



# Charnwood

*Leading in Leicestershire*

## 2009 Air Quality Updating and Screening Assessment for Charnwood Borough Council

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

June 2009



**Charnwood Borough Council - England**

<b>Local Authority Officer</b>	Peter Weatherill (Environmental Health Technical Officer)
--------------------------------	--

<b>Department</b>	Environmental Health
<b>Address</b>	Charnwood Borough Council Southfield Road Loughborough Leicestershire LE11 2TR
<b>Telephone</b>	01509 634641
<b>e-mail</b>	<a href="mailto:peter.weatherill@charnwood.gov.uk">peter.weatherill@charnwood.gov.uk</a>

<b>Report Reference number</b>	CBC/USA/09
<b>Date</b>	Tuesday, 07 July 2009

## **Executive Summary**

As part of the 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 three 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) sources.

In 2008, the monitoring of nitrogen dioxide at 34 locations in Charnwood demonstrated a breach of UK air quality objectives at 7 sites (an additional site which recorded a breach during 2008 is shown within the report to be beneath the objective levels when the nearest receptor is considered).

All of the 7 sites reporting exceedences are within the existing Loughborough Air Quality Management Area.

At the time of writing, Charnwood are in the process of submitting 2 outstanding Detailed Assessments from previous rounds of LAQM reporting;

- i. NO<sub>2</sub> results around the junction at Humberstone Lane, Thurmaston.  
**(This DA has recently been submitted to DEFRA and we await their appraisal).**
- ii. PM<sub>10</sub> levels in the vicinity of the Lafarge Aggregates quarry at Mountsorrel.  
**(A 7 month monitoring period involving a Partisol particulate monitor is currently commissioned and collecting data for report submission later in the 2009).**

Sulphur dioxide emissions from the Great Central Railway engine sheds are believed to be causing occasional breaches of short-term air quality objectives. Local knowledge would indicate that the existing Air Quality Management Area around the sheds should be retained, although previous monitoring suggests that the extent of the problem is not as great as was originally feared.

Progress with the implementation of the Charnwood Air Quality Action Plan is ongoing. Many of the transport related actions have been absorbed into the Local Transport Plan which means that they are much more likely to be achieved, and we continue to work closely with local partners, and specifically Leicestershire County Council Highways Department, to influence transport policy and delivery.

# Table of contents

<b>1</b>	<b>Introduction</b>	<b>5</b>
1.1	Description of Local Authority Area	5
1.2	Purpose of Report	6
1.3	Air Quality Objectives	7
1.4	Summary of Previous Review and Assessments	8
<b>2</b>	<b>New Monitoring Data</b>	<b>9</b>
2.1	Summary of Monitoring Undertaken	9
2.2	Comparison of Monitoring Results with AQ Objectives	12
<b>3</b>	<b>Road Traffic Sources</b>	<b>19</b>
3.1	Narrow congested streets with residential properties close to the kerb	19
3.2	Busy streets where people may spend 1-hour or more close to traffic	19
3.3	Roads with high flow of buses and/or HGVs.	19
3.4	Junctions and busy roads	19
3.5	New roads constructed or proposed since the last round of review and assessment	20
3.6	All roads with significantly changed traffic flows.	20
3.7	Bus and coach stations	20
<b>4</b>	<b>Other Transport Sources</b>	<b>21</b>
4.1	Airports	21
4.2	Railways (diesel and steam trains)	21
4.3	Ports (shipping)	21
<b>5</b>	<b>Industrial Sources</b>	<b>22</b>
5.1	New or Proposed Industrial Installations	22
5.2	Major fuel (petrol) storage depots	23
5.3	Petrol stations	23
5.4	Poultry farms	23
<b>6</b>	<b>Commercial and Domestic Sources</b>	<b>24</b>
6.1	Biomass combustion – Individual Installations	24
6.2	Biomass combustion – Combined Impacts	24
6.3	Domestic Solid-Fuel Burning	24
<b>7</b>	<b>Fugitive or Uncontrolled Sources</b>	<b>25</b>
<b>8</b>	<b>Conclusions and Proposed Actions</b>	<b>26</b>
8.1	Conclusions from New Monitoring Data	26
8.2	Conclusions from Assessment of Sources	26
8.3	Proposed Actions	26
<b>9</b>	<b>References</b>	<b>28</b>

**Appendices**

Appendix A	QA/QC Data
Appendix B	Unadjusted Monthly Mean NO <sub>2</sub> Tube Data (2008)

# **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.

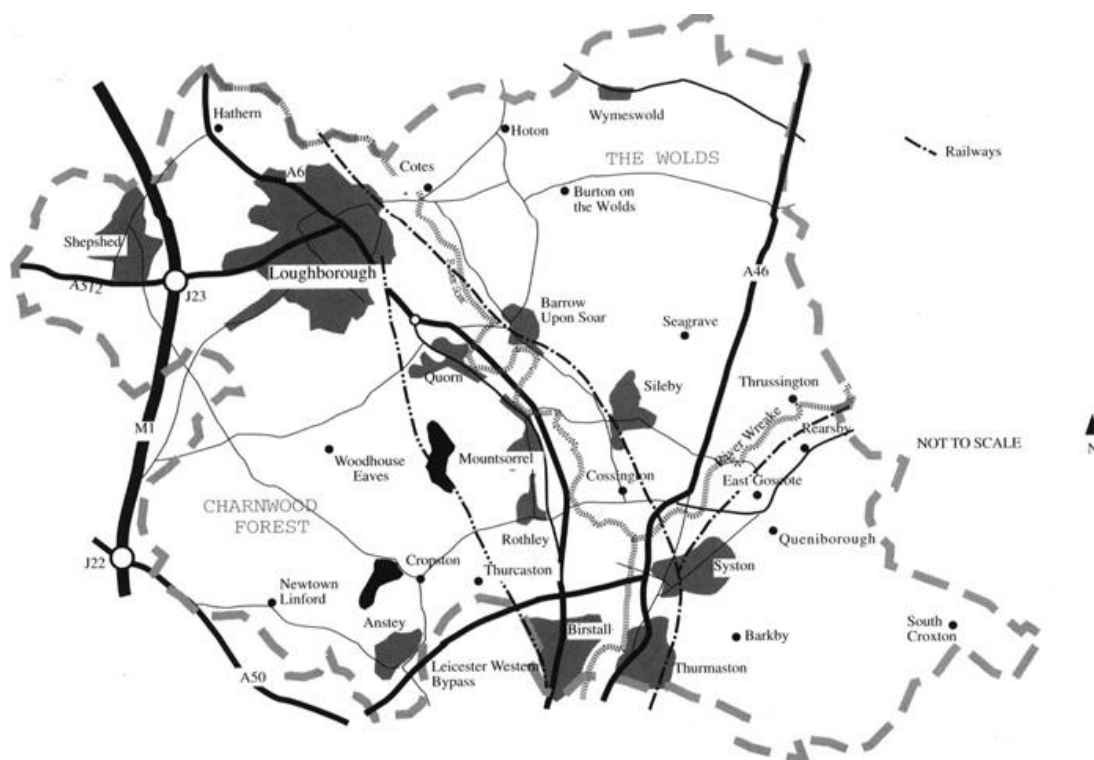
### **Map of Charnwood Borough in Leicestershire**



### **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.



## 1.3 Air Quality Objectives

The air quality 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  $\mu\text{g}/\text{m}^3$  (milligrammes per cubic metre,  $\text{mg}/\text{m}^3$  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 Local Air Quality Management in England.**

Pollutant	Air Quality Objective		Date to be achieved by
	Concentration	Measured as	
<b>Benzene</b>	16.25 $\mu\text{g}/\text{m}^3$	Running annual mean	31.12.2003
	5.00 $\mu\text{g}/\text{m}^3$	Annual mean	31.12.2010
<b>1,3-Butadiene</b>	2.25 $\mu\text{g}/\text{m}^3$	Running annual mean	31.12.2003
<b>Carbon monoxide</b>	10.0 $\text{mg}/\text{m}^3$	Running 8-hour mean	31.12.2003
<b>Lead</b>	0.5 $\mu\text{g}/\text{m}^3$	Annual mean	31.12.2004
	0.25 $\mu\text{g}/\text{m}^3$	Annual mean	31.12.2008
<b>Nitrogen dioxide</b>	200 $\mu\text{g}/\text{m}^3$ not to be exceeded more than 18 times a year	1-hour mean	31.12.2005
	40 $\mu\text{g}/\text{m}^3$	Annual mean	31.12.2005
<b>Particles (PM<sub>10</sub>) (gravimetric)</b>	50 $\mu\text{g}/\text{m}^3$ , not to be exceeded more than 35 times a year	24-hour mean	31.12.2004
	40 $\mu\text{g}/\text{m}^3$	Annual mean	31.12.2004
<b>Sulphur dioxide</b>	350 $\mu\text{g}/\text{m}^3$ , not to be exceeded more than 24 times a year	1-hour mean	31.12.2004
	125 $\mu\text{g}/\text{m}^3$ , not to be exceeded more than 3 times a year	24-hour mean	31.12.2004
	266 $\mu\text{g}/\text{m}^3$ , 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. This report explained that the intended (expected) Detailed Assessment in relation to PM10 levels in the vicinity of the Lafarge 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.

Following communications with DEFRA it was agreed that this outstanding Detailed Assessment could be deferred until 2009. At the time of writing a Partisol particulate monitor is currently commissioned and collecting data for report submission later in the year.

A further Detailed Assessment in respect of the NO<sub>2</sub> results around the junction at Humberstone Lane, Thurmaston, which became evident when compiling our 2007 Report, has recently been submitted to DEFRA and we await their appraisal.

Therefore, we approach this particular reporting phase of the policy guidance with three 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

All the above reports are available on the Charnwood Borough Council website at the following address: [www.charnwood.gov.uk/environment/airpollution.html](http://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 3 automatic monitoring sites, summarised in Table 2.1.

The analysers are serviced under schedule via Casella Ltd.

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)

Following latest guidance, the factors used for the gravimetric TEOM data correction were first considered to be derived from the King’s College London Volatile Correction Model (VCM) – however, please see notes under Tables 2.5a/b. Historic gravimetric correction applies the default correction factor (1.3) as advised in previous editions of the Guidance.

**Table 2.1 Details of Automatic Monitoring Sites**

Site Name	Site Type	OS Grid Ref	Pollutants Monitored	In AQMA?	Relevant Exposure? (Y/N with distance (m) to relevant exposure)	Distance to kerb of nearest road (N/A if not applicable)	Worst-case Location?
Durham Rd (Loughborough)	Urban background	X 452352 Y 320697	NO <sub>2</sub> , SO <sub>2</sub> , PM10	N	N	N/A	N
Baxter Gate (Loughborough)	Kerbside	X 453687 Y 319672	NO <sub>2</sub>	Y	N (Not in the immediate vicinity of the monitor)	1m	N
Melton Rd (Syston)	Roadside	X 462540 Y 311428	NO <sub>2</sub>	Y	Y (10m)	3m	N

#### 2.1.2 Non-Automatic Monitoring

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

During 2008:

- Nitrogen dioxide diffusion tubes were deployed at 35 sites (tubes in triplicate being used at the 3 automatic monitoring sites).
- 3 sulphur dioxide monitoring locations
- 4 benzene diffusion tube monitoring locations

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

## Charnwood Borough Council - England

**Table 2.2 Details of Non- Automatic Monitoring Sites**

Site Name	Site Type	OS Grid Ref	Pollutants Monitored	In AQMA?	Relevant Exposure? (Y/N with distance (m) to relevant exposure)	Distance to kerb of nearest road (N/A if not applicable)	Worst-case Location?
Ratcliffe Rd (Loughborough)	Roadside	X 454087 Y 320392	NO <sub>2</sub>	Y	Y (façade)	~3m	Y
Shelthorpe Rd (Loughborough)	Roadside	X 454234 Y 318657	NO <sub>2</sub>	N	Y (~8m)	~3m	Y
Forest Rd (Loughborough)	Roadside	X 452833 Y 318776	NO <sub>2</sub>	N	Y (façade)	~6m	Y
Haydon Road (Loughborough)	Roadside	X 452314 Y 319620	NO <sub>2</sub>	Y	Y (~8m)	~6m	Y
Alan Moss Rd/Epinal Way (Loughborough)	Roadside	X 452173 Y 319924	NO <sub>2</sub>	Y	Y (façade)	~15m	Y
Epinal Way/Ling Rd (Loughborough)	Roadside	X 453678 Y 318194	NO <sub>2</sub>	N	Y (façade)	~9m	Y
Leicester Rd (Loughborough)	Roadside	X 454002 Y 319253	NO <sub>2</sub>	Y	-	~3m	Y
Derby Rd (Loughborough)	Roadside	X 453231 Y 320028	NO <sub>2</sub>	Y	Y (~3m)	~3m	Y
Derby Rd/Brisco Avn (Loughborough)	Roadside	X 452670 Y 320527	NO <sub>2</sub>	Y	Y (~3m)	~4m	Y
Durham Rd AQMS 1 (Loughborough)	Urban Background	X 452352 Y 320697	NO <sub>2</sub>	N	N	n/a	n/a
Durham Rd AQMS 2 (Loughborough)	Urban Background	X 452352 Y 320697	NO <sub>2</sub>	N	N	n/a	n/a
Durham Rd AQMS 3 (Loughborough)	Urban Background	X 452352 Y 320697	NO <sub>2</sub>	N	N	n/a	n/a
Alan Moss Rd/A6 Derby Rd (Loughborough)	Roadside	X 452903 Y 320212	NO <sub>2</sub>	Y	Y (façade)	~8m	Y
High St (Loughborough)	Roadside	X 453730 Y 319596	NO <sub>2</sub>	Y	-	~3m	Y
Market Place (Loughborough)	Urban Centre	X 453611 Y 319540	NO <sub>2</sub>	Y	N	n/a	n/a
Ashby Rd (Loughborough)	Roadside	X 453189 Y 319709	NO <sub>2</sub>	Y	Y (façade)	~4m	Y
Cow Hill Lodge (Shepshed)	Roadside	X 448876 Y 318307	NO <sub>2</sub>	N	Y (façade)	~10m	Y
Rosebery St (Loughborough)	Roadside	X 452697 Y 319921	NO <sub>2</sub>	N	Y (~13m)	~3m	Y
Melton Rd Town Centre (Syston)	Roadside	X 462777 Y 311692	NO <sub>2</sub>	Y	Y (~3m)	~3m	Y
1123 Melton Rd (Syston)	Roadside	X 462351 Y 311213	NO <sub>2</sub>	Y	Y (façade)	~6m	Y
1116 Melton Rd (Syston)	Roadside	X 462373 Y 311254	NO <sub>2</sub>	Y	Y (façade)	~3m	Y
Loughborough Rd (Birstall)	Roadside	X 459233 Y 309590	NO <sub>2</sub>	N	Y (façade)	~15m	Y

## Charnwood Borough Council - England

A6 (Birstall)	Roadside	X 459178 Y 309890	NO <sub>2</sub>	N	Y ~2m	~5m	Y
21 Humberstone Lane (Thurmaston)	Roadside	X 460821 Y 308757	NO <sub>2</sub>	N	Y (façade)	~6m	Y
5 Wayside Dr (Thurmaston)	Roadside	X 460861 Y 308824	NO <sub>2</sub>	N	Y (façade)	~6m	N
43 Humberstone Ln (Thurmaston)	Roadside	X 460861 Y 308824	NO <sub>2</sub>	N	Y (façade)	~5m	Y
620 Melton Rd (Thurmaston)	Roadside	X 460760 Y 308897	NO <sub>2</sub>	N	Y (façade)	~5m	N
565 Melton Rd (Thurmaston)	Roadside	X 460654 Y 308615	NO <sub>2</sub>	N	Y (façade)	~15m	Y
Ashby Rd Central (Shepshed)	Roadside	X 448121 Y 318257	NO <sub>2</sub>	N	Y (~12m)	2m	Y
Loughborough Rd (Hathern)	Roadside	X 450260 Y 321922	NO <sub>2</sub>	N	Tube located ~3m from kerb  Nearest receptor is approx 30m away and approx 14m from kerb		Y
Baxter Gate (Loughborough)	Roadside	X 453682 Y 319672	NO <sub>2</sub>	Y	-	~2m	Y
Barrow St (Loughborough)	Roadside	X 453901 Y 319488	NO <sub>2</sub>	N	Y (façade)	~10m	Y
School St (Loughborough)	Roadside	X 453946 Y 319619	NO <sub>2</sub>	N	Y (façade)	~3m	Y
Fennel St (Loughborough)	Roadside	X 453694 Y 319890	NO <sub>2</sub>	N	Y (façade)	~3m	Y
High St (Syston)	Roadside	X 462369 Y 311809	NO <sub>2</sub>	Y	Y (façade)	~4m	Y
Syston AQMS 1	Roadside	X 462540 Y 311428	NO <sub>2</sub>	Y	Y (~10m)	~3m	Y
Syston AQMS 2	Roadside	X 462540 Y 311428	NO <sub>2</sub>	Y	Y (~10m)	~3m	Y
Syston AQMS 3	Roadside	X 462540 Y 311428	NO <sub>2</sub>	Y	Y (~10m)	~3m	Y
Baxter Gate AQMS 1 (Loughborough)	Kerbside	X 453687 Y 319672	NO <sub>2</sub>	Y	-	~1m	Y
Baxter Gate AQMS 2 (Loughborough)	Kerbside	X 453687 Y 319672	NO <sub>2</sub>	Y	-	~1m	Y
Baxter Gate AQMS 3 (Loughborough)	Kerbside	X 453687 Y 319672	NO <sub>2</sub>	Y	-	~1m	Y
Ratcliffe Rd (Loughborough)	Roadside	X 454087 Y 320392	Benzene	Y	Y (façade)	~3m	Y
Shelthorpe Rd (Loughborough)	Roadside	X 454234 Y 318657	Benzene	N	Y (~8m)	~3m	Y
High St (Loughborough)	Roadside	X 453730 Y 319596	Benzene	Y	-	~3m	Y
Market Place (Loughborough)	Urban Centre	X 453611 Y 319540	Benzene	Y	N	n/a	n/a

## 2.2 Comparison of Monitoring Results with AQ Objectives


### 2.2.1 Nitrogen Dioxide

There are no sites recording more than 18 1-hour means above  $200\mu\text{g}/\text{m}^3$ , however as can be seen from the following 2008 data results there are a number of exceedences of the  $40\mu\text{g}/\text{m}^3$  annual mean. All of these sites, with the exception of one, occurred in areas already declared as part of an AQMA.

The one outstanding site (Ashby Rd Central, Shepshed) is a roadside location where the tube is positioned ~12m away from the façade of the nearest receptor.

Using the “NO<sub>2</sub> with Distance from Roads Calculator” (Issue 2) available from the UK Air Quality Archive, it is possible for us to calculate the distance NO<sub>2</sub> falloff between the kerbside tube and this receptor. Using this calculator the concentration at the receptor is shown below to be  $32.7\mu\text{g}/\text{m}^3$ :

**This calculator allows you to predict the annual mean NO<sub>2</sub> 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.**



**Enter data into the yellow cells**

<b>Step 1</b>	<b>How far from the KERB was your measurement made (in metres)?</b>	(Note 1)	<b>2</b>	metres
<b>Step 2</b>	<b>How far from the KERB is your receptor (in metres)?</b>	(Note 1)	<b>14</b>	metres
<b>Step 3</b>	<b>What is the local annual mean background NO<sub>2</sub> concentration (in <math>\mu\text{g}/\text{m}^3</math>)?</b>	(Note 2)	<b>14.94332</b>	$\mu\text{g}/\text{m}^3$
<b>Step 4</b>	<b>What is your measured annual mean NO<sub>2</sub> concentration (in <math>\mu\text{g}/\text{m}^3</math>)?</b>	(Note 2)	<b>47.6</b>	$\mu\text{g}/\text{m}^3$
<b>Result</b>	<b>The predicted annual mean NO<sub>2</sub> concentration (in <math>\mu\text{g}/\text{m}^3</math>) at your receptor</b>	(Note 3)	<b>32.7</b>	$\mu\text{g}/\text{m}^3$

Note 1: This 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](http://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 LAGM 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 2: 16/03/09. Created by Dr Ben Marner; Approved by Prof Duncan Laxen. Contact: [benmarner@aqconsultants.co.uk](mailto:benmarner@aqconsultants.co.uk)

## Charnwood Borough Council - England

### Automatic Monitoring Data

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

Site ID	Location	Within AQMA?	Proportion of year with valid data 2008 %	Annual mean concentrations ( $\mu\text{g}/\text{m}^3$ )		
				2006	2007	2008
11	Durham Rd, L'boro	N	97.6	26.7	30.6	26.7
34/36	Melton Rd, Syston	Y	97.2	n/a	n/a	34.4
37/39	Baxter Gate, L'boro	Y	97.6	n/a	n/a	<b>47.8</b>

**Table 2.3b Results of Automatic Monitoring for Nitrogen Dioxide: Comparison with 1-hour Mean Objective**

Site ID	Location	Within AQMA?	Data Capture 2008 %	Number of Exceedences of hourly mean ( $200 \mu\text{g}/\text{m}^3$ )		
				2006	2007	2008
11	Durham Rd, L'boro	N	97.6	0	0	0
34/36	Melton Rd, Syston	Y	97.2	n/a	n/a	6
37/39	Baxter Gate, L'boro	Y	97.6	n/a	n/a	0

*If the period of valid data is less than 90% of a full year, include the 99.8<sup>th</sup> %ile of hourly means in brackets.*

Diffusion Tube Monitoring Data

Table 2.4 Results of Nitrogen Dioxide Diffusion Tubes

Site ID	Location	Within AQMA?	Data Capture 2008 %	Annual mean concentrations ( $\mu\text{g}/\text{m}^3$ ) Adjusted for bias		
				2006	2007	2008
1	Ratcliffe Rd (Loughborough)	Y	100	43.7	51.0	<b>48.0</b>
2	Shelthorpe Rd (Loughborough)	N	100	29.9	33.3	31.9
3	Forest Rd (Loughborough)	N	100	34.9	38.0	35.3
5	Haydon Road (Loughborough)	Y	100	35.2	37.7	37.2
6	Alan Moss Rd/Epinal Way (Loughborough)	Y	100	31.7	34.7	31.8
7	Epinal Way/Ling Rd (Loughborough)	N	100	34.9	37.3	33.6
8	Leicester Rd (Loughborough)	Y	100	43.8	48.9	<b>41.2</b>
9	Derby Rd (Loughborough)	Y	100	43.7	46.2	38.9
10	Derby Rd/Brisco Avn (Loughborough)	Y	100	31.4	39.5	36.3
11 i	Durham Rd AQMS 1 (Loughborough)	N	100	27.2	30.8	26.7
11 ii	Durham Rd AQMS 2 (Loughborough)	N	100	25.2	30.4	27.2
11 iii	Durham Rd AQMS 3 (Loughborough)	N	100	27.8	30.2	26.5
12	Alan Moss Rd/A6 Derby Rd (Loughborough)	Y	100	40.1	42.8	<b>44.5</b>
13	High St (Loughborough)	Y	100	70.4	78.2	<b>65.9</b>
14	Market Place (Loughborough)	Y	100	27.4	32.7	28.6
15	Ashby Rd (Loughborough)	Y	100	45.8	48.3	<b>46.6</b>
16	Cow Hill Lodge (Shepshed)	N	42	-	-	36.1
17	Rosebery St (Loughborough)	N	92	26.3	29.1	27.5
18	Melton Rd Town Centre (Syston)	Y	100	40.3	42.3	33.3
19	1123 Melton Rd (Syston)	Y	100	35.8	38.2	30.6
20	1116 Melton Rd (Syston)	Y	100	38.5	43.6	32.7
21	Loughborough Rd (Birstall)	N	100	40.5	43.7	30.7



## Charnwood Borough Council - England

22	A6 (Birstall)	N	92	41.3	44.5	36.4
23	21 Humberstone Lane (Thurmaston)	N	100	46.2	48.3	37.4
23a	5 Wayside Dr (Thurmaston)	N	92	-	-	26.5
23b	43 Humberstone Ln (Thurmaston)	N	92	-	-	33.9
23c	620 Melton Rd (Thurmaston)	N	92	-	-	28.2
23d	565 Melton Rd (Thurmaston)	N	92	-	-	31.1
26	Ashby Rd Central (Shepshed)	N	100	40.2	50.7	<b>47.6</b>
27	Loughborough Rd (Hathern)	N	100	40.3	45.9	38.2
28	Baxter Gate (Loughborough)	Y	92	53.2	57.8	<b>49.8</b>
29	Barrow St (Loughborough)	N	100	32.2	37.6	36.5
30	School St (Loughborough)	N	92	30.4	35.9	30.7
31	Fennel St (Loughborough)	N	100	33.3	36.9	35.1
33	High St (Syston)	Y	100	27.1	40.8	30.0
34	Syston AQMS 1	Y	100	-	-	36.5
35	Syston AQMS 2	Y	100	-	-	33.9
36	Syston AQMS 3	Y	100	-	-	33.2
37	Baxter Gate AQMS 1 (Loughborough)	Y	100	-	-	<b>46.4</b>
38	Baxter Gate AQMS 2 (Loughborough)	Y	100	-	-	<b>48.5</b>
39	Baxter Gate AQMS 3 (Loughborough)	Y	100	-	-	<b>48.5</b>

For unadjusted monthly mean data for 2008, please see Appendix C.

### **Bias Correction Factors used in Table 2.4:**

#### 2008

Results for tubes 13, 28, and 37-39 have been corrected against the Baxter Gate automatic monitor (factor = 1.08)

Results for tubes 18-23, 23a-d and 33-36 have been corrected against the Syston automatic monitor (factor = 0.94)

All other tubes are corrected against the Durham Road automatic monitor (factor = 1.13)

#### 2007

All tubes corrected against the Durham Road automatic monitor (factor = 1.12)

#### 2006

All tubes corrected against the Durham Road automatic monitor (factor = 1.14)

## 2.2.2 PM<sub>10</sub>

In 2008 there were no recorded breaches of either the Annual Mean or 24-hour Mean objectives at our only long-term automatic (TEOM) monitoring site.

The monitoring site is an urban background site just outside of the Loughborough NO<sub>2</sub> AQMA.

**A separate Detailed Assessment in respect of PM<sub>10</sub> levels in the vicinity of the Lafarge Quarry in Mountsorrel is due to be submitted in the final quarter of 2009.**

**Table 2.5a Results of PM<sub>10</sub> Automatic Monitoring: Comparison with Annual Mean Objective**

Site ID	Location	Within AQMA?	Data Capture 2008 %	Annual mean concentrations (µg/m <sup>3</sup> )		
				2006	2007	2008
11	Durham Rd, L'boro	N	95.1	20.8	19.5	16.9

**Table 2.5b Results of PM<sub>10</sub> Automatic Monitoring: Comparison with 24-hour Mean Objective**

Site ID	Location	Within AQMA?	Data Capture 2008 %	Number of Exceedences of the 24-hour mean (50 µg/m <sup>3</sup> ) <i>If data capture &lt; 90%, include the 90<sup>th</sup> %ile of hourly means in brackets.</i>		
				2006	2007	2008
11	Durham Rd, L'boro	N	95.1	5	8	1

### Notes:

- i. All figures in Tables 2.5a/b have been derived by using the default 1.3 gravimetric correction factor as advised in previous editions of the Technical Guidance.
- ii. 2008 figures were attempted to be calculated from the King's College London Volatile Correction Model (VCM) model on 29<sup>th</sup> May 2009 (i.e. **after 28<sup>th</sup> April 2009**, when an error in the model equation was identified and corrected). However, the following error was reported during this attempt:

**"There are no known FDMS<sup>\*</sup> sites within the valid range of the Volatile Correction Model, which is 130km"**

[FDMS = Filter Dynamics Measurement System. A relatively new automatic monitoring technique and a proven equivalent to the reference method for PM10 and PM2.5].

## Charnwood Borough Council - England

### 2.2.3 Sulphur Dioxide

In 2008 there were no recorded breaches of either the 15 minute, 1-hour or 24-hour Mean objectives at our automatic SO<sub>2</sub> monitoring site.

The monitoring site is an urban background site just outside of the Loughborough NO<sub>2</sub> AQMA.

**Table 2.6 Results of Automatic Sulphur Dioxide Monitoring**

<b>2008</b>	
Maximum 15 minute mean concentration	114.4µgm <sup>-3</sup>
Exceedences of 15 minute concentration @ 266µgm <sup>-3</sup>	0
Maximum 1 hour mean concentration	71.8µgm <sup>-3</sup>
Exceedences of 1 hour concentration @ 350µgm <sup>-3</sup>	0
Maximum 24-hour mean concentration	23.9µgm <sup>-3</sup>
Exceedences of 24-hour concentration @ 125µgm <sup>-3</sup>	0
Data capture	46.3%

(A conversion factor of 2.66 has been applied to the raw data originally measured as ppb, as per Annex1: 1.163 / Box A1.5 (pg A1-36) LAQM.TG assuming 20°C and 101.3 kPa)

As the 46% data capture recorded for 2008 was <90%; guidance states that a percentile calculation should be used rather than a count of exceedences:

#### **15 Minute Mean Concentration (2008)**

From the 16,253 data points captured throughout 2008, the 99.9<sup>th</sup> percentile is calculated as being 58.5µgm<sup>-3</sup>

#### **1 Hour Mean Concentration (2008)**

From the 4,203 data points captured throughout 2008, the 99.7<sup>th</sup> percentile is calculated as being 23.9µgm<sup>-3</sup>

#### **24 Hour Mean Concentration (2008)**

From the 169 data points captured throughout 2008, the 99<sup>th</sup> percentile is calculated as being 8.0µgm<sup>-3</sup>

**2.2.4 Benzene**

In 2008 there were no recorded breaches of either the annual or running annual mean objectives at our 4 benzene diffusion tube locations:

Location	Within AQMA?	Data Capture 2008 %	Annual mean concentrations ( $\mu\text{g}/\text{m}^3$ )		
			2006	2007	2008
Ratcliffe Rd (Loughborough)	N	100	1.59	1.65	1.47
Shelthorpe Rd (Loughborough)	N	100	1.29	1.36	1.26
High St (Loughborough)	N	100	2.08	2.06	1.63
Market Place (Loughborough)	N	100	0.89	1.09	0.94

***Due to the consistent low levels that have been recorded since 1999; a decision to suspend all future benzene monitoring within the Borough was made at the end of 2008.***

## **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 (>20%) flow of buses/HGVs, which 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 (>10,000 vehicles) that 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**

Planning permission for the Loughborough Inner Relief Road (LIRR) was granted in May 2007. The scheme will provide a peripheral route around the central core of the town, replacing the A6 between its junctions at Bridge Street and at Southfields Road. The IRR is not intended to increase capacity, but it will enable the part of the A6 through the town centre to be closed off to traffic (except buses) and eliminate the severance and conflict which exists between the high volume of traffic and large numbers of pedestrian crossing movements.

As part of the Planning Application, a full Air Quality Assessment - NO<sub>2</sub> and PM<sub>10</sub> - for the proposed route (which significantly impacts on the existing Loughborough NO<sub>2</sub> AQMA) was submitted as part of the Transport Analysis Guidance (TAG) as required by the DfT.

Subject to satisfactory completion of the statutory procedures and government money being made available, construction of the relief road and junction improvements will be undertaken. Once traffic is diverted to this new route, work will commence on the town centre transport improvements, thus minimising disruption to the town.

A Public Hearing is scheduled for summer 2009 in respect of the scheme. A further AQ Assessment is currently being undertaken by consultants, which will be supported by more recent data and more reliable modelling methods.

Full details of the scheme can be seen at:

[http://www.leics.gov.uk/index/highways/road\\_pathway\\_maintenance/major\\_transport\\_projects/loughborough\\_town\\_centre\\_transport\\_proposals.htm](http://www.leics.gov.uk/index/highways/road_pathway_maintenance/major_transport_projects/loughborough_town_centre_transport_proposals.htm)

Charnwood Borough Council has assessed new/newly identified junctions meeting the criteria in Section A.5 of Box 5.3 in TG(09), 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 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 area 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 30<sup>th</sup> 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 has assessed new/proposed industrial installations, and concluded that it will not be necessary to proceed to a Detailed Assessment.

#### **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<sup>3</sup>, 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 30/01/07***

The above facility is permitted for 339,472 laying hens. All houses have side extraction ventilation systems.

As the farm has less than 400,000 birds and is mechanically ventilated 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 confirms that there are no biomass combustion plants in the Local Authority area.

### **6.2 Biomass Combustion – Combined Impacts**

Charnwood Borough Council confirms that there are no biomass combustion plants in the Local Authority area.

### **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**

Following previous rounds of LAQM reports; Charnwood Borough Council are mid-term through a 7 month monitoring period in respect of an outstanding Detailed Assessment in relation to PM<sub>10</sub> levels in the vicinity of the Lafarge Aggregates quarry at Mountsorrel.

Following communications with DEFRA it was agreed that this outstanding Detailed Assessment could be deferred until 2009. At the time of writing a Partisol particulate monitor is currently commissioned and collecting data for report submission later in the year.

## 8 Conclusions and Proposed Actions

### 8.1 Conclusions from New Monitoring Data

New (2008) monitoring data shows that the  $40\mu\text{g}\cdot\text{m}^{-3}$  annual mean objective for  $\text{NO}_2$  was exceeded at the following monitored locations:

1. Ratcliffe Rd (Loughborough)
2. Leicester Rd (Loughborough)
3. Alan Moss Rd/A6 Derby Rd (Loughborough)
4. High St (Loughborough)
5. Ashby Rd (Loughborough)
6. Ashby Rd Central (Shepshed)
7. Baxter Gate (Loughborough)

With the exception of the Shepshed site; all the above locations fall within the existing Loughborough Air Quality Management Area.

As shown under 2.2.1; when considering the nearest receptor, the result from the roadside tube at Shepshed falls within the objective level when the "NO<sub>2</sub> with Distance from Roads Calculator" (Issue 2) is applied to the data.

There have been no other exceedences recorded for 2008.

### 8.2 Conclusions from Assessment of Sources

Until completion of the Detailed Assessment later this year in relation to  $\text{PM}_{10}$  levels in the vicinity of the Lafarge Aggregates quarry at Mountsorrel; the impact of sources/fugitive emissions remains uncertain.

Outside of the existing AQMA (The Loughborough GCR AQMA), we consider that no other new/existing/significantly changed sources are leading to (or will lead to) potential exceedences 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. Already within an existing AQMA
- c. Subject to an outstanding Detailed Assessment

i.e. in respect of:

- (1)  $\text{NO}_2$  results around the junction at Humberstone Lane, Thurmaston.

***DA recently submitted to DEFRA and we await their appraisal.***

***The conclusion of this report has already led to the re-location of a number of diffusion tubes in order to further determine the extent of the  $\text{NO}_2$  exposure in the area.***

**Charnwood Borough Council - England**

- (2) PM<sub>10</sub> levels in the vicinity of the Lafarge Aggregates quarry at Mountsorrel  
**7 month monitoring underway.**

Further to our submission of (2) later this year and following any recommendations that are made to us in respect of (1); our next action will be the submission of the 2010 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](http://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](http://www.charnwood.gov.uk/pages/airpollution)

LAQM Support - NO<sub>2</sub> Diffusion Tube QA/QC

[www.laqmsupport.org.uk/no2qaqc.php](http://www.laqmsupport.org.uk/no2qaqc.php)

## **Appendices**

Appendix A: QA/QC Data

Appendix B: Unadjusted Monthly Mean NO<sub>2</sub> Tube Data (2008)

## Appendix A: QA/QC Data

### Diffusion Tube Bias Adjustment Factors

All NO<sub>2</sub> diffusion tubes are supplied and analysed by Gradko using 20% TEA in water preparation.

### Factor from Local Co-location Studies

Triplicates are co-located at our 3 automatic monitoring sites:

Site ID	Location	Triplicate annual mean average (µg/m <sup>3</sup> ) (Dm)	Automatic analyser annual mean concentration (µg/m <sup>3</sup> ) (Cm)	Bias correction factor (Cm / Dm)
11	Durham Rd, L'boro	23.7	26.7	1.13
34/36	Melton Rd, Syston	36.8	34.4	0.94
37/39	Baxter Gate, L'boro	44.2	47.8	1.08

### Discussion of Choice of Factor to Use

Consideration was 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 were part of our decision for *using locally derived factors*.

- 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

Due to having 3 monitors in the borough we have chosen 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.

It should be noted however that historically our correction factors have been considerably higher than those that can be obtained via the national correction spreadsheet. ***We therefore feel that our corrected results may be marginally (at least) exaggerated.***

### PM Monitoring Adjustment

- All figures in Tables 2.5a/b have been derived by using the default 1.3 gravimetric correction factor as advised in previous editions of the Technical Guidance.
- 2008 figures were attempted to be calculated from the King's College London Volatile Correction Model (VCM) model on 29<sup>th</sup> May 2009 (i.e. ***after 28<sup>th</sup> April 2009***, when an error in the model equation was identified and corrected). However, the following error was reported during this attempt:

**"There are no known FDMS sites within the valid range of the Volatile Correction Model, which is 130km"**



## Charnwood Borough Council - England

### Short-term to Long-term Data adjustment

From the diffusion tube sites monitored during 2008, only one site would be considered of “short-term” duration where data adjustment is necessary to allow for seasonal variation etc.

The Cow Hill Lodge (Shepshed) tube was deployed in August and is now part of our long-term network

Applying the calculation as per Box 3.2 Estimation of annual mean concentrations from short-term monitoring data on page 3.4 of LAQM.TG(09):

Partial measured mean concentration (**M**) for Cow Hill Lodge (Aug-Dec 08) =  $32.9\mu\text{g}/\text{m}^3$

Site	Site Type	Annual Mean (Am)	Period Mean (Pm)	Ratio (Am/Pm)
Durham Rd, L'boro	Urban Background	23.7	24.3	0.975
Market Place, L'boro	Urban Centre (pedestrianised)	25.3	26.4	0.958
Rosebery St, L'boro	Roadside	24.4	25.0	0.976
			<b>Average (R<sub>a</sub>)</b>	<b>0.970</b>

Best estimate of Cow Hill Lodge in 2008 will be  $\mathbf{M} \times \mathbf{R}_a = 32.9 \times 0.970 = 31.91\mu\text{g}/\text{m}^3$

### QA/QC of automatic monitoring

The analysers are serviced under schedule via Casella Ltd.

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) over the preceding 12 months, prepared by AEA, are as follows:

<u>WASP Rounds 97 - 100 (Apr 2007 - Apr 2008)</u>	:	Good
<u>WASP Rounds 98 - 102 (Jul 2007 - Jul 2008)</u>	:	Good
<u>WASP Rounds 99 - 103 (Oct 2007 - Oct 2008)</u>	:	Good
<u>WASP Rounds 100 - 104 (Jan 2008 - Jan 2009)</u>	:	Good

## Appendix B: Unadjusted Monthly Mean NO<sub>2</sub> Tube Data (2008)

NITROGEN DIOXIDE RESULTS MICROGRAMS/CUBIC METRES															
Site ref		Jan-08	Feb-08	Mar-08	Apr-08	May-08	Jun-08	Jul-08	Aug-08	Sep-08	Oct-08	Nov-08	Dec-08	UNBIASED ANN.AVE	
1	RATCLIFFE RD, LOUGHBOROUGH	47.53	53.56	38.92	48.56	32.09	47	38.57	38.21	33.73	39.48	51.23	40.92	<b>42.5</b>	
2	SHELTHORPE RD, LOUGHBOROUGH	252	38.73	25.11	31.68	32	16.32	20.14	19.62	30.46	25.93	36.84	37.05	28.3	
3	FOREST RD, LOUGHBOROUGH	34.87	41.06	25.14	37.22	36.06	26.42	22.92	25.78	24.13	29.3	38.42	33.87	31.3	
5	HAYDON RD, LOUGHBOROUGH	43.83	40.87	29.4	32.18	21.7	21.73	24.09	34.38	27.91	38.04	40.22	40.83	32.9	
6	ALAN MOSS RD/EPINAL WAY, LOUGHBORO	35.51	36.9	27.37	29.81	20.88	21.98	21.57	25.15	25.04	30.07	32.01	31.78	28.2	
7	EPINAL WAY/LING RD	30.65	38.92	28.01	29.94	26.76	26.88	25.65	24.19	31.27	21.38	36.88	35.83	29.7	
8	LEICESTER RD, LOUGHBOROUGH	35.36	40.84	38.27	42	58.63	32.56	32.83	27.84	18.53	26.96	41.41	41.77	36.4	
9	DERBY RD, LOUGHBOROUGH I	36.54	44.14	28.56	37.36	43.68	33.15	27.69	25.62	22.65	26.27	37.22	50.18	34.4	
10	DERBY RD/BRISCOE AVE 2	35.96	37.88	32.24	34	30.96	26.75	26.18	24.74	22.87	29.73	40.5	43.39	32.1	
11 i	DURHAM RD, LOUGHBOROUGH	30.57	35.88	22.12	22.54	22.69	18.06	14.89	15.8	15.34	20.74	33.28	32.16	23.7	
11 ii	DURHAM RD 2, LOUGHBOROUGH	28.05	32.36	27.48	23.29	24.43	19.86	13.53	18.08	18.19	20.4	31.65	31.18	24.0	
11 iii	DURHAM RD 3, LOUGHBOROUGH	26.58	34.01	17.23	23.7	12.55	21.95	17.45	18.19	25.04	22.53	32.24	29.43	23.4	
12	ALAN MOSS RD/A6	34.55	44	38.15	38	39.3	29.68	28.62	33.32	53.34	38.94	46.4	47.94	39.4	
13	HIGH ST, LOUGHBOROUGH	80.33	79.95	61.32	67.22	48.33	62.1	58.06	66.77	37.6	68.47	38.86	63.14	<b>61.0</b>	
14	MARKET PLACE, LOUGHBOROUGH	27.67	33.59	22.83	26.3	22.01	23.11	16.74	18.99	20.78	25.31	33.39	33.29	25.3	
15	ASHBY RD, LOUGHBOROUGH	45.75	49.86	39.05	41.24	44.06	34.39	37.5	38.7	39.62	36.16	42	46.94	<b>41.3</b>	
16	LODGE HOUSE SHEPSHED	nd	nd	nd	nd	nd	nd	nd	38.7	26.54	24.76	35.65	39.01	32.9	
17	ROSEBERY ST, LOUGHBOROUGH	27.79	35.34	22.69	22.14	18.48	16.51	nd	18.66	15.29	24.1	33.64	33.53	24.4	
18	MELTON RD TOWN CENTRE, SYSTON 1	44.75	43.72	33.37	31.13	38.08	26.39	32.64	30.94	25.45	33.93	40.42	44.51	35.4	
19	MELTON RD/ADJ ST PETERS RD, SYSTON 2	41.2	41.29	28.81	34	29.91	24.39	22.06	27.1	27.72	33.35	39.71	40.67	32.5	
20	MELTON RD SYSTON 3	42.55	43.21	31.72	30.18	33.18	35.9	25.68	30.26	24.83	34.75	46.45	38.46	34.8	
21	LOUGHBOROUGH RD, BIRSTALL	45.9	42.75	30.98	32.95	25.12	30.46	25.91	31.12	21.68	32.99	41.15	30.3	32.6	
22	BIRSTALL A6	42.47	47.24	33.06	43.16	38.43	35.26	32.58	nd	35.35	37.93	45.02	35.58	38.7	
23	21 HUMBERSTONE LANE, THURMASTON	49.79	51.94	37.75	47.69	37.07	29.75	30.01	40.3	29.47	37.09	39.59	47.65	39.8	
23a	5 WAYSIDE DR, THURMASTON	nd	38.41	32.48	26.28	25.92	25.45	23.66	23.52	11.18	31.55	36.81	34.37	28.1	
23b	43 HUMBERSTONE LANE, THURMASTON	nd	47.18	26.65	39.88	33.77	37.01	35.71	33.85	26.89	34.79	42.39	38.77	36.1	
23c	620 MELTON RD, THURMASTON	nd	38.46	33.32	31.66	23.15	24.54	26.12	26.64	20.28	35.66	32.13	38.3	30.0	
23d	565 MELTON RD, THURMASTON	nd	45.33	35.51	32.98	21.84	29.25	26.66	30.56	31.98	29.14	41.53	38.93	33.1	
26	ASHBY RD CENTRAL, SHEPSHED	41.25	54.73	35.39	43.56	59.93	30.73	38.15	38.8	29.32	39.58	49.27	44.46	<b>42.1</b>	
27	LOUGHBOROUGH RD, HATHERN	38.45	43.68	32.5	22.81	29.84	34.59	28.48	24.98	31.71	33.37	44.51	40.97	33.8	
28	BAXTERGATE, LOUGHBOROUGH	46.23	59.44	nd	51.44	54.1	46.35	36.81	29.4	32.41	41.04	59.13	51.14	<b>46.1</b>	
29	BARROW ST, LOUGHBOROUGH	36.07	36.71	29.76	32.38	28.41	25.92	27.97	24.77	28.59	30.5	43.06	43.51	32.3	
30	SCHOOL ST, LOUGHBOROUGH	33.01	38.19	26.48	28.34	17.41	25.2	nd	21.05	13.63	27.61	32.72	35.21	27.2	
31	FENNEL ST, LOUGHBOROUGH	35	41.25	28.7	30.83	28.92	25.29	28.96	30.72	22.15	29.89	39.63	31.64	31.1	
33	HIGH STREET, SYSTON	40.46	40.5	29.32	30.67	25.4	28.23	26.8	27.65	28.01	34.46	38.12	33.43	31.9	
34	SYSTON AQMS1	47.58	49.4	31.1	35.12	37.63	34.92	34.39	37.98	33.58	37.85	42.03	44.53	38.8	
35	SYSTON AQMS2	50.7	50.54	31.38	33.96	29.79	29.52	27.53	35.24	15.83	38.08	44.24	46.04	36.1	
36	SYSTON AQMS3	43.94	42.87	33.27	29.97	22.43	27.39	29.5	34.68	32.15	43.01	42.46	42.6	35.4	
37	LOUGHBOROUGH AQMS1	47.29	52.58	40.85	54.51	43.72	47.56	39.15	32.02	21.04	40.05	52.73	43.85	<b>42.9</b>	
38	LOUGHBOROUGH AQMS2	43.35	51.11	47.46	46.28	58.97	42.96	37.39	31.96	30.1	40.61	53.84	54.43	<b>44.9</b>	
39	LOUGHBOROUGH AQMS3	45.47	52.3	46.63	50.92	49.88	51.11	39.93	31.57	29.42	39.68	47.46	54.21	<b>44.9</b>	