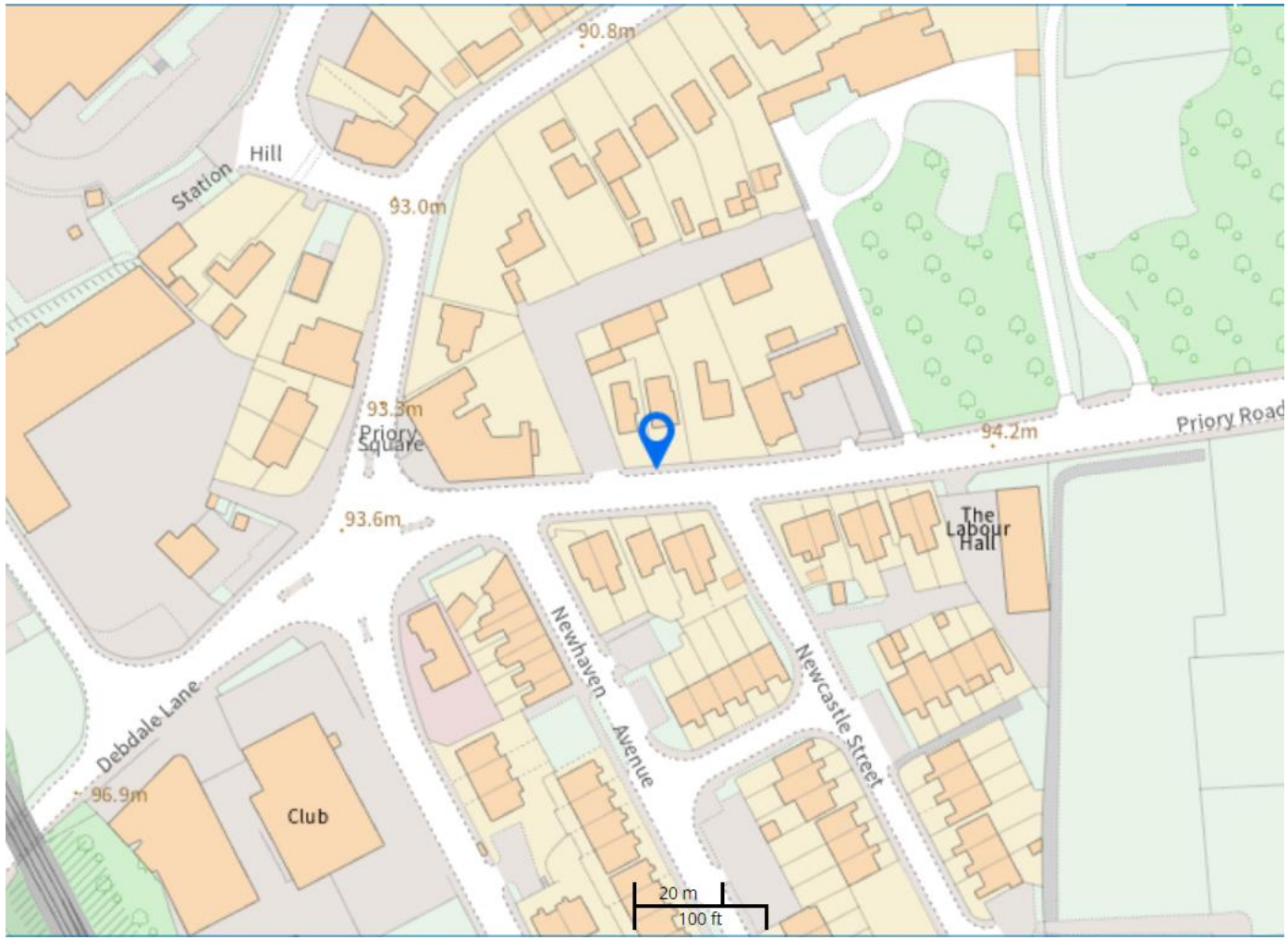


Figure D.12 – Map of non-automatic monitoring site RS (Rosemary Street)

The blue marker shows the tube's location on Rosemary Street (A6009) in Mansfield (453269 361308), approximately 1km W of Mansfield town centre. This road forms part of the ring road around the town centre.

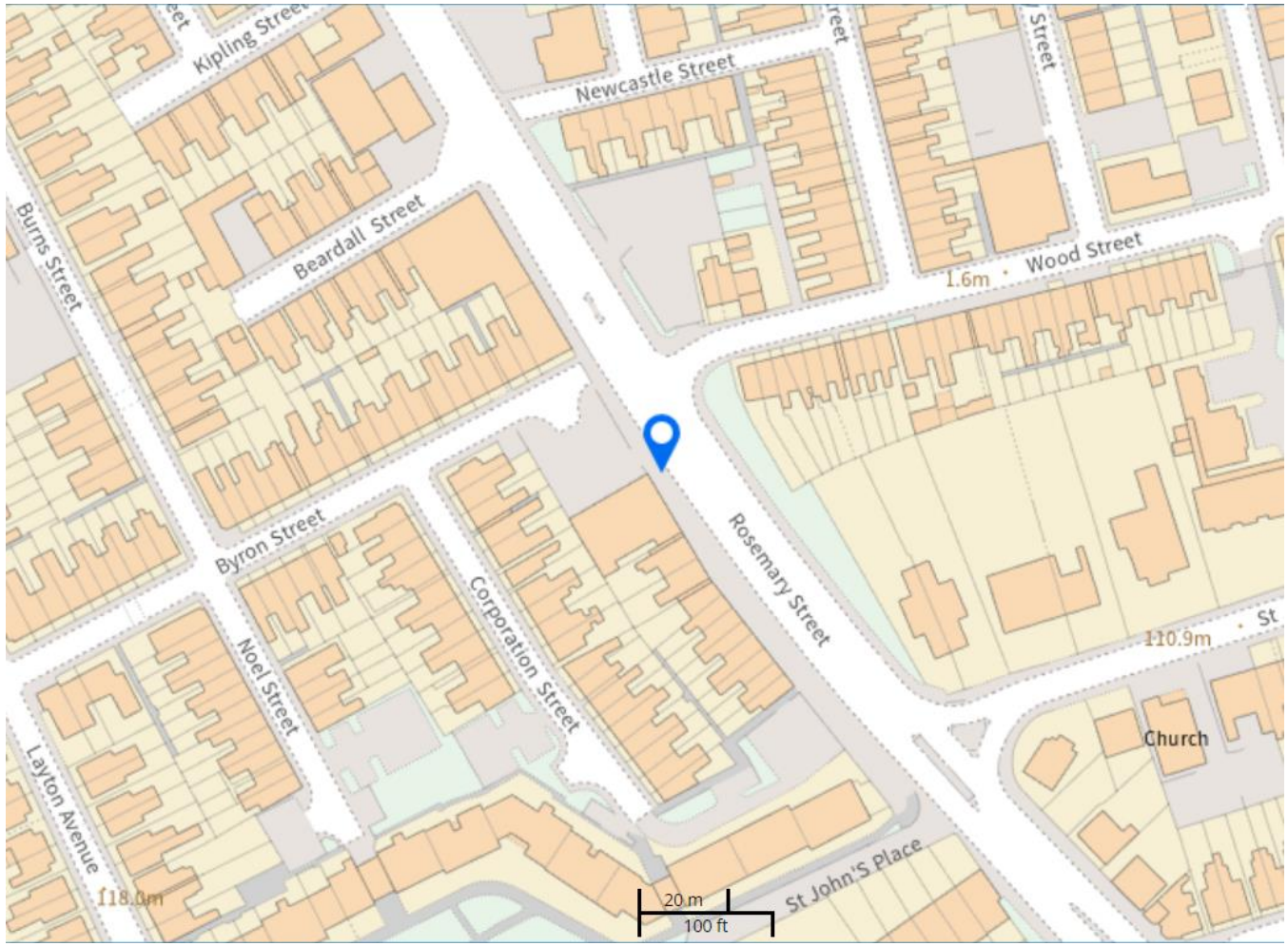


Figure D.13 – Map of non-automatic monitoring site SS (Sherwood Street)

The blue marker shows the tube's location on the B6035 (Sherwood Street) in Warsop at 456889 367638, approximately 9km SSW of Mansfield town centre.

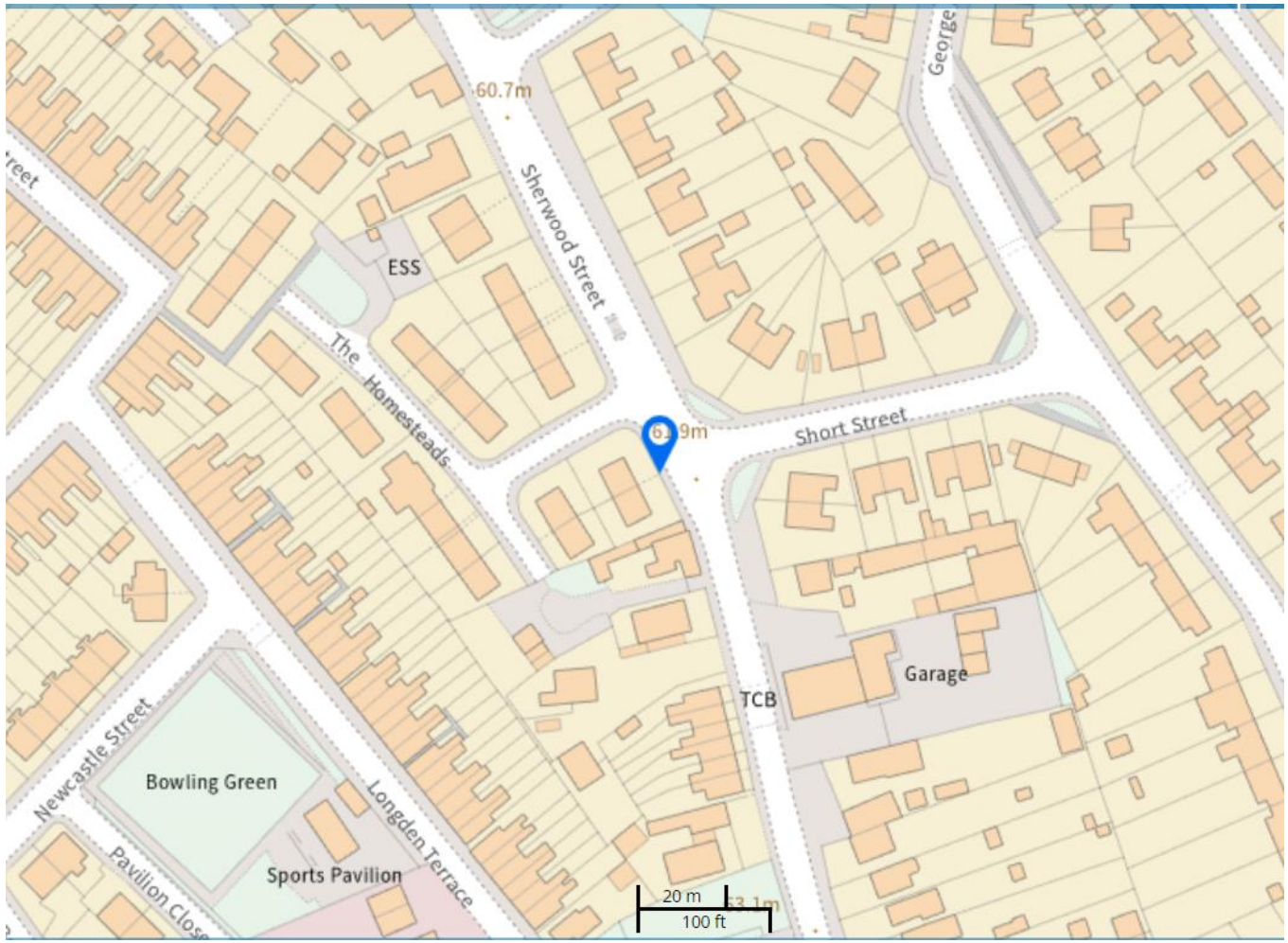


Figure D.14 – Map of non-automatic monitoring site SRE (Southwell Road East)

The blue marker shows the tube's location on Southwell Road East (B6020) in Rainworth (458513 358623), approximately 6km SE of Mansfield town centre.

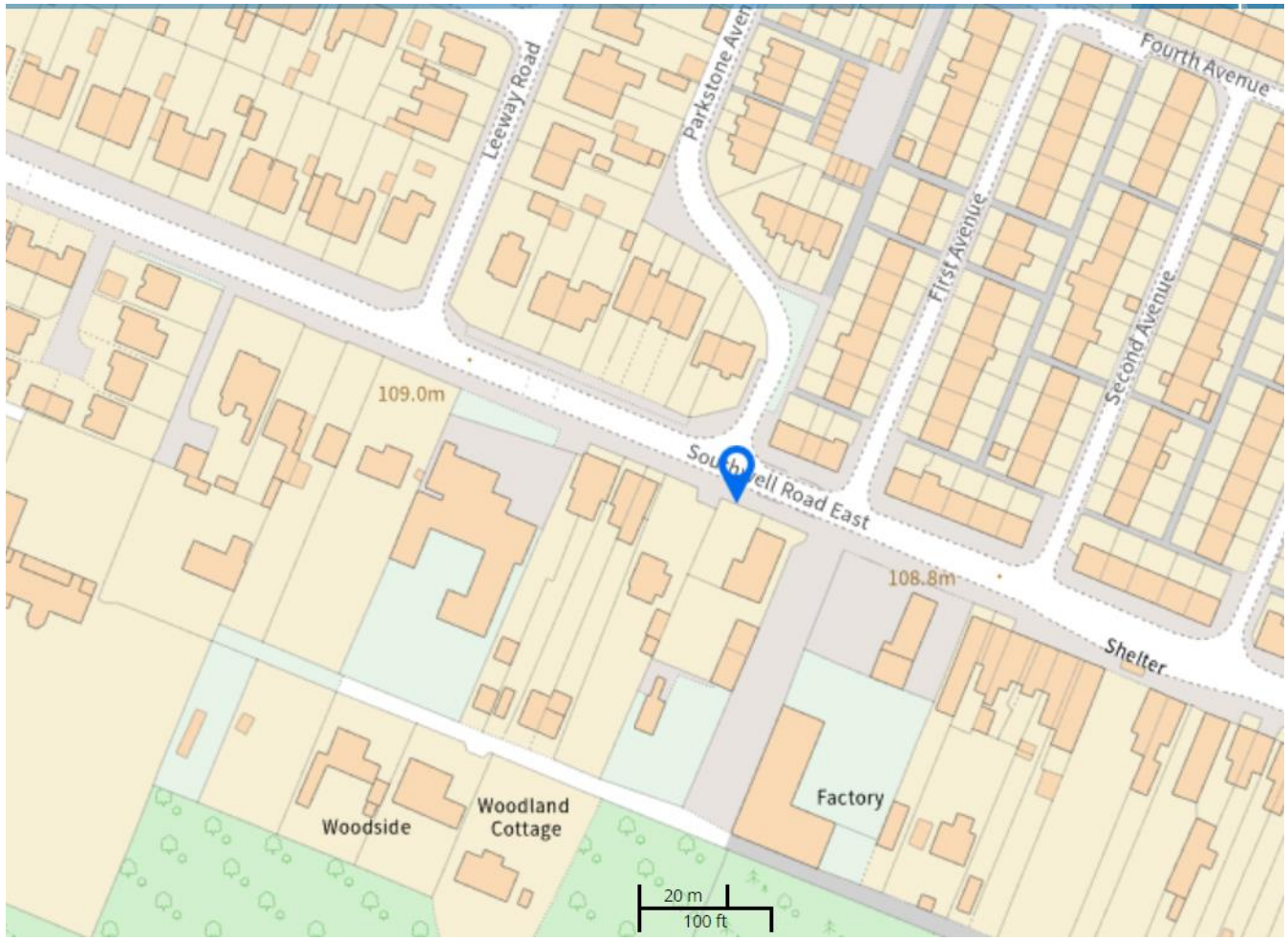


Figure D.15 – Map of non-automatic monitoring site WT (Warsop Town Hall)

The blue marker shows the tube's location on Church Street (A60) at Warsop Town Hall (456663 368019), approximately 8.5km NNE of Mansfield town centre.

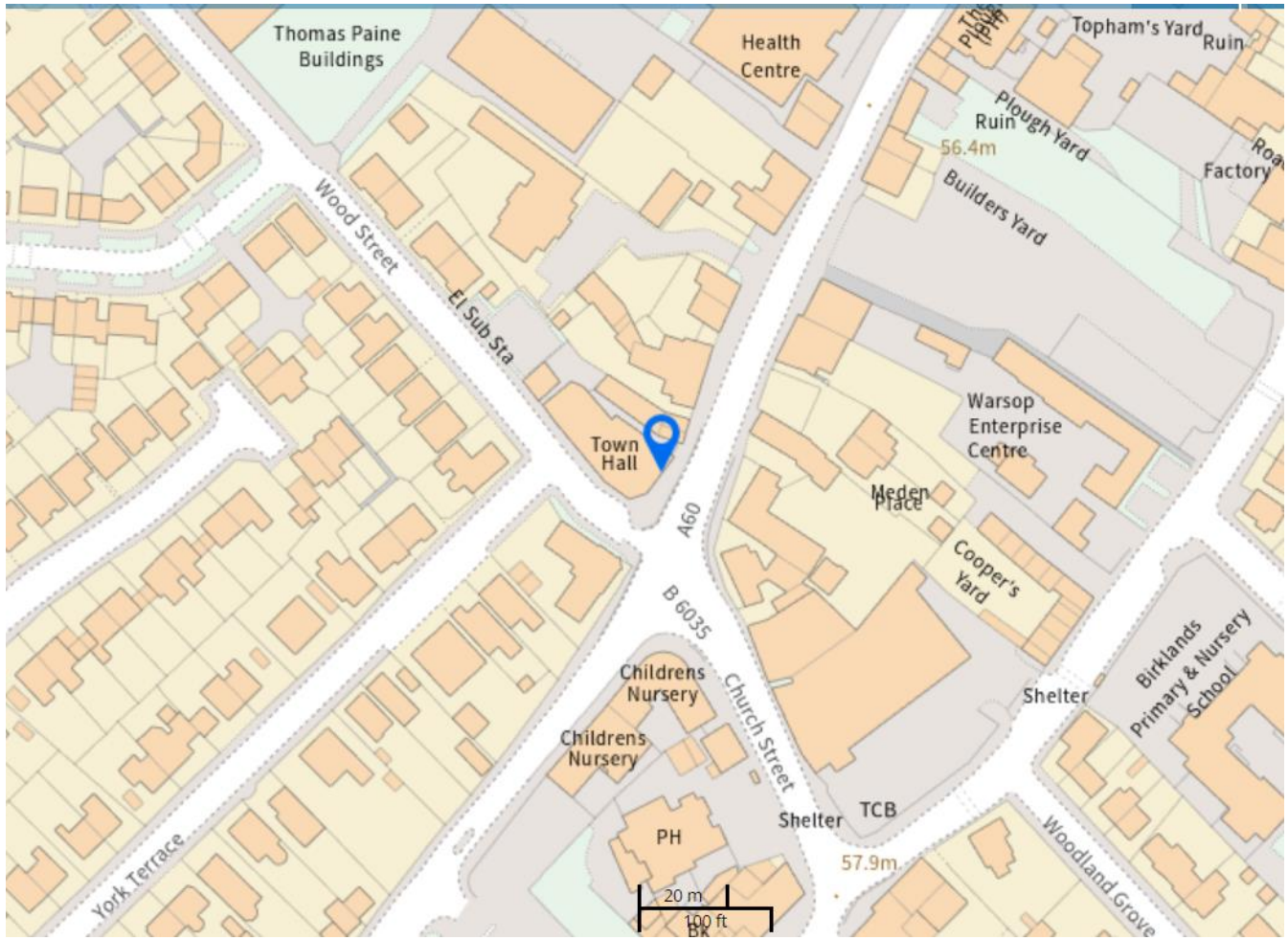
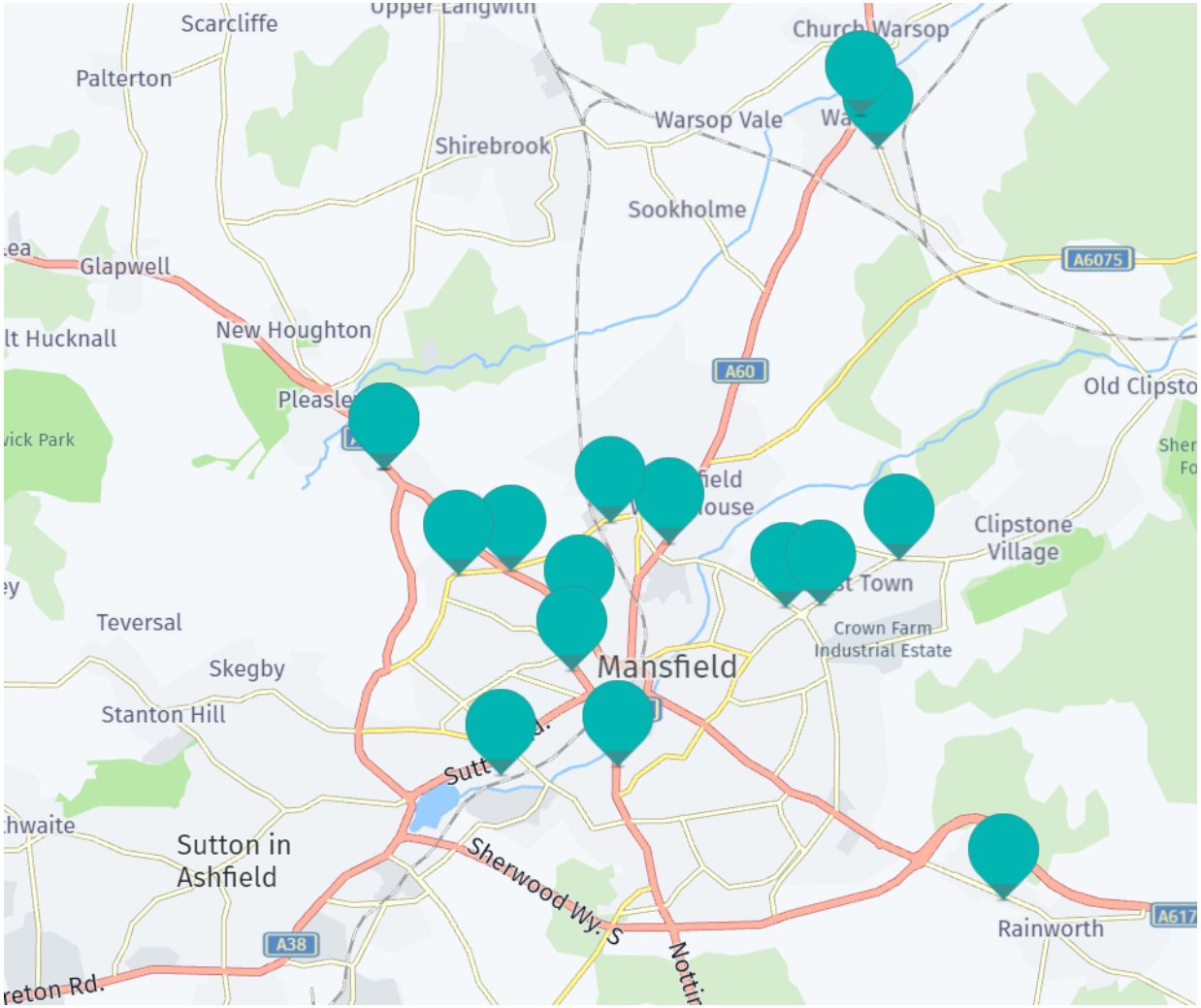


Figure D.16 – Map of all non-automatic monitoring site

The blue markers show the locations of tube sites across the whole district.



Appendix E: Summary of air quality objectives in England

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

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

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

Glossary of terms

Abbreviation	Description
AQAP	Air Quality Action Plan - A detailed description of measures, outcomes, achievement dates and implementation methods, showing how the local authority intends to achieve air quality limit values'
AQMA	Air Quality Management Area – An area where air pollutant concentrations exceed / are likely to exceed the relevant air quality objectives. AQMAs are declared for specific pollutants and objectives
ASR	Annual Status Report
Defra	Department for Environment, Food and Rural Affairs
DMRB	Design Manual for Roads and Bridges – Air quality screening tool produced by National Highways
EU	European Union
FDMS	Filter Dynamics Measurement System
LAQM	Local Air Quality Management
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

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