2015 Air Quality Updating and Screening Assessment for Charnwood Borough Council

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

October 2015

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Report Reference number	CBC/USA/2015
Date	2 October 2015

Executive Summary

As part of their duties under the Environment Act 1995 local authorities are obliged to undertake a full Updating and Screening Assessment of air quality within their districts, every 3 years.

The report asks local authorities to review and assess air quality in their areas in detail, and to determine whether or not the air quality objectives are likely to be achieved. Where exceedences have been recorded or are considered likely, the local authority must then proceed to a Detailed Assessment prior to the declaration of an Air Quality Management Area (AQMA) and the preparation of an Air Quality Action Plan (AQAP), setting out the measures it intends to put in place in pursuit of the objectives.

Charnwood has four Air Quality Management Areas (AQMAs), which were declared because of predicted breaches of national air quality objectives at residential properties in the borough. The causes of these predicted breaches are resulting from both emissions from local traffic and commercial (railway & quarry) sources.

In 2014, the monitoring of nitrogen dioxide at 40 locations in Charnwood demonstrated a breach of UK air quality objectives at a single site. This site, Nottingham Road (Loughborough), has been subjected to traffic disruption over recent years resulting from the construction of 2 major road schemes within the town.

Following completion of the Loughborough Inner Relief Road (LIRR) in March 2014, we would now expect to see full year annual mean concentrations falling back to normalised levels. Provisional in-house results for Jan-Jun 2015 confirm that this is likely to be the case with the site attaining compliance with the National Air Quality Objective Level of 40µgm^{-3} in the next round of reporting.

Furthermore, since the opening of the LIRR we are already able to demonstrate significant measurable air quality improvements to residents living alongside the arterial routes through Loughborough.

Progress with Lafarge quarry in relation to the Mountsorrel (PM_{10}) Air Quality Management Area declared in November 2011, is on-going. A dust management plan has been approved and a number of process solutions and procedural improvements have now been implemented and will be periodically assessed and reviewed. Results from these changes are already indicating a positive influence in local concentration levels, indicating that the permissible dust levels have now been achieved.

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Appendices

1 Introduction

1.1 Description of Local Authority Area

The Borough of Charnwood is located in the heart of the East Midlands sitting centrally in the triangle formed by Nottingham, Leicester and Derby. The Borough covers an area of 108 square miles and consists of a mix of urban settlements and rural farmland.

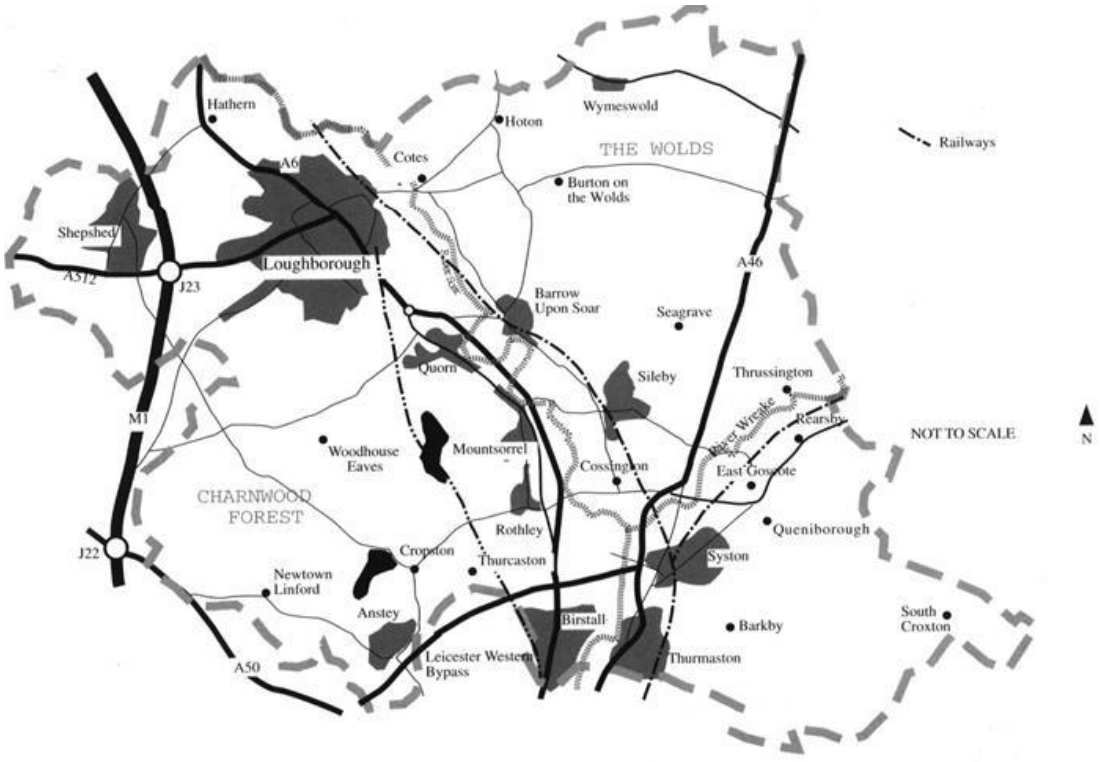
Map of Charnwood Borough in Leicestershire

The Borough of Charnwood

Just over one third of the 155,000+ population live in the thriving university town of Loughborough. The remaining residents are distributed between the northern town of Shepshed and the southern towns and villages on the outskirts of the city of Leicester including Anstey, Birstall, Thurmaston and Syston and the villages located along the Soar and Wreake river valleys.

Charnwood has a wide range of commercial and industrial activities. Loughborough is traditionally associated with the engineering sector, whilst the villages along the Soar and Wreake have long associations with the footwear, hosiery and knitwear

industries. High technology industries are being rapidly attracted into the Borough, mirroring the national experience of the contraction of the traditional heavy industries. The changing industrial infrastructure of the Borough will continue to create challenges in relation to air quality management.



A substantial and varied transport network serves the Borough. The major road links include the M1 motorway, the A6 and the A46 all of which run to a greater or lesser extent through the Borough. The Ivanhoe and Great Central railway lines run through the central spine of the Borough, and the East Midlands airport is located approximately three miles from the north western boundary of Charnwood.

Generally ambient air pollution has never been considered to be of excessive concern for local residents in the Borough. However, as is the case in many parts of the country, the atmospheric emissions from certain individual point sources have caused considerable nuisance for those residents in the immediate vicinity. Some of these individual point sources will not have been highlighted through this report, as they are not producers of any of the seven key pollutants highlighted in the National Air Quality Strategy. This does not indicate a lack of concern by the authors of the report to generate solutions to these problems, but is simply due to the fact that they fall outside the remit of this report.

1.2 Purpose of Report

This report fulfils the requirements of the Local Air Quality Management process as set out in Part IV of the Environment Act (1995), the Air Quality Strategy for England, Scotland, Wales and Northern Ireland 2007 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 exceedences are considered likely, the local authority must then 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.

The objective of this Updating and Screening Assessment is to identify any matters that have changed which may lead to risk of an air quality objective being exceeded. A checklist approach and screening tools are used to identify significant new sources or changes and whether there is a need for a Detailed Assessment. The USA report should provide an update of any outstanding information requested previously in Review and Assessment reports.

1.3 Air Quality Objectives

The airquality objectives applicable to LAQM **in England** are set out in the Air Quality (England) Regulations 2000 (SI 928), The Air Quality (England) (Amendment) Regulations 2002 (SI 3043), and are shown in Table 1.1. This table shows the objectives in units of microgrammes per cubic metre $\mu g/m^3$ (milligrammes per cubic metre, mg/m^3 for carbon monoxide) with the number of exceedences in each year that are permitted (where applicable).

Table 1.1 Air Quality Objectives included in Regulations for the purpose of LAQM in England

Pollutant	Air Quality Objective		Date to be achieved by
	Concentration	Measured as	
Benzene	16.25 $\mu g/m^3$	Running annual mean	31.12.2003

	5.00 $\mu g/m^3$	Running annual mean	31.12.2010
1,3-Butadiene	2.25 $\mu g/m^3$	Running annual mean	31.12.2003
Carbon monoxide	10.0 mg/m^3	Running 8-hour mean	31.12.2003
Lead	0.5 $\mu g/m^3$	Annual mean	31.12.2004
	0.25 $\mu g/m^3$	Annual mean	31.12.2008
Nitrogen dioxide	200 $\mu g/m^3$ not to be exceeded more than 18 times a year	1-hour mean	31.12.2005
	40 $\mu g/m^3$	Annual mean	31.12.2005
Particles (PM_{10}) (gravimetric)	50 $\mu g/m^3$, not to be exceeded more than 35 times a year	24-hour mean	31.12.2004
	40 $\mu g/m^3$	Annual mean	31.12.2004
Sulphur dioxide	350 $\mu g/m^3$, not to be exceeded more than 24 times a year	1-hour mean	31.12.2004
	125 $\mu g/m^3$, not to be exceeded more than 3 times a year	24-hour mean	31.12.2004
	266 $\mu g/m^3$, not to be exceeded more than 35 times a year	15-minute mean	31.12.2005

1.4 Summary of Previous Review and Assessments

In December 2000 Charnwood Borough Council completed a first Review and Assessment of air quality in the Borough. The object of the project was to determine whether concentrations of seven pollutants identified by UK Government as being most concern to public health were likely to be above air quality objectives set in the National Air Quality Strategy. The objectives of the Strategy are based on levels at which there are considered to be no effect on human health.

Three Air Quality Management Areas were declared in 2001 on the basis of this report.

In May 2003 an Updating and Screening Assessment was issued to review the findings of the original project by taking into consideration any changes that had occurred outside of the three Air Quality Management Areas that had been declared on the basis of the first assessment, as well as any improvements that had been made in the methods of predicting air quality changes.

2004 saw two further detailed assessments published. One provided a detailed review and assessment of traffic related air quality – the Round 1, Stage 4 Review and Assessment. The other provided a detailed review and assessment of air quality around two industrial locations – the Round 2 Detailed Review and Assessment. These reports were undertaken to examine and refine in more detail the predictions of how air quality is likely to change in each of those areas in relation to the possibility of potential breaches against the set objectives, in order to produce an Action Plan implementing changes that would endeavour to see that the objectives are met.

Following a Progress Report submitted in 2005, a full review and assessment of air quality in Charnwood was undertaken in the Round 3 Updating and Screening Assessment, completed in 2006. All sources of air pollution were considered in this report, with collated monitoring data from previous years being fully analysed based on the methodology outlined in Technical Guidance LAQM.TG(03) Update – January 2006 published by the Department for the Environment Food and Rural Affairs.

In 2007 a Progress Report was prepared for DEFRA, presenting results from our monitoring network throughout 2006. It was explained as part of the report that an intended Detailed Assessment in relation to PM10 levels in the vicinity of the Lafarge Tarmac aggregates quarry at Mountsorrel, which had been identified during previous year's reports, had not been undertaken due to technical issues (data retrieval and software problems) with the on-site monitoring equipment. Subsequently, following a more thorough period of monitoring during 2009-2010; this Detailed Assessment was ultimately completed in 2011 with the recommendation made by Authority that a

further AQMA should be declared in respect to exceedences of the 24-hr PM10 objective being accepted by DEFRA. The AQMA was declared in November 2011 with a Further Assessment Report submitted, and accepted by DEFRA during 2013.

The 2009 Detailed Assessment in respect of previously reported NO_2 diffusion tube concentrations around the junction at Humberstone Lane, Thurmaston, had pointed towards there being potential exceedences on the northern side of Humberstone Lane. The outcome of the modelling within this report suggested being in contradiction to local knowledge in that the southern side would be most affected. Recommendations were made to DEFRA that a further period of diffusion tube monitoring would be undertaken, specifically targeting the properties highlighted in the report to be at 'risk', prior to drawing final conclusions. Updated results/comments made as part of our 2010 Progress Report – concluding that concentrations were within the objective levels at the relevant locations - indicated that there was no need to proceed to a declaration of an AQMA in respect to the NO2 (annual mean). DEFRA accepted these conclusions.

2009 - 2014 also saw the submission of our annual reporting requirements in terms of Updated & Screening Assessments and subsequent Progress Reports. All conclusions and recommendations were accepted by DEFRA.

We therefore approach this particular reporting phase of the policy guidance with four declared Air Quality Management Areas within the Borough:

1. **Loughborough Air Quality Management Area**
   Designated in relation to a likely breach of the nitrogen dioxide (annual mean) objective as specified in the Air Quality Regulations (England)(Wales) 2000

2. **GCR Air Quality Management Area**
   Designated in relation to a likely breach of the sulphur dioxide (fifteen minute mean) objective as specified in the Air Quality Regulations (England)(Wales) 2000.

3. **Syston Air Quality Management Area**
   Designated in relation to a likely breach of the nitrogen dioxide (annual mean) objective as specified in the Air Quality Regulations (England)(Wales) 2000

4. **Mountsorrel Air Quality Management Area**
   Designated in relation to a likely breach of the particulate matter (PM10) (24 hour mean) objective as specified in the Air Quality Regulations (England)(Wales) 2000

All the above reports are available on the Charnwood Borough Council website at the following address: www.charnwood.gov.uk/environment/airpollution.html

2 New Monitoring Data

2.1 Summary of Monitoring Undertaken

2.1.1 Automatic Monitoring Sites

Charnwood operates 4 automatic monitoring sites, summarised in Table 2.1.

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(09)

Note:

During 2014* continuing technical problems were encountered with the operation of automatic analysers located at Durham Road (NOx, PM_{10}, SO_2), Syston (NO_2) and Baxter Gate (NO_2), leading to extended periods of sampling 'down time' and subsequent insufficient data-capture rates.

We therefore have no new data to present from these analysers and have adjusted the NO_2 diffusion tubes throughout our network against The National Diffusion Tube Bias Adjustment Factor Spreadsheet v06/16.

Data presented in Figures 2.3 & 2.4 is therefore intended for historical reference only.

* *2015 has seen a continuation in the issues relating to these analysers. At the time of writing decisions are being made as to whether to decommission some, or all, of their use.*

Table 2.1 Details of Automatic Monitoring Sites

Site Name	Site Type	X OS GridRef	Y OS Grid Ref	Pollutants Monitored	In AQMA?	Monitoring Technique	Relevant Exposure? *(Y/N with distance (m) to relevant exposure)*	Distance to kerb of nearest road *(N/A if not applicable)*	Does this location represent worst-case exposure?
Durham Rd (Loughborough)	Urban background	452352	320697	NO_2, SO_2, PM_{10}	N	TEOM (PM_{10}) UV Fluorescence Chemi-Iluminescence	N	n/a	N
Baxter Gate (Loughborough)	Roadside	453687	319672	NO_2	Y	Chemi-Iluminescence	N (Not in the immediate vicinity of the monitor)	1m	N
Melton Rd (Syston)	Roadside	462540	311428	NO_2	Y	Chemi-Iluminescence	Y (10m)	3m	N
Mountsorrel	Industrial / Other	457355	315396	PM_{10}	Y	Volumetric Gravimetric	Y (~34M)	n/a	Y

2.1.2 Non-Automatic Monitoring Sites

Since the completion of the first review and assessment of air quality we have sought to continuously update and improve our monitoring network.

During 2014:

- Nitrogen dioxide diffusion tubes were deployed at 40 locations (tubes in triplicate being used at the 3 automatic monitoring sites).

Tubes were located as close as practicable to receptor locations – usually on the façades of residential properties.

Table 2.2 Details of Non-Automatic Monitoring Sites

Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA?	Is monitoring collocated with a Continuous Analyser (Y/N)	Relevant Exposure? *(Y/N with distance (m) to relevant exposure)*	Distance to kerb of nearest road *(N/A if not applicable)*	Does this location represent worst-case exposure?
Ratcliffe Rd (Loughborough)	Roadside	454087	320392	NO_2	Y	N	Y (façade)	~3m	Y
Shelthorpe Rd (Loughborough)	Roadside	454234	318657	NO_2	N	N	Y (~8m)	~3m	Y
Forest Rd (Loughborough)	Roadside	452833	318776	NO_2	N	N	Y (façade)	~6m	Y
Haydon Rd (Loughborough)	Roadside	452314	319620	NO_2	Y	N	Y (~8m)	~6m	Y
Alan Moss Rd/Epinal Way (Loughborough)	Roadside	452173	319924	NO_2	Y	N	Y (façade)	~15m	Y
Epinal Way/Ling Rd (Loughborough)	Roadside	453678	318194	NO_2	N	N	Y (façade)	~9m	Y
Leicester Rd (Loughborough)	Roadside	454002	319253	NO_2	Y	N	-	~3m	Y
Derby Rd (Loughborough)	Roadside	453231	320028	NO_2	Y	N	Y (~3m)	~3m	Y

Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA?	Is monitoring collocated with a Continuous Analyser (Y/N)	Relevant Exposure? *(Y/N with distance (m) to relevant exposure)*	Distance to kerb of nearest road *(N/A if not applicable)*	Does this location represent worst-case exposure?
Derby Rd/Brisco Avn (Loughborough)	Roadside	452670	320527	NO_2	Y	N	Y (~3m)	~4m	Y
Durham Rd AQMS 1 (Loughborough)	Urban Background	452352	320697	NO_2	N	Y	N	n/a	n/a
Durham Rd AQMS 2 (Loughborough)	Urban Background	452352	320697	NO_2	N	Y	N	n/a	n/a
Durham Rd AQMS 3 (Loughborough)	Urban Background	452352	320697	NO_2	N	Y	N	n/a	n/a
Alan Moss Rd/A6 Derby Rd (Loughborough)	Roadside	452903	320212	NO_2	Y	N	Y (façade)	~8m	Y
High St (Loughborough)	Roadside	453730	319596	NO_2	Y	N	-	~3m	Y
Market Place (Loughborough)	Urban Centre	453611	319540	NO_2	Y	N	N	n/a	n/a

Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA?	Is monitoring collocated with a Continuous Analyser (Y/N)	Relevant Exposure? *(Y/N with distance (m) to relevant exposure)*	Distance to kerb of nearest road *(N/A if not applicable)*	Does this location represent worst-case exposure?
Ashby Rd (Loughborough)	Roadside	453189	319709	NO_2	Y	N	Y (façade)	~4m	Y
Cow Hill Lodge (Shepshed)	Roadside	448876	318307	NO_2	N	N	Y (façade)	~10m	Y
Rosebery St (Loughborough)	Roadside	452697	319921	NO_2	N	N	Y (~13m)	~3m	Y
Melton Rd Town Centre (Syston)	Roadside	462777	311692	NO_2	Y	N	Y (~3m)	~3m	Y
1123 Melton Rd (Syston)	Roadside	462351	311213	NO_2	Y	N	Y (façade)	~6m	Y
1116 Melton Rd (Syston)	Roadside	462373	311254	NO_2	Y	N	Y (façade)	~3m	Y
Loughborough Rd (Birstall)	Roadside	459233	309590	NO_2	Y	N	Y (façade)	~15m	Y
A6 (Birstall)	Roadside	459178	309890	NO_2	N	N	Y (~2m)	~5m	Y
21 Humberstone Lane (Thurmaston)	Roadside	460821	308757	NO_2	N	N	Y (façade)	~6m	Y

Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA?	Is monitoring collocated with a Continuous Analyser (Y/N)	Relevant Exposure? *(Y/N with distance (m) to relevant exposure)*	Distance to kerb of nearest road *(N/A if not applicable)*	Does this location represent worst-case exposure?
43 Humberstone Lane (Thurmaston)	Roadside	460861	308824	NO_2	N	N	Y (façade)	~5m	Y
38 Humberstone Lane (Thurmaston)	Roadside	460908	308775	NO_2	N	N	Y (façade)	~5m	Y
22 Humberstone Lane (Thurmaston)	Roadside	460835	308784	NO_2	N	N	Y (façade)	~5m	Y
Ashby Rd Central (Shepshed)	Roadside	448121	318257	NO_2	N	N	Y (~12m)	2m	Y
Loughborough Rd (Hathern)	Roadside	450260	321922	NO_2	N	N	Tube located ~3m from kerb. Nearest receptor is ~30m away and ~13m from kerb		Y
Baxter Gate (Loughborough)	Roadside	453682	319672	NO_2	Y	N	-	~2m	Y

Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA?	Is monitoring collocated with a Continuous Analyser (Y/N)	Relevant Exposure? *(Y/N with distance (m) to relevant exposure)*	Distance to kerb of nearest road *(N/A if not applicable)*	Does this location represent worst-case exposure?
Barrow St (Loughborough)	Roadside	453901	319488	NO_2	N	N	Y (façade)	~10m	Y
School St (Loughborough)	Roadside	453946	319619	NO_2	N	N	Y (façade)	~3m	Y
Fennel St (Loughborough)	Roadside	453694	319890	NO_2	N	N	Y (façade)	~3m	Y
High St (Syston)	Roadside	462369	311809	NO_2	Y	N	Y (façade)	~4m	Y
Syston AQMS 1	Roadside	462540	311428	NO_2	Y	Y	Y (~10m)	~3m	Y
Syston AQMS 2	Roadside	462540	311428	NO_2	Y	Y	Y (~10m)	~3m	Y
Syston AQMS 3	Roadside	462540	311428	NO_2	Y	Y	Y (~10m)	~3m	Y
Baxter Gate AQMS 1 (Loughborough)	Kerbside	453687	319672	NO_2	Y	Y	-	~1m	Y
Baxter Gate AQMS 2 (Loughborough)	Kerbside	453687	319672	NO_2	Y	Y	-	~1m	Y
Baxter Gate AQMS 3 (Loughborough)	Kerbside	453687	319672	NO_2	Y	Y	-	~1m	Y

Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA?	Is monitoring collocated with a Continuous Analyser (Y/N)	Relevant Exposure? *(Y/N with distance (m) to relevant exposure)*	Distance to kerb of nearest road *(N/A if not applicable)*	Does this location represent worst-case exposure?
33 Nottingham Rd (Loughborough)	Roadside	454000	319977	NO_2	N	N	-	~3m	Y
89 Nottingham Rd (Loughborough)	Roadside	454154	320116	NO_2	N	N	Y (façade)	~3m	Y
156 Ratcliffe Rd (Loughborough)	Roadside	454285	320294	NO_2	N	N	Y (façade)	~6m	Y
156 Meadow Rd (Loughborough)	Roadside	453933	320663	NO_2	N	N	Y (façade)	~8m	Y
31 Station Boulevard (Loughborough)	Roadside	454142	320593	NO_2	N	N	Y (façade)	~9m	Y
91 Wharncliffe Rd (Loughborough)	Roadside	454250	319682	NO_2	N	N	Y (façade)	~4m	Y

2.2 Comparison of Monitoring Results with AQ Objectives

2.2.1 Nitrogen Dioxide

As can be seen from the following results for 2014; during this period there has been only a single diffusion tube falling outside of an existing AQMA that has exceeded the 40µgm^{-3} annual mean.

This single site, at Nottingham Road (Loughborough), has for some time been subject to traffic disruption resulting from the construction of 2 major road schemes within the town.

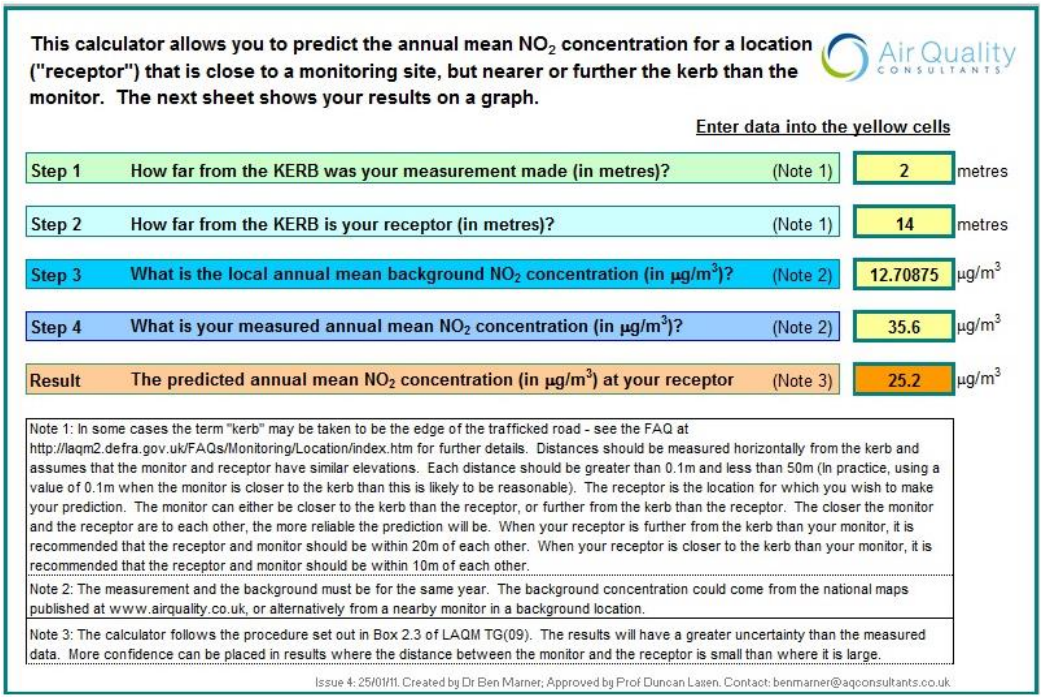
Following completion of the Loughborough Inner Relief Road (LIRR) in March 2014, we would now expect to see full year annual mean concentrations falling back to normalised levels. Provisional in-house results for Jan-Jun 2015 confirm that this is likely to be the case with the site attaining compliance with the National Air Quality Objective Level of 40µgm^{-3} in the next round of reporting.

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 "NO_2 with Distance from Roads Calculator" (Issue 4) available from the UK Air Quality Archive, it is possible for us to calculate the distance NO_2 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 25.2µg/m^{-3}



This calculator allows you to predict the annual mean NO_2 concentration for a location ("receptor") that is close to a monitoring site, but nearer or further the kerb than the monitor. The next sheet shows your results on a graph.

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Enter data into the yellow cells

Step 1	How far from the KERB was your measurement made (in metres)?	(Note 1)	2	metres
Step 2	How far from the KERB is your receptor (in metres)?	(Note 1)	14	metres
Step 3	What is the local annual mean background NO_2 concentration (in µg/m^3)?	(Note 2)	12.70875	µg/m^3
Step 4	What is your measured annual mean NO_2 concentration (in µg/m^3)?	(Note 2)	35.6	µg/m^3
Result	The predicted annual mean NO_2 concentration (in µg/m^3) at your receptor	(Note 3)	25.2	µg/m^3

Note 1: In some cases the term "kerb" may be taken to be the edge of the trafficked road - see the FAQ at http://laqm2.defra.gov.uk/FAQs/Monitoring/Location/index.htm for further details. Distances should be measured horizontally from the kerb and assumes that the monitor and receptor have similar elevations. Each distance should be greater than 0.1m and less than 50m (In practice, using a value of 0.1m when the monitor is closer to the kerb than this is likely to be reasonable). The receptor is the location for which you wish to make your prediction. The monitor can either be closer to the kerb than the receptor, or further from the kerb than the receptor. The closer the monitor and the receptor are to each other, the more reliable the prediction will be. When your receptor is further from the kerb than your monitor, it is recommended that the receptor and monitor should be within 20m of each other. When your receptor is closer to the kerb than your monitor, it is recommended that the receptor and monitor should be within 10m of each other.

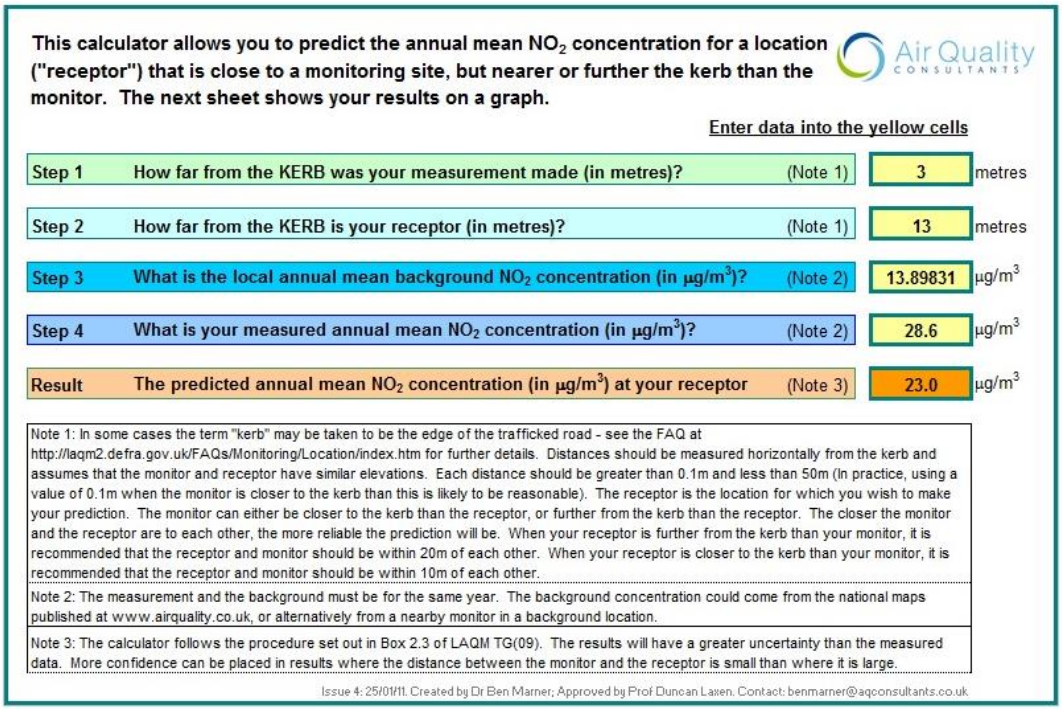
Note 2: The measurement and the background must be for the same year. The background concentration could come from the national maps published at www.airquality.co.uk, or alternatively from a nearby monitor in a background location.

Note 3: The calculator follows the procedure set out in Box 2.3 of LAQM TG(09). The results will have a greater uncertainty than the measured data. More confidence can be placed in results where the distance between the monitor and the receptor is small than where it is large.

Issue 4: 25/01/11. Created by Dr Ben Marner; Approved by Prof Duncan Laxen. Contact: benmarner@aqconsultants.co.uk

Loughborough Rd (Hathern)

Using the calculator the concentration at the nearest receptor is shown below to be 23.0µg/m^{-3}



This calculator allows you to predict the annual mean NO_2 concentration for a location ("receptor") that is close to a monitoring site, but nearer or further the kerb than the monitor. The next sheet shows your results on a graph.

Air Quality CONSULTANTS

Enter data into the yellow cells

Step 1	How far from the KERB was your measurement made (in metres)?	(Note 1)	3	metres
Step 2	How far from the KERB is your receptor (in metres)?	(Note 1)	13	metres
Step 3	What is the local annual mean background NO_2 concentration (in µg/m^3)?	(Note 2)	13.89831	µg/m^3
Step 4	What is your measured annual mean NO_2 concentration (in µg/m^3)?	(Note 2)	28.6	µg/m^3
Result	The predicted annual mean NO_2 concentration (in µg/m^3) at your receptor	(Note 3)	23.0	µg/m^3

Note 1: In some cases the term "kerb" may be taken to be the edge of the trafficked road - see the FAQ at http://laqm2.defra.gov.uk/FAQs/Monitoring/Location/index.htm for further details. Distances should be measured horizontally from the kerb and assumes that the monitor and receptor have similar elevations. Each distance should be greater than 0.1m and less than 50m (In practice, using a value of 0.1m when the monitor is closer to the kerb than this is likely to be reasonable). The receptor is the location for which you wish to make your prediction. The monitor can either be closer to the kerb than the receptor, or further from the kerb than the receptor. The closer the monitor and the receptor are to each other, the more reliable the prediction will be. When your receptor is further from the kerb than your monitor, it is recommended that the receptor and monitor should be within 20m of each other. When your receptor is closer to the kerb than your monitor, it is recommended that the receptor and monitor should be within 10m of each other.

Note 2: The measurement and the background must be for the same year. The background concentration could come from the national maps published at www.airquality.co.uk, or alternatively from a nearby monitor in a background location.

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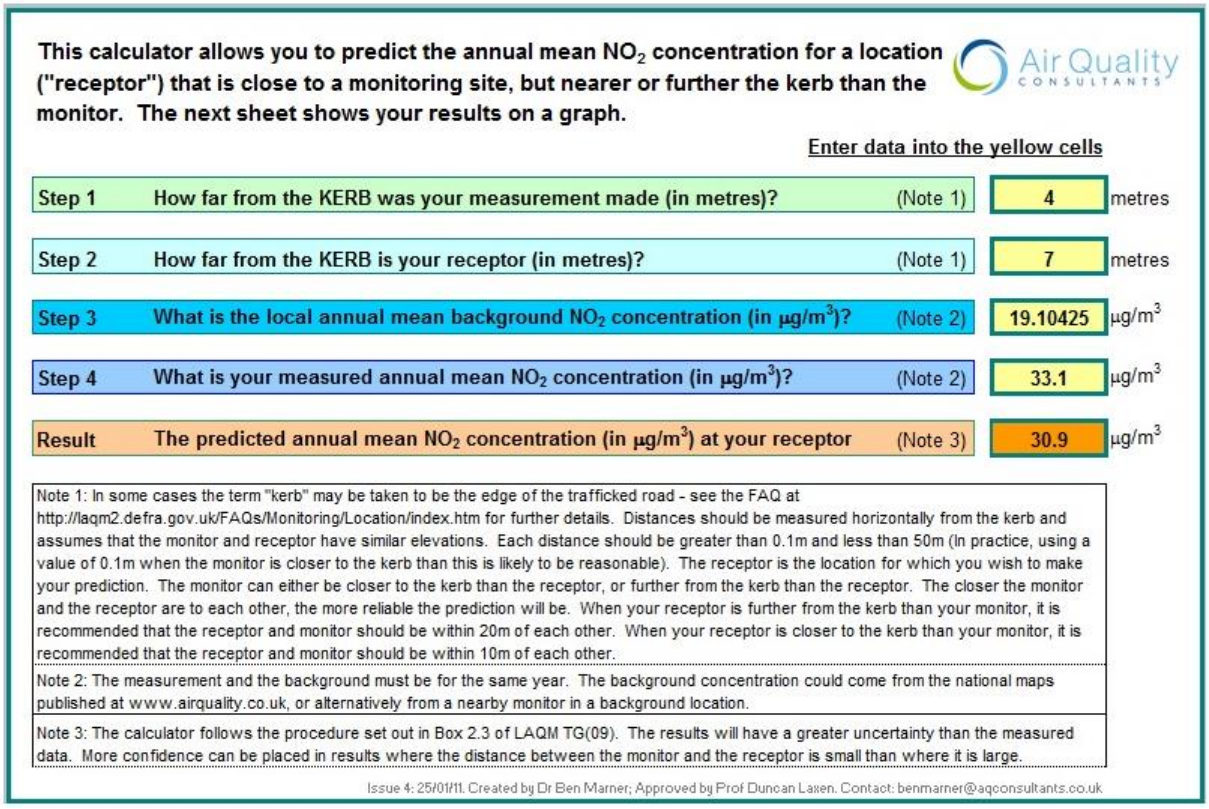
A6 (Birstall)

Using the calculator the concentration at the nearest receptor is shown below to be 30.9µg/m^{-3}



This calculator allows you to predict the annual mean NO_2 concentration for a location ("receptor") that is close to a monitoring site, but nearer or further the kerb than the monitor. The next sheet shows your results on a graph.

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Enter data into the yellow cells

Step 1	How far from the KERB was your measurement made (in metres)?	(Note 1)	4	metres
Step 2	How far from the KERB is your receptor (in metres)?	(Note 1)	7	metres
Step 3	What is the local annual mean background NO_2 concentration (in µg/m^3)?	(Note 2)	19.10425	µg/m^3
Step 4	What is your measured annual mean NO_2 concentration (in µg/m^3)?	(Note 2)	33.1	µg/m^3
Result	The predicted annual mean NO_2 concentration (in µg/m^3) at your receptor	(Note 3)	30.9	µg/m^3

Note 1: In some cases the term "kerb" may be taken to be the edge of the trafficked road - see the FAQ at http://laqm2.defra.gov.uk/FAQs/Monitoring/Location/index.htm for further details. Distances should be measured horizontally from the kerb and assumes that the monitor and receptor have similar elevations. Each distance should be greater than 0.1m and less than 50m (In practice, using a value of 0.1m when the monitor is closer to the kerb than this is likely to be reasonable). The receptor is the location for which you wish to make your prediction. The monitor can either be closer to the kerb than the receptor, or further from the kerb than the receptor. The closer the monitor and the receptor are to each other, the more reliable the prediction will be. When your receptor is further from the kerb than your monitor, it is recommended that the receptor and monitor should be within 20m of each other. When your receptor is closer to the kerb than your monitor, it is recommended that the receptor and monitor should be within 10m of each other.

Note 2: The measurement and the background must be for the same year. The background concentration could come from the national maps published at www.airquality.co.uk, or alternatively from a nearby monitor in a background location.

Note 3: The calculator follows the procedure set out in Box 2.3 of LAQM TG(09). The results will have a greater uncertainty than the measured data. More confidence can be placed in results where the distance between the monitor and the receptor is small than where it is large.

Issue 4: 25/01/11. Created by Dr Ben Marner; Approved by Prof Duncan Laxen. Contact: benmarner@aqconsultants.co.uk

Table 2.3 Results of Automatic Monitoring of Nitrogen Dioxide: Comparison with Annual Mean Objective

Site ID	Site Location	Valid Data Capture for period of monitoring %[a]	Valid Data Capture 2014 % [b]	Annual Mean Concentration μg/m^3				
				2010	2011	2012	2013	2014
11	Durham Rd, L'boro	No Data	No Data	28.7	24.8	24.83	24.83	No Data
34-36	Melton Rd, Syston	No Data	No Data	34.4	30.6	34.38	36.29	No Data
37-39	Baxter Gate, L'boro	No Data	No Data	**51.6**	**53.5**	**76.4 (Note A)**	**Note A**	No Data

Table 2.4 Results of Automatic Monitoring for Nitrogen Dioxide: Comparison with 1-hour mean Objective

Site ID	Site Location	Valid Data Capture for period of monitoring %[a]	Valid Data Capture 2014 % [b]	Number of Exceedences of Hourly Mean (200 μg/m^3)				
				2010	2011	2012	2013	2014
11	Durham Rd, L'boro	No Data	No Data	0	0	0 (86.0)	0	No Data
34-36	Melton Rd, Syston	No Data	No Data	0	0	0 (99.3)	54 **(Note B)**	No Data
37-39	Baxter Gate, L'boro	No Data	No Data	0	184	336 (386) **(Note A)**	**Note A**	No Data

[a] i.e. data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.
[b] i.e. data capture for the full calendar year (e.g. if monitoring was carried out for six months the maximum data capture for the full calendar year would be 50%.)
[c] If the period of valid data is less than 90%, the 99.8th percentile of hourly means in shown in brackets

Note A: Data from the Baxter Gate analyser gives a gentle but steady deterioration in NO_2 concentrations from approx. late Aug 2012. In the last quarter, 307 hourly exceedences were logged which we believe are erroneous and should be discarded. This pattern culminated with an analyser failure in Jan/Feb 2013 and a subsequent CPU board replacement returned, for a short time, output values to be more in-keeping with values of expected magnitude. However, further problems surfaced throughout 2013 and a long period of in-operation has also been encountered through most of 2014 in connection with the long-term failure of an aircon unit servicing the monitor

Note B: 52 of the 54 reported exceedences of the 200µgm^{-3} mean occurred over a 3 week period covering 19th May – 9th June, with the remaining 2 on the 6th May. No single exceedences have previously been recorded at this monitoring location since installation in 2009. On the 17th June the analyser underwent its annual (full) service, including recalibration by our external servicing partners; since the service we have experienced no further exceedences and are therefore confident in assuming that these elevated levels can be attributed to 'natural drift' in the response of the analyser to the pollutant rather than the true ambient levels.

Diffusion Tube Monitoring Data

Table 2.5 Results of Nitrogen Dioxide Diffusion Tubes in 2011

Site ID	Location	Site Type	Within AQMA?	Triplicate or Collocated Tube	Data Capture 2014 (Number of Months or %)	Data with less than 9 months has been annualised (Y/N)	Confirm if data has been distance corrected (Y/N)	Annual mean concentration (Bias Adjustment factor) 2014 (μg/m^3)
1	Ratcliffe Rd (Loughborough)	Roadside	Y	-	12	n/a	n/a	21.6 (0.91)
2	Shelthorpe Rd (Loughborough)	Roadside	N	-	12	n/a	n/a	22.3 (0.91)
3	Forest Rd (Loughborough)	Roadside	N	-	12	n/a	n/a	26.6 (0.91)
5	Haydon Rd (Loughborough)	Roadside	Y	-	12	n/a	n/a	25.2 (0.91)
6	Alan Moss Rd/Epinal Way (Loughborough)	Roadside	Y	-	12	n/a	n/a	23.4 (0.91)
7	Epinal Way/Ling Rd (Loughborough)	Roadside	N	-	11	n/a	n/a	26.1 (0.91)
8	Leicester Rd (Loughborough)	Roadside	Y	-	11	n/a	n/a	34.2 (0.91)
9	Derby Rd (Loughborough)	Roadside	Y	-	11	n/a	n/a	30.7 (0.91)

Site ID	Location	Site Type	Within AQMA?	Triplicate or Collocated Tube	Data Capture 2014 (Number of Months or %)	Data with less than 9 months has been annualised (Y/N)	Confirm if data has been distance corrected (Y/N)	Annual mean concentration (Bias Adjustment factor) 2014 (μg/m^3)
10	Derby Rd/Brisco Avn (Loughborough)	Roadside	Y	-	12	n/a	n/a	25.1 (0.91)
11 i	Durham Rd AQMS 1 (Loughborough)	Urban Background	N	Triplicate	12	n/a	n/a	18.3 (0.91)
11 ii	Durham Rd AQMS 2 (Loughborough)	Urban Background	N	Triplicate	11	n/a	n/a	19.2 (0.91)
11 iii	Durham Rd AQMS 3 (Loughborough)	Urban Background	N	Triplicate	12	n/a	n/a	19.3 (0.91)
12	Alan Moss Rd/A6 Derby Rd (Loughborough)	Roadside	Y	-	12	n/a	n/a	27.8 (0.91)
13	High St (Loughborough)	Roadside	Y	-	10	n/a	n/a	39.1 (0.91)
14	Market Place (Loughborough)	Urban Centre	Y	-	11	n/a	n/a	21.4 (0.91)

Site ID	Location	Site Type	Within AQMA?	Triplicate or Collocated Tube	Data Capture 2014 (Number of Months or %)	Data with less than 9 months has been annualised (Y/N)	Confirm if data has been distance corrected (Y/N)	Annual mean concentration (Bias Adjustment factor) 2014 (μg/m^3)
15	Ashby Rd (Loughborough)	Roadside	Y	-	12	n/a	n/a	30.0 (0.91)
16	Cow Hill Lodge (Shepshed)	Roadside	N	-	12	n/a	n/a	24.8 (0.91)
17	Rosebery St (Loughborough)	Roadside	N	-	11	n/a	n/a	17.0 (0.91)
18	Melton Rd Town Centre (Syston)	Roadside	Y	-	12	n/a	n/a	27.7 (0.91)
19	1123 Melton Rd (Syston)	Roadside	Y	-	12	n/a	n/a	24.5 (0.91)
20	1116 Melton Rd (Syston)	Roadside	Y	-	12	n/a	n/a	28.4 (0.91)
21	Loughborough Rd (Birstall)	Roadside	Y	-	12	n/a	n/a	30.5 (0.91)
22	A6 (Birstall)	Roadside	N	-	12	n/a	Y	30.9 (0.91)
23	21 Humberstone Lane (Thurmaston)	Roadside	N	-	12	n/a	n/a	32.5 (0.91)

Site ID	Location	Site Type	Within AQMA?	Triplicate or Collocated Tube	Data Capture 2014 (Number of Months or %)	Data with less than 9 months has been annualised (Y/N)	Confirm if data has been distance corrected (Y/N)	Annual mean concentration (Bias Adjustment factor) 2014 (μg/m^3)
23b	43 Humberstone Lane (Thurmaston)	Roadside	N	-	12	n/a	n/a	30.4 (0.91)
23c	38 Humberstone Lane (Thurmaston)	Roadside	N	-	12	n/a	n/a	22.3 (0.91)
23d	22 Humberstone Lane (Thurmaston)	Roadside	N	-	12	n/a	n/a	26.3 (0.91)
26	Ashby Rd Central (Shepshed)	Roadside	N	-	12	n/a	Y	25.2 (0.91)
27	Loughborough Rd (Hathern)	Roadside	N	-	11	n/a	Y	23.0 (0.91)
28	Baxter Gate (Loughborough)	Roadside	Y	-	11	n/a	n/a	33.7 (0.91)
29	Barrow St (Loughborough)	Roadside	N	-	12	n/a	n/a	23.5 (0.91)
30	School St (Loughborough)	Roadside	N	-	12	n/a	n/a	20.6 (0.91)
31	Fennel St (Loughborough)	Roadside	N	-	12	n/a	n/a	29.9 (0.91)

Site ID	Location	Site Type	Within AQMA?	Triplicate or Collocated Tube	Data Capture 2014 (Number of Months or %)	Data with less than 9 months has been annualised (Y/N)	Confirm if data has been distance corrected (Y/N)	Annual mean concentration (Bias Adjustment factor) 2014 (μg/m^3)
33	High St (Syston)	Roadside	Y	-	12	n/a	n/a	25.7 (0.91)
34	Syston AQMS 1	Roadside	Y	Triplicate	12	n/a	n/a	30.8 (0.91)
35	Syston AQMS 2	Roadside	Y	Triplicate	12	n/a	n/a	29.4 (0.91)
36	Syston AQMS 3	Roadside	Y	Triplicate	10	n/a	n/a	28.8 (0.91)
37	Baxter Gate AQMS 1 (Loughborough)	Kerbside	Y	Triplicate	12	n/a	n/a	33.8 (0.91)
38	Baxter Gate AQMS 2 (Loughborough)	Kerbside	Y	Triplicate	12	n/a	n/a	33.7 (0.91)
39	Baxter Gate AQMS 3 (Loughborough)	Kerbside	Y	Triplicate	12	n/a	n/a	32.2 (0.91)
44	33 Nottingham Rd (Loughborough)	Roadside	N	-	12	n/a	n/a	32.9 (0.91)
45	89 Nottingham Rd (Loughborough)	Roadside	N	-	12	n/a	n/a	**40.1** (0.91)

Site ID	Location	Site Type	Within AQMA?	Triplicate or Collocated Tube	Data Capture 2014 (Number of Months or %)	Data with less than 9 months has been annualised (Y/N)	Confirm if data has been distance corrected (Y/N)	Annual mean concentration (Bias Adjustment factor) 2014 (μg/m^3)
46	156 Ratcliffe Rd (Loughborough)	Roadside	N	-	12	n/a	n/a	22.0 (0.91)
47	156 Meadow Rd (Loughborough)	Roadside	N	-	11	n/a	n/a	25.5 (0.91)
48	31 Station Boulevard (Loughborough)	Roadside	N	-	12	n/a	n/a	24.0 (0.91)
49	91 Wharncliffe Rd (Loughborough)	Roadside	N	-	12	n/a	n/a	27.5 (0.91)

[a] i.e. data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.
[b] i.e. data capture for the full calendar year (e.g. if monitoring was carried out for six months the maximum data capture for the full calendar year would be 50%.)
[c] Means to be "annualised" as in Box 3.2 of TG(09), if monitoring was not carried out for the full year.

Table 2.6 Results of Nitrogen Dioxide Diffusion Tubes (2010 to 2014)

Site ID	Location	Within AQMA?	Annual mean concentration μg/m^3				
			2010	2011	2012	2013	2014
1	Ratcliffe Rd (Loughborough)	Y	**42.3**	30.8	26.9	29.5	21.6
2	Shelthorpe Rd (Loughborough)	N	28.3	22.5	25.8	36.1	22.3
3	Forest Rd (Loughborough)	N	31.6	25.4	29.2	32.7	26.6
5	Haydon Rd (Loughborough)	Y	34.8	33.9	29.0	32.1	25.2
6	Alan Moss Rd/Epinal Way (Loughborough)	Y	31.2	30.2	27.1	28.2	23.4
7	Epinal Way/Ling Rd (Loughborough)	N	34.3	25.3	28.8	30.1	26.1
8	Leicester Rd (Loughborough)	Y	**43.2**	31.8	35.9	**42.7**	34.2
9	Derby Rd (Loughborough)	Y	**43.1**	31.4	36.8	**40.4**	30.7

Site ID	Location	Within AQMA?	Annual mean concentration μg/m^3				
			2010	2011	2012	2013	2014
10	Derby Rd/Brisco Avn (Loughborough)	Y	36.8	32.7	30.4	30.9	25.1
11 i	Durham Rd AQMS 1 (Loughborough)	N	28.6	25.1	21.9	24.7	18.3
11 ii	Durham Rd AQMS 2 (Loughborough)	N	28.6	23.8	23.6	23.4	19.2
11 iii	Durham Rd AQMS 3 (Loughborough)	N	28.7	25.5	23.1	26.1	19.3
12	Alan Moss Rd/A6 Derby Rd (Loughborough)	Y	39.6	**40.6**	34.8	33.6	27.8
13	High St (Loughborough)	Y	**66.0**	**52.6**	**56.3**	**65.7**	39.1
14	Market Place (Loughborough)	Y	29.5	21.3	25.2	25.9	21.4

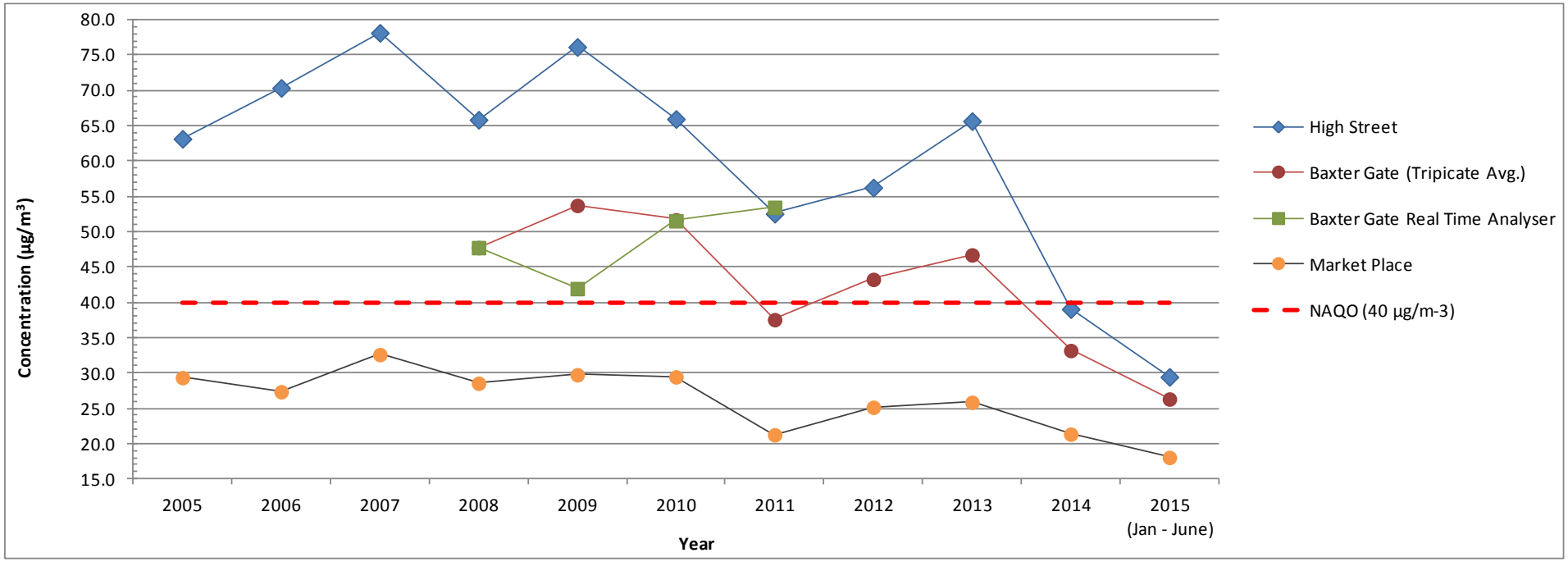
Site ID	Location	Within AQMA?	Annual mean concentration μg/m^3				
			2010	2011	2012	2013	2014
15	Ashby Rd (Loughborough)	Y	**42.0**	31.9	34.2	38.5	30.0
16	Cow Hill Lodge (Shepshed)	N	37.1	33.8	29.2	32.2	24.8
17	Rosebery St (Loughborough)	N	26.1	24.3	23.7	24.9	17.0
18	Melton Rd Town Centre (Syston)	Y	34.8	30.4	29.3	36.8	27.7
19	1123 Melton Rd (Syston)	Y	32.4	26.0	27.5	31.7	24.5
20	1116 Melton Rd (Syston)	Y	37.2	29.0	29.0	36.1	28.4
21	Loughborough Rd (Birstall)	N	34.4	30.9	33.8	39.5	30.5
22	A6 (Birstall)	N	39.7	30.6	34.2	37.9	30.9
23	21 Humberstone Lane (Thurmaston)	N	**40.3**	32.5	35.2	**41.4**	32.5

Site ID	Location	Within AQMA?	Annual mean concentration μg/m^3				
			2010	2011	2012	2013	2014
23b	43 Humberstone Lane (Thurmaston)	N	**46.4**	30.0	33.4	38.1	30.4
23c	38 Humberstone Lane (Thurmaston)	N	28.7	23.7	25.7	28.3	22.3
23d	22 Humberstone Lane (Thurmaston)	N	32.1	25.5	28.9	32.4	26.3
26	Ashby Rd Central (Shepshed)	N	31.5	32.8	29.5	27.9	25.2
27	Loughborough Rd (Hathern)	N	29.9	28.5	26.7	27.9	23.0

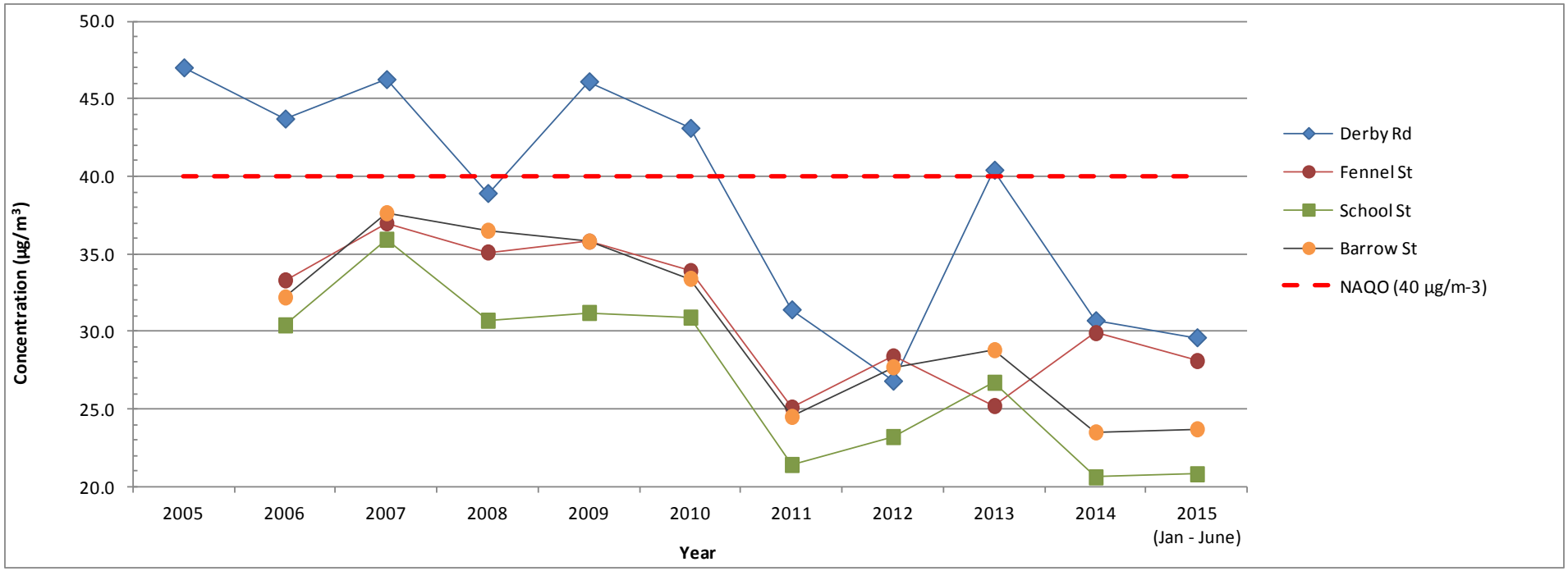
28	Baxter Gate (Loughborough)	Y	**53.4**	39.1	**45.0**	**46.1**	33.7
29	Barrow St (Loughborough)	N	33.4	24.5	27.7	28.8	23.5
30	School St (Loughborough)	N	30.9	21.4	23.3	26.7	20.6
31	Fennel St (Loughborough)	N	33.9	25.1	28.4	25.2	29.9
33	High St (Syston)	Y	32.5	26.7	31.9	33.1	25.7
34	Syston AQMS 1	Y	35.0	31.5	33.6	36.5	30.8
35	Syston AQMS 2	Y	35.2	30.3	32.5	36.7	29.4
36	Syston AQMS 3	Y	33.3	30.3	31.5	35.5	28.8
37	Baxter Gate AQMS 1 (Loughborough)	Y	**52.5**	38.6	**43.7**	**46.5**	33.8
38	Baxter Gate AQMS 2 (Loughborough)	Y	**52.4**	37.3	**42.6**	**47.1**	33.7
39	Baxter Gate AQMS 3 (Loughborough)	Y	**50.3**	36.9	**43.6**	**46.7**	32.2
44	33 Nottingham Rd (Loughborough)	N	**41.5**	31.1	35.9	36.5	32.9

45	89 Nottingham Rd (Loughborough)	N	**48.8**	39.3	**42.9**	**48.2**	**40.1**
46	156 Ratcliffe Rd (Loughborough)	N	36.5	25.8	25.5	28.5	22.0
47	156 Meadow Rd (Loughborough)	N	29.8	26.0	27.7	30.1	25.5
48	31 Station Boulevade (Loughborough)	N	-	-	29.3	29.3	24.0
49	91 Wharncliffe Rd (Loughborough)	N	-	-	28.9	34.4	27.5

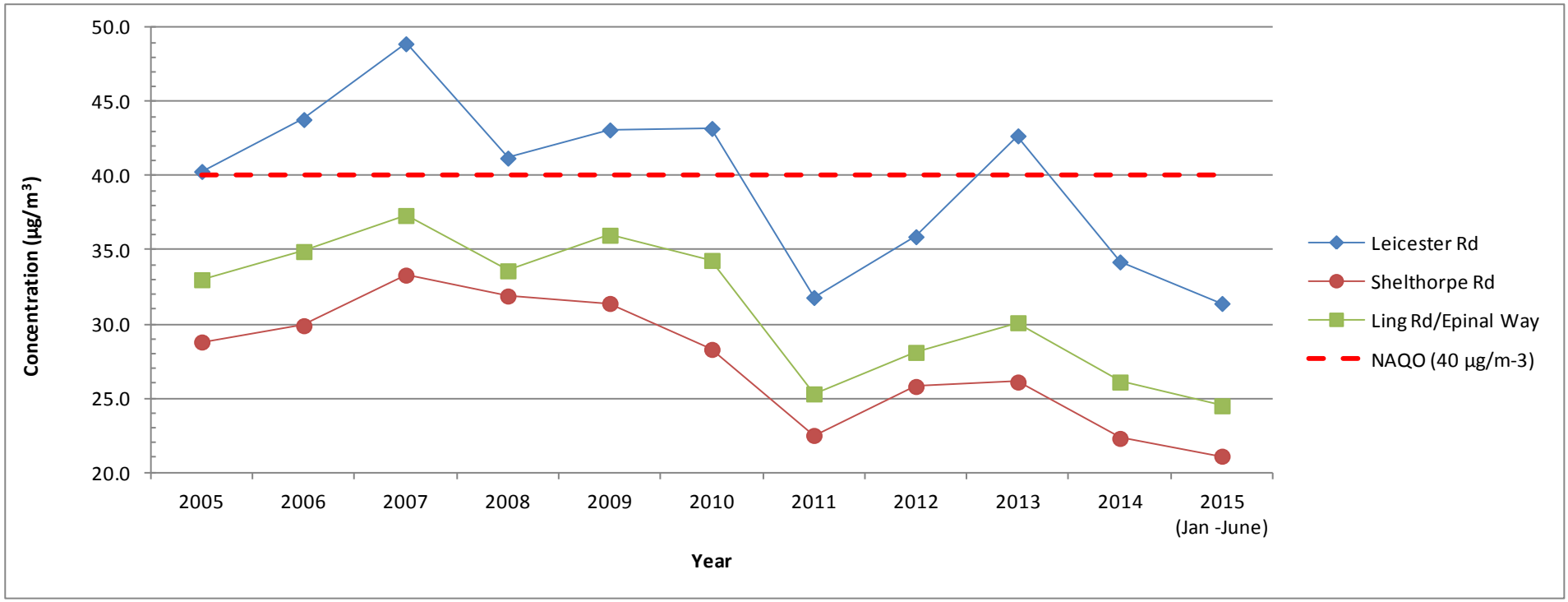
Figure 2.4 Trends in Annual Mean Nitrogen Dioxide Concentrations measured at Diffusion Tube Monitoring Sites



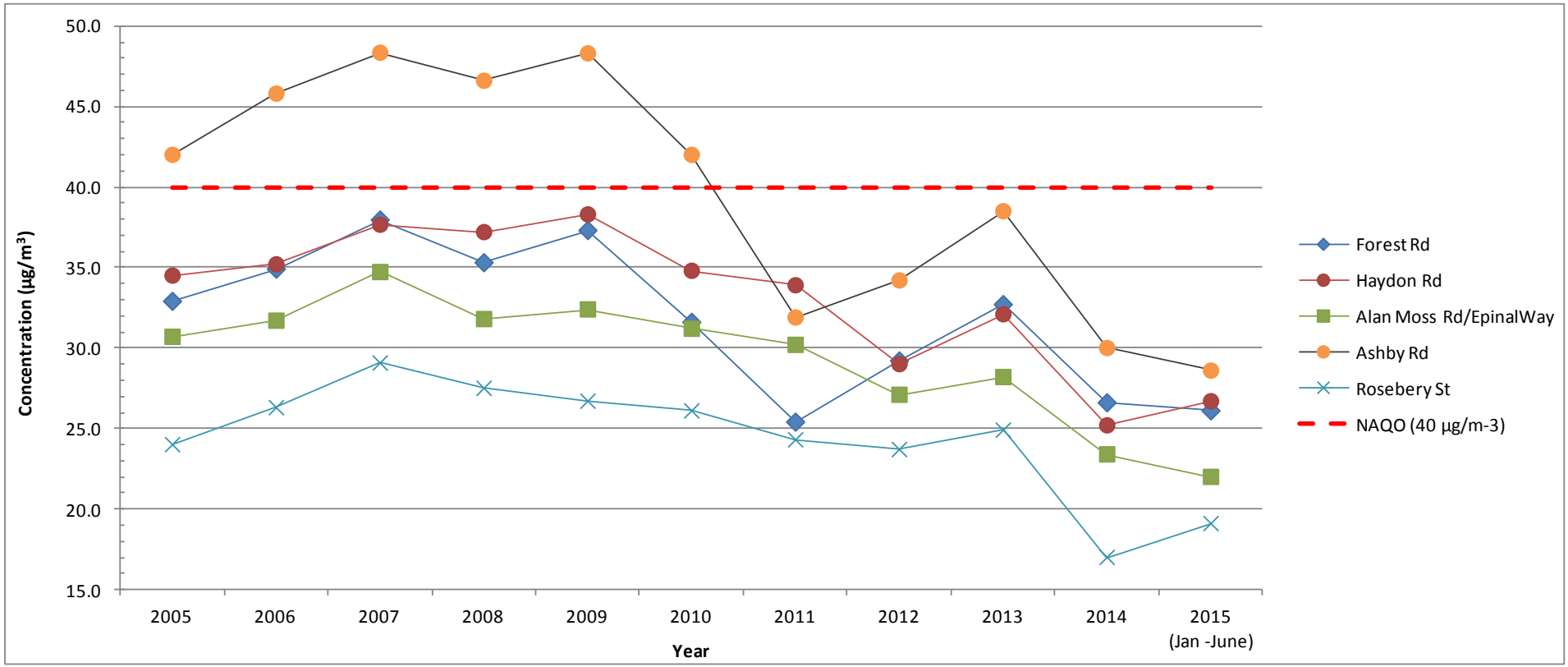
Plot of NO_2 Concentration against Year for Loughborough Town Centre (i) monitoring sites



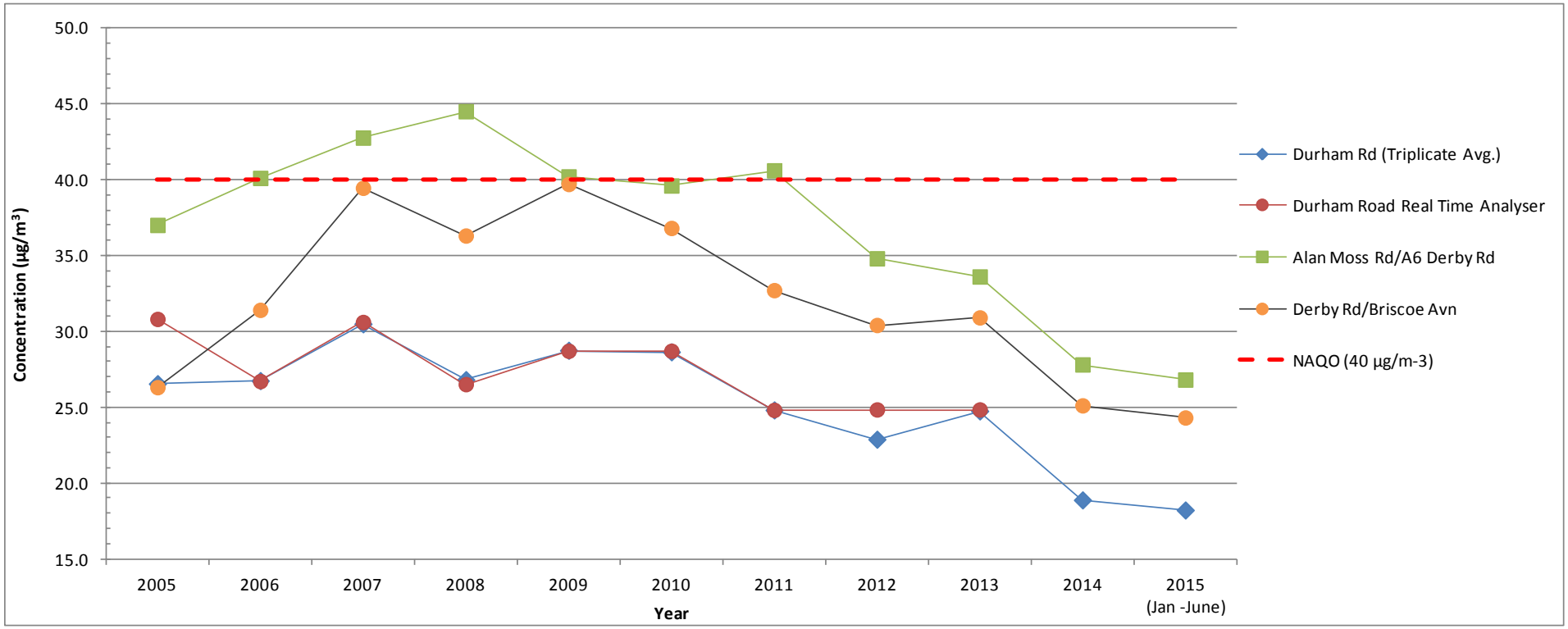
Plot of NO_2 Concentration against Year for Loughborough Town Centre (ii) monitoring sites



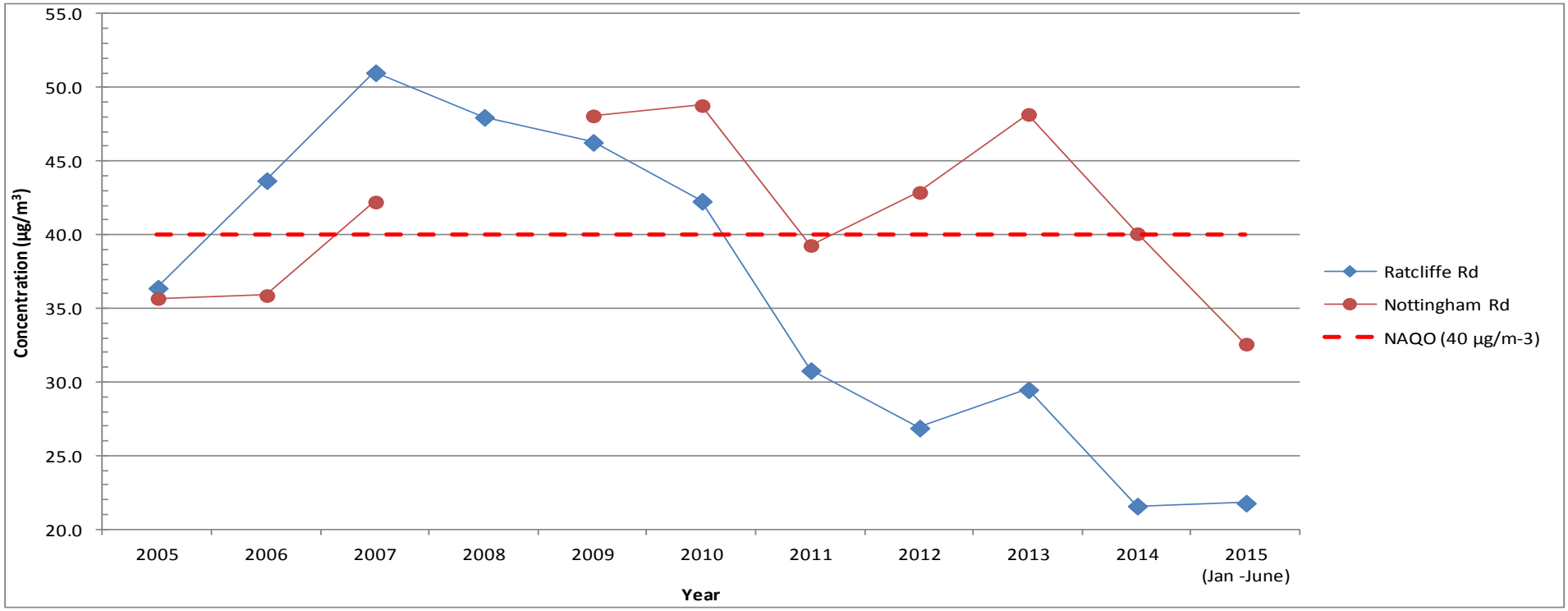
Plot of NO_2 Concentration against Year for Loughborough South monitoring sites



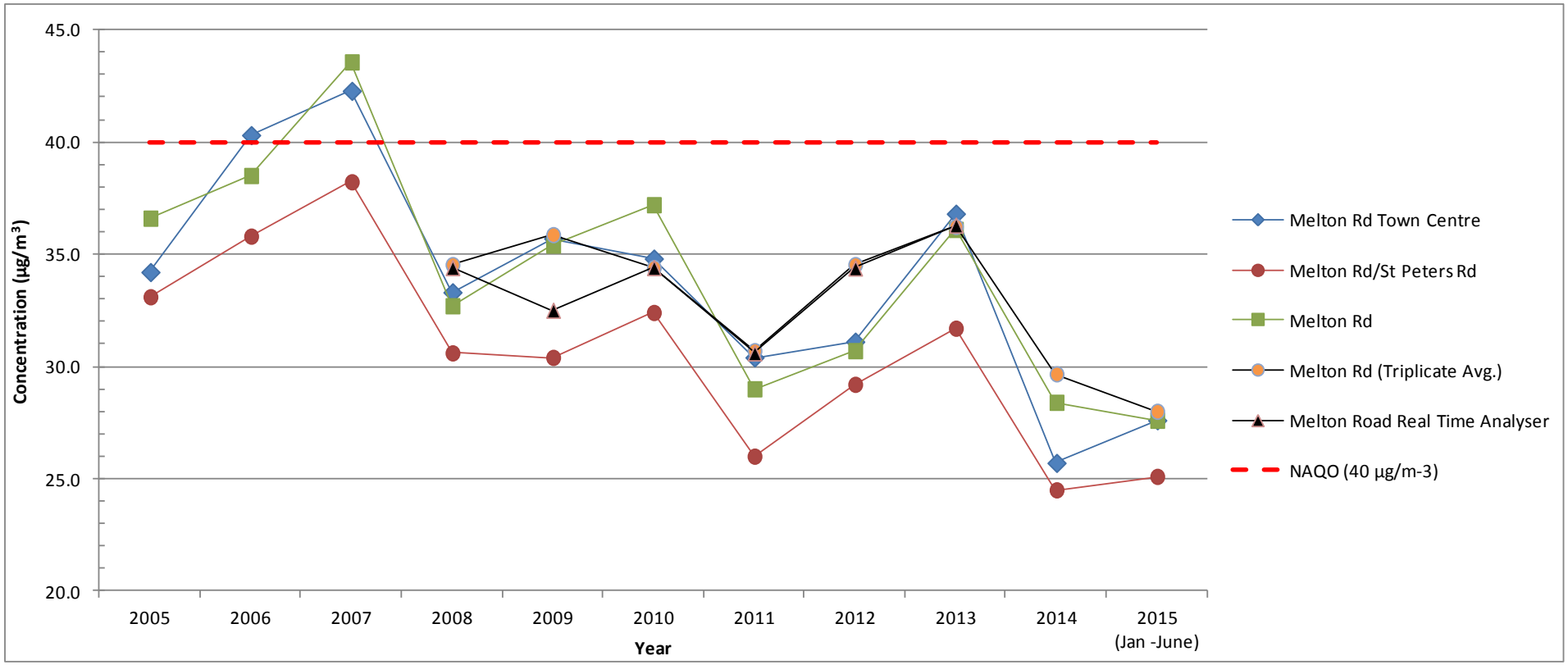
Plot of NO_2 Concentration against Year for Loughborough West monitoring sites



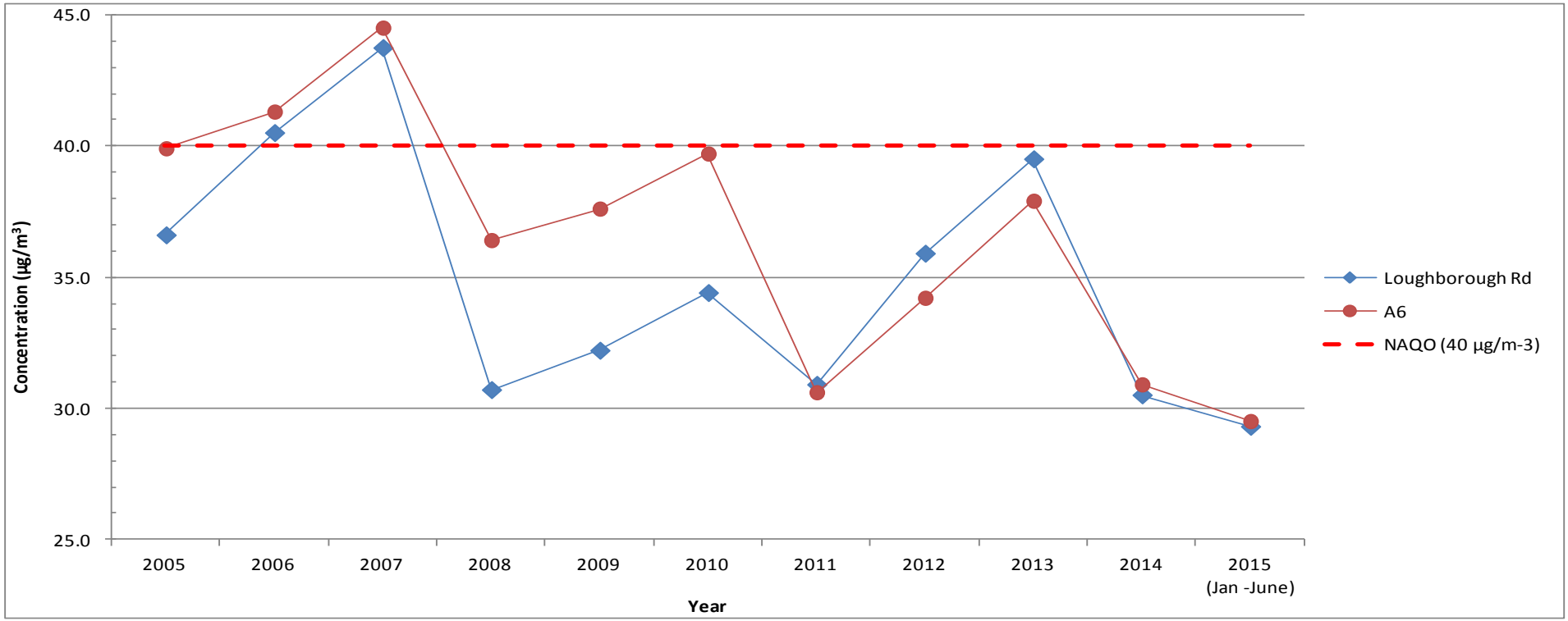
Plot of NO_2 Concentration against Year for Loughborough North monitoring sites



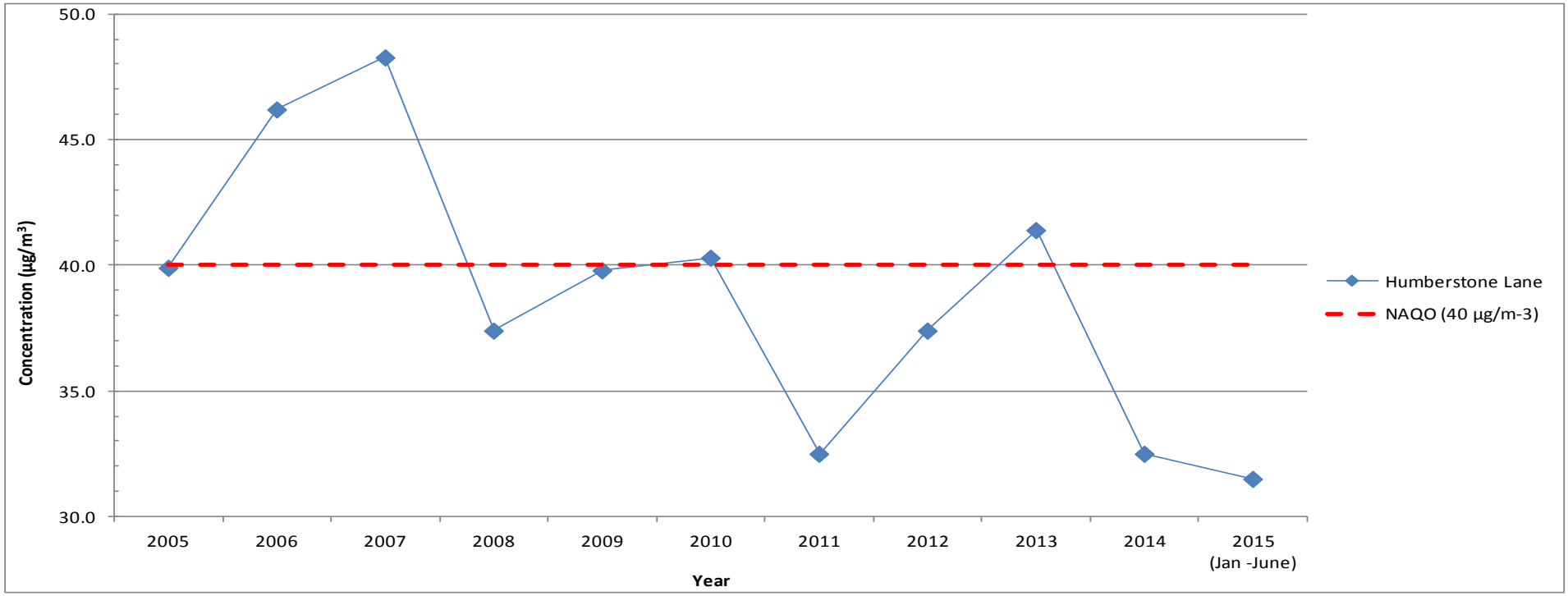
Plot of NO_2 Concentration against Year for Loughborough East monitoring sites



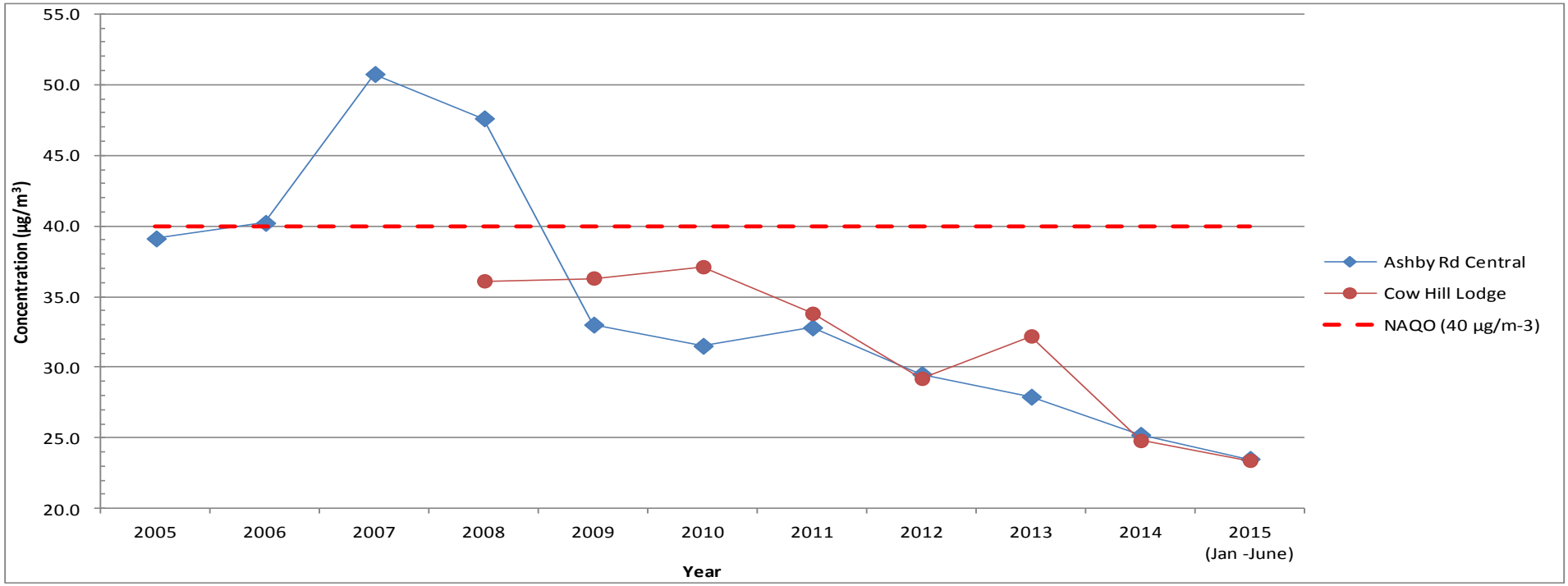
Plot of NO_2 Concentration against Year for Syston monitoring sites



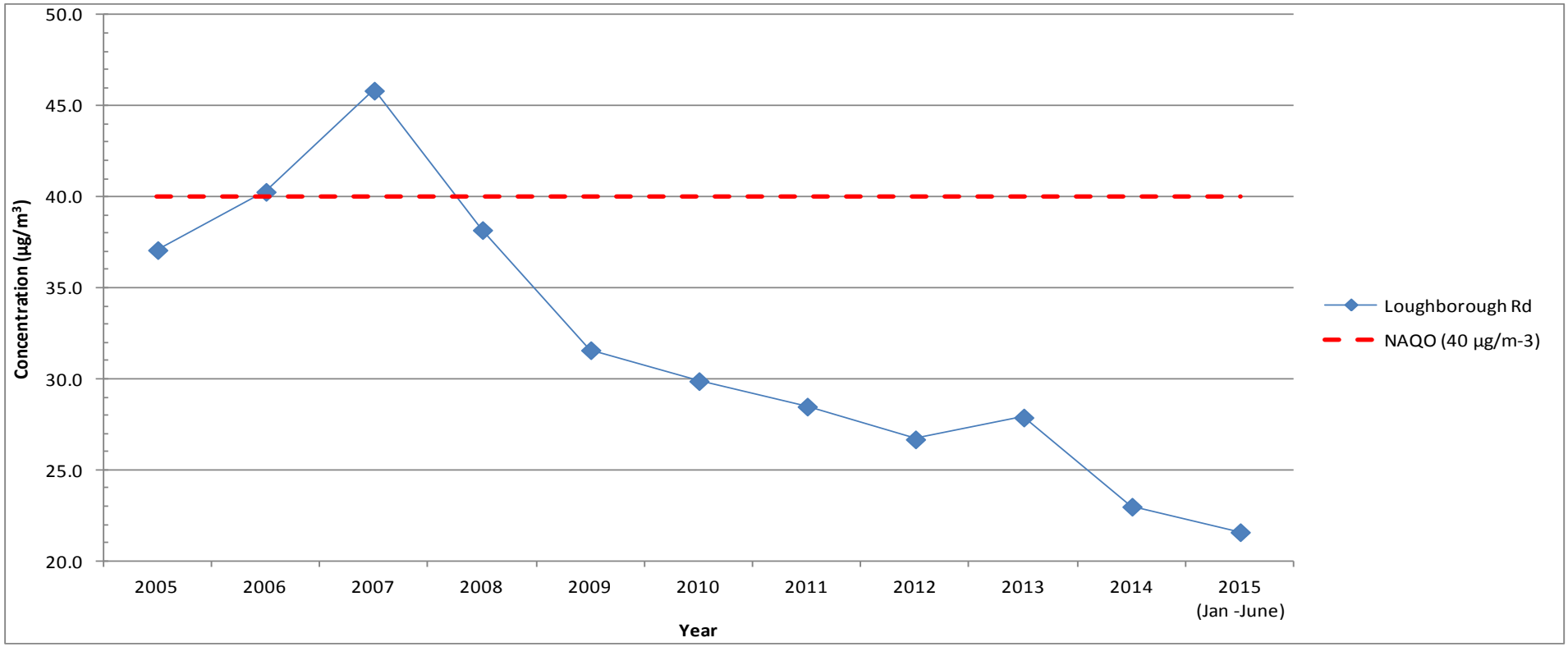
Plot of NO_2 Concentration against Year for Birstall monitoring sites



Plot of NO_2 Concentration against Year for Thurmaston monitoring sites



Plot of NO_2 Concentration against Year for Shepshed monitoring sites



Plot of NO_2 Concentration against Year for Hathern monitoring sites

2.2.2 PM_{10}

Due to technical issues, no data has been obtained from our automatic (TEOM) urban background site just outside of the Loughborough NO_2 AQMA during 2014.

Any likely breach of the particular Air Quality Standards at this location would be improbable.

Data presented in Figures 2.7 & 2.8 is therefore intended for historical reference only.

Mountsorrel Quarry

Since 26th October 2011 we have been operating a Partisol unit in the vicinity of the Lafarge Tarmac quarry in Mountsorrel to monitor PM10 levels in connection with the Mountsorrel AQMA.

Our latest published update reports that for the 365 days previous to 21st July 2015 (inclusive) our recorded results indicate **26 exceedences** of the 24-hr mean National Air Quality Objective from 277 valid sampling days (a data capture rate of ~76% for this period). This would be the equivalent to 35 exceedences per annum assuming a 100% data capture rate, compared to the permitted maximum of 35. The annual average concentration for this period is 26.58 µg/m-3

Results obtained during our study in 2009/10 (against which results the Air Quality Monitor was declared against) showed **60 exceedences** a corresponding period of time from 313 valid sampling days, the equivalent to 70 exceedences per annum. The annual average concentration for this period was 33.18 µg/m-3

Results to date would suggest that since closer working with the quarry management team and the implementation/continual refinement of the Quarry's Dust Management and Monitoring Plan (DMMP, that we have been able to achieve a significant reduction (~20%) in the average concentration of PM10 at the sampling site (which is considered to be a worse case position) when compared to results prior to the declaration of the Air Quality Management Area (AQMA).

2014 data gathered by the Partisol at Mountsorrel is plotted in Figure 2.9. Data from the Nottingham AURN station, where available, has also been plotted to give a comparative indication of national air quality elsewhere in the UK.

From the available data, we are noting that there is a very strong correspondence between the Mountsorrel data and the daily average PM10 concentrations at Nottingham (and also Birmingham Tyburn) during our sampling intervals.

In addition, there have been episodes of high PM10 concentrations at our sampler corresponding with correspondingly high levels at Nottingham Centre and/or Birmingham Tyburn, such occurrences are likely to be 'transboundary' and therefore not associated with local sources.

Table 2.7 Results of Automatic Monitoring of PM_{10}: Comparison with Annual Mean Objective

Site ID	Site Type	Within AQMA?	Valid Data Capture for monitoring Period %[a]	Valid Data Capture 2014 %[b]	Confirm Gravimetric Equivalent (Y or NA)	Annual Mean Concentration μg/m^3				
						2010	2011	2012	2013	2014
11	Durham Rd, L'boro (Urban Background)	N	No Data	No Data	Y	17.8	19.1	10.2	16.9	No Data

Table 2.8 Results of Automatic Monitoring for PM_{10}: Comparison with 24-hour mean Objective

Site ID	Site Type	Within AQMA?	Valid Data Capture for monitoring Period %[a]	Valid Data Capture 2014 %[b]	Confirm Gravimetric Equivalent	Number of Exceedences of 24-Hour Mean (50 μg/m^3)				
						2010	2011	2012	2013	2014
11	Durham Rd, L'boro (Urban Background)	N	No Data	No Data	Y	1	5	0	2	No Data

[a] i.e. data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.
[b] i.e. data capture for the full calendar year (e.g. if monitoring was carried out for six months the maximum data capture for the full calendar year would be 50%.)

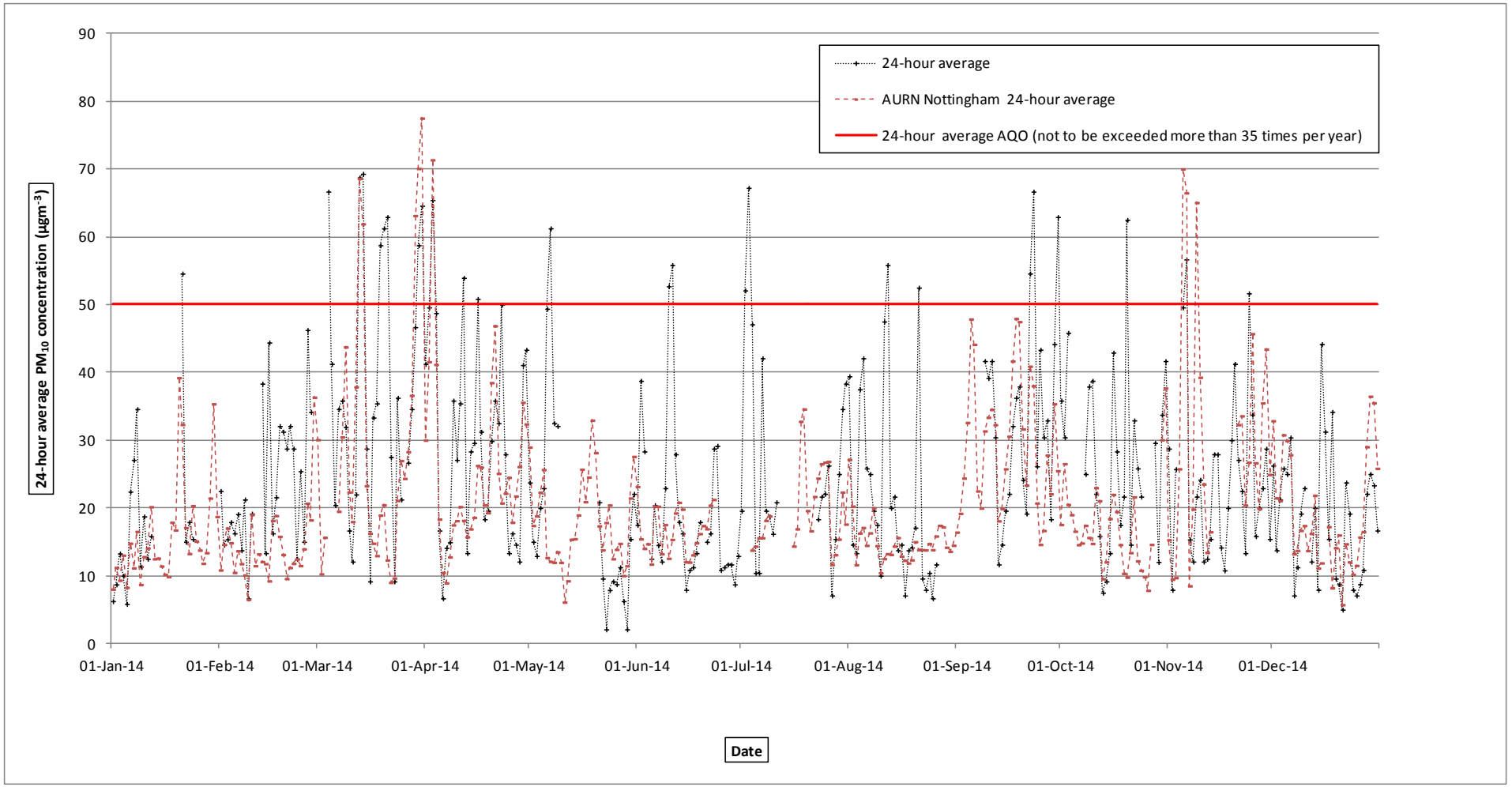


Figure 2.9: Plot of 24-hour average PM_{10} concentrations observed at Mountsorrel - 2014

2.2.3 Sulphur Dioxide

Due to technical issues, no data has been obtained during 2014 from our automatic SO_2 urban background site just outside of the Loughborough NO_2 AQMA.

Any likely breach of the particular Air Quality Standards at this location would be improbable.

Table 2.9 Results of Automatic Monitoring of SO_2: Comparison with Annual Mean Objective

Site ID	Site Type	Within AQMA?	Valid Data Capture for monitoring Period %[a]	Valid Data Capture 2014 %[b]	Number of Exceedences (percentile in bracket μg/m^3)[c]		
					15-minute Objective (266 μg/m^3)	1-hour Objective (350 μg/m^3)	24-hour Objective (125 μg/m^3)
11	Durham Rd, L'boro (Urban Background)	N	No Data	No Data	No Data	No Data	No Data

[a] i.e. data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.
[b] i.e. data capture for the full calendar year (e.g. if monitoring was carried out for six months the maximum data capture for the full calendar year would be 50%.)
[c] if data capture is less than 90%, include the relevant percentile in brackets

2.2.4 Benzene

Charnwood Borough Council no longer monitor for Benzene. This decision was based on significant historic monitoring data indicating that any likely breach of the particular Air Quality Standard would be improbable.

2.2.5 Summary of Compliance with AQS Objectives

Charnwood Borough Council has examined the results from monitoring in the Borough.

Concentrations outside of existing AQMAs are either below the objectives at relevant locations, or have been subjected to a previous Detailed Assessment and/or discussed with DEFRA that there is no need to proceed to a Detailed Assessment.

3 Road Traffic Sources

3.1 Narrow Congested Streets with Residential Properties Close to the Kerb

Charnwood Borough Council confirms that there are no new/newly identified congested streets with a flow above 5,000 vehicles per day and residential properties close (within 2m) to the kerb, that have not been adequately considered in previous rounds of Review and Assessment.

3.2 Busy Streets Where People May Spend 1-hour or More Close to Traffic

Charnwood Borough Council confirms that there are no new/newly identified busy streets (>10,000 vehicles per day) where people may spend 1 hour or more close (within 5m) to traffic, that have not been adequately considered in previous rounds of Review and Assessment.

3.3 Roads with a High Flow of Buses and/or HGVs.

Charnwood Borough Council confirms that there are no new/newly identified roads with high flows (>20%) of buses/HDVs, that have not been adequately considered in previous rounds of Review and Assessment.

3.4 Junctions

Charnwood Borough Council confirms that there are no new/newly identified busy junctions/busy roads, which have not been adequately considered in previous rounds of Review and Assessment.

3.5 New Roads Constructed or Proposed Since the Last Round of Review and Assessment

Charnwood Borough Council has assessed new/proposed roads meeting the criteria in Section A.5 of Box 5.3 in TG(09), further to those previously identified (above), and concluded that it will not be necessary to proceed to a Detailed Assessment.

3.6 Roads with Significantly Changed Traffic Flows

Charnwood Borough Council confirms that there are no new/newly identified roads with significantly changed traffic flows (i.e roads with more than 10,000 vehicles per day that have experienced more than a 25% increase in traffic flow), which have not been adequately considered in previous rounds of Review and Assessment.

3.7 Bus and Coach Stations

Charnwood Borough Council confirms that there are no relevant bus stations (un-enclosed / close to relevant exposure, including nearby residential properties) in the Local Authority area.

4 Other Transport Sources

4.1 Airports

There are no airports in the Local Authority or relevant exposure within 1,000m of an airport boundary.

4.2 Railways (Diesel and Steam Trains)

4.2.1 Stationary Trains

The GCR AQMA

The GCR AQMA came into effect on 30th November 2005 in respect of likely breaches of the sulphur dioxide (fifteen minute mean). This decision was based upon a monitoring study conducted between December 2004 and April 2005 during which time a UV fluorescence sulphur dioxide monitor was located 50 metres away from the location at which steam locomotives are brought “into steam” at the Great Central Railway engine sheds.

No further periods of monitoring have been conducted since the declaration of this AQMA. It is however felt that the results (which are discussed fully in our previously submitted “Progress Report and Round 2 Further Assessment”) in conjunction with the current operational procedures at GCR, are broadly representative of the current air quality of the area.

Charnwood Borough Council confirms that there are no locations where diesel or steam trains are regularly stationary for periods of 15 minutes or more, with potential for relevant exposure within 15m, that have not been adequately considered in previous rounds of Review and Assessment ***or are subject to an existing AQMA.***

4.2.2 Moving Trains

Charnwood Borough Council confirms that there are no locations with a large number of movements of diesel locomotives, and potential long-term relevant exposure within 30m. (As per the rail lines listed in Table 5.1 of the LAQM.TG(09))

4.3 Ports (Shipping)

There are no ports or shipping within the Local Authority area.

5 Industrial Sources

5.1 Industrial Installations

5.1.1 New or Proposed Installations for which an Air Quality Assessment has been carried out

Charnwood Borough Council confirms that they have assessed any new/proposed industrial installations for which an Air Quality Assessment has been carried out, and concluded that it will not be necessary to proceed to any Detailed Assessments.

5.1.2 Existing Installations where Emissions have Increased Substantially or New Relevant Exposure has been Introduced

Charnwood Borough Council confirms that there are no industrial installations with substantially increased (greater than 30%) emissions or new relevant exposure in their vicinity within its area or nearby in a neighbouring authority.

5.1.3 New or Significantly Changed Installations with No Previous Air Quality Assessment

Charnwood Borough Council have assessed new/proposed industrial installations, and concluded that it will not be necessary to proceed to any Detailed Assessment.

5.2 Major Fuel (Petrol) Storage Depots

There are no major fuel (petrol) storage depots within the Local Authority area.

5.3 Petrol Stations

Charnwood Borough Council confirms that there are no petrol stations meeting the specified criteria**.**

i.e. with an annual throughput of 2000m^3, close to a road with more than 30,000 vehicles and with relevant exposure within 10m of the pumps (ignoring petrol stations with Stage 2 recovery systems fitted).

5.4 Poultry Farms

Sunrise Poultry Farms, Seagrave Road, Sileby.
Environmental Agency Licence No. RP3237MG
Permit Date 09/04/13

The above facility is permitted for 362,224 laying hens. The houses have side extraction ventilation systems.

As the farm has less than 400, 000 birds and is mechanically ventilated without any relevant residential properties within 100m then it will therefore not be necessary to proceed to a Detailed Assessment.

Charnwood Borough Council confirms that there are no poultry farms meeting the specified criteria.

6 Commercial and Domestic Sources

6.1 Biomass Combustion – Individual Installations

Charnwood Borough Council has previously assessed any relevant biomass combustion plants and concluded that it will not be necessary to proceed to a Detailed Assessment.

6.2 Biomass Combustion – Combined Impacts

Charnwood Borough Council has assessed the biomass combustion plant, and concluded that it will not be necessary to proceed to a Detailed Assessment.

6.3 Domestic Solid-Fuel Burning

Charnwood Borough Council confirms that there are no areas of significant domestic fuel use (any area of about 500x500m with more than 50 houses burning coal/smokeless fuels as their primary source of heating) in the Local Authority area.

7 Fugitive or Uncontrolled Sources

Charnwood Borough Council confirms that there are no potential sources of fugitive particulate matter emissions in the Local Authority area which have not been considered by previous rounds of review and assessment.

8 Conclusions and Proposed Actions

8.1 Conclusions from New Monitoring Data

Nitrogen Dioxide

New (2014) monitoring data shows that the 40µgm^3 annual mean objective for NO_2 was exceeded at the following monitored location:

1. Nottingham Road, Loughborough

This location falls outside of the existing Loughborough AQMA. As explained earlier in the report, it has been associated with long-term traffic diversions due to the construction of major road schemes within the town and is anticipated to meet compliance in the next reporting phase (2016).

Further to this site, no further monitoring has identified any potential or actual exceedences at relevant locations either within or outside of existing AQMAs.

PM_{10}

Results from the Partisol monitor at Mountsorrel continue to indicate that there has been a significant improvement in dust concentrations within the village.

Quarterly update meetings continue to be held with the quarry management team to review both process and operational improvements that have been implemented under the quarry Dust Management and Monitoring Plan (DMMP).

8.2 Conclusions from Assessment of Sources

Outside of the existing SO_2 AQMA (The Loughborough GCR AQMA) we consider that no other new/existing/significantly changed sources are leading to (or will lead to) potential exceedences of the Air Quality Objective within the Borough.

8.3 Proposed Actions

The Updating and Screening Assessment has not identified the need to proceed to a Detailed Assessment for any pollutant in this round of review. We also do not feel that any changes are required to existing AQMAs in terms of boundary changes/revocation at this time.

Currently all pollutants/monitoring sites/objectives are either:

a. Compliant

b. Expected to meet compliance in the next reporting phase (2016)

c. Within an existing AQMA

Our diffusion tube monitoring network is annually reviewed to consider potential developing ‘hotspots’ or in preparation for larger infrastructure schemes such as the Eastern Gateway Project (EGP) and the Loughborough Inner Relief road (LIRR) in previous years.

Our next action will be the submission of the 2016 Progress Report.

9 References

LAQM Technical Guidance document TG(09)
www.defra.gov.uk/environment/airquality/local/guidance/pdf/tech-guidance-laqm-tg-09.pdf

Charnwood Borough Council - Previous Air Quality Review & Assessment documents (including Final AQ Action Plan)
www.charnwood.gov.uk/pages/airpollution

LAQM Support - NO_2 Diffusion Tube QA/QC
www.laqmsupport.org.uk/no2qaqc.php

Appendices

Appendix A: QA:QC Data

Diffusion Tube Bias Adjustment Factors

All NO_2 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

Historically, due to having 3 monitors in the Borough, we chose to apply the most appropriate correction factor against each of the individual tubes i.e. tubes in the south of the Borough are corrected against the Syston station factor, rather than the using the factors from the monitors in the north of the Borough.

However, as data collection % from our automatic monitors has been significantly beneath acceptable values during 2014, we have therefore applied the bias correction factor as per The National Diffusion Tube Bias Adjustment Factor Spreadsheet v06/16 which gives a factor of 0.91 (from 21 studies) for Gradko analysed 20% TEA in water, for all our 2014 samples.

PM Monitoring Adjustment

2010 to 2014 figures shown in tables 2.7 & 2.8 have been adjusted by using the King's College London Volatile Correction Model (VCM).

Short-term to Long-term Data adjustment

There were no monitoring sites during 2014 that would have been "short term".

Therefore no further data adjustment is necessary for seasonal variation

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(09)

QA/QC of diffusion tube monitoring

The independent Workplace Analysis Scheme for Proficiency (WASP), operated by the Health and Safety Laboratory, is yearly assessment against agreed performance criteria that is aimed at the analytical laboratories that supply and analyse the diffusion tubes.

This scheme allows national co-ordination within a quality assurance/quality control (QA/QC) framework

Quarterly performance summaries in the WASP scheme for the laboratory chosen to prepare and analyse diffusion tubes on behalf of Charnwood Borough Council (Gradko), prepared by AEA, are as follows:

WASP Rounds 121 - 124 (Apr 2013 - Feb 2015)**:** Satisfactory

Appendix B: Unadjusted Monthly Mean NO_2 Diffusion Tube Data (2014)

	NITROGEN DIOXIDE RESULTS MICROGRAMS/CUBIC METRES													
Site ref		Jan-14	Feb-14	Mar-14	Apr-14	May-14	Jun-14	Jul-14	Aug-14	Sep-14	Oct-14	Nov-14	Dec-14	ANN.AVE
1	RATCLIFFE RD,LOUGHBOROUGH	32.23	28.78	24.03	24.84	21.29	20.64	20.09	17.21	24.44	21.1	26.7	23.52	23.74
2	SHELTHORPE RD,LOUGHBOROUGH	30.51	24.87	27.29	21.4	19.63	23.67	20.09	17.45	26.15	23.11	31.43	27.99	24.47
3	FOREST RD,LOUGHBOROUGH	30.65	35.73	32.31	26.02	28.63	29.03	26.26	22.94	30.64	30.62	27.01	30.97	29.23
5	HAYDON RD, LOUGHBOROUGH	36.93	40.07	29.77	26.03	26.17	22.75	22.83	24	26	19.91	23.85	34.54	27.74
6	ALAN MOSS RD/EPINAL WAY, LOUGHB	31.87	32.11	28.54	23	23.99	19.46	20.74	19.97	24.34	25.61	27.1	31.39	25.68
7	EPINAL WAY/LING RD	34.32	26.09	30.24	24.31	28.21	27.52	24.86	23.42	0	29.92	36.15	30.69	28.70
8	LEICESTER RD,LOUGHBOROUGH	42.45	35.66	41.36	38.88	37.31	42.08	36.72	30.71	39.91	31.86	36.45	0	37.58
9	DERBY RD, LOUGHBOROUGH 1	41.96	35.98	0	33.87	33.82	34.63	29.12	24.46	34.46	31.77	35	36.6	33.79
10	DERBY RD/BRISCOE AVE 2	38.83	33.09	27.75	28.87	23.71	23.84	23	20.5	28.15	27.5	24.92	31.02	27.60
11 i	DURHAM RD, LOUGHBOROUGH	28.23	23.71	13.26	16.52	15.43	19.34	18.65	13.79	24.63	19.28	22.44	26.35	20.14
11 ii	DURHAM RD 2, LOUGHBOROUGH	29.24	23.28	22.41	19.72	17.91	18.21	17.91	15.61	0	19.53	21.87	26.11	21.07
11 iii	DURHAM RD 3, LOUGHBOROUGH	28.77	24.49	22.62	18.56	17.94	19.18	18.83	15.04	23.71	20.51	17.74	26.88	21.19
12	ALAN MOSS RD/A6	36.95	32.77	34.17	31.45	30	29.05	28.42	24.29	33.09	29.83	20.02	36.31	30.53
13	HIGH ST,LOUGHBOROUGH	69.32	55.05	53.88	52.13	0	0	30.98	29.47	34.86	35.87	29.57	38.76	42.99
14	MARKET PLACE,LOUGHBOROUGH	28.11	27.24	24.44	18.83	19.44	19.97	18.85	17.92	24.27	28.59	30.6	0	23.48
15	ASHBY RD, LOUGHBOROUGH	38.32	39.26	36.32	30.66	33.96	30.89	27.87	27.45	33.69	34.42	29.29	33.29	32.95
16	LODGE HOUSE SHEPSHED	27.49	34.98	29.29	15.93	30.66	27.66	25.74	24.24	29.45	28.87	26.42	25.79	27.21
17	ROSEBERY ST,LOUGHBOROUGH	26.35	0	23.31	16.29	16.47	15	15.71	14.81	11.39	19.88	22.3	23.49	18.64
18	MELTON RD TOWN CENTRE,SYSTON	35.3	31.37	32.44	29.73	27.03	28.58	26.05	22.39	33.44	32.69	30.49	35.36	30.41
19	1123 MELTON RD/ADJ ST PETERS RD, S	26.41	27.16	27.9	25.16	26.03	24.32	22.38	27.47	30.12	26.67	25.19	34.9	26.98
20	1116 MELTON RD SYSTON 3	33.64	32.6	32.12	27.1	30.94	30.05	27.3	26.07	35.07	30.47	29.86	39.32	31.21
21	LOUGHBOROUGH RD,BIRSTALL	41.31	33.91	36.81	32.42	34.04	29.7	29.12	29.52	31.98	31.72	32.79	38.38	33.48
22	BIRSTALL A6	43.7	38.51	39.34	35.62	35.73	35.64	31.59	29.19	40.4	33.4	33.49	40.41	36.42
23	HUMBERSTONE LANE,THURMASTON	40.39	42.92	36.99	34.11	35.94	30.84	28.55	27.09	34.67	37.01	36.79	43.63	35.74
23b	43 HUMBERSTONE LANE, THURMASTC	42.06	39.59	35.73	25.88	32.47	31.61	25.18	24.24	35.33	32.37	39.75	36.48	33.39
23c	38 HUMBERSTONE LANE, THURMASTC	32.42	27.75	25.39	22.22	19.98	20.32	18.65	20.16	24.61	28.28	21.34	33.1	24.52
23d	22 HUMBERSTONE LANE, THURMASTC	36.62	30.75	28.69	36.2	25.18	21.53	24.54	22.73	30.29	25.88	28.97	35.19	28.88
26	ASHBY RD CENTRAL,SHEPSHED	43.65	37.62	41.44	39.97	39.96	43.96	35.13	34.45	44.6	38.55	30.48	39.06	39.07
27	LOUGHBOROUGH RD,HATHERN	38.64	34.44	0	31.57	32.22	30.34	27.99	24.83	34.31	30.29	32.19	28.37	31.38
28	BAXTERGATE, LOUGHBOROUGH	45.73	0	39.97	44.38	42.04	39.65	25.44	26.4	39.53	30.29	35.02	39.25	37.06
29	BARROW ST, LOUGHBOROUGH	27.2	30.93	25.67	22.88	26.6	22.49	19.23	21.86	29.82	22.15	29.95	30.7	25.79
30	SCHOOL ST, LOUGHBOROUGH	29.76	29.23	21.83	19.11	20.6	18.39	12.8	18.26	22.03	23.38	26.8	29.95	22.68
31	FENNEL ST, LOUGHBOROUGH	35.51	27.25	31.01	30.12	33.17	28.49	30.83	27	36.84	32.55	41.1	40.21	32.84
33	HIGH STREET, SYSTON	36.29	30.08	31.13	25.89	23.62	22.39	21.23	23.92	28	32.29	31.18	32.65	28.22
34	SYSTON AQMS1	41.68	38.02	33.06	29.46	32.1	27.4	26.56	27.21	33.98	37.96	33.81	44.58	33.82
35	SYSTON AQMS2	39.41	38.31	33.04	29.78	32.48	26.2	26.82	25.85	31.78	33.4	29.87	40.14	32.26
36	SYSTON AQMS3	37.94	33.62	33.7	29.88	31.52	26.07	25.91	25.68	0	0	30.45	41.53	31.63
37	LOUGHBOROUGH AQMS1	53.11	39.5	42.42	44.8	43.7	41.9	27.67	23.74	35.57	31.22	30.86	30.98	37.12
38	LOUGHBOROUGH AQMS2	56.11	39.97	44.93	37.07	43.41	38.5	27.6	24.62	37.01	26.69	33.92	34.24	37.01
39	LOUGHBOROUGH AQMS3	37.94	38.74	45.05	39.09	40.76	37.82	27.91	24.14	34.52	31.45	30.92	35.78	35.34
44	33 NOTTINGHAM RD, LOUGHBOROU	40.48	35.41	39.49	38.14	34.07	33.52	30.55	27.81	37.76	35.86	38.35	42.29	36.14
45	89 NOTTINGHAM RD, LOUGHBOROU	50.74	45.51	49.95	46.64	44.51	47.01	39.27	35.69	48.32	45.83	34.2	41.01	44.06
46	156 RATCLIFFE RD, LOUGHBOROUGH	27.14	22.48	28.16	21.8	22.05	23.86	22.08	19.44	28.31	25.11	22.76	26.78	24.16
47	156 MEADOW LANE, LOUGHBOROUG	40.75	28.84	0	24.8	22.43	23.47	22.1	20.38	28.17	31.6	32.51	32.93	28.00
48	STATION BOULEVADE	33.53	28.61	29.43	23.61	24.61	20.14	20.4	16.6	30.12	26.4	29.52	33.6	26.38
49	WHARNCLIFFE ROAD, LOUGHBOROU	39.91	34.98	32.59	29.77	28.43	29.82	24.18	21.41	33.09	27.32	31.7	29.19	30.20