



2019 Air Quality Annual Status Report (ASR)

In fulfilment of Part IV of the
Environment Act 1995
Local Air Quality Management

June 2019

Charnwood Borough Council

Local Authority Officer	Peter Weatherill <small>MSc. MCIEH</small> Environmental Health Technical Officer
Department	Environmental Health
Address	Charnwood Borough Council Southfield Road Loughborough Leicestershire LE11 2TR
Telephone	01509 634641
E-mail	Peter.weatherill@charnwood.gov.uk
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Executive Summary: Air Quality in Our Area

Air Quality in Charnwood

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 and older people, and those with heart and lung conditions. There is also often a strong correlation with equalities issues, because areas with poor air quality are also often the less affluent areas^{1,2}.

The annual health cost to society of the impacts of particulate matter alone in the UK is estimated to be around £16 billion³.

Data for Loughborough from 2018 indicates that there continues to be a significant reduction in the concentration of NO₂ levels around the town centre since the opening of the Inner Relief Road in November 2014.

The stretches of High Street and Baxter Gate that border on the recently pedestrianised area have fallen from average figures of 56 and 44µg/m³ over the 5 years before the road was opened, down to 28 and 29µg/m³ respectively during the fourth full year of monitoring (2018) since the road was opened. These figures thus maintain a 4th year beneath the Air Quality Objective levels.

A further measurable improvement for residents has also been observed along Barrow Street where concentrations have fallen from 28 to 23µg/m³ and Ashby Road where concentrations have dropped to 28 from 35µg/m³

Whilst these figures continue to be encouraging and help to support one of the main objectives behind the construction of the road, Officers will continue to monitor and report upon their results.

Monitoring at Syston continues to show that NO₂ levels remain consistently beneath the Air Quality Objectives. As 2018 has provided “another year to confirm this trend”, then following the request of Defra for us to postpone our proposal to revoke the AQMA made in our 2018 ASR - where we presented data to indicate that the AQO

¹ Environmental equity, air quality, socioeconomic status and respiratory health, 2010

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

³ Defra. Abatement cost guidance for valuing changes in air quality, May 2013

had not been exceeded since 2008, we will now seek Cabinet approval for the revocation.

On-going partnership work with Mountsorrel Quarry (Tarmac) remains, primarily through the integration of relevant bodies over the quarry's Dust Management and Monitoring Plan (DMMP). This document continued to be regularly reviewed by Council Officers and the quarry management team. Implementation of the DMMP continues to identify and refine operational activities, with its focus to ensure that any sources of on-site fugitive dust emissions are continually identified and addressed through appropriate mechanisms to reduce impact to the local community.

Whilst PM₁₀ levels have markedly lowered since the introduction of the quarry DMMP, it is apparent that residents still experience episodic concentration impact from local activities; we can however support the suggestion that transboundary movement has played a part in a number of the 24-hour exceedances experienced at Mountsorrel

Further information about the work of the Council in respect to Local Air Quality Management can be found on our webpages at:

<http://www.charnwood.gov.uk/pages/airpollution>

Actions to Improve Air Quality

Success is continuing to be seen in relation to the 2 major air quality areas of concern for the Council, namely the maintained reduction of NO₂ levels in Loughborough town centre and PM₁₀ concentrations at Mountsorrel. It is important to recognise that the beneficial outcomes to public health that are being observed for both of these AQMAs are as a direct result of positive actions having been taken (both physically-engineered i.e. the Inner Relief Road, or through the means of successful collaboration i.e. the DMMP), through their identification, evaluation and the implementation of measures designed to mitigate public exposure.

Conclusions and Priorities

It is again encouraging to see that all monitoring during 2018 has been in compliance with the air quality objectives, both inside and outside of the existing AQMAs. Overall trends for NO₂ remain downwards and the work committed to at Mountsorrel Quarry continues to achieve PM₁₀ concentrations averaging around 25% lower than those observed when compared to results during 2009/10, prior to the declaration of the Air Quality Management Area (AQMA).

A second set of monitoring data has been reported from our SO₂ monitor located close to the Great Central Railway engine sheds. Whilst results again suggest that concentrations are within the required objective levels of this particular pollutant, it is our intention to continue to monitor levels as we are aware that there has been some disruption to the monitoring over the past 2 years with both equipment and 'server-side' enhancements taking the monitor off-line for extended periods.

A number of queries from Members have been received over the course of the past year in respect to the air quality in their respective Wards. Whilst we have no reason to believe there are any areas of concern we have, where appropriate and practicable, catered for the re-siting of a small number of existing diffusion tubes to specific areas which were not covered by our network as of 2018.

Local Engagement and How to get Involved

In order to help local people and visitors to travel easily in and around Charnwood and Leicestershire as well as to reach places further afield, all whilst reducing the burden on the environment; more information about the local buses, cycling paths, car share schemes, local air travel and road traffic and weather conditions can be found on our public transport and sustainable travel website pages at:

[Public transport and sustainable travel](#).

Alternatively, follow the direct links below for information on:

- [Cycling, pedestrian and other pathways](#) located within Charnwood.
- [Leicestershire Sustainable Travel](#)
- [The 'Chose How You Move' Car share scheme](#)

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1 Local Air Quality Management

This report provides an overview of air quality in Charnwood during 2018. 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 Charnwood to improve air quality and any progress that has been made.

The statutory air quality objectives applicable to LAQM in England can be found in **Error! Reference source not found.** in Appendix E.

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 must prepare an Air Quality Action Plan (AQAP) within 12-18 months setting out measures it intends to put in place in pursuit of compliance with the objectives.

A summary of AQMAs declared by Charnwood Borough Council can be found in Table 2.1. Further information related to declared or revoked AQMAs, including maps of AQMA boundaries are available online at https://uk-air.defra.gov.uk/aqma/local-authorities?la_id=52

Alternatively, see Appendix D: Map(s) of Monitoring Locations and AQMAs, which provides for a map of air quality monitoring locations in relation to the AQMA(s).

Table 2.1 – Declared Air Quality Management Areas

AQMA Name	Date of Declaration	Pollutants and Air Quality Objectives	City / Town	One Line Description	Is air quality in the AQMA influenced by roads controlled by Highways England?	Level of Exceedance (maximum monitored/modelled concentration at a location of relevant exposure)				Action
						At Declaration		Now		
Loughborough	Declared 2001, Amended 2004	NO2 Annual Mean	Loughborough	An area encompassing a number of properties around the town centre	NO	Unknown (in excess of 40 µg/m3)	µg/m3	33.5 µg/m3 (Leicester Rd)	µg/m3	Charnwood Local Air Quality Management Plan – Final Action Plan
Syston	Declared 2001, Amended 2004	NO2 Annual Mean	Syston	Residential properties along Melton Rd and Sandford Rd	NO	Unknown (in excess of 40 µg/m3)	µg/m3	32.1 µg/m3 (1116 Melton Rd)	µg/m3	Charnwood Local Air Quality Management Plan – Final Action Plan

Charnwood Borough Council

Great Central Railway (GCR)	Declared 2001	SO2 15 Minute Mean	Loughborough	An area encompassing residential properties near The Great Central Railway	NO	Unknown (in excess of 266 µg/m3 more than 35 times a year)	µg/m3	No exceedances of any objective level recorded during the 2018 monitoring period	µg/m3	Charnwood Local Air Quality Management Plan – Final Action Plan
Mountsorrel	Declared 2011	PM10 Annual Mean	Mountsorrel	An area encompassing residential properties near Mountsorrel Quarry	NO	60 recorded exceedances (from 313 valid samples) of the 24 Hr Mean	Exceedances	15 recorded exceedances (from 199 valid samples) of the 24 Hr Mean. Equivalent to 28 for full year	Exceedances	Dust Management and Monitoring Plan

Charnwood Borough Council confirm the information on UK-Air regarding their AQMA(s) is up to date

2.2 Progress and Impact of Measures to address Air Quality in Charnwood

Defra's appraisal of last year's ASR concluded that the monitoring continued to confirm that there were no results, or recent evidence of exceedances above objectives for:

- Loughborough AQMA
- Syston AQMA
- Mountsorrel AQMA
- Great Central Railway AQMA

Furthermore, it was noted that our air quality monitoring strategy had been reviewed in 2017 with no issues being raised in regards to the location or type of monitoring undertaken. We will of course continue to review our network and act accordingly to cover as best as possible any developing issues.

As a response to our 2018 proposal to revoke the Syston AQMA; it was requested that we continued the monitoring for a further year to ensure that a decline in concentrations seen since 2015 did not continue the trend. As presented below, data for 2018 indicates that levels fell back from 2017 and remain beneath the objective level for the 11th successive year when real-time monitoring was established.

The appraisal commented that there was no evidence that our AQAP had been updated in the last year, and many measures now appeared to be complete or non-active. It would be fair to say that the outcome of those implemented measures has seen observed concentrations at all sites within the Borough, both within and outside declared AQMAs, meeting compliance with the AQOs. We therefore feel there are no immediate identifiable issues for which further explicit attention needs to be reflected through a revised AQAP. Quantitative monitoring continues.

Whilst the Mountsorrel PM₁₀ AQMA is influenced by a site specific industrial 'source' and process operations continuing to be regularly reviewed by Environmental Health Officers / updated where necessary through the quarry's Dust Management and Monitoring Plan (DMMP); further influencing the impact of 'general' local pollution i.e.

NO₂ levels that are in compliance with AQOs (and matters relating to climate change) are largely issues that run outside of the scope of an exacting AQAP.

Furthermore, many overarching measures Charnwood are seeking to implement are not thought of in isolation at departmental level, for which evidencing within in this document would be unfeasible, but rather form an integral but broader strategic approach. There are a number of detailed strategic documents that are monitored by and reported on elsewhere in the Council.

Local Plan (2011-2028) Core Strategy. This is a multi-faceted document that is strategically developed to acknowledge the wider perspective with consideration given to current national and local legislative and economic challenges, but still charting a level of control over sustainable development and means to reduce environmental impact throughout the Borough.

More information on the Local Plan and details towards its measure of progress can be viewed on the Council website:

<https://www.charnwood.gov.uk/pages/corestrategydpd>

The latest available annual monitoring report (2017-2018) is available to download from:

https://www.charnwood.gov.uk/files/documents/annual_monitoring_report_2017_2018/Annual%20Monitoring%20Report%202017-2018.pdf

Climate Change Strategy. The Climate Change Strategy 2018-2022 sets out the Council's aim of influencing and empowering residents, community groups, schools and businesses in the Borough to help them to mitigate climate change by reducing their carbon emissions and also aims to implement carbon reduction projects to reduce the carbon emissions of its own buildings.

More information on the Strategy can be found at:

https://www.charnwood.gov.uk/pages/climate_change_strategy

With the Action Plan available to download from:

https://www.charnwood.gov.uk/files/documents/climate_change_strategy_and_action_plan/Climate%20Change%20Strategy%20and%20Action%20Plan.pdf

The schedule from the Action Plan has been reproduced under Table 2.2.

Table 2.2 – Progress on Measures to Improve Air Quality

Measure No.	Measure	EU Category	EU Classification	Organisations involved and Funding Source	Planning Phase	Implementation Phase	Key Performance Indicator	Reduction in Pollutant / Emission from Measure	Progress to Date	Estimated / Actual Completion Date	Comments / Barriers to implementation
1	<p>6% Shift from travel by private car to walking, cycling and public transport</p> <p>(Charnwood Local Plan 2011 to 2028 Core Strategy Policy CS17 / CS18)</p> <p>https://www.charnwood.gov.uk/files/documents/adopted_core_strategy/Charnwood%20Local%20Plan%202011%20-%202028%20Core%20Strategy%20Adopted%20November%202015.pdf</p>	Policy Guidance and Development Control	Other policy	Charnwood Borough Council	-	-	<p>100% of new houses to be within 400m of a local bus service.</p> <p>100% of major developments to provide walking, cycling and public transport links to key facilities and services</p>		There have been no decisions taken that are contrary to Policy	2028	Policy provides significant guidance and measures to mitigate any air quality impacts such as Sustainable Travel Plans and key decision making for all major developments

Awareness Raising

Ref	Commitment	Action	Measure	Target	Responsibility	Timescale	Links to Policies
1.1	We will recognise climate change as a corporate commitment for the Council	Ensure climate change is recognised as a priority within the corporate plan	Climate Change included in the Corporate Plan for 2020-2025	Corporate plan published with Climate Change as a key priority	Corporate Management Sustainability	2020	Corporate Plan
1.2	We will encourage environmental education and promote climate action through a proactive communication campaign	Engage with schools to promote environmental programmes	Working with schools across the Borough on the 'Enviro Detectives' resource	Number of children engaged 200- 300	Street Management	Annual	Climate Local
1.2.1			Promotion of the 'Don't Muck Around' Campaign to Schools and Young People	Achieve 5 entries/pledges from schools and young people	Street Management	Annual	Corporate Plan
1.2.2		Encourage residents to adopt energy efficiency measures	Frontline Services training & awareness taking place Information on website	Training provided	Sustainability	Annual	Climate Local
1.2.3				Website up to date	Private Sector Housing		
					Landlord Services		
1.2.4	Encourage residents to reduce waste to landfill and increase recycling	Awareness programmes in place #Recycle Right campaign (along with Comms Team) Big Guide brochure delivered to all new properties	Two number of promotions	Cleansing	Annual	Zero waste strategy	
1.2.5	Encourage the improvement of our environment by taking part in Loughborough in Bloom	Resources and promotion's in place to support and take part in competition	Maintain the number of Love Your Neighbourhood groups >30	Open Spaces	Annual	Open Spaces Strategy	
1.2.5	Encourage residents to cut down on meat consumption to within accepted health guidelines to help reduce the carbon emissions associated with meat production and to bring about health benefits	Work with Leicestershire Nutrition Dietetic Services as part of the Lifestyle Activity programme for adults to raise awareness	Ensure key messages delivered through our dietitians	Recreational Services	Annual	Climate Change Strategy	
		Awareness programme in place	Deliver 1 promotional campaign annually	Sustainability			

Ref	Commitment	Action	Measure	Target	Responsibility	Timescale	Links to Policies
1.3	We will encourage a low carbon economy	Work with partnership agencies to encourage businesses to adopt energy efficiency measures by signposting to relevant services and opportunities	Engage with Businesses to promote energy efficiency Details made available on website and publications	Deliver 1 promotional campaign annually	Economic Regeneration Sustainability	Annual	Climate Local
1.4	We will promote environmental behaviour change and showcase best practice	Develop and implement an environmental behavioural change programme and work with teams to showcase positive changes in environmental practice	Programme in place Questionnaire to staff on feedback of scheme	Number of staff taking part 40	All Services Sustainability	Annual	Climate Local

Reducing our Impact on Climate Change

Ref	Commitment	Action	Measure	Target	Responsibility	Timescale	Links to Policies
2.1	We will measure and reduce carbon emissions across our buildings and operations, including our fleet	Implement actions in Carbon Management Plan	Reduction in carbon emissions from energy saving schemes	Carbon 2020 pledge	All Services Sustainability	2020	Climate Local
2.1.1			Resources available to complete annual carbon monitoring report	Production of annual report	Sustainability	Annual	Climate Local
2.1.2		Review low carbon solutions across Council buildings, operations and fleet	Number of schemes implemented	Carbon savings will depend on schemes developed	Asset Management	Ongoing	Climate Local
2.1.3		Improve energy efficiency of Council ICS equipment	Minimise surplus hardware and energy demand through virtualisation of devices by the implementation of Thin Client Terminal	Carbon savings will depend on schemes developed	Information & Communication Services	Ongoing	ICS Strategy Carbon Management Plan
2.1.4			Implementation of Cloud based telephony system	Migration onto the new phone system and decommission existing telephone infrastructure	Information & Communication Services	2018	ICS Strategy
2.1.5			Implementation of Office 365	Complete the proof of concept with 25 users	Information & Communication Services	Ongoing	ICS Strategy
2.1.6			Options identified for improving remote working systems, encouraging smarter, more efficient working	Carbon savings will depend on schemes developed	Information & Communication Services	Ongoing	ICS Strategy Carbon Management Plan
2.1.7			Support tree planting across Chamwood to offset CO ₂ emissions, provide habitat for wildlife, enhance natural landscape and reduce flood risk	Number of trees planted	Plant 10,000 trees	Open Spaces Natural & Built Environment	2020

Ref	Commitment	Action	Measure	Target	Responsibility	Timescale	Links to Policies
2.1.8		Assess the feasibility of electric or hybrid vehicles when the Council's existing fleet vehicles are replaced	Number of electric or hybrid vehicles / leased	Minimum of 3 electric / hybrid vehicles leased	Fleet Management	Ongoing	Climate Local
2.2	We will encourage energy reduction, clean energy and energy efficiency and promote its benefits to our community and businesses	Update and implement the Home Energy Conservation Act (HECA) report	Production of HECA report	Report published	Private Sector Housing	Biannual	HECA
2.2.1		Work in partnership to deliver government energy efficiency programmes	ECO top up grant contribution	Guidance available to support residents	Private Sector Housing	Ongoing	Private Sector Housing Grants Policy
2.2.2			Resources in place to signpost to first contact plus	Guidance available to support residents	Private Sector Housing	Ongoing	
2.2.3		Energy Performance Certificate records for Council housing stock to be updated to give an average SAP value	Energy Performance Certificate records being updated on the stream line software which will give an average SAP value	To carry out EPC's at all void properties and upload to software	Landlord Services	Ongoing	Housing Business Plan
2.2.4		Provide top-up roofing insulation, cavity wall and boiler upgrade programme for Council housing stock	Investment in programme	125 loft insulation installations based on £400 per property	Landlord Services	2018/19	Housing Business Plan
2.2.5		Carry out stock condition surveys to monitor energy condition of Council housing stock	Stock condition surveys	250 stock condition surveys per year this may be increased with the new capital contract starting in April 2018	Landlord Services	Ongoing	Housing Business Plan
2.2.6		Ensure Chamwood standard is implemented and maintained for Council housing stock	Chamwood Standard in place and being maintained	No properties not meeting standard programmes created from the housing management system to ensure the Chamwood standard is maintained	Landlord Services	Ongoing	Housing Business Plan

Ref	Commitment	Action	Measure	Target	Responsibility	Timescale	Links to Policies
2.3	We will minimise the climate impact from development and encourage a low carbon economy through the planning system	Encourage a sustainable pattern of development supported by a low carbon transport infrastructure	Amount of new major developments that provide walking, cycling and public transport access to key facilities and services embedded in the emerging local plan	100% of major developments to provide walking, cycling and public transport links to key facilities and services	Plans, Policy & Place Making Development Management	Ongoing	Core Strategy
2.3.1			Green Travel Plans required for all major developments	100% of major development to have travel plan			
2.3.2		Encourage renewable sources of energy supply	Amount of new energy being provided from renewable or low carbon energy developments embedded in the emerging local plan	27.5 MWe of energy provision from decentralised and renewable sources of energy supply	Plans, Policy & Place Making Development Management	Ongoing	Core Strategy
2.3.3			Include policies in our Local Plan that encourage developers to achieve high energy standards and to incorporate renewable and decentralised (on-site) energy generation.	Local Plan adopted by 2020	Plans, Policy & Place Making Development Management	Ongoing	
2.3.4		Promote sustainable design in buildings	Include policies in our Local Plan that encourage new large scale development to explore and incorporate new low carbon district heating networks	Local Plan adopted by 2020	Plans, Policy & Place Making Development Management	Ongoing	Core Strategy
2.3.5			Sustainable Design category in the Chamwood Design Awards	Design Awards Scheme	Conservation & Landscape	Biannual	
2.4	We will encourage reduced car use and promote sustainable travel	Investigate actions in Council Sustainable Travel Plan	Implementation of actions	1 new scheme introduced	Sustainability	2021	Climate Local
2.4.1		Promote cycling, walking, running and other physical activity to our own staff and the wider community	Assess the feasibility of electric or hybrid pool car / bike	1 electric / hybrid vehicles leased 1 electric pool bike	Fleet Management Sustainability Street Management	2021	Climate Local

Ref	Commitment	Action	Measure	Target	Responsibility	Timescale	Links to Policies
2.4.2			Engage with workplaces in the Borough	Provide a bespoke physical activity package to 5 Charnwood based workplaces per year	Sport and Active Recreation Team	Ongoing	
2.4.3			Deliver and promote national physical activity/health Campaigns to Charnwood residents	In line with Public Health Priorities Deliver 3 campaigns weeks per year and achieve 300 new participants annually	Sport and Active Recreation Team	Ongoing	
2.4.4			Provide support to Charnwood based cycling clubs and groups to deliver recreational and family bike rides	2 New ride leaders trained annually 10 Recreational / family Bike Rides delivered annually	Sport and Active Recreation Team	Ongoing	
2.4.5			Develop and promote new and existing walking initiatives	Deliver 2 New Patient Participation Groups and Community Walking groups annually Provide training to 10 volunteers walk leaders annually Promote the Charnwood Walks programme with an annual target of 2000 attendances	Sport and Active Recreation Team	Ongoing	
2.4.6			Develop a parkrun site within Charnwood at Derby Road Playing Fields in partnership with our Open Spaces team, Loughborough Rugby Club, local running clubs, local workplaces and Loughborough University	Weekly park run event organised. With 500 members annually and 2500 attendances Annually.	Sport and Active Recreation Team	Ongoing	

Ref	Commitment	Action	Measure	Target	Responsibility	Timescale	Links to Policies
2.4.7			Support the development of the Green Gym project	Promote the physical activity volunteering opportunities with the Green Gym project to individuals, community groups and local workplaces at 5 events	Sport and Active Recreation Team	Ongoing	
2.4.8		Promote non-recreational cycling for commuting as well as recreational cycling	Promote the 'Choose how you Move' programme to encourage cycling for commuting	Promotional campaign in place	Sport and Active Recreation Team Sustainability	Ongoing	
2.5	We will encourage an increase in the proportion of reuse and recycling and a reduction in waste to landfill	Update and implement the Zero Waste Strategy	New Zero Waste Strategy in place	Strategy published	Cleansing	Ongoing	Zero Waste Strategy
2.5.1			Zero Waste Strategy in place to divert waste from landfill and improve recycling	Compare tonnage of landfill waste with other LCC authorities as well as against the national average	Cleansing	Ongoing	Zero Waste Strategy
2.5.2			Increase the household recycling rate. Tonnages of green waste and recycling as a percentage	Contractors to achieve a 50% household recycling rate	Cleansing	Ongoing	Zero Waste Strategy
2.5.3		Implement waste education / promotional campaigns	Resources available to deliver educational campaigns on reducing waste to landfill and recycling	Deliver waste promotional programmes on an annual basis	Cleansing	Ongoing	Zero Waste Strategy
2.5.4		Phase out use of single use plastics within Council offices and buildings	Investigate use of single use plastics	Implement reduction of single use plastics	Sustainability	Ongoing	Zero Waste Strategy
2.6	We will work in partnership to improve air quality	Monitor and review air quality across the borough to determine whether national air quality objectives are being met	Preparation of DEFRA annual monitoring report	Review annually	Environmental Protection – Regulatory services	Ongoing	Chamwood Air Quality Action Plan
2.6.1			Air Quality Annual Status Report	Production of Monitoring Report	National air quality targets being met	Environmental Protection –	Annually in April

Climate Change Resilience

Ref	Commitment	Action	Measure	Target	Responsibility	Timescale	Links to Policies
3.1	We will work with our partners to understand the current and future risks of flooding	Review Charnwood Community Flood Plans with Local Resilient Forum partners	Charnwood Community Flood Plans & recommendations being implemented	Review biannually	Resilience Officer in association with LRF partners	April 2018	Business Continuity Plan Major Incident Plan
3.2	We will work with communities and businesses to increase resilience to future changes in climate	Promote the community flood warden monitoring scheme	Number of Flood Wardens in place	At least 1 flood warden for each flood warning area	Resilience Officer	Ongoing	Business Continuity Plan Major Incident Plan
3.2.1			Flood wardens scheme on Charnwood and LRF websites	Website updated on a regular basis	Resilience Officer	Ongoing	Business Continuity Plan Major Incident Plan
3.2.2		Advise residents on steps to increase resilience	Up to date information made available on Charnwood and LRF websites	Website updated on a regular basis	Resilience Officer	Ongoing	Business Continuity Plan Major Incident Plan
3.2.3		Development of community resilient plans with parish councils	Number of community resilient plans in place	5 plans in place	Resilience Officer	Ongoing	Business Continuity Plan Major Incident Plan
3.2.4		Promote the Climate East Midlands Business adaptation guide for business	Information provided on website, forums, seminars & business groups	Deliver 1 new promotional campaign annually	Regeneration Sustainability	Ongoing	Climate Local
3.3	We will ensure business continuity planning at the council is resilient to climate impacts	Work with partners to prepare and assess Council business continuity plans	Annual assessment of business continuity plans and reviews of live incidents.	Annual assessment complete	Health & Safety Officer	Annual	Business Continuity Plan Major Incident Plan

Ref	Commitment	Action	Measure	Target	Responsibility	Timescale	Links to Policies
3.3.1			Quarterly assessment of Strategic Risk Register	Annual assessment complete	Audit	Ongoing	
3.4	We will ensure that Council owned open spaces and habitat are well adapted to the changing climate	Work in partnership to carry out biodiversity and heritage audits in Charnwood	Full list of Council owned land and their wildlife features	2 No. of Biodiversity & Heritage audits conducted 5 new LNR sites to be accredited by 2020	Open Spaces	2020	Open Spaces Strategy
3.4.1		Work in partnership to deliver Charnwood Forest Regional Park partnership funding	Promote heritage, improve biodiversity, geology, history and cultural values of Charnwood sites	Stage 1 completed and approved by HLF Development phase, Stage 2 to take place during 18/19 and 19/20	Open Spaces Conservation & Landscape	2020	
3.5	When new development is considered in areas with nature conservation value we will ensure that risks can be managed through suitable adaptation measures	Protect and enhance native species and habitats	Monitoring the implementation of policies such as CS11 Landscape and Countryside, CS12 Green Infrastructure and CS13 Biodiversity and Geodiversity	Core Strategy annual monitoring report published	Plans, Policy & Place Making Conservation & Landscape	Ongoing	Core Strategy
3.5.1		Promotion of climate resilient buildings through the revised Local Plan	Embed policy in emerging Local Plan	Local Plan published	Plans, Policy & Place Making	2020	Core Strategy
3.5.2		Promote and support opportunities for environmental enhancement and regeneration	Embed policy in emerging Local Plan	Local Plan published	Plans, Policy & Place Making	2020	Core Strategy
3.6	We will support healthy and ethical local food initiatives.	Promote the allotment and community orchard schemes	Number of new allotment schemes introduced Number of community orchards introduced	1 no of new allotment schemes introduced 1 no of community orchards scheme introduced	Open Spaces	Ongoing	Open Spaces Strategy
3.6.1		Work with partners to support the Loughborough farmers market	Number of businesses participating in the Farmers Market.	Sustain the number of businesses participating in the Farmers Market	Leisure Services – Markets & Fairs	Ongoing	

Ref	Commitment	Action	Measure	Target	Responsibility	Timescale	Links to Policies
3.6.2		Work with partners to promote and support Fairtrade in the borough	Information provided on website	Deliver 1 promotion annually	Sustainability	Ongoing	

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.

Charnwood Borough Council considers some of the following measures (either independently or in combination) as a means to assess PM_{2.5} levels within the Borough:

As no local PM_{2.5} monitoring or modelling data is available, there are several sources of existing information that may assist in evaluating PM_{2.5} at the local level. This includes, but is not limited to:

National PM_{2.5} Monitoring. There are approximately eighty PM_{2.5} monitoring stations within the AURN. Monitoring data from sites located either close to, or within the local authority area, these will provide a good indicator as to likely PM_{2.5} concentrations within the Council area.

National PM_{2.5} Modelling. Defra maintains national background maps, which are provided for each 1km × 1km grid square across the UK. By plotting the PM_{2.5} mapped data for the appropriate base year, PM_{2.5} concentrations can be identified within the local authority area. Although considered quite coarse resolution, such information may prove useful to local authorities in directing actions to areas that are most in need of reductions in PM_{2.5} levels.

Ratio of PM₁₀ to PM_{2.5}. In the absence of any PM_{2.5} monitoring data, local authorities can use one of the methodologies provided in LAQM.(TG16) Chapter 7 Section 1 (paras 7.107 to 7.111) to provide an indication of PM_{2.5} concentrations.

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

3.1 Summary of Monitoring Undertaken

3.1.1 Automatic Monitoring Sites

This section sets out what monitoring has taken place and how it compares with objectives.

Charnwood Borough Council undertook automatic (continuous) monitoring at 4 sites during 2018. Table A.1 in Appendix A shows the details of the sites.

Maps showing the location of the monitoring sites are provided in Appendix D. Further details on how the monitors are calibrated and how the data has been adjusted are included in Appendix C.

3.1.2 Non-Automatic Monitoring Sites

Charnwood Borough Council undertook non- automatic (passive) monitoring of NO₂ at 48 sites (52 tubes) during 2018. Table A.2 in Appendix A shows the details of the sites.

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

3.2 Individual Pollutants

The air quality monitoring results presented in this section are, where relevant, adjusted for bias, “annualisation” and distance correction. Further details on adjustments are provided in Appendix C.

3.2.1 Nitrogen Dioxide (NO₂)

Table A.3 in Appendix A compares the ratified and adjusted monitored NO₂ annual mean concentrations for the past 5 years with the air quality objective of 40µg/m³.

For diffusion tubes, the full 2018 dataset of monthly mean values is provided in Appendix B.

Table A.4 in Appendix A compares the ratified continuous monitored NO₂ hourly mean concentrations for the past 5 years with the air quality objective of 200µg/m³, not to be exceeded more than 18 times per year.

There were no exceedences of the annual mean air quality objective in 2018.

3.2.2 Particulate Matter (PM₁₀)

Charnwood Borough Council continues to monitor PM₁₀ levels in the vicinity of Mountsorrel Quarry. Recent monitoring has shown that levels are in compliance with the air quality objectives. Further areas of site improvement and methods for on-site monitoring are detailed within the sites Dust Management and Monitoring Plan, available at: [Mountsorrel Quarry Dust Management and Monitoring Plan](#)

Table A.5 in Appendix A compares the ratified and adjusted monitored PM₁₀ annual mean concentrations for the past 5 years with the air quality objective of 40µg/m³.

Table A.66 in Appendix A compares the ratified continuous monitored PM₁₀ daily mean concentrations for the past 5 years with the air quality objective of 50µg/m³, not to be exceeded more than 35 times per year.

There were no exceedences of the annual mean air quality objective in 2018.

3.2.3 Particulate Matter (PM_{2.5})

Charnwood Borough Council do not undertake any local monitoring of PM_{2.5}

As outlined in section 2.3; consideration will be taken via a number of available indicative data sources as well as local knowledge for us to identify any localised 'hot-spots' that may be, or become, potential areas of concern.

It is important to note however that due to its extremely small size, PM_{2.5} can travel for long distances in the air and it is estimated that as much as 40% to 50% of the levels found in any given area can be from sources outside a local authority's direct boundary ⁴.

The following provides an estimation of PM_{2.5} using the nationally derived correction factor from recorded PM₁₀ observations at the Mountsorrel PM₁₀ monitoring site, considered to be the 'worst-case' location for public exposure to dust within the Borough:

The recorded annual mean concentration of PM₁₀ at the Mountsorrel site in 2018 was 24.7µg/m³. The PM_{2.5} concentration at this location can be estimated as follows:

The recorded annual mean PM₁₀ concentration multiplied by the nationally derived correction factor: 24.7 x 0.7 = 17.4

Estimated annual mean PM_{2.5} = 17.3µg/m³

Given the fact that considerable effort is being made to lessen PM₁₀ dust emissions from Mountsorrel Quarry over recent years via the DMMP; it would be fair to suggest that whilst not directly measured, it is likely that associated levels of PM_{2.5} from the plant are also seeing discernible reductions.

⁴ Fine Particulate Matter (PM_{2.5}) in the United Kingdom. Air Quality Expert Group (AQEG) Report, 2012

3.2.4 Sulphur Dioxide (SO₂)

Monitoring in respect of the Great Central Railway commenced in July 2016 although initial 'teething' issues were experienced with the unit preventing any meaningful data becoming available until January 2017.

A number of firmware updates and 'server-side' adjustments to the data acquisition and handling process have taken place since the unit was deployed. Whilst this has resulted in periods no available data capture, it has allowed a re-characterisation of the SO₂ sensor to give a higher confidence to the raw readings than was initially the case at the commencement of monitoring.

The monitor is co-located alongside 3x sulphur dioxide tubes that are changed on a monthly basis. 3 further 'background' diffusion tubes have also been located throughout the Borough to allow a comparison of concentrations against the site of interest.

Table A.7 in Appendix A compares the ratified continuous monitored SO₂ concentrations for 2018 with the air quality objectives for SO₂.

As per 2017, this set of results would indicate that receptor exposure continues to be within the required objective levels for this particular pollutant, however we will continue to monitor levels to build a longer term picture of concentrations at this site.

Appendix A: Monitoring Results

Table A.1 – Details of Automatic Monitoring Sites

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA?	Monitoring Technique	Distance to Relevant Exposure (m) ⁽¹⁾	Distance to kerb of nearest road (m) ⁽²⁾	Inlet Height (m)
CM1	Mountsorrel	Industrial	457355	315396	PM10	YES	Volumetric Gravimetric	~34	N/A	~1.5
CM2	Great Central Railway	Industrial	454380	319768	SO2	YES	Electrochemical Sensor	0	N/A	~1.5
CM3	Baxter Gate (Loughborough) AQMA	Kerbside	453687	319672	NO2	YES	Chemiluminescent	N/A	~1	~1.5
CM4	Syston AQMA	Roadside	462540	311428	NO2	YES	Chemiluminescent	~10	~3	~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

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA?	Distance to Relevant Exposure (m) ⁽¹⁾	Distance to kerb of nearest road (m) ⁽²⁾	Tube collocated with a Continuous Analyser?	Height (m)
DT1	Ratcliffe Rd (L'boro)	Roadside	454087	320392	NO2	YES	0	~3	NO	~3
DT2	Shelthorpe Rd (L'boro)	Roadside	454234	318657	NO2	NO	~8	~3	NO	~3
DT3	Forest Rd (L'boro)	Roadside	452833	318776	NO2	NO	0	~6	NO	~2.5
DT4	Haydon Rd (L'boro)	Roadside	452314	319620	NO2	YES	~8	~6	NO	~2.5
DT5	Alan Moss Rd / Epinal Way (L'boro)	Roadside	452173	319924	NO2	YES	0	~15	NO	~1.5
DT6	Epinal Way / Ling Rd (L'boro)	Roadside	453678	318678	NO2	NO	0	~9	NO	~3
DT7	Leicester Rd (L'boro)	Roadside	454002	319253	NO2	YES	0	~3	NO	~3
DT8	Derby Rd (L'boro)	Roadside	453231	320028	NO2	YES	~3	~3	NO	~3
DT9	Derby Rd / Briscoe Avn (L'boro)	Roadside	452670	320527	NO2	YES	~3	~4	NO	~3
DT10	Durham Rd 1 (L'boro)	Urban Background	452352	320697	NO2	NO	N/A	N/A	NO	~3.5
DT11	Durham Rd 2 (L'boro)	Urban Background	452352	320697	NO2	NO	N/A	N/A	NO	~3.5
DT12	Durham Rd 3 (L'boro)	Urban Background	452352	320697	NO2	NO	N/A	N/A	NO	~3.5
DT13	Alan Moss Rd / A6 Derby Rd (L'boro)	Roadside	452903	320212	NO2	YES	0	~8	NO	~1.5

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DT14	High St (L'boro)	Roadside	453730	319596	NO2	YES	N/A	~3	NO	~3
DT15	Market Place (L'boro)	Urban Centre	453611	319540	NO2	YES	N/A	N/A	NO	~3
DT16	Ashby Rd (L'boro)	Roadside	453189	319709	NO2	YES	0	~4	NO	~3
DT17	Cow Hill Lodge (Shepshed)	Roadside	448876	318307	NO2	NO	0	~10	NO	~1.5
DT18	Roseberry St (L'boro)	Roadside	452697	319921	NO2	NO	~13	~3	NO	~3
DT19	Melton Rd Town Centre (Syston)	Roadside	462777	311692	NO2	YES	~3	~3	NO	~3
DT20	1123 Melton Rd (Syston)	Roadside	46235	311213	NO2	YES	0	~6	NO	~1.5
DT21	1116 Melton Rd (Syston)	Roadside	462373	311254	NO2	YES	0	~3	NO	~3
DT22	Loughborough Rd (Birstall)	Roadside	459233	309233	NO2	NO	0	~15	NO	~1.5
DT23	A6 (Birstall)	Roadside	459178	309890	NO2	NO	~2	~5	NO	~3
DT24	21 Humberstone Lane (Thurmaston)	Roadside	460821	308757	NO2	NO	0	~6	NO	~1.5
DT25	43 Humberstone Lane (Thurmaston)	Roadside	460861	308824	NO2	NO	0	~5	NO	~1.5
DT26	22 Humberstone Lane (Thurmaston)	Roadside	460835	308784	NO2	NO	0	~5	NO	~1.5

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DT27	Ashby Rd Central (Shepshed)	Roadside	448121	318257	NO2	NO	~12	~2	NO	~3
DT28	Loughborough Rd (Hathern)	Roadside	450260	321922	NO2	NO	~30	~3	NO	~3
DT29	Barrow Street (L'boro)	Roadside	453901	319488	NO2	NO	0	~10	NO	~3
DT30	School Street (L'boro)	Roadside	453946	319619	NO2	NO	0	~3	NO	~3
DT31	Fennel Street (L'boro)	Roadside	453694	319890	NO2	NO	0	~3	NO	~3
DT32	High Street (Syston)	Roadside	462369	311809	NO2	YES	0	~4	NO	~3
DT33	Syston AQMS 1	Roadside	462540	311428	NO2	YES	~10	~3	YES	~1.5
DT34	Syston AQMS 2	Roadside	462540	311428	NO2	YES	~10	~3	YES	~1.5
DT35	Syston AQMS 3	Roadside	462540	311428	NO2	YES	~10	~3	YES	~1.5
DT36	Baxter Gate AQMS 1	Kerbside	453687	319672	NO2	YES	N/A	~1	YES	~1.5
DT37	Baxter Gate AQMS 2	Kerbside	453687	319672	NO2	YES	N/A	~1	YES	~1.5
DT38	Baxter Gate AQMS 3	Kerbside	453687	319672	NO2	YES	N/A	~1	YES	~1.5
DT39	Nottingham Rd (L'boro)	Roadside	454154	320116	NO2	NO	N/A	~3	NO	~3
DT40	156 Ratcliffe Rd (L'boro)	Roadside	454285	320294	NO2	NO	0	~6	NO	~1.5
DT41	156 Meadow Lane (L'boro)	Roadside	453933	320663	NO2	NO	0	~8	NO	~1.5
DT42	31 Station Boulevard	Roadside	454142	320593	NO2	NO	0	~9	NO	~1.5

	(L'boro)									
DT43	91 Wharnccliffe Rd (L'boro)	Roadside	454250	319682	NO2	NO	0	~4	NO	~1.5
DT44	3 Simpson Cl (Syston)	Roadside	461499	310459	NO2	NO	0	~30	NO	~1.5
DT45	1 Brackenfield Way (Thurmaston)	Roadside	461994	309975	NO2	NO	0	~8	NO	~1.5
DT46	74 Hathern Rd (Shepshed)	Roadside	448311	320511	NO2	NO	0	~8	NO	~1.5
DT47	7 Shepshed Rd (Hathern)	Roadside	449935	322227	NO2	NO	0	~11	NO	~1.5
DT48	37 Darwin Crescent (L'boro)	Suburban	450942	321076	NO2	NO	~4	N/A	NO	~1.5
DT49	Far Street (Wymeswold)	Roadside	460313	323521	NO2	NO	~1	~2	NO	~3
DT50	Groby Rd (Anstey)	Roadside	454800	308525	NO2	NO	~1	~3	NO	~3
DT51	15 Leicester Rd (Anstey)	Roadside	455167	308549	NO2	NO	0	~4	NO	~3
DT52	22 Main Street (Barkby)	Roadside	463483	309880	NO2	NO	0	~4	NO	~3

Notes:

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

(2) N/A if not applicable.

Table A.3 – Annual Mean NO₂ Monitoring Results

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2018 (%) ⁽²⁾	NO ₂ Annual Mean Concentration (µg/m ³) ⁽³⁾				
					2014	2015	2016	2017	2018
CM3	Kerbside	Automatic	62	62	=	=	=	29.45	29.05
CM4	Roadside	Automatic	96	96	=	=	=	34.87	27.64
DT1	Roadside	Diffusion Tube	100	100	21.6	21	24.3	24.3	20.9
DT2	Roadside	Diffusion Tube	100	100	22.3	20.1	23.1	21.0	20.0
DT3	Roadside	Diffusion Tube	100	100	26.6	25	28.6	26.7	24.1
DT4	Roadside	Diffusion Tube	100	100	25.2	26	27.8	30.0	23.1
DT5	Roadside	Diffusion Tube	100	100	23.4	21.5	23.7	24.8	20.4
DT6	Roadside	Diffusion Tube	100	100	26.1	24.4	26.7	29.1	26.0
DT7	Roadside	Diffusion Tube	92	92	34.2	30.6	37.9	36.0	33.5
DT8	Roadside	Diffusion Tube	100	100	30.7	28.7	33.4	33.3	28.8
DT9	Roadside	Diffusion Tube	100	100	25.1	23.1	26.8	27.0	22.5
DT10	Urban Background	Diffusion Tube	92	92	18.3	17.8	19.9	21.1	17.7
DT11	Urban Background	Diffusion Tube	100	100	19.2	17	19.4	19.7	17.9
DT12	Urban Background	Diffusion Tube	100	100	19.3	16.9	19.1	19.9	17.2
DT13	Roadside	Diffusion Tube	100	100	27.8	25.2	27.4	27.5	24.9

DT14	Roadside	Diffusion Tube	92	92	39.1	28.5	32.4	33.0	28.4
DT15	Urban Centre	Diffusion Tube	100	100	21.4	18.4	21.2	21.3	17.3
DT16	Roadside	Diffusion Tube	100	100	30	26.7	28	31.6	28.0
DT17	Roadside	Diffusion Tube	100	100	24.8	21.3	27.1	25.4	23.3
DT18	Roadside	Diffusion Tube	100	100	17	17.9	19.7	19.4	17.0
DT19	Roadside	Diffusion Tube	100	100	27.7	27.2	31.7	33.2	26.1
DT20	Roadside	Diffusion Tube	100	100	24.5	22.9	27.3	29.8	24.1
DT21	Roadside	Diffusion Tube	100	100	28.4	26.4	35.8	37.2	32.1
DT22	Roadside	Diffusion Tube	100	100	30.5	28.5	32.3	33.7	26.3
DT23	Roadside	Diffusion Tube	100	100	33.1	30.2	34.1	35.6	29.4
DT24	Roadside	Diffusion Tube	92	92	32.5	30.9	33.9	35.3	28.3
DT25	Roadside	Diffusion Tube	100	100	30.4	26	32.6	34.2	29.7
DT26	Roadside	Diffusion Tube	100	100	26.3	24.1	27.3	30.9	24.1
DT27	Roadside	Diffusion Tube	100	100	35.6	31.5	39	34.9	33.9
DT28	Roadside	Diffusion Tube	100	100	28.6	25.4	30.1	28.3	25.0
DT29	Roadside	Diffusion Tube	100	100	23.5	22.6	26.3	26.0	23.3
DT30	Roadside	Diffusion Tube	100	100	20.6	19.9	22.1	22.4	19.6
DT31	Roadside	Diffusion Tube	100	100	29.9	27.4	31.4	30.5	28.9

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DT32	Roadside	Diffusion Tube	83	83	25.7	24.7	28.5	32.2	26.0
DT33	Roadside	Diffusion Tube	100	100	30.8	27.6	30.5	35.4	28.3
DT34	Roadside	Diffusion Tube	100	100	29.4	27.1	29.8	34.6	27.6
DT35	Roadside	Diffusion Tube	100	100	28.8	25.7	29.8	34.1	26.8
DT36	Kerbside	Diffusion Tube	100	100	33.8	26.2	30.9	29.9	29.5
DT37	Kerbside	Diffusion Tube	100	100	33.7	25.3	31.7	29.9	28.6
DT38	Kerbside	Diffusion Tube	100	100	32.2	26.1	31	28.8	28.8
DT39	Roadside	Diffusion Tube	83	83	40.1	30.7	35.2	32.6	32.6
DT40	Roadside	Diffusion Tube	100	100	22	21.1	24.8	22.9	22.2
DT41	Roadside	Diffusion Tube	100	100	25.5	21.5	24.6	23.6	22.8
DT42	Roadside	Diffusion Tube	100	100	24	22.2	25.8	25.8	22.5
DT43	Roadside	Diffusion Tube	100	100	27.5	24.3	28.2	25.7	24.0
DT44	Roadside	Diffusion Tube	100	100	:	21.8	26.5	28.0	20.8
DT45	Roadside	Diffusion Tube	100	100	:	19.9	22.2	24.5	19.6
DT46	Roadside	Diffusion Tube	100	100	:	18.9	22.2	21.5	20.4
DT47	Roadside	Diffusion Tube	100	100	:	21.1	22.9	24.2	21.9
DT48	Suburban	Diffusion Tube	100	100	:	14.1	17.6	15.8	14.3
DT49	Roadside	Diffusion Tube	100	100	:	27.9	31.6	29.4	27.7

DT50	Roadside	Diffusion Tube	100	100	=	21.9	26.6	27.4	22.7
DT51	Roadside	Diffusion Tube	100	100	=	22.2	26.2	27.5	23.6
DT52	Roadside	Diffusion Tube	92	92	=	18	20.8	23.1	17.7

Diffusion tube data has been bias corrected

Annualisation has been conducted where data capture is <75%

Notes:

Exceedances of the NO₂ annual mean objective of 40µg/m³ are shown in **bold**.

NO₂ annual means exceeding 60µg/m³, indicating a potential exceedance of the NO₂ 1-hour mean objective are shown in **bold and underlined**.

(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%).

(3) Means for diffusion tubes have been corrected for bias. All means have been “annualised” as per Boxes 7.9 and 7.10 in LAQM.TG16 if valid data capture for the full calendar year is less than 75%. See Appendix C for details.

Figure A.1 – A.11 Trends in Annual Mean NO₂ Concentrations

The following plots show the trends in Annual Mean Nitrogen Concentrations measured at selected Diffusion Tube Monitoring Sites.

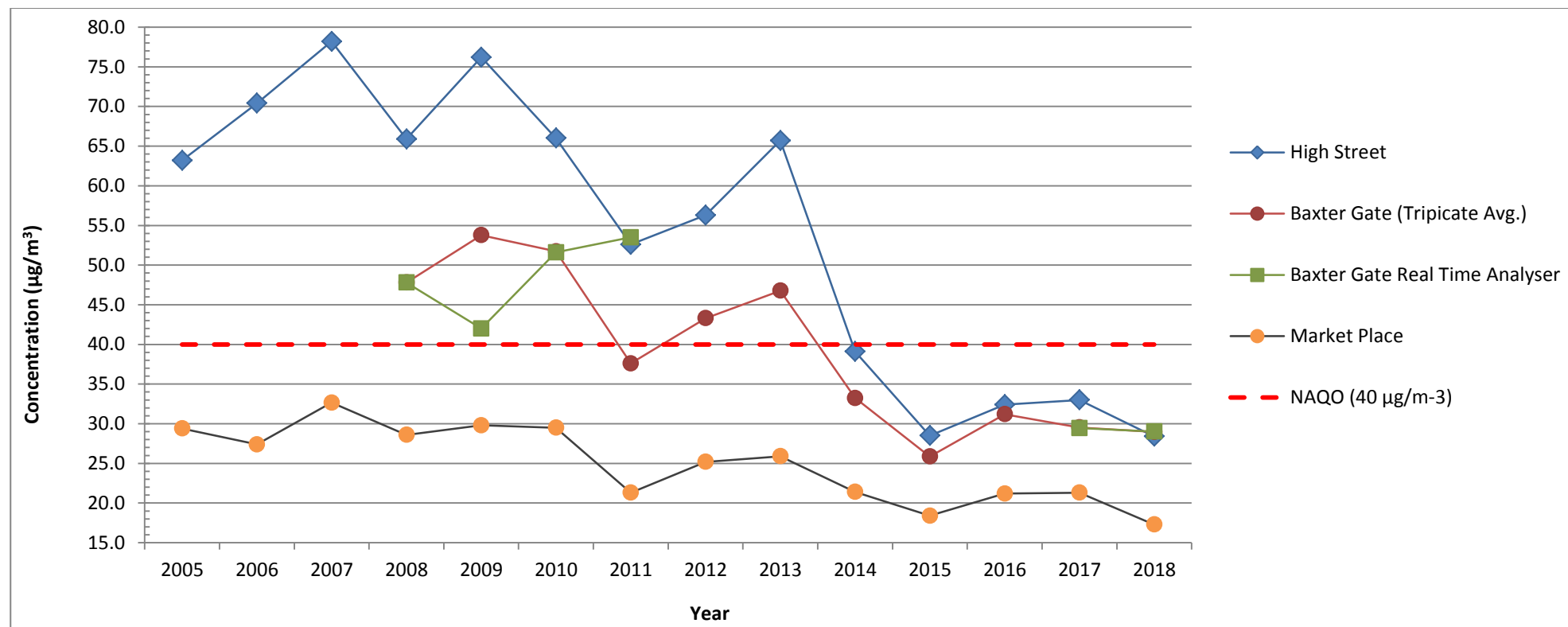


Figure A.1 Plot of NO₂ Concentration against Year for Loughborough Town Centre (i) sites

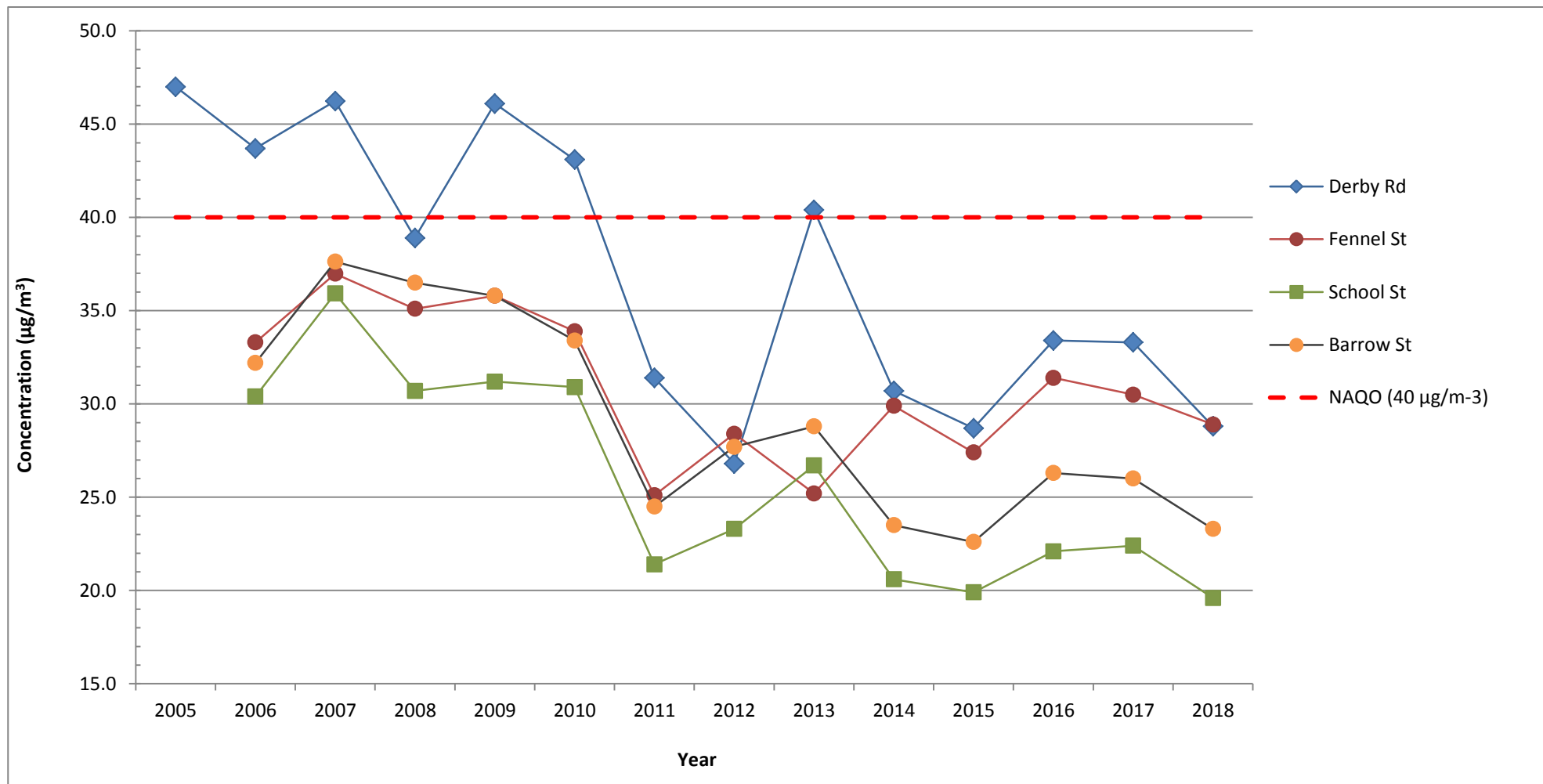


Figure A.2 Plot of NO₂ Concentration against Year for Loughborough Town Centre (ii) sites

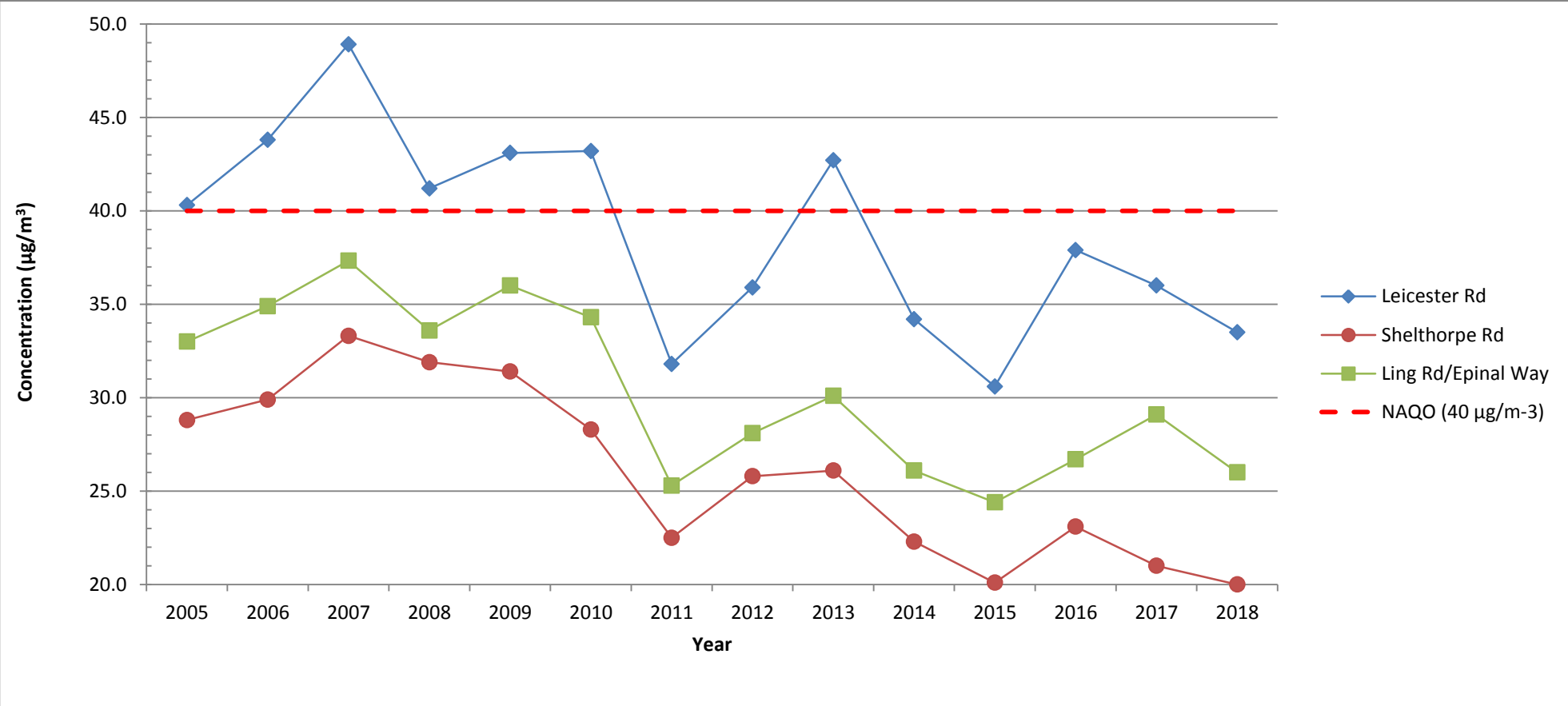


Figure A.3 Plot of NO₂ Concentration against Year for Loughborough South sites



Figure A.4 Plot of NO₂ Concentration against Year for Loughborough West sites

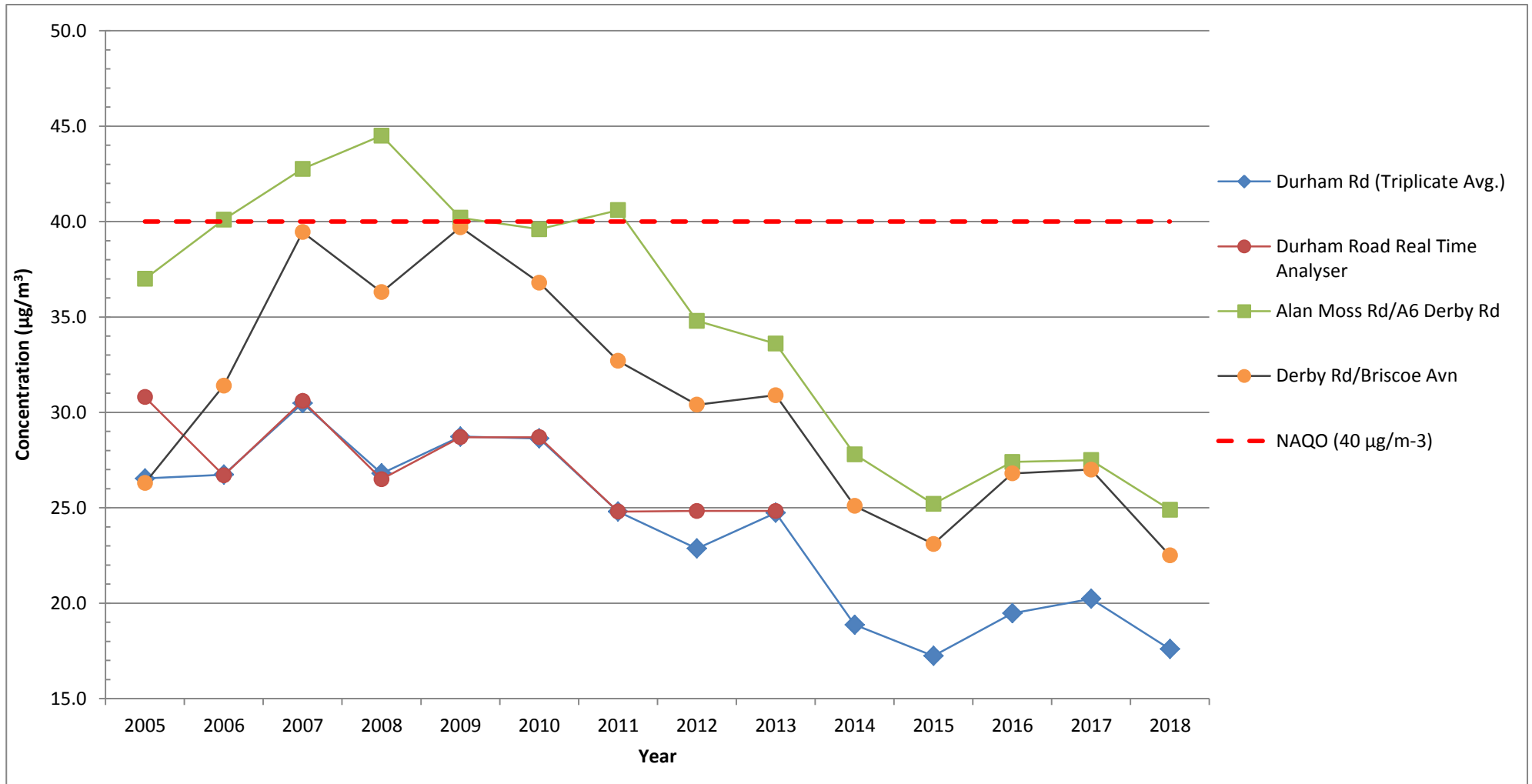


Figure A.5 Plot of NO₂ Concentration against Year for Loughborough North sites

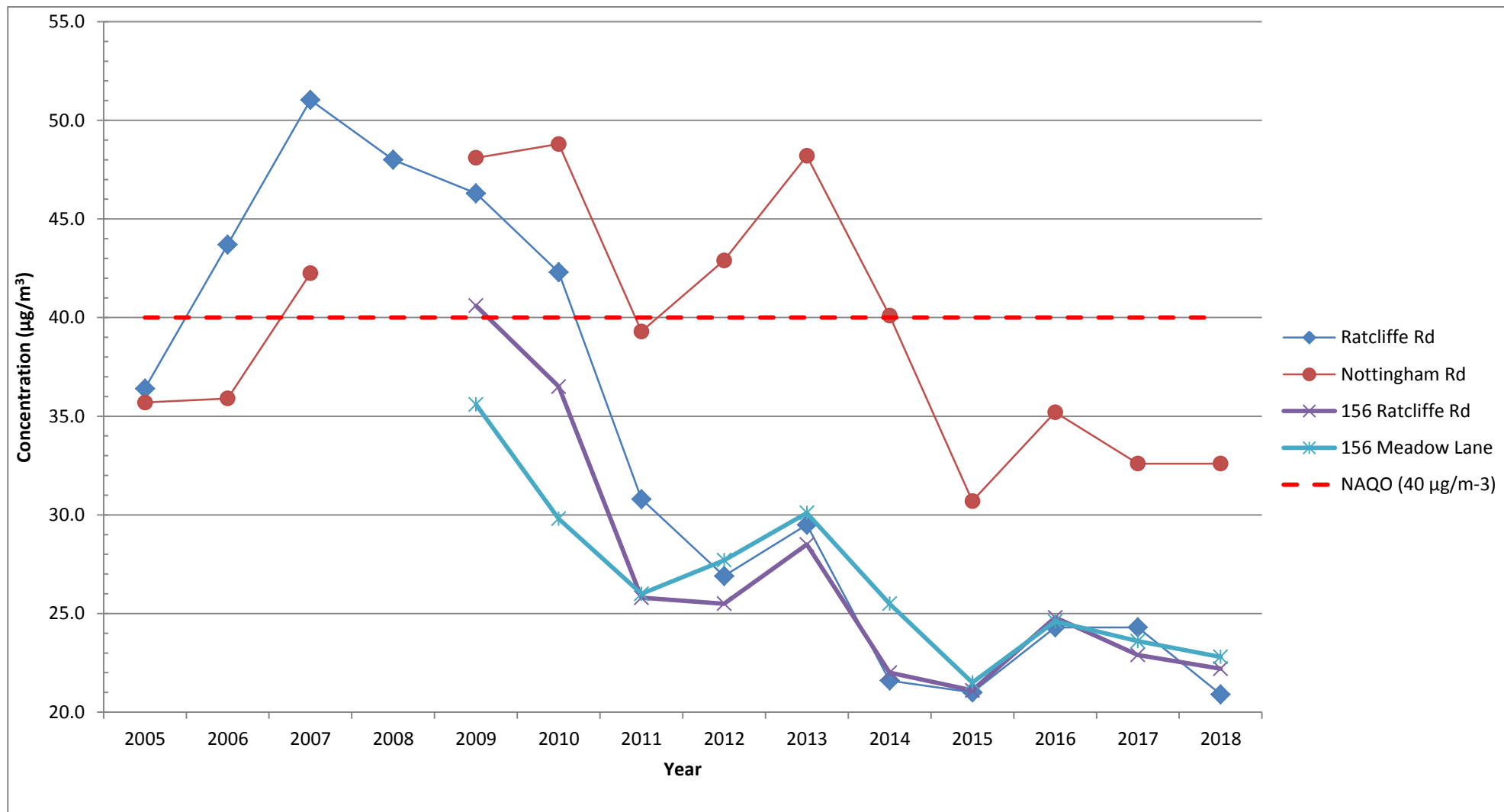


Figure A.6 Plot of NO₂ Concentration against Year for Loughborough East sites

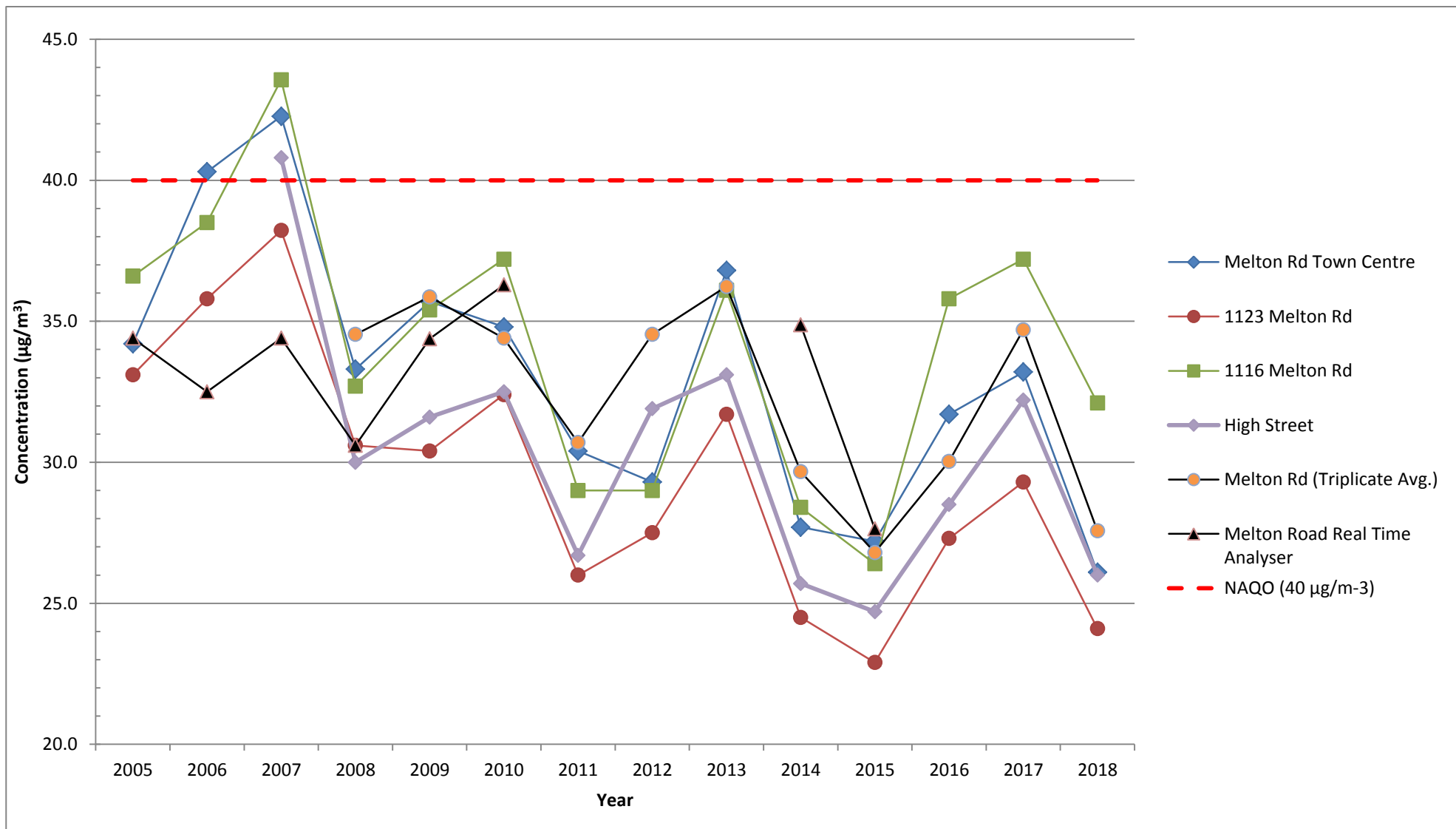


Figure A.7 Plot of NO₂ Concentration against Year for Syston sites

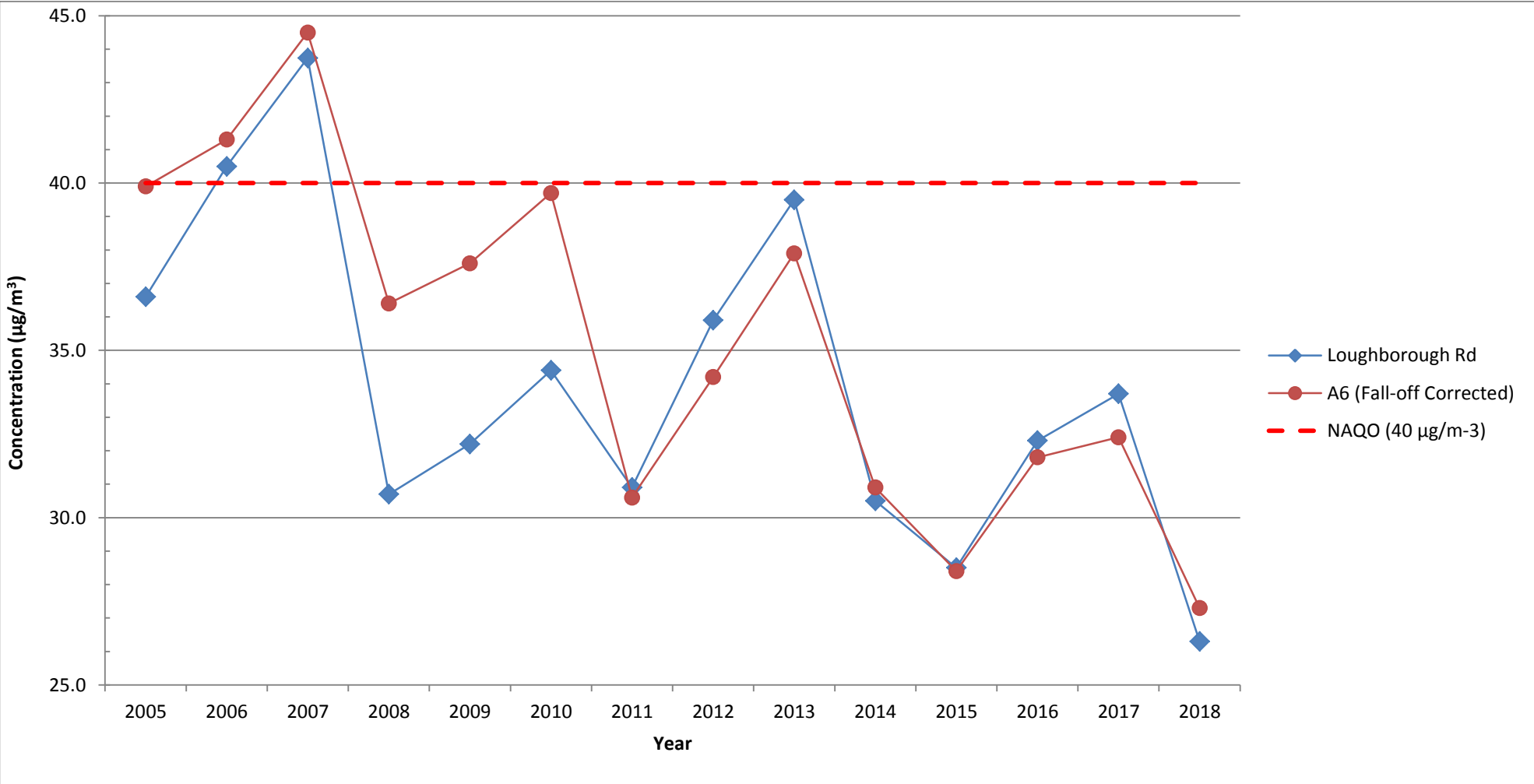


Figure A.8 Plot of NO₂ Concentration against Year for Birstall sites

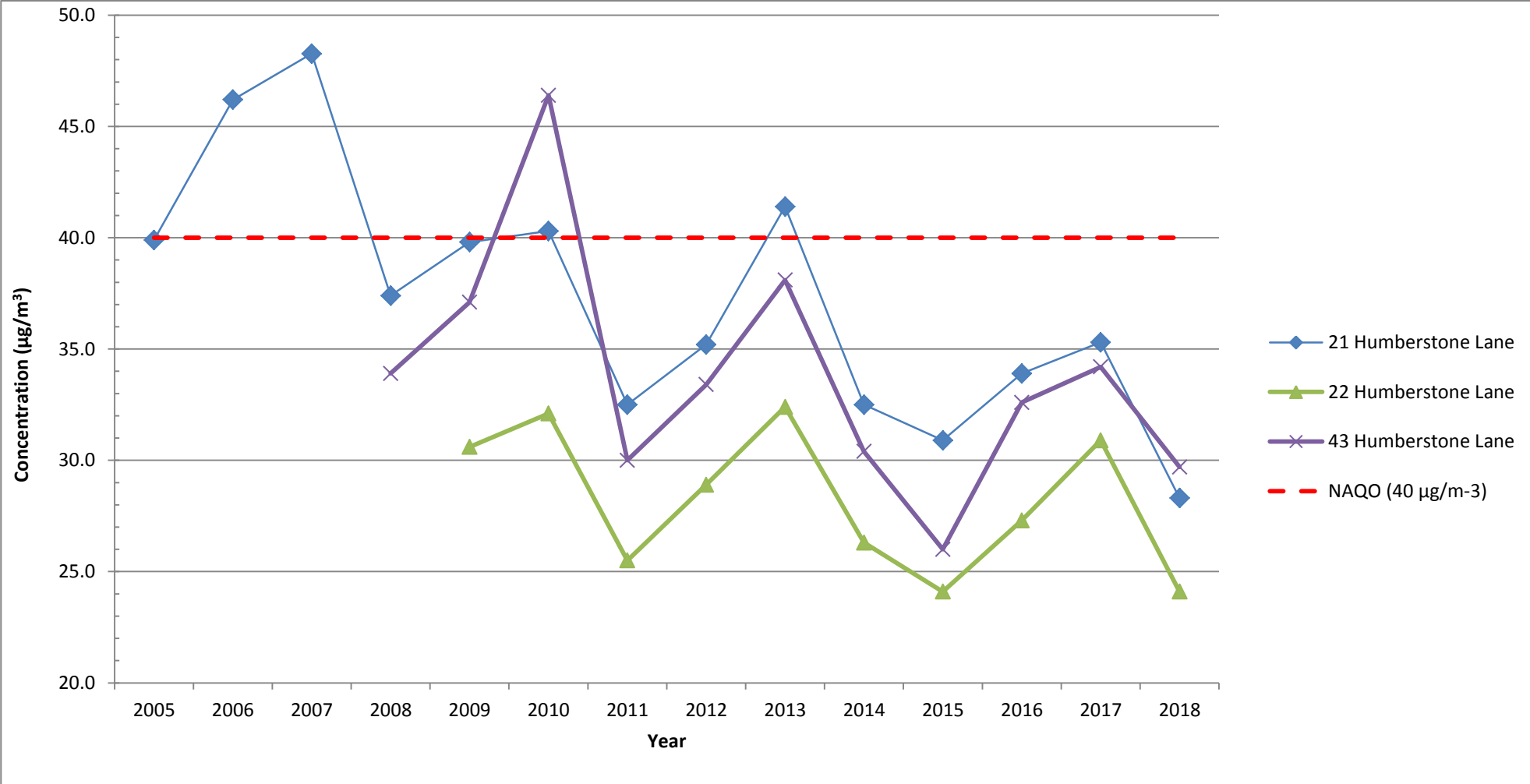


Figure A.9 Plot of NO₂ Concentration against Year for Thurmaston sites

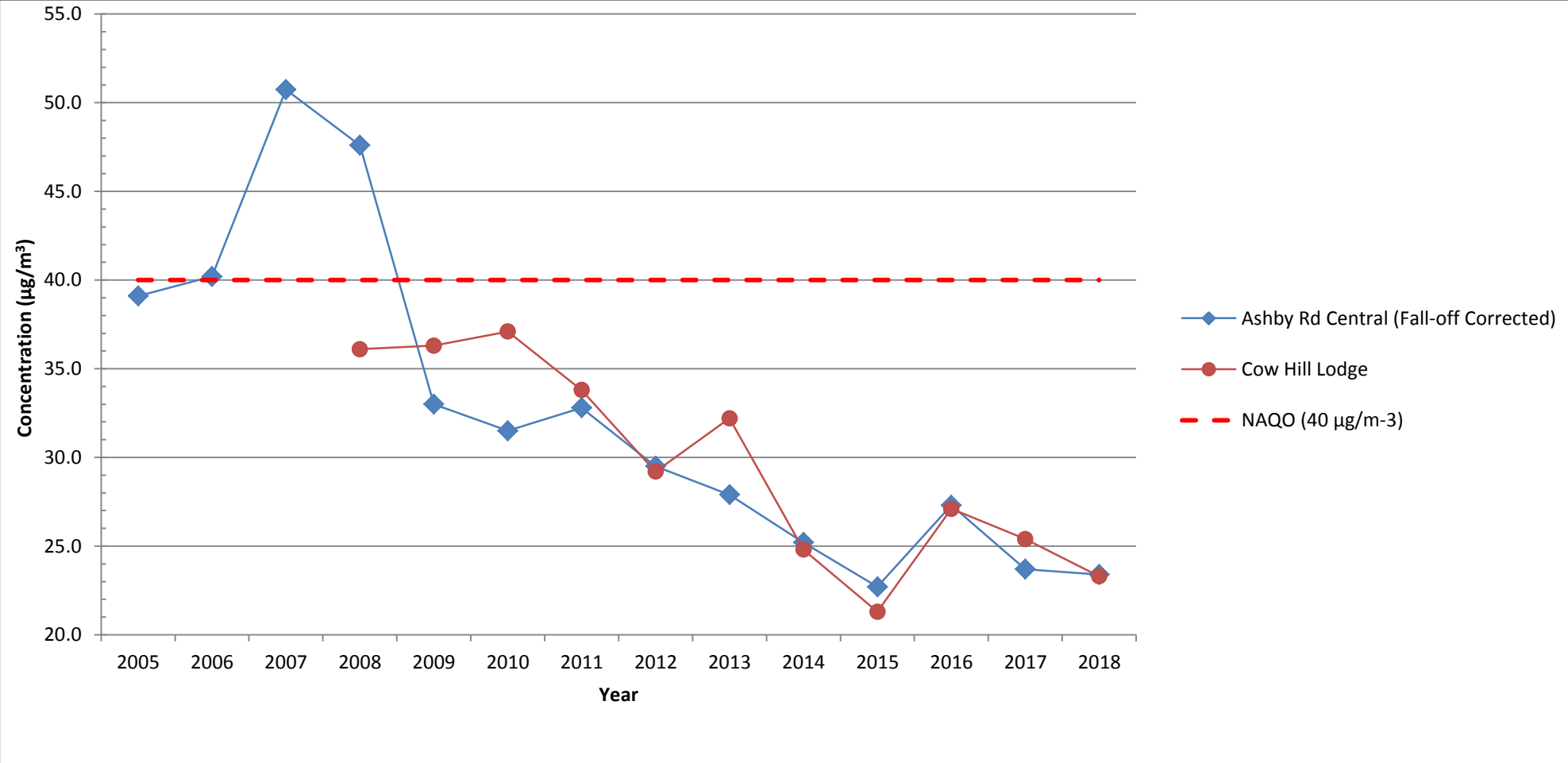


Figure A.10 Plot of NO₂ Concentration against Year for Shepshed sites

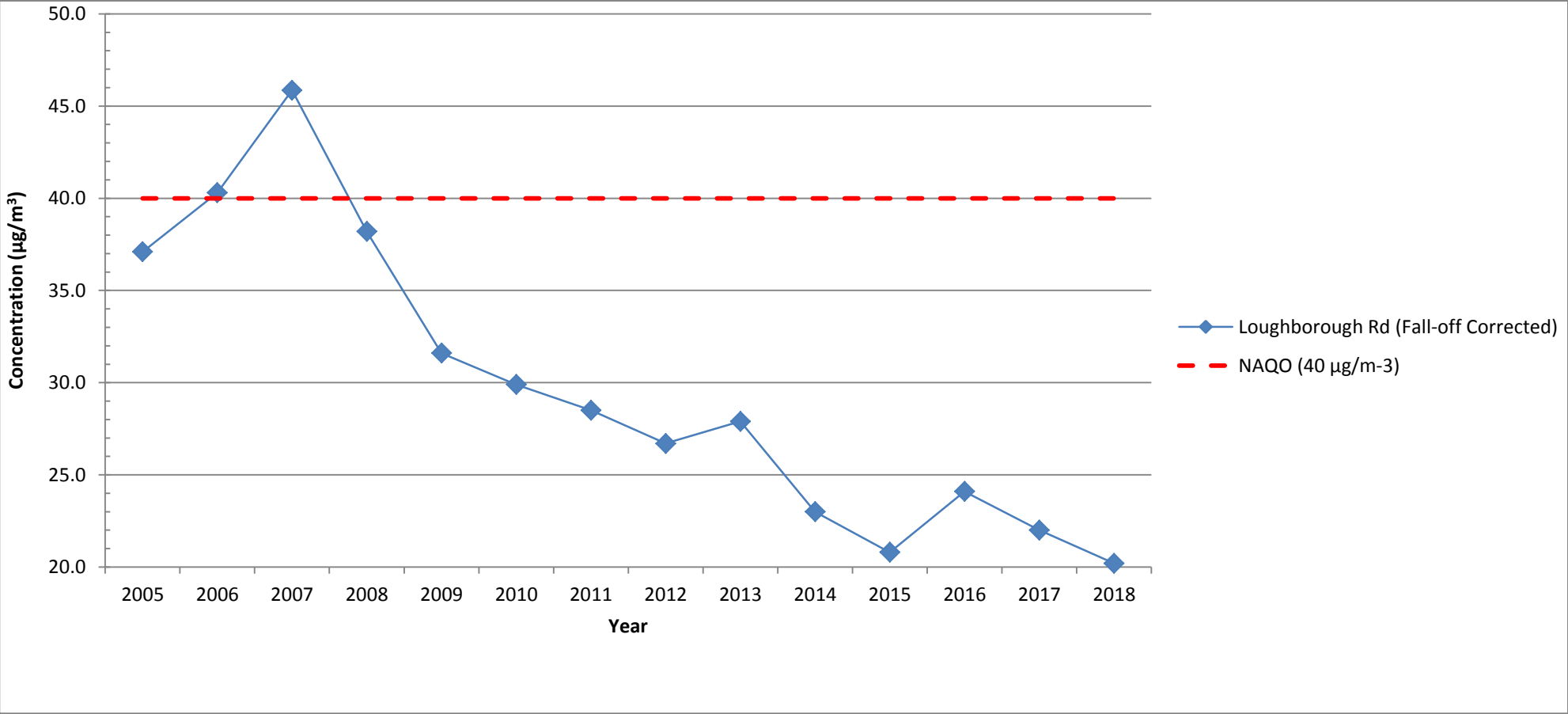


Figure A.11 Plot of NO₂ Concentration against Year for Hathern site

Table A.4 – 1-Hour Mean NO₂ Monitoring Results

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2018 (%) ⁽²⁾	NO ₂ 1-Hour Means > 200µg/m ³ ⁽³⁾				
					2014	2015	2016	2017	2018
CM3	Kerbside	Automatic	62	62	-	-	-	0	[95.9]
CM4	Roadside	Automatic	96	96	-	-	-	[11.46]	0

Notes:

Exceedances of the NO₂ 1-hour mean objective (200µg/m³ not to be exceeded more than 18 times/year) are shown in **bold**.

(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%).

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

Table A.5 – Annual Mean PM₁₀ Monitoring Results

Site ID	Site Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2018 (%) ⁽²⁾	PM ₁₀ Annual Mean Concentration (µg/m ³) ⁽³⁾				
				2014	2015	2016	2017	2018
CM1	Industrial	55	55	25.5	27.09	24.65	24.84	24.66

Annualisation has been conducted where data capture is <75%

Notes:

Exceedances of the PM₁₀ annual mean objective of 40µg/m³ are shown in **bold**.

(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%).

(3) All means have been “annualised” as per Boxes 7.9 and 7.10 in LAQM.TG16, valid data capture for the full calendar year is less than 75%. See Appendix C for details.

Table A.6 – 24-Hour Mean PM₁₀ Monitoring Results

Site ID	Site Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2018 (%) ⁽²⁾	PM ₁₀ 24-Hour Means > 50µg/m ³ ⁽³⁾				
				2014	2015	2016	2017	2018
CM1	Industrial	55	55	[49.12]	[49.01]	[46.86]	[46.94]	[46.25]

Notes:

Exceedances of the PM₁₀ 24-hour mean objective (50µg/m³ not to be exceeded more than 35 times/year) are shown in **bold**.

(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%).

(3) If the period of valid data is less than 85%, the 90.4th percentile of 24-hour means is provided in brackets.

Table A.7 – SO₂ Monitoring Results

Site ID	Site Type	Valid Data Capture for monitoring Period (%) ⁽¹⁾	Valid Data Capture 2018 (%) ⁽²⁾	Number of Exceedances 2018 (percentile in bracket) ⁽³⁾		
				15-minute Objective (266 µg/m ³)	1-hour Objective (350 µg/m ³)	24-hour Objective (125 µg/m ³)
CM2	Industrial	87	87	0 [61.6]	0 [41.4]	0 [24.9]

Notes:

Exceedances of the SO₂ objectives are shown in **bold** (15-min mean = 35 allowed a year, 1-hour mean = 24 allowed a year, 24-hour mean = 3 allowed a year)

(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%).

(3) If the period of valid data is less than 85%, the relevant percentiles are provided in brackets.

Appendix B: Full Monthly Diffusion Tube Results for 2018

Table B.1 – NO₂ Monthly Diffusion Tube Results - 2018

Site ID	NO ₂ Mean Concentrations (µg/m ³)												Annual Mean		
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Raw Data	Bias Adjusted (0.93 & 0.91) and Annualised ⁽¹⁾	Distance Corrected to Nearest Exposure ⁽²⁾
DT1	25.7	24.0	24.7	19.0	20.1	16.3	20.3	20.0	22.3	26.2	25.7	26.0	22.5	20.9	
DT2	24.2	17.5	25.1	18.5	20.8	17.2	18.5	18.2	19.4	26.0	26.2	26.2	21.5	20.0	
DT3	23.02	24.31	29.83	24.87	26.81	23.97	25.89	22.54	25.73	28.18	25.6	29.81	25.9	24.1	
DT4	28.95	26.07	29.52	22.68	21.58	16.96	21.37	17.57	27.23	27.89	26.48	31.09	24.8	23.1	
DT5	28.26	21.8	22.96	17.91	20.18	15.63	19.59	21.17	21.68	25.79	22.44	25.68	21.9	20.4	
DT6	28.55	27.4	29.77	26.47	27.4	23.27	26.76	25.69	26.85	31.69	29.74	32.42	28.0	26.0	
DT7	26.19	38.13	43.18	35.37	39.99	40.55	38.54	30.31	0	34.75	34.24	34.75	36.0	33.5	
DT8	27.38	34.33	36.15	36.46	31.12	28.95	28.17	25.14	27.98	35.3	31.06	30.09	31.0	28.8	
DT9	28.75	26.14	27.98	24.13	21.19	17.27	20.69	20.09	21.32	27.88	26.68	28.44	24.2	22.5	
DT10	22.93	0	21.5	18.26	17.77	13.77	15.19	15.59	17.23	21.81	21.74	23.48	19.0	17.7	
DT11	23.67	21.68	22.38	17.54	17.61	14.26	15.21	15.26	16.85	21.23	22.38	22.3	19.2	17.9	
DT12	23.73	18.2	23.52	16.35	17.13	14.14	15.03	15.76	16.31	20.95	20.92	19.81	18.5	17.2	
DT13	24.53	27.64	30.57	24.2	28.91	21.92	22.96	23.94	24.96	30.45	31.54	29.52	26.8	24.9	
DT14	30.23	33.59	0	29.04	29.14	22.58	28.22	27.41	30.97	33.42	35.68	34.98	30.5	28.4	
DT15	23.06	19.64	20.47	16.8	16.9	11.85	14.23	15.51	16.92	20.49	23.43	23.45	18.6	17.3	

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DT16	33.46	32.47	33.63	27.43	31.87	24.24	32.68	26.99	28.64	32.79	32.83	34.64	31.0	28.0	
DT17	30.45	24.19	28.83	26.86	14.24	20.7	26.07	25.11	25.19	24.48	27.01	27.5	25.1	23.3	
DT18	21.18	22.37	20.33	15.67	15.18	11.33	13.09	15.4	17.25	22.28	22.23	23.23	18.3	17.0	
DT19	28.82	31.34	30.31	25.09	27.07	23.9	25.41	26.24	30.22	30.52	30.58	34.93	28.7	26.1	
DT20	30.24	27.19	29.34	27.03	24.66	20.85	23.97	22.44	26.1	29.13	25.89	31.45	26.5	24.1	
DT21	43.74	36.88	34.28	30.15	33.04	28.42	31.67	34.8	35.61	37.63	33.91	42.85	35.2	32.1	
DT22	27.62	35.16	33.73	27.61	24.83	22.06	24.37	26.69	28.83	30.46	29.56	35.43	28.9	26.3	
DT23	37.62	35.68	33.04	33.69	39.24	25.64	29.4	24.61	24.86	33.17	33.79	36.45	32.3	29.4	27.3
DT24	0	35.75	28.94	33.18	29.61	24.98	32.12	30.31	30.1	33.6	34.71	28.73	31.1	28.3	
DT25	39.68	34.42	35.23	26.35	32.76	23.99	32.05	30.03	33.23	34.45	34.62	34.11	32.6	29.7	
DT26	30.84	31.05	25.4	24.52	23.64	18.76	22.39	24.08	27	31.16	28.1	31.41	26.5	24.1	
DT27	35.72	39.69	39.47	31.44	40.38	38.97	35.19	33	34.97	38.04	36.95	33.19	36.4	33.9	23.4
DT28	31.39	30.63	27.92	24.44	25.09	18.49	26.54	21.72	24.17	32.2	30.11	29.83	26.9	25.0	20.2
DT29	26.43	17.98	31.58	28.1	26.65	21.23	21.15	22.13	23.5	26.78	30.02	25.84	25.1	23.3	
DT30	25.92	23.75	23.53	18.83	18.23	11.75	18.31	18.91	21.9	23.14	22.31	26.17	21.1	19.6	
DT31	38.61	33.3	32.15	27.45	34.08	28.56	28.83	21.27	25.07	33.74	35.59	35.04	31.1	28.9	
DT32	36.95	30.75	24.95	0	21.75	0	23.61	24.89	26.81	32.33	32.46	31.43	28.6	26.0	
DT33	38.47	31.73	33.03	28.33	25.91	23.5	29.42	31.6	33.95	32.26	30.15	35.08	31.1	28.3	
DT34	38.06	34.26	31.05	29.69	24.73	23.03	25.22	30.98	33.36	31.19	30.68	31.02	30.3	27.6	
DT35	38.71	33.64	25.45	26.09	25.02	22.62	26.86	30.41	31.88	30.6	30.12	31.97	29.4	26.8	
DT36	33.37	34.12	38.01	32.78	39.33	29.26	27.26	21.44	21.63	33.2	40.04	30.18	31.7	29.5	
DT37	37.07	36.61	30.92	30.34	37.11	31.04	26.34	16.35	22.59	30.21	39.86	30.97	30.8	28.6	
DT38	36.88	33.49	33.56	31.51	37.14	29.42	24.56	21.52	22.02	30.14	39.63	31.93	31.0	28.8	
DT39	0	37.39	34.54	34.06	38.03	34.83	36.34	31.92	0	34.03	36.89	32.05	35.0	32.6	
DT40	26.22	26.69	25.37	21.51	25.14	20.3	21.89	21.43	23.42	26.71	22.75	25.83	23.9	22.2	
DT41	26.26	29.77	25.61	24.08	24.1	19.25	20.79	20.66	21.39	24.76	28.91	28.18	24.5	22.8	
DT42	25.05	18.17	26.84	23.74	25.63	18.7	25.46	24.46	24.17	24.06	26.57	27.88	24.2	22.5	

Charnwood Borough Council

DT43	28.91	26.21	28.65	25.15	27.6	24.48	23.26	19.82	22.29	26.89	28.49	27.58	25.8	24.0	
DT44	30.71	32.68	21.49	19.96	18.37	14.05	18.05	19.37	20.53	25.84	26.9	27.33	22.9	20.8	
DT45	22.13	26.49	23.99	19.17	19.05	13.82	16.81	20.67	22.11	25.4	22.89	25.54	21.5	19.6	
DT46	23.96	26.15	23.17	26.55	24.11	19.29	20.17	16.12	16.97	23.01	24.95	18.79	21.9	20.4	
DT47	29.65	27.45	25.08	22.57	19.37	19.76	20.73	21.31	22.9	24.34	25.12	25.44	23.6	21.9	
DT48	22.41	15.4	18.66	16.42	12.67	9.63	11.33	12.51	11.25	15.14	19.52	19.31	15.4	14.3	
DT49	30.78	37.45	29.51	22.27	34.68	31.72	32.49	26.52	26.6	27.95	30.62	27.04	29.8	27.7	
DT50	31.24	28.34	25.97	22.27	26.12	18.11	21.94	21.14	21.72	26.23	29.17	26.95	24.9	22.7	
DT51	32.79	25.74	29.8	23.96	22.8	19.22	24.64	23.09	25.54	26.39	27.63	28.91	25.9	23.6	
DT52	22.72	22.51	0	27.28	15.23	10.93	16	15.78	18.22	21.93	22.42	20.56	19.4	17.7	

Local bias adjustment factor used [0.93 'North' tubes & 0.91 'South tubes]

Note: Equivalent 'National Bias Factor' for 2018 would be 0.93

Where applicable, data has been distance corrected for relevant exposure

Notes:

Exceedances of the NO₂ annual mean objective of 40µg/m³ are shown in **bold**.

NO₂ annual means exceeding 60µg/m³, indicating a potential exceedance of the NO₂ 1-hour mean objective are shown in **bold and underlined**.

(1) See Appendix C for details on bias adjustment and annualisation.

(2) Distance corrected to nearest relevant public exposure.

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

Diffusion Tubes

All NO₂ diffusion tubes are supplied and analysed by Gradko using 20% TEA in water preparation.

Consideration is normally given to the advisory documents on the LAQM Support website when defining and considering whether to use local or national co-location bias adjustment factors.

The following factors are part of our decision for deciding on which factors to use:

- Tube exposure time
- Length of the monitoring study
- QA/QC of the chemiluminescence analyser
- QA/QC of diffusion tubes
- Siting of the co-location study
- Siting of other tubes in the survey

Factor from Co-location Studies

Triplicates are co-located at our 2 automatic monitoring sites:

Site ID	Location	Triplicate annual mean average (µg/m ³) (Dm)	Automatic analyser annual mean concentration (µg/m ³) (Cm)	Bias correction factor (Cm / Dm)
DT 36, 37, 38	CM3 Baxter Gate, L'boro	31.17	29.05	0.93
DT 33, 34, 35	CM4 Melton Rd, Syston	30.27	27.64	0.91

Tubes in the 'north' of the Borough i.e. Loughborough, Shepshed, Hathern and Wymeswold, have been corrected against the factor of x0.93

Tubes in the 'south' of the Borough i.e. Syston, Thurmaston, Birstall, Anstey and Barkby have been corrected against the factor of x0.91

Short-term to Long-term Data adjustment

As data capture for 2018 at our Baxter Gate NO₂ monitor (CM3) was at 62%, due to inconsistency in the data obtained from late August, further adjustment was necessary to account for seasonal variation from this “short term” monitoring.

Adjustment has been made following the methodology to annualise continuous monitoring data as per Box 7.9 in LAQM.TG16 as follows:

The Measured mean (**M**) at site CM3 between January and the August date was 27.3 µg/m³

Background Site	Annual Mean 2018 (A_m)	Period Mean 2018 (P_m)	Ratio (P_m / A_m)
Leicester University	23.2	21.9	1.059
Burton-on-Trent Horninglow	18.9	17.4	1.086
Nottingham Centre	27.5	26.3	1.046
Average (R_a)			1.064

The best estimate of the annual mean for site CM3 in 2018 will be:

$$\mathbf{M \times R_a = 27.3 \times 1.064 = 29.05 \mu g/m^3}$$

Diffusion Tube – Distance Correction

The raw data for three sites: Ashby Rd Central (Shepshed), Loughborough Rd (Hathern) and A6 (Birstall) have been distance corrected as they are all roadside locations where the tubes are positioned some distance away from the façade of the nearest receptor – in all cases on a roadside lighting column.

Using the “NO₂ with Distance from Roads Calculator” (v 4.2) available from the UK Air Quality Archive, it is possible for us to calculate the distance NO₂ falloff between these kerbside tubes and the nearest receptors, as follows:

Ashby Rd Central (Shepshed)


Using the calculator the concentration at the nearest receptor is shown below to be 23.4µg/m⁻³

Enter data into the pink cells

Step 1	How far from the KERB was your measurement made (in metres)?	2	metres
Step 2	How far from the KERB is your receptor (in metres)?	14	metres
Step 3	What is the local annual mean background NO ₂ concentration (in µg/m ³)?	10.79002	µg/m ³
Step 4	What is your measured annual mean NO ₂ concentration (in µg/m ³)?	33.9	µg/m ³
Result	The predicted annual mean NO ₂ concentration (in µg/m ³) at your receptor	23.4	µg/m ³

Loughborough Rd (Hathern)

Using the calculator the concentration at the nearest receptor is shown below to be $20.2\mu\text{g}/\text{m}^{-3}$




Enter data into the pink cells

Step 1	How far from the KERB was your measurement made (in metres)?	3	metres
Step 2	How far from the KERB is your receptor (in metres)?	13	metres
Step 3	What is the local annual mean background NO ₂ concentration (in $\mu\text{g}/\text{m}^3$)?	12.38751	$\mu\text{g}/\text{m}^3$
Step 4	What is your measured annual mean NO ₂ concentration (in $\mu\text{g}/\text{m}^3$)?	25	$\mu\text{g}/\text{m}^3$
Result	The predicted annual mean NO ₂ concentration (in $\mu\text{g}/\text{m}^3$) at your receptor	20.2	$\mu\text{g}/\text{m}^3$

A6 (Birstall)

Using the calculator the concentration at the nearest receptor is shown below to be $27.3\mu\text{g}/\text{m}^{-3}$



Enter data into the pink cells

Step 1	How far from the KERB was your measurement made (in metres)?	4	metres
Step 2	How far from the KERB is your receptor (in metres)?	7	metres
Step 3	What is the local annual mean background NO ₂ concentration (in $\mu\text{g}/\text{m}^3$)?	16.14903	$\mu\text{g}/\text{m}^3$
Step 4	What is your measured annual mean NO ₂ concentration (in $\mu\text{g}/\text{m}^3$)?	29.4	$\mu\text{g}/\text{m}^3$
Result	The predicted annual mean NO ₂ concentration (in $\mu\text{g}/\text{m}^3$) at your receptor	27.3	$\mu\text{g}/\text{m}^3$

QA/QC of diffusion tube monitoring

As part of their provision of support to Local Authorities for air quality management, Defra and the Devolved Administrations provide a set of centralised QA/QC services, to assist Local Authorities using diffusive samplers for monitoring of ambient nitrogen dioxide (NO₂) concentration, as part of their Local Air Quality Management process.

This is aimed at the analytical laboratories that supply and analyse the diffusion tubes, and currently comprises:

Promotion of the independent AIR-PT scheme, operated by LGC Standards and supported by the Health and Safety Laboratory, with yearly assessment against agreed performance criteria. AIR-PT combines two long running PT schemes: LGC Standards STACKS PT scheme and HSL Workplace Analysis Scheme for Proficiency (WASP) PT scheme. For more information the AIR-PT scheme, please click [here](#).

Performance summaries in the AIR-PT scheme for the laboratory chosen to prepare and analyse diffusion tubes on behalf of Charnwood Borough Council (Gradko), prepared by AEA, are as per the follows links:

[AIR-PT-Rounds 19 to 30 \(Apr 2017 - Feb 2019\)](#) (PDF 228KB)

Results submitted were determined to be **satisfactory**

QA/QC of automatic monitoring

The analysers are serviced under schedule via Matt's Monitors.

Daily "automatic" and fortnightly manual calibrations are also undertaken, the later performed by the Local Authority.

Data validation and ratification procedures follow Technical Guidance LAQM.TG(16)

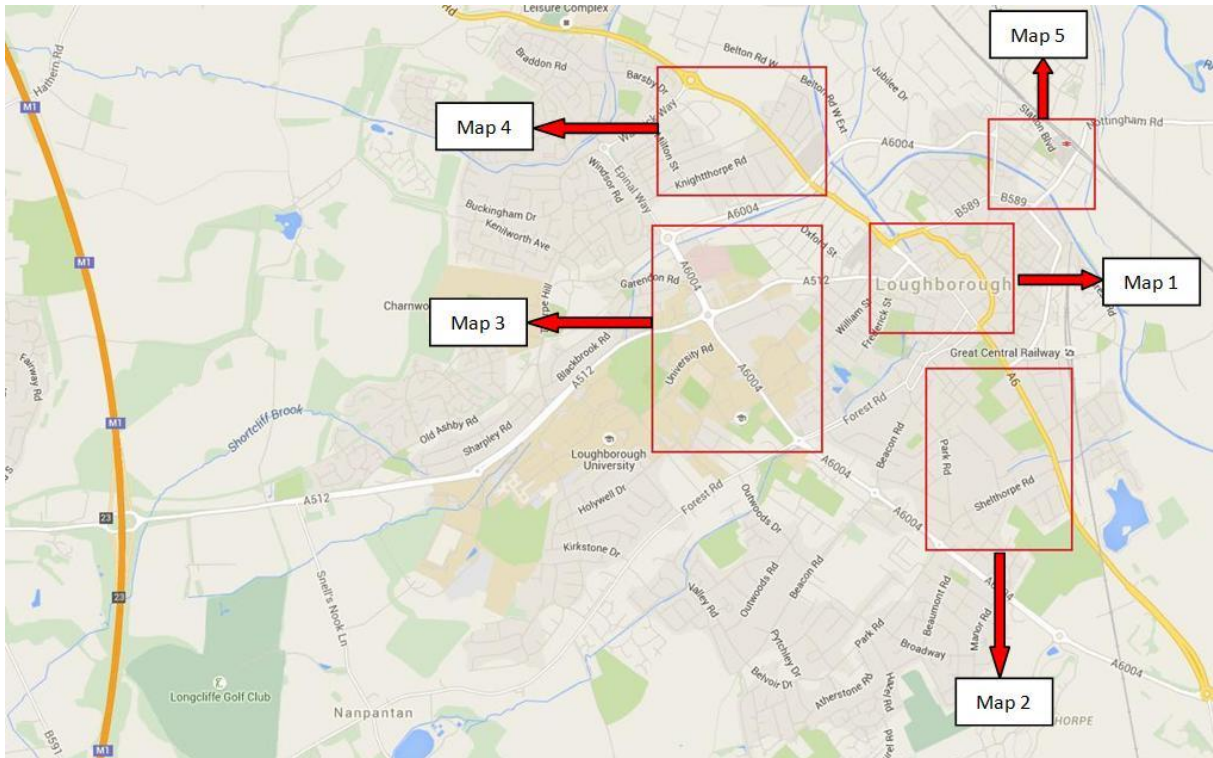
Appendix D: Map(s) of Monitoring Locations and AQMAs

Selected maps of key monitoring areas

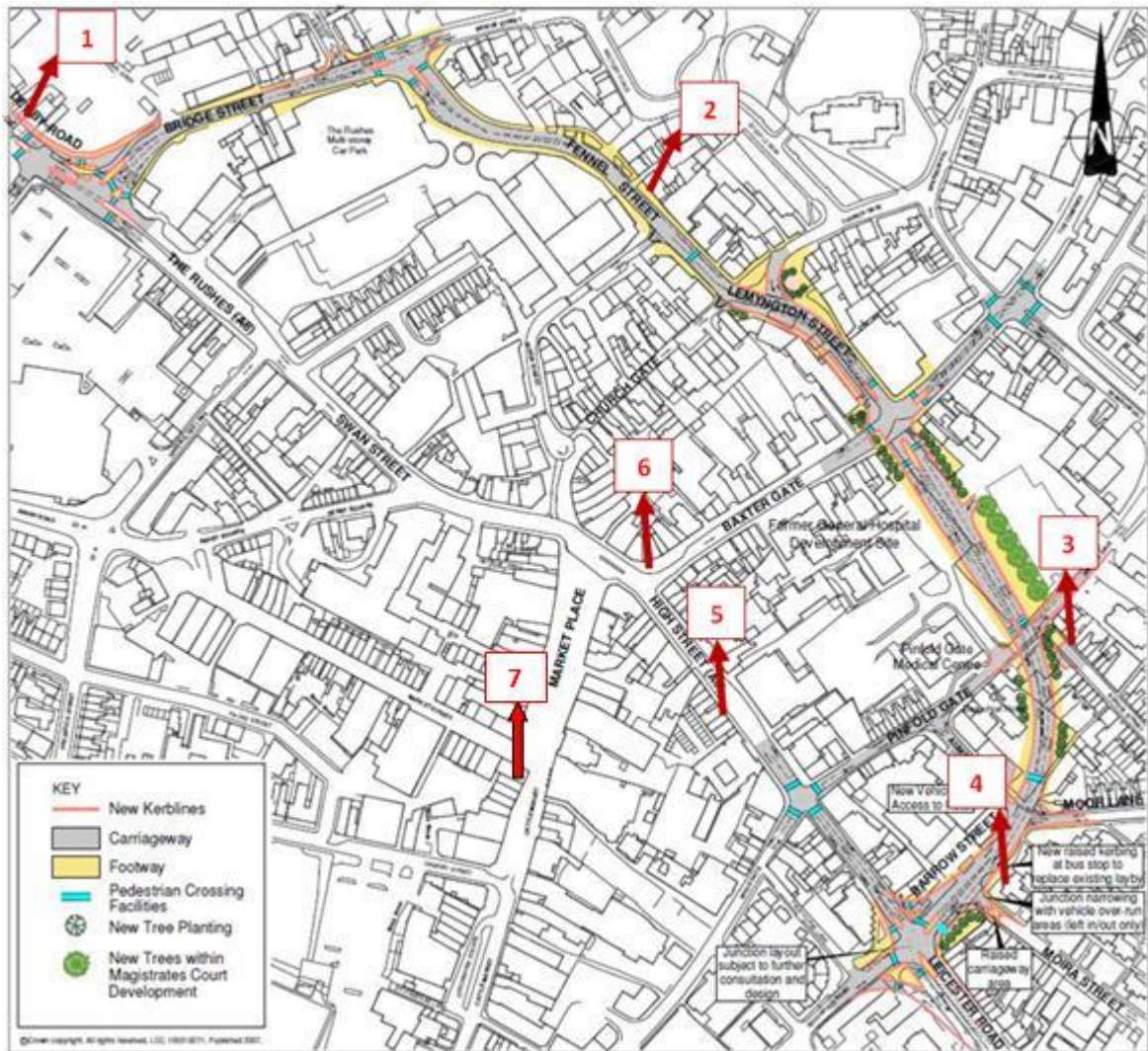
The Borough of Charnwood



Loughborough Area:



Map 1: Loughborough Town Centre



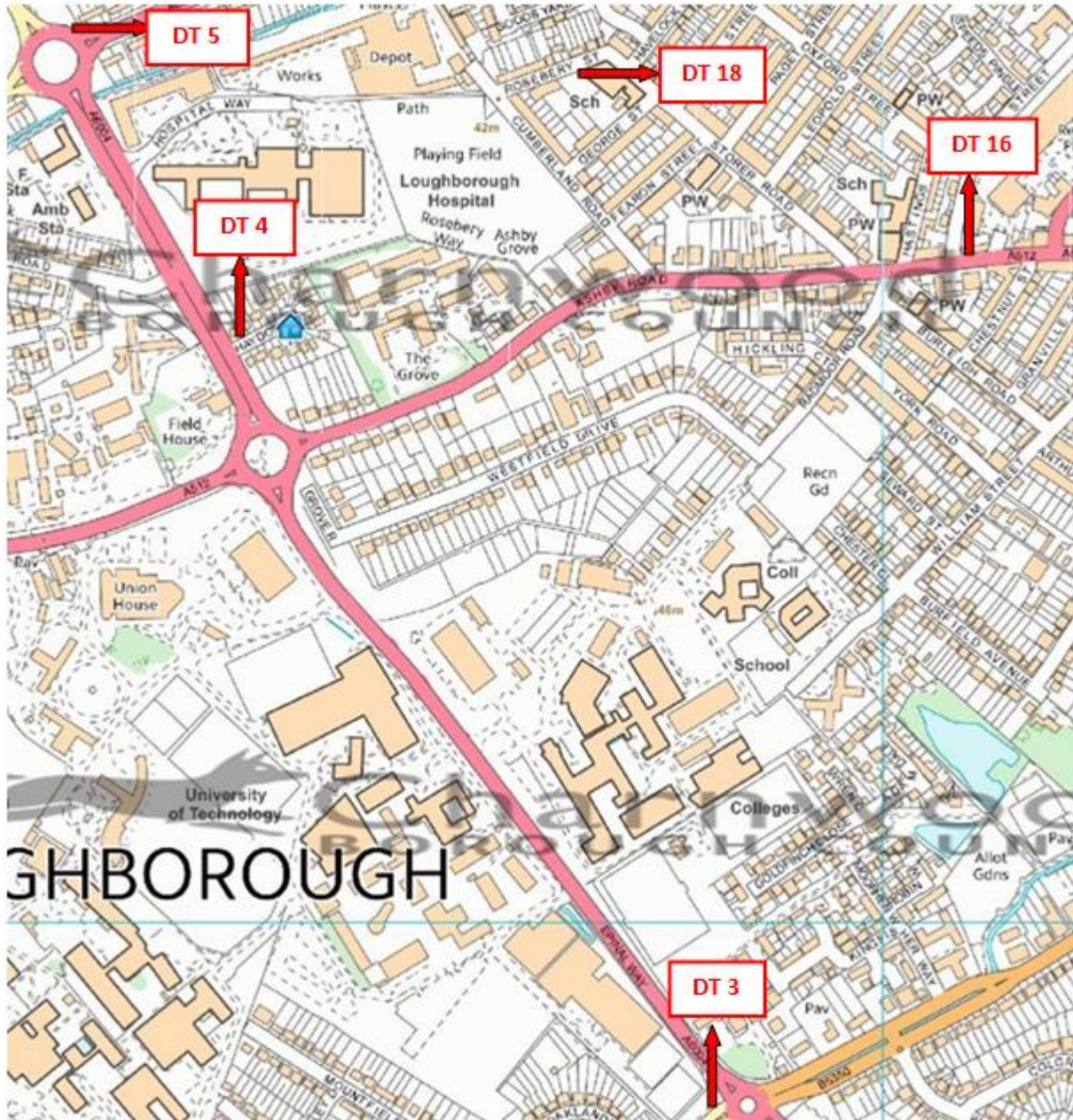
Map Position	Site ID	Site Name	Pollutant
1	DT8	Derby Road	NO ₂
2	DT31	Fennel Street	NO ₂
3	DT30	School Street	NO ₂
4	DT29	Barrow Street	NO ₂
5	DT14	High Street	NO ₂
6	DT36, DT37, DT38	Baxter Gate AQMS 1, 2, and 3	NO ₂

The above map shows the route of the Inner Relief Road which opened in November 2014. Traffic is now routed away from the town centre.

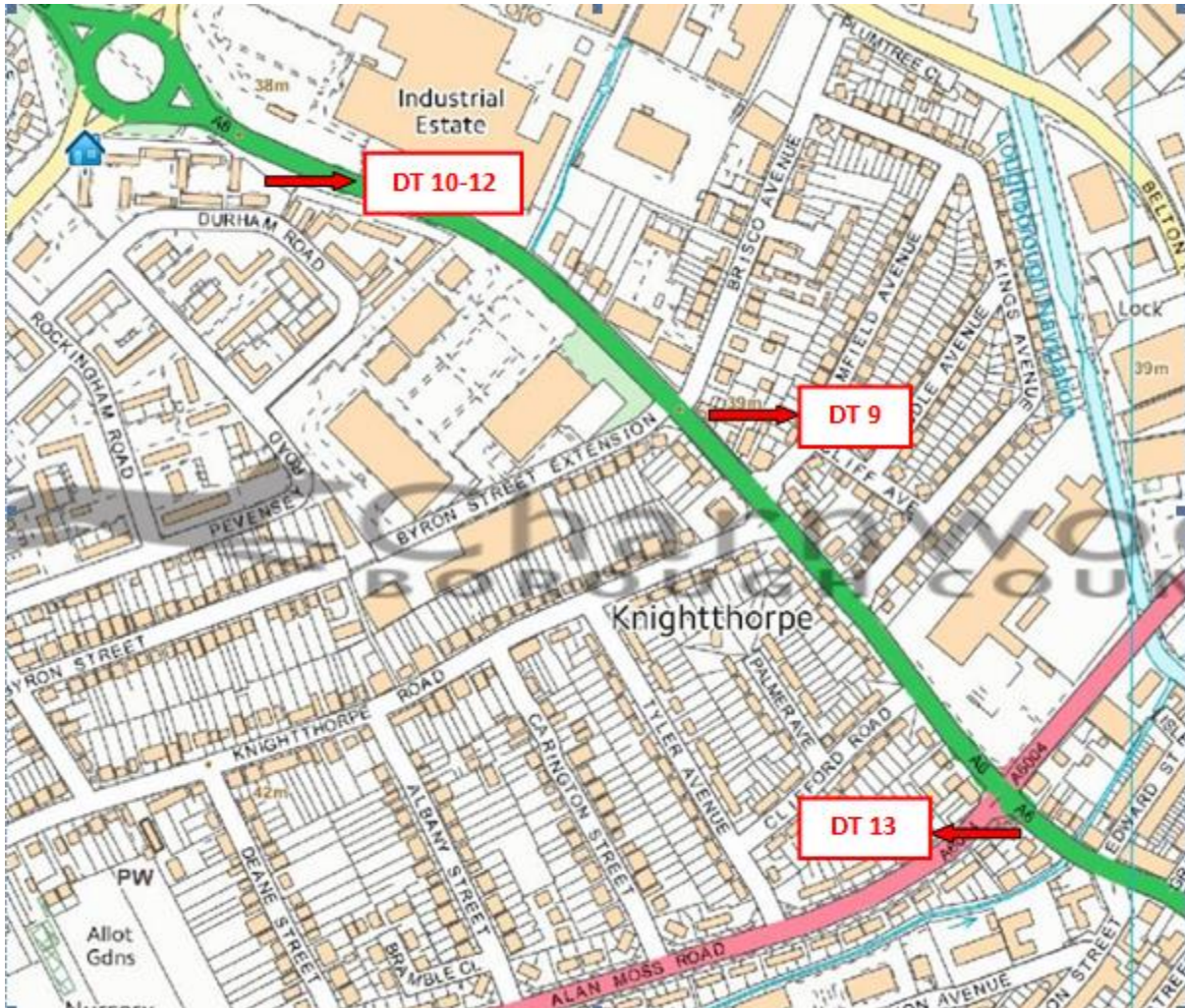
Map 2: Loughborough South



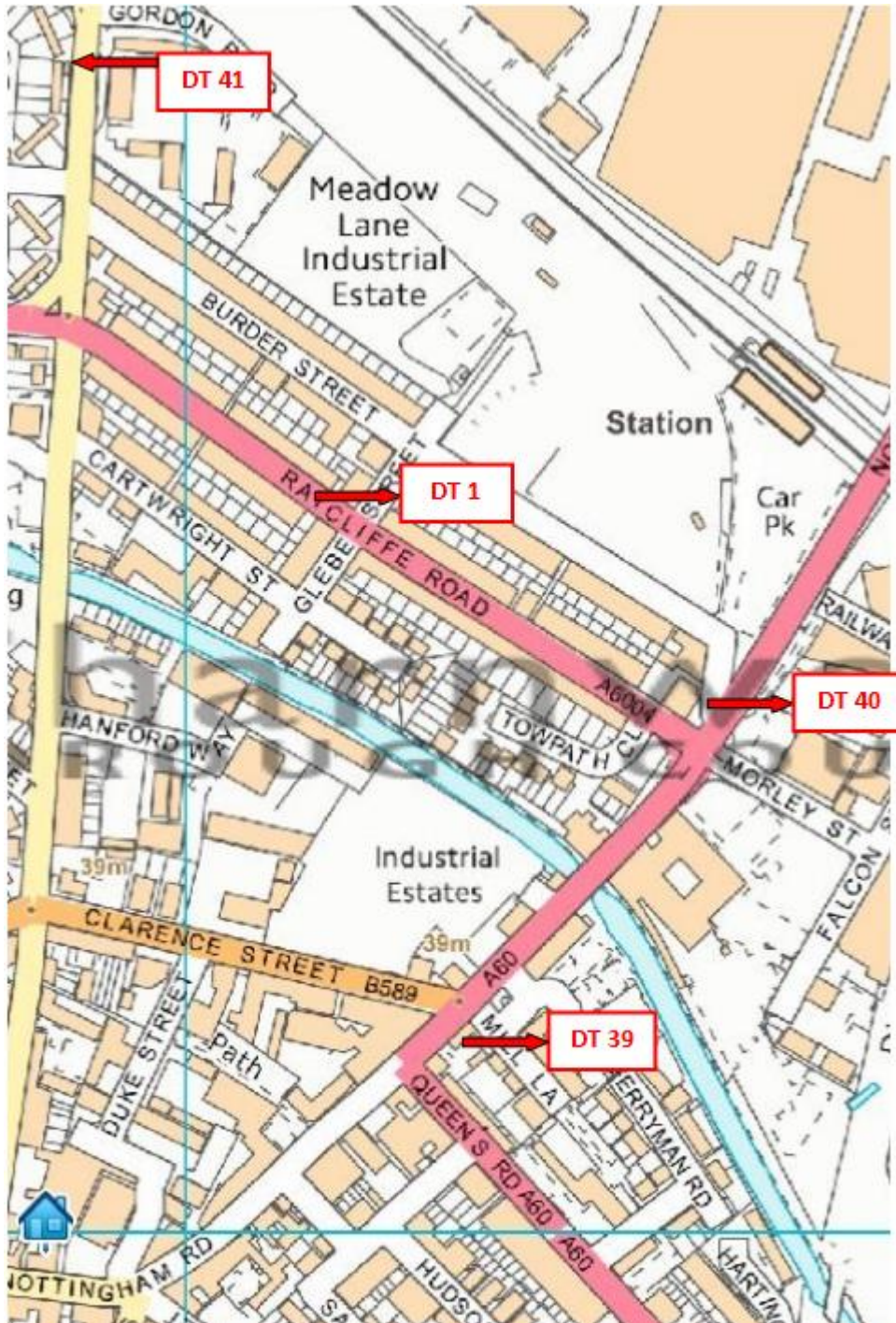
Map 3: Loughborough West



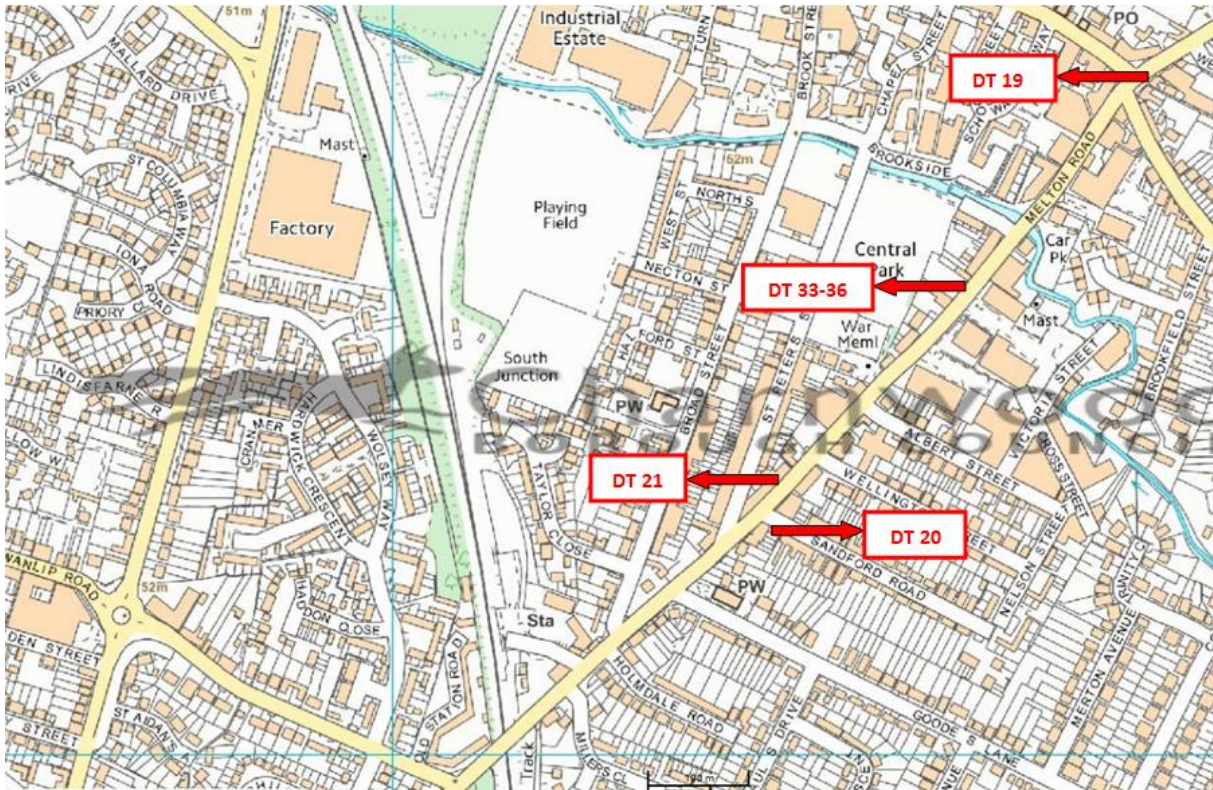
Map 4: Loughborough North



Map 5: Loughborough East



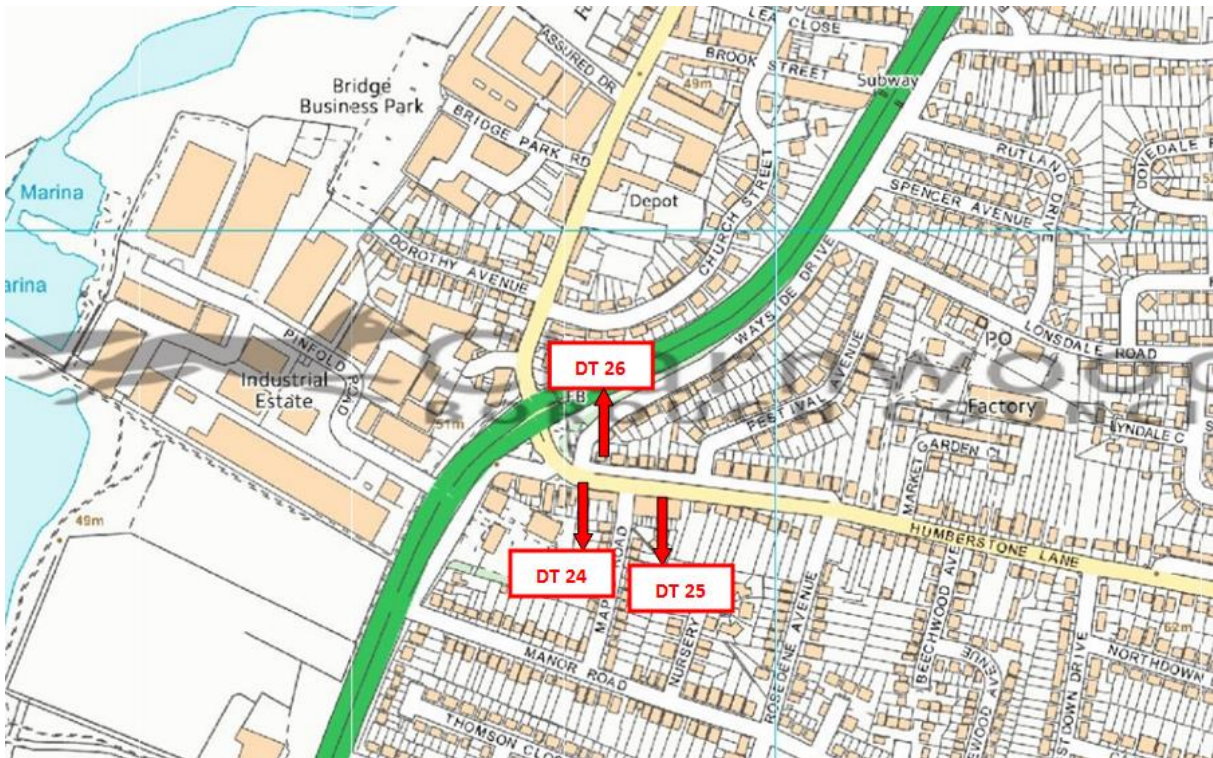
Map 6: Syston



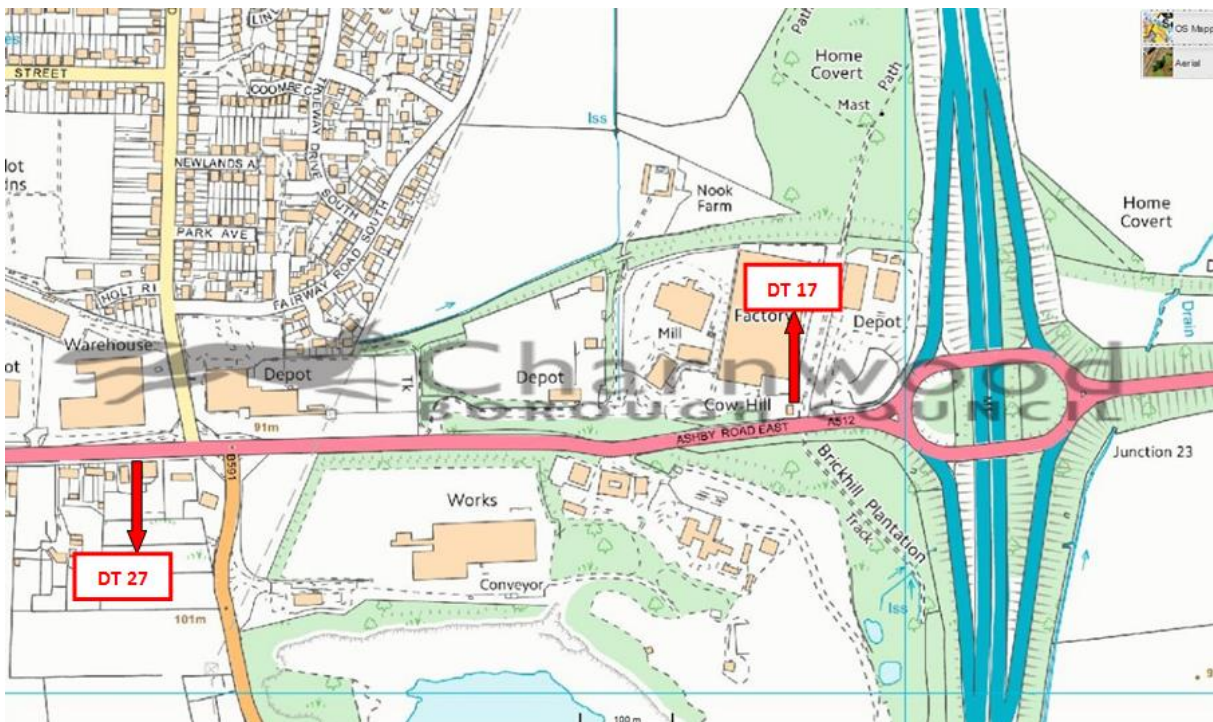
Map 7: Birstall



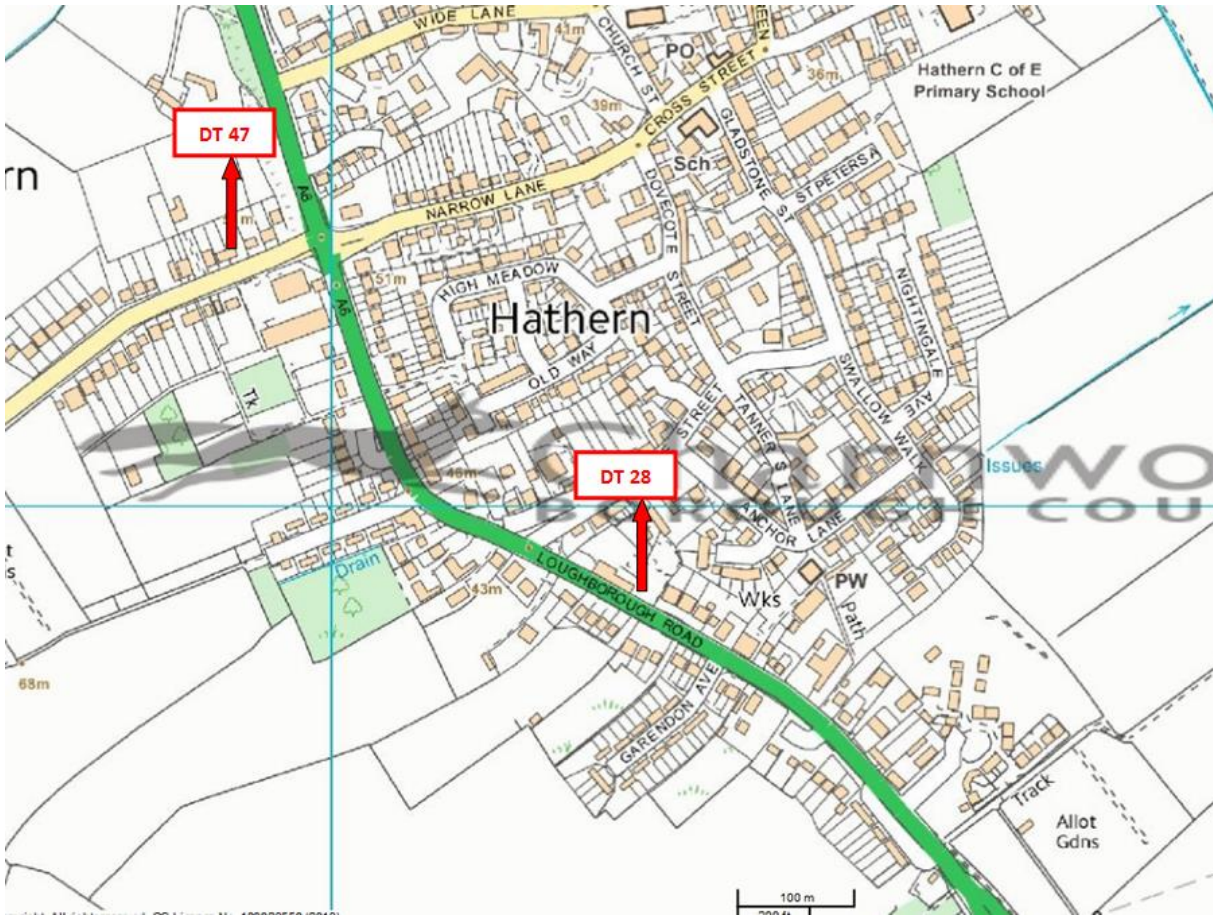
Map 8: Thurmaston



Map 9: Shepshed



Map 10: Hathern



Appendix E: Summary of Air Quality Objectives in England

Table E.1 – Air Quality Objectives in England

Pollutant	Air Quality Objective ⁴	
	Concentration	Measured as
Nitrogen Dioxide (NO ₂)	200 µg/m ³ not to be exceeded more than 18 times a year	1-hour mean
	40 µg/m ³	Annual mean
Particulate Matter (PM ₁₀)	50 µg/m ³ , not to be exceeded more than 35 times a year	24-hour mean
	40 µg/m ³	Annual mean
Sulphur Dioxide (SO ₂)	350 µg/m ³ , not to be exceeded more than 24 times a year	1-hour mean
	125 µg/m ³ , not to be exceeded more than 3 times a year	24-hour mean
	266 µg/m ³ , not to be exceeded more than 35 times a year	15-minute mean

⁴ The units are in microgrammes of pollutant per cubic metre of air (µg/m³).

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	Air quality Annual Status Report
Defra	Department for Environment, Food and Rural Affairs
DMMP	Dust Monitoring and Management Plan
DMRB	Design Manual for Roads and Bridges – Air quality screening tool produced by Highways England
EU	European Union
GCR	Great Central Railway
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 (micrometres or microns) 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

Charnwood Borough Council - Previous Air Quality Review & Assessment documents (including Final AQ Action Plan)

<https://www.charnwood.gov.uk/pages/airpollution>

LAQM Technical Guidance document TG(16)

<https://laqm.defra.gov.uk/documents/LAQM-TG16-February-18-v1.pdf>

LAQM Support - NO₂ Diffusion Tube QA/QC

<https://laqm.defra.gov.uk/diffusion-tubes/diffusion-tubes.html>